FREE LUNCH OR CHEAP FIX?:

THE EMISSIONS TRADING IDEA AND THE CLIMATE CHANGE CONVENTION

David M. Driesen [1]

Emissions trading has become a key component of U.S. environmental legal regimes. The U.S. has successfully lobbied to make international environmental benefit trading, an expanded form of emissions trading, a part of international efforts to address the threat of global climate change through the Framework Convention on Climate Change and the Kyoto Protocol to that Convention. Legal Scholars have lauded emissions trading, as a "free lunch" that will encourage innovation, enhance democratic accountability, and reduce the cost of environmental cleanup. This article argues that emissions trading functions as a cheap fix, reducing short-term costs while tending to lessen innovation and thwart democratic accountability. Because of this, emissions trading will ultimately weaken efforts to address complex environmental problems, unless policymakers carefully limit trading programs to make sure that they do not undermine innovation and democratic accountability. The author recommends specific limits to international emissions trading designed to avoid undermining the long-term efficacy of the climate change regime.

[P]arsimony is not economy. It is separable in theory from it; and in fact it may or it may not be a *part* of economy, according to circumstances. Expense, and great expense, may be an essential part in true economy. If parsimony were to be considered as one of the kinds of that virtue, there is, however, another and a higher economy. Economy is a distributive virtue, and consists, not in saving, but in selection. Parsimony requires no providence, no sagacity, no powers of combination, no comparison, no judgment. Mere instinct, and that not an instinct of the noblest kind, may produce this false economy in perfection. The other economy has larger views. It demands a discriminating judgment, and a firm, sagacious mind.

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[1] Assistant Professor, Syracuse University College of Law; J.D. Yale Law School, 1989. I wish to thank Professors William Buzbee and Charles Hall for their advice and suggestions. I assume responsibility for any errors and omissions.

Edmund Burke[2]

INTRODUCTION

When the roof leaks, a homeowner must decide whether to patch the roof or replace it. The homeowner recognizes that this decision involves a choice between a cheap fix and a solution with more short-term costs and more long-term benefit.

The decision to patch the roof may address today's leak more cheaply than replacing the roof. But the wise homeowner does not regard this "least-cost" solution as something she should accept as readily as, say, a "free lunch" to which there is no discernible downside. The homeowner at least considers whether a more expensive solution, replacing the roof, may work better in the long run.

Nations often face a similar choice between cheap fixes and more enduring solutions to societal problems when they create new law. However, policy makers and scholars may either fail to perceive the existence of this choice or fail to think about it carefully. Any solution that promises to meet a short-term policy goal with fairly low immediate costs may seem like a "free lunch."

This article focuses on a very serious problem facing the international community, global climate change, and a very important idea in environmental policy, achieving environmental goals more cheaply through emissions trading.[3] Emissions trading programs allow polluters to forego otherwise required pollution reductions at regulated

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2.A Letter to a Noble Lord (1795), *in* SELECTED WRITINGS AND SPEECHES-EDMUND BURKE, at 564[END]65 (Peter J. Stanlis ed.) (1968).

3.*See* Daniel Bodansky, *The United Nations Framework Convention on Climate Change: A Commentary*, 18 YALE J. INT'L L. 451, 453 (1993) (predicted rise in temperature "could have severe effects on coastal areas, agriculture, forests, and human health"); Dr. Ranee Khooshie Lal Panjabi, *Can International Law Improve the Climate? An Analysis of the United Nations Framework Convention on Climate Change Signed at the Rio Summit in 1992*, 18 N.C.J. INT'L L. & COM. REG. 491, 493[END]500 (1993); Intergovernmental Panel on Climate Change (IPCC), THE REGIONAL IMPACTS OF CLIMATE CHANGE: AN ASSESSMENT OF VULNERABILITIES (Robert T. Watson et al. eds., 1997) [hereinafter IPCC REGIONAL IMPACTS]; IPCC, CLIMATE CHANGE 1995: THE SCIENCE OF CLIMATE CHANGE 6 (J.T. Houghton et al. eds., 1996) [hereinafter IPCC 1995 SCIENCE]; David M. Driesen, *Is Emissions Trading an Economic Incentive Program?: Replacing the Command and Control/Economic Incentive Dichotomy*, 55 WASH. & LEE L. REV. 289, 291[END]92 (1998) (describing the importance of emissions trading in environmental policy); Royal C. Gardner, *Banking on Entrepreneurs: Wetlands Mitigation Banking, and Takings*, 81 IOWA L. REV. 527 (1996) (arguing that trading offers a way of avoiding takings claims while continuing to regulate wetlands); Robert W. Hahn & Robert N. Stavins, *Incentive-Based Environmental Regulation: A New Era from an Old Idea?*, 18 ECOLOGY L.Q. 1 (1991) (discussing factors explaining increased use of emissions trading); Robert W. Hahn & Gordon L. Hester, *Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program*, 6 YALE J. ON REG. 109 (1989); Daniel J. Dudek & John Palmisano, *Emissions Trading: Why is*

pollution sources if they produce or purchase equivalent reductions made elsewhere.[4] Since a polluter will only choose to purchase a reduction elsewhere when doing so saves money, emissions trading tends to reduce private sector compliance costs. Recognizing this, some very prominent scholars have analogized emissions trading to a "free lunch" and this analogy has influenced many policy makers.[5]

The United States has made international emissions trading a centerpiece of its climate change policy.[6] Trading issues commanded the attention of delegates to the recent Kyoto conference on climate change, and they promise to play an important role in the future evolution of international law addressing climate change.[7]

This article argues that the cheap fix metaphor describes emissions trading better than the free lunch metaphor that some scholars have applied to it. The "free lunch" metaphor captures emissions trading's theoretical capacity to meet a short-term goal at less cost than traditional regulation. But emissions trading, and environmental benefit trading generally, may increase the risk of long-term environmental damage. For example, trading may facilitate avoidance of initially expensive or difficult investments in innovative technology. Avoidance of innovation may raise long-term costs and make future progress more difficult. The cheap fix metaphor captures significant problems with emissions trading that have received relatively little attention.

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this Thoroughbred Hobbled, 13 COLUM. J. ENVTL. L. 217 (1988).

4.*See* Driesen, *supra* note 2, at 290.

5.*See* Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law: The Democratic Case for Market Incentives*, 13 COLUM. J. ENVTL. L. 171, 172 (1988); THE ENVIRONMENTAL PROTECTION SYSTEM IN TRANSITION: TOWARD A MORE DESIRABLE FUTURE 39[END]40 (1998) [hereinafter ENVIRONMENTAL TRANSITION] (reflecting a policy consensus of various government officials, industry representatives, and academics that emissions trading programs "hold great promise as cost-effective methods for achieving environmental goals and encouraging technological innovation"). Nevertheless, most responsible analysts and policy-makers realize that emissions trading poses complex design issues and is not a good tool for all problems. *See, e.g.*, Driesen, *supra* note 2, at 309, 329 & n.186; WILLIAM J. BAUMOL & WALLACE E. OATES, THE THEORY OF ENVIRONMENTAL POLICY 190 (2d ed. 1988) (claiming that the ideal policy requires a mix of trading and other approaches); J.H. DALES, POLLUTION, PROPERTY AND PRICES 98 (1968) (pointing out that emissions trading is impracticable for "diffuse" pollution); ENVIRONMENTAL TRANSITION, *supra* note 4, at 39[END]40.

6.*See* James H. Searles, *Analysis of the Kyoto Protocol to the U.N. Framework Convention on Climate Change*, 21 Int'l. Env't. Rep. (BNA) 131, 133 (Feb. 4, 1998) (U.S. has demanded emissions trading in exchange for legally binding emissions reductions); Tanya L. Forsheit, *International Emissions Trading: Equity Issues in the Search for Market-Based Solutions to Global Environmental Degradation*, 18 U. PA. J. INT'L ECON. L. 689, 704 (1997).

7.Searles, *supra* note 5, at 132[END]33; *Kyoto Protocol Opens for Signature As Officials Face Talks on New Issues*, 21 Int'l Env't. Rep. (BNA) 246 (March 18, 1998) (joint implementation and emissions trading at core of agenda for Buenos Aires conference in November).

Decisions about whether to adopt legal cheap fixes involve analogues to the economic and budgetary considerations a homeowner faces in deciding whether to replace or repair a leaky roof. Writing law, however, involves more than just financial calculations. Law helps shape norms[8] and political expectations that help a community to function effectively over the long-term.[9] The need to shape norms capable of uniting a community to address difficult problems often makes short-term fixes less desirable for a society than for a stable homeowner. For cheap fixes may disregard important norms and values. Yet government officials may have even more reasons to choose cheap fixes than the heads of stable households. This suggests that scholars should make understanding cheap fix problems a central focus of their work, especially when they write about treaty regimes and legislation.

Part I of this article explains key features of the United Nations Framework Convention on Climate Change (Framework Convention or Convention),[10] the Kyoto Protocol to that Convention,[11] and emissions trading. The Framework Convention contains two potentially conflicting principles relevant to emissions trading, the principle that developed countries should provide leadership in addressing climate change (the leadership principle), and the cost effectiveness principle.[12] Part I explains the "free lunch" theory of emissions trading and

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8.*See* FRIEDRICH V. KRATOCHWIL, RULES, NORMS, AND DECISIONS: ON THE CONDITIONS OF PRACTICAL AND LEGAL REASONING IN INTERNATIONAL RELATIONS AND DOMESTIC AFFAIRS (1989); Audie Klotz, *Norms Reconstituting Interests: Global Racial Equality and U.S. Sanctions Against South Africa*, 49 INT'L ORG. 451 (1995); Richard H. McAdams, *The Origin, Development, and Regulation of Norms*, 96 MICH. L. REV. 338 (1997); Lawrence Lessig, *Social Meaning and Social Norms*, 144 U. PA. L. REV. 2181 (1996); Cass R. Sunstein, *On the Expressive Function of Law*, 144 U. PA. L. REV. 2021, 2022 (1996); Carol M. Rose, *Rethinking Environmental Controls: Management Strategies for Common Resources*, 1991 DUKE L.J. 1, 36 ("We need to pay attention to the lessons we provide for ourselves through our laws."); *cf.* ROBERT C. ELLICKSON, ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES (1991).

9.*See, e.g.*, Klotz, *supra* note 7, at 451 (describing how a norm of racial equality helped transform politically defined interests in South Africa). *See generally* LYNNE M. JURGIELEWICZ, GLOBAL ENVIRONMENTAL CHANGE AND INTERNATIONAL LAW: PROSPECTS FOR PROGRESS IN THE LEGAL ORDER 100[END]16 (1996) (discussing the role of norms and expectations in establishing international regimes); Robert D. Cooter, *Decentralized Law for a Complex Economy: The Structural Approach to Adjudicating the New Law Merchant*, 144 U. PA. L. REV. 1643, 1647 (1996) (norms arise to coordinate the interaction of people in a community).

10.*Report of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change on the Work of the Second Part of its Fifth Session*, U.N. Conference on Environment and Development: Framework Convention on Climate Change, 5th Sess. pt. 2, Annex I, U.N. Doc. A/AC.237/18 (1992) (Part II)/Add. 1, *reprinted in* 31 I.L.M. 849 [hereinafter Framework Convention].

11.*Report of the Conference of the Parties on its Third Session*, Kyoto Protocol to the U.N. Framework Convention on Climate Change, 3rd Sess., pt. 2, Annex I, U.N. Doc. FCCC/CP/1997/7/add.1, *reprinted without certain technical corrections in* 37 I.L.M. 22 (1998) [hereinafter Kyoto Protocol].

12.Generally speaking, this article uses the term "developed countries" to refer to those countries listed in

trading's role in the Climate Change Convention (i.e., the Framework Convention with the Kyoto Protocol to that Convention).

Part II of this article examines emissions trading's likely impact on the long-term development of the Climate Change Convention. The Framework Convention's leadership principle may require developed countries to create and apply advanced technology reducing greenhouse gas emissions. Unfortunately, a broad trading program may help avoid that investment. Part II discusses how innovation avoidance may affect long-term efforts to address climate change. This part also discusses how emissions trading may interfere with the democratic accountability needed to make any international environmental legal regime effective over the long-term.[13] It argues that a "cheap fix" theory of emissions trading calls much needed attention to potential long-term problems with emissions trading that the "free lunch" theory neglects.

Part III discusses the general problem of how scholars should think about the desirability of cheap fixes. It recommends that legal scholars identify the competing values at stake in the choice of whether to use a cheap fix to address environmental and social problems. This analysis should include consideration of the role law plays in defining norms for the society and helping a community remain cohesive enough to address important problems in the future. Finally, this part recommends limiting this experiment in international trading to capture some of trading's cheap fix benefits without damaging the long-term international effort to effectively address climate change and other international environmental problems.

I. THE CLIMATE CHANGE CONVENTION AND THE EMISSIONS TRADING IDEA

This part will discuss the Framework Convention on Climate Change, the recent Kyoto Protocol to the Framework Convention, and emissions trading. This discussion will provide a basic understanding of the "free lunch" theory of trading and the law governing trading under the Climate Change Convention.

Annex I to the Framework Convention on Climate Change. *See* Framework Convention, *supra* note 9, Annex I, 31 I.L.M. at 872. These countries include the European countries, Japan, Canada, Australia, the United States, and the former Soviet Union.

13.*See, e.g.*, David A. Wirth, *Legitimacy, Accountability, and Partnership: A Model for Advocacy on Third World Environmental Issues*, 100 YALE L.J. 2645, 2653[END]55 (1991) (discussing accountability problems at the World Bank).

A. *The United Nations Framework Convention on Climate Change*

This discussion of the Framework Convention begins with an explanation of the principal problems its drafters sought to address. This part then describes the Framework Convention itself, emphasizing the major principles relevant to evaluating emissions trading.

1. *Equitable and Practical Problems*

Greenhouse gases, such as water vapor, carbon dioxide, nitrous oxides, and methane, tend to warm the earth's atmosphere.[14] Since the dawn of the industrial age, anthropogenic emissions of greenhouse gases have caused a significant rise in global mean surface temperatures and scientists expect these gases to cause greater increases in the future.[15] Burning fossil fuels creates greenhouse gas emissions, so serious efforts to combat climate change may involve less reliance upon fossil fuels.[16] Some terrestrial ecosystems (such as forests) and the oceans tend to sequester carbon emissions, acting as "carbon sinks."[17] Carbon sinks effectively reduce atmospheric

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14.*See* IPCC 1995 SCIENCE, *supra* note 2, at 59[END]60. The World Meteorological Association and the United Nations Environmental Program have established the Intergovernmental Panel on Climate Change (IPCC). G.O.P. OBASI & HS. E. DOWDESWELL, *Foreword to* IPCC 1995 SCIENCE, *supra* note 2, at vii. Thousands of scientists in more than 150 countries participate in IPCC assessments. The 1995 report, for example, reflects the work of more than 500 scientists as either authors, contributors, or reviewers. ROBERT BOLIN ET AL., *Preface in* IPCC 1995 SCIENCE, *supra* note 2, at xi. This article relies principally on the consensus views of this large number of scientists as reflected in the IPCC reports.

15.IPCC 1995 SCIENCE, *supra* note 2, at 3[END]7.

16.Winfried Lang, *Is the Ozone Depletion Regime a Model for an Emerging Regime on Global Warming?*, 9 UCLA J. ENVTL. L. & POL'Y 161, 161 (1991) (progress on global warming depends upon meeting the rising needs of developing countries without reliance upon fossil fuel combustion). *See* IPCC, CLIMATE CHANGE 1995: IMPACTS, ADAPTATIONS AND MITIGATION OF CLIMATE CHANGE: SCIENTIFIC-TECHNICAL ANALYSES 14[END]16 (Robert T. Watson et al. eds., 1996) [hereinafter IPCC IMPACTS] (discussing reducing greenhouse gas emissions from fossil fuel and switching to non-fossil energy sources); IPCC, CLIMATE CHANGE 1995: ECONOMIC AND SOCIAL DIMENSIONS OF CLIMATE CHANGE 11 (James P. Bruce et al. eds., 1996) [hereinafter IPCC DIMENSIONS] (discussing energy efficiency improvements, fuel switching). In 1990, fossil fuel consumption accounted for 70% to 90% of all anthropogenic sources of carbon dioxide. IPCC IMPACTS, *supra* note 15, at 84. Fossil fuel combustion is "the primary source of the greenhouse effect." Jennifer Woodward, *Turning Down the Heat: What United States Laws Can Do to Help Ease Global Warming*, 39 AM. U. L. REV. 203, 208 (1989).

17.*See* IPCC 1995 SCIENCE, *supra* note 2, at 61, 449; John H. Cushman, *Scientists are Turning to Trees to Repair the Greenhouse*, N.Y. TIMES, March 3, 1998 at F4.

concentrations of carbon, because they absorb more carbon from the atmosphere than they release.[18] Hence, efforts to conserve and enhance forests help ameliorate climate change.[19] Conversely, burning forests exacerbates climate change by releasing carbon dioxide into the atmosphere.[20]

Climate change in turn may increase the frequency of floods, droughts, and other natural disasters, spread infectious diseases, and disrupt ecosystems.[21] Warming may melt ice sheets and raise sea levels, causing inundation of low lying coastal areas.[22]

In 1992, representatives of more than 140 countries gathered in Rio de Janeiro to address the climate change problem. The delegates to this "Earth Summit," the United Nations Conference on Environment and Development, faced a formidable challenge, because so many important activities contribute to climate change.[23] Electricity generation, industrial production, transportation, timber harvesting, and land use decisions all play significant roles.[24]

The delegates also faced a serious equitable problem that frequently arises in international environmental

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18.Joy E. Hect & Brett Orlando, *Can the Kyoto Protocol Support Biodiversity Conservation? Legal and Financial Challenges*, 28 Envtl. L. Rep. (Envtl. L. Inst.) 10508, 10509 (1998).

19.*See* IPCC DIMENSIONS, *supra* note 15, at 11 (discussing "forestry options"); IPCC IMPACTS, *supra* note 15, at 775[END]97 (evaluating forest management strategies for mitigating climate change); Richard A. Houghton & George M. Woodwell, *Forests as Carbon Sinks, in* CRITERIA FOR JOINT IMPLEMENTATION UNDER THE FRAMEWORK CONVENTION ON CLIMATE CHANGE 35[END]40 (Kilaparti Ramakrishna ed. 1994) [hereinafter CRITERIA] (discussing the implications of continued deforestation, halting deforestation, net reforestation and substituting wood fuels for fossil fuels).

20.*See* IPCC 1995 SCIENCE, *supra* note 2, at 449; Woodward, *supra* note 15 at 208[END]10.

21.IPCC REGIONAL IMPACTS, *supra* note 2, at 2[END]6; *see* Robert L. Fischman, *Global Warming and Property Interests: Preserving Coastal Wetlands as Sea Levels Rise*, 19 HOFSTRA L. REV. 565, 565 (1991) (discussing climate change's potential threats to coastal wetlands).

22.*See* IPCC REGIONAL IMPACTS, *supra* note 2, at 5, 7, 9[END]15; IPCC 1995 SCIENCE, *supra* note, 2 at 6; LYNNE T. EDGERTON, THE RISING TIDE: GLOBAL WARMING AND WORLD SEA LEVELS (1991). This poses an especially severe problem for small island states. *See* William C. Burns, *Global Warming[EMD]The United Nations Framework Convention on Climate Change and the Future of Small Island States*, 6 DICK. J. ENVTL. L. & POL'Y 147 (1997).

23.Martin J. LaLonde, *The Role of Risk Analysis in the 1992 Framework Convention on Climate Change*, 15 MICH. J. INT'L L. 215, 217 (1993). *See* Kyoto Protocol, *supra* note 10, Annex A, 37 I.L.M. at 42 (listing sources of emissions).

24.*See* IPCC IMPACTS, *supra* note 15, at 21, 39[END]51; W. NEIL ADGER & KATRINA BROWN, LAND USE AND THE CAUSES OF GLOBAL WARMING (1994). *See, e.g., European Commission Outlines Strategy to Cut CO2 Emissions From Transportation*, 28 Env't Rep. (BNA) 2679 (April 17, 1998).

law. Developing countries usually have very limited resources to address environmental problems that require global efforts.[25] Furthermore, developed countries often have made disproportionate contributions to global pollution problems. Creators of international environmental treaties must craft obligations that adequately address the environmental problem at hand, yet avoid imposing an unfair burden upon developing countries.[26]

Developed countries, especially the United States, played a leading role in creating the climate change problem, primarily by burning large amounts of fossil fuels.[27] Industrialized countries contain just 20% of the world's population, yet they generate approximately 65% of present global emissions. These developed countries were responsible for producing 73% of cumulative emissions between 1950 and 1995.[28] The United States has the highest per capita carbon dioxide emission rate in the world[29] and alone accounts for about one quarter of the world's fossil carbon emissions.[30]

But the developed countries probably cannot solve this problem alone.[31] A number of underdeveloped countries are growing rapidly and increasing their own greenhouse gas emissions at prodigious rates.[32] If large developing countries (such as China, India and Brazil), emulate America's inefficient technology[33] as they grow

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25.This article uses the term developing countries to refer to those countries not listed in Annex I of the Framework Convention. *See* Framework Convention, *supra* note 9, Annex I, 31 I.L.M. at 872.

26.*See* Edith Brown Weiss, *International Environmental Law: Contemporary Issues and the Emergence of a New World Order*, 81 GEO. L.J. 675, 705 (1993) (citing issues of responsibility for harm to global resources as the most controversial equitable issues in the international community).

27.*See* IPCC DIMENSIONS, *supra* note 15, at 94 (describing historic carbon dioxide and methane contributions by region and discussing fossil fuel burning as source of emissions).

28.DUNCAN AUSTIN, CLIMATE PROTECTION POLICY: CAN WE AFFORD TO DELAY 17 (1997). The figures for cumulative emissions matter, because past emissions remain in the atmosphere and contribute to present and future warming trends. *See* IPCC DIMENSIONS, *supra* note 15, at 93 (noting contribution of past emissions to current atmospheric concentrations of greenhouse gases). Hence, developed countries' past contributions remain relevant to the equities in distributing reduction obligations going forward.

These differentials in emissions reflect differentials in consumption. "About 25% of the world's populations consume almost 80% of the global energy." IPCC IMPACTS, *supra* note 15, at 82END83. Since 1860, less than 20% of the cumulative global population has consumed 85% of all energy used. *Id.* at 83.

29.IPCC DIMENSIONS, *supra* note 15, at 95.

30.*Id.* at 95.

31.*Id.* at 97.

32.*See* IPCC IMPACTS, *supra* note 15, at 657END68.

33.The United States emits more carbon per unit of gross national product (GNP) than any country in the

economically, their greenhouse gas emissions will probably surpass developed country greenhouse gas emissions within a few decades.[34]

2. *A Framework of Principles and Goals*

The delegates to the 1992 Earth Summit failed to agree upon ambitious and specific legally binding obligations to reduce greenhouse emissions and limit rainforest destruction. Instead, they adopted a "framework convention," which established objectives, principles, and a set of unambitious, and sometimes vague, obligations.[35] The adoption of an initial framework convention has become a common means of beginning international legal efforts to solve environmental problems.[36] For example, efforts to address depletion of the stratospheric ozone layer and transboundary air pollution in Europe began with framework conventions.[37] In these two cases, and in some other cases as well, agreement to substantive measures came later, often in the form of protocols to the framework convention.[38] In other cases, subsequent obligations never became more concrete and

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world except China if GNP is measured in purchasing power parity exchange rates. *See* IPCC DIMENSIONS, *supra* note 15, at 96. U.S. carbon emissions per unit of GNP remain among the highest in the world if measured in U.S. dollars at market exchange rates. *Id.*

34.Even if one assumes fairly modest growth in developing country carbon dioxide emissions, developed countries' fossil fuels carbon dioxide emissions will equal those of the OECD countries by 2020. IPCC DIMENSIONS, *supra* note 15, at 97.

35.*See* Framework Convention, *supra* note 9.

36.*See* Weiss, *supra* note 24 at 687END88; *Developments in the Law-International Environmental Law*, 104 HARV. L. REV. 1484, 1542END46 (1991) [hereinafter *Developments*] (evaluating the framework-protocol approach and predicting that it may not adequately address global warming).

37.*See* United Nations: Vienna Convention for the Protection of the Ozone Layer, Mar. 22, 1985, 26 I.L.M. 1516 (framework convention was established to address ozone depletion); Convention on Long Range Transboundary Air Pollution, Nov. 13, 1979, 18 I.L.M. 1442; Lang, *supra* note 15, at 164END67 (discussing evolution of ozone regime and long-range transboundary air pollution regime).

38.*See* JURGIELEWICZ, *supra* note 8, at 186 (the Vienna Convention established a "general obligation" to protect the ozone layer and the subsequent Montreal Protocol created "more substantive obligations"). *See, e.g.*, Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on the Reduction of Sulfur Emissions or Their Transboundary Fluxes by at Least 30 Percent *in* United Nations: Protocols to the 1979 Convention on Long-Range Transboundary Air Pollution, July 8, 1985, 27 I.L.M. 698, 707; Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution Concerning the Emissions of Nitrogen Oxides or Their Transboundary Fluxes, Oct. 31, 1988, 28 I.L.M. 212, 216; Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution Concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes, Nov. 18, 1991, 31 I.L.M. 573; Montreal Protocol on Substances

international legal efforts failed to accomplish much.[39]

The Framework Convention that emerged from the Earth Summit established an objective for the international community, namely "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[40] The Framework Convention contains a set of obligations and principles designed to help the world work toward meeting this objective.[41] The discussion that follows focuses on the obligations and principles most relevant to the emissions trading idea and the "cheap fix" versus "free lunch" theme.[42]

a. *The Developed Country Leadership Principle*

The 154 states that signed the Framework Convention agreed upon a principle of "common but differentiated responsibilities," which appears in article 3, section 1.[43] This principle requires all countries to assume some responsibility for addressing climate change while allowing the vigor of each nation's response to vary. This principle addresses the problem of reconciling equity with the need for global efforts addressing a

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that Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1541, 1550 (entered into force Jan. 1, 1989) [hereinafter Montreal Protocol]; Montreal Protocol Parties: Adjustments and Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer, June 29, 1990, 30 I.L.M. 537 [hereinafter London Amendments].

39.*See* David S. Ardia, *Does the Emperor Have No Clothes? Enforcement of International Laws Protecting the Marine Environment*, 19 MICH. J. INT'L L. 497, 526 (1998) ("Few international agreements contain substantive commitments ._._._."); *cf.* Catherine Tinker, *Responsibility for Biological Diversity Conservation Under International Law*, 28 VAND. J. TRANSNAT'L L. 777, 813 (1995) ("it is too early to tell how effectively the treaty will be implemented ._._._."); Amanda Hubbard, Comment, *The Convention on Biological Diversity's Fifth Anniversary: A General Overview of the Convention*[EMD] *Where has it Been and Where is it Going?*, 10 TUL. ENVT'L L.J. 415, 444 (1997) (substantively, the convention has accomplished little). *See, e.g.*, Convention on Biological Diversity, June 5, 1992, 31 I.L.M. 818; Lee A. Kimball, *The Biodiversity Convention: How to Make It Work*, 28 VAND. J. TRANSNAT'L L. 763, 765 (1995).

