

WAITING TO EXHALE?: GLOBAL WARMING AND TAX POLICY

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INTRODUCTION: GLOBAL WARMING, ENERGY POLICY, TAX POLICY

Energy policy, tax policy, and the warming of the earth may seem like unrelated topics, but they are inextricably linked. In the wake of the energy crisis of the summer of 2001,¹ the United States took another look at the tax treatment of energy providers. Congress and the Bush Administration rejected the widely accepted tenets of the Kyoto Protocol, provoking worldwide criticism.² Many scientists agree on the solutions to global warming including conservation, conversion to renewable energy sources, and preservation and enhancement of carbon sinks.³ As the foremost emitter of greenhouse gases (“GHG”) the United States cannot sit idly while the world wrestles with this problem; however, taking action against

1. See John C. Hilke & Michael Wise, *Who Turned Out the Lights? Competition and California's Power Crisis*, ANTITRUST, Summer 2001, at 76 (discussing the California electricity crisis and its consequences); STEVEN L. PULLER, PRICING AND FIRM CONDUCT IN CALIFORNIA'S DEREGULATED ELECTRICITY MARKET (Nov. 2001) (Program on Workable Energy Regulation (POWER), Univ. of Cal. Energy Inst., Working Paper PWP-080) (noting the rise in energy prices in California was driven by changes in costs and demand), available at <http://www.ucei.berkeley.edu/ucei/PDF/PWP080.pdf>. Although there is dispute as to whether there was an energy crisis in the summer of 2001, in a deregulated energy market like California, there is a tremendous incentive for suppliers to reduce production, creating price increases in the spot market. *Id.*

2. See Dana Milbank, *Criticism Greets Bush as Europe Trip Begins*, WASH. POST, June 13, 2001, at A1 (describing European criticism of the Bush Administration's opposition to the Kyoto treaty); see also discussion *infra* Part II.B (summarizing the Kyoto Protocol).

3. See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SUMMARY FOR POLICYMAKERS, CLIMATE CHANGE 2001: MITIGATION, A REPORT OF WORKING GROUP III OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 5–6, 8 (2001) (discussing the results of a wide range of environmental studies, both regional and global, where common solutions to, and trends of, GHG emissions were identified and included low-carbon energy use and carbon sequestration), available at <http://www.ipcc.ch/pub/wg3spm.pdf> (last visited Aug. 9, 2002).

global warming will be difficult.⁴ Re-examining the tax treatment of GHG emitters and carbon sinks may provide a politically palatable solution to global warming, as well as benefits to citizens.

Any re-examination of the tax treatment of GHG emitters and carbon sinks should, in part, depend upon the state of our forests; one third of the land area of the United States is covered with forests,⁵ thus, preserving and enhancing the carbon absorption of this resource would provide a significant means of reducing the total carbon output of the United States.⁶ This Article briefly examines the scientific debate surrounding global warming and its potential consequences. In addition, this Article analyzes current energy tax proposals that may affect U.S. GHG emissions. At press time, Congress was working to reconcile House and Senate versions of a major energy tax bill, which, although providing certain additional incentives for energy conservation, would enhance the massive subsidies currently provided to the fossil fuel industries under the Internal Revenue Code.⁷

This Article will address the value of U.S. forests as producers of goods and services, tangible and intangible, including their value as carbon sinks to counteract global warming, and conclude that carbon sinks may also provide a politically feasible way of reducing U.S. GHG emissions. Forests produce lumber and paper, but they also improve air and water quality, serve as wildlife habitats, and provide

4. See Alvin Powell, *Babbitt Delivers Earth Day Address: Takes Aim at President Bush's Environmental Backdealing*, HARV. GAZETTE, Apr. 26, 2001 (quoting Bruce Babbitt, former Secretary of the Interior as stating: "[t]he difficulty of this task is matched only by its importance"), available at <http://www.news.harvard.edu/gazette/2001/04.26/09-babbitt.html>.

5. See W. BRAD SMITH, FOREST SERV., U.S. DEP'T OF AGRIC., 1997 RPA ASSESSMENT: THE UNITED STATES FOREST SERVICE CURRENT SITUATION 2 (1999) (noting that the extent of forests in the United States has changed little in the Twentieth Century and, in fact, that the volume of American timberland having actually risen by thirty-six percent), available at <http://www.srsfia.usfs.msstate.edu/wo/review.htm> (last visited Aug. 9, 2002).

6. While carbon sinks provide a significant means of GHG abatement, I do not mean to imply that other measures, such as conservation, should not be employed. However, in today's political climate, carbon storage by preserving U.S. forests probably has a better chance of implementation than energy conservation.

7. See Securing America's Future Energy Act of 2001, H.R. 4, 107th Cong. (2002) (adopting tax incentives to provide substantial financial benefits for energy conservation, but also establishing new I.R.C. provisions that allow oil and gas plants to expense, or deduct from income, costly environmental regulation compliance programs and also allowing natural gas plants to significantly accelerate the depreciation of property, thus recovering expenses at a much quicker rate); see also Energy Policy Act of 2002, H.R. 4, 107th Cong. (2002) (revising the House version for Senate consideration). Conferences were held on June 27, 2002 and July 25, 2002, with final resolution expected in September 2002. See Press Release, Senator Frank Murkowski, Energy Conferences Making Progress Securing America's Energy Supply (June 25, 2001) (on file with author).

recreational opportunities and spiritual respite from the urban world.⁸ Carbon sequestration in forestland has been recognized by the Intergovernmental Panel on Climate Change (“IPCC”) as the exclusive means of offsetting carbon gas emissions under the Kyoto Protocol.⁹ In concluding that the value of living forests exceeds their value as timber, this Article considers whether the Federal income tax system encourages the maximization of forest values, and what changes in the tax system would better serve the goal of maximizing forest values.¹⁰ This Article focuses on U.S. law and forests located within the United States because, although global warming is an international problem, the United States can best implement conservation policies within its boundaries.¹¹ As the producer of more GHG’s than any other country in the world,¹² the United States should set the example for the rest of the world.¹³ In addition, the

8. See generally Robert L. Fischman, *Stumbling to Johannesburg: The United States’ Haphazard Progress Toward Sustainable Forestry Law*, 32 ENV’T L. REP. 10291 (2002) (describing the ecological, economic and spiritual benefits of forests).

9. See The Kyoto Protocol To The United Nations Framework Convention on Climate Change, Art. 3.3. (1997) [hereinafter Kyoto Protocol] (requiring industrialized nations to reduce their emissions of greenhouse gases with the ultimate goal of stabilizing GHG concentrations in the atmosphere), available at <http://www.unfccc.int>. The Kyoto Protocol allows developed countries, including the United States, to meet their emissions requirements in two ways: (1) by reducing emissions from GHG sources, and (2) by using carbon sinks to remove CO₂ from the atmosphere. *Id.* art. 3. Under the Kyoto Protocol, only forests count as carbon sinks, although grasses and soils also store CO₂. *Id.* Article 3.3 of the Kyoto Protocol reads, in pertinent part:

The net changes in greenhouse gas emissions by sources and removals by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation since 1990, measured as verifiable changes in carbon stocks in each commitment period, shall be used to meet the commitments under this article of each Party included in Annex I.

Id.

10. See *infra* Part III.B.4 (discussing the implication of tax changes on forests and timber production).

11. See John Dernbach, *Moving the Climate Change Debate From Models to Proposed Legislation: Lessons From State Experience*, 30 ENV’T L. REP. 10933, 10940 (2000) (“For practical and legal reasons, instruments utilized by the United States to reduce net GHG emissions should focus first and foremost on sources and sinks within the United States.”).

12. See United Nations Framework Convention on Climate Change (UNFCCC), *National Communications From Parties Included In Annex I to the Convention: Greenhouse Gas Inventory Data from 1990 to 1998* 8 fig.5 (Oct. 11, 2000) (describing the steps taken by nations to implement the Convention and giving an inventory of their GHG emissions), available at <http://www.unfccc.int/resource/natcom/index.html>. In 1998, the United States emitted 6.7 million gigagrams (Gg) of GHG’s, whereas Japan, the second highest emitter after the United States, emitted only 1.3 million Gg. *Id.* The U.S. increase in GHG emissions from 1990 to 1998 approximates Canada’s (the third highest emitter) emissions for 1998 (approximately 700,000 Gg). *Id.*

13. See Dernbach, *supra* note 11, at 10940 (arguing that legal tools such as demand-side management, system benefit charges, and tax credits that focus on

other benefits of forest conservation at home, such as clean water and recreational opportunities, will accrue to American residents, citizens, and taxpayers.¹⁴

Finally, this Article focuses on tax policy, because the emerging consensus among legal scholars favors economic incentives,¹⁵ rather than command-and-control regulations,¹⁶ for reaching environmental goals;¹⁷ the Federal income tax has proved an effective delivery system

CO[2] emissions have the potential to reduce GHG emissions). Taking the lead in, or at least not opting out of, GHG abatement will also give the United States “credibility in international negotiations.” *Id.* This statement is supported by India and China’s response to a potential U.S. pullout: “At a preliminary negotiating session in New York in February 1995, China and India, both of which have vast coal resources, argued that unless the U.S. leads the way by significantly cutting its own emissions, their obligation to develop their own economies outweighs their obligation to preserve the global environment.” ROSS GELBSPAN, *THE HEAT IS ON: THE HIGH STAKES BATTLE OVER THE EARTH’S THREATENED CLIMATE* 118 (1977).

14. See Chad Hanson, *Big Timber’s Big Lies*, *SIERRA*, Sept./Oct. 2000, at 62 (explaining that because the United States is setting trends in international policies affecting forests, preserving forests at home could lead to worldwide forest preservation).

15. See Stephen M. Johnson, *Economics v. Equity: Do Market-Based Environmental Reforms Exacerbate Environmental Injustice?*, 56 *WASH. & LEE L. REV.* 111, 133 (1999) (“Instead of mandating uniform pollution reductions on a national basis, market-based approaches use economic incentives to encourage polluters to reduce their pollution in the most cost-effective manner.”). *But see* David M. Driesen, *Is Emissions Trading an Economic Incentive Program?: Replacing the Command and Control/Economic Incentive Dichotomy*, 55 *WASH. & LEE L. REV.* 289, 290 (1998) (endorsing a more subtle approach to environmental regulation, and stating that “both traditional regulation and emissions trading rely upon the threat of a monetary penalty to secure compliance with government commands setting emission limitations”). Professor Driesen concludes that both traditional regulation and emissions trading can be considered “economic incentive program[s].” *Id.* at 290. He defines an “economic incentive program” as “any program that provides an economic benefit for pollution reduction[sic] or an economic penalty for pollution.” *Id.* at 323.

16. See Bruce A. Ackerman & Richard Stewart, *Reforming Environmental Law*, 37 *STAN. L. REV.* 1333, 1343 (1985) (describing command-and-control regulation as a system that “envision[s] inevitably ill-informed bureaucrats continually ‘fine-tuning’ technological and economic decisions . . .”). *But see* Howard Latin, *Ideal Versus Real Regulatory Efficiency: Implementation of Uniform Standards and “Fine-Tuning” Regulatory Reforms*, 37 *STAN. L. REV.* 1267, 1270-71 (1985) (arguing the advocates for market incentives have “an excessive preoccupation with theoretical efficiency, while . . . plac[ing] inadequate emphasis on actual decisionmaking costs and implementation constraints,” and identifying some advantages of traditional command-and-control regulation over market incentives).

17. See Jon D. Hanson & Kyle D. Logue, *The Costs of Cigarettes: The Economic Case for Ex Post Incentive-Based Regulation*, 107 *YALE L.J.* 1163, 1174 (1998) (arguing that severe failures in the cigarette market warrant “some form of victim-initiated ex post incentive-based regulation, such as enterprise liability or smokers’ compensation”). See generally Robert W. Hahn & Robert N. Stavins, *Incentive-Based Environmental Regulation: A New Era from an Old Idea?*, 18 *ECOLOGY L.Q.* 1 (1991) (advocating the use of economic-incentive approaches to influence future environmental policy); Bruce A. Ackerman & Richard Stewart, *Reforming Environmental Law: the Democratic Case for Market Incentives*, 13 *COLUM. J. ENVTL. L.* 171 (1988) (arguing that a reformed regulatory system will likely promote democratic dialogue that could shape the future of environmental law).

for economic incentives.¹⁸ Lawrence H. Summers, former Treasury Secretary under the Clinton Administration, noted that “the administrative efficiencies associated with providing benefits through the tax code is less than under direct expenditures.”¹⁹ Further, providing targeted credits through the code means “less government regulation relating to the subsidy.”²⁰

18. See CONG. RESEARCH SERV., COMM. ON THE BUDGET, TAX EXPENDITURES: COMPENDIUM OF BACKGROUND MATERIAL ON INDIVIDUAL PROVISIONS 2, 105th Cong., 2d Sess. (1998) (describing the revenue costs, impact and underlying rationale of each provision of the federal tax laws dealing with tax expenditures). Federal tax provisions designed to encourage certain kinds of behavior by granting special tax relief are called “tax expenditures.” *Id.* at 5. Tax expenditures are economically equivalent to direct government payments, albeit channeled through the tax system. *Id.* at 16. Although tax expenditures have been criticized as “hidden subsidies” that create undue complexity and unwarranted tax loopholes, tax expenditures provide certain political and psychological advantages over direct spending programs. See generally, e.g., CHRISTOPHER HOWARD, THE HIDDEN WELFARE STATE: TAX EXPENDITURES AND SOCIAL POLICY IN THE UNITED STATES (1997) (describing the widespread system of tax subsidies for social benefits, which mostly target those of higher socioeconomic status); Victor Thuronyi, *Tax Expenditures: A Reassessment*, 1988 DUKE L.J. 1155 (proposing a category of alternative tax provisions that would replace certain tax provisions with non-tax programs, thereby providing benefits such as tax code simplification); STANLEY S. SURREY & PAUL R. MCDANIEL, TAX EXPENDITURES (1985) [hereinafter SURREY & MCDANIEL] (describing how the enactment and incidence of tax expenditures raise complex questions about the legislative process and tax policy). “Legislators or presidents who do not want to appear to be ‘big spenders’ can comfortably approve tax expenditures without damaging their image of fiscal conservatism.” *Id.* at 104. “Business generally dislikes the idea of government subsidies, with its implication that the private sector is incapable of performing on its own. Tax expenditures, which business does not view as subsidies, carry no such negative psychological effect.” *Id.* at 107. It seems that businesses protest too much—a subsidy by any other name would still fill the corporate coffers. Professor Zelinsky, in a seminal 1986 article, argued that “tax incentives may be more efficient for the implementation of government policies than direct expenditure programs because of lower transactions costs.” Edward A. Zelinsky, *Efficiency and Income Taxes: The Rehabilitation of Tax Incentives*, 64 TEX. L. REV. 973, 975-76 (1986).

19. Press Release, United States Department of the Treasury Secretary Lawrence H. Summers, Remarks to the 63rd Annual Conference of the Tax Foundation, Washington D.C. (Nov. 16, 2000), available at <http://www.treas.gov/press/releases/Is1029.htm>.

20. *Id.*

I. GLOBAL WARMING

A. *Evidence and Consequences*

There are no alternatives to many of the climate services provided by nature, and several of the changes prompted by increasing greenhouse gases in the atmosphere may prove to be irreversible.²¹

Yes, it is hot out here—it's not just you. In response to an inquiry by the Bush Administration, scientists confirmed that global temperatures are rising.²² The eleven warmest years of this century have all occurred since 1980, with 1995 being the warmest year in recorded history.²³ Why is it so hot? To the dismay of weather reporters and picnic planners everywhere, weather is naturally variable and hard to predict. Scientific evidence of ice ages (and their subsequent thawing) shows that wide variations in temperature do occur.²⁴ However, the largest temperature increase during any century for the past thousand years occurred in the twentieth century.²⁵

Although global warming first entered the public consciousness in the late 1980s, with the establishment of the Intergovernmental Panel on Climate Change (IPCC),²⁶ it has long been known that excess carbon dioxide could lead to global warming.²⁷ Recent concerns about global warming focus on the substantial evidence suggesting that the present warm period has been at least partially caused by human activities, such as burning fossil fuels and tropical

21. Policies to Enhance Sustainable Development, Meeting of the OECD Council, Ministerial Level 2001, at 9 (2001).

22. Committee on the Science of Climate Change, National Research Council, Climate Change Science: An Analysis of Some Key Questions 1 (2001), available at <http://www.nap.edu>.

23. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SUMMARY FOR POLICYMAKERS, A REPORT OF WORKING GROUP I OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE: THE SCIENTIFIC BASIS 2 (2001) ("Globally, it is very likely (90-99%) that the 1990's was the warmest decade and 1998 the warmest year in the instrumental record, since 1861."), available at <http://www.ipcc.ch/pub/spm22-01.pdf> (last visited Aug. 9, 2002). "The increase in temperature in the 20th century is likely (66-90%) to have been the largest of any century during the past 1,000 years." *Id.*

24. William K. Stevens, *In Ancient Ice Ages, Clues to Climate*, N.Y. TIMES, Feb. 16, 1999, at F1.

25. *Id.* at F2.

26. See Kyoto Protocol, *supra* note 9, at art. 1, ¶ 3 (defining the IPCC as that established in 1988 by the World Meteorological Organization and the United Nations Environment Programme).

27. See GELBSPAN, *supra* note 13, at 176 (noting that Svante Arrhenius, a Swedish chemist, discovered over 100 years ago that a buildup of atmospheric carbon dioxide could lead to planetary warming).

deforestation.²⁸ Although scientists concede that human activity cannot unequivocally be shown to cause the observed climate change, the magnitude of the warming in comparison with natural variations in climate strongly suggest a connection.²⁹ Carbon dioxide, the most common GHG, is emitted when people and animals exhale, when biological matter decays, and when fossil fuels are burned.³⁰ Carbon

28. See Rainforest Action Network, *Rainforests and Global Warming: Rainforests Fact Sheet* (concluding that CO[2], the "main" GHG, is actively changing the Earth's atmosphere and seventy-seven percent of CO[2] emissions are produced by fossil fuel combustion and deforestation), at http://www.ran.org/info_center/factsheets/04a.html (last visited Aug. 9, 2002) (on file with the American University Law Review). Additionally, industrial processes and fertilizer use were listed as contributing to GHG emissions. *Id.*; see *infra* note 29 and accompanying text (documenting human contributions to GHG emissions). See generally WILLIAM MCKIBBEN, *THE END OF NATURE* 91 (1989) ("The greenhouse effect is a more apt name than those who coined it imagined. The carbon dioxide and trace gases act like panes of glass on a greenhouse-the analogy is accurate. But it's more than that. We have built a greenhouse, a human creation, where once sweet flowers bloomed.").

29. GELBSPAN, *supra* note 13, at 17. "Emissions resulting from human activities are substantially increasing the atmospheric concentrations of the greenhouse gases These increases will enhance the greenhouse effect, resulting on average in an additional warming of the Earth's surface." INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, IPCC FIRST ASSESSMENT REPORT: OVERVIEW 31 AUGUST 1990, in INT'L L. & GLOBAL CLIMATE CHANGE 280, 281 (Robin Churchill & David Freestone eds., 1991). "Most of the observed warming over the last 50 years is likely to have been due to the increase in GHG concentrations." Richard A. Kerr, *It's Official: Humans Are Behind Most of Global Warming*, 291 SCI. 566, 566 (2001) (quoting an IPCC panel).

There will always be some uncertainty surrounding the prediction of changes in such a complex system as the world's climate. Nevertheless, we support the IPCC's conclusion that it is at least 90% certain that temperatures will continue to rise, with average global surface temperature projected to increase by between 1.4 and 5.8 degrees Celsius above 1990 levels by 2100. This increase will be accompanied by rising sea levels; more intense precipitation events in some countries and increased risk of drought in others; and adverse effects on agriculture, health and water resources The balance of the scientific evidence demands effective steps now to avert damaging changes to the Earth's climate.

Editorial, Joint Statement Issued by the Australian Academy of Sciences et al., *The Science of Climate Change*, 292 SCI. 1261, 1261 (2001); see also Clare Breidenich et al., *Current Development: The Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 92 AM. J. INT'L L. 315, 316 (1998) (discussing the conclusions of the IPCC's Working Group I, which determined that although not all scientists agreed as to the exact human cause of global warming, they did agree that the alarming levels of GHG's were a serious threat to the global environment); GELBSPAN, *supra* note 13, at 69 (quoting Jerry Mahlman, Director of NOAA's Geophysical Fluid Dynamics Laboratory as stating, "the IPCC assessments are the most widely accepted statements ever on climate change"); Peter A. Stott et al., *External Control of 20th Century Temperature by Natural and Anthropogenic Forcings*, 290 SCI. 2133, 2136 (2000) ("Natural forcings were relatively more important in the early century warming and anthropogenic warmings have played a dominant role in warming observed in recent decades."); Francis W. Zwiers & Andrew J. Weaver, *The Causes of 20th Century Warming*, 290 SCI. 2081, 2083 (2000) ("Forcing from anthropogenic activities . . . has been the main driver of climate change during the past century.").

30. See Breidenich, *supra* note 29, at 317:

The primary source of GHG emissions is the burning of fossil fuels, mainly coal, oil and gas, which releases CO[2] into the atmosphere. Other sources

dioxide is absorbed by growing forests and other plant material, and is stored in living trees, undisturbed soils, polar ice, and the oceans.³¹ GHGs increase global temperatures by acting like an insulator, preventing the sun's warmth from dissipating into space.³² Global warming, if left unchecked, could lead to the thawing of the permafrost;³³ rising sea levels, resulting in flooding of islands and coastal regions;³⁴ increased intensity and frequency of severe storms, changes in the amount and frequency of precipitation, changes in ocean currents; and increased tropical diseases such as malaria, cholera, and dengue fever.³⁵ One commentator has aptly called these worst-case scenarios "biblical in proportion."³⁶ Others argue that

of GHGs include methane from agriculture and energy production and distribution; nitrous oxide (N₂O) from agriculture and industrial processes; and hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆) (the 'synthetic' or 'exotic' GHGs) from a variety of industrial and consumer uses.

31. See JAY R. MALCOLM & LOUIS R. PITELKA, ECOSYSTEMS AND GLOBAL CLIMATE CHANGE: A REVIEW OF POTENTIAL IMPACTS ON U.S. TERRESTRIAL ECOSYSTEMS AND BIODIVERSITY 18 (Pew Center on Global Climate Change 2000) (arguing that the adverse effects on ecosystems from climate change can be lessened by focusing on maintaining habitats and by maintaining overall ecosystem structure).

32. *Understanding Climate Change: A Beginner's Guide to the UN Framework Convention and its Kyoto Protocol*, at 5-6 (describing GHG as "a blanket around the earth").

33. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SUMMARY FOR POLICYMAKERS, A REPORT OF WORKING GROUP II OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2001: IMPACTS, ADAPTATION AND VULNERABILITY 3, 6 (2001) [hereinafter IPCC II] (including a list that is the beginning of potential impacts, which could include significant slowing of the oceanic thermohaline circulation (the Gulf Stream) and accelerated global warming due to massive releases of methane from melting permafrost), available at <http://www.ipcc.ch/pub/wg2SPMfinal.pdf> (last visited Aug. 9, 2002).

34. JAMES G. TITUS & VIJAY K. NARAYANAN, EPA, THE PROBABILITY OF SEA LEVEL RISE iii, 230-R-95-008 (1995) (noting that the EPA estimates the potential rise in sea level to be between 15 and 65 centimeters (roughly .05 to 2 feet) by the year 2100), available at <http://www.epa.gov/globalwarming/publications/impacts/sealevel/probability.html> (last visited Jan. 9, 2002).

35. See Paul R. Epstein, *Climate and Health*, 285 SCI. 347, 347 (1999) (arguing that extreme weather can be a threat to public health). Dr. Epstein, the Associate Director of the Center for Health and the Global Environment, Harvard Medical School, explains the connection between climate change and disease as follows:

The atmosphere holds 6% more water vapor with each 1 [degrees] C rise in temperature. The resulting increase in evaporation and greater residence time for water vapor in the atmosphere boosts humidity and heat indices, fuels storms, and reinforces the greenhouse effect (the trapping of heat by atmospheric gases such as carbon dioxide). An increase in the cloud cover blocks outgoing heat, contributing to disproportionate warming at night and during the winter-conditions that are unhealthy for humans but advantageous for insects that transmit infectious diseases. A moisture-laden atmosphere also generates more tropical-like downpours that create breeding grounds for mosquitoes, propel rodents from burrows, and flush nutrients, chemicals, and microorganisms into waterways.

Id.

36. Jeffrey J. Rachlinski, *The Psychology of Global Climate Change*, 2000 U. ILL. L.

increased global warming may help some nations by increasing crop yields.³⁷

Global warming represents a classic “tragedy of the commons” issue.³⁸ In his 1968 seminal article, Garrett Hardin described the tragic outcome of a resource commonly held by members of a tribe.³⁹ Each user of the commons exploits the resource until the expected benefits of his or her actions equal the expected costs, ignoring the costs imposed on other potential users of the commons.⁴⁰ The individual decisions made without concern for the common good culminate in tragic overuse and the potential destruction of the commons.⁴¹ Hardin suggested two possible solutions to this problem: socialism and privatization.⁴² The economic approach to property law suggests that private property ownership is usually more efficient and productive, but also suggests that government intervention may be necessary when the market fails to account for total costs.⁴³ The

REV. 299, 300 (2000). And what about a plague of locusts? See *Grasshoppers Rescend on West*, WILM. NEWS J., July 18, 2002, at A3 (suggesting that a mild winter and hot, dry spring precipitated a bumper crop of grasshoppers).

37. See, e.g., K.E. Idso & S.B. Idso, *Plant Responses to Atmospheric CO[2] Enrichment in the Face of Environmental Constraints: A Review of the Past 10 Years' Research*, 69 AGRIC. & FOREST METEOROLOGY 153 (1994) (noting how the United States might realize net positive benefits from a warmer, CO[2]-rich environment); IPCC II, *supra* note 33, at 6.

38. Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243 (1968); see also RICHARD L. OTTINGER ET AL., ENVIRONMENTAL COSTS OF ELECTRICITY 127 (1990) (“The earth’s atmosphere is a global commons into which the world’s population emits the gaseous by-products of its activities . . .”). If fuel costs included the full cost of the environmental consequences of the combustion of the fuel, there would be no marginal benefit to increased use of currently low cost fuels such as coal that emit large amounts of CO[2] into the global commons. “Unfortunately, the tragedy the world now faces is that the economic benefits that each electricity generator derives from emitting more CO[2] are greater than the harm to it resulting from the increased emissions.” *Id.* at 137; see Douglas R. Williams, *Valuing Natural Environments: Compensation, Market Norms, and the Idea of Public Goods*, 27 CONN. L. REV. 365, 419-25 (1995) (arguing that restoration costs, rather than commodity value, should be the measure of damage to the environment).

39. Hardin, *supra* note 38, at 1244.

40. *Id.*

41. *Id.*

42. *Id.* at 1245-47.

43. See Carol Rose, *The Comedy of the Commons: Custom, Commerce, and Inherently Public Property*, 53 U. CHI. L. REV. 711, 720-21 (1986) (suggesting, as a third alternative, ownership of the resource by an “unorganized public.”).

There lies outside purely private property and government-controlled “public property” a distinct class of “inherently public property” which is fully controlled by neither government nor private agents. [This “inherently public” property is] collectively “owned” and “managed” by society at large, with claims independent of and indeed superior to the claims of any purported governmental manager. Despite the well-known problems of unorganized collective access to a resource—the “tragedy of the commons”—equally difficult problems are posed by governmental management: the cost of instituting that management and, perhaps, the temptations of politically motivated redistribution.

global commons of the earth's atmosphere is not susceptible to either socialism or privatization.⁴⁴ Traditional notions of state sovereignty hold that states have a right to act autonomously, regardless of adverse external consequences.⁴⁵ Thus, a state is free to opt-out of collective efforts to preserve the global commons.⁴⁶ Although the United States, as a sovereign nation, engages in democratic decision making through the political process, its dominant world role, combined with the ability to opt-out of international action, effectively disenfranchises world citizenry, especially citizens of countries whose interests may not be consistent with global capital policy.⁴⁷ Specifically, the external costs of global warming are likely to fall disproportionately on the poor.⁴⁸ Climate sensitive industries like agriculture, coastal fisheries, and forestry constitute large portions of the economies of developing nations.⁴⁹ Poor people also disproportionately bear the risks of climate-related natural disasters;

Id. While air indisputably falls into the category of "inherently public property," issues of sovereignty discussed below will make it difficult to assert this property claim.

44. Although, as discussed *infra*, carbon trading systems can effectively privatize or at least commercialize the global commons of the atmosphere. See, e.g., Ricardo Bayon, *Fight Global Warming the Capitalist Way: Trading Pollution Credits Works and Should be Expanded*, WASH. POST WKLY., Aug. 13-19, 2001, at 23 (analogizing the potential market for CO[2] credits to the thriving market for SO[2] credits and noting that "by the end of the decade . . . the CO[2] market could be worth tens of billions of dollars.") (citations omitted); see also Gilles Trequesser, *Critics of Kyoto Talks Say Air Now a Commodity*, SCI., Nov. 5, 2001, at 1 (quoting Tom Goldtooth's claim that "there is now talk of privatizing the air that we breathe"), at <http://www.web.net/nben/envnews/media/01/nov/kyoto.html> (last visited June 2, 2002).

45. Richard Falk & Andrew Strauss, *On the Creation of a Global Peoples Assembly: Legitimacy and the Power of Popular Sovereignty*, 36 STAN. J. INT'L L. 191 (2000). Falk and Strauss also note that the UNFCCC and Kyoto Protocol are examples of the success of global civil society in addressing international issues. *Id.* at 195-99. If Falk and Strauss's proposal for a Global People's Assembly was adopted, then all of the citizens of the world would have a say in the utilization of global commons.

46. See Carol M. Rose, *From Local to Global Commons: Private Property, Common Property, and Hybrid Property Regimes: Expanding the Choices for the Global Commons: Comparing Newfangled Tradable Allowance Schemes to Old-Fashioned Common Property Regimes*, 10 DUKE ENVTL. L. & POL'Y F. 45, 50 (1999) (noting that global commons problems have many local components and although global warming from carbon dioxide is a planet-wide environmental issue, forests that sequester carbon, for example, can be highly localized).

47. See Falk & Strauss, *supra* note 45, at 212 ("[T]he lack of direct democratic accountability to citizens has also significantly affected policy outcomes. The international regulatory framework has been driven almost exclusively by the neo-liberal (free-market) economic precepts so in vogue with the forces of international capital."). "Community interests, especially the interests of poor people, are largely ignored. The socially sensitive regulatory framework adopted by some of the more progressive societies of the twentieth century has been cast aside in favor of nineteenth century laissez-faire models." *Id.*

48. POVERTY AND CLIMATE CHANGE, ENVIRONMENT MATTERS ANNUAL REVIEW 23 (World Bank Group 2000).

49. *Id.* at 23.

for example, between 1990 and 1998, ninety-four percent of the world's major natural disasters and ninety-seven percent of natural disaster-related deaths occurred in developing countries.⁵⁰ The costs of future severe weather events influenced by global warming are estimated at \$300 billion, with the United States bearing approximately ten percent of those costs.⁵¹

Given the severity of the potential consequences from global warming, the United States must act to protect the global commons of the atmosphere.⁵² Commons issues have been historically resolved in a number of ways, such as restricting access to the commons, creating incentives to preserve the commons, and imposing externality costs on those who abuse the commons.⁵³ Traditionally, discussions of commons issues generally involved a discrete common pool resource ("CPR"), such as a forest or grasslands, and a limited number of participants who shared the resource.⁵⁴ A global CPR, such as climate, raises more complex issues: beyond the obvious physical problem of restricting access, a global CPR has six billion participants.⁵⁵ As some researchers note, "having larger numbers of participants in a CPR increases the difficulty of organizing, agreeing on rules, and enforcing rules."⁵⁶ Moreover, these participants are culturally diverse, which increases the difficulty of reaching agreement about governing the global CPR.⁵⁷ Finally, although all inhabitants of the earth will feel some consequences of global warming, geographical distance dims our recognition of this interrelationship.⁵⁸

50. *Id.*

51. See Env'tl. Media Servs., *Environmental Concerns* (noting that global warming will result in rising sea levels, more frequent hurricanes and blizzards, and damage to agriculture and fishing), at http://www.ems.org/climate/climate_concerns.html (last updated Nov. 6, 2000) (on file with the American University Law Review). The United States loses about \$30 billion per year, from health-related measures and more intensive water management; and climate change could cost developing nations up to \$9.3 trillion over the next twenty years. Andrew Simms, *Global Warming's Victims Could Take U.S. to Court*, INT'L HERALD TRIB., Aug. 7, 2001, available at [http://www.iht.com/ihtsearch.php?id=28507&owner=\(IHT\)&date=20010807000000](http://www.iht.com/ihtsearch.php?id=28507&owner=(IHT)&date=20010807000000).

52. Hardin, *supra* note 38, at 1244.

53. Elinor Ostrom et al., *Revisiting the Commons: Local Lessons, Global Challenges*, 284 SCI. 278, 284 (1999).

54. See *id.* at 279 (noting that CPRs have involved depletable ecosystems such as forests).

55. See *id.* at 281 (describing the problems resulting from the sheer number of people in the global CPR).

56. *Id.*

57. See *id.* (observing that cultural diversity frequently is accompanied by divergent economic interests).

58. See *id.* (asserting that the complexity of ecosystem interaction makes it difficult to view CPRs as global).

B. International Response

1. The Kyoto Protocol

The GHG emissions of the United States, the world's largest emitter, constitute about twenty percent of the total manmade GHGs worldwide.⁵⁹ In the year 2000, CO[2] emissions by the United States increased by 3.1%, one of the biggest annual increases in a decade.⁶⁰ The Environmental Protection Agency ("EPA") does not regulate GHG emissions because CO[2] has not been designated a "criteria pollutant" under the Clean Air Act.⁶¹ Although the United States is a party to the United Nation's Framework Convention on Climate Change ("UNFCCC"), which developed the Kyoto Protocol in 1997, the U.S. has not ratified the Kyoto Protocol.⁶²

In general, the Kyoto Protocol establishes individualized country targets, or goals, for reductions in GHG emissions.⁶³ For example, the United States would be required to reduce GHG emissions to seven percent below 1990 levels, whereas the European Union countries would be required to accomplish an eight percent reduction.⁶⁴ Additionally, the Kyoto Protocol permits limited

59. See Bill Sammon, *Bush Hits Others for Global Warming: Urges Increased Study, Not Treaty*, WASH. TIMES, June 12, 2001, at A1 (reporting that Bush, while recognizing the need for the United States to reduce its emissions, insisted that the high rate of GHG emissions are understandable considering that the United States is responsible for twenty-five percent of the world's economic output).

60. See ENERGY INFO. ADMIN., DEP'T OF ENERGY, EMISSIONS OF GREENHOUSE GASES IN THE UNITED STATES 2000 DOE/EIA-0573, at 19 (2001) [hereinafter EIA: EMISSIONS OF GREENHOUSE GASES] (detailing statistics regarding greenhouse gas emissions in the United States over the past decade), available at <http://www.eia.doe.gov/oiarf/1605/ggrpt/pdf/057300.pdf> (last visited Aug. 9, 2002).

61. See Clean Air Act, 42 U.S.C. § 7412(b) (1994) (requiring the EPA to publish a list of air pollutants that reasonably can be anticipated to endanger public health). But see *Is CO₂ a Pollutant and Does EPA Have the Power to Regulate It?: J. Hearing Before the House Subcomm. on Nat'l Econ. Growth, Natural Res. and Regulatory Affairs of the H. Comm. on Gov't Reform & Subcomm. on Energy & Env't of the H. Comm. on Sci.*, 106th Cong. (1999) (statement of Gary Guzy, EPA General Counsel) (noting that CO[2] meets the Clean Air Act's definition of criteria pollutant, although the EPA had made no determination to exercise its authority over CO[2]).

62. See Kevin Sullivan, *Four U.S. Senators Lobbying in Kyoto; Viewpoints Vary on Climate Treaty*, WASH. POST, Dec. 3, 1997, at A35 (indicating that the U.S. representatives to the Kyoto Protocol conference held divergent views on how to deal with global warming); see also S. Res. 98, 105th Cong., 143 CONG. REC. S8138-39 (daily ed. July 25, 1997) (enacted) [hereinafter Byrd-Hagel Resolution] (resolving that any climate control treaty that attempted to reduce emissions must be accompanied by an analysis of the impact on the U.S. economy); Lakshman Guruswamy, *Climate Change: The Next Dimension*, 15 J. LAND USE & ENVTL. L. 341, 345 (2000) (contending that it is unlikely the United States will ratify the Kyoto Protocol).

63. See Kyoto Protocol, *supra* note 9, art. 3 (stating that, while their commitment period is from 2008 until 2012, countries must be able to demonstrate progress by 2005).

64. See *id.* annex B (showing the emissions targets for all involved countries, some of which will be allowed emissions growth under the treaty).

emissions trading; for example, the “Clean Development Mechanism” (“CDM”) allows developed countries to invest in emission reduction projects in developing countries.⁶⁵ The investing countries may then apply a portion of the reductions generated by these projects toward meeting their own emission targets.⁶⁶

Even though the United States has not ratified the Kyoto Protocol, some U.S. industries have already begun to invest in CDM programs.⁶⁷ For example, General Motors (“GM”) and American Electric Power (“AEP”) have invested \$15.4 million to fund the purchase and reforestation of land on the Atlantic Coast of Brazil.⁶⁸ GM decided to invest in Brazil because the property values are lower than in the United States, and because the forests along Brazil’s Atlantic Coast absorb more carbon than similar areas in the United States.⁶⁹ GM hopes to earn a return on its investment through the carbon sequestration market.⁷⁰

2. *Why the United States resists GHG regulation*

The Kyoto Agreement and the UNFCCC face significant political resistance in the United States. Opponents invoke four different categories of arguments to support remaining dormant in the wake of global warming: (1) insufficient evidence about the effects of anthropogenic global warming;⁷¹ (2) carbon emissions in the United

65. See *id.* art. 12 (explaining that CDMs assist non-developed countries achieve sustainable development and assist developed countries in complying with their quantified emission limitation and reduction commitments).

66. *Id.*

67. See Press Release, Pew Center on Global Climate Changes, Three More Companies Join the Fight Against Climate Change (June 28, 2001) [hereinafter Pew Press Release] (listing the membership of the Pew Center’s Business Environmental Leadership Council (“BELC”), a group of thirty-three companies that are committed to taking steps to reduce GHG emissions, to include Boeing, BP, DuPont, Sunoco, and Toyota), available at http://www.pewtrusts.com/ideas/ideas_item.cfm?content_item_id=635&content_type_id=7&page=7&issue=19&issue_name=Global%20warming&name=Grantee%20Press%20Releases (last visited Aug. 9, 2002).

68. See Andrew Downie, *Brazil Sees a New Forest for the Trees: Pairs with U.S. to Revive Woods*, WASH. TIMES, July 31, 2001, at A12 (reporting that the companies have given money up front and that the companies have committed themselves to the reforestation project for forty years).

69. See *id.* (noting that companies are looking for ways to mitigate the effects of the GHG emissions from their core businesses).

70. See *id.* (stating that investments of this type are risky because the carbon market is in its early stages of development).

71. See, e.g., Mark Z. Barabak, *The Times Poll; Bush Criticized As Fear For Environment Grows; Survey: Majority Say Pollution Is Worsening, And Fighting It Is More Important Than Creating Jobs*, L.A. TIMES, Apr. 30, 2001, at A1 (indicating that thirty-eight percent of Americans felt that Bush opposed the Kyoto Protocol because of insufficient evidence that carbon dioxide emissions cause global warming). But see Kerr, *supra* note 29, at 566 (stating that an international group of scientists accepts the significance of anthropogenic global warming).

States are not rising as fast as the GDP;⁷² (3) developing countries will not reduce their emissions;⁷³ and (4) reducing carbon emissions will hurt the U.S. economy.⁷⁴

The UNFCCC incorporates the concept of “common but differentiated responsibility” (“CBDR”), which led to the individualized GHG reduction targets for each country.⁷⁵ The U.S. Senate passed the Byrd-Hagel Resolution in July 1997, disagreeing with the premise that developed countries with the largest share of GHG emissions should take the first steps to reduce GHG emissions.⁷⁶ In March 2001, President Bush rejected any U.S. obligation to join in

72. See NAT'L ENERGY POLICY DEV. GROUP, RELIABLE AFFORDABLE, AND ENVIRONMENTALLY SOUND ENERGY FOR AMERICA'S FUTURE 3-11 (2001) (discussing how U.S. GHG emissions have begun to decline, even as the U.S. economy has been growing at an unprecedented rate), available at <http://www.whitehouse.gov/energy>.

73. See David G. Victor, *Weak on Warming*, WASH. POST., Feb. 19, 2002, at A15 (pointing out that the Kyoto Protocol does not offer any counter-argument to the Bush Administration's argument that developing countries will not reduce their emissions because the Protocol does not require participation by developing countries).

74. *But see infra* notes 104-16 (outlining a study commissioned by the Department of Energy in which scientists found some economic benefits to curbing GHG emissions). The fourth reason seems inconsistent with the second reason—if the U.S. economy can grow successfully without a concomitant increase in GHG emissions, then reducing GHG emissions should not hurt the economy. However, if the increase in GDP is due to an increase in service-related industries, further GHG restrictions may disproportionately harm manufacturing industries.

75. See U.N. Conference on Env't & Dev., Framework Convention on Climate Change, pmbl. & arts. 3-4, reprinted in 31 I.L.M. 849, 851-56 (1992) (referring explicitly to, and defining, the concept of common but differentiated responsibility); Guruswamy, *supra* note 62, at 356. Guruswamy states that CBDR,

recognizes that only international cooperation will help to resolve a problem of the magnitude of global warming, but that in responding to the problem, different states have different social and economic conditions that affect their response capabilities. CBDR also incorporates the equitable notion that developed countries which have the largest share of historical and current emissions of GHGs, should take the first painful actions to ameliorate the problem.

Id. (citations omitted).

76. See Byrd-Hagel Resolution, *supra* note 62 (resolving that the United States will not sign a climate change treaty that does not contain quantified emissions limitations for developing countries or that would cause serious harm to the U.S. economy); see also Senator Frank H. Murkowski, *The Kyoto Protocol is Not the Answer to Climate Change*, 37 HARV. J. ON LEGIS. 345, 345-46 (2000) (arguing that growing emissions from developing nations, that are not bound by emissions limits under the Kyoto Protocol, would quickly overshadow any achievements in emissions reduction by the United States and other nations that are subject to Kyoto's limits; and finally, that implementing the Kyoto Protocol could cause significant increases in gasoline and electricity prices). *But see* Erik Eckholm, *China Said to Sharply Reduce Emissions of Carbon Dioxide*, N.Y. TIMES, June 15, 2001, at A1 (stating that Chinese officials want a developed country to show them that reduced carbon emissions do not prevent a high standard of living for its citizens); James M. Lindsay, *Global Warming Heats Up: Uncertainties, Both Scientific and Political Lie Ahead*, 19 BROOKINGS REV. 26, 28 (2001) (suggesting that making developing countries curtail emissions would force them “to clean up a mess they didn't create and potentially keep them poor by denying them the right to pollute their way to wealth”).

GHG reductions under the Kyoto Protocol, stating that the Kyoto Protocol is “fatally flawed” and would harm the U.S. economy.⁷⁷ U.S. Senator Frank Murkowski argued that “[t]he Kyoto Protocol climate treaty, often offered as the ‘cure’ for climate change, is actually bitter medicine that would weaken the American economy and discourage the sustained long-term effort needed to stabilize greenhouse gas concentrations and protect the global environment.”⁷⁸ Professor Michael J. Glennon agreed, stating that “nixing [the] Kyoto [Protocol] probably enhanced relative American economic power.”⁷⁹

In August 2001, the Senate Foreign Relations Committee, expressing a change of heart, unanimously approved a resolution that called on the Bush Administration to provide specific proposals to reduce GHG emissions.⁸⁰ Although President Bush later promised new technological initiatives to combat global warming,⁸¹ when negotiators from 165 nations met in Marrakesh in November, 2001

77. See *Cooler Heads on Kyoto*, N.Y. TIMES, June 12, 2001, at A18 (commenting that one study estimates that implementing the Kyoto Protocol would cost the United States \$400 billion in lost productivity over the next decade); see also Edmund L. Andrews, *Bush Angers Europe by Eroding Pact on Warming*, N.Y. TIMES, Apr. 1, 2001, at A3 (saying that Bush’s decision not to support the global warming treaty has evoked an unusual amount of anger from European leaders); Amy Goldstein & Eric Pianin, *Hill Pressure Fueled Bush’s Emissions Shift*, WASH. POST, Mar. 15, 2001, at A1 (stating that Bush used the energy crisis to rationalize his change in position regarding the Kyoto Protocol); Lindsay, *supra* note 76, at 28 (explaining that Bush’s change in position was due to a downturn in the U.S. economy and the looming energy crisis in the Western United States); Eric Pianin & William Drozdiak, *Bush’s Reversal Could Affect Global Warming Agreement*, WASH. POST, Mar. 16, 2001, at A3 (stating that Bush refused to support the Kyoto Protocol because it would be burdensome for the U.S. economy and would counter the administration’s goal of increasing domestic energy production); Press Release, White House, President Bush Announces Clear Skies & Global Climate Change Initiative (Feb. 14, 2002) [hereinafter Bush Press Release] (announcing a new plan for climate change mitigation, which would involve transferable emission credits and emission reductions tied to GDP), available at <http://whitehouse.gov/news/releases/2002/02/print/20020214.html> (last visited Aug. 9, 2002).

78. Murkowski, *supra* note 76, at 345 (footnote omitted); see also Warwick McGibbon, *Moving Beyond Kyoto*, 66 BROOKINGS INST. POL’Y BRIEF 1 (2000) (“[T]he Kyoto Protocol is never going to work because it is the wrong approach to tackling the climate change issue What is required is an insurance policy against the possibility that climate change could be very costly to the planet.”), available at <http://brook.edu/dybdocroot/comm/policybriefs/pb066/pb66.htm>.

79. Michael J. Glennon, *There’s a Point to Going It Alone; Unilateralism Has Often Served Us Well*, WASH. POST, Aug. 12, 2001, at B2. Professor Glennon cites Kyoto as just one manifestation of the benefits of American unilateralism, noting that the power to act alone is “an indispensable attribute of sovereignty.” *Id.*

80. See Eric Pianin, *Bush Urged to Negotiate Global Warming Treaty*, WASH. POST, Aug. 2, 2001, at A14 (reporting that the non-binding committee resolution illustrates the growing congressional support for mandatory limits on carbon dioxide and other GHGs).

81. See Sammon, *supra* note 59, at A1 (reporting that Bush’s proposal includes the National Climate Change Technology Initiative (“NCCTI”), as well as more research on climate change and increased interactions with the United Nations).

for the purpose of agreeing on the implementation of the Kyoto Protocol, the United States conspicuously remained silent.⁸²

Despite the Bush administration's lackluster performance, some American businesses have already started acting to curb global warming.⁸³ Power industry executives argue that the regulation of carbon dioxide is inevitable and want to ensure that, in the coming decades, their investments in plant expansions will not be wasted.⁸⁴ A growing number of companies have voluntarily adopted climate-related measures that have already saved them millions of dollars.⁸⁵ For example, in 2000, IBM saved \$15.2 million and reduced CO₂ emissions by more than five million tons.⁸⁶ The Federal government should not only encourage other businesses to follow suit, but should follow these businesses' lead itself.

Three months after Marrakesh, President Bush announced his unilateral shift in global climate policy and proposed reductions in GHG "intensity" and a separate pollution reduction plan involving a "cap-and-trade" policy.⁸⁷ Some argue that it will be harder for the United States to take a unilateral approach to global warming while

82. See Eric Pianin, *160 Nations Agree to a New Warming Treaty*, WASH. POST, Nov. 10, 2001, at A1 [hereinafter Pianin, *Nations Agree*] (noting that last summer, White House officials admitted that the Administration would present fresh proposals at the meeting in Morocco, but the events of September 11th have pushed U.S. action on global warming initiatives aside). Paula Dobriansky, Undersecretary of State, and the head of the U.S. delegation, arrived at the conference with no new offers and remained in the background. *Id.* Latin American officials have already predicted that environmental initiatives could be "another casualty of the Sept. 11 attacks on America." Shasta Darlington, *Latam Says Green Issues Eclipsed by US Attacks*, REUTERS NEWS SERV., Oct. 24, 2001, available at <http://www.planetark.org/dailynewsstory.cfm/newsid/12968/newsDate/24-Oct-2001/story.htm>. Brazil's environment minister, Jose Sarney, said "[w]e have to fight terrorism, but we also have to do whatever possible to come to sustainable development." *Id.* Almost a year after the attacks of September 11, 2001, the United States continues to disregard the environmental concerns of the rest of the world. See, e.g., Joseph B. Verrengia, *U.S. Opposes Summit Effort on Clean Energy*, WILMINGTON NEWSJ., Aug. 28, 2002, at A2.

83. See Pew Press Release, *supra* note 67 (demonstrating that many U.S. companies are acting to reduce GHG emissions).

84. See Pianin, *Nations Agree*, *supra* note 82, at A22 (stating that several of the nation's largest utilities are placing pressure on the Bush administration to shift its opposition to regulating carbon dioxide emissions).

85. See Sarah Z. Sleeper, *Corporate America's Stars Come Out to Cut the Power*, INVESTOR'S BUS. DAILY, July 27, 2001, at A6 (discussing the U.S. corporations that have made the most significant conservation contributions).

86. See *id.* (explaining the steps that IBM took to achieve its conservation goals).

87. See Bush Press Release, *supra* note 77 (proposing to reduce GHG emissions at a rate corresponding to the GDP); cf. Paul Krugman, *Ersatz Climate Policy*, N.Y. TIMES, Feb. 15, 2002, at A21 (arguing that Bush's proposal would ultimately lead to increases in GHG emissions because Bush's promise to reduce GHG "intensity" translates into a promise to reduce the GHG to gross national product ratio; however this ratio is expected to increase by thirty percent in the next ten years, thus effectively increasing GHG emissions).

expecting U.S. allies to support its war on terrorism.⁸⁸ Environmentalists have already alleged that the President's plan will not curb warming.⁸⁹ Contrary to the opinion of National Security Advisor Condoleezza Rice, the Kyoto Protocol is not dead.⁹⁰ Despite the U.S. pullout of the treaty, it is almost certain that the Kyoto Protocol will be ratified by a sufficient number of industrialized countries to put it into effect.⁹¹ But without U.S. participation, the Kyoto Protocol's effect will be minimal.⁹²

The United States bears some risk in opting out of the Kyoto Protocol, as noted by Professor Andrew L. Strauss. Professor Strauss has found grounds for suing the United States in the International Court of Justice ("ICJ") for failing to reduce GHG emissions.⁹³ If the

88. See Eric Pianin, *Warming Pact a Win for European Leaders*, WASH. POST, Nov. 11, 2001, at A2 (quoting Dutch Environment Minister, Jan Pronk, who served as chair of the recent conference on global warming in Bonn and Marrakesh, as saying, "[a]fter the events of September 11th, if there is any reason to call for international, global approaches, [the U.S. should also] join a global approach to the existing global problem of climate change"); see also Pianin, *Nations Agree*, *supra* note 82, at A22 (quoting Philip Clapp, President of the National Environmental Trust, as stating, "[h]ow long can the administration turn its back on issues the rest of the world cares about—from global warming to trade in small arms—and expect broad support on issues like the war on terrorism?").

89. See John Podesta, *Do the Math: Under the White House Global Warming Plan, Carbon Dioxide (CO₂) Pollution Would Continue Increasing at Same Rate as Past Decade*, CLIMATE CHANGE & SUSTAINABLE DEV. COMM. NEWSLETTER (ABA Mar. 2002) (arguing that even if voluntary GHG emission targets are achieved, U.S. emissions of carbon dioxide would continue to increase at almost exactly the same rate that they have for the past ten years), available at <http://www.abanet.org/enviro/committees/climatechange/podesta.html> (last visited Aug. 9, 2002); Andrew C. Revkin, *Bush Plan Expected To Slow, Not Halt, Gas Emission Rise*, N.Y. TIMES, Feb. 14, 2002, at A1 (reporting that opponents of Bush's plan fear that the plan lacks credible incentives for corporations to invest in emissions reductions); see also S. 556, 107th Cong. (2001) (proposing a plan, sponsored by Congressman Jim Jeffords (D-VT), that would limit emissions of four major pollutants from power plants: carbon dioxide, mercury, sulfur dioxide, and nitrogen oxides); Podesta, *supra* (indicating that the Jeffords plan enjoys bipartisan support).

90. See Lindsay, *supra* note 76, at 28 (reporting Ms. Rice as saying that new, post-Kyoto, solutions to the global warming problem will need to be developed).