40.Framework Convention, *supra* note 9, art. 2, 31 I.L.M. at 854.

41.*See* Lang, *supra* note 15, at 172 (pointing out in 1991 that potential state parties already understand that a global warming regime would probably consist of a framework convention supplemented by more specific protocols).

42.For a comprehensive treatment of the Framework Convention see Bodansky, *supra* note 2. *See also* Dr. Ranee Khooshie Lal Panjabi, *supra* note 2.

43.Framework Convention, *supra* note 9, art. 3(1), 31 I.L.M. at 854.

problem to which all countries contribute.[44]

The principle of "common but differentiated responsibilities" also reflects the experience of the rather successful effort to address similar equitable problems while preventing stratospheric ozone depletion.[45] Several chemicals tend to deplete the stratospheric ozone layer, which shields human beings from harmful levels of ultraviolet radiation. At the time the international community agreed to phase out several chemicals under the Montreal Protocol on Ozone Depleting Chemicals, the industrialized world used large amounts of these substances as refrigerants and industrial solvents.[46] Developing countries were not prepared to give up the future benefit of refrigeration or domestic industries that use solvents, benefits long enjoyed by developed countries.[47] So the developed countries agreed to lead the effort to solve the environmental problem they caused by phasing out several ozone-depleting substances during the Montreal Protocol's first decade.[48] They also agreed to a program of developing and transferring new technology to make it possible for less developed countries to enjoy refrigeration and increased manufacturing capability without relying on ozone-depleting chemicals.[49] The Montreal Protocol authorized some initial *increases* in developing countries' use of ozone depleters, but required developing countries

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44.Article 3 section 1 of the Framework Convention clearly links equity to the common but differentiated responsibilities principle. "The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities." *Id.* art. 3(1), 31 I.L.M. at 854; *see also* IPCC DIMENSIONS, *supra* note 15, at 90.

45.IPCC DIMENSIONS, *supra* note 15, at 89 ("the Montreal Protocol approach was extensively discussed as a `model' for the Framework Convention on Climate Change"); *see* Elizabeth P. Barratt-Brown, *Building a Monitoring and Compliance Regime Under the Montreal Protocol*, 16 YALE J. INT'L L. 519, 519[END]31 (1991) (discussing the evolution of the legal regime protecting the ozone layer); RICHARD ELLIOT BENEDICK, OZONE DIPLOMACY: NEW DIRECTIONS IN SAFEGUARDING THE PLANET (1991) (describing the diplomatic history of the regime).

46.OECD, CLIMATE CHANGE: MOBILIZING GLOBAL EFFORT 95 (1997); *see* Montreal Protocol, *supra* note 37, art. 2, par. 1-4, 26 I.L.M. at 1552.

47.*See generally* Barratt-Brown, *supra* note 44, at 534 (discussing developing country dissatisfaction with the agreement before concerns about availability of substitute chemicals were allayed).

48.*See* Montreal Protocol, *supra* note 37, art. 2, par. 1-4, 26 I.L.M. at 1552; London Amendments, *supra* note 37, arts. 2A, 2B, 2C, 2D, 2E, 30 I.L.M. at 539[END]41, 543[END]45.

49.*See* Montreal Protocol, *supra* note 37, art. 5, par. 2-3, 26 I.L.M. at 1556. The parties subsequently agreed to create a multilateral fund to promote this technology transfer. *See* London Amendments, *supra* note 37, arts. 10, 10A, 30 I.L.M. at 550[END]51.

to reduce consumption of these chemicals a decade after the developed countries phased them out.[50] Developing countries agreed to a late phaseout because they believed that developed countries would develop adequate substitutes as they eliminated their own consumption of ozone depleters.[51] Accordingly, developing countries could help solve the environmental problem without foregoing benefits formerly associated with use of ozone depleters. The developed countries did, in fact, develop adequate substitutes for many ozone-depleting chemicals, many of which actually cost less than the chemicals they replaced.[52]

The Framework Convention's principle of "common but differentiated responsibility" to address climate change includes a principle of developed country leadership. Article 3, section 1 states that the differentiated responsibilities must match the "respective capabilities" of the various countries.[53] It then states, "[a]ccordingly, the developed country Parties should take the lead in combating climate change . . . ."[54]

The delegates to the Earth Summit envisioned leadership similar to that developed countries showed in addressing ozone depletion.[55] The structure of the specific obligations developed countries assumed under the Framework Convention helps flesh out the contours of this leadership principle.

The leadership principle includes an expectation that developed countries will make earlier and/or deeper cuts in greenhouse gas emissions than less developed countries, as under the Montreal Protocol.[56] The Framework Convention obligates developed countries to adopt measures and policies with an "aim of returning" greenhouse

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50.*See* Montreal Protocol, *supra* note 37, art. 5, par. 1, 26 I.L.M. at 1555; London Amendments, *supra* note 37, art. 5, 30 I.L.M. at 547[END]48.

51.OECD, *supra* note 45, at 93 (target dates for phaseout are later than similar obligations for developed countries to allow "time for effective technology transfer and cooperation").

52.*Id.* at 97 (replacements for ozone depleting substances "have frequently proved cheaper and more effective than" the substances they replaced).

53.IPCC DIMENSIONS, *supra* note 15, at 89.

54.*Id.*

55.OECD, *supra* note 45, at 97 (stating that the approach to ozone depleting chemicals relied upon a principle of "common but differentiated" responsibilities).

56.*See* NICK MABEY ET AL., ARGUMENT IN THE GREENHOUSE: THE INTERNATIONAL ECONOMICS OF CONTROLLING GLOBAL WARMING 11 (1997) (the "general tone of the agreement is that the developed countries must demonstrate that they are serious about limiting emissions ._._.").

gas emissions to 1990 levels by the year 2000.[57]

This stabilization target does not apply to developing countries. Rather, the Framework Convention obligates developing countries to "address," rather than stabilize, greenhouse gas emissions.[58] Hence, the leadership principle calls on developed countries to exercise leadership by example, i.e., by stabilizing emissions before requiring developing countries to do so.

The Framework Convention explicitly links differentiation of emissions control obligations to the leadership principle. It requires that developed countries' "policies and measures . . . demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions."[59] The reference to "longer-term trends" may obligate developed countries to meet the near term stabilization goal through methods that might make subsequent reductions easier. Modifying long-term trends requires reductions not just in the next few years, but also far into the future. Innovation can lower long-term costs and make subsequent achievements easier.[60]

The obligations respecting rainforests also reflect some differentiation of responsibilities. The Framework Convention obligates developed countries to protect and enhance carbon sinks.[61] Developing countries, on the other hand, need only "address" removal by sinks and "promote and cooperate in the conservation and enhancement, *as appropriate*, of sinks . . . ."[62] The Framework Convention differentiates responsibilities by using more qualified language to describe the developing country obligation than the language describing the developed

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57.Framework Convention, *supra* note 9, art. 4(2)(a), (b), 31 I.L.M. at 856[END]57. This stabilization target for emissions reflects a compromise between the United States, which did not want to reduce emissions, and most other developed countries, which seemed willing to make some cuts in greenhouse gas emissions. *See* Bodansky, *supra* note 2, at 468, 475, 490[END]91; PRUE TAYLOR, AN ECOLOGICAL APPROACH TO INTERNATIONAL LAW 332 (1998) (the United States achieved a "watering down of obligations by continual threats to boycott" the Earth Summit); James A. Beard, *An Application of the Principles of Sustainability to the Problem of Global Climate Change: An Argument for Integrated Energy Services*, 11 J. ENVTL. L. & LITIG. 191, 203 (1996) (discussing successful U.S. efforts to defeat a proposal to reduce emissions by 20%).

58.Framework Convention, *supra* note 9, 31 I.L.M. at 855.

59.*Id.* art. 4(2)(a), 31 I.L.M. at 856.

60.*See* Richard B. Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 CAL. L. REV. 1256, 1260, 1279, 1285, 1311 (1981); 1995 IPCC DIMENSIONS, *supra* note 15, at 37 (innovation provides perhaps the best opportunity for low cost reductions).

61.Framework Convention, *supra* note 9, art. 4(2)(a), 31 I.L.M. at 856.

62.*Id.* art. 4(1)(b), (d), 31 I.L.M. at 855 (emphasis added).

country obligation.[63]

The Framework Convention does not, however, impose a clear specific quantitative commitment or goal upon any country's rainforest protection or enhancement efforts. The Framework Convention does not explicitly state, for example, that all countries must halt rainforest destruction or limit its loss by a fixed percentage or acreage amount.[64]

The leadership principle also requires the most developed countries to provide technological and financial support to aid developing countries' efforts to address climate change.[65] Specifically, the most developed countries must provide the "agreed full incremental cost" of developing country treaty compliance, including funds "for the transfer of technology."[66] This language closely resembles language in the London Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer[67] that promised technological and economic assistance deemed essential to realizing protocol objectives equitably and effectively.[68]

Since developing countries did commit to addressing greenhouse gas emissions and sink conservation and enhancement, the developed countries' commitment to financing these efforts has meaning even prior to adoption

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63.If the "as appropriate" language requires enhancement of sinks only when appropriate, with conservation being an option when it is more appropriate, then the language actually constitutes a nearly equivalent obligation. If on the other hand, the "as appropriate" language means that the country may forego conservation and enhancement when neither seems appropriate to it, then the language imposes a much lesser obligation.

64.The lack of an explicit demand for developed country leadership in sink conservation based upon a quantitative commitment probably reflects two problems. First, reform of national policies to actually reverse rainforest destruction poses enormous political and economic challenges. Second, most of the rainforest lies in developing rather than developed countries. This means that an approach based on strict conservation in developed countries would have little direct impact on most of the world's rainforests. *See* IPCC DIMENSIONS, *supra* note 15, at 95 (almost all carbon dioxide emissions from deforestation come from "a relatively small group of developing countries"). By contrast, developed country reductions in greenhouse gas emissions would have great impact on worldwide emissions, since developed countries account for most of the world's emissions.

65.The term "most developed countries" refers to the countries listed in Annex II to the Framework Convention, which generally excludes the former Soviet Union and much of eastern Europe. *See* Framework Convention, *supra* note 9, Annex II, 31 I.L.M. at 873.

66.*Id.* art. 4(3), 31 I.L.M. at 858.

67.*See* London Amendments, *supra* note 37, art. 10, par. 1, 30 I.L.M. at 550.

68.*See id.* art. 10, at 550 (requiring funding of "all agreed incremental costs" of developing country compliance); *id.* art. 10A, at 551 (requiring each party to take "every practicable step" to ensure appropriate technology transfer).

of quantitative commitments. Indeed, developing countries without quantitative commitments have implemented several energy conservation and renewable energy projects.[69] The Framework Convention creates a financing mechanism to support such efforts.[70]

The Preamble to the Framework Convention also reflects the technological and financial components of the leadership principle. It recognizes that developing countries will actually need to increase energy consumption in order to grow, but qualifies this recognition by "taking into account the possibilities for achieving greater energy efficiency . . . ."[71] The Preamble then recognizes that energy efficiency involves "application of new technologies on terms which make such application economically and socially beneficial."[72]

The Framework Convention clearly envisions leadership from developed countries. More precisely, the Framework Convention reflects an expectation that developed countries will apply advanced technologies to improve energy efficiency and reduce emissions and then transfer the fruits of these efforts to less developed countries with appropriate financial support. This differentiation of responsibility should lead developing countries, in time, to accept more concrete commitments under the treaty.

b. *The Cost-Effectiveness Principle*

The Framework Convention also contains a cost-effectiveness principle. This principle arises in the context of an articulation of the "precautionary principle," a general principle of international environmental law. The precautionary principle counsels nations to address environmental problems as a precaution even in the face of scientific uncertainty.[73] Article 3, section 3, states that "lack of full scientific certainty should not be used as a

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69.*See also* Wirth, *supra* note 12, at 2656 (discussing potential for energy efficiency improvements in developing countries); IPCC IMPACTS, *supra* note 15, at 88 (explaining that "solar, wind, and hydro power can be either carbon-free or carbon neutral").

70.*See* Framework Convention, *supra* note 9, arts. 4(3), 11, 31 I.L.M. at 858, 864END65. For negotiating history and parsing of details see Bodansky, *supra* note 2, at 524END27.

71.Framework Convention, *supra* note 9, preamble, 31 I.L.M. at 853.

72.*Id.*; *see also* Wirth, *supra* note 12, at 2657 (energy efficiency and conservation could help developing countries avoid at least $1.4 trillion in power supply expansion costs between 1990 and 2008).

73.*See* Weiss, *supra* note 25, at 690 (stating that there is no agreement on the content or existence of the principle); Daniel Bodansky, *Scientific Uncertainty and the Precautionary Principle*, 33 ENV'T 4 (1991); M.P.A. Kindall, *UNCED and the Evolution of Principles of International Environmental Law*, 25 J. MARSHALL L. REV. 19, 23 (1991) (discussing elements of a precautionary approach).

means of postponing" measures needed to respond to "threats of serious or irreversible damage."

This precautionary principle has special salience in the climate change context, because of the particulars of the science. Greenhouse gases emitted today commit the world to climate change decades (if not centuries) hence, because they remain in the atmosphere for many decades after their emission.[74] In addition, scientists fear that climate change may occur quickly and unpredictably.[75] Hence, waiting for scientific certainty before taking action may involve suffering through decades or centuries of hurricanes, droughts, ecological destruction, and sea level rise. This is so even if a moment of actual certainty arrives exactly as these disasters begin, and this recognition triggers an immediate and vigorous response.[76] Climate-induced environmental change cannot be reversed quickly, and may not be reversible at all, due to the long time scales involved.[77] The paragraph that articulates the precautionary principle states that countries' response measures "should be cost-effective so as to ensure global benefits at the lowest possible cost."[78]

The cost effectiveness principle found in article 3, section 3 of the Framework Convention may conflict with the developed country leadership principle. The leadership principle calls on developed countries to make the earliest and/or deepest emission cuts in order to develop the technologies needed for everyone to make progress. Cuts in greenhouse gas emissions may be more expensive in developed countries than in developing countries, because developing countries use such primitive technology that improving technology to reduce emissions often

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74.IPCC 1995 SCIENCE, *supra* note 2, at 3 (explaining that long lives of greenhouse gases means that "they affect radiative forcing on long time scales"); IPCC IMPACTS, *supra* note 15, at 4 (stating that given a stable level of greenhouse gas emissions, stabilization of atmospheric concentrations of long-lived greenhouse gases will require decades to millennia, and that stabilization of atmospheric concentrations will only produce "equilibration of the climate system" in decades to centuries).

75.William K. Stevens, *If Climate Changes, It May Change Quickly*, N.Y. TIMES, Jan. 27, 1998, at F1; IPCC IMPACTS, *supra* note 15, at 25; WILLIAM R. CLINE, THE ECONOMICS OF GLOBAL WARMING 34[END]35 (1992) (reviewing several potential catastrophe scenarios).

76.Furthermore, "[u]nambiguous detection of climate-induced changes in most ecological and social systems will prove extremely difficult in the coming decades." IPCC IMPACTS, *supra* note 15, at 5; *cf. NASA Scientists Propose Climate Index; Suggest Change Apparent in Alaska, Asia*, 21 Int'l Env't Rep. (BNA) 446 (Apr. 29, 1998) (discussing index designed to distinguish long-term climate change from natural fluctuations).

77.IPCC IMPACTS, *supra* note 15, at 23.

78.Framework Convention, *supra* note 9, art. 3(3), 31 I.L.M. at 854.

costs very little.[79] But the principle of developed country leadership would seem to require that the potentially more expensive cuts from developed countries come first.

Article 3, section 3 addresses this potential conflict and suggests that the leadership principle may qualify the cost effectiveness principle. It states that policies and measures should "take into account different socio-economic contexts."[80] This statement suggests that more economically advanced countries should carry most of the burden.

Since article 3, section 3 calls for taking both cost effectiveness and differing socio-economic contexts into account, it fails to definitively resolve the tension between the cost effectiveness and leadership principles. In light of the wealth of support for the leadership principle in the convention's preamble,[81] principles,[82] commitments,[83] and precedent,[84] the cost effectiveness principle ought not defeat the leadership principle. On the other hand, cost effectiveness clearly has a role to play under the treaty. So far, cost effectiveness concerns have tended to dominate debates about implementation of the Climate Change Convention.[85]

The commitments in the Framework Convention did not effectively address the climate change problem.[86] Since the Framework Convention's signing, greenhouse gas emissions and rainforest destruction have increased in many countries. The failure to agree on clearly binding numerical limits to greenhouse gas emissions or rainforest destruction helps explain this failure. Although developed countries did agree upon an emissions stabilization

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79.*See* Bodansky, *supra* note 2, at 521 ("developing countries tend to use energy less efficiently than developed countries and can attain emissions reductions more cheaply.").

80.*Id.*

81.*See* Framework Convention, *supra* note 9, preamble, 31 I.L.M. at 851END53.

82.*See id.* art. 3(1), (2), 31 I.L.M. at 854.

83.*See id.* art. 4, 31 I.L.M. at 855END59.

84.*See, e.g.*, Montreal Protocol, *supra* note 37, art. 2, 26 I.L.M. at 1552END54; London Amendments, *supra* note 37, 30 I.L.M. at 539END45.

85.*See* Alex G. Hanafi, Note, *Joint Implementation: Legal and Institutional Issues for an Effective International Program to Combat Climate Change*, 22 HARV. ENVTL. L. REV. 441, 461END62 (1998).

86.*See* MATTHEW PATERSON, GLOBAL WARMING AND GLOBAL POLITICS 64 (1996) (commentators generally agree that the Framework Convention is environmentally inadequate).

target, the treaty language does not clearly state whether this target is a mere goal or a binding commitment.[87]

The Framework Convention, however, articulates principles that establish a foundation for subsequent agreements to move further.[88] In effect, the Earth Summit created international legal norms to guide subsequent efforts to write more specific rules to address climate change, even if it did not itself produce a set of rules that would actually improve the environment.[89]

B. *The Kyoto Protocol to The United Nations Framework Convention on Climate Change*

The Framework Convention generally requires its "supreme body", the Conference of the Parties (COP),[90] to meet periodically to review the adequacy of the convention and national implementation efforts.[91] By the mid-1990s, it was obvious that developed countries, including the United States, would not meet the Framework Convention's target, stabilization of emissions at 1990 levels by the year 2000.[92] Moreover, the overwhelming majority of scientists agreed that the parties needed to make cuts substantially below 1990 levels, not just stabilize emissions at those levels, to even stabilize atmospheric concentrations of carbon dioxide at very high levels many years in the future.[93] Furthermore, stabilizing greenhouse gas concentrations at these already high levels commits the earth to rising global temperatures and sea level rise for hundreds of years after stabilization.[94]

87.*See* Framework Convention, *supra* note 9, art. 4(2), 31 I.L.M. at 856[END]57.

88.*See* JURGIELEWICZ, *supra* note 8, at 217 (explaining that the Framework Convention may generate expectations that lead to firm legal rules in the future).

89.*See* McAdams, *supra* note 7, at 383[END]84 (explaining that communities internalize abstract norms prior to more concrete norms translating the abstraction into concrete behavior).

90.Framework Convention, *supra* note 9, art. 7(2), 31 I.L.M. at 860[END]61.

91.*Id.* art. 7, 31 I.L.M. at 860[END]62. In particular, it requires a review of the adequacy of the principle commitments in the treaty at its first session and again, no later than the end of 1998. *See id.* arts. 4(d), 7(4), 31 I.L.M. at 857, 862.

92.*See Report of the Conference of the Parties on its Second Session*, Framework Convention on Climate Change, U.N. Doc. FCCC/CP/1996/15, at 5 (1996) [hereinafter COP2 Report] (first national communications of developed country parties revealed that they "expected to be unable to meet the emission reduction targets of the Convention" to stabilize greenhouse gas emissions at 1990 levels).

93.IPCC 1995 SCIENCE, *supra* note 2, at 25; IPCC, CLIMATE CHANGE 1994: RADIATIVE FORCING OF CLIMATE CHANGE AND AN EVALUATION OF THE IPCC 1S92 EMISSION SCENARIOS (J.T. Houghton et al. eds., 1995) [hereinafter IPCC, RADIATIVE FORCING].

94.IPCC 1995 SCIENCE, *supra* note 2, at 45.

The COP agreed to meet in Kyoto in 1997 to enact protocols aimed at making the Convention more effective.[95] Prior to this meeting, the European Union proposed a fifteen percent reduction in each developed country's greenhouse gas emissions.[96] In the United States, this proposal alarmed industries that relied heavily on fossil fuel burning. These industries sought to persuade the President and the Congress to take positions that would assure a failure to adopt concrete commitments to emission reductions at Kyoto.

The United States Senate passed a resolution demanding that the United States accept no agreement quantitatively limiting greenhouse gases unless developing countries also agreed to reduce in the same time period.[97] Compliance with this resolution would rule out emulation of the specific approach used to reduce stratospheric ozone depletion[EMD]that is, deferring developing country emission reductions until after developed countries have already completed substantial cuts. Indeed, one could imagine only one possible international agreement that might represent real compliance with the emission reduction component of the leadership principle, while remaining consistent with the Congressional resolution. In theory, the developed world could agree to deep cuts and secure commitments from less developed countries for modest reductions over the same time period.

The Clinton Administration, however, took a position that appeared to preclude this outcome. Just prior to the Kyoto meeting, President Clinton announced that the United States would seek a postponement of the 2000 deadline for stabilization at 1990 levels, rather than accept cuts in emissions below 1990 levels.[98] Given this position, adherence to the developed country leadership principle would almost surely conflict with the combined positions of the executive and legislative branches of the American government. Developing countries could not

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95.*See Report of the Conference of the Parties on its First Session*, The Berlin Mandate: Review of the Adequacy of Article 4, paragraph 2(a) and (b), of the Convention, including proposals related to the protocol and decisions on follow-up, Decision 1/CP.1, U.N. Doc. FCCC/CP/1995/7/Add.1 (1995), 34 I.L.M. 1671, 1676 (concluding that the commitments made in the Framework Convention are inadequate and calling for establishment of "quantified limitation and reduction objectives").

96.Paola Bettelli et al. eds., *Report of the Third Conference of the Parties to the United Nations Framework Convention on Climate Change: 1[END]11 December 1997,* 12 EARTH NEG. BULL. 76, at 2 (available at <http://www.iisd.ca>) (visited May 15, 1998) [hereinafter *COP3 Summary*]. More precisely, the European Union proposed a fifteen percent reduction from 1990 levels of carbon dioxide, methane, and nitrous oxide by 2010. Patricia Thompson, *The Third Conference of the Parties to the United Nations Framework Convention on Climate Change: The December 1997 Kyoto Protocol,* Y.B. COLO. J. INT'L ENVTL. L. & POL'Y 219, 221 (1997).

97.143 CONG. REC. S8113[END]05 (daily ed. July 25, 1997).

98.*See* Searles, *supra* note 5, at 134 (describing U.S. agreement to a seven percent cut as a "significant change from its earlier proposal to merely stabilize emissions at the 1990 level").

make any cuts below 1990 levels without making more reductions than the developed countries would under the United States proposal, since the United States proposal called for no cuts from developed countries.[99]

After Vice President Gore instructed the U.S. negotiators to show more "flexibility," they helped break the impasse this initial position created by agreeing to slightly more vigorous action.[100] The resulting Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto Protocol) does not contain rules limiting emissions of particular gases.[101] Instead, the parties agreed to a more abstract limit, a limit on aggregate greenhouse gas emissions.[102] This approach allows countries to forego carbon dioxide reductions in exchange for reducing other specifically listed greenhouse gases. The Kyoto Protocol requires each developed country to meet quantitative limits for "carbon dioxide equivalent emissions."[103] The protocol uses an estimate of the "global warming potential" of listed greenhouse gases to measure the worth of reducing other gases in lieu of carbon dioxide.[104]

The Kyoto Protocol contemplates at least a five percent reduction in developed country greenhouse gas emissions, on average, by the "commitment period 2008 to 2012."[105] The Kyoto Protocol supplements this aim with more specific binding national quantitative reduction requirements. In a break with precedent, the Protocol

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99.*See generally* AUSTIN, *supra* note 27, at 17 (if the United States opts to delay emission reductions developing countries will almost certainly follow suit).

100.*See* Joby Warrick, *Gore Urges Resolution at Climate Talks; With Summit in Disarray, Vice President Prods U.S. Negotiators to Bridge Gaps*, WASH. POST, Dec. 8, 1998, at A1; Searles, *supra* note 5, at 134 (describing U.S. compromise in agreeing to a seven percent reduction below 1990 levels).

101.Kyoto Protocol, *supra* note 10. *See generally* Searles, *supra* note 5; Clare Breidenich et al., *The Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 92 AM. J. INT'L L. 315 (1998).

102.Kyoto Protocol, *supra* note 10, arts. 3(1), 5(3), 37 I.L.M. at 33, 35.

103.*Id.* art. 3(1), 37 I.L.M. at 33.

104.*Id.* art. 5(3), 37 I.L.M. at 35. The listed gases are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. *See id.* Annex A, 37 I.L.M. at 42. Estimates of the relative global warming potential of greenhouses gases have substantial uncertainties. *See* IPCC 1995 SCIENCE, *supra* note 2, at 188; IPCC, RADIATIVE FORCING, *supra* note 92. The parties must use the estimates of relative global warming potential over a 100 year period provided in the relevant 1995 IPCC report as the basis for tradeoffs amongst gases. *Methodological Issues Related to the Kyoto Protocol, in Report of the Conference of the Parties on its Third Session*, FCCC/COP, 3rd Sess., U.N. Doc. FCCC/CP/1997/7/Add.1, at 31.

105.Kyoto Protocol, *supra* note 10, art. 3(1), 37 I.L.M. at 33.

actually assigns different percentage reduction requirements to different developed nations.[106] For example, Japan, the United States, and the European Union may have to reduce emissions by six, seven, and eight percent, respectively, but the Kyoto Protocol authorizes some developed countries with more modest emissions to actually increase their pollution within specified limits.[107]

This modest five percent average cut from developed countries left little room for differentiated developing country reductions, and the Kyoto Protocol contains no specific mandates for developing country emission reductions.[108] Hence, the agreement may not meet the strictures of the Senate resolution, and United States ratification of the agreement, which requires Senate approval, remains uncertain.[109] The Protocol will only enter into force if nations responsible for fifty-five percent of the developed country emissions ratify the Protocol. Hence, a failure by the United States and Russia to ratify the Protocol could prevent its entry into force.[110] Because the Protocol only modestly limits developed country emissions and does not limit developing country emissions, global carbon emissions may still rise by thirty-two percent by the year 2010, even assuming full compliance.[111]

C. *Accountability under the Climate Change Convention*

106.*See id.* Annex B, 37 I.L.M. at 42.

107.*See id.*

108.These cuts are modest in the sense that they call for much less reduction than a number of climate change scientists called for. *See Proposal Forwarded by 100 Countries Calls for Trading System, `Green Bank,'* 28 Env't Rep. (BNA) 1527, 1528 (Dec. 5, 1997) (quoting David Rind, a climate modeler with the National Aeronautics and Space Administration's Goddard Institute for Space Studies, as stating that "none of the targets floated ._._. go far enough."); David Malakoff, *Thirty Kyotos Needed to Control Warming*, 278 SCIENCE 2048 (1997) (reporting climate scientists' skepticism about the adequacy of Kyoto's cuts). Furthermore, a five percent reduction may be extremely inexpensive. *See* CLINE, *supra* note 74 (suggesting that a 20% cut in emissions may be available at no cost); Ross Gelbspan, *A Good Climate For Investment*, 281 ATLANTIC MONTHLY, June 1, 1998 at 26 (stating that 30% reductions have "no negative economic impacts").