91. See Colum Lynch, *EU Ratifies Global Warming Treaty; Kyoto Accord En Route to Becoming Law Despite U.S. Rejection*, WASH. POST, June 1, 2002, at A15 (reporting that the recent ratification by the European Union (EU) almost guarantees the treaty will become law); see also Pianin, *Nations Agree*, *supra* note 82, at A22 (noting that the new agreement created in Marrakesh includes a market-based mechanism designed to assist highly industrialized countries in meeting their targets by allowing them to purchase carbon credits on an international financial market from countries with relatively small GHG emissions). The agreement would also allow participants to reduce their quotas by expanding forests and farmlands that absorb carbon dioxide from the atmosphere. *Id.*

92. See William D. Nordhaus, *Global Warming Economics*, 294 SCI. 1283, 1283 (2001) ("[T]he accord will accomplish relatively little in emissions reductions without U.S. participation—reducing global carbon-dioxide emissions by about 1% relative to no policy in the first period, 2008 to 2012.").

93. See generally Andrew L. Strauss, *Suing the United States for Global Warming Emissions: Discussion Paper for In the Red Conference* (July 10, 2001).

United States has entered into treaties with the complainants that specifically provide for dispute resolution before the ICJ, they could assert jurisdiction over the United States pursuant to Article 36(1) of the Statute of the ICJ.⁹⁴ While the United States has not entered into any treaties that specifically forbid GHG emissions, it has entered into a number of Friendship, Commerce, and Navigation (FCN) treaties that provide that each party will treat the other fairly.⁹⁵ Professor Strauss argues that the harm caused by the GHG emissions to other parties to these treaties may provide grounds for legal action.⁹⁶ Alternatively, countries injured by the United States' GHG emissions might seek advisory opinions from the ICJ,⁹⁷ or they might seek other forms of alternative dispute resolution, such as international arbitration under the Law of the Sea Convention.⁹⁸ Another ground for a cause of action might be the international legal principle that states are liable for the international effects of actions within their boundaries.⁹⁹ Specifically, environmental groups have explored the possibility of bringing a class action suit against the United States or emitting corporations.¹⁰⁰ Attorneys general from eleven states have sent a letter to President Bush urging him to act now to curtail global warming, stating that "continuing federal inaction will inevitably lead to a wider range of state regulatory efforts, [and] states . . . are beginning to review their litigation options."¹⁰¹

94. See 36 I.C.J. § 1 (2002) (stating the jurisdiction of the ICJ includes all cases referred to it by involved parties and any matters so provided by the Charter, treaties, and conventions of the United Nations); Strauss, *supra* note 93, at 2.

95. See generally Herman Walker, Jr., *Modern Treaties of Friendship, Commerce, and Navigation*, 42 MINN. L. REV. 805, 807 (1958) (stating that FCN treaties include a variety of agreements that establish ground rules for the daily intercourse between countries).

96. See Strauss, *supra* note 93, at 4 (contemplating an application of the treaties to prescribe against harm to foreign interests). Professor Strauss is not optimistic about the chances of success for such a suit, noting that the ICJ rejected Iran's argument that several treaty provisions were violated by the U.S. military during the Iran-Iraq War. *Id.* The ICJ found that it had jurisdiction but generally rejected a broad interpretation of FCN treaties that would be helpful in a global warming case. *Id.*

97. *Id.* at 5-6.

98. *Id.* at 6-7; see also Division for Ocean Affairs and Law of the Sea, United Nations Law of the Sea Convention, pt. XI, sec. 5, at art. 188 (1982) (outlining the procedure for arbitration under the Convention).

99. See RESTATEMENT (THIRD) OF THE FOREIGN RELATIONS LAW OF THE UNITED STATES § 601 (1987) (stating that each state is obligated to take measures to ensure that activities within its boundaries are conducted to avoid significant injury to the environment of another state).

100. See Katharine Q. Seelye, *Global Warming May Bring New Variety of Class Action*, N.Y. TIMES, Sept. 6, 2001, at A14 (describing how a group of environmental lawyers is exploring new legal strategies to combat global warming). Even industries might bring an action for environmental harm caused by global warming; for example, owners of forested property may be injured if climate change causes the death of their heat-intolerant trees. *Id.*

101. Letter from Thomas F. Reilly, Massachusetts Attorney General et al., States

Delaying any substantive action on global warming could have other practical consequences for the United States, especially because it seems likely that carbon reduction targets can be met in part by carbon trading.¹⁰² As a late adopter, the United States could miss lower cost carbon-trading opportunities, resulting in higher compliance costs when the United States finally decides to act.¹⁰³

Some researchers argue that stemming GHG emissions could be good for the U.S. economy.¹⁰⁴ In 2000, scientists from five of the National Laboratories were commissioned by the Department of Energy ("DOE") to form the Interlaboratory Working Group ("IWG").¹⁰⁵ The IWG developed and compared three scenarios for GHG mitigation and energy efficiency in the Clean Energy Future ("CEF") study,¹⁰⁶ thus exploring several possible futures in a systematic way.¹⁰⁷ First, the Business As Usual ("BAU") Scenario was developed from the Energy Information Administration's ("EIA") Annual Energy Outlook 1999 and was considered the baseline scenario, reflecting current law and policies.¹⁰⁸ Next, the Moderate

Attorneys General Press Bush Administration on Climate Change (July 17, 2002), available at http://www.ago.state.ma.us/press_rel/0702.asp?head2=July%2C+2002&parent=464§ion=5.

102. See Ricardo Bayon, *Trading Futures in Dirty Air: Here's a Market-Based Way to Fight Global Warming*, WASH. POST, Aug. 5, 2001, at B2 (comparing the success of the sulfur dioxide trading program of the 1990s to the possible success of a carbon trading program).

103. See *id.* (stating that if carbon emissions caps are implemented, the price of carbon will skyrocket).

104. See, e.g., J. ANDREW HOERNER & JAN MUTL, GOOD BUSINESS: ANALYSIS OF ENERGY EFFICIENCY POLICY 17 (asserting that a well-designed, American energy efficiency policy could foster significant economic gains), available at <http://www.sustainableconomy.org/goodbusiness.pdf> (last visited Aug. 9, 2002); see also *The Role of Tax Incentives in Energy Policy: Hearings before the S. Comm. on Finance*, 107th Cong. 56-58 (2001) (statement of Prof. Daniel M. Kammen) (examining the increasing number of renewable energy options equally or less expensive than the prevailing fossil fuel technologies); Daniel M. Kammen, *Kammen Remarks at Finance Hearing on Energy Tax Incentive Proposals*, TAX NEWS TODAY, JULY 12, 2001, at 134 ("There is finally a growing understanding that a responsible national energy policy includes a global climate change mitigation strategy that can be environmentally effective and economically advantageous.").

105. Members of the Interlaboratory Working Group came from Argonne National Laboratory, Lawrence Berkeley National Laboratory, National Laboratory Renewable Energy Laboratory, Oak Ridge National Laboratory, and Pacific North West National Laboratory.

106. See INTERLABORATORY WORKING GROUP ON ENERGY-EFFICIENT AND CLEAN ENERGY TECHS., SCENARIOS FOR A CLEAN ENERGY FUTURE ch. 8 (2000) [hereinafter CLEAN SCENARIOS] (identifying the potential for impressive advances in the development and deployment of clean energy technologies through the adoption of fiscal incentives, voluntary programs, regulations, research and development and concluding that the overall benefits of such policy changes would be comparable to their costs), available at http://www.ornl.gov/ORNL/Energy_Eff/CEF.htm (revised Dec. 20, 2000).

107. *Id.* at 8.4.

108. See *id.* at 3.2.1 (describing the three main methodologies that were used in

Scenario was defined by a set of policies reflecting a slight shift in political influences and public opinion, and was characterized by stricter codes and regulations, information outreach, and tax credits.¹⁰⁹ Finally, the Advanced Scenario embodied a set of policies consistent with an impending national crisis concerning energy productivity, oil supply vulnerability, air quality, and GHG mitigation.¹¹⁰ In addition, the Advanced Scenario assumed the existence of a nationwide carbon permit trading system.¹¹¹ In both the Moderate and Advanced scenarios examined by the National Laboratories, the energy bill savings, in combination with recycled revenues from the domestic carbon trading system, exceeded the annualized direct costs of the technologies and policies.¹¹² J. Andrew Hoerner and Jan Mutl took the CEF study further and analyzed the overall economic impact on the U.S. economy and on specific industries.¹¹³ They found that “a properly designed energy-efficiency policy, including a market incentive to reduce fossil fuel consumption, together with cuts in other taxes, would be beneficial to a substantial majority of U.S. businesses, whether measured by value of shipments or by employment.”¹¹⁴ Taken together over a twenty year forecast, the net benefits for most individual businesses are very large in the aggregate.¹¹⁵ These results are based entirely on domestic policies and produce net domestic benefits.¹¹⁶

Subsequently, the Economic Policy Institute of the Center for a Sustainable Economy conducted a macroeconomic analysis of an alternative approach to climate and energy policy, and concluded that over two million jobs could be created over the next twenty years together with a fifty percent reduction in the United States’ carbon

the study).

109. *Id.*

110. *Id.*

111. *Id.*

112. *See id.* at 3.5.2 (analyzing the incremental investment technology costs, policy and administrative costs, and direct savings created by implementing each of the three scenarios). These analyses did not reflect the value of other important benefits such as reduced vulnerability to oil supply disruptions, cleaner air, and improved balance of payments. *Id.*

113. *See* HOERNER & MUTL, *supra* note 104, at 11 (examining the potential effects of environmentally friendly tax incentives, and other similar reforms, on 498 industries and concluding that within ten years, eighty-four percent of these industries would save millions of dollars if these tax policies were adopted).

114. *Id.* at 17; *see also* REPETTO ET AL., GREEN FEES: HOW A TAX SHIFT CAN WORK FOR THE ENVIRONMENT AND THE ECONOMY 59 (World Resources Institute 1992) (endorsing a reduction in “deadweight losses” from taxes on capital and labor as a means to counterbalance potential economic losses from reduced fossil fuel use).

115. HOERNER & MUTL, *supra* note 104, at 17.

116. *Id.* at 18.

emissions.¹¹⁷

Although there is ongoing debate as to whether economic theory and traditional cost-benefit analysis are appropriate for assessing responses to a major environmental threat like global warming, Richard Posner noted that while economics can determine what is an efficient distribution of resources, it cannot resolve the issue of whether such distribution is socially or ethically desirable.¹¹⁸ Using solely economic calculations based on market evaluations for cost-benefit measurements might lead to inadequate protection of the environment.¹¹⁹ Legislation to protect the environment need not rely only on conventional economics, but can reflect public concerns for the environment.¹²⁰ In *Whitman v. American Trucking Associations*,¹²¹ the Supreme Court found that the EPA could not interpret the Clean Air Act¹²² as defined solely by the implementation costs of pollution abatement measures.¹²³ This precedent, although based on a specific

117. See JAMES P. BARRETT & J. ANDREW HOERNER, ECON. POLICY INST. & CTR. FOR A SUSTAINABLE ECON., CLEAN ENERGY AND JOBS: A COMPREHENSIVE APPROACH TO CLIMATE CHANGE AND ENERGY POLICY 2 (2002) (concluding that a policy plan combining a "polluter-pays" approach with reduced taxes on working people and the promotion of new, clean technologies would advance both environmental protection and economic prosperity, disproving the idea of a required choice), available at <http://www.sustainableeconomy.org/press/globalwarming8.pdf> (last visited Aug. 18, 2002). The proposed plan would have four elements: (1) a carbon/energy tax on major energy sources combined with cuts in wage taxes; (2) promotion of energy efficient and renewable energy technologies; (3) a border adjustment of carbon tax for fossil-fuel producing and energy intense industries, thus preserving the competitiveness of these industries; and (4) transition assistance for workers adversely impacted by the policy. *Id.* at 9-14. By combining an energy tax with energy efficient technologies, the overall tax rate would remain relatively low. *Id.* at 10.

118. RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 15 (5th ed. 1992); see also Johnson, *supra* note 15, at 120 (citing economists' admission that economic theory cannot pass social or moral judgments on the allocation of resources).

119. See Peter A. Diamond & Jerry A. Hausman, *On Contingent Valuation Measurement on Nonuse Values*, in CONTINGENT VALUATION: A CRITICAL ASSESSMENT 3-5 (Jerry A. Hausman ed., 1993) (explaining that economic calculations, based on people's behavior and choices, cannot reflect the value of commodities not traded in markets or directly affecting people's actions; for example, the value of wilderness in Maine visited by few, the value of a nearly extinct species, the value of the Grand Canyon, even if left unseen); see also John R.E. Bliese, *Conservative Principles and Environmental Policies*, 7 KAN. J.L. & PUB. POL'Y 1, 18 (spring 1998) (arguing that market signals do not provide clear indications of long-term resources because they are the products of speculation and manipulation).

120. Diamond & Hausman, *supra* note 119, at 22-23.

121. 531 U.S. 457 (2001).

122. Clean Air Act, 42 U.S.C. §§ 7401-7671 (2000).

123. See *Whitman*, 531 U.S. at 465 (holding that under the non-delegation doctrine, the EPA is not permitted to apply cost-benefit analysis to the implementation of new standards unless explicitly instructed to do so by the enabling statute). Specifically, where the statute provides that national primary ambient air quality standards are to be set at the level requisite to protect public health, § 109, 42 U.S.C.A. 7409(b), the cost of implementation could not be considered. *Whitman*, 531 U.S. at 465. The Court stated,

statute, indicates the legislature's willingness to forego a cost-benefit analysis where the analysis would endanger public health.¹²⁴ Thus, despite conflicting evidence about the cost of GHG abatement and the potential effect on the economy, its probable effect on the environment justifies taking action.¹²⁵

The businesses most likely to be hurt by restrictions on GHG emissions have powerful friends in the Administration and Congress.¹²⁶ The coal industry gives significantly more funding to Republicans than Democrats, and coal industry executives have been rewarded with positions such as energy advisor to the Bush-Cheney transition team¹²⁷ and deputy secretary of the Department of the Interior.¹²⁸ The coal industry's influence is reflected in the Administration's rejection of carbon dioxide emission regulation because it would reduce coal-burning plants' efficiency and further exacerbate the energy crisis.¹²⁹ President Bush's rejection of the Kyoto Protocol advanced the coal industry's view that, "carbon

[t]he EPA . . . is to identify the maximum airborne concentration of a pollutant that the public health can tolerate, decrease the concentration to provide an 'adequate' margin of safety, and set the standard at that level. Nowhere are the costs of achieving such a standard made part of the initial calculation.

Id.

124. *Id.* at 458 (concluding that the cost factor is indirectly related to public health and had Congress meant to consider costs, Congress would have expressly mentioned it in §§ 108-109 of the Clean Air Act).

125. *Id.*

126. See GELBSPAN, *supra* note 13, at 33 (noting that over the last six years, the oil and coal industries have spent millions of dollars to minimize the threat of climate change, "[f]or [the fossil fuel industry] . . .").

127. See Dan Morgan, *Betting on Bush Pays Off for Big Coal*, WASH. POST WKLY., Apr. 2, 2001, at 12 (noting that the holding company of the Peabody Group contributed \$250,000 to the Republican National Committee in July 2001). For example, Irl Englehardt, Chairman of the Peabody Group, the nation's largest coal enterprise was placed on the EPA's transition team. John Mintz, *Transition Advisers Have Much to Gain: Consumer Activists Concerned Big Business Will Use Team Members to Muscle the Incoming Bush Administration*, WASH. POST, Jan. 17, 2001, at A15.

128. See Morgan, *supra* note 127, at 12 (noting coal industry officials' strong political influence, not only the executive branch of the government, but also in Congress). In addition, J. Steven Giles, has lobbied for coal and gas companies and was nominated by Bush to be the Deputy Secretary of the Interior. Press Release, The White House, President Bush to Nominate Four Individuals to Serve in His Administration (Mar. 8, 2001), available at <http://www.whitehouse.gov/news/releases/2001/03/20010308-18.html> (last visited Aug. 9, 2002).

129. See Peter Behr, *Crisis? What Crisis?: Market Forces and Conservation Have Calmed Fears Over Fuel and Electric Supplies*, WASH. POST WKLY., June 18, 2001, at 18 (noting California's successful and surprising avoidance of an energy crisis by using less energy to avoid paying the high energy prices and concluding that when energy is more expensive, people use less of it); Peter Behr, *On the Energy Roller Coaster*, WASH. POST WKLY., Sept. 10, 2001, at 18 (citing four key factors involved in the unexpected drop in energy prices: (1) conservation, (2) regulation, (3) increased production, and (4) recession). By June 2001, commentators were wondering what happened to the energy crisis, as gasoline and natural gas prices plummeted.

dioxide is not a pollutant, and it should not be defined as such.”¹³⁰

As discussed later in this Article, oil, gas, and coal already receive significant subsidies via preferential treatment under the Internal Revenue Code.¹³¹ Professor Garrett notes that current beneficiaries of federal programs are in a better position to gain even more benefits, because they already have organized and developed expertise in lobbying the relevant committees.¹³² The marginal costs of seeking new programs for an organized, established group are much less than those of a group that must bear the significant start-up costs of organization.¹³³ This difference raises significant hurdles to the enactment of GHG abatement legislation.

Human psychology can also explain resistance to GHG regulation.¹³⁴ Recently, Jeffrey Rachlinski explored the psychological impact of climate change reforms.¹³⁵ He theorized that “cognitive processes associated with evaluating new scientific information and with evaluating decisions involving losses suggest that people will not support costly precautions against global warming.”¹³⁶ While it may seem rational to support social and legislative changes to reduce global warming, the nature of the evidence about global warming and the human response to such evidence bodes ill for such reforms.¹³⁷ People tend to embrace evidence that supports their existing beliefs about the world and reject evidence that is inconsistent with such beliefs.¹³⁸ Therefore, mixed evidence on a

130. *National Energy Policy—Coal: Hearing Before the Subcomm. On Energy and Air Quality of the House Comm. On Energy & Commerce*, 107th Cong. 16 (2001) (statement of J. Brett Harvey, President & CEO, Consol Energy, Inc., the “nation’s largest producer of underground coal,” *id.* at 15).

131. *See infra* Part III.A.2 (highlighting the current state of the tax code within the oil and gas production context).

132. *See* Elizabeth Garrett, *Harnessing Politics: The Dynamics of Offset Requirements in the Tax Legislative Process*, 65 U. CHI. L. REV. 501, 522 (1998) (concluding that the dynamic will further entrench status quo distributions of government resources).

133. *Id.* *See also* Todd J. Zwicki, *Environmental Externalities and Political Externalities: The Political Economy of Environmental Regulation and Reform*, 73 TUL. L. REV. 845, 863 (1999) (arguing that the significant barriers to environmental reform come from the collision of industry and environmentalists’ interests, rather than the industry’s opposition to environmentalism). Professor Zwicki believes that industry and environmental groups cooperate to allocate gains derived from regulation among themselves and that only the public loses in having to pay higher prices. *Id.* at 849.

134. Rachlinski, *supra* note 36, at 299.

135. *Id.*

136. *Id.* at 304.

137. *See* Dale Jamieson, *Uncertainty and Risk Assessment: Scientific Uncertainty and the Political Process*, 545 ANNALS AM. ACAD. POL. & SOC. SCI. 35, 36 (1996) (explaining that opposing partisans take advantage of the scientific uncertainty concerning climate change to further divisiveness over the issue).

138. *See id.* at 39 (arguing that because “scientific” uncertainty is not strictly scientific, but also deeply cultural, scientific advances alone will not eliminate people’s perception of risk).

subject about which people have strong opinions tends to make their opinions stronger.¹³⁹

The evidence for climate change comes from highly complex climate models, rather than from everyday experience. The real dangers and evidence of global climate change cannot be understood without using scientific theory.¹⁴⁰ Because scientific theory entails some uncertainty, some people will remain unconvinced.¹⁴¹ Diminished and inconsistent public support makes it hard to promulgate any GHG regulations or implement new taxes on carbon emissions.¹⁴²

However, even if all of the scientific evidence supported a theory of global warming, psychologists and behavioral economists believe that people would be unwilling to make changes that might reduce their perceived quality of life.¹⁴³ This phenomenon is known as loss aversion, which causes people to be less willing to sacrifice their present benefits for future benefits, and thus creates significant hurdles for global warming abatement. Under a loss aversion theory, people would not start using fossil fuels at the risk of global warming, even if enhanced wealth was a substantial probability.¹⁴⁴ However, as society is already reaping the economic benefits of consuming fossil fuels, it is unlikely to reduce its consumption, resulting in what would be perceived as a sure loss in economic benefit.¹⁴⁵ History shows the

139. *See id.* at 40 (“[U]ncertainty reduces science to just another playground for competing ideologies.”).

140. *Id.* at 36. Jamieson elaborates:

Knowledge claims presuppose categories, but categories are relative. For example, some people point to increases in global mean temperatures and extreme climatic events as evidence of global warming. But why is global mean temperature a significant category? Why not instead focus on, say, average temperatures? And why bring together in the single class of extreme events such diverse phenomena as hailstorms, droughts, hurricanes, heat waves, cold snaps, and so on? What are the baselines from which the claims of increasing frequency or increasing temperature are projected? What may appear to be an increase from a baseline of 50 years ago may appear to be a decrease from a baseline of 500 or 5000 years ago. Of course, stories can be told about why one form of categorization is better than another; the point is that empirical investigation presupposes categories, without being able to justify them empirically in advance.

Id.

141. *See id.* (“[T]he very characteristics of science that enable it to have its unique cultural authority as a knowledge producer disable it from bringing public decisions to closure.”).

142. *See id.* at 40 (arguing that direct appeals to uncertainty rarely foster consensus in policy-based debates).

143. Rachlinski, *supra* note 36, at 307.

144. *Id.*

145. *See* Murkowski, *supra* note 76, at 358:

It is difficult for politically attuned leaders to agree to risk America’s economic growth in an effort to minimize the uncertain impacts of climate

effect of this phenomenon in the long delays in implementing safeguards for various hazardous substances such as asbestos and hydrocarbons.¹⁴⁶ In the case of asbestos, a researcher wrote in 1898 that exposure to asbestos dust would cause injury to the lungs.¹⁴⁷ The European Union acted one hundred years later, in 1998, to impose a ban on asbestos, which is to be implemented by member states by 2005.¹⁴⁸ The European Environment Agency noted that: “[t]he costs of preventative actions are usually tangible, clearly allocated and often short-term, whereas the costs of failing to act are less tangible, less clearly distributed and usually longer term, posing problems of governance. Weighing up the overall pros and cons of action, or inaction, is therefore very difficult”¹⁴⁹

The risk of harm from global warming in the future is also discounted in an economic sense. The long lag until many of the harmful effects of GHG emissions are felt affects society’s willingness to incur costs to prevent climate change.¹⁵⁰ With such a long time horizon, all benefits are discounted to zero using any positive discount rate, so that a death prevented in the distant future is worth nothing today.¹⁵¹

Of course, cost-benefit analysis for environmental issues has practical and philosophical problems.¹⁵² Former Vice-President Al

change. Even if it could be determined that action now yields benefits later, the discounting of those benefits means that the current willingness-to-pay for emissions reductions is quite low relative to current costs.

146. See EUROPEAN ENVTL. AGENCY, ENVTL. ISSUE REPORT NO. 22, LATE LESSONS FROM EARLY WARNINGS: THE PRECAUTIONARY PRINCIPLE 1896-2000 59 (Paol Harremöes ed., 2001) (noting politicians’ hesitance to promote long-term societal interests over the short-term interests of powerful interest groups).

147. *Id.* at 53.

148. *Id.* at 57.

149. *Id.* at 3-4.

150. See Richard L. Revesz, *Environmental Regulation, Cost-Benefit Analysis, and the Discounting of Human Lives*, 99 COLUM. L. REV. 941, 943 (1999) (critiquing analysts’ practice of discounting losses to future generations when assessing environmental policies).

151. See *id.* (opposing the use of a discount theory in cases of environmental harm and advocating a policy of intergenerational obligations and sustainable development); see also Bliese, *supra* note 119, at 20 (asserting that it almost always makes more financial sense to destroy a sustainable natural resource by overuse, or overharvesting, and to put the money in the bank because harvesting yields higher annual returns when selling all the trees or fish and banking the money, as compared to harvesting sustainably; thus, any positive discount rate causes catastrophes in the distant future to be reduced to insignificant factors in the present decision making process).

152. See Wallace E. Oates, Symposium, *Innovations in Environmental Policy: From Research to Policy: The Case of Environmental Economics*, 2000 U. ILL. L. REV. 135, 149 (2000) (noting the difficulty of placing monetary values on benefits, such as improved health and extended longevity, that result from reduced air pollution); see also John P. Weyant, Pew Ctr. on Global Climate Change, *An Introduction to the Economics of Climate Change Policy* 44 (2000) (noting that with respect to climate

Gore suggested that one of the most effective ways to reduce pollution is “to put a price on the environmental consequences of our choices, a price that would be reflected in the marketplace.”¹⁵³

Developing new, cheaper sources of electricity represents a solution to the problem that may be consistent with economic and psychological forces.¹⁵⁴ Developing alternatives to fossil fuels, however, may require government intervention because current industrial and residential use of fossil fuels is firmly entrenched.¹⁵⁵

The United States could reduce carbon dioxide emissions by reducing fossil fuel usage and increasing carbon absorption.¹⁵⁶ Fossil fuel usage could be reduced by increasing the proportion of non-carbon emitting energy sources such as nuclear, wind, or solar, and by conserving energy by increasing efficiency and reducing waste.¹⁵⁷

One way this could be accomplished is by using the revenue from reducing the tax incentives enjoyed by fossil fuel industries to increase tax incentives for renewable energy and conservation.¹⁵⁸

change, five elements determine the results of a cost-benefit analysis of GHG abatement: (1) base case emissions projection; (2) policy regime (e.g., whether emissions trading is permitted); (3) whether benefits of GHG reductions are considered; (4) the rate and extent of substitution of energy products; and (5) the rate of improvement of the energy substitutes over time), *available at* http://www.pewclimate.org/projects/econ_introduction.cfm. Variations in these elements account for variation in the predictions made under different models of cost benefit analysis. *Id.*

153. ALBERT GORE, JR., *EARTH IN THE BALANCE: ECOLOGY AND THE HUMAN SPIRIT* 348 (1992).

154. Rachlinski, *supra* note 36, at 318-19. Gary Bryner from the Natural Resources Center of the University of Colorado School of Law notes that, “[t]here is a major disconnect between our reliance on markets for the efficient allocation of resources, and the failure of markets to include the true costs of producing energy from fossil fuels. . . . The problem of inadequate pricing of fossil fuels is ultimately a political challenge.” Gary C. Bryner, *The National Energy Policy: Assessing Energy Policy Choices*, 73 U. COLO. L. REV. 341, 412 (2002).

155. See GELBSPAN, *supra* note 13, at 97 (citing Kirk Brown of the Business Council for a Sustainable Economy, who predicts that if Congress gave the renewable energy industry the approximately \$20 billion in tax credits that it gives to fossil fuel producers, climate-friendly technologies would become instantly competitive with fossil fuels).

156. See U.N. Env’t Programme, Info. Unit for Conventions, *Understanding Climate Change: A Beginner’s Guide to the UN Framework Convention* 24 (citing the adoption of such measures throughout the world as essential to the success of efforts to curb global warming), *available at* <http://www.unep.ch/iuc/submenu/begin/beginner.htm> (last visited Jan. 9, 2002).

157. *Id.*

158. See GELBSPAN, *supra* note 13, at 97-98 (citing Alden Meyer, an energy specialist with the Union of Concerned Scientists, who estimates that a near absolute transition to a renewable energy economy could easily be accomplished at a cost of about \$25 billion a year over the next ten years, resulting in a major increase in economic growth). Reducing the subsidies for fossil fuels would also facilitate the imposition of a carbon tax. Subsidies encouraging the use of fossil fuels inhibit the effectiveness of a carbon tax because they discourage substitution. Dernbach, *supra* note 11, at 10976; see *Effect of Federal Tax Laws on the Production, Supply and Conservation of Energy*:

Carbon absorption can be increased by planting new forests, conserving existing timberlands, and by employing less intensive agricultural methods.¹⁵⁹ Although the Internal Revenue Code already contains incentives for reforestation and conservation, some changes could be made to increase the availability of such incentives.¹⁶⁰

II. TAX POLICY AND GLOBAL WARMING

A. Energy

1. Vice President Cheney's report

Although other concerns have taken precedence recently, energy policy remains crucial to our nation's infrastructure. In May 2001, Vice President Richard Cheney produced a report that projected the growth of the "fundamental imbalance between supply and demand," causing the U.S. energy crisis.¹⁶¹ The imbalance was illustrated in the years 1991-2001 by a 2.3% increase in domestic energy production, versus a seventeen percent increase in consumption, with a further thirty-two percent increase in consumption projected by 2020.¹⁶² The report direly predicted, "[t]his imbalance, if allowed to continue, will inevitably undermine our economy, our standard of living, and our national security."¹⁶³ It outlined three "principal energy challenges": conserving energy, upgrading U.S. energy distribution infrastructures, and increasing production while protecting the environment.¹⁶⁴

The numbers in the Vice President's report do not tell the whole story.¹⁶⁵ First, fossil fuels contain differing amounts of carbon,

Hearing before the Subcomm. on Select Revenue Measures of the House Comm. on Ways and Means, 107th Cong. 9 (2001) [hereinafter Ways and Means Hearing] (statement of Joseph Mikrut) ("Tax incentives can offset the failure of market prices to signal the desirable level of investment in energy-saving and alternative energy technologies because they increase the private return from the investment by reducing its after-tax cost."), available at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=107_house_hearings&docid=f:74221.wais (last visited June 9, 2002).

159. U.N. Env't Programme, *supra* note 156, at 21, 24. The results of continued GHG emissions would be compounded if the balancing effects of carbon sinks were removed. *Id.* at 21.

160. See *Ways and Means Hearing, supra* note 158, at 10-31.

161. NAT'L ENERGY POLICY DEV. GROUP, NATIONAL ENERGY POLICY: REPORT OF THE NATIONAL ENERGY POLICY DEVELOPMENT GROUP viii (2001), available at <http://www.whitehouse.gov-energy-National-Energy-Policy.pdf>.

162. *Id.* at 1.1.

163. *Id.* at viii.

164. *Id.* at ix.

165. See Dana Milbank, *Cheney Refuses Records' Release: Energy Showdown with GAO Looms*, WASH. POST, Jan. 28, 2002, at A1, A12 (discussing the congressional investigation and Cheney's refusal to cooperate with congressional "erosion of

producing differing amounts of GHG; coal contains the highest level of carbon per unit of energy, while petroleum contains twenty-five percent less and natural gas contains forty-five percent less.¹⁶⁶ Second, GHG emissions resulting from transportation have not been reduced, despite the introduction of stricter auto emission standards and cleaner fuels.¹⁶⁷ Petroleum accounted for thirty-nine percent of 1998 U.S. energy use, primarily consumed in transportation.¹⁶⁸ By comparison, coal accounted for twenty-three percent of U.S. consumption, primarily for electric utilities, and natural gas accounted for twenty-three percent, primarily in residential and industrial applications.¹⁶⁹ Between 1990 and 1998, the number of driver miles increased by twenty-one percent, fueled by economic and population growth, more roads, and relatively low gas prices.¹⁷⁰ In light of the continued rise in U.S. petroleum consumption, mostly due to increased transportation consumption, the first logical step in implementing demand-side management is to increase the price of petroleum products, thus reducing use, but as discussed below, both current and pending legislation does not offer this solution.¹⁷¹

[presidential] powers”). Some members of Congress questioned whether the results of the report were skewed because of industry advisers and asked the General Accounting Office (“GAO”) to investigate. See Dana Milbank, *GAO Sues Administration Over Task Force Records*, WASH. POST, Feb. 23, 2002, at A7 (reporting the GAO suit against Cheney); see also Mike Allen, *GAO to Sue Cheney Within 2 or 3 Weeks: Hill Agency Seeks Energy Records*, WASH. POST, Jan. 31, 2002, at A4 (stating that the GAO suit, the first of its kind brought by the GAO against a federal entity, sought to uncover information regarding meeting attendees, locations, dates, and subject matter); Eric Pianin & Dan Morgan, *Cheney and the Oilmen*, WASH. POST WKLY., Mar. 4-10, 2002, at 15 (reporting the U.S. District Court order requiring the Department of Energy to submit over 7,500 pages of materials). Compare Dana Milbank & Mike Allen, *Energy Contacts Disclosed: Consumer Groups Left Out, Data Show*, WASH. POST, Mar. 26, 2002, at A1, A8 (noting that although thousands of documents were withheld, the DOE delivered 11,000 heavily redacted pages to the District Court, which revealed the administration’s heavy reliance on the advice of the energy industry), with H. Josef Hebert, *Energy Panel Gave Environmentalists Brief Input*, THE NEWS J., Mar. 26, 2002, at A3 (noting that input from environmental activists was given only minimal and belated consideration in the DOE’s report).

166. U.S. ENVTL. PROT. AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-1998 at ES-10 (2000), National Center for Environmental Publications and Information (releasing annual GHG emissions data for most types of fuel and numerous economic sectors, in accordance with commitments to the U.N. Framework Convention on Climate Change), available at <http://www.epa.gov/globalwarming/emissions/national>.

167. *Id.* at ES-7.

168. *Id.* at ES-10.

169. *Id.*

170. *Id.* at ES-7.

171. See *infra* Part III.A.3 (discussing the latest energy legislation pending in Congress and noting that it falls short of significant emission reduction targets).

2. *Present law*

To understand the tax subsidies enjoyed by fossil fuel industries, we must first examine the taxation of business assets; most taxpayers can recover the cost of purchasing business assets by means of the depreciation deduction.¹⁷² The idea behind the depreciation deduction is that the costs of capital assets should be recovered over their useful life.¹⁷³ The amount of the depreciation deduction is typically calculated with reference to the initial cost of the property and its expected useful life.¹⁷⁴ Rather than require each taxpayer to determine the useful life of each asset, the Code and Internal Revenue Service ("IRS") set forth recovery periods for a large range of assets.¹⁷⁵ The recovery periods vary from three years for some animals to thirty-nine years for nonresidential real property.¹⁷⁶ The cost of oil and gas production may be recovered by means of the depletion deduction.¹⁷⁷ The mechanism of the depletion deduction recognizes that it may be difficult to establish a useful life for an oil well, as it is difficult to know how much oil is in the ground.¹⁷⁸ Accordingly, the Internal Revenue Code permits percentage depletion for certain holders of oil and gas interests.¹⁷⁹ Percentage depletion differs from depreciation and cost depletion in that the total amount of depletion deductions may exceed the actual cost of

172. See I.R.C. § 167 (West 2002) (stating the general depreciation rule, basis for depreciation, and exceptions); see also *id.* § 168 (expanding the depreciation mechanism with an accelerated cost recovery system ("ACRS")).

173. *Id.* § 168.

174. See *id.* (establishing property categories and corresponding methods for calculating the property's "useful life" for depreciation).

175. See *id.* § 168(c) (providing supplemental property lists and exceptions); Rev. Proc. 87-56, 1987-2 C.B. 674 (providing a detailed and lengthy supplement to the property lists in § 168(c)).

176. See, e.g., I.R.C. § 168(e)(3)(A) (assigning a three year recovery period for a horse); Rev. Proc. 87-56, 1987-2 C.B. 677 (assigning a three year recovery period for breeding hogs); I.R.C. § 168(c) (assigning recovery periods for real property, including fifty years for railroad grading property).

177. I.R.C. §§ 611-613.

178. See C.W. RUSSELL ET AL., INCOME TAXATION OF NATURAL RESOURCES 804 (2000) (suggesting that the legislative intent of this depreciation mechanism was (1) to allow a depletion deduction based on the gross income from the oil well, regardless of recovery of base investment; and (2) to create an incentive for exploration by improving the previous estimated value method, which provoked frequent disputes between the I.R.S. and taxpayers). But see *id.* at 105 (allaying concerns over the uncertainty of oil and gas investments with an assertion that geological and geophysical exploration technology has advanced recently, but admitting that drilling remains the only accurate method for establishing the presence of recoverable oil).

179. See Treas. Reg. § 1.611-1(b) (amended 1973) (stating that the "economic interest" for the depletion allowance requires a capital investment in the mineral rights, and excludes any contract-based interest).

the interest.¹⁸⁰ Thus, investment in qualifying oil and gas properties has the potential to yield greater proportionate tax benefits than investment in any other type of property.¹⁸¹

The percentage depletion method for oil and gas properties is limited to independent producers and royalty owners.¹⁸² Generally, fifteen percent of the taxpayer's gross income from the oil or gas producing property is deductible,¹⁸³ limited to 100 percent of the net income from the property for the year.¹⁸⁴ In addition, the percentage depletion deduction is limited to sixty-five percent of the taxpayer's overall net income, with certain modifications.¹⁸⁵ Before 1991, the deduction was limited to fifty percent of net income.¹⁸⁶ Since 1993, the alternative minimum tax provisions do not apply to oil and gas percentage depletion deductions, thus providing additional incremental benefits for oil and gas producers.¹⁸⁷ For example,

180. See RUSSELL, *supra* note 178, at 804 (observing that the percentage depletion allowance is not limited to the original capital investment).

181. See I.R.C. § 613(b) (limiting the depletion allowance to fifty percent of taxable income for a broad range of mines, wells, and deposits whose percentage depletion rates range from five to twenty-two percent of gross income, while allowing oil and gas properties, but not other investments, to deduct up to 100% of taxable income). Oil and gas investments are treated preferentially. For example, assume Investor A has invested \$4,125,000 in oil-producing property and Investor B has invested \$4,125,000 in a high-rise apartment building. Assume that both investments have a gross income of \$1,000,000 per year. Under Internal Revenue Code ("I.R.C.") § 613A(c)(1), Investor A can deduct 15% of her net income, or \$150,000 per year, for depletion. Under I.R.C. § 168(c), Investor B can deduct the fixed yearly percentage of her \$4,125,000 investment allowed in her recovery period of 27.5 years for residential real property, thus \$150,000 in the case of Investor B as well. After 27.5 years, Investor B has fully depreciated her investment, and is allowed no further deductions. Investor A can continue to take a depletion deduction of up to fifteen percent of gross income from her oil producing property, even after her initial investment has been completely recovered. Moreover, capital improvements that Investor B makes to her property must be depreciated over a straight-line recovery period. On the other hand, Investor A can take advantage of I.R.C. § 263A(c) and deduct intangible drilling and development costs, such as wages and supplies, as though they were expenses rather than capital improvements. While this simple example illustrates the mechanism of percentage depletion, as a practical matter the preferential tax treatment for oil and gas properties is generally fully reflected in the market price. Thus, the subsidy will result in failure of the market to accurately reflect the pre-tax values.

182. See I.R.C. § 613A(c)(1)-(4) (defining the depletion allowance for independent producers, and royalty owners, as approximately 1000 barrels of oil per day—or its natural gas equivalent); *see also id.* § 613A(d) (excluding all retailers and refiners producing an excess of 50,000 barrels per year from the independent producer depletion deduction).

183. *Id.* § 613A(c)(1).

184. *Id.* § 613(a).

185. *Id.* § 613A(d)(1).

186. See The Omnibus Budget Reconciliation Act of 1990, Pub. L. No. 101-508, § 11522(a), 104 Stat. 1388 (amending I.R.C. § 613(a) to allow a deduction of up to 100% of net income for oil and gas properties).

187. See The Energy Policy Act of 1992, Pub. L. No. 102-486, § 1915(a)(1), 106 Stat. 2776 (1993) (amending I.R.C. § 57(a)(1) to exclude oil and gas properties

eligible taxpayers may take percentage depletion for up to 1000 barrels average daily production of domestic crude oil or an equivalent amount of domestic natural gas.¹⁸⁸ When the price of oil gets low, taxpayers who own an economic interest in marginal wells have even greater incentives.¹⁸⁹ The fifteen percent statutory depletion rate is increased by one percent for each whole dollar that the average price of crude oil for the immediately preceding calendar year is less than \$20 per barrel, up to a maximum depletion rate of twenty-five percent.¹⁹⁰ For example, in 1999 the average price of a barrel of crude oil was \$15.56.¹⁹¹ Thus, the percentage depletion rate for marginal wells in 2000 was nineteen percent.¹⁹²

While equipment costs of oil and gas production must be recovered either by cost depletion or percentage depletion, intangible drilling and development costs ("IDCs") can be expensed and recovered immediately.¹⁹³ IDCs include all expenditures made by an operator for wages, fuel, repairs, hauling, supplies, etc., incident to and necessary for the drilling of wells and the preparation of wells for the production of oil and gas.¹⁹⁴ The election to expense IDCs gives another advantage to investment in oil and gas properties over other types of capital assets.¹⁹⁵

Oil and gas producers are also eligible for the enhanced oil recovery credit ("EOR"),¹⁹⁶ which is a component of the general business credit.¹⁹⁷ A qualified EOR project must involve the use of one or more tertiary recovery methods defined in I.R.C.

using the depletion deduction under I.R.C. § 613A). *See generally* I.R.C. §§ 55-59 (detailing the alternative minimum tax formula, which imposes a minimum tax and disallows some deductions, thus imposing a floor, or tax that must be paid only if income is over a certain level).

188. I.R.C. § 613A(c)(3)-(4).

189. *See id.* § 613A(c)(6)(D) (defining marginal production and marginal wells); *id.* § 613A(c)(6)(H) (suspending the taxable income limit imposed by I.R.C. § 613(a) on percentage depletion for marginal production, for 1998 to 2001); *see also* The Creation and Worker Assistance Act of 2002, Pub. L. No. 107-47, § 607(a)(1), 116 Stat. 21 (extending the suspension of the taxable income limit for marginal production through 2003).

190. I.R.C. § 613A(c)(6)(C).

191. Notice 2000-23, 2000-1 C.B. 952.

192. I.R.C. § 263A(c) (allowing intangible costs to be treated as business expenses rather than capital investments, at the operator's election, when the costs are associated with the drilling and development of oil, gas, and geothermal wells).

193. *Id.* § 263(c).

194. Treas. Reg. § 1.612-4(a) (as amended in 2002).

195. *See* I.R.C. § 179 (allowing limited expenses to be deducted in the year they were incurred, and imposing restrictions on type of expenditure covered).

196. *See id.* § 43 (allowing an enhanced oil recovery credit for any taxable year equal to fifteen percent of the taxpayer's qualified enhanced oil recovery costs for such taxable year).

197. *Id.* § 38(a).

§ 193(b)(3).¹⁹⁸ While oil and gas producers get the bulk of the tax benefits, certain producers of fuel from unconventional sources may use a tax credit of \$3 per barrel or barrel equivalent.¹⁹⁹ The Code also imposes excise taxes on oil, which benefit the Hazardous Substance Superfund and the Oil Spill Liability Fund.²⁰⁰

Taxpayers may obtain limited tax credits for producing electricity from certain renewable resources, such as wind, closed loop biomass, and poultry litter.²⁰¹ There is also a tax credit for investments in solar and geothermal energy property.²⁰² The total estimated tax expenditures for renewable resources is \$500 million from 2001 to 2005, less than nine percent of the amount to be spent on oil and gas.²⁰³ Of these types of renewable power sources, all except wind, solar, hydroelectric, and geothermal energy produce GHG emissions.²⁰⁴

Energy conservation efforts receive even less benefit from the Code. A taxpayer may exclude from income the value of any subsidy provided by a public utility for the purchase or installation of an energy conservation measure primarily designed to reduce the consumption of electricity or natural gas or to improve the

198. *Id.* § 193(b)(3) (defining tertiary recovery method).

199. *See id.* § 29 (determining the tax credit for fuel production from an unconventional source). From 2001 to 2005, tax expenditures for the benefit of oil and gas producers are estimated to total \$5.8 billion, while the tax credit for unconventional fuels totals \$5.3 billion. STAFF OF J. COMM. ON TAXATION, 107th CONG., ESTIMATES OF FEDERAL TAX EXPENDITURES FOR FISCAL YEARS 2001-2005 16 (Comm. Print 2001) [hereinafter J. COMM. PRINT].

200. *See* I.R.C. § 4611 (determining the Hazardous Substance Superfund financing rate is 9.7 cents a barrel, and the Oil Spill Liability Trust Fund financing rate is five cents a barrel).

201. *See id.* § 45 (defining wind, closed-loop biomass, and poultry waste as “qualified energy resources”). The credit is a component of the general business credit, which in total may not exceed twenty-five percent of net regular tax liability above \$25,000, or the tentative minimum tax. *Id.* § 38. This provision, scheduled to expire in 2002, was extended two years until 2004. Job Creation and Worker Assistance Act of 2002, Pub. L. No. 107-147, § 603, 116 Stat. 21, 59 (extending tax credit allowance to boost employment as a result of the events of September 11, 2001).

202. *See* I.R.C. § 48 (establishing a ten percent investment credit for the cost of “energy property” defined as (1) equipment that uses solar energy to generate electricity to heat or cool a structure, or to provide solar process heat; or (2) equipment used to produce, distribute, or use energy derived from a geothermal deposit). This credit is also a component of the general business credit and subject to its limitations. *See id.* § 38 (defining the limitations of the credit allowed based on the amount of tax).

203. *See* J. COMM. PRINT, *supra* note 199, at 17 (adding tax credit for production in solar and geo-thermal energy facilities at \$100 million to tax credit for electricity production from wind, biomass, and poultry waste at \$400 million to total \$500 million).

204. *See* INT’L ENERGY AGENCY, OECD, GREENHOUSE GAS EMISSIONS; THE ENERGY DIMENSION 14 (1991) (listing the various greenhouse gases and their concentration in the atmosphere).

management of energy demand with respect to a dwelling unit.²⁰⁵ In 1996, Congress removed this exclusion for property other than dwelling units.²⁰⁶ The cost of this program is anticipated to total \$100 million from 2001 to 2005.²⁰⁷ The Code allows a portion of the cost of certain clean-fuel vehicles to be expensed rather than capitalized.²⁰⁸ Finally, the Code permits a ten percent tax credit for the cost of a qualified electric vehicle, up to a maximum credit of \$4,000.²⁰⁹ Depending on how the electricity is produced, this credit may result in a reduction of GHG emissions.²¹⁰

One might inquire how the subsidies for fossil fuel industries have impacted usage. Congress mandates following the cost of tax expenditures, but does not provide for study of the consequences of such expenditures.²¹¹

3. *Recent legislative proposals*

Recent energy tax proposals generally increase the imbalance of benefits in favor of the oil and gas industry.²¹² The U.S. House of Representatives and the Senate have passed two different versions of an energy tax bill.²¹³ The differences will need to be resolved by a House-Senate conference.²¹⁴ On May 1, 2002, the Senate named

205. See I.R.C. § 136(c)(1) (defining “energy conservation measure”).

206. See Small Business Job Protection Act of 1996, Pub. L. No. 104-188, § 1617(a), 110 Stat. 1755 (substituting “energy demand with respect to a dwelling unit” in place of “energy demand—(A) with respect to a dwelling unit, and (B) on or after January 1, 1995, with respect to property other than dwelling units”). The exclusion for non-residential property had only been in effect one year. *Id.*

207. J. COMM. PRINT, *supra* note 199, at 17.

208. See I.R.C. § 137A (allowing a deduction equal to the cost of any qualified clean-fuel vehicle property and any qualified clean-fuel vehicle refueling property). This provision, scheduled to expire in 2002, was extended two years until 2004. Job Creating and Worker Assistance Act of 2002, Pub. L. No. 107-147, § 606, 116 Stat. 21, 59.

209. See I.R.C. § 30 (establishing a credit for qualified electric vehicles).

210. See *id.* § 30(c)(1) (defining “qualified electric vehicle” as “any motor vehicle which is powered primarily by an electric motor drawing current from rechargeable batteries, fuel cells, or other portable sources of electrical current”).

211. J. COMM. PRINT, *supra* note 199, at 2. In fact, the Joint Committee specifically states that “in the process of listing tax expenditures, no judgment is made, nor any implication intended, about the desirability [or effectiveness] on any special tax provision as a matter of public policy.” *Id.* at 3.

212. See Editorial, *Adding Up the Energy Bills*, WASH. POST, Apr. 29, 2002, at A20 (noting that by preserving the oil industry’s benefits, the Bush Administration is continuing the long standing policy of shying away from requiring industry sacrifice).

213. See Securing America’s Future Energy Act of 2001, H.R. 4, 107th Cong. (2001); The Energy Policy Act of 2002, 1 CONG. REC. S3342-3418 (daily ed. Apr. 25, 2002).

214. See *Adding Up the Energy Bills*, *supra* note 212, at A20 (stating that since debates in the House and Senate have been completed the bills will move forward to a joint conference committee).

conferees,²¹⁵ but as of press time no firm date has been set for final reconciliation.²¹⁶ The House bill, the Securing America's Future Energy Act of 2001, or the SAFE Act of 2001,²¹⁷ which passed the House on August 1, 2001, establishes tax incentives, including tax credits, with respect to: (1) oil and gas production;²¹⁸ (2) offshore oil and gas vessels and structures;²¹⁹ (3) emission reductions and efficiency improvements in coal-based electricity generation facilities;²²⁰ (4) early commercial applications of advanced clean coal technologies;²²¹ (5) prepayments for natural gas;²²² (6) electric power;²²³ (7) spent nuclear fuel storage;²²⁴ (8) energy efficiency;²²⁵ (9) alternative fuels;²²⁶ and (10) renewable energy.²²⁷ The goal of the bill is to reduce the U.S. dependence on foreign energy sources from fifty-six percent to forty-five percent by January 1, 2012, and to reduce U.S. dependence on Iraqi energy sources from 700,000 barrels per day to 250,000 barrels per day by January 1, 2012.²²⁸ Another stated

215. See Appointment of Conferees on H.R. 4, Securing America's Future Energy Act of 2001, 148 CONG. REC. H3462 (daily ed. June 12, 2002) (listing the conferees as Senators Bingaman, Hollings, Baucus, Kerry, Rockefeller, Breaux, Reid, Jeffords, Lieberman, Murkowski, Domenici, Grassley, Nickles, Lott, Craig, Campbell, and Thomas).

216. See 148 CONG. REC. D830-01 (daily ed. July 25, 2002) (noting the conferees met but have not completed comparing the two versions of the bill); 148 CONG. REC. D692-01 (daily ed. June 27, 2002) (announcing the first meeting of the conferees); see also Press Release, Senator Frank Murkowski, *supra* note 7.

217. See H.R. 4, § 6503 (permitting oil and gas drilling in the Arctic National Wildlife Refuge ("ANWR") in Alaska); see also Michael Grunwald, *Departmental Differences Show Over ANWR Drilling: Interior's Norton Rebuffs Wildlife Service in Senate Testimony*, WASH. POST, Oct. 29, 2001, at A3 (asserting that Interior Secretary Gail Norton "cherry-picked" data from the Fish and Wildlife Service to present a false picture of the impact of drilling in ANWR on caribou populations). However, it is unlikely that a conference version of the bill would include drilling in ANWR.

218. See H.R. 4, § 3301 (establishing a credit for producing oil and gas from marginal wells).

219. See *id.* §§ 6201-6234 (establishing royalties in kind for offshore oil and gas development).

220. See *id.* § 3118 (establishing credit for production in qualifying advanced clean coal technology).

221. See *id.* § 3117 (establishing credit for investments in qualifying advanced clean coal technology).

222. See *id.* § 3213 (establishing rules and exceptions to prepayments for natural gas).

223. See *id.* § 3207 (establishing tax-exempt bond financing for certain electric facilities).

224. See *id.* §§ 2341-2344 (authorizing appropriations for development of nuclear energy technology).

225. See *id.* § 3107 (establishing credit for energy efficient appliances).

226. See *id.* §§ 901-903 (establishing provisions on waste reduction and use of alternatives).

227. See *id.* §§ 701-702 (establishing a renewable energy production incentive).

228. See *id.* § 2 (declaring Congress should take all actions necessary in the areas of conservation, efficiency, alternative source, technology development, and domestic production to reduce the U.S. dependence on foreign energy sources).

goal of the bill is to improve environmental quality by reducing emissions of air pollutants and greenhouse gases.²²⁹

Despite the worthy goal of reducing GHG emissions, it seems unlikely that this bill will accomplish that goal. In terms of total expenditures over the next five years, the Joint Committee on Taxation estimates that conservation provisions in the bill will cost about \$6.9 billion, or thirty-seven percent of the total cost of the bill.²³⁰ "Reliability" and production provisions, all of which will encourage the use of GHG emitting fuels, are estimated to cost \$11.8 billion, or sixty-three percent of the total cost of the bill.²³¹ The original Senate bill, "The Energy Tax Incentives Act of 2002," in contrast, spends \$5.425 billion on provisions similar to those labeled "conservation provisions" in the SAFE Act and only \$750 million on oil and gas incentives.²³² The Senate bill, after several amendments, passed on April 25, 2002.²³³ As amended, the Energy Tax Incentives Act spends \$5.9 billion on conservation provisions and \$7.8 billion on reliability and production provisions.²³⁴ Given the shift towards production and "reliability" created by the amendments to the original Senate bill, the conference agreement can hardly be expected to move farther in the direction of conservation.