109.*See* Searles, *supra* note 5, at 134; John J. Fialka, *Global EMD Warming Debate Gets No Consensus in Industry*, WALL ST. J., Apr. 16, 1998, at A24 (describing Congressional opposition to treaty implementation).

110.*See Key Issues Outlined for Upcoming Talks on International Emission Trading System*, 21 Int'l Env't Rep. 414, 415 (BNA) (Apr. 29, 1998).

111.*See Carbon Emissions Predicted to Increase Substantially by 2020, DOE Report Says*, 21 Int'l Env't Rep. 439 (BNA) (Apr. 29, 1998).

The Climate Change Convention establishes international law.[112] Traditionally, scholars have viewed international law as the set of legal norms governing relationships between states.[113] But non-state actors, such as environmental groups, have a growing role in generating and ensuring compliance with international law.[114] Government officials seek to reach international environmental agreements because public demands and public scrutiny of implementation help the legal regime function.[115]

International environmental law regimes govern more than just relationships between states. International environmental law seeks to induce state action to protect the environment.[116] In most contexts, this means that international environmental law seeks state actions aimed at changing private conduct. No international military force exists to force nations to meet quantitative national limits in an international treaty.[117] Hence, a treaty must rely upon other methods to induce compliance.[118]

Countries generally honor specific international legal obligations.[119] This article cannot offer a complete

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112.JURGIELEWICZ, *supra* note 8, at 219.

113.*See* RESTATEMENT (THIRD) OF FOREIGN RELATIONS §_101 (1986).

114.*See generally* JURGIELEWICZ, *supra* note 8, at 176[END]77; Barratt-Brown, *supra* note 44, at 520[END]22.

115.*See* JURGIELEWICZ, *supra* note 8, at 248 (stating that pressure may be needed to make international law "change or evolve" and that laws "heighten public expectations").

116.*See id.* at 151 ("Domestic implementation of international agreements is obviously important for the successful implementation of a regime.").

117.*See* Robert N. Stavins, *Policy Instruments for Climate Change: How Can National Governments Address a Global Problem?*, 1997 U. CHI. LEGAL F. 293, 299 ("no world government[END]or any other institution[END]appears capable of administering, monitoring and enforcing" international mechanisms to meet climate change goals). *See generally* Kratochwil, *supra* note 7, at 256 (stating that international law is not primarily a "punitive order").

118.JURGIELEWICZ, *supra* note 8, at 113 (referring to the need for a "substitute for coercion" in making international legal regimes effective); Ardia, *supra* note 38, at 510 ("Because most ._._. environmental agreements are only morally binding ._._. [their] success ._._. depends upon" voluntary national efforts to "enforce compliance amongst their citizens.").

119.LOUIS HENKIN, HOW NATIONS BEHAVE 47 (2d. ed. 1979); *cf.* Harold K. Jacobson, *Conceptual, Methodological and Substantive Issues Entwined in Studying Compliance*, 19 MICH. J. INT'L L. 569, 570[END]71 (1998) (we have a lack of systematic knowledge about the extent of compliance); Harold Jacobson & Edith Brown Weiss, *Strengthening Compliance with International Environmental Accords: Preliminary Observations from a Collaborative Project*, 1 GLOBAL GOVERNANCE 119, 122 (1995) (compliance with international environmental agreements is often "haphazard and ragged").

theory as to why nations usually comply or why they sometimes do not comply with international law.[120] But democratic accountability may play a role.[121]

First, national leaders may desire esteem from their peers in other countries.[122] To the extent their countries violate clear international legal obligations, they may lose face in front of their peers in other countries.[123] Hence, they may feel accountable toward their peers and comply out of a sense of obligation toward them.[124]

Second, national leaders may fear direct loss of prestige for themselves and their countries as a result of noncompliance.[125] If the world's people regard a nation as a violator of international law, this reduces the regard people around the world have for the country.[126] National leaders may feel some accountability toward world public opinion.[127]

Finally, leaders who violate international treaty commitments may offend voters in their own countries who identify with a treaty's goals.[128] As a result, failure to abide by treaties may harm officials in national elections.[129] Loss of international prestige may harm leaders of non-compliant countries at home as well, by

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120.Professor Koh has sought to explain this in terms of transnational legal process. *See generally* Harold Hongju Koh, *Why Do Nations Obey International Law?*, 106 YALE L.J. 2599 (1997) (review essay) [hereinafter Koh, *Why Nations Obey?*]; Harold Hongju Koh, *Transnational Legal Process*, 75 NEB. L. REV. 181 (1996) [hereinafter Koh, *Transnational*].

121.*See* Lang, *supra* note 15, at 167 (explaining how green lobbies and public opinion helped create agreement to strong measures protecting the stratospheric ozone layer); Jacobsen & Weiss, *supra* note 118 (discussing various factors that influence compliance, including NGO participation, information, and political characteristics of implementing countries).

122.*See* JURGIELEWICZ, *supra* note 8, at 113 (states are accountable to other states).

123.*See* Bodansky, *supra* note 2, at 533 (meetings of the COP provide a forum for discussions among states and bring peer pressure to comply).

124.*See generally* Sunstein, *supra* note 7, at 2029END30 (an expectation of shame may deter people from violating norms).

125.*See* Koh, *Why Nations Obey?*, *supra* note 119, at 2639 (discussing claim that fear of "loss of reputation" provides the "ultimate impetus for compliance").

126.*See* Bodansky, *supra* note 2, at 533 (meetings of COP help focus "public pressure" on states to comply).

127.*See* JURGIELEWICZ, *supra* note 8, at 113 (states are accountable to the international public).

128.*See id.* (states are accountable to their own populations).

129.*See* PATERSON, *supra* note 84, at 61END62 (describing how the United States modified its position on

damaging their credibility.

For these potential consequences to motivate national leaders to comply, the leaders must perceive these consequences as a plausible result of violations. To achieve this, a mechanism must exist for detecting and publicizing treaty violations.[130] In the climate change context, this mechanism includes reporting and publication of national plans to meet targets and the data necessary to determine whether the nation is delivering the required reductions.[131] The Climate Change Convention contains provisions that address this.[132]

The Climate Change Convention has provisions aimed at generating national plans to meet the targets. It requires all parties to "publish . . . programmes containing measures to mitigate climate change"[133] The Convention also requires developed countries to send the COP "a detailed description of . . . measures that it has adopted" and "a specific estimate" of its policies' effects.[134] The Convention requires an expert "subsidiary body for implementation" to review these descriptions and report the results to the COP.[135] It cautiously requires the COP to seek and use, "where appropriate," information from "non-governmental bodies."[136] The Convention thus provides a potential role for environmental groups in assessing ongoing implementation efforts.

The Framework Convention also provides for the COP's assessment and publication of implementation

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climate change after George Bush endured criticism from Democratic Presidential candidates for his initial position).

130.*See generally* Jacob Werksman, Compliance Systems and the Climate Change Convention: Traffic Signs on the Road to Kyoto 2 (1997) (unpublished manuscript on file with the author) (citing the wide agreement on the need for "a robust and transparent" system of detecting non-compliance); Ardia, *supra* note 38, at 505 (describing international cooperation in monitoring and enforcement as crucial to making environmental agreements meaningful).

131.*See* Werksman, *supra* note 129. (describing the evaluation of compliance in the Climate Change regime).

132.*See* Framework Convention, *supra* note 9, arts. 4, 7, 9, 10, 12, 31 I.L.M. at 855; Kyoto Protocol, *supra* note 10, arts. 3, 5, 6, 7, 8, 10, 13, 37 I.L.M. at 37.

133.Framework Convention, *supra* note 9, art. 4(1)(b), 31 I.L.M. at 855; Kyoto Protocol, *supra* note 10, art. 10(a), (b), 37 I.L.M. at 37.

134.Framework Convention, *supra* note 9, art. 12(2), 31 I.L.M. 865; *see id.* art. 4(2)(b), 31 I.L.M. at 857.

135.*Id.* art. 10, 31 I.L.M. at 863END64.

136.*Id.* art. 7, 31 I.L.M. at 861.

information.[137] The Framework Convention requires the COP to "assess . . . implementation of the [C]onvention,"[138] "adopt" and publish "regular reports" on the "implementation of the Convention,"[139] and "facilitate" information exchange amongst parties "on measures adopted" to meet treaty commitments.[140] On the other hand, the Framework Convention authorizes a party to designate information about compliance as confidential, thereby preventing its submission to other bodies, except as part of aggregated data.[141] This provision could frustrate efforts to hold individual countries responsible for noncompliance, thereby reducing the effectiveness of public accountability in encouraging compliance.

Reporting about national plans may provide information that can be used to assess whether countries have plans that appear likely to succeed. This alone may create pressures to adopt credible plans. However, information about plans cannot tell the international community whether plans succeed in meeting their targets.

Accordingly, the Framework Convention contains provisions designed to develop the information needed to assess actual physical compliance with emission reduction targets.[142] Since the Kyoto Protocol expresses national emission limitations as a percentage of greenhouse gas emissions in 1990,[143] one would need to know at least the 1990 emissions, and the emissions during the compliance period (2008 to 2012), to determine whether compliance has occurred.[144] Monitoring of progress toward the quantitative targets requires reporting interim emissions.

137.*See* Bodansky, *supra* note 2, at 547 (explaining why treaty language probably does contemplate review of individual country performance).

138.Framework Convention, *supra* note 9, art. 7(2)(e), 31 I.L.M. at 861.

139.*Id.* art. 7(2)(f), 31 I.L.M. at 861.

140.*Id.* art. 7(2)(b), 31 I.L.M. at 861.

141.*Id.* art. 12(9), 31 I.L.M. at 866.

142.Professor Robert N. Stavins argues that it may not be necessary to monitor ex post compliance if an ex ante "demonstration of likely compliance" has been made. *See* Stavins, *supra* note 116, at 310. This argument overlooks a long history of failure to produce planned reductions of pollutants, even in developed countries such as the United States. It seems extraordinarily naïve. At any rate, Professor Stavins' judgment on this matter conflicts with that of the international community framing the treaty, which has provided, at least loosely, for generation of information that could help verify post-hoc compliance.

143.*See* Kyoto Protocol, *supra* note 10, Annex B, 37 I.L.M. at 42.

144.*See id.* art. 3(1), 37 I.L.M. at 33.

The Framework Convention requires all parties to "develop, periodically update, publish and make available to the Conference of the Parties . . . national inventories of greenhouse gas emissions."[145] If these inventories include accurate estimates of 1990 baseline emissions of each relevant gas and provide timely and accurate information on current emissions, then it should be possible to determine whether a country has complied with the percentage limitations set out in the agreement.

The Kyoto Protocol contains provisions designed to adapt these requirements to the task of actually monitoring compliance with quantitative limits. Article 5 requires developed countries to estimate anthropogenic emissions and sink removals using methodologies that the Intergovernmental Panel on Climate Change and the COP agree upon.[146] Article 7 requires these countries to submit annual inventories of emissions and sinks including "supplementary information" to make sure that compliance with the new limits can be verified.[147] The Kyoto Protocol further requires expert review teams to "provide a thorough and comprehensive technical assessment of . . . implementation" and to communicate this assessment to the COP.[148] The Kyoto Protocol then requires the COP to assess implementation.[149]

The Climate Change Convention vaguely authorizes the COP to "make recommendations on any matters necessary for" implementation.[150] It also creates a dispute settlement procedure.[151] This procedure relies primarily upon negotiation and non-binding arbitration, rather than binding dispute resolution.[152] Article 14 of the

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145.Framework Convention, *supra* note 9, art. 4(1)(a), 31 I.L.M. at 855; *see id.* art. 12(1), 31 I.L.M. at 865.

146.*See* Kyoto Protocol, *supra* note 10, art. 5, 37 I.L.M. at 35.

147.*Id.* art. 7, 37 I.L.M. at 35[END]36.

148.*Id.* art. 8, 37 I.L.M. at 36.

149.*See id.* art. 13(4)(a), 37 I.L.M. at 39.

150.Framework Convention, *supra* note 9, art. 7(2)(g), 31 I.L.M. at 861; Kyoto Protocol, *supra* note 10, art. 13(4)(f), 37 I.L.M. at 39.

151.*See* Framework Convention, *supra* note 9, arts. 13, 14, 31 I.L.M. at 866[END]67; *see also* Bodansky, *supra* note 2, at 547[END]49.

152.The treaty establishes a "multilateral consultative process" to resolve "questions regarding" convention implementation. Framework Convention, *supra* note 9, art. 13, 31 I.L.M. at 866. Article 14, section 1 requires parties to a dispute to "seek ._._. settlement ._._. through negotiation." If this negotiation process fails, a party may secure convocation of a "conciliation commission." *Id.* art. 14(5), (6), 31 I.L.M. at 867. The commission only makes a "recommendatory award," which "the parties" must "consider in good faith." *Id.* art 14(6), 31 I.L.M. at 867.

Framework Convention also allows parties to mutually agree that disputes will be submitted to the International Court of Justice and/or binding arbitration.[153] These procedures only apply to disputes between national governments. The formal dispute resolution provisions do not provide a mechanism for non-governmental organizations (NGOs), including environmental advocacy groups, to seek redress of complaints.

Since the COP meets regularly, its ongoing review processes provide a forum that may expose defects in national implementation.[154] This tends to facilitate peer and public pressure to comply, making countries more accountable for implementation failures.[155] A provision in the Framework Convention which allows NGOs to participate in COP meetings unless at least a third of the parties present object may help facilitate public accountability.[156] Unlike some international agreements, the Framework Convention does not contemplate the use of trade sanctions to secure compliance[157]nor does it mandate binding dispute resolution.

In sum, the Kyoto Protocol (absent trading) creates a concrete obligation to meet national aggregate emission limitations. The Climate Change Convention seeks to require the submission of national plans that make before the fact assessment of progress toward implementation possible. The Convention also requires the availability of adequate national information to enable the world to ascertain (after the fact) whether a country has complied with specific limits on national emissions. Each country may make sufficient plans to avoid the embarrassment of facing accusations in a public forum that it failed to meet an international obligation.[158] Through

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153.*Id.* art. 14(2-4), 31 I.L.M. at 867.

154.*See* Bodansky, *supra* note 2, at 533. The COP meets annually unless it decides otherwise. *See* Framework Convention, *supra* note 9, art. 7(4), (5), 31 I.L.M. at 855[END]61.

155.*See* Bodansky, *supra* note 2, at 533.

156.Framework Convention, *supra* note 9, art. 7(6), 31 I.L.M. at 862.

157.*See generally* Foundation for International Environmental Law, Implementing the Climate Change Convention: Trade Law Implications on the Road to Kyoto and Beyond (1997) (unpublished manuscript on file with author).

158.I use the term "may" deliberately. In spite of the existence of the formal structure described, the relevant international institutions and the NGOs may lack the capacity to comprehensively monitor implementation efforts. *See* Ardia, *supra* note 38, at 512, 524[END]25 (discussing the inadequacy of funding of the United Nations Environmental Program and the weakness of Secretariats of environmental treaties); Kamen Sachariew, *Promoting Compliance with International Legal Standards: Reflections on Monitoring and Reporting Mechanisms*, 2 Y.B. OF INT'L ENVTL. L. 37, 39 (1991) (noting that the high cost of "maintaining large scale permanent monitoring networks" limits NGO's involvement in monitoring). Monitoring remains highly dependent upon cooperation from national governments.

these mechanisms, the authors of the Climate Change Convention try to foster accountability for complying with the Convention's mandates.

D. *Emissions Trading*

The United States has used emissions trading to address environmental problems over the years.[159] From the perspective of many American government officials, it seemed only natural to make international trading part of the effort to address climate change. Not surprisingly, the United States has consistently worked to make emissions trading a big part of the Climate Change Convention.[160]

1. *Trading Under the Framework Convention*

The Framework Convention does not explicitly mention emissions trading.[161] But it refers to a concept called "joint implementation," which one can plausibly interpret as a reference to trading.[162] Article 4(2)(a), for example, states that "[p]arties may implement . . . policies and measures jointly . . . ."[163] This could be interpreted

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159.*See, e.g.*, Driesen, *supra* note 2, at 311[END]21.

160.The United States' insistence on this point almost torpedoed the negotiations at Kyoto. *See COP3 Summary*, *supra* note 95, at 11[END]12. The United States' made clear that its agreement to reductions depended on acceptance of emissions trading. *See* Paola Bettelli et al., *Highlights from the Third Conference of the Parties to the United Nations Framework Convention on Climate Change: 8 December 1997*, 12 EARTH NEG. BULL. NO. 74 1, 2 (1997) [hereinafter *Highlights*]; *see also* COP2 Report, *supra* note 91, at 48 (United States' statement that "international emissions trading must be part of any future regime."). The United States has not always been alone in its support of emissions trading. *See* Jonathan Green and Philippe Sands, *Establishing an International System for Trading Pollution Rights*, 15 Int'l Env't Rep. (BNA) 80, 82[END]83 (Feb. 12, 1992) (discussing an early emissions trading proposal put forth by Norway and Germany).

161.*See* JOYEETA GUPTA, THE CLIMATE CHANGE CONVENTION AND DEVELOPING COUNTRIES: FROM CONFLICT TO CONSENSUS? 117 (1997) (Framework Convention "does not explicitly state" that a country undertaking measures abroad "has the right to credit itself with part of the emission reductions.").

162.*See* JOINT IMPLEMENTATION TO CURB CLIMATE CHANGE: LEGAL AND ECONOMIC ASPECTS 1[END]6 (Onno Kuik et al. eds., 1994) [hereinafter JOINT IMPLEMENTATION]; S. Barrett, *Joint Implementation for Achieving National Abatement Commitments in the Framework Convention on Climate Change*, OECD, Paris (1993); JOINT IMPLEMENTATION OF CLIMATE CHANGE COMMITMENTS: OPPORTUNITIES AND APPREHENSIONS xi (Prodipto Ghosh & Jyotsna Puri eds., 1994) [hereinafter OPPORTUNITIES AND APPREHENSIONS].

163.Framework Convention, *supra* note 9, art. 4(2)(a), 31 I.L.M. at 856. Furthermore, Article 4, section 2(b) establishes that developed countries must aim to return their emissions to 1990 levels "individually or jointly." *Id.* art. 4(2)(b), 31 I.L.M. at 857. Article 4, section 2(d) provides that the Conference of the Parties at its first session "shall ._._. take decisions regarding criteria for joint implementation ._._._." *Id.* art. 4(2)(d), 31 I.L.M. at 857.

narrowly to mean that one country could help another achieve national emissions reductions.[164] It could also be interpreted broadly to allow a country to claim credits for activities it jointly implements abroad.[165] These credits could then justify not meeting otherwise applicable domestic obligations.

Recognizing that a mere reference to "joint implementation" raises more questions than it answers,[166] the parties agreed that the COP would "take (sic) decisions regarding criteria to govern joint implementation" at its first session, within one year after the Framework Convention entered into force.[167] Since then, the COP has failed to agree upon detailed criteria governing joint implementation, but it has made a few general decisions.[168]

At its first meeting in Berlin, the COP clarified that developed countries could not claim credits for activities implemented jointly with developing countries as a means of fulfilling the Framework Convention target of stabilizing developed country emissions at 1990 levels.[169] The COP, however, authorized the development of

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164.*See* GUPTA, *supra* note 160, at 116 (stating that developing countries tend to interpret joint implementation to refer to "general cooperation" in implementation rather than credit transfer).

165.*See* Navroz K. Dubash, *Commoditizing Carbon: Social and Environmental Implications of Joint Implementation, in* OPPORTUNITIES AND APPREHENSIONS, *supra* note 161, at 51, 56 (setting out such a definition).

166.*See* JOINT IMPLEMENTATION, *supra* note 161, at 46, 78; GUPTA, *supra* note 160, at 116[END]17 (discussing the ambiguous nature of the joint implementation text).

167.Framework Convention, *supra* note 9, arts. 4(2)(d), 7(4), 31 I.L.M. at 857, 862.

168.*See* JOINT IMPLEMENTATION, *supra* note 161, at 73 (the FCCC does not define joint implementation); Climate Change Convention Secretariat, *Activities Implemented Jointly: Methodological Issues, The Determination of Environmental Benefits Related to the Mitigation of Climate Change Through Activities Implemented Jointly* (visited Dec. 5, 1997) <http://www.unfccc.de/fccc/ccinfo/aij_radd.htr> (identifying issues still unresolved in late 1997).

169.The COP recognized the following: (1) According to the provisions of the Convention, the commitments under Article 4.2(a), to adopt national policies and to take corresponding measures on the mitigation of climate change apply only to Parties included in Annex I to the Convention (Annex I Parties), and that Parties not included in Annex I to the Convention (non-Annex I Parties) have no such commitments; (2) Activities implemented jointly between Annex I Parties and non-Annex I Parties will not be seen as fulfillment of current commitments of Annex I Parties under Article 4.2(b), of the Convention; but they could contribute to the achievement of the objectives of the Convention and to the fulfillment of commitments of Annex II Parties under Article 4.5 of the Convention; (3) Activities implemented jointly under the Convention are supplemental, and should only be treated as a subsidiary means of achieving the objective of the Convention; (4) Activities implemented jointly in no way modify the commitments of each Party under the Convention. *Activities Implemented Jointly Under the Pilot Phase in* Report of the Conference of the Parties on its First Session, Decision 5/CP.1, Apr. 7, 1995, U.N. Doc. FCCC/CP/1995/7/Add.1 (1995), 34 I.L.M. 1671, 1685 [hereinafter Pilot Phase Decision].

pilot joint implementation projects, including projects carried out in developing countries.[170] These pilot projects involve voluntary commitments by governments and private companies to conduct cooperative international activities that they characterize as contributing to the Convention's objectives.[171] The COP established "a framework for reporting . . . on the possible global benefits, . . . the national . . . impacts," and any "technical difficulties encountered."[172] The COP also decided on a set of very general criteria to govern joint implementation during the pilot phase.[173] It did not, however, agree upon a set of criteria to judge whether pilot projects fail or succeed in demonstrating the feasibility of "joint implementation" as a credit generating activity. Nor did the COP ever define precise criteria that these projects should meet or otherwise clarify the "joint implementation" concept.[174] Country reports on pilot projects generally do not describe environmental benefits in a detailed manner and they rarely provide sufficient explanation of the basis for cost and greenhouse gas mitigation calculations.[175]

170.*See id.* at 1686. For a recent report on the nature of the projects see *Activities Implemented Jointly Under the Pilot Phase: Synthesis Report on Activities Implemented Jointly (Note by the Secretariat)*, FCCC/SBSTA, 7th Sess., Item 8 of the Provisional Agenda, U.N. Doc. FCCC/SBSTA/1997/12 [hereinafter Pilot Phase Report]; *see also* Glenn Wiser, *Joint Implementation: Incentives for Private Sector Mitigation of Global Climate Change*, 9 GEO. INT'L ENVTL. L. REV. 747, 751 (1997); GOVERNMENT OF THE UNITED STATES, PUB. NO. DOE/PO-0048, ACTIVITIES IMPLEMENTED JOINTLY: FIRST REPORT TO THE SECRETARIAT OF THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (1996).

171.*See* Wiser, *supra* note 169, at 750; David Hodas, *The Climate Change Convention and Evolving Legal Models of Sustainable Development*, 13 PACE ENVTL. L. REV. 75, 93END94 (1995) (describing some projects); Announcement of Ground Rules for U.S. Initiative on Joint Implementation, 59 Fed. Reg. 28,442 (1994).

172.Pilot Phase Decision, *supra* note 168 (ordering establishment of Subsidiary Body for Scientific and Technological Advice to develop a reporting framework); *Activities Implemented Jointly Under the Pilot Phase: Uniform Reporting Format*, FCCC/SBSTA, 2d Sess., U.N. Doc. FCCC/SBSTA/1996/8, Annex IV (1996) (subsidiary body's proposed reporting framework); *Activities Implemented Jointly Under the Pilot Phase*, Decision 8/CP.2, FCCC/COP, 2d Sess., U.N. Doc. FCCC/CP/1996/15/Add.1 (1996) at 14 (COP invites parties to use the subsidiary body's reporting framework).

173.*See* Pilot Phase Decision, *supra* note 168. The COP decided that projects "should be ._._. supportive of national environmental and development" policy and contribute to cost effectiveness. *Id.* at 1686. The relevant governments should approve all projects. *See id.* "Activities implemented jointly should bring about real, measurable and long-term environmental benefits related to the mitigation of climate change that would not have occurred in the absence of such activities." *Id.* Finally, financing of joint implementation "shall be additional to the financial obligations" already contained in the treaty. *Id.*

174.*See* Pilot Phase Decision, *supra* note 168. The COP decision does not explicitly define issues to evaluate the utility of joint implementation as a means of meeting (or redefining) quantitative targets for emission reductions. Individual countries have developed very general criteria, which vary quite a bit from country to country. *See* Pilot Phase Report, *supra* note 169, at 6.

175.*See* Pilot Phase Report, *supra* note 169, at 5.

2. *Trading Under the Kyoto Protocol*

The Kyoto Protocol explicitly mentions provision of credits for projects undertaken abroad.[176] The trading arguably incorporated in the Kyoto Protocol makes it necessary to qualify statements about the quantitative limits countries ostensibly accepted in the Protocol. To the extent the Protocol allows international trading, it may allow countries to make less domestic reductions than the national quantitative limits seem to require, if they purchase something deemed equivalent from elsewhere. This involves foregoing physical compliance, defined as literally bringing the emissions in a country down to the lower level specified in the Annex B of the Kyoto Protocol,[177] which spells out each developed countries' quantitative limits for greenhouse gas emissions. Instead, trading involves "virtual" compliance without physical compliance.[178]

The Kyoto Protocol, however, does not clearly allow trading to justify a country's failure to physically meet national quantitative reduction commitments. Article 3 simply restates the ambiguity found in the Framework Convention, providing that developed countries "shall, *individually or jointly*, ensure that their aggregate carbon dioxide equivalent emissions . . . do not exceed their assigned amounts" in Annex B.[179]

Article 4 of the Kyoto Protocol supports an interpretation that allows at least one form of trading to result in virtual compliance. It states that countries that have agreed to fulfill their commitments jointly under Article 3 will be "deemed" in compliance when virtual compliance occurs.[180] This provision was designed primarily to allow the European Community to comply with a community-wide limit created through aggregation of the relevant

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176.See Kyoto Protocol, *supra* note 10, arts. 6(1), 12(3)(b), 37 I.L.M. at 42.

177.*See id.* Annex B, 37 I.L.M. at 42.

178.*See id.*

179.*Id.* art. 3(1), 37 I.L.M. at 33 (emphasis added).

180.The Kyoto Protocol states:
Any parties included in Annex I that have reached an agreement to fulfill their commitments under article 3 jointly, shall be deemed to have met those commitments provided that their total combined aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of Article 3. The respective emission level allocated to each of the Parties to the agreement shall be set out in that agreement. *Id.* art. 4(1), 37 I.L.M. at 34.

national emission limitations.[181]

But another provision addressing more generalized emissions trading,[182] Article 6, states that "the acquisition of emission reduction units shall be *supplemental* to domestic actions for the purposes of meeting commitments under Article 3."[183] Article 17 reinforces this idea that emissions trading must be supplemental, stating that "any . . . trading shall be supplemental to domestic actions for the purpose of meeting quantified emission limitation and reduction commitments under that Article."[184] The term "supplemental" could indicate that countries must meet their quantified obligations through physical compliance, but may use credits to meet basic non-quantified obligations or supplement compliance with the treaty.[185]

181.*See* Farhana Yamin, Developing Countries and Emission Trading, Address at Canada/U.S. Emissions Trading Forum in Vancouver 5 (March 16END17, 1998) (unpublished manuscipt on file with the author); Breidenich et al., *supra* note 100, at 321.

182.Some discussions of the issues in the Kyoto Protocol make a distinction between "emissions trading" on the one hand and "joint implementation" on the other. *See, e.g.*, Brendan P. McGivern, Introductory Note to Kyoto Protocol, Dec. 10, 1997, 37 I.L.M. 22, 26 (treating trading under article 16 [article 17 in the revised text] as emissions trading and trading under article 6 as "joint implementation"). This distinction obscures the issues involved in any international transfer of credit for meeting greenhouse gas limitations and lacks clarity. *See id.* (treating transactions under article 6 as an instance of "joint implementation"); Frank T. Joshua, International Greenhouse Gas Emissions Trading: Structure and Organization of the Emissions Market 6 (1998) (draft unpublished manuscript on file with the author) (treating transactions under article 6 as emissions trading); *Negotiators Optimistic on Treaty Including Emissions Trading, Joint Implementation*, NAT'L ENV'T DAILY (BNA), Dec. 5, 1997, *available in* LEXIS, BNA Library, BNAEVR file (describing joint implementation as "a system of credit sharing for emission offset projectsEMDsuch as planting treesEMDin developing countries that are sponsored by industrialized nations). The text of the treaty does not define "joint implementation" and does not support the notion that an international consensus exists about its meaning. This article will therefore use the term emissions trading to refer to any arrangement involving a transfer of credits or obligations.

The distinction between trading and joint implementation arose after the first COP voted to ban trading as a means of meeting quantitative commitments under the joint implementation provisions of the Framework Convention. Under pressure from the United States to authorize such trades, early drafts of the Kyoto Protocol contained proposals for both emissions trading and joint implementation, but never clearly defined either term. *See, e.g.*, *Reports by the Chairmen of the Informal Consultations Conducted at the Seventh Session of the Ad Hoc Group on the Berlin Mandate*, FCCC/AGBM at 20END22, U.N. Doc. FCCC/AGBM/1997/INF.1 (1997).

183.Kyoto Protocol, *supra* note 10, art. 6(1)(d), 37 I.L.M. at 35 (emphasis added).

184.*Id.* art. 17. Article 17 appeared as article 16 bis when the Kyoto Protocol first appeared on the Framework Convention's web page and as reprinted in International Legal Materials. *See* 37 I.L.M. 22, 22 n.* (noting that I.L.M. text is reproduced from *draft* text from a visit to the web site on January 15, 1998); *Id.* art. 17 (article 16 bis). The Secretariat subsequently made a technical correction to the text appearing on the web page, renumbering this as article 17. *See* United Nations Framework Convention on Climate Change Internet Web Site (visited June 18, 1998) <http://www.unfccc.de/fccc/docs/cop3/ 107a01.pdf>.

185.For example, under the Framework Convention developed countries have an obligation to protect and enhance greenhouse gas sinks and reservoirs independent of the quantitative obligations in the Kyoto

The second sentence of Article 17, however, states that developed countries "may participate in emissions trading for the purposes of fulfilling their commitments under Article 3 of this Protocol."[186] This would seem to contradict a reading requiring complete physical compliance with quantitative obligations. This ambiguity reflects the inability of the international community to reach consensus on whether trading should generate credits toward compliance with developed country quantitative limits.[187]

The United States did not want to limit trading to reductions in greenhouse gas emissions. It sought to broaden trading to allow countries and/or their polluters to forego reductions in greenhouse gas emissions in exchange for carrying out actions that protected or enhanced greenhouse gas sinks.[188] This might allow credit for forestry projects similar to those American electric utilities implemented as pilot projects to demonstrate the "feasibility" of "joint implementation."[189]

This idea goes beyond emissions trading to encompass environmental benefit trading, a concept which is a more amorphous form of trading than emissions trading. Proponents of this broadened trading argue that trading carbon sink preservation and enhancement for emission reductions is appropriate, because both play a role in preventing climate change. The Kyoto Protocol may actually authorize this kind of generalized trading between developed countries, but it requires an expert body to develop criteria to govern trading.[190] For this reason, one

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Protocol. *See* Framework Convention, *supra* note 9, art. 4(2)(a), 31 I.L.M. at 856. They might use tradable credits to satisfy these obligations.

186.Kyoto Protocol, *supra* note 10, art. 17.

187.*See COP3 Summary*, *supra* note 95, at 11END12; McGivern, *supra* note 181, at 26 ("The negotiations in Kyoto nearly collapsed over the issue of emissions trading.").

188.*See generally* JOINT IMPLEMENTATION, *supra* note 161, at 187END94.

189.*See* William R. Moomaw, *Achieving Joint Benefits from Joint Implementation*, *in* CRITERIA, *supra* note 18, at 12 (describing tree planting as the "first and best known example of a joint implementation strategy").

190.Article 6 provides that developed country parties may trade "emission reduction units" in order to meet its quantitative emission reduction commitments. *See* Kyoto Protocol, *supra* note 10, art. 6, 37 I.L.M. at 35. The term emission reduction units literally refers to emission reductions and not sink enhancement. *See id.* Sink enhancement does not reduce emissions, rather it enhances or conserves the ability of greenhouse gas "sinks" (such as forests) to ameliorate the damage from increased emissions. Forestry projects may tend to remove carbon from the atmosphere thereby reducing atmospheric concentrations of greenhouse gases, but they do not reduce "emissions"END the release of gases into the atmosphere by polluters.

The context, however, shows that the parties intended to give the term a broader interpretation than the literal language allows. Article 6 refers to "emission reduction units" resulting from "projects aimed at reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks."

cannot say that the agreement requires any absolute reductions in greenhouse gas emissions without appropriate caveats. The agreement leaves open the possibility of substituting tree planting for otherwise required greenhouse gas emission reductions.[191]

The United States also wished to expand trading to include trades between developed and developing countries. The Kyoto Protocol generally rejected this proposal; Articles 3, 4, and 6 only authorize trading between developed countries.[192]

But Article 12 establishes a limited exception to this decision not to endorse trades between developed and developing countries. It allows developed countries to count "certified emission reductions" in meeting their quantitative targets.[193] Article 12 implies that these credits will come from projects carried out in developing countries. Article 12 creates a "clean development mechanism" to certify these credits.[194] It establishes this mechanism's purpose as assisting developing countries "in achieving sustainable development and in contributing to the ultimate objective of the Convention."[195] And it provides that developing countries "will benefit from project

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Kyoto Protocol, *supra* note 10, art. 6, 37 I.L.M. at 35. Hence, projects enhancing forests' "anthropogenic" carbon removal capacity may generate "emission reduction units" under the treaty, even though they literally do not reduce emissions.

Article 3, sections 10 and 11 require the addition or subtraction of these "emission reduction units" to countries' quantitative emission reduction obligations. Kyoto Protocol, *supra* note 10, art. 3(10), (11), 37 I.L.M. at 34. Hence, these emission reduction units, which might include things other than emission reductions, may count toward the quantitative emission limitations set out in Annex B of the Kyoto Protocol.

191.Indeed, the Kyoto Protocol may allow parties to avoid domestic reductions to the extent it engages in vigorous domestic tree planting. *See* Kyoto Protocol, *supra* note 10, art. 3(3), (4), 37 I.L.M. at 33.

192.Article 3 states that the "Parties included in Annex I," the developed countries, "shall individually or jointly," reduce emissions. *Id.* art. 3, 37 I.L.M. at 33. Article 4 authorizes trading of commitments for "any Parties included in Annex I." *Id.* art. 4, 37 I.L.M. at 34. Similarly, article 6 states:
\FNEXT1 For the purpose of meeting its commitments under Article 3, *any Party included in Annex I* may transfer to, or acquire from, *any other such Party* emission reduction units resulting from projects aimed at reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks of greenhouse gases in any sector of the economy ._._._.**\FNEXT1**

Id. art. 6, 37 I.L.M. at 35 (emphasis added); *see Highlights supra* note 159, at 2 (Chairman Estrada said joint implementation between Annex I and non-Annex I Parties had been dropped).

193.Kyoto Protocol, *supra* note 10, art. 12(3)(b), 37 I.L.M. at 38.

194.*Id.* art. 12(1), (7), 37 I.L.M. at 38. For background on the negotiating history of this provision, see *U.S. Proposes New Funding Scheme for Joint Implementation Trading*, 28 Env't Rep. (BNA) 1525 (Dec. 5, 1997).

195.Kyoto Protocol, *supra* note 10, art. 12(2), 37 I.L.M. at 38.

activities resulting in certified emission reductions."[196] In order for projects to help developing countries in the manner contemplated, they must be carried out in those countries.

While Article 12 authorizes geographically broad trading, it restricts some aspects of trading. In contrast to Articles 3 and 6, which contemplate credit for forestry projects, Article 12 only authorizes credits for "emission reductions."[197]

Furthermore, Article 12 requires that developed country purchasers of clean development credits fund more than a simple transfer of emission reduction credits. It directs the COP to "ensure that a share of the proceeds from certified" projects "cover administrative expenses" and help "developing country Parties that are particularly vulnerable to" climate change's "adverse effects" to adapt.[198] This may allow island states likely to suffer greatly from sea level rise and increasingly frequent storms to benefit from purchases of reductions.

Finally, Article 12 requires these projects to have value going beyond the simple generation of credits. Reductions must not only be "real" and measurable, but also bring "*long-term* benefits related to . . . climate change."[199]

The provisions adopted in the Protocol do not provide clear answers to even the most basic questions about joint implementation. Indeed, the delegates to the Kyoto Protocol recognized that the provisions they adopted failed to address a number of crucial issues, including whether credits could be claimed for activities carried out abroad, what entities may trade, monitoring issues, accounting issues, oversight, and methodologies for estimating environmental benefits.[200] Hence, important issues about the scope and nature of trading remain open after Kyoto.[201]

196.*Id.* art. 12(3)(a), 37 I.L.M. at 38.

197.*See id.* art. 12(3)(b), 37 I.L.M. at 38.

198.*Id.* art. 12(8), 37 I.L.M. at 38.

199.*Id.* art. 12(5)(b), 37 I.L.M. at 38 (emphasis added).

200.*See* Report of the Conference of the Parties on its Third Session, Decision 1/CP.3 FCCC/COP, 3d Sess. at 5END6, U.N. Doc. FCCC/CP/1997/7/Add.1 (1997) (requesting subsidiary bodies to guide the Secretary in addressing *inter alia* various emissions trading issues at the fourth meeting of the COP in Buenos Aires in 1998).

201.*See* Searles, *supra* note 5, at 133, 135.

3. *The Free Lunch Theory of Trading*

Many American scholars and government officials tend to view emissions trading as a free lunch, a proposition with no significant downside.[202] This probably helps explain the American government's enthusiastic attitude toward international emissions trading. This subsection will explain the "free lunch" theory of emissions trading.

Emissions trading offers the theoretical ability to achieve some environmental goals with less private sector cost than traditional regulatory approaches.[203] Suppose, for example, that a 100 ton reduction in aggregate sulfur dioxide (SO2) emissions could protect a lake from acid rain. Assume that two power plants, called Cheap and Expensive, cause this problem and each emits 150 tons of SO2. If no other sources of this pollutant existed, the government could address this problem by requiring each pollution source to reduce emissions by 50 tons. This involves setting a uniform standard for an industrial category, an approach found in many environmental statutes.[204]

Equalized emission reduction does not necessarily imply equalized cost, since one plant's equipment may make pollution control more expensive than that of another. Suppose that Cheap has control costs of $1,000 per ton, but that Expensive has control costs of $2,000 per ton. A uniform standard demanding fifty ton reductions would then produce $150,000 in pollution control expenditures, $50,000 at Cheap ($1,000 X 50) and $100,000 at Expensive ($2,000 X 50).

Suppose, however, that the government writes the same emission limitations, but allows the pollution sources to trade reductions. Presumably, Expensive will pay Cheap to make fifty tons of reductions in its stead. Cheap will cut its emission by 100 tons below its baseline level at a cost of $100,000 ($1,000 per ton X 100 tons). Expensive will not cut its emissions at all. The public will secure the 100 tons of reduction needed to protect the

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202.*See, e.g.,* Ackerman & Stewart, *supra* note 4, at 172; *Kyoto Meeting Ends With Agreement, Leaving Details for 1998 in Buenos Aires*, 28 Env't Rep. (BNA) 1567 (Dec. 12, 1997) (Senator Robert Byrd states that "emissions trading and `joint implementation' ._._. minimize economic pain and maximize the use of new technologies.").

203.Driesen, *supra* note 2, at 312[END]13; Ackerman & Stewart, *supra* note 4, at 179.

204.*See* Ackerman & Stewart, *supra* note 4, at 172[END]73; *cf.* Driesen, *supra* note 2, at 308, n.93 (arguing that the commentators have exaggerated the dominance of the uniform standards approach). *See, e.g.*, 33 U.S.C. §_1312 (1994); 42 U.S.C. §§_7411(a), 7412(d), 7521 (1994).

lake from acidification, but the pollution sources will pay $100,000 instead of $150,000. In theory, emissions trading offers a more cost effective means of meeting an environmental goal than a uniform standard, whenever marginal costs vary between plants.

International trading of environmental benefits may tend to reduce the costs of complying with the Climate Change Convention.[205] The precise argument generally made about emissions trading, that trading saves money relative to a uniform emissions standard,[206] does not apply to the Climate Change Convention. For the Protocol has assigned non-uniform national limits to each developed country's emissions. Hence, there is no problem of uniform standards to overcome on the international level. Furthermore, the Climate Change Convention does not require countries to use uniform emission standards to meet climate change goals. Countries may choose carbon taxes, subsidies for advanced technologies, cooperative agreements with industry, domestic emissions trading, non-uniform emission standards, uniform standards, or any other mechanism to reduce emissions domestically under the Convention.

However, a slightly different argument for the proposition that trading saves money may apply. Countries (or their nationals) will only trade if purchasing a credit from abroad costs less than implementing something at home, whether or not the home reduction comes about because of a uniform emissions standard.[207] For example, President Clinton has proposed to subsidize innovative technology tending to reduce carbon dioxide emissions through tax credits.[208] The United States could reduce this investment and purchase credits for somebody else's reduction abroad under the treaty.[209] Accordingly, a variant of the argument most responsible for the free lunch theory of emissions trading seems to apply to climate change. Emissions trading reduces the costs of meeting emission reduction goals by allowing countries (or their nationals) to secure the cheapest possible emission

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205.*See* Stavins, *supra* note 116, at 298[END]99.

206.*See* Driesen, *supra* note 2, at 312[END]13; Ackerman & Stewart, *supra* note 4, at 173, 179 (comparing the economic efficiency of a trading system to a system based upon uniform standards).

207.Significant differences in marginal abatement costs may exist between countries. *See Key Issues Outlined for Upcoming Talks on International Emission Trading System,* 21 Int'l Env't Rep. (BNA) 414 (Apr. 29, 1998) (Costa Rica's minister of environment estimates that allowance prices in the industrialized world will cost about $70 per ton, while costing only about $10 per ton in the developing world).

208.John H. Cushman Jr., *Clinton Seeks Tax Credits for Fuel Savings,* N.Y. TIMES, Jan. 31, 1998, at A11.

209.*See generally* Wiser, *supra* note 169, at 760[END]61 (advocating a carbon tax with a credit against the tax available for emission reduction credits earned abroad).

reductions.[210]

But the parties to the Kyoto Protocol may already have taken cost-effectiveness into account by assigning differentiated national caps on greenhouse gas emissions. To the extent the differentiation of national emission limits already reflects consideration of cost effectiveness, implementation of the Protocol should not require much reliance on emissions trading.[211] Furthermore, even without international emissions trading, countries can lower their compliance costs through the use of domestic economic incentive measures.[212] So countries may lower costs without international emissions trading.[213]

In spite of this, one can construct a justification for international emissions trading on cost-effectiveness grounds. The individual national caps may reflect considerations other than comparative cost-effectiveness. Alternatively, the cost-effectiveness estimates justifying the differentials may prove inaccurate in practice. In either case, emissions trading should enhance the cost-effectiveness of delivering the reductions.

Similarly, even if national economic incentive programs lower compliance costs, additional opportunities for cost savings may exist beyond the border. The existence of differentiated caps and authority to use national economic incentive approaches may lessen the value of emissions trading, but they do not necessarily eliminate the possibility of realizing some cost savings from emissions trading.[214]

Professors Bruce Ackerman and Richard Stewart have also argued that emissions trading combines democratic accountability with the "market mechanism" of emissions trading.[215] They claim that emissions trading

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210.*See* JOINT IMPLEMENTATION, *supra* note 161, at 161 (joint implementation can enhance the cost-effectiveness of implementation measures "particularly where the marginal costs of response strategies" differ from country to country).

211.The IPCC states that the initial allocation of emissions rights amongst nations does not affect global abatement costs significantly. *See* IPCC DIMENSIONS, *supra* note 15, at 339. This makes sense if one assumes that all initial allocations will be traded until an optimum is reached anyway. But to the extent that the initial allocation of rights already reflects cost-effectiveness considerations, the initial allocation will accomplish what the trading system would otherwise seek to accomplish in theory, the production of more reductions where reductions are cheaper.

212.*See* Stavins, *supra* note 116, at 302[END]07 (discussing domestic carbon taxes and tradable permits).

213.*Id.*

214.*See* IPCC DIMENSIONS, *supra* note 15, at 338[END]40.

215.*See* Ackerman & Stewart, *supra* note 4, at 171; *cf.* Lisa Heinzerling, *Selling Pollution, Forcing Democracy*, 14 STAN. ENVTL. L.J. 300, 303 (1995) (arguing that the history of the acid rain program does not support the notion that emissions trading enhances democratic accountability).

offers an opportunity to focus public attention on decisions about aggregate emission reductions, rather than more arcane issues arising in environmental law.[216] This helps explain their use of the "free lunch" metaphor.[217] If a "free market" approach also offers democratic accountability, perhaps no downside exists.

In fact, an emissions trading program must begin with some public body establishing emission limitations; so a trading program does involve, more or less, democratic decisions.[218] Professors Ackerman and Stewart go further, however, and argue that emissions trading actually offers more democratic accountability than traditional regulation.[219] They reach this conclusion by comparing a hypothetical emissions trading program in which Congress sets emission limitations to a traditional regulatory program in which an administrative body sets limits for categories of pollution sources in arcane administrative rulemaking proceedings.[220]

Most writings on emissions trading also claim that trading tends to foster innovation.[221] Commentators rely on the fact that emissions trading creates an incentive for some pollution sources to make more reductions than a regulator requires, because the owners of these "overcomplying" sources may sell these credits to other pollution sources.[222]

An important question exists as to the proper scope of the free lunch theory of trading. Professor Ackerman and Stewart articulated their free lunch theory in defense of an emissions trading program that capped

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216.*See* Ackerman & Stewart, *supra* note 4, at 189.

217.*See id.* at 171END72 (arguing that emissions trading combines better democratic debate with significant savings and then suggesting that emissions trading is a free lunch because it is better "in terms of all relevant public values").

218.*See* Driesen, *supra* note 2, at 324.

219.*See* Ackerman & Stewart, *supra* note 4, at 171, 188END91 (economic incentives will vastly "improve the quality of debate about environmental values").

220.Professors Ackerman and Stewart criticize "uniform" best available technology (BAT) regulations because they "impose massive information gathering burdens on *administrators*." *Id.* at 174 (emphasis supplied). They also criticize BAT because it tends to encourage industry to litigate in order to delay or defeat "regulatory requirements." *Id.* They then state that emissions trading will enhance democratic debate by focusing "Congressional debate ._._. upon the fundamental question" of how many pollution permits to grant. *Id.* at 189.

221.*See, e.g.*, Ackerman & Stewart, *supra* note 4, at 183 (emissions trading "promises to ._._. reward innovative improvements in existing cleanup techniques.").

222.*See* Driesen, *supra* note 2, at 334.

emissions at levels chosen by Congress.[223] Indeed, they advocated a system in which polluters would have to buy permits from the government.[224] The government would limit the quantity of permits and hence the volume of total emissions.[225] This raises the question of whether the free lunch theory properly constitutes a theory about emissions trading in general, or a theory about cap and trade programs.

The acid rain trading program capping sulfur dioxide emissions in order to address acid rain more closely resembles the Ackerman/Stewart ideal than other emissions trading programs.[226] The acid rain program has saved money while significantly advancing environmental protection precisely because it caps emissions and requires continuous emissions monitoring.[227] As a result, the program seems likely to succeed in making significant reductions in pollution while lowering costs.[228] It therefore seems to vindicate the free lunch theory of emissions trading as offering effective environmental protection at lower cost.

But perhaps not. Throughout the 1980s, United States Environmental Protection Agency (EPA) authorized state emissions trading programs that did not cap the overall mass of emissions.[229] Instead, polluters would secure credits in lieu of meeting source specific limits on emission rates.[230] These programs often receive

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223.Professors Ackerman and Stewart state that the trading system should force Congress to decide about the "rate of change" of existing levels of pollution. Ackerman & Stewart, *supra* note 4, at 189[END]90. This necessarily implies a cap on emissions. Otherwise, it is possible to dictate outcomes at particular plants, but not changes in overall emission levels. Caps are also implicit in their argument that a restricted supply of pollution rights would be available. *See id.* at 186. *See* Driesen, *supra* note 2, at 326.

224.*See* Ackerman & Stewart, *supra* note 4, at 178[END]83.

225.*Id.* at 186.

226.For a description of the acid rain program see David Driesen, *Air Pollution Control, in* POWELL, TREATISE ON PROPERTY 865.5A[5] (1994); Brennan Van Dyke, *Emissions Trading to Reduce Acid Deposition*, 100 YALE L.J. 2707 (1991); Nancy Kete, *The U.S. Acid Rain Allowance Trading System, in* OECD, CLIMATE CHANGE: DESIGNING A TRADABLE PERMIT SYSTEM 78[END]108 (1992).

227.*See* Driesen, *supra* note 2, at 317[END]19.

228.*Id.* at 318[END]19. I have questioned whether the emissions trading mechanism constitutes an adequate explanation of the cost savings realized so far. *See id.*

229.*See id.* at 314[END]16 (describing some of these programs). I include "bubbles," which only authorize trades between units within a plant as trading programs, even though a "bubble" limits the scope of trading geographically. *See id.* at 313[END]16.

230.*See* Driesen, *supra* note 2, at 317[END]18.

credit for saving pollution sources a lot of money.[231] But these programs rarely produced the emissions reductions that the non-trading programs they replaced called for. Indeed, many of them saved polluters money by allowing them to hide the fact that they did nothing to reduce pollution.[232]

Since 1990, the EPA has not applied the lessons this mixed experience offers to its supervision of state emissions trading programs. It has encouraged state programs without emission caps and without direct monitoring of emissions.[233] As a result, a number of states have written rules that may duplicate the failures of the 1980s, rather than emulate the potentially successful acid rain program.[234]

Government officials and a number of scholars may assume that the free lunch theory applies to all trading programs. But it may only properly apply to programs that cap emissions and carefully monitor them. Other kinds of programs may offer substantial cost savings for polluters with significant costs to the environment. Such programs may resemble expensive, rather than free, lunches.

The free lunch theory of emissions trading claims that emissions trading (or perhaps only some emissions trading programs) offers significant advantages over traditional environmental programs. These benefits include lowered cost, superior incentives for innovation, and enhanced democratic process.

II. EMISSIONS TRADING AS A CHEAP FIX

Trading may help society meet short-term environmental goals more cheaply than traditional approaches. This part asks whether a least cost solution to an immediate environmental objective necessarily constitutes the best approach to a long-term environmental problem.

More specifically, this part questions the free lunch theory's claim that emissions trading tends to foster innovation and advance democratic values. It argues that emissions trading has a tendency to delay innovation and interfere with democratic accountability. Because of this, trading may hinder long-term progress, even if it does reduce short-term costs. For these reasons, it may constitute a cheap fix, not a free lunch. This should affect policy

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231.*See id.* at 313.

232.*See id.* at 314END16.

233.*See id.* at 320.

234.*See id.* at 320 n.149 (discussing some of the failed 1990s bubbles); MICH. ADMIN. CODE L.L. 336.2201END336.2218 (1998) (Michigan's recently adopted "open market" trading rule).

makers' response to proposed trading programs.

A. *Trading, Innovation, and the Future of the Climate Change Convention*

This subsection will address the issue of innovation under the treaty. First, it will discuss the issue of whether trading may tend to discourage innovation. Second, it will explain the importance of innovation to the future of the treaty.

This article focuses on the emissions trading issue, not the issue of selecting the proper target for reductions. This subsection asks whether international trading tends to foster innovation or facilitate its avoidance for any given target.

1. *Trading and Innovation*

The Framework Convention envisions a process of innovation in developed countries, subsidized technology transfer to developing countries, and the eventual assumption by all countries of adequate obligations to avoid dangerous climate change. Trading may either contribute to or detract from this long-term process.

Many economists assume that emissions trading generates innovation, because trading encourages the pollution source with the cheapest control options to make more reductions than the government requires of it in order to sell credits to other sources for which emissions control is more expensive.[235] These economists assume, correctly, that making more reductions will generally require more innovation than making fewer reductions. Accordingly, cheap sources wishing to sell credits to polluters with more expensive control options innovate more than they would absent emissions trading. This argument focuses very narrowly on pollution sources with relatively cheap control options and does not consider how emissions trading might effect innovation at the pollution sources with relatively expensive control options.

Broadening the analysis to include all of the pollution sources eligible to trade casts grave doubts on the theory that emissions trading encourages more innovation than a comparable traditional regulation, as some

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235.*See, e.g.*, Stavins, *supra* note 116, at 302[END]03 (describing emissions trading as promoting "dynamic efficiency," i.e., technological innovation); Gary E. Marchant, *Freezing Carbon Dioxide Emissions: An Offset Policy for Slowing Global Warming*, 22 ENVTL. L. 623, 630 (1992) (applying this reasoning to the climate change problem).

economists have realized.[236] An emissions trading program creates two incentives: an incentive for the cheaper facility to emit less pollution than the government will authorize; and an incentive for the more expensive facility to emit more pollution than the government will authorize under a comparable traditional regulation.[237] In emissions trading, foregoing normally required emission reductions at plants with relatively expensive control options finances "additional" reductions (reductions going beyond requirements) at cheaper facilities.[238] The money saved by foregoing emission reductions at one facility finances the "extra" emission reductions at another.[239]

At a minimum, this means that an emissions trading program decreases the incentives for innovations at relatively expensive facilities, since operators of these facilities will emit more than they would under a comparable uniform standard.[240] These operators, who might have tried to innovate to escape expensive pollution control requirements under a traditional performance standard, will tend to purchase credits instead.