"Reliability" provisions include increased benefits from depreciation and depletion of fossil fuel assets.²³⁵ The bill reduces the depreciation period for petroleum refining assets from ten years to

229. *See id.* § 2003(3) (listing the eight purposes for the proposed Act including the reduction of air, water, and other environmental impacts, such as greenhouse gases, of energy production, distribution, transportation, and use processes).

230. J. COMM. ON TAXATION, ESTIMATED REVENUE EFFECTS OF A CHAIRMAN'S AMENDMENT IN THE NATURE OF A SUBSTITUTE TO THE "ENERGY POLICY ACT OF 2001" SCHEDULED FOR MARKUP BY THE COMM. ON WAYS AND MEANS ON JULY 18, 2001, JCX-62-01 (2001) [hereinafter HOUSE REVENUE EFFECTS].

231. *Id.*

232. Compare HOUSE REVENUE EFFECTS, *supra* note 230 (establishing that SAFE includes "clean coal," "clean-fuel vehicles," and an extension of the I.R.C. § 45 credit for producing electricity from certain sources in its "conservation provisions."), with J. COMM. ON TAXATION, ESTIMATED REVENUE EFFECTS OF THE "ENERGY TAX INCENTIVE ACT OF 2002," AS ORDERED REPORTED BY THE COMM. OF FINANCE ON FEBRUARY 13, 2002, JCX-8-02 (2002) [hereinafter SENATE REVENUE EFFECTS] (documenting the loss in revenues to Oil and Gas Provisions to be nearly twice those of Conservation and Energy Efficiency Provisions). Also, the estimates for the Senate bill do not account for subsequent amendments added prior to the bill's passage.

233. 148 CONG. REC. S3342-3418 (daily ed. Apr. 25, 2002).

234. J. Comm. on Taxation, Comparison of the Estimated Budget Effects of Division C. of H.R. 4, the "Energy Tax Policy Act of 2001," as Passed by the House of Representatives and Division H. of H.R. 4, the "Energy Tax Incentives Act of 2002," and Certain Mandates as Amended by the Senate, May 23, 2002, JCX-44-02 (2002), available at <http://www.bailoutwatch.orggovreports/JCTComparisonOfHouseSenateEnergyBills.pdf>.

235. *See* H.R. 4, §§ 3201-3213 (relating to credit granted under the reliability provision).

seven years, thereby accelerating the tax benefits of such an investment.²³⁶ The SAFE Act also increases the barrel-per-day limit for percentage depletion by independent refiners from 50,000 barrels per day to 75,000 barrels per day.²³⁷ Production provisions include a new \$3 per barrel or \$0.50 per 1000 cubic feet of natural gas tax credit for oil and gas production from marginal wells,²³⁸ suspension of the limitation on percentage depletion based on taxable income,²³⁹ an election to expense certain expenditures related to oil and gas exploration,²⁴⁰ extension of the carry-back period for losses from oil and gas properties,²⁴¹ repeal of the alternative minimum tax IDC preference,²⁴² and a provision permitting the offset of alternative minimum tax by the enhanced oil recovery credit.²⁴³ The Energy Tax Incentives Act contains similar provisions, except it requires two year amortization of certain expenditures related to oil and gas exploration and does not change any of the alternative minimum tax preferences or extend the carryback period for losses from oil and gas properties.²⁴⁴

Conservation provisions in the SAFE Act include a fifteen percent credit for residential solar hot water (up to \$2,000),²⁴⁵ increased tax credit for qualified electric vehicles,²⁴⁶ a tax credit for energy efficient appliances,²⁴⁷ a tax credit for increasing the energy efficiency of homes (either existing or new construction),²⁴⁸ the allowance of a

236. See Rev. Proc. 87-56, 1987-2 C.B. 674, 678 (providing current recovery period of costs, through depreciation, at ten years).

237. H.R. 4, § 3206(a).

238. *Id.* § 3301.

239. See *id.* § 3302 (discussing temporary suspension of limitation based on sixty-five percent of taxable income and extension of suspension of taxable income limit with respect to marginal production).

240. See *id.* § 3303(a) (relating to deductions for delay rental payments).

241. *Id.* § 3305. Generally, net operating losses can only be carried back two years and carried forward twenty years. I.R.C. § 172(b)(1)(A) (West 2002). Carrying back net operating losses permits operating losses in year 5 to be used against net income in year 3 or 4, thus producing a refund of the tax liabilities in years 3 and 4; if the net operating losses in year 5 exceed the net income in years 3 and 4, then those losses can be carried forward to year 6, to offset any income in that year. Carry-backs are more valuable than carry-forwards, because they provide a current benefit (i.e., a refund) versus a future benefit (potential reduction in tax liability in future years).

242. See H.R. 4, § 3308 (allowing temporary repeal of alternative minimum tax preference for intangible drilling costs).

243. *Id.* § 3309.

244. SENATE REVENUE EFFECTS, *supra* note 232, at 2-3.

245. See H.R. 4, § 3102 (expanding credit for electricity produced from renewable resources).

246. *Id.* § 3106.

247. *Id.* § 3107.

248. See *id.* §§ 3108-3109 (establishing credit for energy efficiency improvements to existing homes and business credit for construction of new energy efficient homes).

deduction for certain energy efficient commercial building properties,²⁴⁹ and a provision permitting offset of non-business energy credits against the alternative minimum tax.²⁵⁰ The Energy Tax Incentives Act contains similar provisions, except that the tax credit for residential solar property includes fuel cell and wind energy properties and the new homes tax credit is more targeted.²⁵¹

As Senator Barbara Boxer said, “[n]o solution to the energy problem is complete without addressing the need to improve the demand side of the equation.”²⁵² Rather than increasing the already large subsidies given to fossil fuel producers under current law, new proposals should aim to eliminate the preferential treatment for oil and gas to give a market incentive to switch to renewable fuels.²⁵³ A bill that included the conservation provisions of the SAFE Act of 2001 and the Energy Tax Incentives Act and repealed the present law granting subsidies for fossil fuels would go a long way towards stemming GHG emissions and global warming.²⁵⁴ In addition, some have advocated imposing a carbon tax on GHG emitters.²⁵⁵ Unfortunately, neither the House nor the Senate considered including a carbon tax in their energy tax bills.²⁵⁶ Others have proposed domestic carbon trading schemes.²⁵⁷ Oregon has already implemented a carbon trading program.²⁵⁸ California just enacted a

249. *Id.* § 3110.

250. *See id.* § 3114 (declaring new nonrefundable personal credits against regular and minimum taxes).

251. *See* SENATE REVENUE EFFECTS, *supra* note 232, at 1 (granting credit for residential fuel cell, solar, and wind energy properties). The new homes tax credit is limited to \$1,250 for homes that are thirty percent more energy efficient and up to \$2,000 for homes that are fifty percent more energy efficient.

252. 147 CONG. REC. S644 (daily ed. Jan. 29, 2001) (statement of Sen. Boxer).

253. *See, e.g.*, I.R.C. § 29(a) (West 2002) (providing enhanced oil recovery credit by allowing a generous credit with a minimal phase-out clause, thus making the credit very attractive to oil producers).

254. *See* H.R. 4, § 2003(3) (stating that reducing GHGs is one of its purposes and that the SAFE Act of 2001 will provide incentives to reduce GHG emissions).

255. *See* Amy C. Christian, *Designing a Carbon Tax: The Introduction of the Carbon-Burned Tax (CBT)*, 10 UCLA J. ENVTL. L. & POL'Y 221, 223 (1992) (arguing that instituting an energy tax would be a wise policy decision). Many countries, including Japan, Sweden, and the U.K., have already begun unilateral emissions reductions and ministers from Germany, Denmark, and the Netherlands, joined by Italy, Belgium and Luxembourg, have recommended to the EC that it propose formal carbon tax legislation. *EC Ministers Ask EC Commission to Make Formal Energy Tax Proposal*, Daily Tax Rep. (BNA) No. 241, at G-3 (Dec. 16, 1991).

256. *See Adding Up the Energy Bills*, *supra* note 212, at A20 (criticizing Congress for not including a carbon tax in the energy bill, claiming it is the most efficient way to promote conservation).

257. *See* Dernbach, *supra* note 11, at 10978 (introducing an emissions trading scheme that enables a country to get credit toward its required emissions reduction by reducing CO₂ emissions in another country).

258. *See id.* at 10970 (indicating that Oregon has taken a unique approach to new electricity generating facilities).

law requiring reduced GHG emissions from cars and trucks.²⁵⁹ Last year Massachusetts adopted state regulations requiring carbon dioxide reductions by power plants.²⁶⁰ New Hampshire also recently enacted carbon trading legislation.²⁶¹ The DOE collects voluntary information about GHG emissions, which should facilitate determination of results from abatement programs.²⁶² Two bills proposed in 1999 would give companies credit under any subsequently passed Federal GHG emissions statute for their voluntary GHG abatement.²⁶³ The Kyoto Protocol permits the use of carbon sinks to reduce total GHG emissions.²⁶⁴ Under the Kyoto Protocol, developed countries like the United States can only count carbon sequestration by forests, although grasses and soils also store CO₂.²⁶⁵

259. Gary Polakovic & Miguel Bustillo, *Davis Signs Bill to Cut Greenhouses Gases*, L.A. TIMES, July 23, 2002, at A1 (requiring new cars sold in California to emit less GHGs).

260. 921 Mass. Reg. 47 (May 11, 2001).

261. Paula Tracy, *Pollution Law a First*, THE UNION LEADER, May 10, 2002, at A2.

262. See ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, VOLUNTARY REPORTING OF GREENHOUSE GASES 2000 SUMMARY, Rep. No. DOE/EIA-0608 (2002), available at <http://www.eia.doe.gov/oiaf/1605/vrrpt/summary/index.html> (last modified May 5, 2002).

263. Credit for Early Reductions Act, S. 547, 106th Cong. (1999).

264. See SEBASTIAN OBERTHUR & HERMANN E. OTT, THE KYOTO PROTOCOL INTERNATIONAL CLIMATE POLICY FOR THE 21ST CENTURY 134 (Alexander Carius & R. Andreas Kraemer eds., Springer 1999) (explaining that when developing countries are measuring their progress toward targeted emission levels, they are to include verifiable changes "resulting from direct human-induced land use change and forestry activities," based on changes in forests since 1990) (quoting Article 3.3 of the Kyoto Protocol). Although developed countries can plant or replant forests to absorb CO₂, they must also count forest losses. See Dernbach, *supra* note 11, at 10939 (discussing the various provisions of the Kyoto Protocol).

265. See R.J. Scholes & I.R. Noble, *Storing Carbon on Land*, 294 SCI. 1012, 1013 (2001), stating,

[t]he existing land sink could, in theory, be enhanced by up to 1.6 PgC/year by 2010 through demonstrated carbon-storing approaches to forest, cropland, and grazing land management[; t]his rate of storage could be maintained for several decades at relatively low cost compared with the cost of reducing fossil fuel emissions and in most cases without compromising other land use objectives.

Id.; Pete Morton, *The Economic Benefits of Wilderness: Theory and Practice*, 76 DENV. U. L. REV. 465, 489-90 (1999) ("The economic benefits of storing carbon in the soils of a wildland network could play a significant role in protecting the temperate rain forests of Alaska, for example, where up to seventy five percent of forest carbon is stored in the soils.").

Protected by the forest canopy, soil carbon can be stored indefinitely (subject to fluctuations caused by natural disturbances) if these forests are reserved in a wildland network. If the forests are logged, however, these soils can quickly decompose and lose their carbon through exposure to increased sunlight, temperature, and wind.

Id.

*B. Forests**1. Benefits*

Reducing fossil fuel use and conserving forests for carbon sequestration would have benefits reaching beyond GHG abatement.²⁶⁶ Burning fossil fuels produces pollutants that adversely affect human health.²⁶⁷ Some researchers assert that air pollution from fossil fuel use “already [is] sickening or killing millions throughout the world.”²⁶⁸ Reducing emissions from just nine coal-fired power plants in the Midwest could avoid 300 deaths, 2,000 respiratory and cardiac hospital admissions, 10,000 asthma attacks, and 400,000 lost workdays due to respiratory symptoms.²⁶⁹ In 1995, the World Health Organization (“WHO”) and the World Resources Institute (“WRI”) estimated that nearly 700,000 air-pollution related deaths occur each year.²⁷⁰ Based on analysis of published studies, researchers concluded that GHG mitigation in four urban areas, Mexico City, New York City, Santiago (Chile), and Sao Paulo (Brazil), could save 64,000 lives through 2020.²⁷¹ President Bush has announced a plan to reduce pollution, called “The Clear Skies Initiative,” which employs a cap-and-trade strategy to cut sulfur dioxide, nitrogen oxides, and mercury emissions.²⁷² The initiative sets

266. See, e.g., *infra* note 272 and accompanying text (listing the benefits that would flow from closing just a few coal-fired energy plants, including saving hundreds of lives and preventing thousands of serious illnesses).

267. See Rebecca M. Thomas, *Asthma U.S. cases: 17 million; Deaths: about 5,300 a year*, WASH. POST, Jan. 1, 2002, at F4 (reporting that scientists suspect pollutants, such as carbon monoxide, nitrogen oxides, sulfur oxides and hydrocarbons, play a role in the dramatic increase in the prevalence of asthma since the early 1980s); see also William Booth, *Study: Pollution May Cause Asthma*, WASH. POST, Feb. 1, 2002, at A2 (discussing recent study results that provide evidence that smog not only aggravates childhood asthma, but can actually cause it); Union of Concerned Scientists, *The Hidden Costs of Fossil Fuels* (arguing that fossil fuels produce particulates that irritate the respiratory system, that the production, transportation and use of oil can cause water pollution, and that coal mining can leave acid residues that cause the affected land to be barren), at <http://www.ucsusa.org/energy/brief.hidden.html> (last visited Aug. 9, 2002) (on file with the American University Law Review).

268. Luis Cifuentes et al., *Hidden Health Benefits of Greenhouse Gas Mitigation*, 293 SCI. 1257, 1257 (2001). Indeed, the serious impact of air pollution on health has long been recognized. When the severely asthmatic King William III of England moved his residence from London to Hampton to avoid the pervasive smog of London, his ministers complained about how inaccessible the monarch was at his rural location. The king reportedly replied, “[d]o you want to see me dead?” 5 LORD MACAULAY, HISTORY OF ENGLAND 258 (Knickerbocker ed. 1906).

269. Cifuentes, *supra* note 268, at 1257.

270. WORLD HEALTH ORG., HEALTH AND ENVIRONMENT IN SUSTAINABLE DEVELOPMENT: FIVE YEARS AFTER THE EARTH SUMMIT 5 (Geneva 1997).

271. See Cifuentes, *supra* note 268, at 1258 (concluding that GHG mitigation would avoid 65,000 chronic bronchitis cases, and 37 million person-days of restricted activity or work loss).

272. See Press Release, The White House, Fact Sheet: President Bush Announces

a cap on the total emissions, and then permits free market trading of emissions allowances. “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.”²⁷³ While a cap-and-trade strategy has had some success,²⁷⁴ Professor David Driesen notes that cap-and-trade strategies can stifle innovation and result in concentrated local pollution.²⁷⁵

Reducing GHG emissions by conserving forests confers additional benefits; forests have recreational value, as well as being a potential source for life-saving pharmaceuticals.²⁷⁶ Urban trees serve as a kind of outdoor air-conditioner, providing shade and evaporative cooling by evaporation of water off leaves.²⁷⁷ Unlike his son, former President George H. W. Bush advocated a “no-regrets” approach to national environmental policy, which would not only reduce GHG emissions, but also provide other societal benefits.²⁷⁸ These policy options stressed “energy efficiency, conservation, renewable energy, planting trees to enhance CO[2] sequestration from the atmosphere, and substitution of fuels producing little or no CO[2].”²⁷⁹ In fact, one commentator said that former President Bush made trees “a kind of fetish of his Administration.”²⁸⁰ For example, the President allocated \$175 million to plant 1 billion trees in 1990.²⁸¹ Calling trees “the oldest, cheapest, most-efficient air purifier on Earth,” Bush also

Clear Skies & Global Climate Change Initiatives (Feb. 14, 2002) (explaining the major provisions of the initiative), *available at* <http://www.whitehouse.gov/news/releases/2002/02/print/20020214.html> (last visited June 3, 2002).

273. David M. Driesen, *Free Lunch Or Cheap Fix?: The Emissions Trading Idea and the Climate Change Convention*, 26 B.C. ENVTL. AFF. L. REV. 1, 36 (1998).

274. See Paul L. Joskow et al., *The Market for Sulfur Dioxide Emissions*, 88 AM. ECON. REV. 669 (1998) (providing empirical analysis that a cap-and-trade strategy creates an efficient emission rights market).

275. See Driesen, *supra* note 273, at 71 (arguing that inherent inefficiencies in the cap-and-trade strategy makes it a cheap-fix).

276. See Norah Deakin Davis, *Decade of the Tree; Meditation on Trees and Tree Planting*, AM. FORESTS, Jan. 1991, at 21 (arguing that the bark of some trees have known human health benefits including a cure to several kinds of cancer).

277. See HEAT ISLAND GROUP, EVAPOTRANSPIRATION (noting that a single properly watered tree can evapotranspire up to forty gallons of water a day, the equivalent of four hours of heat produced by a small electric space heater), *at* <http://eetd.lbl.gov/heatlands/Vegetation/Evapotranspiration.html> (last modified June 16, 1999) (on file with the American University Law Review).

278. See President’s Remarks to the Intergovernmental Panel on Climate Change, I PUB. PAPERS 157 (Feb. 5, 1990) (outlining the U.S. environmental policy under the first Bush administration), *available at* <http://bushlibrary.tamu.edu/papers/1990/90020502.html> (last visited June 1, 2002).

279. Murkowski, *supra* note 76, at 358.

280. Lance Morrow, *Forest of Dreams*, TIME, Feb. 12, 1990, at 74 (discussing the Earth Core’s treatment under different presidential administrations).

281. *Id.*

declared, “[w]e need to reforest this bountiful Earth.”²⁸² Taking the lead on conserving forests would also set a good example for other nations facing rapid deforestation.²⁸³

2. Capacity

Forests are already playing a vital role in solving the problem of global warming.²⁸⁴ The carbon sequestration capacity of U.S. forests is significant.²⁸⁵ The EPA estimated annual U.S. carbon sequestration at 270 million metric tons carbon equivalent.²⁸⁶ This means that U.S. forests and other carbon sinks offset approximately 17.7% of total U.S. anthropogenic carbon dioxide emissions from 1990 through 1999.²⁸⁷ However, increasing forest harvests and land-use changes reduced the total net carbon sequestration resulting from land use and forestry activities by approximately seven percent between 1990

282. Assoc. Press, *Bush Urges Tree Planting to Cleanse Air: Greening of America Is Low-Cost Part of Environmental Stance*, L.A. TIMES, Sept. 18, 1989, at A2; see also Editorial, *Reagan, Spare That Tree!*, WASH. POST, Aug. 17, 1980, at C6 (refuting the contention that a majority of air pollution comes from plants and trees); Manuel Lerdau et al., *Plain Production and Emission of Volatile Organic Compounds*, BIOSCIENCE, June 1997, at 373 (noting that urban areas with large amounts of isoprene-emitting vegetation, such as the replacement species for chestnut trees on the East coast, can double the biomass of isoprene-emitting species); Christine Mlot, *A Clearer View of Why Plants Make Haze*, 268 SCI. 641 (May 5, 1995) (reporting that new realizations that natural sources of hydrocarbons can swamp any human contributions sparked several government agencies to rethink ozone-control strategies to include efforts to curb nitrogen oxide).

283. See *Big Timber's Big Lies*, *supra* note 14, at 62 (arguing that domestic forest preservation can increase international momentum for further forest conservation efforts); see also Tracy Walmer, *Bush Plants Seed Against Pollutants*, USA TODAY, Jan. 31, 1990, at A3 (reporting that domestic forest preservation can increase the U.S. image abroad by increasing U.S. credibility on environmental issues).

284. See Steven C. Wofsy, *Where Has All the Carbon Gone?*, 292 SCI. 2261 (June 22, 2001) (arguing that a relatively stable amount of CO₂ accumulating in the atmosphere over the last twenty years despite a forty percent increase in emission rates can be attributed to forests and other components of the biosphere, such as soil and the ocean); see also Bruce A. McCarl & Uwe A. Schneider, *Greenhouse Gas Mitigation in U.S. Agriculture and Forestry*, 294 SCI. 2481 (Dec. 21, 2001) (reporting that afforestation in the United States will reduce U.S. agricultural production, thus increasing international production and likely increasing GHG emissions in other countries creating leakage); Carol C. Barford et al., *Factors Controlling Long- and Short-Term Sequestration of Atmospheric CO₂ in a Mid-Latitude Forest*, 294 SCI. 1688 (2001) (Harvard Forest study encouraging the use of forests for carbon sequestration); Jim Gillon & Dan Yakir, *Influence of Carbon Anhydrase Activity in Terrestrial Vegetation on the O-18 Content of Atmospheric CO₂*, 291 SCI. 2584 (2001) (“The oxygen-18 content of atmospheric carbon dioxide (CO₂) is an important indicator of CO₂ uptake on land We show large differences in the activity of carbonic anhydrase (which catalyzes CO₂ hydration and ¹⁸O exchange in leaves) among major plant groups that cause variations in the extent of ¹⁸O equilibrium.”).

285. See EIA: EMISSIONS OF GREENHOUSE GASES, *supra* note 60, at 69 (combining sequestration studies and estimates by the Environmental Protection Agency, U.S. Forestry Service, and Department of Agriculture).

286. *Id.*

287. *Id.*

and 1999.²⁸⁸ Harvard Forest researchers found that long-term rates of carbon sequestration were directly affected by the forest's management.²⁸⁹ Some researchers note the negative effects of forestry based carbon sequestration.²⁹⁰ It may be hard to determine the net CO₂ effect of forestry projects because of difficulty in baseline measurement, difficulty in measuring CO₂ flows, and leakage concerns.²⁹¹ Forestry projects could also pull funds from technology development.²⁹² Forestry projects are relatively low cost, compared to technology development, and so may lower the price of tradable clean development mechanism ("CDM") credits.²⁹³ However, researchers that note the negative aspects of forestry projects also note their collateral benefits: protecting biodiversity, preventing soil erosion, and improving watershed management.²⁹⁴ Other researchers argue that forest conservation is inconsistent with maximizing carbon sequestration and advocate clear-cutting followed by replanting.²⁹⁵ Clear-cutting, though, disturbs forest soils that also store significant amounts of carbon.²⁹⁶ Newly planted saplings take many years before reaching maximum carbon storage capacity.²⁹⁷ A newly planted clear-cut does not protect biodiversity, prevent soil erosion, or improve watershed management.²⁹⁸ Mature forests continue to absorb carbon, while providing these other benefits.²⁹⁹

288. *Id.*; see also Wofsy, *supra* note 284, at 2263 (explaining that timber harvesting increased because U.S. land use decisions are driven largely by market pressures). Wofsy further notes that the United States has never considered carbon sequestration in making land use decisions. *Id.*

289. See Barford, *supra* note 284, at 1690 (noting that the age structure, species composition, and health of a forest affects its carbon absorption capacity, and can be manipulated by forest management strategies).

290. See Wolfram Kagi & Oliver Langauer, *Misconceptions on Forestry CDM*, JOINT IMPLEMENTATION Q. 6 (Dec. 2000) (identifying five misconceptions of forestry management), available at <http://www.northsea.nl/jiq/4-2000.pdf> (last visited Aug. 9, 2002).

291. *Id.*

292. See *id.* (arguing that because forest projects tend to be more economical, they tend to attract funds that might otherwise go to technology projects).

293. *Id.*

294. *Id.*

295. See Dan Ferber, *Forests: No Greenhouse Antidote?*, 293 SCI. 1425 (2001) (providing evidence that at least one type of forest does not requester carbon).

296. See Wofsy, *supra* note 284, at 2263 (explaining that organic matter such as wood debris and soil sequester significant amounts of CO₂).

297. See MICHAEL TOTTEN, GETTING IT RIGHT: EMERGING MARKETS FOR STORING CARBON IN FORESTS 19 (1999) (arguing that even fast-growing tree species take decades to reach their carbon maximizing potential), available at www.wri.org/pdf/ftcarbonbro/pdf.

298. See *id.* (citing estimates that the conversion of five million hectares of old-growth forests to younger plantations in Washington and Oregon created significant carbon losses).

299. See Barford, *supra* note 284, at 1688 (arguing that mid- to large-sized forests can be manipulated to increase carbon sequestration); TOTTEN, *supra* note 297, at 19

Therefore, mature forests should be harvested sustainably, while areas that have already been deforested should be reforested.³⁰⁰

3. *Forest conservation*

The concept of conserving forests inspires passionate support and passionate resistance—in the United States, forests and timberlands are battlegrounds. The logging and paper industries seek to use both public and private timberlands to provide profits for shareholders and jobs for employees. The environmental movement, along with ordinary Americans, seeks to preserve forests for their value as habitat and just to know that forests still exist. The battle to save trees can take dramatic and sometimes humorous forms.³⁰¹ Can forests be preserved to achieve both environmental health and economic flexibility? As we enter the twenty-first century, the world's forests are shrinking at an alarming rate.³⁰² Eighty percent of the world's original forest cover has been lost.³⁰³ Tropical forests are being deforested at a rate of fifteen million hectares per year.³⁰⁴ In Russia, which contains twenty-two percent of the world's forests, the

(arguing that old-growth forests offer large and up-front carbon offset opportunities).

300. See TOTTEN, *supra* note 297, at 18 (outlining a three-part strategy to maintain current carbon stocks, increase carbon reservoirs through a combination of forest management strategies, and displace fossil fuel use with sustainable biomass).