Emissions trading may induce less net innovation than traditional regulation.[241] The trading program effectively lessens or eliminates the pollution control obligations of the sources having the greatest need for innovation, those facing high control costs. It provides an incentive for low cost sources to make more reductions than a regulation would otherwise require. But the low cost sources may meet their needs with conventional technology, since achieving reductions for them is relatively cheap. Emissions trading, by shifting reductions from high cost to low cost facilities, may weaken incentives for innovation, even while it generates short-term cost savings.

Traditional regulation requires emission reductions from specifically targeted pollution sources. It does not allow polluters to forego control of a targeted source in exchange for a reduction elsewhere. This locational

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236.*See, e.g.*, David A. Malueg, *Emissions Credit Trading and The Incentive to Adopt New Pollution Abatement Technology*, 16 J. ENV'T ECON. & MAN. 52 (1987).

237.*See* Marchant, *supra* note 234, at 629 (emissions trading encourages "firms with lower marginal costs of reducing pollution to reduce more emissions than firms with higher marginal costs.").

238.Driesen, *supra* note 2, at 337.

239.*Id.*

240.*Id.* at 334.

241.*See* Dubash, *supra* note 164, at 73[END]74 (joint implementation lessens the incentive to innovate).

constraint may increase the need for innovation by requiring very focused pollution control efforts that might be expensive absent innovation. Easing the spatial constraints of traditional regulation may make it easier to choose some standard technology at a pollution source where control costs are inexpensive, rather than encourage innovation. If countries trade a large volume of environmental benefits under the Climate Change Convention, this may impede innovation for similar reasons.

Developed countries, if required to make substantial domestic reductions in greenhouse gas emissions, may induce substantial innovation.[242] Indeed, President Clinton has announced an implementation strategy designed to encourage innovation in the United States. In particular, his policy seeks to encourage development of very energy efficient vehicles, renewable energy, and energy conservation. Other countries have announced strategies to induce similar changes, using a wide variety of fiscal, regulatory, and social mechanisms.[243] Implementation of these packages, however, may provoke resistance, especially if policies encourage use of innovative technologies that may displace lucrative existing technologies.

Trading offers a country the opportunity to make less domestic change to the degree it purchases credits abroad. Since innovation often involves significant initial costs, trading may create an economic incentive to deploy existing technology abroad in lieu of innovation at home.[244]

Suppose, for example, that an American electric utility faces emission limitations stringent enough to force it to increase reliance on renewable energy sources and fuel cells.[245] Given an international trading option, the utility may earn equivalent credits building a coal-burning power plant using standard technologies in a country that burns coal directly to heat buildings, cook, and power small industries.[246] Or it may retrofit an existing

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242.*See* Woodward, *supra* note 15, at 217 (many nations look to the United States for leadership and innovative technology in addressing climate change).

243.*See, e.g., When Virtue Pays a Premium*, THE ECONOMIST, Apr. 18, 1998, at 57 [hereinafter *Virtue*] (referring to Sweden's carbon tax and Germany's subsidy of wind power).

244.*See* JOINT IMPLEMENTATION, *supra* note 161, at 75[END]76.

245.Renewable energy sources include solar energy, biomass, hydropower, and geothermal power. *See* IPCC IMPACTS, *supra* note 15, at 589, 602[END]16. Fuel cells convert chemical energy into electricity without burning fossil fuels. *See id.* at 594; *see also* Matthew L. Wald, *Fuel Cell Will Supply All Power to a Test House*, N.Y. TIMES, June 17, 1998, at A28.

246.*See* IPCC IMPACTS, *supra* note 15, at 596. Coal is the most carbon intensive fossil fuel. *See* IPCC DIMENSIONS, *supra* note 15, at 241.

dirty coal-fired power plant abroad.[247] Even if use of standard technology abroad produces equivalent emission reductions at less cost than domestic reductions, the use of standard technology does nothing to support the process of developing renewable energy resources or advanced technologies.[248] It consequently does nothing to change the cost differential that prevents the widespread deployment of technologies with much lower emissions.[249] More initially expensive investments in developing and applying renewable energy might lower this cost differential over time; past investments have already substantially lowered the cost of producing renewable energy.[250] A decision to retrofit a Russian power plant (for example) resembles homeowner's decision to patch a leaky spot on the roof, rather than to begin building a new roof capable of withstanding future storms.

Trading may not only discourage the up-front investment in innovation necessary to develop new technologies with some initial costs, it may lead to avoidance of inexpensive but institutionally difficult energy efficiency improvements. Wide agreement exists that fairly large cuts in greenhouse gas emissions are available at little or no net cost through investments in energy efficiency, which tend to reduce consumption of fossil fuels and associated greenhouse gas emissions.[251] Many energy efficiency improvements tend to produce enough savings in fuel costs to finance the initial cost of introducing greater efficiency.

247.*See* Chris Rolfe, *An Environmental Perspective on International Greenhouse Gas Emission Trading* (visited May 10, 1998) <http://www.vcn.bc.ca/wcel/wcelpub/1998/12249.html>.

248.For a general review of available and advanced technological options for reducing greenhouse gas emissions see IPCC IMPACTS, *supra* note 15, at 589[END]640. *See also* IPCC DIMENSIONS, *supra* note 15, at 329 (a special effort is necessary to reverse the strong tendency for fossil fuel technology to become the major future supply source for developing countries).

249.*See* Wald, *supra* note 244, at A28 (the idea of fuel cells has been around for 100 years, but until recently fuel cells were too expensive for every day applications.).

250.*See* IPCC DIMENSIONS, *supra* note 15, at 242 (costs of renewable energy are falling partly because of "learning effects" and "economies of scale"). *See, e.g.*, *Honda Sets Goal of Zero Waste Discharges, Greenhouse Gas Cuts at All Domestic Sites*, 21 Int'l Env't Rep. (BNA) 428 (Apr. 29, 1998) (Honda announces a solar electric power generation system that reduces power generation costs substantially); Wald, *supra* note 244, at A28 (explaining that fuel cell costs are falling and are expected to fall further, especially if mass produced).

251.*See* IPCC DIMENSIONS, *supra* note 15, at 12[END]13 (citing agreement that energy efficiency gains of 10% to 30% above baseline trends is available over the next two to three decades at negative to zero net cost and that greater free improvements are available over longer time scales); *see also* ALLIANCE TO SAVE ENERGY ET AL., ENERGY INNOVATIONS: A PROSPEROUS PATH TO A CLEAN ENVIRONMENT (1997) (making policy recommendations designed to realize a large amount of reductions while accomplishing a net savings of $58 billion by 2010).

Substantial institutional barriers make it difficult to implement these inexpensive reductions.[252] The actual free market economy, as opposed to the perfect market economists model, often fails to realize cost saving emission reductions. Energy efficiency investments that save money for the society as a whole over a long period of time do not necessarily appear economic to the people in a logical position to make investments. For example, a homeowner may not invest in insulation, energy efficient lighting, and energy efficient appliances that would more than pay for themselves in a few years. The homeowner may not have the resources to make the required up-front investment or may not plan to live in a house long enough to realize the full return on the investment.

Similarly, cultural factors, not just costs, help explain the increased use of passenger cars in the United States, which contributes to climate change.[253] Reversing this increase would no doubt require politically difficult changes, even if a shift to mass transit were economically attractive.[254]

In many cases, realizing free or very inexpensive "no regrets" options requires significant institutional reforms that require political effort.[255] Government officials may find it easier to realize more expensive reductions abroad, than to realize cheap reductions at home that require political and cultural change.

The broader the universe of trading opportunities, the greater the potential to find cheap fixes that avoid long-term investments.[256] In crafting agreements about trading, the international community faces important issues

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252.*See* Rolf Selrod & Asbjorn Torvanger, *What Might the Minimum Requirements for Making the Mechanism of Implementation Under the Climate Change Convention Credible and Operation, in* OPPORTUNITIES AND APPREHENSIONS, *supra* note 161, at 8 (discussing the existence of institutional and other barriers to "no regrets" (i.e. profitable) options).

253.*See* Craig N. Oren, *Getting Commuters Out of Their Cars: What Went Wrong*, 17 STAN. ENVTL. L.J. 141, 160[END]74 (1998). Economic cost also plays a role. *See id*. at 165 (citing the drop in the cost of auto travel as a key reason for increased vehicle use).

254.*See id.* at 190[END]98 (explaining the reasons for the failure of an employee trip reduction program in the Clean Air Act).

255.The term "no regrets" refers to measures that would address climate change, but would be worth doing anyway, even if no climate change problem existed, usually for economic reasons. IPCC DIMENSIONS, *supra* note 15, at 15 n.2.

256.Even if the Climate treaty did nothing to authorize international trading, countries could employ domestic emissions trading to meet their national limits for greenhouse gas emissions. This would allow developed countries, the only countries with quantitative limits under the Kyoto Protocol, to reduce their costs of meeting greenhouse gas limitations. This would allow some avoidance of innovation. But to the extent reasonably easy things are already being done, some industries might have to innovate in order for a country to meet its limit.

If one can only trade emission reductions with the OECD countries, then one can only avoid innovation until the limits of existing technologies are exhausted in all of these technically advanced

about the appropriate geographic breadth of trading and about which countries may trade. The degree of the threat to innovation depends on the particulars of the law governing trading. Geographically broad trading opportunities to realize credits for using standard technologies or planting trees may facilitate avoidance of investments in energy efficiency and renewable energy.

2. *The Importance of Innovation under the Climate Change Convention*

Avoidance of innovation would have important consequences for the future of the treaty. As explained above, the Convention relies upon innovation from developed countries to meet its goals. Article 2 of the Kyoto Protocol explicitly encourages one type of innovation of special importance to climate change, increased use of "new and renewable forms of energy" in developed countries.[257] Article 2 also encourages developed countries to make other changes relevant to energy policy that may require innovations, namely "enhancement of energy efficiency" and measures limiting greenhouse gas emissions in the transport sector.[258]

The Intergovernmental Panel on Climate Change, an international panel of scientists charged with assessing the environmental and socio-economic impact of climate change,[259] identified reducing reliance upon

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countries. This may allow more deferral of innovation than a purely domestic trading regime would allow. But since these countries are also advanced, and they have capped greenhouse gas emissions under the Kyoto Protocol, limits on greenhouse gas emissions might continue to drive some innovation.

If one can trade with Eastern Europe and the former Soviet Union, the opportunities to avoid innovation become much greater. These countries have extremely dirty and antiquated means of producing power, including coal[END] burning power plants with very high carbon dioxide emissions. *See* Ryszard Janikowski et al., *Joint Implementation Projects Between the Netherlands and Poland*, *in* JOINT IMPLEMENTATION, *supra* note 161, at 133 (describing Polish emission sources). This means that western countries can purchase emission reduction credits by helping to "modernize" existing power plants with current standard western technologies. Extending trading to developing countries would increase the opportunities to avoid innovation enormously, since so many developing countries could reduce emissions by retrofitting existing older facilities.

Allowing credit for tree planting also expands the opportunities to avoid innovation. The wider the area in which once can escape emission reduction obligations through tree planting, the greater the innovation avoidance potential.

257.Kyoto Protocol, *supra* note 10, art. 2(1)(a)(iv), 37 I.L.M. at 32.

258.*Id.* art. 2(1)(a)(i), (v), 37 I.L.M. at 33.

259.*See Protection of Global Climate for Present and Future Generations of Mankind*, G.A. Res. 53, U.N. GAOR, 43rd Sess., Supp. No. 49, at 133[END]34, U.N. Doc. A/RES/43/53 (1988). For background on the formation of the Intergovernmental Panel on Climate Change (IPCC), *see* Bodansky, *supra* note 2, at 463[END]65; *see also* Framework Convention, *supra* note 9, art. 21(2), 31 I.L.M. at 870 (providing for cooperation between the interim Secretariat of the Convention and the IPCC).

inefficient use of fossil fuels as important to meeting climate change goals in a manner consistent with nations' economic aspirations.[260] If population and energy consumption both increase worldwide, then continued reliance on inefficient burning of fossil fuels will increase, not decrease, worldwide emissions of carbon dioxide.[261] Hence, in the long run, reducing emissions while accommodating population growth and economic development requires reduced reliance upon inefficient fossil fuel consumption.[262] This necessarily implies deploying alternative renewable energy and improving energy efficiency.[263]

Society tends to rely on fossil fuel burning to generate energy, because fossil fuel traditionally costs less than renewable forms of energy.[264] Policies tending to perpetuate this cost differential pose a serious barrier to reducing reliance on fossil fuels, especially for developing countries.[265] The Kyoto Protocol recognizes this and recommends that developed countries phase out fiscal incentives in the "greenhouse gas emitting sectors that run counter to" the Convention's objectives.[266] The United States, for example, actually subsidizes fossil fuel burning through a wide variety of fiscal measures, including the oil depletion allowance and other tax breaks for the coal and oil industries.[267]

In addition, decisions to retrofit old plants or build new coal-fired power plants abroad may actually make

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260.*See* IPCC IMPACTS, *supra* note 15, at 39END49; *see also* IPCC DIMENSIONS, *supra* note 15, at 229END31 (discussing costs of these options); Hodas, *supra* note 170, at 92 (developing country state-of-the-art energy efficiency and renewable energy investments essential to economic growth without increased fossil fuel use).

261.*See* IPCC DIMENSIONS, *supra* note 15, at 236.

262.*See* IPCC, RADIATIVE FORCING, *supra* note 92, at 266 ("[F]ossil fuel CO_2 emissions contribute more to current and potential future climate change than any other single gas released by any other single human activity."); *see also id.* at 270 (assumptions about population and per capita income "are important sources of differences in projected emissions.").

263.*See* INTERNATIONAL ENVIRONMENTAL LAW ANTHOLOGY 466 (Anthony D'amato & Kirsten Engel eds., 1996).

264.*See Cleaner Energy*, THE ECONOMIST, Apr. 18, 1998, at 17.

265.*See id.* (explaining how carbon taxes might help reduce carbon dioxide emissions).

266.Kyoto Protocol, *supra* note 10, art. 2(1)(a)(v), 37 I.L.M. at 33.

267.*See* Gelbspan, *supra* note 107, at 27 (calling for redirection of the $21 billion the United States invests in subsidizing fossil fuels and listing some of the subsidies); Beard, *supra* note 56, at 201 (stating that the United States provides tax breaks and other subsidies to producers of coal, oil, natural gas, and uranium). Other countries also subsidize fossil fuels. *See, e.g., Cleaner Energy*, THE ECONOMIST, Apr. 18, 1998, at 17 (Germans pay a mandatory premium on electric bills to support the coal industry).

it harder to switch to cleaner technologies once they become available. Once investors make fresh investments in older plants, they may want to keep these plants running for a long time in order to maximize the return from these sunk costs. However, countries may invest in cleaner renewable energy and avoid costly retrofits or fresh investments in dirty old technology if they have cleaner technologies available.

Innovation tends to reduce costs in the long run.[268] Innovations tending to bring down the cost of renewable energy[269] and improve energy efficiency may be essential to meeting the Framework Convention's objective of avoiding dangerous climate change.[270]

Lowering costs through innovation, however, does not constitute a free lunch. Typically technological innovation follows investment, sometimes costly investment, in researching, developing, and deploying new technologies.[271] Similarly, realizing opportunities to improve energy efficiency, even when profitable, may require difficult institutional changes that government officials may find challenging.

Long-term societal benefits that accrue from the development of cleaner technologies may involve some short-term costs for some sectors.[272] Cheaper, cleaner power and more efficient energy use may harm producers of more expensive, dirtier fossil fuels.[273] Most progress involving any kind of technological change produces some winners and some losers.[274]

268.*See, e.g.*, Wirth, *supra* note 12, at 2657 (noting cost saving potential of energy efficiency and conservation).

269.*See Virtue supra* note 242, at 57 ("[R]enewables are becoming less expensive.").

270.*See* Gelbspan, *supra* note 107, at 22[END]26 (arguing that effectively addressing climate change requires a switch from fossil fuels to renewable energy sources); Irving M. Mintzer, *Institutional Options and Operational Challenges in the Management of a Joint Implementation Regime in* CRITERIA, *supra* note 18, at 47[END]48 (focusing joint implementation exclusively on the cheapest reduction options "will delay the development of technologies with the potential for the large emissions reductions that will be needed over the long term for stabilizing atmospheric concentrations" of greenhouse gases).

271.*See generally* Mintzer, *supra* note 269 (describing increased corporate investment in renewables); JOHN L. BERGER, CHARGING AHEAD: THE BUSINESS OF RENEWABLE ENERGY AND WHAT IT MEANS TO AMERICA (1997).

272.*See* Stewart, *supra* note 59, at 1376 (discussing scrapping of "embedded political and social capital in existing institutions").

273.*See generally* Gelbspan, *supra* note 107, at 22[END]27 (discussing, *inter alia*, fossil fuel purveyors' efforts to derail efforts to address climate change effectively).

274.*See* Stewart, *supra* note 59, at 1376 (discussing transitional costs accompanying technological change).

Societal decisions to make these kinds of investments may resemble, in some respects, a homeowner's decision to buy a new roof. Even if buying a new roof saves money in the long run, it involves higher short-term costs than just patching it.

3. *Disrupting the Normative Community Through Violation of the Leadership Principle*

Avoiding innovation may conflict with the leadership principle. This may have important consequences for future treaty development. As explained above, the Framework Convention features an agreement that developed countries will provide leadership through innovation and technological transfer. This forms an essential predicate to future agreements to make further progress.

Trading increases the risk that countries and industries that have the capacity to develop new technologies will fail to do so. This failure will make it more difficult, as a practical matter, for developing countries to agree to significant cuts in the future. With innovative technologies available, developing countries can agree to future emission reductions without having to drastically reduce already low levels of consumption.

Emissions trading may also make future emission reductions more expensive for countries that generate credits for joint implementation.[275] These countries may exhaust cheap emission reduction opportunities in their efforts to sell joint implementation credits.[276] This may raise the price of future emission reductions in the credit generating countries.[277]

Moreover, developing countries may see trading as a betrayal of the Framework Convention's principles.[278] In the Framework Convention, the international community agreed that adopted norms, including the leadership principle, would shape future conduct.[279] To the extent the most powerful countries force subsequent agreements to depart from these norms, developing countries may feel little obligation to comply with the norms

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275.*See* JOINT IMPLEMENTATION, *supra* note 161, at 76.

276.*See id.*; *see also* Prodipto Ghosh et al., *Perspectives of Developing Countries on Joint Implementation*, *in* OPPORTUNITIES AND APPREHENSIONS, *supra* note 161, at 26[END]27.

277.*See* JOINT IMPLEMENTATION, *supra* note 161, at 76.

278.*See id*. at 182 (discussing objections to "principle of joint implementation").

279.*See generally* KRATOCHWIL, *supra* note 7, at 70 (stating that norms rule out certain methods of goal seeking). Different disciplines use the term "norm" in different ways. *See* Cooter, *supra* note 8, at 1656. I use it to refer to obligations. *See id.* at 1656[END]57 (endorsing this use of the term of legal discussions).

that might demand a lot of them.[280]

More concretely, the overarching norm of "common but differentiated responsibilities" reflects an expectation that developed countries will provide leadership, and that developing countries will make substantial clean-up commitments in the future. If developing countries believe that developed countries have not exercised the required leadership, they may be more reluctant to assume serious commitments in the future.[281] Developing countries may correctly conclude that developed countries have not complied with the leadership principle if they trade frequently enough to avoid innovation.

This does not establish that all purchases of credits inherently conflict with the leadership principle. International trading rules that only allow credits for innovative projects could assure that trading did not undermine innovation. These rules could allow countries to earn credits through subsidizing renewable energy abroad, but disallow credits earned through retrofitting coal burning power plants, for example. Even trading that does not discourage innovation, however, might still conflict with the leadership principle. After all, the leadership principle calls on developed countries to assume greater reduction responsibilities. To the extent a developed country chooses to purchase reduction credits abroad in lieu of making reductions at home, it has arguably avoided the differentiation of responsibilities called for in the Framework Convention.[282]

On the other hand, a trading proponent might argue that the developed country has assumed greater emission reduction responsibilities than the developing country to the extent the developed country paid for the

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280.*See* IPCC IMPACTS, *supra* note 15, at 83 ("The concept of equity is prominent in the Framework Convention on Climate Change because of the need to gain a widespread audience."); *Chinese Official Says Western Nations Attempting to Shirk Climate Responsibility*, Int'l Env't Daily (BNA) d8 (Dec. 10, 1997); *Companies Encouraged to Participate in Pilot Phase of Joint Implementation*, Int'l Env't Daily (BNA) d2 (May 25, 1995) (discussing perception among developing countries that developed countries will use joint implementation to shirk their responsibilities).

281.Indeed, the developing countries have insisted that they are not yet willing to assume reduction commitments, in part, because the developed countries have not met the national emission stabilization target they agreed to in the Framework Convention. *See* Yamin, *supra* note 180, at 1[END]2.

282.*See Environment Minister Faults U.S. Policy Emissions Trading on Eve of Kyoto Talks*, Nat'l Env't Daily (BNA) (Dec. 2, 1997), *available in* LEXIS, BNA library, BNAENV file (French Minister of Environment and Territorial Development stating that Kyoto "had not been called to enable `rich polluting nations to pay poorer nations for their efforts to reduce greenhouse gas emissions'."); Pier Vellinga & Roebijn Heintz, *Joint Implementation: A Phased Approach, in* CRITERIA, *supra* note 18, at 5 (arguing that joint implementation could allow developed countries to "buy their way out of their obligation to take the lead in combating climate change").

foreign emission-reducing activity.[283] Arguably, the developed country may exercise leadership by paying for a reduction, regardless of its location.[284]

This argument might make sense if the leadership principle only required a differentiation of emission reduction commitments. After all, the differing economic capacities of nations helped justify the Framework Convention's differentiation of responsibilities in the first place.[285] To the extent that developed countries finance more reductions than developing countries, perhaps they have exercised the required leadership in reducing emissions.[286]

But the leadership principle calls for financial help and technology transfer as well. More concretely, the Framework Convention requires developed countries to fund the "full incremental cost" of developing country compliance with the treaty, and to fund needed technology transfers.[287] This means that trading with developing countries conflicts with the leadership principle. This type of trading enables a developed country to claim credit for meeting a required financial leadership obligation, which in turn justifies less leadership from the developed country in emission reductions. Thus, a developed country that trades with developing countries does not offer the leadership that the treaty calls for. For the treaty requires the full complement of emissions reductions *and* financial assistance from developed countries.

Emissions trading with developing countries also involves double counting, which is detrimental to the environment.[288] Without trading, developed country compliance with the treaty generates two sets of reductions: reductions from projects developed countries finance in developing countries and reductions developed countries

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283.This would comport with the principle that those who have the most resources should contribute the most to a common effort to address a problem. *See* THOMAS M. FRANCK, FAIRNESS IN INTERNATIONAL LAW AND INSTITUTIONS 390 (1995) (attributing this principle to the philosopher Henry Shue).

284.*See* Vellinga & Heintz, *Joint Implementation: A Phased Approach, in* CRITERIA, *supra* note 18, at 9 (investment in joint implementation pilot projects "can be considered" a form of leadership).

285.*See* Bodansky, *supra* note 2, at 479[END]80, 503 (explaining that OECD countries believed that this difference in capacity justified differential treatment of developed and developing countries).

286.On the other hand, developing countries believe that the differences in historical emissions justify different treatment. *See id.* at 480, 503. Under this view, it is not clear why escape from domestic obligations through purchasing of credits would be justified.

287.Framework Convention, *supra* note 9, art. 4(3-5), 31 I.L.M. at 858.

288.Experts on joint implementation agree that double counting is undesirable and should be avoided. *See, e.g.*, JOINT IMPLEMENTATION, *supra* note 161, at 51.

(or their nationals) make at home. Trading allows the developed country (or its nationals) to take credit for reductions financed abroad to justify not making required reductions at home. This involves double counting reductions made abroad to satisfy both the financial and domestic emission reduction obligations. Since this generates only one set of reductions instead of two, the double counting trading fosters generates less net reductions than the treaty calls for.[289]

Developed country financing of projects in developing countries does constitute financing of treaty compliance. The Framework Convention obligates developing countries to adopt measures "addressing" greenhouse gas emissions and sinks.[290] Any project that could arguably create credits addresses greenhouse gas emissions and sinks. Hence, developed countries fulfill their obligation to finance treaty compliance when they finance projects in developing countries. And claiming credits for this financing does constitute double counting, as described above.

The COP has made one decision that might address this issue. In 1995, the COP agreed that "the financing of activities implemented jointly shall be additional to the financial obligations of" developed countries under the Framework Convention.[291] The developed countries already have a financial obligation to finance the "full agreed incremental cost" of the developing countries' very general obligation to address greenhouse gas emissions and sink removals under Article 4.[292] Hence, this restriction could bar joint implementation with developing countries altogether.

289.Professor Tsjalle van der Burg addresses a related problem in JOINT IMPLEMENTATION, *supra* note 161, at 81END84. He argues that a government sponsored joint implementation project meets an "additionality" requirement if "it is not acceptable according to the investment criteria of the government." *Id.* at 84. He does not address the question of how to define the "investment criteria" of a government with sufficient precision to separate additional from non-additional projects. This criteria surely should assume that the government fully meets its treaty obligations to fund the agreed incremental cost of projects needed to comply with the treaty. Interpreted this way, only funding going beyond the incremental cost of treaty compliance would meet the additionality requirement.

The Kyoto Protocol adopted a concept of additionality much narrower than that advocated by Professor Tsjalle van der Burg. Accordingly, the Kyoto Protocol's additionality requirement does not by itself solve the double counting problem identified above, even if Professor van der Burg's broader concept of additionality, as interpreted here, would address this adequately.

290.Framework Convention, *supra* note 9, art. 4(1)(b), 31 I.L.M. at 855.

291.Pilot Phase Decision, *supra* note 168, at 19.

292.Framework Convention, *supra* note 9, art. 4(1)(b)(2), (3), 31 I.L.M. at 854.

One could argue that this financial "additionality" language (requiring that projects funded for credit be additional to those that developed countries must finance) only applies to projects undertaken without earning credits during the pilot phase. This language comes from the COP decision establishing a pilot phase of joint implementation in which no party would earn credits and the international community would evaluate the feasibility of joint implementation for credit.[293] But this restriction on financial double counting applies to "activities implemented jointly," not just to activities implemented jointly *under the pilot program*.[294] Hence, the language may apply to all activities implemented jointly, including subsequent projects for credit. Other sentences in the same decision expressly limit themselves to activities undertaken during the pilot phase. This suggests that the COP knew how to limit its decisions to pilot phase projects when it wanted, but did not do so with respect to the financial additionality requirement.[295]

Assuming that this financial additionality requirement does apply to joint implementation generally (which seems likely), it may still allow some joint implementation for credit. Other language in the same decision specifically authorizes joint implementation of activities in developing countries, at least during the pilot phase.[296] This would seem inconsistent with reading the financial additionality requirement to prohibit joint implementation altogether.

On the other hand, if the COP allows any trade with developing countries, it may not really address this problem of conflict with the leadership principle.[297] For developed countries should fund the full agreed incremental cost of any project addressing climate change under the Framework Convention's terms.

The conflict between funding projects in developing countries for credit and the leadership principle may strike some policy makers as formalistic. After all, developed countries have not always provided all of the funds

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293.*See* Pilot Phase Decision, *supra* note 168, at 19.

294.*Id.* (The COP decided "that the financing of activities implemented jointly shall be additional to the financial obligations of Parties included in Annex I ._._._.").

295.*See id.*

296.*See id.* (The COP decided "to establish a pilot phase for activities implemented jointly among Annex I Parties and, on a voluntary basis, with non-Annex I Parties that so request.").

297.The Kyoto Protocol does establish a Clean Development Mechanism to certify projects in developing countries that may generate credits. *See* Kyoto Protocol, *supra* note 10, art. 12, 37 I.L.M. at 38. Hence, the policy issue addressed in the COP decision remains relevant to the implementation of this provision. Furthermore, the United States may seek broader authority to trade with developing countries.

that the Framework Convention requires.[298] Most countries face political and budgetary constraints that make full funding difficult.[299] Emissions trading may tap a new source of financing[EMD]private sector money[EMD]since polluters can earn credits by funding emission reductions abroad.[300]

As a practical matter, however, funding projects abroad for credit does not augment the effort to address climate change. Generating credits makes compliance with existing developed country obligations cheaper, since the purchaser uses a project's reductions in emissions to justify doing less at home. By contrast, funding that generates emission reductions without credits (as envisioned by the financial assistance provisions) generates reductions in developing countries, which are in addition to those that the developed countries make at home.

Furthermore, treating the obligation to fund full incremental cost as merely a formalistic requirement may undermine the normative community that must develop the treaty.[301] Claiming credits for activities that developed countries had promised to perform without credits amounts to treating the funding obligation as a mere technicality of no importance. But this funding commitment forms part of the normative structure that led the developing countries to accept common (albeit differentiated) responsibilities.[302] Undermining this norm may lessen

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298.*See Decision 9/CP.2: Communications from Parties Included in Annex I to the Convention: Guidelines, Schedule and Process for Consideration*, FCCC/COP, 2nd Sess., at 17 U.N. Doc. FCCC/CP/1996/15/Add.1 (1996) (recognizing "need to address the concern" that developed countries listed in Annex II are failing to meet their commitments to technology transfer and funding); Laura H. Kosloff, *Climate Change Mitigation and Sustainable Development*, 12 FALL NAT. RESOURCES & ENV'T 93, 96 (1997) (stating that budget contraints may cause governments to reallocate existing aid, rather than augment net developmental assistance to address climate change).

299.*See generally* Irving M. Mintzer, *Institutional Options and Operational Challenges in the Management of a Joint Implementation Regime in* CRITERIA, *supra* note 18, at 47 (discussing the decline in funds available for public expenditures [as of 1994]).

300.*See* William R. Moomaw, *Achieving Joint Benefit from Joint Implementation, in* CRITERIA, *supra* note 18, at 13; Sid Embree, *Investing in Less Greenhouse Gas Intensive Development: What Joint Implementation Could Be?, in* OPPORTUNITIES AND APPREHENSIONS, *supra* note 161, at 90[END]91. Sid Embree argues that joint implementation will not disrupt other aid flows. *See id.* But the problem raised above is more fundamental. Surely if the developed countries are fully meeting their obligations under the Climate Change Convention, little need should exist for joint implementation. Implicitly repudiating this obligation remains a problem.

301.I use the term "normative community" to capture the idea that those involved in creating the international regime governing climate change share a set of expectations and some knowledge that contributes to the evolution of legal norms developing the regime. *See generally* JURGIELEWICZ, *supra* note 8 at 100[END]08 (describing international legal regimes); Rose, *supra* note 7, at 32 (discussing how stories of a common past and history may help persuade "a social and moral community" to cooperate in resource management).

302.*See* GUPTA, *supra* note 160, at 119 (Brazilian officials called joint implementation "fraudulent and

developing countries' sense that they have an obligation to comply with the part of the norm that poses political difficulties for them.[303]

Trading away this obligation to fund adds insult to the injury of any funding shortfalls.[304] Providing inadequate funding obviously undermines the treaty's effectiveness. But countries understand that a failure to fully meet an obligation does not amount to a repudiation of the obligation.[305] Creating a structure that fails to treat the obligation seriously, however, comes perilously close to repudiation and may therefore undermine the entire regime.[306]

B. *Trading and Democratic Accountability*

Proponents of the free lunch theory of emissions trading suggest that trading enhances democratic decision-making by focusing public attention on the right question, the quantity of desired total emission reductions.[307] Public decision-making, however, can focus on the total quantity of net emission reductions whether or not the government chooses to use emissions trading as a means of meeting the chosen quantity of emission reductions.[308]

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dishonest" while pointing out that developed countries have an obligation to transfer technology under the Framework Convention.).

303.*See generally Activities Implemented Jointly under the Pilot Phase: Submission by the Group of 77 and China, Note by the Secretariat*, FCCC/SBSTA, 6th Sess., U.N. Doc. FCCC/SBSTA/1997/Misc. Doc. 5 (1997).

304.In order to address this problem some have proposed only allowing joint implementation after investing countries have allocated .7% of their GNP to official development assistance. *See* JOINT IMPLEMENTATION, *supra* note 161, at 49.

305.*See* KRATOCHWIL, *supra* note 7, at 63 (discussing the importance of the justification and explanation for violations of treaty regimes).

306.Nazrov Dubash has argued that the existence of joint implementation opportunities will increase the incentives to inadequately fund the financial mechanism under the Framework Convention. *See* Nazrov K. Dubash, *Commoditizing Carbon: Social and Environmental Implications of Joint Implementation, in* OPPORTUNITIES AND APPREHENSIONS, *supra* note 161, at 77.

307.*See* Ackerman & Stewart, *supra* note 4, at 189 (when environmental statutes come up for revision, citizens may focus on the question of the appropriate quantitative reduction in pollution rights).

308.*See* Driesen, *supra* note 2, at 328 (explaining that Congress enacted quantitative limits on pollution in several places in the 1990 Amendments to the Clean Air Act).

The free lunch theory's narrow focus upon democratic decision-making ignores the issue of democratic accountability for implementing public decisions.[309] I have argued elsewhere that emissions trading may layer the complexities of emissions trading, which usually are formidable, on top of the complications involved in setting and enforcing emission limitations.[310] This complexity may make citizen participation in designing and implementing an emissions trading program even more difficult than citizen participation in designing and implementing a comparable traditional regulation written by the same institution. To evaluate the issue of democratic accountability for implementing decisions made in the international arena, we need some understanding of enforcement and democratic accountability in that setting.

In order for an international environmental regime to succeed, three steps must take place. First, a group of states must create international law. Professor Harold Koh refers to this as "norm" enunciation.[311] Second, nations must adopt national laws and programs to implement the internationally agreed upon norms.[312] Third, the

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309.While Ackerman and Stewart fail to discuss public involvement in implementation of agreed upon reductions, they do discuss enforcement from a bureaucratic perspective. *See* Ackerman & Stewart, *supra* note 4, at 181[END]183. They argue that the auction of rights to pollute would increase the incentives for agencies to effectively monitor and enforce pollution laws. *See id.* As I have pointed out elsewhere, this argument does not necessarily apply to trading systems without an auction of pollution rights. *See* Driesen, *supra* note 2, at 320[END]21 n.150. I have also argued that this argument does not withstand careful analysis in light of the history of emissions trading. *See id.* Environmentalists have secured effective monitoring of sulfur dioxide emissions in the acid rain program by bargaining hard for it as a condition for supporting the program. In most other cases, emissions trading has proceeded without adequate monitoring.

310.*See* Driesen, *supra* note 2, at 329[END]30; *see also* Barry D. Nussbaum, *Phasing Down Lead in Gasoline in the United States, in* OECD CLIMATE CHANGE: DESIGNING A TRADABLE PERMIT SYSTEM 27[END]28 (1992) (explaining why bubbles are more complex than traditional regulations).

311.Koh, *Why Nations Obey?*, *supra* note 119, at 2639 (discussing norm "enunciation" or "interpretation"). *See generally* Koh, *Transnational*, *supra* note 119. This norm enunciation step constitutes one step of a three phase legal process through which nations come to obey international legal rules. *See* Koh, *Why Nations Obey?*, *supra* note 119, at 2646. Professor Koh plans to elaborate on this process in a forthcoming book. *See id.* at 2646 n.237. This article's legal process description is intended to describe fairly simply what must occur for an international environmental regime to function. I make no claim to provide a universally applicable description of international legal process. Indeed, international environmental law may be different from other international legal regimes in that it requires not just restraints on state action, but effective affirmative state actions to secure private actions affirmatively contributing to the objectives of international agreements. *See* JURGIELEWICZ, *supra* note 8, at 111[END]12 (discussing the generation of norms through international regimes).

312.*See* Koh, *Transnational*, *supra* note 119, at 204 ("Law-abiding states *internalize* international law by incorporating it into their domestic legal and political structures._._. .") [emphasis in original]; THOMAS M. FRANCK, FAIRNESS IN INTERNATIONAL LAW AND INSTITUTIONS 373[END]76 (1995) (discussing relationship between international law and national action).

national laws and programs must induce private actions that protect the environment.[313] One can evaluate a substantive international legal regime's ability to foster democratic accountability based on its tendency to hinder or help public efforts to hold officials responsible for: (1) adequate international norm enunciation; (2) national compliance; and (3) private actions implementing the norms.[314]

Emissions trading may interfere with accountability in several ways. First, it may disrupt the process of translating general international goals into specific concrete national commitments.[315] Second, it may make it more difficult to hold government officials accountable for meeting agreed upon national commitments. Finally, it may undermine the overarching international principle of national responsibility for private sector emissions emanating from a country's territory, an important overarching international norm tending to support accountability. Below, I discuss these threats to democratic accountability in the context of the Climate Change Convention.

1. *The Trading Idea as an Impediment to Making Specific Commitments*

Many international treaties fail to realize their objectives because they do not articulate precise enough international law.[316] This lack of precision may make it difficult to hold national officials accountable for favoring

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313.*See* JAMES CAMERON, JACOB WERKSMAN, & PETER RODERICK, IMPROVING COMPLIANCE WITH INTERNATIONAL ENVIRONMENTAL LAW 53 (1996).

314.*See* Weiss, *supra* note 25, at 695[END]96 (explaining that effective implementation requires state implementation and effective private responses); JURGIELEWICZ, *supra* note 8, at 113 (explaining how international regimes foster "accountability of states" to their own populations, other states, and the international public), 248 (pointing out that "laws heighten public expectations"); INSTITUTIONS FOR THE EARTH: SOURCES OF EFFECTIVE INTERNATIONAL ENVIRONMENTAL PROTECTION 246[END]47 (1993) (public support was critical to adoption and implementation of effective regulations addressing oil pollution).

315.Democratic accountability does play a role in this process. *See* PATERSON, *supra* note 85, at 61[END]62 (describing how the United States modified its position on climate change after George Bush endured public criticism for his initial position).

316.*See* MABEY, *supra* note 55, at 10 (while the Montreal Protocol "enforced substantive controls" many other multilateral agreements did not); Ardia, *supra* note 38, at 504 ("Few international environmental agreements contain substantive commitments ._._._."); *Compliance With International Environmental Treaties: The Empirical Evidence*, 92 AM. SOC'Y INT'L L. PROC. 234 (1997) [hereinafter *Compliance*]; *cf.* Giselle Vigneron, *Compliance and International Agreements: A Case Study of the 1995 United Nations Straddling Fish Stocks Agreement*, 10 GEO. INT'L ENVTL. L. REV. 581 (1998) (describing compliance mechanisms and concluding that we do not have sufficient data to evaluate actual compliance with this agreement yet); Rebecca Becker, *MARPOL 73/78: An Overview in International Environmental Enforcement*, 10 GEO. INT'L ENVTL. L. REV. 625 (1998) (concluding that in spite of fairly specific provisions in the International Convention for the Prevention of Pollution from Ships, enforcement has been uneven).

good or bad international legal rules.[317] Perhaps more importantly, these imprecise laws tend to foster national failures to take concrete actions to meet the regime's goals.[318] The public may have difficulty holding national government officials accountable for violating an international legal norm, if the norm does not clearly explain what international law demands of a country.[319]

The Framework Convention articulates a broad normative idea that nations should avoid dangerous climate change.[320] It translates this broad norm into a developed country "aim" of returning greenhouse gas emissions to 1990 levels by the year 2000.[321] This locution makes it difficult to give national leaders either credit or blame for committing to stabilize emissions (or deciding not to do anything). The phrasing makes it difficult to state whether the leaders have agreed to a binding limit stabilizing emissions or not.[322] The mention of a concrete target certainly suggests a serious commitment. But the use of the term "aim" might suggest something more akin to a goal than a binding commitment.

Furthermore, this ambiguity made it difficult to hold nations accountable for emission increases after the adoption of the Framework Convention. It is difficult to argue that developed countries that increased their emissions (such as the United States) violated an international agreement. Hence, the Framework Convention had little normative force as a generator of concrete actions.

317.*See* Christopher C. Joyner, *Biodiversity in the Marine Environment: Resource Implications for the Law of the Sea*, 28 VAND. J. TRANSNAT'L L. 635, 650 (1995) (arguing that the United Nations Convention on Biological Diversity lacks specific provisions that would "control parties whose nationals violate norms associated with" preserving marine biodiversity).

318.*See Developments*, *supra* note 35, at 1504[END]07 (discussing the problem of vague obligations failing to bind states). On the other hand, some evidence exists that ambitious, non-binding instruments may have more influence on behavior than modest binding agreements. *See Compliance*, *supra* note 315, at 241[END]50. Those who propose new models based on this seem to agree that the Climate Change Convention needs binding commitments, but that stronger non-binding commitments should supplement these binding commitments. *See id.* at 248[END]49.

319.*See id.* at 238 (explaining that vague language in the Convention on Biodiversity makes it "quite hard to determine when a state ._._. has ._._. committed an internationally wrongful act"); Koh, *Why Nations Obey?*, *supra* note 119 at 2640 (noting the role of non-governmental organizations in norm "interpretation").

320.*See* Framework Convention, *supra* note 9, art. 2, 31 I.L.M. at 854.

321.*Id.* art. 4(2)(b), 31 I.L.M. at 857.

322.*See* JOINT IMPLEMENTATION, *supra* note 161, at 77 (discussing interpretation of the "target"); Dr. Ranee Khooshie Lal Panjabie, *supra* note 2, at 528[END]29 (referring to "constructive ambiguities" in these articles).

Annex B to the Kyoto Protocol, however, seems to help clarify national obligations under the Climate Change Convention.[323] It establishes national quantified emission limitations, stated as a percentage reduction in greenhouse gas emissions below 1990 levels. Article 3, section 1 clearly establishes these limits as binding, stating that the developed country parties "shall . . . ensure that their . . . emissions of . . . greenhouse gases . . . do not exceed their assigned amounts."[324] This means that while holding the international community accountable for any particular accomplishment is difficult, the Protocol, absent trading, establishes a clear basis for holding each developed nation accountable for meeting a quantifiable national commitment.[325] The national caps in Annex B seem to translate an amorphous international goal, preventing dangerous climate change, into fairly specific national obligations aimed at moving toward this goal.[326]

However, these seemingly concrete physical national obligations vanish before the eyes of a careful reader, because of provisions designed to facilitate trading. In fact, the treaty may instead create a much less specific "virtual" obligation, a developed country's obligation to either make the required reduction or earn credits abroad deemed equivalent to the specified reduction under rules yet to be defined.[327] Indeed, the Kyoto Protocol may be read as not requiring any emission reductions at all, to the extent it allows tree planting to substitute for emission reductions.[328] The Kyoto Protocol now contains more amorphous commitments than the Protocol would have if the

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323.*See* Kyoto Protocol, *supra* note 10, Annex B, 37 I.L.M. at 42. The Kyoto Protocol, however, did not establish a specific *aggregate* emission limitation for developed counties' emissions. Instead, article 3, section 1 of the Protocol requires these parties to return their greenhouse gas emissions to country-specific levels set out in an annex to the agreement "with a view to reducing their overall emissions ._._. by five percent." *Id.* art. 3(1), 37 I.L.M. at 33. This "overall emissions" provision suffers from the same vice as the earlier "aim" to stabilize language, ambiguity about whether a binding commitment exists. *Id.* Hence, no hard cap exists for aggregate emissions from developed countries.

324.*Id.* art. 3(1), 37 I.L.M. at 33.

325.The Protocol, however, remains vague about when these countries must achieve these reductions. It requires that the parties must achieve this level between 2008 and 2012. *See id.* art. 3(7), 37 I.L.M. at 34. This means it will be impossible to recognize a failure to meet the target until 2012.

326.I qualify the term "specific" with the word "fairly" because the limit applies to a basket of greenhouse gases, including some that are not very well monitored. Hence, the limit is more amorphous than a limit on a single gas would be.

327.*See* Kyoto Protocol, *supra* note 10, arts. 3(10-12), 4, 6, 12, 17, 37 I.L.M. at 34-35, 38, 40; *cf.* Breidenich et al., *supra* note 100, at 327 (stating on the one hand that the Protocol establishes a clear, mandatory set of targets, but on the other hand, allows those targets to be increased).

328.*See* Kyoto Protocol, *supra* note 10, arts. 3(3), (7), 6(1)(b), 37 I.L.M. at 33, 35-36.

countries of the world had agreed to the reductions specified in Annex B without trading.

This vagueness creates real difficulties in determining what precisely the parties have agreed to do. A post-Kyoto dispute concerning trading of so-called "hot air" illustrates this vagueness.[329] Because of the economic collapse of Eastern Europe and the former Soviet Union, emissions have fallen in this area since 1990, in spite of antiquated energy systems.[330] A dispute has arisen about whether other developed countries may purchase credits reflecting this downturn in emissions in lieu of physical national compliance.[331]

If the COP allows trading of "hot air" credits, the developed countries will likely realize less aggregate emission reductions than national compliance without trading would generate.[332] But to the extent the five percent aggregate developed country reduction target in the Kyoto Protocol already takes the economic downturn of countries in transition to market economies into account, the developed countries may realize this five percent target, even if they trade "hot air."[333] Accepting this use of hot air involves interpreting the treaty as using the five percent target, rather than the results of each nation complying with its binding national cap, as the measuring rod of effective implementation. But the Protocol creates no binding obligation to meet the five percent target. Rather, it states that the developed countries "shall, individually or jointly ensure that their aggregate . . . emissions . . . do not exceed their assigned amounts . . . *with a view to reducing their overall emissions of such gases by at least 5 percent*."[334] This language resembles the amorphous language expressing the Framework Convention's aim to

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329.*See* CHRIS ROLFE, TURNING DOWN THE HEAT: EMISSIONS TRADING AND CANADIAN IMPLEMENTATION OF THE KYOTO PROTOCOL 60, 310[END]12 (1998); *U.N. Researcher Faults EU Opposition to Emission Trading for Kyoto Compliance*, 21 Int'l Env't. Rep. (BNA) 415 (Apr. 28, 1998).

330.*See* ROLFE, *supra* note 328, at 311 (Russian emissions are currently only 74% of 1990 emissions, and they are only projected to increase to 80 or 90% of 1990 levels by 2010).

331.*See Commission Outlines `Step-by-Step' Plan for Emissions Trading Under Kyoto Protocol*, 21 Int'l Env't. Rep. (BNA) 551 (June 10, 1998) (describing European opposition to hot air credits). I use the locution "purchase credits" to encompass both purchase of emission reduction units under article 6 and bubbling under article 4.

332.ROLFE, *supra* note 328, at 311 (Hot air trading "will allow nations buying the rights to increase their emissions while the nations selling them do nothing to reduce their emissions.").

333.*See* Kyoto Protocol, *supra* note 10, art. 3(1), 37 I.L.M. at 33; *U.N. Researcher Faults EU Opposition to Emission Trading for Kyoto Compliance*, 21 Int'l Env't. Rep. (BNA) 415 (Apr. 28, 1998); *cf.* Breidenich et al., *supra* note 100, at 320 (emission reduction is equivalent to 5.2 percent only if one does not take into account the 1995 base year used for HFCs, PFCs, SF6, and the possible use of the Clean Development Mechanism).

334.Kyoto Protocol, *supra* note 10, art. 3(1), 37 I.L.M. at 33 (emphasis added).

stabilize emissions at 1990 levels by the year 2000.[335] If compliance with this language provides the measuring rod for assessing implementation of the Kyoto Protocol, the world has made little progress in clarifying the Framework Convention.

One might hypothesize that the Kyoto Protocol clearly requires that developed countries at least collectively ensure that their aggregate emissions equal the aggregate of their national targets.[336] But to the extent the COP allows developed countries to claim credits for reductions in developing countries under Article 12, developed country emissions will likely exceed the aggregate limits as well.[337] The provisions introduced to facilitate trading make definite simple statements about what precisely the parties have agreed to accomplish very difficult. This hinders public understanding of the agreement and accountability.

The logic of the idea of emissions trading may lead to imprecise law making. Emissions trading involves indifference to the location of reductions.[338] Government officials eager to avoid accountability may treat the emissions trading idea as an opportunity to avoid making specific decisions about where reductions will come from. Indeed, emissions trading may help officials avoid specificity about what must be done. They may avoid specifying which pollutants polluters must reduce or even whether pollution must be reduced at all. To the extent that national leaders avoid decisions, environmental law will become vague and more difficult to enforce.

Almost all environmental legal regimes involve a series of steps translating general requirements into concrete decisions to require specific emission reductions of specific polluters.[339] If trading fosters vague law, it may seriously disrupt these environmental legal regimes.

One may design a trading program specific enough to induce a specific response. The acid rain program, for example, contains unusually specific decisions allocating specific numbers of allowances to emit sulfur dioxide

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335.*See* Framework Convention, *supra* note 9, art. 4(2)(a), (b), 31 I.L.M. at 856-57.

336.*See* Kyoto Protocol, *supra* note 10, art. 3(1), 37 I.L.M. at 33.

337.*See id.* art. 12(3)(b), 37 I.L.M. at 38; Breidenich et al., *supra* note 100, at 320.

338.*See* Driesen, *supra* note 2, at 332.

339.*See, e.g.*, David M. Driesen, *Should Congress Direct the Environmental Protection Agency to Allow Serious Harms to Public Health to Continue?: Cost-Benefit Tests and National Ambient Air Quality Standards Under the Clean Air Act*, 11 TULANE ENVTL. L. REV. (forthcoming 1998) (explaining that states decide which pollution sources to address and how stringently to regulate their emissions in order to meet national ambient air quality standards under the Clean Air Act).

to specific facilities, but then authorizes trading of these allowances.[340] Nevertheless, the trading idea has a tendency to encourage vague law.

2. *Trading as an Impediment to Accountability for Meeting Commitments*

Trading may make it difficult to hold any given national government accountable for meeting treaty commitments. The degree of the undermining of accountability, however, depends upon the particulars of the trading program.

The Kyoto Protocol allows developed countries, rather than private parties, to transfer "emission reduction" units amongst themselves.[341] This comports with the Protocol's overall structure. The Protocol does not create obligations for any particular private party. It only creates obligations for countries. Individual nations choose how to translate these national obligations into programs aimed at particular sources of emissions. Hence, the treaty relies upon national government officials taking responsibility for inducing appropriate private actions to reach an aggregate national target.

The Kyoto Protocol also requires developed country parties to subtract or add transferred units to their "assigned amount."[342] Suppose that the country of "Small" emitted 100 million metric tons of emissions in 1990 and must make a five percent cut under Annex B of the Kyoto Protocol, a five million ton reduction. If that country purchases a million tons of carbon credits abroad, this accounting provision would allow Small to substract the one million tons of credits from its five million ton assigned reduction, yielding a requirement to reduce domestic emissions by only four million tons. Conversely, if Small sold one million tons of credits, it would have to add a million tons to its five million ton assigned reduction and make a six million ton domestic reduction.

If the COP interprets this provision to require this adjustment prior to carrying out joint implementation activities, this would help preserve national accountability.[343] Each developed country would have to meet a target

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340.*See* 42 U.S.C. §§ 7651c(e) tbl. A, 7651d(g) tbl. B (1994) (allocating allowances to particular emitting units). *See generally* Van Dyke, *supra* note 225.

341.*See* Kyoto Protocol, *supra* note 10, art. 3(10-12), 37 I.L.M. at 34.

342.*Id.*

343.The Kyoto Protocol provides for advanced transfer under article 4, when countries agree to implement their commitments jointly. *See id.* art. 4(1), (2), 37 I.L.M. at 34. But articles 6 and 12 provide for transfer of "emission reduction units" and "certified emission reductions" without explicitly requiring advanced

adjusted to account for expected trades and could be held accountable for physically meeting the adjusted target, whether the trades occur or not. As long as an international body does the math necessary to adjust the targets properly, this may not greatly complicate national accountability.

Trading may, however, proceed in a way that would make national accountability very difficult. For example, the COP could plausibly interpret the Kyoto Protocol not to require specific *a priori* national decisions about the amount of credits to purchase or sell, since most of the provisions for adjusting accounts do not explicitly state when the accounting should occur (or who should monitor it).[344]

Rules that adjust national accounts after the fact might make it very difficult for the public to reliably monitor national implementation in a timely manner.[345] Suppose, for example, that the country of Big writes a plan that credibly provides for its required five percent reduction, but states that some unspecified amount of these reductions may come from the country of Small. Small submits a plan to realize its five percent reduction, but states that it may sell some credits to Big. If the emission reductions called for under Small's plan earn credits in Big, non-compliance occurs because of double counting.

For example, suppose that both countries emit 100 million metric tons of carbon dioxide in 1990. Absent trading, Big would reduce its emissions by 5 million tons to 95 million tons (a five percent cut) and Small would reduce its emissions by 5 million tons to 95 million tons in order to comply, thus reducing their aggregate to the 190 million ton level. If Big claims credit for 5 million tons of Small's reductions made as part of Small's treaty compliance, then Small would still emit 95 million tons at the end of the compliance period, since it would make the reductions it planned to make. But Big would emit 100 million tons at the end of the period, because its credits would justify not making any physical reductions. Trading would then only bring aggregate emissions down to the 195 million ton level, a level 5 million tons higher than the level a non-trading program would achieve. Double counting would reduce program performance.

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adjustment of targets. *See id.* arts. 6, 12, 37 I.L.M. at 35, 38. *See* Vellinga & Heintz, *supra* note 283, at 8 (proposing separate accounting for joint implementation projects and dual commitments to funding reductions abroad and making some at home).

344.*See* Kyoto Protocol, *supra* note 10, arts. 3(10), (11), 6, 12, 37 I.L.M. at 34, 35, 38; *see also id.* art. 17 (postponing decision on "accountability" for emissions trading); *cf. id.* art. 4(1-2), 37 I.L.M. at 34.

345.*See generally* JURGIELEWICZ, *supra* note 8, at 113 (explaining that international regimes must make states accountable by "rendering their performance transparent to scrutiny by the international community").