301. See *Woman Strikes Deal With Lumber Company to Leave Redwood Home*, N.Y. TIMES, Dec. 19, 1999, at A39 (reporting that Julia “Butterfly” Hill spent two years living high in an ancient redwood she named Luna, coming down only after reaching an agreement with the tree's owners, the Pacific Lumber Company, to spare the tree and a 2.9 acre buffer zone around it); Michelle Locke, *A Striptease to Save Trees*, THE NEWS J., Nov. 13, 2000, at A3 (stating that Donna Nieto, “poet, performer, conservation crusader, and the new nude thing on the eco-protest scene” removes her clothing to campaign against clear cutting and to stop logging trucks); *The Simpsons: Homer to the Max* (FOX television broadcast, Feb. 7, 1999) (showing one instance in which a fictional television family engaged in tree-saving activism). In *Homer to the Max*, Homer is invited to a party of Springfield's elite by his new best friend, Trent Steele. *Id.* At the party, Trent makes a speech and asks, “[i]f a tree falls in the forest, will you make a sound?” *Id.* To rousing assent, the party-goers board the protest bus and Homer and Marge are next seen chained to enormous redwood trees. *Id.* In *The Simpsons, Lisa the Tree Hugger*, Lisa attempts to impress a handsome “eco-hunk” by camping out in a giant redwood destined for logging. *The Simpsons, Lisa the Tree Hugger* (FOX television broadcast, Nov. 9, 2000) (providing another example of the humorous forms that the battle to save trees can take). In both *Simpsons* episodes, the trees failed to survive. See also *Hawn Protests Use of Her Name*, L.A. TIMES, July 29, 2000, at F2 (reporting Goldie Hawn objected after the Bureau of Land Management named a timber sale near Oregon's Fawn Creek the “Goldie Fawn”); *Hawn's In a Huff Over Timber Tribute*, THE NEWS J., Sept. 27, 2000, at A4 (speaking through her spokeswoman, Ms. Hawn said that she did not “want to see beautiful timber land destroyed in her name”).

302. See TOTTEN, *supra* note 297, at 17 (stating that the world could lose 650 million hectares of tropical forest over the next sixty years).

303. *Id.*

304. *Id.*; see also WEBSTER'S UNABRIDGED DICTIONARY 885 (1996) (defining a hectare as approximately two and a half (2.5) acres).

government recently acted to lift logging restrictions.³⁰⁵ In contrast, China has made a concerted effort to stem deforestation and encourage planting of trees.³⁰⁶ As a result, the net uptake of CO₂ by forests in China has increased from 360 Tg in 1990 to 410 Tg in 2000.³⁰⁷ In the United States, although forests cover thirty-three percent of the land area—roughly seventy percent of their extent at the time of European colonization—only twenty percent of old growth forest remains.³⁰⁸

a. History

Arguably the presence of forests was the single most important factor to the success of human civilization.³⁰⁹ For over five thousand years, until the middle of the nineteenth century, wood constituted the principal fuel and building material.³¹⁰ Without wood, man would not have fire: without fire, man would not have bread, pottery to bake the bread, or metal tools to harvest the wheat.³¹¹ With ready access to wood, civilizations grew strong and prospered.³¹² They built

305. See Mark Hertsgaard, *Russia is an Eco-Disaster—and It Just Got Worse*, THE NEWS J., July 24, 2000, at A7 (reporting that the Russian President's plan to improve the investment climate for logging will decrease fresh water supplies and lead to plant and animal extinctions).

306. See Peichang Zhang et al., *China's Forest Policy for the 21st Century*, 288 SCI. 2135, 2135-36 (2000) (explaining that although China's demand for timber resulted in a three fold increase in volume of timber harvested annually from the 1950s to the 1990s, in 1998, China established a new forest policy called the Natural Forest Conservation Program (NFCP) which significantly restricts cutting in natural forest areas); David G. Streets et al., *Recent Reductions in China's Greenhouse Gas Emissions*, 294 SCI. 1835 (2001) (explaining that carbon dioxide levels decreased in China because of a radical reform of its coal and energy industries); see also Philip Pan, *Environmentalists Rip Chopsticks*, ARIZ. REPUBLIC, Feb. 11, 2001, at A30 (describing China's budding environmental movement that urges the use of reusable chopsticks, decrying the waste of trees for the manufacture of wooden chopsticks); *Chinese Use 25 Mil Trees for Utensils*, ARIZ. REPUBLIC, Feb. 11, 2001, at A30 (stating that China uses twenty-five million trees annually to produce 45 billion pairs of disposable chopsticks).

307. See Streets et al., *supra* note 306, at 1835 (describing that China's promotion of afforestation resulted in an increase in the uptake of CO₂). 1 Teragram (tg) of CO₂ equals 1 million tons.

308. See, e.g., *Why Mature Forests Must be Protected*, BRIEFING DOC. (N.W. Old-Growth Campaign Bellingham, Wash.), May 31, 2002 (explaining only twenty percent of the original old growth forests remain in the Pacific Northwest and that this depletion will have severe consequences on the environment), at <http://www.nwoldgrowth.org/infostation/infostation2.cfm?doctype=briefingdocument> (last visited Aug. 9, 2002) (on file with the American University Law Review).

309. See JOHN PERLIN, *A FOREST JOURNEY: THE ROLE OF WOOD IN THE DEVELOPMENT OF CIVILIZATION* 26 (1989) (arguing that wood played a crucial role in the development of civilization).

310. See *id.* at 25 (stating that the tree supply declined as wood was used for fuel and building during the Iron Age).

311. See *id.* at 26 (considering how wood and heat contributed to the development of agriculture, construction materials, and food supply).

312. See *id.* at 28 (stating that "wood is the foundation upon which early societies

great ships and became wealthy traders.³¹³ They built great houses. When wood supplies ran low, societies moved on in search of wood, or conquered neighbors for their wood, or simply perished.³¹⁴ Ancient civilization also experienced the consequences of deforestation: soil erosion, floods, and drought, and perhaps even experienced global warming.³¹⁵ The New World's vast timber resources acted as an impetus for England's colonization of America.³¹⁶ Unfortunately for England, America's forests also strengthened the power of the revolutionaries, paving the way for independence.³¹⁷ After the American Revolution, forest resources helped the United States become a world leader.³¹⁸ Travelers visiting the United States after independence described Virginia as "an immense forest, . . . almost without bounds,"³¹⁹ and New York as "nothing but one vast forest."³²⁰ In the late eighteenth century, a French naturalist who traveled through Kentucky, Indiana, Illinois, and Michigan noted that "the most striking feature of America is the rugged and dreary prospect of an almost universal forest."³²¹ The limitless American forest "was at once the source of subsistence and a wilderness whose conquest was the key to the future of plenty that early Americans sought for themselves and their descendants."³²²

b. Value of timber

Conserving trees will mean fewer trees cut and marketed. Can the environmental value of trees be distinguished from the market value

were built").

313. *See id.* at 27 (explaining that ships, carts and chariots were made of wood).

314. *See id.* at 25 (explaining that without wood, the great ancient civilizations of Greece, Egypt, and Rome would not have emerged).

315. *See* Wallace S. Broecker, *Was the Medieval Warm Period Global?*, 291 *SCI.* 1497, 1498 (2001) (arguing that there have been a series of global warmings, oscillating over 100,000 years and lasting 1500 years each). The Medieval Warm Period lasted from approximately 800 to 1200 A.D. *Id.*

316. *See* PERLIN, *supra* note 309, at 263 (explaining that plantation owners in the West Indies looked to New England for a permanent supply of wood when their supply diminished).

317. *See id.* at 323 (stating that wood, and the resources the American colonies had access to, gave them the power to defeat the British).

318. *See id.* at 333 (quoting Tench Coxe, who observed that "no country, so well accommodated with navigation and adapted to commerce and manufactures, possesses as great a treasure of wood and timber as did the United States.").

319. JOHN F. D. SMYTH, *I A TOUR IN THE UNITED STATES OF AMERICA* 36 (1784).

320. GEORGE W. PIERSON, *TOCQUEVILLE AND BEAUMONT IN AMERICA* 190 (1938). Tocqueville's traveling companion, Gustave Beaumont, similarly concluded that "the whole country is but a forest." *Id.* at 193.

321. C.F. VOLNEY, *A VIEW OF SOIL AND CLIMATE OF THE UNITED STATES OF AMERICA* 6 (1804).

322. THOMAS R. COX ET AL., *THIS WELL WOODED LAND: AMERICANS AND THEIR FORESTS FROM COLONIAL TIMES TO THE PRESENT* 12 (1985).

of cut timber? Early cases discussed the value of timberlands, concluding that the value of wild lands is limited to their income producing potential.³²³ The existence of a market for timber enables “value” to be determined through exchange and quantified by price.³²⁴ In 1997, the market value of U.S. timber related products totaled \$97.8 billion dollars: about 1.2% of the national GDP for that year.³²⁵ Paper products account for approximately fifty-nine percent of this amount.³²⁶ The United States and Canada are the world’s leading producers and exporters of “market pulp,” primarily used to make paper products.³²⁷ Americans consumed 235 board feet of wood products per capita.³²⁸ In the 1990s, each 1 billion cubic feet of timber harvested in the U.S. was used for the following: 88,000 homes; 5 million tons of pulp, paper and paperboard products; 25 million shipping pallets; 120 trillion BTUs of energy; and nearly 4 million tons of miscellaneous uses such as furniture, fence posts and telephone poles, wood used in home remodeling, and exports.³²⁹ Single-family housing is the largest consumer of lumber products.³³⁰ The average housing unit consumes 14,000 board feet of lumber.³³¹

323. See, e.g., *Bartlett v. Pickering*, 92 A. 1008, 1010 (Me. 1915) (because wild lands in Maine are generally valuable only for income producing purposes, it must have been contemplated that the cutting and sale of marketable trees would be allowed); *Williard v. Williard*, 56 Pa. 119, 128-29 (Pa. 1867) (rejecting a claim of waste against a life tenant engaged in “cutting and rafting timber,” where “the pine lands . . . are often valuable only for their timber, and are bought solely for this use”); see also *Bradstreet v. Huntington*, 30 U.S. (5 Pet.) 402, 448 (1831) (characterizing wilderness as essentially worthless until converted to human use, which reflects the prevailing mindset of the era that underdeveloped regions were useless, and thought of as “waste” land); *Davis v. Mason*, 26 U.S. (1 Pet.) 503, 507 (1828) (lamenting that property in a title dispute in Kentucky consisted of “waste and vacant lands” in “a mere uncultivated country, in wild and impenetrable woods, in the sullen and solitary haunts of beasts of prey . . .”); *Massie v. Watts*, 10 U.S. (6 Cranch) 148, 164 (1810) (characterizing Virginia land as “an immense unexplored wilderness, covered with savages equally fierce and hostile”); *Pierson v. Post*, 3 Cai. R. 175, 175 (N.Y. 1805) (referring to “certain wild and uninhabited, unpossessed and waste land”).

324. See *Morton*, *supra* note 265, at 76 (explaining that placing a value on wilderness will make it possible to compare it to other commodities, such as timber).

325. U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES 697 tbl. 1147 (1999) [hereinafter 1999 STATISTICAL ABSTRACT].

326. *Id.*

327. U.S. DEP’T OF COMMERCE, U.S. INDUSTRIAL AND TRADE OUTLOOK 10-7 (2000) [hereinafter 2000 INDUSTRIAL AND TRADE OUTLOOK].

328. 1999 STATISTICAL ABSTRACT, *supra* note 325, at 700 tbl. 1154.

329. H. JOHN HEINZ III CTR. FOR SCI., ECON., AND THE ENV’T, THE STATE OF THE NATION’S ECO-SYSTEMS: 1999 PROTOTYPE FOR COMMENT, at http://www.us-ecosystems.org/forests/food_fiber/index.html#1 (last modified July 10, 2000) [hereinafter THE NATION’S ECO-SYSTEM] (on file with the American University Law Review).

330. See 2000 INDUSTRIAL AND TRADE OUTLOOK, *supra* note 327, at 7-2 (2000) (stating that single family housing construction is one of the main engines of the U.S. gross domestic product).

331. *Id.* at 7-4.

In 1996, a total of 36.7 million board feet (mbf) was used for housing: 19.0 mbf for new housing; 17.7 mbf for upkeep and improvements, amounting to 59% of the total U.S. timber production in that year.³³²

Other benefits of forests, such as scenic beauty,³³³ watershed protection,³³⁴ and the preservation of biodiversity,³³⁵ though highly valued by society, are undervalued in a market sense, because they are not traded. The same problem exists with other natural resources: recently, a team of economists and ecologists estimated the dollar value of seventeen worldwide ecosystem services that are not part of the normally measured money economy, such as water filtration by wetlands, air filtration by plants, nitrogen fixing by soil microbes, and the like.³³⁶ Their estimate is that these seventeen services that we take for granted are worth approximately twice the entire gross global product, an estimate, they believe, that is too low.³³⁷ As forestlands cannot be simultaneously used as wilderness and timber production, the relative undervaluing of preserved forests as compared to timber production complicates land and resource allocation decisions.³³⁸ Creating a market for forestry carbon sequestration projects would help balance the values of conservation and timber production.³³⁹

332. 1999 STATISTICAL ABSTRACT, *supra* note 325, at 700 tbl. 1154.

333. See Davis, *supra* note 276, at 25 (discussing that trees provide noise barriers and screen unpleasant sights); see also ECONOMIC WELL BEING AND ENVIRONMENTAL PROTECTION IN THE PACIFIC NORTHWEST: A CONSENSUS REPORT BY PACIFIC NORTHWEST ECONOMISTS 16 (Thomas M. Power ed., 1995) (concluding that relatively intact national forests contribute to high quality of life in the Northwest and have attracted more jobs to the area than have been lost through reductions in timber cutting).

334. See Davis, *supra* note 276, at 25 (explaining that trees play a vital role in the hydrologic cycle because they help protect water quality). The author explains that tree roots stay the progress of desertification because they control erosion and aerate the soil. *Id.* Tree roots also reduce the need for irrigation because they shield crops from the impact of wind. *Id.*; see also *News from the World of Trees*, 105 AM. FORESTS 11 (1999) (showing how forest buffers protect water quality and reporting that in Delaware, the U.S. Department of Agriculture agreed to pay up to \$8 million of the total cost for the restoration, revegetation, and maintenance of 6,000 forest buffers along Delaware's waterways).

335. See William M. Flevaris, Note, *Ecosystems, Economics, and Ethics: Protecting Biological Diversity at Home and Abroad*, 65 S. CAL. L. REV. 2039 (1992) (arguing that the destruction of old growth forests has reduced biodiversity).

336. See Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, 387 NATURE 253 (1997) (arguing that ecosystem services are not quantified in economic markets, but are a significant part of the economic value of the planet).

337. See *id.* (stating that gross national product equals \$18 trillion and a minimum estimate of the value of ecological systems is \$33 trillion).

338. See Morton, *supra* note 265, at 466 (claiming public land management agencies have undervalued wilderness benefits in their land and resource benefit plans).

339. See generally TOTTEN, *supra* note 297, at 2-4 (arguing that carbon emissions have caused climate changes and companies have created emissions trading systems in response).

c. Ownership of forest land

The United States Department of Agriculture defines forestland as: a *Land cover/use* category that is at least 10 percent stocked by single-stemmed woody species of any size that will be at least 4 meters (13 feet) tall at maturity. Also included is land bearing evidence of natural regeneration of tree cover (cut over forest or abandoned farmland) and not currently developed for nonforest use. Ten percent stocked, when viewed from a vertical direction, equates to an areal canopy of at least twenty-five percent or greater. The minimum area for classification of forest land is 1 acre, and the area must be at least 100 feet wide.³⁴⁰

In 1992, the United States contained 737 million acres in forestland.³⁴¹ Of that 737 million acres, 504 acres constituted timberland, which is defined as forest land not withdrawn from timber utilization by statute or administrative regulation.³⁴²

Three main groups own U.S. forestland: (1) the government; (2) the timber industry; and (3) non-industrial private landowners. Each of these groups may respond to different types of incentives for carbon sequestration. Of all timberland in the United States, 354 million acres of timberland are privately held.³⁴³ Non-industrial private forest land (“NIPF”) constitutes forty-eight percent of the entire nation’s forestland, while timber companies hold ten percent and public land comprises the rest.³⁴⁴ In the Mid-Atlantic region,

340. NATURAL RES. CONSERVATION SERV., U.S. DEP’T OF AGRIC., SUMMARY REPORT: 1997 NATIONAL RESOURCES INVENTORY 82-83 (revised 2000) [hereinafter 1997 NRI], available at http://www.nrcs.usda.gov/technical/NRI/1997/summary_report/glossary.html.

341. See 1999 STATISTICAL ABSTRACT, *supra* note 325, at 698 tbl. 1150 (comparing acres of forest land in the United States from 1970 (754 million acres), 1987 (731 million acres), and 1992 (737 million acres)).

342. See *id.* (showing total number of timberland acreage to include federal, state, and privately owned land).

343. *Id.*

344. See J. Dixon Esseks & Robert J. Moulton, *Evaluating the Forest Stewardship Program Through a National Survey of Participating Forest Land Owners*, Center for Governmental Stud., Northern Illinois University 16 (2000) (indicating the importance of non-industrial private land), at <http://www.rtp.srs.fs.fed.us/econ/pubs/misc/jde991.pdf>. However, some timber companies are divesting themselves of their timber. One large forest products company, Georgia-Pacific, has recently disposed of its timberland in a creative transaction. See Robert Willins & Harley G. A. Wright, *Tax-Free Real Estate Spinoffs: Will They Catch On*, 94 TAX NOTES 619 (2002) (describing the tax consequences of the Georgia-Pacific/Plum Creek transaction). The chairman and CEO of Georgia-Pacific stated that,

not only is fee timber ownership not necessary, we believe such ownership destroys value Fee timber is thought to provide a hedge against high wood prices. But in reality many forest products companies liquidate high-value fee timber, which is accounted for at low historical values, to prop up

small parcels make up much of this privately held timberland.³⁴⁵ A study showing forests and low-density housing suggests there is extensive human development within patches of all sizes in this region.³⁴⁶

1) *Public Forests*

Should all or any forestland be publicly held? Conventional wisdom says that private ownership is the best way to maximize the benefit of resources.³⁴⁷ On the other hand, forests may be viewed as so important to the national interest that the Federal government should administer them for the benefit of all citizens.³⁴⁸ However, it is doubtful that government ownership of forests results in the benefit of all citizens. John Bliese calls the national forests victims of a classic “iron triangle.”³⁴⁹ An “iron triangle” refers to the relationship between timber companies who want cheap access to forests, the members of Congress who accept campaign contributions from the timber companies and vote for their subsidies, and the Forest Service, which is rewarded by Congress with large appropriations for timber sales and a budget system that increases the agency’s own income whenever it sells timber, no matter the cost to the taxpayers.³⁵⁰

While the Federal government has the power to conserve forests, in practice the government is under-compensated for timber cut from public lands.³⁵¹ Consider purchasing a six-foot Christmas tree for \$40: the U.S. Forest Service sells a sixty-year-old, forty-foot-tall ponderosa pine for half that amount.³⁵² In 1980, the Forest Service sold timber worth \$737 million for \$625 million (85% of value); in 1990, timber

manufacturing earnings in times of low end-product prices. This destroys value.

GEORGIA-PACIFIC CORP., 2000 ANNUAL REPORT: LETTER TO SHAREHOLDERS 4 (2001), at <http://www.gp.com/center/financials/pdf/2000/g-par/lettertoshare.pdf> (last visited Aug. 9, 2002) (on file with the American University Law Review).

345. See THE NATION’S ECO-SYSTEM, *supra* note 329 (“A case study in the Mid-Atlantic region found almost two million patches 1.2 acres or less in size. Most of the region’s forests (80 percent) was in four large patches, each with an area greater than 1 million acres.”).

346. *Id.*

347. See discussion of tragedy of the commons, *supra* note 38.

348. See Ostrom, *supra* note 53, at 279 (noting that government property involves “resource rights held by a government that can regulate or subsidize use,” and that, in the United States, forests are not open access property).

349. Bliese, *supra* note 119, at 24.

350. *Id.*; see also RANDAL O’TOOLE, REFORMING THE FOREST SERVICE 34-35 (1988) (analyzing the Forest Service’s budgeting system).

351. See Bliese, *supra* note 119, at 32 (arguing that one of the most notorious examples of environmentally destructive subsidies in the United States is the below-cost sale of timber from our National Forests).

352. Michael Kiefer, *Whose Woods are These?: The Woods Are Lovely, Dark and Deep; The Forest Service has Promises to Keep*, PHOENIX NEW TIMES, June 10, 1992, at 32.

worth \$1.2 billion was sold for \$849 million (71% of value); in 1997, timber worth \$498 million was sold for \$197 million (40% of value).³⁵³ Congress sometimes requires the Forest Service to provide goods and services at below market value, such as recreational permits and grazing rights.³⁵⁴ Under several federal laws, the Forest Service is not required to maximize financial returns when considering possible uses for the land.³⁵⁵ The Multiple-Use Sustained Yield Act of 1960, for example, requires the Forest Service to consider the “relative values of the various uses of the forest, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.”³⁵⁶ Many environmental laws force the Forest Service to disallow certain uses of the land if that use will “jeopardize” the resource, again hampering the Service’s ability to generate revenue.³⁵⁷ However, when Congress permits the Forest Service to charge fair market value, such as for timber sales, the Forest Service often fails to do so.³⁵⁸ For example, despite General Accounting Office (“GAO”) advice, the Forest Service continued to use oral bids at single bidder sales rather than sealed bid auctions, resulting in an estimated

353. 1999 STATISTICAL ABSTRACT, *supra* note 325, at 697 tbl. 1148.

354. See U.S. GEN. ACCOUNTING OFFICE, REPORT TO THE CHAIRMAN, COMMITTEE ON THE BUDGET, HOUSE OF REPRESENTATIVES, FOREST SERVICE: BARRIERS TO GENERATING REVENUE OR REDUCING COSTS GAO/RCED 98-58 5 (1998) [hereinafter GAO REPORT 98-58] (noting the long-standing philosophy of free access to public lands), available at <http://www.wildwilderness.org/docs/gao98-58.htm>. Powerful interest groups sometimes influence legislation that permits enhanced access to below market priced timber resources. In 1995, the Logging Rider of the Reversions Act permitted “salvage” logging without regard to environmental concerns. See Patti A. Goldman & Kristen L. Boyles, *Foresaking the Rule of Law: The 1995 Logging Without Laws Rider and its Legacy*, 27 ENVTL. L. 1035, 1043 (1997) (describing efforts of timber lobbyists to use the rider to sidestep environmental laws). During debate on the Logging Rider, Representative Bill Richardson (D-N.M.) stated:

[The Rider allows] the pillaging of the environment just to hand a bonus check to the timber industry. [It] is a [timber] lobbyist’s dream and a taxpayer nightmare. . . . This rescissions bill replaces the rule of law with lawlessness. It says to the American people that Congress cares more about creating a few temporary jobs now than it does about deficit reduction and environmental protection for the future.

141 CONG. REC. H6642 (daily ed. June 29, 1995).

355. See GAO REPORT 98-58, *supra* note 354, at 28 (explaining that in passing laws affecting the Forest Service, Congress expected it to consider economic issues, but “specifically ruled out” maximizing profits as the dominant goal of the agency). The Forest Service is required to plan for six renewable surface uses: outdoor recreation, rangeland, timber, watersheds and water flows. *Id.* at 12.

356. *Id.* at 28.

357. See *id.* at 28-29 (noting that federal environmental laws have forced the Forest Service to change the focus of their work to sustaining wildlife and its habitat).

358. See *id.* at 44 (describing the Forest Service’s missed opportunities to charge fair market value for uses and resources); see also B.J. Bergman, *Timber!! One Hundred Years Later, the U.S. Forest Service Still Sees Our Forests Only for the Trees*, 4 THE PLANET (1997) (describing below-market timber sales), available at <http://www.sierraclub.org/planet/199706/timber.asp>.

decrease in timber sales of \$56 million from 1992 to 1996.³⁵⁹ The GAO found that “generating revenue and reducing costs are not mission priorities for the agency, and managers lack both flexibility to make choices and accountability for results.”³⁶⁰ Congressional provisions providing for revenue sharing from timber sales prior to deducting costs may further reduce the Forest Service’s incentive to charge fair market value.³⁶¹ The GAO concluded, “inefficiency and waste at the Forest Service have cost taxpayers hundreds of millions of dollars and opportunities for economic gains have been lost through indecision and delay.”³⁶²

The portion of U.S. timber produced by the Forest Service is declining in proportion to timber produced privately, in part because use of national forest lands is increasingly limited. A Clinton Administration ban on new roads and commercial logging in certain areas would protect an additional 58.5 million acres of “some of the nation’s most pristine timberland.”³⁶³ The area of national forests

359. GAO REPORT 98-58, *supra* note 354, at 44.

360. *Id.* at 27.

361. *See id.* at 41 (observing that the Forest Service spent \$1.3 billion dollars in preparing and administering timber sales in 1992 and did not have to deduct those expenses from the \$3 billion in revenue, putting the money into other things including conservation programs); *see also* OFFICE OF TECH. ASSESSMENT, U.S. CONG., FOREST SERVICE PLANNING: ACCOMMODATING USES, PRODUCING OUTPUTS, AND SUSTAINING ECOSYSTEMS, OTA-F-505 151 (1992), *available at* http://www.wws.princeton.edu/~ota/disk1/1992/9216_n.html (detailing early laws that provide a percentage of timber revenue from federal lands to communities for schools and roads). Although it is not a new phenomenon, recent legislation provides annual payments to the states and counties from National Forest Service lands. *See* Secure Rural Schools and Community Self Determination Act of 2000, Pub. L. No. 106-393, 114 Stat. 1607 (2000) (stabilizing annual payments made to states and counties containing National Forest System land and public domain lands managed by the Bureau of Land Management, when counties use the payments for the benefit of public schools and roads). These laws are difficult to challenge because they require one to argue against funding public school. As the Sixth Circuit noted in *Sierra Club v. Thomas*, 105 F.3d 248 (6th Cir. 1997), *vacated sub nom.* Ohio Forestry Ass’n v. Sierra Club, 523 U.S. 726 (1998) (reversing on other grounds), rural citizens who are dependent on timber revenue convince politicians to pressure the Forest Service to maintain sales. *Id.* at 251. The Forest Service is then forced to choose between maintaining jobs and income for the community or “risk over-harvesting and below cost sales.” *Id.* Not only does this symbiotic relationship affect Forest Service revenues, but it can harm the environment. As another court found during the litigation surrounding the impacts of cutting old growth timber on the northern spotted owl: “Mill owners and loggers, and their employees, especially in small towns, have developed since World War II an expectation that federal timber will be available indefinitely, and a way of life that cannot be duplicated elsewhere.” *Seattle Audubon Soc’y v. Evans*, 771 F. Supp. 1081, 1089 (W.D. Wash. 1991), *aff’d*, 952 F.2d 297 (9th Cir. 1991). The court also found that, in order to continue to support these small communities and provide a steady flow of federal timber, the Forest Service and Bureau of Land Management has engaged in “a remarkable series of violations of the environmental laws.” *Id.*

362. GAO REPORT 98-58, *supra* note 354, at 49.

363. Eric Pianin, *Clinton Set to Protect Vast Areas of Forest; Bans on Roads on Logging*

managed as wilderness, wild and scenic rivers, and national monuments has increased considerably, expanding from less than nine percent in 1964 to twenty-six percent in 1994.³⁶⁴ The number of visitor days in the national forests has grown from about 25 million in 1950 to over 340 million in 1996.³⁶⁵ As a result, private lands produce more timber than the national forests.³⁶⁶

The Forest Service's failure to maximize revenue by limiting revenue-generating uses of national forests may not be a cause for concern for those who want to see the carbon sequestration value of the forest maximized. However, allowing below market timber harvesting does cause concern because timber that could otherwise be used to store carbon is being sold at bargain prices that do not even take into account the commodity value of the timber, let alone its value as carbon storage.³⁶⁷ National forests are common-pool

Upset Westerners, WASH. POST, Jan. 5, 2001, at A1. While President George W. Bush's Administration originally contemplated challenging the ban, as of this writing, the roadless regulations were in a sixty-day moratorium. See Eric Pianin, *White House Seeks to Scuttle Clinton Ban on Logging, Roads; Bush Asks Justice Department to Reopen National Forests*, WASH. POST, Apr. 26, 2001, at A12; see also USDA Forest Service, *Roadless Area Conservation*, at <http://www.roadless.fs.fed.us> (last visited Aug. 8, 2002) (on file with the American University Law Review) (displaying recent information regarding the status of roadless areas). Forest Service Chief Mike Dombeck resigned over concerns about the Bush Administration's direction on national forests. See Katherine Pflieger, *Bush's Plan for Forest Service Prompt Chief to Depart*, CHI. TRIB., Mar. 28, 2001, at 13. As chief, Dombeck worked to conserve old-growth forests. Dombeck took over the service in January 1997 and reshaped it from a government agency considered to be a friend to the timber industry to a more cautious guardian of the national forest system. *Id.* While more than 200 scientists have urged Bush to spare forests, the Forest Service recommended against providing permanent wilderness protection to more than 9 million acres in Alaska's Tongass National Forest. See *Scientists Want Logging in National Forests to Stop*, ST. LOUIS POST DISPATCH, Apr. 17, 2002, at A8 (describing letter from scientists that calls for an end to commercial logging); see also Eric Pianin, *Wilderness Protection Not Advised for Tongass; Forest Service Decision Upsets Environmentalists*, WASH. POST, May 17, 2002, at A27 (reporting on a decision to allow logging in about a quarter of the forest).