Nobody (including the officials writing the plans) can tell whether national plans count the same emission reduction twice, unless the plans state which emission reductions will be traded and which will count toward domestic compliance. Hence, absent *a priori* decisions about transfers or systematic rules prohibiting and checking for double counting, one cannot use a national plan reliably to evaluate likely compliance.

Indeed, trading undermines national accountability by making it theoretically impossible for a country to ensure its own compliance with the virtual emission reduction obligation. Absent trading, countries can, by simply monitoring their own emissions and implementing adequate measures, make sure that they meet their emission reduction obligations. To the extent that they use trading to meet their own obligations, they may depend on monitoring and oversight abroad to ensure that the country from which they purchased credits actually makes the reductions. Failures outside of the national jurisdiction can prevent national compliance. Furthermore, countries using even well-monitored credits cannot know whether these credits are surplus to the generating country's national compliance efforts (and therefore legitimately tradable), without evaluating another country's plans and compliance efforts. At the end of the compliance period one could, in theory, determine whether the developed countries achieved the cuts envisioned by the treaty in the aggregate.[346] But by then, it's too late to correct failures.

Furthermore, national governments may lack sufficient incentives to respond to public demands to monitor joint implementation properly, because they can readily escape responsibility for failures by blaming them on private companies or the other country involved in joint implementation.[347] Even if one determined precisely what went wrong after the fact (which would require a lot of effort and coordination),[348] a problem would exist about who should accept responsibility, the credit purchasing or the credit generating country.[349]

346.*See* Kyoto Protocol, *supra* note 10, art. 3(1), 37 I.L.M. at 33.

347.It would take an enormous effort just to determine precisely what happened. One would have to look at each joint implementation project and determine whether it was double counted or failed to deliver the reductions attributed to it. This would involve review of compliance data and a careful review of the project's place in several nation's plans.

348.*See* Rolf Selrod & Asborn Torvanger, *What Might be the Minimum Requirements for Making the Mechanism of Implementation Under the Climate Convention Credible and Operational*, *in* OPPORTUNITIES AND APPREHENSIONS, *supra* note 161, at 6[END]7 (discussing possible "leakage" problems).

349.*See* GUPTA, *supra* note 160, at 130 (asking whether the host country or the investing country will be responsible for project failure); *Joint Liability System Proposed for Buyers, Sellers in Global Trading System*, 29 Env't Rep. (BNA) 353 (June 12, 1998). The COP could address this problem by writing clear legal rules about responsibility for shortfalls arising from joint implementation. These rules could also spell out responsibilities for making sure that double counting did not occur and that credits reflect real emission

International trading also creates a perverse incentive with respect to monitoring. Credit users can save money by purchasing credits from jurisdictions incapable or unwilling to properly monitor credit generating activity.[350] Even if a given pollution reduction activity costs the same amount in two jurisdictions and generates identical actual emission reductions, an incentive exists to make reductions in the jurisdiction where one can exaggerate the number of credits and escape effective oversight.[351] This undermines accountability, because nations may plausibly claim compliance based on trades they do not monitor.[352]

Proponents of trading sometimes disclaim any need for government oversight by invoking free market metaphors. People purchase blue jeans without the government monitoring every transaction and quality remains good. A few trading proponents may imagine that the "invisible hand" of the free market might ensure proper generation and use of environmental credits without effective government oversight.

The free market tends to produce good blue jeans because the purchasers care about the quality of the product. The purchaser buys the product specifically to obtain the benefits good blue jeans provide. If the blue jeans start falling apart in the first month of wearing, customers will stop purchasing jeans from that company. Because companies want customers to continue purchasing their jeans, they tend to make good blue jeans.

Emissions trading by private parties divorces purchase from interest in the quality of the "goods," absent government oversight. Private parties usually do not purchase emission reduction credits because they want to

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reductions that would not occur otherwise.

350.*See* Stavins, *supra* note 116, at 312 (discussing the incentive for parties to a joint-implementation project to exaggerate its value).

351.*See* MABEY, *supra* note 55, at 25; A. Markandaya, *JI: The Way Forward or A Negotiator's Nightmare, in* OPPORTUNITIES AND APPREHENSIONS, *supra* note 161, at 39END40 (discussing incentive to inflate baselines so as to exaggerate reductions). Dr. Markandaya argues that payments based on the level of reductions could reduce the incentive to exaggerate reductions. As explained below, this argument is incorrect to the extent it suggests that the market by itself would reduce the incentive to exaggerate reductions. Effective oversight by international institutions, if that is possible, might reduce the incentives to exaggerate.

352.Professor Stavins claims that allocating more permits to permit sellers in an emissions trading scheme would somehow "address" the enforcement difficulty that emissions trading might create. *See* Stavins, *supra* note 116, at 310. He argues that this allocation would make sellers "vulnerable to enforcement actions by the (enforcing) coalition of countries." He does not explain why an enforcing coalition of countries would emerge or how they could enforce reductions. Indeed, he seems to admit that the "enforcing coalition" would likely be the developed countries who purchase credits, and that the very scheme he advocates creates an incentive for them not to enforce. *Id.* The buyers would have an interest in allowing fraud so as to reduce the costs of purchasing credits.

realize real environmental improvement. If that were a sufficient motivation to purchase reduction credits, no need would exist to allow the use of credits to fulfill local emission reduction obligations. Instead, companies would simply engage in voluntary cleanup without emissions trading.

Rather, companies purchase credits because they can use them to fulfill an environmental obligation that they would otherwise have to fulfill with more expensive domestic measures.[353] The emission credit "goods," no matter how shoddy, are adequate for the companies' purposes if the government accepts them.

Indeed, from the purchaser's point of view, the best credits are the cheapest. The cheapest credits reflect no conscious effort to improve the environment, for they cost nothing to generate. Routine economic activity generates incidental emission reductions and increases all the time, even with no environmental efforts going on, public or private. Plants generate emission reductions routinely in response to market signals, by reducing production when orders fall off, closing unprofitable facilities, and replacing outmoded equipment with newer equipment.[354] Absent very restrictive rules, polluters in an emissions trading system may purchase credits reflecting these incidental reductions occurring elsewhere.[355] They need not, however, assume debits for increases that occur elsewhere when business picks up or a new plant opens up.

This problem of credits for doing nothing does not matter very much in a comprehensive cap and trade system. Such a system prohibits all relevant private parties from emitting pollution without permits and limits the quantity of permitted emissions to reflect environmental goals. But the Climate Change Convention does not directly limit the emissions of any individual polluter, much less all of them.[356] Trading under the Climate Change Convention, absent a very strong set of rules and implementing institutional arrangements, may well allow incidental reductions that occur as overall global emissions rise to justify taking fewer specific actions to reverse

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353.Companies may also carry out joint implementation because they anticipate using the credits later. *See Joint Implementation*, *supra* note 161, at 74.

354.*See* Driesen, *supra* note 2, at 315.

355.In the climate change context, Russia, the Ukraine, and Eastern European nations have abundant credits available that reflect no pollution control effort, because of the collapse of their economies after 1990. *See* ROLFE, *supra* note 328, at 311 (describing claiming credit for credits generated by economic collapse as "hot air"); *U.N. Researcher Faults EU Opposition to Emission Trading for Kyoto Compliance*, 21 Int'l Envt. Rep. (BNA) 415 (Apr. 28, 1998).

356.*See* Navroz K. Dubash, *Commoditizing Carbon: Social and Environmental Implications of Joint Implementation*, *in* OPPORTUNITIES AND APPREHENSIONS, *supra* note 161, at 52[END]56 (explaining the difference between a tradable carbon permit system and joint implementation).

the trends.[357]

The issue of what constitutes effective government oversight in this context, of course, gives rise to endless debate.[358] My point here, however, is limited. Emissions trading across jurisdictional lines tends to undermine political accountability. The precise extent of this problem depends upon the particulars of the trading system adopted. But the general tendency exists.[359] And the debate about joint implementation under the Climate Change Convention has not adequately addressed these issues.[360]

This tendency has important long-term implications. The weakening of accountability may, in the long-term, undermine international environmental law. If international environmental law generates a series of seemingly concrete, but ultimately elusive obligations, it will lose its effectiveness over time.[361] Defections from international treaties may rise and nations seeking resolution of international environmental problems may turn to unilateral remedies, such as trade sanctions, or in extreme cases, even war.[362] Alternatively, important global problems may simply go unaddressed, because the law fails to generate concrete solutions to them.

357.*See* Rolf Selrod & Asbjorn Torvanger, *What Might be the Minimum Requirements for Making the Mechanism of Implementation under the Climate Change Convention Credible and Operational, in* OPPORTUNITIES & APPREHENSIONS, *supra* note 161, at 5 (the emissions growth rate can be positive even if countries implement some measures reducing emissions); *see also* Chiranjeev Bed, *No-Regrets Under Joint Implementation, in* OPPORTUNITIES & APPREHENSIONS, *supra* note 161, at 103[END]07 (arguing that allowing credit for "no-regrets" options, cheap or profitable reduction opportunities will lower "overall abatement").

358.*See, e.g.*, OPPORTUNITIES & APPREHENSIONS, *supra* note 161, at 1[END]12, 99[END]103; Green & Sands, *supra* note 159, at 82[END]85.

359.*See generally* Marchant, *supra* note 234, at 628 (the effectiveness of an emissions trading program depends upon its legal, technical and administrative details).

360.In this respect, the evolution of the climate change convention so far is not encouraging. The Kyoto Protocol lacks any institutional or procedural detail on how compliance with trading provisions will be assessed. *See* Werksman, *supra* note 128, at 13[END]14 (identifying this defect in pre-Kyoto proposals). *See generally* Kyoto Protocol, *supra* note 10.

361.Indeed, most environmental agreements already fail to accomplish much, in part because of weaknesses in monitoring and enforcement provisions. *See* Ardia, *supra* note 38, at 504[END]05.

362.*See* Sean T. Fox, *Responding to Climate Change: The Case for Unilateral Trade Measures to Protect the Global Atmosphere*, 84 GEO. L.J. 2499 (1996) (arguing for the use of trade sanctions to promote efforts to address climate change); David M. Driesen, *The Congressional Role in International Environmental Law and its Implications for Statutory Interpretation*, 19 B.C. ENVTL. AFF. L. REV. 287, 303[END]08 (1991) (describing some of the history and theory of unilateral action).

3. *Interference with a Principle of National Responsibility for Private Sector Emissions*

International law traditionally involves law governing relationships between sovereign states.[363] The idea of sovereignty has a territorial basis. Nations have the right and responsibility to control activities within their borders.[364] These general principles of international law give rise to specific principles of national responsibility in the international environmental area. International environmental law establishes a general national duty to make sure that private sector activities on a nation's soil do not cause serious environmental harms to neighboring countries, a territorial responsibility principle.[365]

The assignment of specific national emission reduction targets is consistent with the territorial responsibility principle. Nations assume responsibility for reducing harmful emissions from their territory.

Trading relaxes this territorial principle. Nations may allow harmful emissions to emanate from their territory, if they earn credits somewhere else. This may represent a fairly serious departure from a norm of national responsibility for consequences of actions taking place within a nation's territory.[366]

Perhaps greater global integration invites a broader ethic of responsibility. For example, countries could be held responsible for all of the environmentally destructive activities their nationals participate in or finance regardless of location under a "financial responsibility principle." But allowing a country to claim credits for reductions the country or its nationals finance abroad, without requiring it to assume responsibility for emission increases the country or its nationals finance abroad, does not advance a "financial responsibility principle," or any other discernible ethic of national responsibility.

363.*See generally* Koh, *Why Nations Obey?*, *supra* note 119, at 2603[END]14 (discussing the evolution of the concept of international law). Of course, non-governmental organizations and other non-state actors have become increasingly important in the development of international regimes. *See, e.g.*, Chiara Giorgetti, *The Role of Non-Governmental Organizations in the Climate Change Negotiations*, 9 COLO. J. INT'L ENVTL. L. & POL'Y 115 (1998).

364.*See* Ardia, *supra* note 38, at 499 ("Historically, customary international law has provided that a sovereign state has jurisdiction to prescribe and enforce its laws ._._. within its territorial borders.").

365.*See* Trail Smelter Arbitration (U.S. v. Can.), 3 R.I.A.A. 1911, 1933 (1938) (Canadians ordered to pay damages for pollution caused by a privately owned smelter); 3 R.I.A.A. 1938, 1966 (1941) (establishing pollution control regime for the same smelter); Declaration of the United Nations Conference on the Human Environment, June 16, 1972, princ. 21, 11 I.L.M. 1416, 1420 (states must ensure that activities within their jurisdiction do not damage areas beyond their jurisdiction). *See generally* Arthur K. Kuhn, Comment, *The Trail Smelter Arbitration-United States and Canada*, 32 AM. J. INT'L L. 785 (1938).

366.*Cf.* Green & Sands, *supra* note 159, at 83[END]84 (discussing whether emissions trading conflicts with state sovereignty over natural resources).

Since the Climate Change Convention does not require countries to assume debits for emission increases or rainforest destruction that they finance, it does not advance any competing ethic.[367] The Convention's embrace of emissions trading departs from the principle of national responsibility for emissions within the national territory.

Countries' willingness to hold their nationals accountable to the international community rests in no small measure upon their acceptance of the national responsibility principle. If international emissions trading becomes widespread and undermines this principle, it will make it very difficult to hold nations accountable for pollution emitted in their countries, most of which comes from private activity. Weakening the national responsibility principle would make it very difficult to negotiate and implement international agreements effectively addressing international environmental problems.[368]

C. *The Broader Significance of the Cheap Fix Theory of Emissions Trading*

Emissions trading in the climate change context may constitute a cheap fix, because it delays innovations, undermines important principles at the heart of international agreements to address climate change, and undermines democratic accountability.[369] The cheap fix nature of trading under the Climate Change Convention carries important lessons for the theory of emissions trading generally.

Emissions trading also constitutes a cheap fix if applied to other environmental problems. Emissions trading tends to produce less innovation than systems without trading. Simply put, innovation may require large investments and emissions trading's objective is to lower short-term investment in environmental protection, without sacrificing short-term environmental progress. Furthermore, trading may facilitate avoidance of inexpensive, but politically difficult, change.

Emissions trading also tends to undermine democratic accountability for environmental problems. It does

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367.*Cf.* GUPTA, *supra* note 160, at 118 (citing Indonesian views that a debiting system should accompany the crediting system).

368.*See generally* Yamin, *supra* note 180, at 5 (stating that certain uses of the trading system "would ._._. sink the entire Climate Change Convention Process by robbing it of all credibility").

369.*See generally* Navroz K. Dubash, *Commoditizing Carbon: Social and Environmental Implications of Joint Implementation, in* OPPORTUNITIES AND APPREHENSIONS, *supra* note 161, at 77END80 (arguing joint implementation will jeopardize the long-term effectiveness of the Framework Convention).

this systematically in all cases by complicating monitoring and enforcement.[370] The severity of this problem depends on the particulars of the trading program.[371] Indeed, few difficulties arise if a single jurisdiction controls the program, an adequately staffed agency supervises trades, and the program requires reliable emissions monitoring. But trading programs that cross jurisdictional lines, involve transactions that are difficult to monitor, or are not supported by adequate agency tracking resources, pose a real threat to accountability.[372] Trading always poses more difficulties for monitoring and enforcement than a comparable non-trading program.[373]

Emissions trading may undermine the developed country leadership principle in the Climate Change Convention and hence the future development of this treaty. This point about the particulars of the Climate Change Convention leads to several more general conclusions.

First, trading must comply with the laws under which it operates. Otherwise, it will tend to undermine the law. The potential of trading to conflict with the legal principle of developed country leadership in the Climate Change Convention provides an example of this problem. Violation of the provisions providing for leadership would weaken the entire regime.

Second, whenever the geography of emission reductions raises equity concerns, trading without constraints that adequately address those concerns may create injustice. These injustices can destabilize the law, undermine support for sound economic incentive programs, and interfere with environmental progress. Most trading proponents recognize the need to avoid trading that creates "hotspots," concentrations of pollutants with locally significant effects. For example, one cannot ethically justify allowing local pollution to cause cancer in Baton Rouge, Louisiana, by claiming a credit for a reduction in New Jersey.

The climate change example shows that the geographic principle involved is much broader than the principle that trading should not create hotspots. When the geography matters to the equities of shifting reductions, trading without adequate geographic constraints may undermine the sense of shared responsibility and community

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370.For a more detailed explanation of this point, see Driesen, *supra* note 2, at 310 n.100.

371.*Id.* at 311, 319[END]22.

372.*See* Green & Sands, *supra* note 159, at 82[END]85 (describing some of the difficulties that confront international emissions trading in the climate change context).

373.*See* Driesen, *supra* note 2, at 310 n.100.

needed to make environmental protection effective in the long-run.[374] Equity may properly restrain the location of reductions either because of the localized effects of the pollution reductions or because equity makes geographically specific assignments of responsibility important.

The points about innovation and accountability show that emissions trading is always a cheap fix. The points about equity and geography should constrain trading generally and may give rise to overlooked long-term problems in some contexts.

III. How to Think About Cheap Fixes

Even if a homeowner recognizes that patching the roof constitutes a cheap fix, she does not automatically replace the roof every time it leaks. She may quite rationally decide that the cheap fix makes more sense than replacing the roof in some circumstances.

Similarly, recognizing that trading is a cheap fix rather than a free lunch does not establish that policy makers should abandon all emissions trading. Rather, the cheap fix theory re-frames the analysis of proposals to employ emissions trading. It introduces questions about innovation, democratic accountability, equity, and the relationship of technical fixes to long-term values.

The particular cheap fix problem examined in this article, emissions trading, is an example of a pervasive, but understudied, legal and policy problem. Cheap fix problems arise all the time in many different contexts, and a full theory of how to think about cheap fixes would require another article. But this part will seek to contribute something to this task.

This part will first explain why legal scholarship that successfully identifies cheap fix problems may make a substantial contribution to policy discussions. Second, this part will outline a barebones theory of how to think about the choice between cheap fixes and more enduring solutions with more short-term costs. Third, this part will apply these principles to the problem of joint implementation under the Climate Change Convention. It explains how one might use trading to lower short-term costs without unduly damaging the long-term future of the effort to address global climate change and develop effective international environmental law. Abandoning the free lunch theory of emissions trading leads to a more thorough and thoughtful consideration of particular proposed

374.*See* Yamin, *supra* note 180, at 4[END]5 (discussing the equity concerns of developing countries aroused by the allocation of emission reduction burdens in the context of joint implementation at Kyoto).

applications of trading, rather than to either the automatic rejection or acceptance of proposed trading programs.

A. *Identifying Cheap Fix Problems as a Central Task for Legal Scholarship Addressing Legislative Problems*

Cheap fix problems arise all of the time. But policy makers and scholars may fail to recognize cheap fix problems or to address them adequately.

For example, the framers of the United States Constitution adopted a cheap fix to the problem of how to address slavery. They agreed to perpetuate slavery and treat slaves as less than full citizens.[375] Specifically, Article I, section 9 of the Constitution prohibited the abolition of the international slave trade until 1809.[376] Article IV, section 2 prohibited states from emancipating fugitive slaves.[377] And Article I, section 2 of the constitution treated each slave as three-fifths of a person for purposes of representation in the House of Representatives and the apportionment of federal taxes.[378] This compromise helped facilitate the agreement of southern states to enter the union.[379]

We have paid, and continue to pay, a very heavy price for this cheap fix.[380] The failure to implement an adequate solution to slavery led to a civil war and contributed to enormous problems that still plague us.[381]

375.*See* WILLIAM WIECEK, THE SOURCES OF ANTISLAVERY CONSTITUTIONALISM IN AMERICA: 1760[END]1848 62 (1977).

376.U.S. CONST. art. I, § 9.

377.*Id.* art. IV, § 2.

378.*Id.* art. I, § 2 states:
Representatives and direct Taxes shall be apportioned among the several States which may be included within this Union, according to their respective Numbers, which shall be determined by adding to the whole Number of free Persons, including those bound to Service for a Term of Years, and excluding Indians not taxed, *three fifths of all other Persons.* (emphasis added)
The provision uses the locution "other Persons" to refer to slaves. The provision requires adding the "whole Number of free Persons" to three fifths of "other Persons," meaning the Persons not free. Constitutional scholars agree that the Framers intended this. *See, e.g.*, WIECEK, *supra* note 376 at 65[END]70. Professor Wiecek identifies several other provisions that addressed slavery as well. *See id.* at 62[END]63.

379.*See* DERRICK BELL, AND WE ARE NOT SAVED: THE ELUSIVE QUEST FOR RACIAL JUSTICE 30 (1987); WIECEK, *supra* note 376, at 68[END]72.

380.*See* BELL, *supra* note 378, at 26, 28[END]29, 32, 37.

381.*See id.*; *see also* WIECEK, *supra* note 374, at 15.

Some leaders at the time understood that slavery was unjust.[382] But identification of an injustice does not amount to identification of a "cheap fix." Rather, writing that identified the perhaps less apparent long-term problems that slavery would create would show that its perpetuation was a cheap fix.

Tax scholars for a number of years have complained about the use of the tax code to enact politically cheap fixes to societal problems.[383] Lawmakers often like to further favored values by granting tax credits or deductions for behavior deemed desirable.[384]

Tax scholars pointed out that the use of exemptions, deductions, and credits for a wide variety of social purposes tends to complicate the tax code over time.[385] This may undermine voluntary compliance and augment general distrust of government in the long-term, even if each exemption enacted serves valid societal goals.[386]

Professor Michael Graetz has recently argued that this balkanization of the tax code has helped undermine the very idea of a progressive and broadly applicable income tax as the principle means of funding government.[387] Whether or not any of the particular cheap fixes are desirable, tax scholars have performed an important service in identifying the long-term problem of cheap fixes tending to complicate and undermine the tax code.

Identification of cheap fix problems should be a central task of scholars studying legislation and treaties.[388] Scholars' ability to reflect upon the broader purposes of a law and its history and direction enable them

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382.*See* BELL, *supra* note 378, at 28, 35 (quoting Thomas Jefferson, Abigail Adams, and Luther Martin).

383.*See, e.g.*, MICHAEL J. GRAETZ, THE DECLINE (AND FALL?) OF THE INCOME TAX 258[END]59 (1997) (pointing out that eliminating various deductions, credits, and exemptions to simplify taxes might be unlikely because these breaks were enacted "to achieve important economic or social purposes"). Professor Graetz, however, criticizes other tax breaks as aimed at scoring political points or satisfying special interests. *See id.* at 192, 270 (discussing a recent $500-per-child income tax credit), 290 (discussing special interest tax breaks).

384.*See id.* at 258[END]59 (discussing various examples and stating that "hardly a day passes without some politician suggesting a new tax cut for people and companies that behave in certain ways").

385.*See id.*

386.*See id.* at 269[END]70 (discussing how short term politics trump long-term goals for the tax code, like that of simplicity).

387.*See* GRAETZ, *supra* note 382, at 3, 7[END]8 (identifying the "foolish and unnecessary complexities" of the tax code as one of four factors undermining the income tax).

388.In recent years the value and importance of studying the substance of legislation has received increased recognition. *See, e.g.*, David M. Driesen, *The Societal Cost of Environmental Regulation: Beyond Administrative Cost-Benefit Analysis*, 24 ECOLOGY L.Q. 545 (1997) (discussing the role of cost-benefit analysis in pollution control law); STEPHEN G. BREYER, BREAKING THE VICIOUS CIRCLE: TOWARD

to identify long-term values (and threats to them) that others, including legislators, may overlook.[389] Since ample incentives exist to pay attention to short-term problems even without legal scholarship, this may represent a substantial contribution. Moreover, legislators often may legislate without sufficient foresight, because of the immense pressures to attend to the considerations of the moment. Cheap fix scholarship may help clarify what precisely a body of law should do in the long run.

Identification of cheap fixes may seem similar to the identification of "hidden costs" as a first step in finding "efficient" solutions to societal problems. When economists identify important disadvantages to any solution, they create an illusion of certainty by characterizing the disadvantage as a cost (sometimes hidden). This word, "cost," suggests that the disadvantage identified, a) is amenable to quantification, and b) can be "weighed" against other "costs" and "benefits" without any reasoned explanation of the weighing. It also draws attention away from the shape and dimension of the particular disadvantage under consideration.[390]

Legal scholars can identify cheap fixes and important long-term problems whether or not they wish to pursue efficiency as a goal. Indeed, they may perform a valuable service by spelling out institutional and societal ramifications of cheap fixes, rather than simply stating that they are a cost and sending them out to a weighing station in the sky.[391]

EFFECTIVE RISK REGULATION (1993) (critiquing regulation); Edward Rubin, *The Concept of Law and the New Public Law Scholarship*, 89 MICH. L. REV. 792, 792 (1991) (noting that the judiciary is an "increasingly secondary legal institution" and discussing some of the differences between judicial and legislative decisionmaking); Cass Sunstein, *Administrative Substance*, 41 DUKE L.J. 572, 607[END]09 (1991) (calling for "substantive" administrative law, including critiques of legislation and administrative rules); Robin West, *Progressive and Conservative Constitutionalism*, 88 MICH. L. REV. 641 (1990) (advocating a focus upon legislative legal discourse because it is potentially more progressive); Howard Latin, *Ideal Versus Real Regulatory Efficiency: Implementation of Uniform Standards and "Fine-Tuning" Regulatory Reforms*, 37 STAN. L. REV. 1267, 1291[END]92 (1985) (critizing regulatory critics who fail to dinstinguish claims that various reforms will meet existing statutory goals better from claims that the statutory goals are inappropriate); *cf.* Ernst Freund, *A Course in Statutes*, 4 AM. L. SCH. REV. 503 (1919) (calling for courses in legislation that rely upon materials other than just cases in 1919).

389.*See generally* Rubin, *supra* note 387, at 818 (arguing that "New Public Law" scholarship can anticipate issues).

390.*See* CASS R. SUNSTEIN, LEGAL REASONING AND POLITICAL CONFLICT (1996) 98 (understanding a number of different things as "costs" may obscure important qualitative distinctions).

391.*See* Holly Doremus, *Restoring Endangered Species: The Importance of Being Wild* (forthcoming 1998) (arguing that the Department of Interior has overlooked the long-term benefits of using a politically difficult approach that educates the public about the value of wild animals). *See generally* Lawrence Lessig, *Social Meanings and Social Norms*, 144 U. PA. L. REV. 2181 (1996) (discussing the advantages of considering the meaning of legal rules).

B. *Thinking About Cheap Fixes*

While identifying cheap fixes may prove helpful, legal scholars may want to contribute to the process of choosing between cheap fixes and more enduring solutions to societal problems. This subsection addresses some elements of this weighing.

The thoughtful homeowner considers whether patching a leaky roof may cost more in the long run than replacing it. This involves guessing about the future of the roof. Surely, the homeowner should consider the cost of patching or replacing the roof. But this is not the central difficulty. The central difficulty involves predicting whether the roof, if patched, will spring a leak elsewhere anytime soon.

Policy makers must also compare the costs of cheap fixes and more enduring solutions, if the problem is mostly about money. These decisions may depend upon expert advice about the future consequences of decisions, comparable to the advice a roofer would give about whether a roof of a given age and condition is likely to leak again soon. Legal scholars may have something worthwhile to say about the future economic consequences of decisions, at least when an analysis of legal rules plays an important role in predicting future economic consequences.

A stable long-term homeowner with adequate income will probably choose the best long-term solution to a problem. But, the incentives for public officials operate differently. Public officials have incentives to choose solutions that maximize perceived public benefits during their term in office.[392] They may not be around when the public experiences the consequences of cheap fixes. Hence, they may have some incentive to act more like a short-term tenant than a long-term homeowner, spending only what is necessary to get by in the short term.

However, the analogy between homeowners and policy makers fails to capture an important dimension of the cheap fix problem. Policy decisions for a society frequently have implications that cost-benefit analysis tends to obscure rather than illuminate.

Law does not function solely as a means of ordering the allocation of resources and the distribution of wealth. Rather, law may help shape norms that may influence the behaviors of members of a society.[393] These

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392.*See* Philip P. Frickey, *Legislative Processes and Products*, 46 J. LEGAL EDUC. 469, 471 (1996) (public choice theory supposes that politicians' principal motivation is to secure reelection).

393.*See* SUNSTEIN, *supra* note 389, at 108[END]10 (rules help coordinate behavior, establish new social

norms may contribute to building a sense of community and shared purpose.[394] This sense of shared community and purpose may play an important role in enabling a community to remain cohesive enough to address long-term problems that resist easy solutions.[395] Or, the erosion of norms reflecting the values and aspirations uniting people may contribute to alienation and destruction of community.[396] Scholars may analyze proposed laws with these considerations in mind.

Hence, the justice inherent in policy choices may matter to law in subtle and complex ways. An analysis comparing cheap fixes to more enduring solutions may need to clarify and discuss the likelihood that specific decisions will further important societal values and the likelihood that they will build (or destroy) a sense of community. This analysis may help clarify the nature of the choice between cheap fixes and more enduring solutions.

Legal scholars may have a great deal to contribute to this process of evaluating the values at stake in competing policy choices. Academic lawyers may explain the link between proposed legal rules and broader societal purposes with some precision.[397] Academic lawyers have training in thinking about the purposes and meaning of legal rules.[398]

Scholars must understand that decision makers often have seemingly compelling reasons to prefer cheap fixes. They always face enormous pressure to find solutions that satisfy enough powerful political interests to actually win enactment.[399]

Because legislators always face powerful pressures to adopt cheap fixes, legal scholars may feel that writing about cheap fixes may serve the interests of truth, but have very little influence upon real decision-making.

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practices, and create consistent action dedicated to a long-term end); Rose, *supra* note 7, at 34[END]37 (discussing the normative message various environmental management systems convey).

394.*See* SUNSTEIN, *supra* note 389, at 109 (discussing the "expressive function" of rules).

395.*See* KRATOCHWIL, *supra* note 7, at 70 (explaining that norms enable parties with conflicting goals to sustain a discourse and negotiate solutions).

396.*Cf. id.* at 90[END]91 (explaining how norms tend to discourage profitable defections from efforts to meet collective goals).

397.*See* Rubin, *supra* note 387, at 826.

398.*See id.* (discussing lawyers' understanding of relations between normative choices and legal rules).

399.*See* Frickey, *supra* note 391, at 471[END]72.

This may be true. Even when this is true in the short run, writing about cheap fix problems may call attention to important long-term values and shift debates over time in important ways.[400] This may help create the impetus for better decisions about when to adopt cheap fixes and when to pursue more enduring solutions. Indeed, recognition of the dilemma may sometimes lead to solutions that serve existing needs adequately, while avoiding unnecessary damage to long-term interests that have received insufficient consideration in policy-making debates.

C. *Trading Under the Climate Change Convention: A Proposal*

The Clinton Administration's position on climate change may well illustrate this tendency to choose cheap fixes in order to increase the likelihood of enactment. The administration would like the Senate to ratify the Kyoto Protocol and may need legislative cooperation to adopt implementing legislation.[401] Since many legislators favor "free market mechanisms," use of emissions trading may constitute a "selling point" in Congress for treaty ratification.

Emissions trading, for example, may help "sell" the Kyoto Protocol to Congress regardless of the details of the particular trading program used. Politicians' responses to economic incentive programs may have little to do with the actual merits of particular programs and much more to do with particular politicians' ideologies.[402] This means that emissions trading may function as a selling point whether the particular program is wholly fraudulent, a sound cheap fix with very bad long-term consequences, or a cheap fix designed to minimize interference with long-term values.

This subsection shows how to design an emissions trading program that seizes many of the benefits of a

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400.*See* RICHARD A. POSNER, OVERCOMING LAW 471EMD72 (1995) (the fact that a new approach to law may take a generation or more to alter professional thinking does not make it useless).

401.The executive branch has some authority to address climate change on its own pursuant to existing legislation. *See* Woodward, *supra* note 15, at 223END30 (explaining that the executive branch may have authority to address climate change pursuant to the National Environmental Policy Act and the Clean Air Act). But some proposals to address climate change would require fresh legislation. *See id.* at 233END38 (discussing legislation proposed in the late 1980s and advocating passage of legislation aimed specifically at global warming).

402.*See* Robert N. Stavins, What Can We Learn from the Grand Policy Experiment: Positive and Normative Lessons from SO2 Allowance Trading 10 (1997) (unpublished manuscript on file with the author); *cf.* Nathaniel O. Keohane et al., *The Choice of Regulatory Instruments in Environmental Policy*, 22 HARV. ENVTL. L. REV. 313 (offering a complex economic model to explain legislative preferences for various regulatory instruments).

cheap fix, without great harm to long-term values. This proposal seeks to reconcile the Framework Convention's cost-effectiveness and leadership principles and to minimize emissions trading's threat to democratic accountability. Even those that favor other proposals should recognize that the cheap fix theory helps identify important questions that any proposal should address.

1. *Focus Upon Innovation*

One could require that joint implementation projects that generate credits toward compliance with quantitative limitations involve advanced technology.[403] This would effectively blend the leadership and cost-effectiveness principles, creating cost-effective leadership.[404]

This idea comports well with the precise language creating the cost-effectiveness principle in the Framework Convention. Article 3, section 3 adopts a principle of "taking into account that policies . . . should be

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403.*See* H. Merkus, *The Framework Convention of Climate Change: Some Thoughts on Joint Implementation*, The Hague, Ministry of Housing, Physical Planning and the Environment, CCD/Paper (1992). Professor Tsjalle van der Burg argues for acceptance of a joint implementation project and a replaced project whose "static advantages ._._., taken together, outweigh their negative dynamic effect on technology development or on transfer and diffusion of technologies." JOINT IMPLEMENTATION, *supra* note 161, at 102.

Professor van der Burg argues that this weighing should be based on the greenhouse gas "effect" of the loss of innovation and technological diffusion. *Id.* at 103. He recognizes that estimating the value of the lost technological innovation poses enormous difficulties, but nevertheless recommends that GHG certificates for individual projects that substitute less innovative for more innovative reduction techniques be subject to a numerical discount. This proposal is quite impractical absent a demonstration that one can reasonably estimate the amount of greenhouse gas emissions the advanced technology will yield in future applications with little administrative cost. Indeed, this would not suffice[END] one would have to be able to calculate the joint implementation's contribution to this future benefit stream numerically.

The problem, however, goes beyond the impracticality of such a proposal. Any joint implementation project that substitutes a standard technology for an advanced technology is worse than no joint implementation project at all in terms of its effect on greenhouse gases. Properly conducted joint implementation will yield the same number of net reductions as single country implementation without a joint implementation project. Hence, any net technological disadvantage will justify forbidding such projects environmentally. There is no need for precise weighing.

The case for allowing joint implementation tending to discourage innovation must rely upon the cost effectiveness principle in the treaty. There is no good case for it environmentally. The cost effectiveness value is discussed above.

404.*See* Irving M. Mintzer, *Institutional Options and Operational Challenges in the Management of a Joint Implementation Regime* in CRITERIA, *supra* note 18, at 47 (since Article 3 of the Framework Convention urges governments to take cost effectiveness "into account," cost effectiveness cannot be the sole criterion for project selection).

cost effective so as *to ensure global benefits* at the lowest possible cost."[405] A policy which tends to avoid innovation through emissions trading does not ensure global benefits. Global benefits may require innovation in order to make it possible for developing countries to assume significant binding reduction commitments. Moreover, the next sentence in section 3 states that climate change policies should "take into account different socio-economic contexts."[406] A focus on advanced technology appropriately reflects the capabilities of developed countries and the fact that developing countries may need advanced technology to meet climate change goals without lowering living standards. The drafters of the Framework Convention considered these differences in capabilities and needs important elements of the "different socio-economic contexts" that the treaty refers to.[407] More obviously, the focus on advanced technology helps implement the leadership principle. It creates a global partnership to advance the state of the art.[408]

A program confined to advanced technology will not meet short-term goals as cheaply as an approach that allows joint implementation projects based on standard technology. But it may lower the long-term costs of avoiding dangerous levels of greenhouse gas concentrations in the atmosphere.

This focus on advanced technology probably will not prevent development of a viable market. Most of the activities implemented jointly and reported to the Secretariat of the Framework Convention on Climate Change as part of the pilot phase involved either renewable energy or energy efficiency enhancing projects.[409] On the other hand, the Framework Convention would not allow forestry related projects, which form a substantial part of the

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405.Framework Convention, *supra* note 9, art. 3(2), 31 I.L.M. at 854 (emphasis added). The New Delhi Statement of the Global Environmental Facility echoes this emphasis, calling on the GEF to "stimulate" technology transfer and adoption. *New Delhi Statement of the First GEF Assembly*, April 3, 1998, 21 Int'l Envt. Rep. (BNA) 396 (Apr. 15, 1998). It states that the GEF "should increase efforts towards ensuring the sustainability of the global environment benefits generated by GEF-financing . . . ." *Id.* Furthermore, the statement provides that "GEF activities should be based on national priorities designed to support sustainable development and the global environment." *Id.* Arguably, retrofits or construction of coal-fired power plants do not fit this criteria, while more innovative energy projects may meet this criteria.

406.*Id.*

407.*See* Bodansky, *supra* note 2, at 499, 502END03.

408.*See* Mintzer, *supra* note 403, at 44 (Joint implementation regime will be judged by its ability to promote transfer of environmentally sound technology "in preference to recycling the same polluting conventional technologies that have contributed to the current state of global risk.").

409.*See* Pilot Phase Report, *supra* note 169, at 7.

United States pilot projects, to become creditable.[410]

This elimination of forestry projects from joint implementation greatly lessens the potential for trading concrete benefits for ephemeral ones. Forestry credits raise the specter of protecting one piece of land for credit, only to see timber demand devour another piece of land more rapidly with no net climate benefit. It creates an incentive for countries to allow deforestation, in order to make room for fresh tree planting activities for credit. Finally, no international agreement exists about how precisely to measure carbon sequestration benefits from forestry projects. Of course, this does not mean that forestry protection is a bad idea, it just means that the uncertainties involved make it a poor commodity for trading.

2. *Geography*

This first international experiment with trading should focus upon trading emission reductions among developed countries. This avoids undercutting the fiscal leadership principle, which requires funding reductions in developing countries in addition to, not as a substitute for, reductions in developed countries.

Furthermore, since developing countries do not have emission caps, trade with them poses especially difficult accounting issues.[411] The United States, a single jurisdiction with a fairly sophisticated bureaucracy, has never succeeded in making a program without an emissions cap work properly.[412] It seems unlikely that fragile international institutions, or a combination of uncoordinated national agencies of widely varying capacity, could make such a system work properly.

In particular, trading outside a cap may well encourage countries to claim credits for incidental emission reductions, reductions that would occur even in the absence of efforts to comply with the Climate Change

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410.*See Joint Implementation*, (visited June 28, 1998) <http://www.state.gov/www/global/oes/97climate_report/part4d.html#joint> *in* Climate Action Report: 1997 Submission of the United States of America Under the United Nations Framework Convention on Climate Change, Dep't of State Pub. no. 10496 (1997) [hereinafter 1997 State Department Report] (showing that a large number of forestry projects are part of the pilot effort).

411.*See* Stavins, *supra* note 116, at 311 (When joint implementation occurs between developed and developing countries without developing country binding targets "it will be difficult to determine the emission-reduction effects of a specific joint implementation project.").

412.*See* Driesen, *supra* note 2, at 311[END]21.

Convention.[413] If this occurs, it will lower the performance of the treaty as a whole.

The Kyoto Protocol seeks to address this problem of incidental reduction claims by requiring that credit generating projects provide "a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to any that would otherwise occur."[414] This language does not adequately address the problem. The requirement that developed countries only receive credit for reductions "additional" to those that "would otherwise occur," even interpreted broadly, does not adequately address problems of demand shifts when trades occur outside a cap. Even if a given emission reduction would not occur without a given project, the project may trigger a demand shift that will be difficult to account for. For example, suppose that a U.S. utility pays a Brazilian power plant to shut down, thus generating an "additional" emission reduction. This shutdown might not have occurred without the payment, but it may still trigger an emission increase at a nearby power plant. If the U.S. power plant claims a credit for the decrease, the United States will produce fewer emission reductions, even though Brazilian net emissions have not changed at all.

A narrow construction of the "additionality" requirement may allow credits for things that would have happened without any pollution control demands. For example, suppose that a company sells burners to coal-fired power plants and receives both payment and emission credits from developing countries that have older plants with less modern burners. It may be that this project would occur with or without pollution reduction credits. The equipment sale may produce enough profit to justify the project even without a credit. Such a sale might meet the "additionality" requirement, since the project might produce an emission reduction additional to what would occur without the project. This problem could, in principle if not in practice, be solved by requiring that no credit be granted for projects that generate revenues for the purchaser of credits. But prominent commentators, whose views I discuss in the margin, have argued against strict implementation of an "additionality" requirement.[415] The

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413.*See* Stavins, *supra* note 116, at 311[END]12 (low-cost abatement projects may be carried out without joint implementation).

414.Kyoto Protocol, *supra* note 10, art. 6(1)(b), 37 I.L.M. at 35.

415.Professors Arts, Peters, Schrijver, and van Sluijs have opposed use of additionality constraints to bar the use of credits from profitable projects. Indeed, they claim that "profitability" constitutes "a necessary condition" for private participation in joint implementation. JOINT IMPLEMENTATION, *supra* note 161, at 44. This statement is incorrect. Polluters with emissions control obligations face expenses and have an incentive to invest in projects that cost less than meeting their obligations domestically, even if the projects produce no profits. *See id.* at 47. Countries may also create an incentive by subsidizing projects abroad. In either case, profitability is not necessary to encourage joint implementation. *See id.*

"additionality" requirement probably will deter taking advantage of some naturally occurring decreases that have no relationship to foreign expenditures. It may simplify national accounting for emission reductions in conjunction with caps. But this constraint does not suffice to obviate the need for a cap as a prerequisite for trading.

3. *Accountability*

Insofar as private companies carry out projects because doing so is profitable, no credit is needed to entice participation and strict criteria for granting credit will have no effect on private capital investment. *Cf. id.* (claiming that strict criteria for credit will reduce capital investment in joint implementation).

In practice, it may be very difficult to properly implement the "additionality" requirement. *Accord* JOINT IMPLEMENTATION *supra* note 161, at 52 ("[S]trict proof of additionality will often be exceedingly difficult."), 80. In principle, it requires one to establish a baseline quantifying "what would ._._. occur" absent an emission reducing project. Indeed, this hypothetical baseline may not suffice to stop emission[END] increasing projects from generating credits. Suppose, for example, that India wishes to build a new power plant to facilitate economic growth. Foreign investors may help build the facility. A supplier may well claim a credit for supplying equipment by claiming that but for its contribution, the plant would be built with less efficient equipment. Hence, projects which increase emissions generate credits justifying avoidance of reductions, and potentially of innovation, in developed countries.

Nevertheless, Professors Arts, Peters, Schrijver, and van Sluijs argue against strict implementation of an additionality requirement, because the "first priority must be to reduce (or absorb) [greenhouse gas emissions] GHG." *Id.* This argument confuses a foregone opportunity to earn credit with a foregone emission reduction. If a credit for joint implementation is denied, then the country that sought to purchase the credit must make the reduction domestically. No loss of emission reductions occurs. On the other hand, granting a credit for a reduction that would occur anyway does involve a loss of emission reductions. *See id.* at 79 (recognizing that use of credits for a project that "would have been done even in the absence of joint implementation could increase total emissions").

Professor Tsjalle van der Burg argues that the "probability" that a project might not be additional can be safely ignored. *Id.* at 84[END]89. This argument actually amounts, at bottom, to assuming the problem away. He assumes that the greenhouse gas "effect of the project" (or the "additionality of the project") has no correlation with the total future "greenhouse gas concentration" (presumably meaning atmospheric concentrations). *Id.* at 88. In other words, any given set of emission reductions has no correlation with future greenhouse gas concentrations. The entire premise of the treaty (and a sound one, if the history of environmental progress is any guide) is that a series of actions that really reduce emissions will generally lower atmospheric concentrations of target gases. *See Controls Would Cut Methane in Atmosphere, Scientists Say*, 29 Env't Rep. (BNA) 354 (June 12, 1998).

Having assumed away the problem, he then states that the "uncertainties related to many other individual phenomena" (such as car purchases and other decisions that can affect emissions) counterbalance "the uncertainty about" the greenhouse gas "effect of the project." JOINT IMPLEMENTATION, *supra* note 161, at 88. This amounts to an argument that since a large number of decisions effect total concentrations, government officials do not need to ensure that society actually realizes any given legally required emission reduction. This argument justifies general sloppiness. Since any successful program will consist of a large number of small (but cumulatively significant) activities reducing emissions, sloppiness with respect to individual projects on such general grounds would seriously risk failure of the program as a whole.

Finally, Professor Tsjalle van der Burg argues that strict additionality requirements might rule out very cost effective projects. *See id.* at 90[END]91. This does not seem like a strong argument. Very cost effective projects may attract financing without the benefit of joint implementation. *See* Stavins, *supra* note 116 at 311[END]12 (low cost projects may be carried out without any policy intervention). So, it seems like a bad idea to give up emission reductions to finance them, unless they surely constitute reductions that would not occur without joint implementation.

One could limit the amount of trading that can occur in order to address accountability issues.[416] This would make it easier to track trading.

The joint implementation pilot projects have failed to demonstrate the feasibility of international emissions trading. International bodies have not yet verified that the pilot projects undertaken so far have generated the claimed reductions.[417] Nor has the United States, a leading proponent of trading, verified that its pilot joint implementation projects have produced the projected environmental benefits.[418] Because the pilot phase began fairly recently, it has not yet shown that using credits from joint projects in lieu of domestic implementation will advance treaty goals.[419] This fact, together with emissions trading's mixed record in general, should caution against a wide expansion of trading before demonstration of institutional capacity to monitor and account for trades. Clear decisions about who will account for and monitor these trades must precede actual trading. At least, ensuring that the volume of trading is low enough so as not to overwhelm the understaffed bodies that must monitor and account for trading seems a wise precaution, in light of the lack of precedent for an effective international trading system.[420]

Precedent exists for numerical limits to trading volume. EPA has written a rule allowing chemical plants, which often contain hundreds of pollution sources, to trade emission reductions among these sources.[421] EPA

416.*See generally* JOINT IMPLEMENTATION, *supra* note 161, at 52 (recommending a limit on transactions as a means of addressing fear that trading will cause countries to use "*only* existing technology"); *U.S. Opposes Cap on Amount of Trading Allowed to Meet Domestic Emission Goals*, 29 Env't Rep. (BNA) 253 (May 29, 1998); *EU Proposal on Emission Trading System Would Cap Amount Nations Can Buy, Sell*, 29 Env't Rep. (BNA) 352 (June 12, 1998).

417.*See* Pilot Phase Report, *supra* note 169, at 5 (discussing the inadequacy of national data).

418.*See* 1997 State Department Report, *supra* note 409, at 1 (claiming that project emissions "will be," not have been, verified). The United States government has reviewed estimates of baselines and projected future benefits. Moreover, some private evaluations of actual (as opposed to projected) accomplishments exist.

419.*See, e.g., Report on the In-depth Review of the National Communication of the United States of America*, FCCC/IDR, at 17, U.N. Doc. FCCC/IDR.1/USA (1996) (most U.S. joint implementation projects will not reduce greenhouse gas emissions until 1997 or 1998 and will not have their full impact before 2000).

420.*See* Marchant, *supra* note 234, at 641 (private trades between sources in different countries pose "insurmountable difficulties" because of the lack of adequate international institutions or machinery to monitor or enforce trades); CAMERON ET AL., *supra* note 312, at 231[END]32 (pointing out that "full-fledged" joint implementation has never been used).

421.*See* 40 C.F.R. pt. 63.150 (1997). This regulation only authorizes trades within a plant, so this constitutes a geographically narrow form of emissions trading, sometimes called a bubble.

recognized that numerous transactions might overwhelm government agencies with limited resources to verify emission estimates.[422] It limited the number of pollution sources that could trade in order to address this problem.[423]

Even limited trading does allow the few pollution sources with exceptionally expensive control options to avoid controls.[424] Hence, limited trading will serve a substantial purpose.

A stringent numerical limit on trading also makes sense of the conflicting language governing the question of whether credits from trades may count toward meeting quantitative limits set in the Kyoto Protocol. Article 17 states that developed countries "may participate in emissions trading for the purposes of fulfilling their" Article 3 commitments, but that this "trading shall be supplemental to domestic actions for the purposes of meeting quantified emissions limitation and reduction commitments under that Article."[425] These provisions can be reconciled by assuming that trading is "supplemental to domestic actions" to the extent that the country using credits from abroad relies principally upon domestic measures to meet treaty commitments.[426] The negotiating history of the Kyoto Protocol supports such a reading.[427] This implies a strict quantitative limit on the amount of credits one can use to meet the Kyoto Protocol's quantitative targets. It may be wise to confine this first experiment with international trading to emissions that can be reliably quantified, such as carbon dioxide.[428] This

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422.*See* National Emissions Standards for Hazardous Air Pollutants for Source Categories; Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry and Other Processes Subject to the Negotiated Rule for Equipment Leaks, 59 Fed. Reg. 19,402, 19,428[END]29 (Apr. 22, 1994).

423.*See id.* at 19,521 (codified at 40 C.F.R. 63.150(f)(1)(1997)).

424.*See, e.g., id.* at 19,429 (explaining that most sources will not find a large number of opportunities for cost-effective credits).

425.Kyoto Protocol, *supra* note 10, art. 17.

426.The interpretation of this provision is an open question that the COP hopes to resolve in Buenos Aires in November of 1998. *See Key Issues Outlined for Upcoming Talks on International Emission Trading System*, 21 Int'l Envt. Rep. (BNA) 414 (Apr. 29, 1998).

427.*See Negotiators Optimistic on Treaty Including Emissions Trading, Joint Implementation*, Nat'l Env't Daily (BNA), Dec. 5, 1997, *available in* LEXIS, BNA Library, BNAEVR file ("[T]he European Union does not want trading to substitute for domestic action to reduce greenhouse emissions."); *Emission Trading, Joint Implementation Specified in Draft Text for Revised Treaty*, 28 Env't Rep. (BNA) 1206 (Oct. 17, 1997) (draft contemplates that domestic measures "should provide the main means of meeting commitments").

428.*See* Marchant, *supra* note 234, at 646[END]47 (discussing the means of estimating carbon dioxide emissions).

will increase the likelihood of success.[429]

Furthermore, the COP should establish clear rules assigning responsibility to verify joint implementation credits, integrating joint implementation into national planning, assigning specific responsibilities to avoid double counting in advance, and providing for national responsibilities and consequences for possible failures. These rules should carefully provide for meaningful public participation in the process, so that the public can help prevent fraud and abuse.

In order to facilitate that participation, the COP should require that all traders and their governments provide a comprehensive set of information to an international clearinghouse.[430] This should be designed to help the public monitor and verify any trade occurring anywhere in the world, without having to depend upon dozens of national governments and private companies for essential information.

4. *The Cheap Fix Theory and the Specific Proposal*

These proposals will not appear attractive to those who think of trading as a "free lunch." The "free lunch" theory tends to favor an objective of maximizing the volume rather than the quality of trades. Maximizing the volume of trades will increase the cost savings from trading. Indeed, it will do this best if emission reductions are absolutely fraudulent. The cheapest credits will come from double counting, claiming credit for activities that would occur with or without trading, or claiming credits for activities that do not, in fact, reduce emissions.

The cheap fix theory calls attention to the full dimensions of the problem. First, to the extent trading generates less environmental benefit than compliance without trading, it offers not just a cheap fix, but a poor cheap fix, like a bad patch job on a homeowner's roof. Second, if trading undermines confidence in international agreements, slows innovation, interferes substantially with the process of translating general international goals into specific national commitments, and greatly lessens public involvement and accountability, it will undermine progress in confronting environmental issues over time.

429.*Accord id.* at 650[END]52 (explaining that other gases are more difficult to monitor), 659[END]60 (discussing the problems in estimating the impacts of forestry projects); *cf.* William R. Moomaw, *Achieving Joint Benefits from Joint Implementation* in CRITERIA, *supra* note 188, at 12 (noting uncertainty about exact amount of greenhouse gas offset in a newly planted forest or energy conservation program).

430.I am indebeted to Professor William Buzbee of the Emory Law School for this idea.

A decision to maximize the volume of trades in this first international trading experiment may, in the long run, reduce the use of trading on the international level.[431] To the extent trading becomes a means of avoiding innovation and accountability, it may earn a very poor reputation. To the extent it helps reduce the cost of innovation and provides a reasonably reliable and flexible means of meeting environmental goals, its reputation (which is deservedly mixed) will improve. It may always be a cheap fix, but depending on the ground rules, it can be either a useful cheap fix that involves only mild conflict with long-term goals, or a very bad decision that makes long-term progress very difficult. The cheap fix theory helps make this dilemma apparent.

CONCLUSION

Cheap fix issues deserve more scholarly attention. Emissions trading, long thought of as a "free lunch," is really a cheap fix. Policy makers should take this into account as they address proposals for emissions trading.

431.*See* AXEL MICHAELOWA, JOINT IMPLEMENTATION OF GREENHOUSE GAS REDUCTIONS UNDER CONSIDERATION OF FISCAL AND REGULATORY ALTERNATIVES 21 (1995) (Some saving potential must be sacrificed in order to prevent misuse of joint implementation "and so ensure its long-term operability."). Some observers cite the Montreal Protocol as precedent for joint implementation under the Climate Change Treaty. *See* JOINT IMPLEMENTATION, *supra* note 161, at 11. The Montreal Protocol does contain some language that resembles the joint implementation language found in the climate change treaty. *See id.* at 10 (citing Montreal Protocol, *supra* note 37, art. 2(8)(a)). But this provision only applied to trades within the European Union. *See* BENEDICK, *supra* note 44, at 94END97 (describing the political background). Furthermore, the Montreal Protocol allowed transfer of production allowances between countries. *See* JOINT IMPLEMENTATION, *supra* note 161, at 10. It does not appear that a significant amount of trading occurred under these provisions. Email Letter from Michael Graber, Deputy Executive Secretary, Secretariat for the Vienna Convention and the Montreal Protocol, United Nations Environment Program to David M. Driesen (June, 30, 1998) (on file with author). Hence, while commentators are correct to state that some legal precedent exists for joint implementation under the climate change treaty, little significant practical experience with emissions trading resulted.