364. GAO REPORT 98-58, *supra* note 354, at 30-31.

365. See *id.* at 36 ("[A] visitor day equals a 12-hour visit. For example, three people visiting a national forest for 4 hours each would equal 1 visitor day. In 1965, a visit averaged 0.83 visitor days.").

366. See 2000 INDUSTRIAL & TRADE OUTLOOK, *supra* note 327, at 7-2 (noting that the supply of standing timber from federal lands was mostly replaced by a supply from private lands); see also Esseks & Moulton, *supra* note 344, at 16 (noting that fifty-nine percent of the total domestic output of timber in 1997 came from NIPF).

367. See Bliese, *supra* note 119, at 24:

Most of our National Forests are not good sources for commercial timber in the first place; most are in arid areas with relatively poor quality trees on steep slopes. But that does not stop the Forest Service from selling them. The Forest Service also allows the timber companies to use clear cutting, the most destructive form of logging, which the companies want simply because it is the cheapest and easiest. The results for the forests have been devastating. Our National Forests have been cut at unsustainable rates for decades. Many forests which would never have been cut at all if timber companies had to cover the costs have been heavily logged for years.

resources (“CPRs”) because they are owned by the government ostensibly for the benefit of all citizens.³⁶⁸ To efficiently manage CPRs, it is recommended that access to the resource is limited and that users are encouraged to invest in, instead of abusing, the resource.³⁶⁹

The Forest Service has been effectively restricting access, but allowing below market sales encourages over-exploitation rather than investment. Reforming the administration of our national forests should start by eliminating below-cost timber sales and other subsidies.³⁷⁰ However, as this Article is focusing on tax incentives for green house gas (“GHG”) reductions, I will not address the kinds of incentives for conservation that might be employed by the Forest Service.³⁷¹ For purposes of creating tax incentives for carbon storage, it is preferable that timberland be held privately as the Forest Service would not be influenced by tax incentives.³⁷²

2) *Private forests*

Tax incentives should be designed to influence behavior in those who would not otherwise engage in that behavior—otherwise they simply present a windfall to the taxpayer.³⁷³ Would tax incentives change the behavior of private forest owners? Non-industrial private forestland offers many benefits, including timber and protection of the environment and, as of 1992, made up nearly half of the nation’s forestland.³⁷⁴ Studies indicate that, depending on the region involved, owners holding between eight percent and thirty-two

368. See Ostrom, *supra* note 53, at 278 (“CPRs include natural and human-concentrated resources in which (i) exclusion of beneficiaries through physical and institutional means is especially costly, and (ii) exploitation by one user reduces resource availability for others.”).

369. *Id.* at 279.

370. See GAO REPORT 98-58, *supra* note 354, at 51 (recommending the Forest Service obtain fair market value for resources and that the Chiefs of the Service revise the agency’s strategic plan accordingly).

371. See Act to Save America’s Forests, S. 1368, 106th Cong. (1999), H.R. 2512, 106th Cong. (1999) (protecting national forests from clear cutting); see also National Forest Protection and Restoration Act of 1999, H.R. 1396, 106th Cong. (1999) (prohibiting financially and environmentally imprudent logging).

372. See Jim Stiak, *Eugene: A Gathering Place*, HIGH COUNTRY NEWS, Oct. 19, 1992, at 10, 12-13 (quoting Tim Hermach of the Native Forest Council, who claims heavily subsidized government timber sales and private incentives are related). By subsidizing timber sales, the government adversely impacts the price of private timber sales. One effect of this is to harm private owners of small timber acreage. *Id.*

373. See Edward A. Zelinsky, *Efficiency and Income Taxes: The Rehabilitation of Tax Incentives*, 64 TEX. L. REV. 973, 992 (1986) (explaining that it is not efficient to offer tax incentives for behavior already performed by the beneficiary).

374. See Esseks & Moulton, *supra* note 344, at 16 (describing the production potential of NIPF).

percent of total private forest acreage never intend to allow logging.³⁷⁵ Another study conducted by the U.S. Forest Service revealed that preservationist owners, who do not intend to allow timber harvesting, hold title to ten percent of the private “forest land” in Michigan.³⁷⁶ Applying these percentages on a national basis, preservationist owners protect over thirty-three million acres of forest wilderness.³⁷⁷ Because NIPF owners generally are not interested in managing their lands for maximum timber harvest, their forests are “underutilized sources of biomass for storing atmospheric CO₂” that can offset GHG emissions.³⁷⁸ The National Research Council believes that NIPFs offer “the greatest opportunity for increasing terrestrial carbon storage in the United States because of their availability (compared with land currently in cultivation) and under-use as illustrated by their low stocking density and volume estimates.”³⁷⁹ Given that some NIPF owners are already conserving timber through inattention or preservationist tendencies, any new tax incentives should be directed towards the owners that are actively harvesting timber, if possible.

Of course, some of the NIPF owners may be responding to incentives already contained in current law. The U.S. Department of Agriculture created the Forestry Incentives Program (“FIP”) and the Stewardship Incentives Program (“SIP”) to offer technical and financial assistance to NIPF owners.³⁸⁰ Some NIPF owners that currently participate in a conservation program reported that they would not have agreed to be a part of the program without the financial incentives.³⁸¹ Those who profit from timberlands face a myriad of local, state, and federal tax rules.³⁸² As this Article focuses on the impact of Federal tax policy on timberlands, I will analyze the Federal tax rules relating to timber, paying specific attention to those provisions that affect the three ways of enhancing forest carbon: (1) preserving and protecting existing forests; (2) practicing

375. John G. Sprankling, *The Antiwilderness Bias in American Property Law*, 63 U. CHI. L. REV. 519 n.230 (1994).

376. DEP’T OF AGRIC., RESOURCE BULLETIN NC-93, THE PRIVATE FOREST LANDOWNERS OF MICHIGAN 14 (1993).

377. Sprankling, *supra* note 375, at 566.

378. Esseks & Moulton, *supra* note 344, at 17.

379. *Id.*

380. See Natural Res. Conservation Serv., U.S. Dep’t of Agric., *Conservation Programs* (providing information on NRCS conservation programs), at <http://www.nrcs.usda.gov/programs> (last visited Aug. 8, 2002).

381. See Esseks & Moulton, *supra* note 344, at 93 (finding that seventy percent of respondents from a Forestry Stewardship Program survey said they would not have implemented as much of the plan without the incentives).

382. See ENVTL. LAW INST., RESEARCH REPORT: FORESTS FOR THE BAY (2000) (analyzing state laws governing timberlands), available at <http://www.eli.org/pdf/ForestsfortheBay00.pdf> (last visited Aug. 10, 2002).

improved low-impact logging or sustainable forest management; and (3) reclaiming degraded lands with fast-growing tree species.³⁸³

4. *Taxation of timber*

a. *Preferential capital gains treatment*

Although timber can be considered a natural resource, the tax treatment of timber differs significantly from the tax treatment of other natural resources such as oil, gas, and minerals.³⁸⁴ As noted above, oil production receives the most preferential treatment of all the natural resources.³⁸⁵ This is because independent oil producers (and royalty owners) may use percentage depletion, a form of cost recovery that permits deductions in excess of the investment.³⁸⁶

The capital gains rules provide the greatest incentive to cut timber. While ordinary income tax rates for individuals vary from 15% to 39.6% (depending on the taxpayer's taxable income),³⁸⁷ the usual capital gain rate is 20%.³⁸⁸ In general, to have capital gains treatment, a taxpayer must sell or exchange a capital asset held for more than one year.³⁸⁹ Stock in trade, inventory, and property held primarily for sale to customers in the ordinary course of business do not constitute capital assets.³⁹⁰ For some taxpayers, timber might be considered inventory or property held for sale in the ordinary course of business.

383. See TOTTEN, *supra* note 297, at 3 (presenting three means of enhancing forest carbon).

384. See RUSSELL, *supra* note 178, at 101 (explaining that the production costs can be deducted or capitalized in the timber industry, which is not allowed in the oil or gas industry).

385. See generally *supra* notes 181-88 and accompanying text (providing an example of how oil production is given preferential treatment in the tax code).

386. See I.R.C. § 611 (West 2002) (listing the types of natural resources that can receive allowances for deduction or depletion, and the special rules governing these allowances); see also STAFF OF THE J. COMM. ON TAXATION, DESCRIPTION OF SELECTED PRESENT-LAW PROVISIONS RELATING TO THE FEDERAL INCOME TAX TREATMENT OF DOMESTIC OIL AND GAS PRODUCTION AND CERTAIN UTILITY CONSERVATION PAYMENTS, JCX-5-01, at 3 (2001) ("Because percentage depletion, unlike cost depletion, is computed without regard to the taxpayer's basis in the depletable property, cumulative depletion deductions may be greater than the amount expended by the taxpayer to acquire or develop the property.").

387. See I.R.C. § 1(a) (listing tax rates that apply to individuals and married couples at different income levels).

388. See *id.* § 1(h) (providing complex rules for determining the tax rate on capital gains). Special rates apply to gains recognized on the sale of collectibles and "unrecaptured section 1250 gains." *Id.* For other capital assets held for more than one year, the 20% rate applies to taxpayers with marginal income tax rates greater than 15%, unless the gain is a "qualified 5-year gain." *Id.* Taxpayers in brackets lower than 15% pay only 10% capital gains tax. *Id.* Corporations do not benefit from the capital gains differential, and are taxed at rates from 15 to 35%. *Id.*

389. See *id.* § 1222 (defining terms relating to capital gains and losses).

390. *Id.* § 1221(a)(1).

Nevertheless, the gains on the sale of such timber may qualify for capital gains treatment under sections 631 and 1231 of the Internal Revenue Code.³⁹¹

Prior to the enactment of section 631, a timber owner who cut timber for sale as logs or for use in its trade or business (e.g., a sawmill business using logs to make lumber or a furniture maker using logs to make furniture) recognized ordinary income on the cutting of the timber, while a timber owner who sold timber outright on the stump recognized capital gains.³⁹² According to one commentator, this disparity created an incentive to sell timber outright, rather than to manage timber for continuous supply.³⁹³ Arguably, this disparate treatment violated principles of horizontal equity,³⁹⁴ because similarly situated timber owners faced significantly different tax consequences as a result of subtle differences in the disposal transaction. The Sixth Circuit described the resulting hardship to timber owners, stating that:

There was little inducement for the operator to cut his timber if [due to high ordinary income tax rates] he could retain only a small portion of the proceeds of sale.

The timber operator was left with three choices. First, he could cut and sell his timber, pay the tax and realize little profit. Second, he could sell his property outright, or the standing timber alone, and obtain capital gains treatment on his profits. Third, he could simply not sell at all and maintain his holdings. These alternatives created problems for the operator. The third one created a problem of national importance.³⁹⁵

391. *See id.* § 1231(a) (providing that if the section 1231 gains exceed the section 1231 losses for any taxable year, such gains and losses will be treated as long-term capital gains or losses). Section 1231(a)(3) defines § 1231 gains and losses, *inter alia*, as recognized gains or losses on the sale or exchange of property used in the trade or business. Section 1231(b)(2) defines property used in the trade or business to include timber to which § 631 applies. *See id.* § 631 (providing rules for how a gain or loss in the cutting of timber is to be calculated). A gain or loss to the taxpayer is recognized in an amount equal to the difference between the fair market value of the timber, and the adjusted basis for depletion of such timber in the hands of the taxpayer. *Id.*

392. RUSSELL, *supra* note 178, at 2207. *See generally* F. Gerald Burnett, *Timber Transactions*, 610 T.M. PORTFOLIO A-2 (1994) [hereinafter 610 T.M. PORTFOLIO] (analyzing the special tax treatment of timber operations, concentrating on I.R.C. §§ 631 and 1231).

393. RUSSELL, *supra* note 178, at 2207.

394. *See* R.A. Musgrave, *In Defense of an Income Concept*, 81 HARV. L. REV. 44, 45 (1967) (defining horizontal equity as the principle that people with the same income should pay the same taxes). Horizontal equity is one criterion for analyzing tax policy decisions.

395. *United States v. Brown Wood Preserving Co.*, 275 F.2d 525, 527 (6th Cir. 1960).

“The problem of national importance” referred to by the Sixth Circuit was the need for forest products created by World War II.³⁹⁶ The rules discriminated against smaller sawmill operators who were unable to purchase standing timber in bulk, and discouraged the use of cutting contracts, which would result in ordinary tax treatment.³⁹⁷ Congress considered cutting contracts useful in applying scientific forest management programs designed to insure continuous supplies of timber in future years.³⁹⁸ Accordingly, in 1944, Congress enacted section 631, which permits a taxpayer to elect to treat a timber cutting as a sale or exchange, thus enabling the taxpayer to receive preferential capital gain treatment on the sale.³⁹⁹ As this preferential treatment only occurs on cutting and sale of timber,⁴⁰⁰ it does not encourage preservation of existing forests. However, to the extent this rule encourages scientific management, it does encourage sustainable forest development.

b. Taxation of timber expenses

Some timber owners may take a depletion deduction.⁴⁰¹ A depletion deduction for timber, unlike the percentage depletion deduction for oil and gas property, is limited to the taxpayer’s basis in the standing timber.⁴⁰² If the eligible taxpayer maintains proper records, he may take an annual depletion deduction with respect to

396. *Id.*

397. *See generally* S. Rep. No. 78-627, at 25-26 (1943) (discussing the general problem of how the tax laws discriminate against those who dispose of timber by cutting it as compared with those who sell timber outright, and suggesting an amendment to the law to remedy the situation).

398. *See* 610 T.M. PORTFOLIO, *supra* note 392, at A-4 (discussing the Forest Industries Committee on Timber Valuation and Taxation’s proposed legislation to eliminate the perceived tax inequities that affected forest property owners and operators). The proposals included provisions to provide that timber cut by an owner before sale would qualify for capital gains taxation, and that gain from timber sold from cutting contracts with retained economic interests would be taxed as capital gains. *Id.*

399. I.R.C. § 631(a) (West 2002).

400. *Id.*

401. *See id.* § 611(a) (stating that only taxpayers who own an “economic interest” in standing timber are eligible for the depletion deduction). The Supreme Court defined “economic interest” as having two elements: (1) acquisition by investment in the natural resource in place; and (2) derivation of income from the extraction or removal of the natural resource. *Palmer v. Bender*, 287 U.S. 551, 557 (1933). The rule in *Palmer* is also set forth in Treasury Regulation § 1.611-1(b)(1). *Treas. Reg.* § 1.611-1(b)(1) (2001). Generally, an owner of the fee or leasehold estate containing the standing timber will hold an economic interest. 610 T.M. PORTFOLIO, *supra* note 392, at A-36. The second prong of the test requires the taxpayer to be at risk: that is, the taxpayer must rely on the severance of the timber for recovery of her investment. *Id.*

402. I.R.C. § 612; *see also* *Treas. Reg.* § 1.611-3(c)(2) (stating that once the total credits for depletion equals the cost or other basis of the timber property plus subsequent allowable capital additions, no further deductions are allowed).

timber cut during the year.⁴⁰³ Thus, if the timber owner cuts no timber, he gets no depletion deduction. Therefore, the timber depletion rules do not encourage preservation of existing forests. Certain timber expenses are currently deductible—however, all of those also relate to the cutting and sale of timber.⁴⁰⁴

While preserving forests offers upfront carbon offset opportunities, afforestation slowly stores carbon, resulting in significant carbon storage in later years.⁴⁰⁵ The Code provides preferential treatment for reforestation costs.⁴⁰⁶ Instead of waiting until the timber is sold, as required with the depletion deduction, certain reforestation costs may be amortized over an eight-year period.⁴⁰⁷ A taxpayer may not amortize more than \$10,000 of reforestation costs annually, no matter how large the taxpayer's woodlands.⁴⁰⁸ The Code also permits a reforestation credit.⁴⁰⁹ However, even these benefits are designed to facilitate the cutting of trees: the deduction and credit only applies to "qualified timber property,"⁴¹⁰ which is defined as a "a woodlot or other site located in the United States which will contain trees in significant commercial quantities and which is held by the taxpayer for the planting, cultivating, caring for, and cutting of trees for sale

403. See Treas. Reg. § 1.611-3 (discussing the rules applicable to depletion allowances for timber, and how the allowance should be computed). The Treasury Department has also ruled that, "[i]n general, the capital remaining in any year recoverable through depletion allowances is the basis provided by section 612 and the regulations thereunder." Treas. Reg. § 1.611-3(a).

404. See Rev. Rul. 71-334, 1971-2 C.B. 248 (enumerating the kind of timber sale expenses that may be deducted: (1) advertising the timber for disposal; (2) cruising to determine the quantity and quality of the timber to be disposed of; (3) marking or otherwise designating the timber for cutting; (4) marking seed trees to be retained; (5) scaling, measuring, or otherwise determining the quantity of timber cut; (6) fees paid to consulting foresters, selling agents and others for services directly related to the timber disposal; (7) supervising or checking performance under the contract; and (8) other expenses directly attributable to the disposal).

405. TOTTEN, *supra* note 297, at 3.

406. See Rev. Rul. 75-467, 1975-2 C.B. 93 (defining reforestation costs as the direct costs incurred in planting and artificial or natural seeding and include (1) preparation of the site, including any girdling, herbicide application, baiting of rodents, or brush removal work to afford good growing conditions; (2) the costs of seed or seedlings; and (3) labor and tool expense); see also I.R.C. § 194(c)(3) (defining reforestation expenditures).

407. See I.R.C. § 194(a) (stating that "a taxpayer is entitled to a deduction of an amount for the eight years, with respect to each month within the taxable year, equal to the amortizable basis at the end of such month divided by the number of months remaining in the period.").

408. See *id.* § 194(b)(1) (limiting the amount to \$5,000 in the case of a separate return of a married individual). *But see* Small Business Tax Fairness Act of 2001, H.R. 546, 107th Cong. (increasing, if enacted, the amounts in I.R.C. § 194 from \$10,000 to \$25,000, but suspending the increase until 2004).

409. See I.R.C. § 48(b) (stating that the reforestation credit is ten percent of the amortizable basis of "qualified timber property").

410. *Id.* §§ 48(b)(2) and 194(c)(1).

or use in the commercial production of timber products.”⁴¹¹

The passive activity loss rules, designed to thwart tax shelters, will likely limit NIPF owners’ use of the reforestation tax benefits.⁴¹² The passive activity loss rules generally restrict the use of passive activity losses (or credits) to offsetting passive activity income, unless the taxpayer “materially participates” in the activity.⁴¹³ Professor Donna Byrne argues that the passive activity loss rules discourage investment in timber growing by NIPF owners.⁴¹⁴ Because the timber growth cycle occurs slowly and lasts decades, few owners can meet any of the annual “material participation” standards set forth in the Treasury regulations.⁴¹⁵ Professor Byrne asserts that timber investment does not constitute the classic tax shelter abuse that Congress tried to prevent by enacting the passive activity loss rules.⁴¹⁶ If NIPF owners provide “the greatest opportunity for increasing terrestrial carbon storage,”⁴¹⁷ discouraging investment in timber growing by NIPF owners also frustrates the goal of curtailing global warming.

c. Incentives for conservation

1) Present law

The Code does provide some incentives for conserving forestland. A timber owner can receive a tax deduction for contributing real property interests in timberland to a charitable organization, the United States, or a State or local government.⁴¹⁸ Charitable donations

411. *Id.* § 194(c)(1).

412. See Donna M. Byrne, *Timber Growers and the Passive Activity Loss Rules: Some Unintended Effects*, 64 *TEMPLE L. REV.* 729, 733-34 (1991) (discussing how the passive activity loss rules act as an impediment to the development of timber growing).

413. I.R.C. § 469(c).

414. See Byrne, *supra* note 412, at 744 (discussing how, while Congress’ tax changes have some effect on timber growing, the passive activity loss rules create an unintended disincentive for timber growers). Under I.R.C. § 469(a)(2), the passive activity rules only apply to individuals, estates, trusts, closely held C corporations, and personal service corporations. *Id.* Accordingly, these rules generally do not affect industrial timber operations, which are usually undertaken by non-closely held corporations. *Id.*

415. See Treas. Reg. § 1.4695T(a) (2001) (containing seven alternate tests for material participation); see also Byrne, *supra* note 412, at 749-51 (discussing the application of the tests to NIPF owners).

416. See Byrne, *supra* note 412, at 742 (mentioning that timber investments are not true tax shelters because of their long growing period, the need for substantial capital investment, and because tax consideration is not the primary motive for them).

417. Esseks & Moulton, *supra* note 344, at 17.

418. The Forest Legacy Program, 16 U.S.C. § 2103c (2001) (providing grants to enrolled states to purchase conservation easements or fee acquisitions on environmentally important forest lands that are threatened with conversion to non-forest uses). The program is funded annually by the Conservation and Reinvestment Act (CAARA). H.R. 701, 107th Cong. (2001); see also Land Trust Alliance, *The Forest*

are generally deductible for income,⁴¹⁹ estate,⁴²⁰ and gift⁴²¹ tax purposes. However, donations of less than the donor's entire interest in the property are generally not deductible.⁴²² But, the Code does provide an exception to the partial interest rule for gifts of qualified conservation interests.⁴²³ Therefore, a timber owner could obtain a deduction for a contribution of his entire interest in the property, a remainder interest, or a conservation easement.⁴²⁴ Although timberland is specifically identified under only one of the definitions of conservation interest, it could potentially fall under any of the four definitions: (1) the preservation of land areas for outdoor recreation by, or for the education of the general public; (2) the protection of a relatively natural habitat of fish, wildlife, or plants, or similar ecosystem; (3) the preservation of open space (including farm and forest land) where such preservation will yield a significant public benefit and is either (a) for the scenic enjoyment of the general public, or (b) pursuant to a clearly delineated Federal, State, or local governmental conservation policy; or (4) the preservation of a historically important land area or a certified historic structure.⁴²⁵ Last year, Congress removed geographic restrictions on eligibility of land donations, freeing up almost one-third of the continental United States, which had been previously ineligible.⁴²⁶ Furthermore, owners wishing to donate easements on forestland may be eligible to

Legacy Program, at <http://www.lta.org/publicpolicy/flshort.htm> (last visited Aug. 9, 2002) (on file with the American University Law Review) (listing states that currently qualify for Forest Legacy funds, states that are in the process of developing Forest Legacy plans, and those that have expressed interest in the program). The program has conserved over 120,000 acres of environmentally important, working forestland.

Id.

419. I.R.C. § 170 (West 2002).

420. *Id.* § 2055.

421. *Id.* § 2522.

422. See STAFF OF THE J. COMM. ON TAXATION, DESCRIPTION OF SELECTED FEDERAL TAX PROVISIONS THAT IMPACT LAND USE, CONSERVATION, AND PRESERVATION, JCX-68-99, at 13 (1999) (discussing generally that gifts of certain types of property interests are subject to special restrictions).

423. See I.R.C. § 170(h) (defining a "qualified conservation contribution" as a contribution of a qualified property interest, to a qualified organization, exclusively for conservation purposes).

424. See I.R.C. § 170(h)(2) (defining "qualified property interest").

425. See I.R.C. § 170(h)(4) (defining "conservation purpose").

426. See Economic Growth and Tax Relief Reconciliation Act of 2001, Pub. L. No. 107-16, § 551(a). 115 Stat. 38 (repealing the distance requirement in I.R.C. § 2031(c)(8)(A)). Prior to amendment, I.R.C. § 2031(c)(8)(A) imposed a geographic restriction on the definition of "qualified conservation easement," requiring that the land be located within twenty-five miles of a metropolitan area or a national park or wilderness area, or within ten miles of an Urban National Forest. The repeal of I.R.C. § 2031(c)(8)(A) will help reduce suburban sprawl by reducing the sale and development of farmland, forests, and other open spaces.

receive payments under the Forest Legacy program.⁴²⁷

In 2001, Congress repealed the estate tax, effective in 2009.⁴²⁸ It is unclear how the repeal⁴²⁹ of the estate tax will impact farm ownership, forest lands, or land conservation. Neither the Joint Committee on Taxation, the General Accounting Office, nor the Treasury Department has ever seriously investigated the issue. One purpose of estate tax repeal is to enable farms and small businesses to pass intact to the next generation.⁴³⁰ However, eliminating the estate tax will not protect land from heirs who want to reap greater profits by development.⁴³¹ On the other hand, the possibility of relief from a portion of the estate tax may motivate landowners to donate a conservation easement. If there is no estate tax “stick,” then the “carrot” of a deductible conservation easement is no incentive.⁴³² If

427. 16 U.S.C. § 2103c(a) (2001). The Forest Legacy Program protects environmentally important forest areas that are threatened by conversion to non-forest uses through the use of conservation easements. The enabling statute authorizes the Forest Service to pay the fair market value of any property interest acquired. *Id.* § 2103c(j). The acquisition costs would be shared among regional organizations, State and other governmental units, landowners, corporations, or private organizations, with the Federal government paying no more than seventy-five percent of the total acquisition costs. *Id.*; see also Laura S. Beliveau, Comment, *The Forest Legacy Program: Using Conservation Easements to Preserve the Northern Forest*, 20 B.C. ENVTL. AFF. L. REV. 507 (1993) (evaluating the various options available to federal, state, and local governments to balance private ownership, economic diversity, and ecological value in the Northern Forest); Forest Legacy Program website (discussing the program’s purpose, activities, administration, guidelines, and who is eligible for its benefits), at <http://www.fs.fed.us/spf/coop/flp.htm> (last visited Aug. 9, 2002) (on file with the American University Law Review).

428. See Janet Hook, *Estate Tax Foes Facing Hurdles; Critics Grow Worried that Momentum to Abolish it Has Faded*, MILWAUKEE J. SENTINEL, Feb. 15, 2001, at 02A (discussing the debate in Congress and other parts of the government about the repeal of the estate tax).

429. See The Economic Growth and Tax Relief Reconciliation Act of 2001 § 501(d) (repealing the estate tax for estates of decedents dying after December 31, 2009). A sunset provision required by the Congressional Budget Act of 1974 requires that the repeal not apply to estates of decedents dying after December 31, 2010. *Id.* § 901(b); David E. Rosenbaum, *Senate Backs More Ethanol; Nears Passage of Energy Bill*, N.Y. TIMES, Apr. 24, 2002, at A24 (reporting how the Senate Majority Leader, Senator Tom Daschle (D-S.D.), agreed to hold a vote on making the repeal permanent in exchange for limiting debate on the energy bill).

430. See S. REP. NO. 107-30, at 51 (2001) (“The Committee finds that the estate and generation skipping transfer taxes are unduly burdensome on affected taxpayers, and particularly decedents’ estates, decedents’ heirs, and businesses, such as small businesses, family-owned businesses, and farming businesses.”).

431. *Contra* Jonathan H. Adler, *Why the “Death Tax” is Deadly for Endangered Species*, FOREST LANDOWNER (Nov./Dec. 1999) (“[T]he estate tax imposes a significant burden on private landowners who wish to maintain land in an undeveloped state from generation to generation The imposition of federal estate taxes often forces large parcels of environmentally valuable land to be broken up into smaller, less environmentally valuable parcels.”), available at <http://www.deathtax.com/deathtax/forest.html> (last visited June 5, 2002).

432. The “carrot” is sweetened to the extent I.R.C. § 170 allows a deduction against income tax.

the estate tax were to be retained, it could be modified to encourage forestland owners to preserve their property. Congress could extend certain provisions of the estate tax to forestland owners. Under present law,⁴³³ heirs who continue farming agricultural estates are allowed to pay any incurred estate tax over ten years.⁴³⁴ Providing for a deferred payment of some or all of the estate taxes due on forestlands could reduce the pressure to sell.

Another provision of the estate tax allows farmers to value their land based on its “use-value” as farmland rather than on the potentially higher market value that developers might be willing to pay.⁴³⁵ This special use valuation provision could be amended to allow greater conservation of forest lands by eliminating the requirement that forest ownership qualify as “businesses” or by treating forest land as “farming.”⁴³⁶ In addition, Congress could remove the cap on conservation easements. When fully phased in this year, the conservation deduction will be limited to \$500,000.⁴³⁷ Unfortunately, in many parts of the country, this deduction will only protect small farms and forests. An uncapped exclusion, however, would protect larger blocks of land, which are critical to healthy ecosystems.

Another tax incentive for forestlands is an exclusion of cost-sharing payments under the forestry incentives program from gross income.⁴³⁸ A significant part of the incentives including cost-sharing payments are found in the Forest Stewardship Program (“FSP”).⁴³⁹ The FSP provides technical assistance through state forestry agencies to help landowners develop management plans for their non-industrial

433. See *supra* note 429. The estate tax repeal is phased in over the next seven years—so it still applies today.

434. See I.R.C. § 6166 (West 2002) (providing a set of rules for the general extension of payment time of an estate tax when the estate consists largely of a closely held business).

435. See *id.* § 2032A (stating that the value of qualified real property shall be its value for use under which it qualifies as qualified real property).

436. See *id.* § 2032A(b)(2) (defining the term “qualified use” as: “use as a farm for farming purposes, or use in trade or business other than the trade or business of farming”).

437. *Id.* § 2031(c)(3).

438. *Id.* § 126(a)(8); see also 16 U.S.C. § 2103(f) (2001) (requiring that the Secretary agree to share the cost of implementing those forestry practices and measures described in agreements where the Secretary determines cost sharing is appropriate); I.R.C. § 194(c)(3)(B) (declaring that “reforestation expenditures shall not include any expenditures for which the taxpayer has been reimbursed under any governmental reforestation cost-sharing program unless the amounts reimbursed have been included in the gross income of the taxpayer.”).

439. See Food, Agriculture, Conservation, and Trade Act of 1990, Pub. L. No. 101-624, § 1215, 104 Stat. 3525 (1990) (establishing the Forest Stewardship Program).

private forest lands.⁴⁴⁰ These plans typically list the owner's objective in managing their land and then recommend activities to achieve each objective.⁴⁴¹ One of the goals of the FSP is to manage and enhance the productivity of timber, fish and wildlife habitats, water quality, wetlands, recreational sources, and the aesthetic value of forest lands.⁴⁴² J. Dixon Esseks and Robert J. Moulton conducted a comprehensive survey of NIPF owners who participated in the FSP.⁴⁴³ The authors surveyed 61,737 NIPF owners throughout the United States, with a majority residing in the Northeast.⁴⁴⁴ The majority of owners surveyed owned 10 to 200 acres of forestland and most had held their land for at least ten years.⁴⁴⁵ When surveyed about their objectives in owning forestland, NIPF owners tended to rank timber production relatively low in importance, often seeing logging as detrimental to higher-ranked objectives such as aesthetic, recreational and other quality of life goals.⁴⁴⁶ In addition, many NIPF owners indicated that they had become more likely to manage their forestland to promote wildlife habitat.⁴⁴⁷ Further, fifty-eight percent of NIPF owners reported implementing a managerial purpose of improving or preserving forestland as wildlife habitat,⁴⁴⁸ while thirty-one percent reported implementing a managerial purpose of harvesting or marketing trees.⁴⁴⁹ The survey also revealed that NIPF owners of relatively small parcels of land tended to value timber production less than did owners of larger tracts.⁴⁵⁰ This finding is reasonable since small parcels might not contain enough mature trees to justify the cost of harvesting or because logging would leave

440. *Id.* at 3526.

441. *Id.*

442. See THE U.S. DEP'T OF AGRIC., THE USDA FOREST SERVICE STRATEGIC PLAN, INTEGRITY AND ACCOUNTABILITY: A FRAMEWORK FOR NATURAL RESOURCE MANAGEMENT 4 (2000 Revision) (defining as part of the mission of the USDA Forest Service to "ensure sustainable ecosystems by restoring and maintaining species diversity and ecological productivity that helps to provide recreation, water, timber, minerals, fish, wildlife, wilderness, and aesthetic values for current and future generations of people."), available at <http://www.fs.fed.us/plan/stratplan.pdf> (last visited Aug. 10, 2002).

443. Esseks & Moulton, *supra* note 344.

444. See *id.* at 24 (defining Northeast to include the states of Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin).

445. *Id.* at 38-39.

446. *Id.* at 16-17.

447. *Id.* at 21.

448. See *id.* at 47 (asking NIPF owners to discuss whether their Stewardship Plan recommends any ways to improve or preserve forestland as habitat for wildlife).

449. See *id.* (asking NIPF owners whether their plan recommends activities having to do with harvesting or marketing trees).

450. *Id.* at 49 (citations omitted).

them with too few trees to enjoy for recreational or aesthetic purposes.

The cost sharing payments of the FSP also provided significant incentives for NIPF owners. Participation in the FSP by owners in Pacific states indicated that cost share participants spent 2.6 times more in non-reimbursed expenses than did non-participants in those states.⁴⁵¹ In addition, the estimates of non-reimbursed spending by cost-sharing participants in the Northern states and Pacific region exceeded the average federal costs per acre by factors of 1.1 to 8.1 respectively.⁴⁵² The survey also revealed that sixty-five percent of NIPF owners indicated that they would not have done as much under their FSP if they had not received cost-sharing payments.⁴⁵³ Further, thirty-two to thirty-seven percent of owners reported planting trees and that such activity was “new” to them.⁴⁵⁴ The survey also found that forty-four to fifty-four percent of NIPF owners indicated that they were “more likely” to pursue improving wildlife habitat.⁴⁵⁵ Lastly, the survey revealed that fifteen to thirty-four percent of NIPF owners reported being less likely to harvest timber than before receiving their FSP plans.⁴⁵⁶

If NIPF owners are more likely to use their land for wildlife habitat, more likely to plant trees, and less likely to harvest timber, it appears that tax-exempt cost-sharing payments and the FSP are already enhancing carbon storage in our nation’s forests. It simply remains for Congress to add carbon storage as one of the goals under the FSP.⁴⁵⁷

451. *See id.* at 61 (indicating that participation in the FSP did make statistically and practically significant differences depending on the region).

452. *See id.* at 63 (using the regional average number of planned acres derived from *all* surveyed owners to arrive at the owner’s spending per acre).

453. *Id.* at 65.

454. *See id.* at 74 (noting that, according to statistical analysis, participants in the FSP were more likely to report that planting trees was new to them if they were: women, were retired, had owned land under the FSP for a short period of time, had received follow up technical assistance and had not received advice from a specialist before entering the FSP).

455. *Id.* at 78.

456. *Id.*

457. *Id.* at 93. Congress should also provide consistent funding for the FSP. The Federal budgets from both fiscal year 1999 and 2000 contained no appropriations for the Stewardship Incentives Program, the principal source of cost-sharing money for the FSP. *See* Forest Serv., U.S. Dep’t of Agric., *Stewardship Incentive Program*, at <http://www.fs.fed.us/cooperativeforestry/sip.htm> (last visited Aug. 9, 2002) (on file with the American University Law Review) (describing Stewardship Incentives Program, including purpose of program, how money is used, eligibility and program administration).

2) *Legislative proposals for conservation*

Congress has contemplated additional incentives for open space preservation. The Community Renewal and New Market Act of 2000 would have excluded fifty percent of the capital gains recognized on sales of real property to a public or private conservation entity.⁴⁵⁸ The Joint Committee on Taxation estimated that the provision would protect \$125 million per worth of land each year at an average cost of \$64 million per year.⁴⁵⁹ The provision also would have helped save land owned by those who cannot afford to give it away and would have given the conservation agencies a competitive edge to acquire and conserve the highest priority sites.⁴⁶⁰ The current reality is a striking contrast: when a conservation group ended up being the highest bidder on a Forest Service timber sale, the sale was voided because the conservation group did not intend to harvest the timber.⁴⁶¹

Congress has also considered various bills to preserve forests. One bill would increase the dollar limitation on reforestation expenditures to \$25,000.⁴⁶² Another would reduce the amount of time required to amortize reforestation expenditures.⁴⁶³ The Forest Resources for the Environment and the Economy Act would add carbon storage as a goal for managing national forests.⁴⁶⁴ A more modest bill would assess opportunities to increase carbon storage on national forests derived from the public domain and facilitate voluntary reporting of forest projects that reduce atmospheric carbon dioxide concentrations.⁴⁶⁵ The Save America's Forest Act would

458. The Community Renewal and New Markets Act of 2000, S. 3152, 106th Cong. § 601 (2000).

459. See J. COMM. ON TAXATION, THE ESTIMATED REVENUE EFFECTS OF S.3152, JCX-106-00, at 4 (2000) (providing comprehensive revenue estimates for the proposed legislation).

460. See Press Release, Nature Conservatory, The Nature Conservatory Calls for Passage of Key Conservation Bill (June 28, 2001), available at <http://nature.org/wherewework/northamerica/colorado/press/press339.html> (urging the inclusion of a conservation tax incentive in the federal budget as proposed by candidate Bush during the campaign).

461. See Kim Murphy, *Ecologists Battle Timber Industry at Auction Block*, L.A. TIMES, May 26, 1997, at A1 (reporting that the Forest Service rejected the auction bid because regulations did not allow them to award a logging contract to a party that had no intention of fulfilling it).

462. The Small Business Tax Fairness Act of 2001, H.R. 546, 107th Cong. § 401.

463. See The Reforestation Tax Act of 2001, H.R. 1581, 107th Cong. (2001) (reducing the amortization period under I.R.C. § 194 from 84 months to 60 months).

464. See S. 1457, 106th Cong. (1999) (amending the Energy Policy Act of 1992 to assess potential for increasing carbon storage on public land and improve reporting of forest projects that reduce atmospheric carbon concentrations).

465. See S. 820, 107th Cong. (2001) (directing the Secretary to establish a Carbon and Forestry Council and also providing guidelines on reporting, monitoring, and

strengthen the protection of native biodiversity and ban clear-cutting on Federal land, and designate certain Federal land as ancient forests, road-less areas, watershed protection areas, special areas, and Federal boundary areas where logging and other intrusive activities are prohibited.⁴⁶⁶ The National Forest Protection and Restoration Act of 2001, which garnered 107 co-sponsors in the House, would stop all logging in national forests.⁴⁶⁷

5. *Demand issues*

a. *Housing*

If the United States reduces its production of timber products without decreasing demand, the increase in carbon storage will be matched by an increase in timber harvesting in other parts of the world, causing leakage as Americans simply import more lumber to satisfy demand.⁴⁶⁸ Outside its own borders, the United States has less control over whether timber is harvested by sustainable methods that minimize carbon-emitting disturbances of forest soil.

The main incentive for timber usage in the Code is the home mortgage interest deduction.⁴⁶⁹ By reducing the effective cost of housing relative to other investments, the home mortgage interest

verification of carbon storage from tree planting and forest management actions).

466. S. 1368, 106th Cong. (1999).

467. H.R. 1494, 107th Cong. (2001).

468. See Bradley A. Harsch, *Consumerism and Environmental Policy: Moving Past Consumer Culture*, 26 *ECOLOGY L.Q.* 543 (1999) (arguing that environmental policies should take into account the normative value of the products created by the polluting (or extractive) process). Harsch further argues that as the purchase of large homes is largely discretionary, the cost of the incremental lumber and energy use should be increased to reflect the diminished marginal utility of the expenditure.

Id. Harsch also states:

[B]oth the conventional and proposed approaches to environmental management fail to make normative value judgments about the products or industrial activities whose harmful effects they seek to minimize. In other words, no matter how important or seemingly trivial a product may be to the economy or to the people's lives, the tendency is to place exactly the same environmental restrictions on its creation and distribution. For example, plastic is regulated in the same way whether it is used to make life-saving syringes or grocery store bags. Similarly, aluminum used to make airplanes is regulated in the same manner as aluminum used to make cans of Coca-Cola. This failure to make normative judgments means that environmental law and policy treat the mere existence of a consumer want as sufficient justification for the ecological disvalue its satisfaction entails. In the present social system, a consumers expressed desire is given validity in the marketplace regardless of the reason for its existence. Environmental policy is indifferent to whether a purchase represents a necessary expenditure or profligacy.

Id. at 577.

469. I.R.C. § 163(h)(3) (West 2002).

deduction encourages home ownership.⁴⁷⁰ As the amount of the deduction increases with increasing costs (which generally correlates to the size of the homes), the home mortgage interest deduction encourages the purchase of larger homes.⁴⁷¹ According to the Industrial & Trade Outlook, “the strength of the domestic housing market, including new construction and remodeling, is the key to growth in the U.S. wood products industry.”⁴⁷² More than eighty-one percent of softwood lumber is used for residential and light commercial construction.⁴⁷³ Further, single family residential construction is the main consumer of softwood lumber, and according to industry data, the average unit uses 14,000 board feet of framing lumber.⁴⁷⁴ The demand for lumber increased 4.1% in 1999 and is expected to continue to increase because of the relatively high level of single-family housing starts, the largest consumer of lumber products, and the vigorous residential repair, remodeling, and home improvement sectors.⁴⁷⁵ Because the average size of homes built in the United States are predicted to increase slightly, more lumber products are expected to be consumed domestically in the years 2000 to 2004.⁴⁷⁶ In addition, increasing activity in the repair and remodeling end-use segments was expected to further bolster lumber consumption.⁴⁷⁷ It has been estimated that of the eighty-one percent of soft lumber used in residential and light commercial construction, approximately twenty-eight percent is used for remodeling.⁴⁷⁸

The home mortgage interest deduction not only leads to increasing lumber consumption, but also to loss of forest land.⁴⁷⁹ From 1982 to 1997, developed land increased from 75 million acres to 105 million acres.⁴⁸⁰ Converted forest lands accounted for over one third of that increase (11.7 million acres), surpassing that of cropland

470. Roberta F. Mann, *The (Not So) Little House on the Prairie: The Hidden Costs of the Home Mortgage Interest Deduction*, 32 ARIZ. ST. L.J. 1347, 1358 (2000).

471. *See id.* at 1395 (arguing that turning the deduction into a tax credit would end the government’s subsidization of the purchase of larger homes).

472. 2000 INDUSTRIAL & TRADE OUTLOOK, *supra* note 327, at 7-2.

473. *See id.* at 7-1 (detailing global industry trends on the use of U.S. wood products).

474. *See id.* at 7-4 (illustrating industry performance in 1999 noting that sawmills and planning mills are the largest sector in the solid wood products industry).

475. *Id.*

476. *See id.* at 7-5 (describing industry and trade projections for sawmills and planning mills for 1999 to 2004).

477. *Id.* at 7-5.

478. *See id.* at 7-4 (reporting that consumption in the remodeling sector decreased 1.9% from 1997 to 1998).

479. *See Mann, supra* note 470, at 1384 (positing that “[t]he home mortgage interest deduction’s most obvious nexus to sprawl is that it facilitates the preexisting American preference for large, single family homes.”).

480. 1997 NRI, *supra* note 340, at 36 tbl. 5.

(8.8 million acres).⁴⁸¹ Sprawl, defined in this Article as low-density development that extends beyond traditional city boundaries,⁴⁸² not only destroys carbon-absorbing forests but also generates significant increases in carbon emissions.⁴⁸³ Low-density development discourages walking and use of public transportation, thus requiring residents to travel by private automobile, which increases pollution and carbon dioxide emissions.⁴⁸⁴ Low-density development far from city centers increases homeowners' commutes, resulting in even more carbon dioxide emissions from cars.⁴⁸⁵ Furthermore, increasing the size of homes means additional energy usage, causing more GHG emissions.⁴⁸⁶

Without completely curtailing development, developers could receive incentives to preserve trees on building sites, instead of clearcutting the site before building.⁴⁸⁷ In a previous article, I detailed a proposal to tailor tax incentives for homeownership to provide greater rewards to those who purchase location efficient homes.⁴⁸⁸ Congress has already considered proposals to create tax

481. *Id.* Despite this, the total amount of forest land increased by about 800,000 acres, primarily because of cropland and pastureland reverting to forest. *Id.*

482. THE SIERRA CLUB, THE 1998 SIERRA CLUB SPRAWL REPORT, at <http://www.sierraclub.org/sprawl/report98/report.asp> (last visited Aug. 9, 2002) (on file with the American University Law Review). The term "sprawl" does not have one technical definition, however, the definition of "sprawl" typically encompasses the same idea as put forth by the Sierra Club.

483. See *infra* note 484.

484. See U.S. GEN. ACCOUNTING OFFICE, COMMUNITY DEVELOPMENT: EXTENT OF FEDERAL INFLUENCE ON "URBAN SPRAWL" IS UNCLEAR GAO/RCED-99-87 1 (Apr. 1999) (reporting on the contribution of federal programs and policies to address urban sprawl); see also F. Kaid Benfield, *Running on Empty: The Case for a Sustainable National Transportation System*, 25 ENVTL. L. 651, 657 (1995) (stating that "[t]he threat of global warming is perhaps less certain but potentially more serious than that of the health problems associated with transportation pollution. Among greenhouse gas emitters, our transportation system is particularly egregious, accounting for about forty-five of all U.S. volatile organic compound emissions.").

485. See, e.g., Mann, *supra* note 470, at 1370-71 nn.137, 138 (discussing how low-density development increases carbon dioxide emissions because of increased automobile usage).

486. See EIA: EMISSIONS OF GREENHOUSE GASES, *supra* note 60, at 22:

At 313.4 million metric tons carbon equivalent, residential carbon dioxide emissions represented 20 percent of U.S. energy-related carbon dioxide emissions in 2000. The residential sector's pro-rated share of electric power sector emissions accounts for about two-thirds of that amount (211.5 metric tons carbon equivalent) Total carbon dioxide emissions from the residential sector increased by 4.9 percent in 2000.

See generally Mann, *supra* note 470 (contending that this increase is further evidence of epidemic sprawl throughout the country).

487. See generally Greenspace Environmental Website, at <http://home.earthlink.net/~whisperingmeadow/cc.html> (last visited Aug. 22, 2002) (on file with the American University Law Review) (stating that clear-cutting is the complete removal of all vegetation from an open area for the purpose of logging or construction).

488. Mann, *supra* note 470, at 1393-96.

incentives for improving the energy efficiency of homes.⁴⁸⁹ Congress has also considered proposals to create tax incentives for using energy efficient, less GHG-emitting automobiles.⁴⁹⁰

489. See H.R. 4, 107th Cong. § 2101 (2002) (providing grants for contractors who build energy efficient homes); S. REP. NO. 107-140, at 16 (2002). The Senate Report described the energy efficient homes provision as follows:

The Committee recognizes that residential energy use for heating and cooling represents a large share of national energy consumption, and accordingly believes that measures to reduce heating and cooling energy requirements have the potential to substantially reduce national energy consumption. The Committee further recognizes that the most cost-effective time to properly insulate a home is when it is under construction and that the most effective mechanism to encourage the utilization of energy-efficient components in the construction of new homes is through an incentive to the builder. Accordingly, the Committee believes that a tax credit for the use of energy-efficiency components in a home's envelope (exterior windows (including skylights) and doors and insulation) or heating and cooling appliances will encourage contractors to produce highly energy-efficient homes, which in turn will reduce national energy consumption. Reduced energy consumption will in turn reduce reliance on foreign suppliers of oil and will reduce pollution in general.

Id.; see also H.R. 4 § 2109 (containing an incentive for increasing the energy efficiency of an existing home); H.R. 2076, 107th Cong. (2001) (providing a fifteen percent credit up to \$2,000 for each of two types of residential solar energy property: qualified photovoltaic systems and qualified water heating systems); H.R. 3455, 107th Cong. (2001) (giving incentives to introduce new technologies to reduce energy consumption in residential buildings). House Report 3455's maximum business deduction for residential rental building expenditures on property that reduces a building's annual energy costs by thirty percent is \$1,500; for property that achieves a fifty percent reduction, the deduction is capped at \$4,000. For the highly energy-efficient property credit, which would be available to principal residence owners as a nonrefundable personal credit, the maximum for thirty percent property would be \$500; for fifty percent property, the maximum credit would be \$1,250. See *id.*; see also The Energy Conservation Tax Credit Act, S. 196, 107th Cong. (2001) (providing a refundable tax credit for the cost of energy conservation measures, such as ceiling insulation, weather stripping, water heater insulation blankets, low-flow showerheads, thermal doors and windows, clock thermostats, and external shading devices). Senate 196 would also provide grants to school districts to retrofit public school buildings to increase energy efficiency and conservation. The bill would require utility companies to provide information on electricity bills regarding the amount of electricity used during peak and nonpeak hours and how much the consumer is paying during each period. *Id.*

490. See H.R. 4 §§ 201-205 (providing tax benefits directly to the consumer to lower the cost of new technology and alternative-fueled vehicles); S. REP. NO. 140, 107th Cong. at 7 (2002). The Senate Report states that these benefits

can help lower consumer resistance to these technologies by making the vehicles more price competitive with purely petroleum-based fuel vehicles and creating increased demand for manufacturers to produce the technologies. The eventual goal is mass production and mass market acceptance of new technology vehicles. No one technology has established that it alone provides the solution. Therefore, it is appropriate to provide tax benefits tailored to specific vehicle technologies, as long as the vehicle's engine technology directly replaces gasoline and diesel fuel with an alternative energy source.

Id. Senate Report 140 largely incorporates concepts from earlier bills. See also Clean Efficient Automobiles Resulting From Advanced Car Technologies Act of 2001 (Clear Act), H.R. 1864, 107th Cong. (encouraging the use of fuel cell, hybrid, battery electric, and other advanced motor vehicle technologies by offering an alternative

b. Paper

After home construction, paper uses the most lumber.⁴⁹¹ Much talk is made of the “paperless” society we are becoming,⁴⁹² but the average American office worker generates between 120 to 150 pounds of recyclable white paper waste per year.⁴⁹³ Generally, manufacturing from recycled materials creates less waste and fewer emissions. Providing tax incentives for recycling could reduce our consumption of virgin lumber for paper, thereby preserving forests for carbon storage. There are few existing federal laws about recycling paper, although several proposals have been made. For example, in 1997, the House of Representatives proposed to make recycling office waste mandatory in its offices.⁴⁹⁴ In 2000, the Greening of the Government Act proposed that federal agencies be required to meet minimum standards for recycled content of paper: forty percent post-consumer materials or thirty percent post-consumer materials/100% Processed Chlorine free.⁴⁹⁵

motor vehicle credit modified specifically for qualified electric vehicles). The credit would also apply to the retail sale of alternative fuels as motor vehicle fuels and could even be used toward the installation of alternative fueling stations. *Id.* These tax incentives would sunset within six years, except for those applying to fuel cell vehicles, which would last ten years. *Id.*; see also 147 CONG. REC. E838 (daily ed. May 17, 2001) (statement of Rep. Camp) (“With minimum development cycles of two to four years for new vehicles, incentives are needed now to move existing designs to the market and thus accelerate the process of consumer acceptance.”); Wider Incentives for Non-Gasoline Small Electric Vehicles Act of 2002, H.R. 3631, 107th Cong. (modifying the electric motor vehicle credit contained in I.R.C. § 30, originally enacted in 1992, by increasing the potential amount of the credit to up to \$40,000 and by including certain three-wheeled vehicles).

491. 1999 STATISTICAL ABSTRACT, *supra* note 325, at 697 tbl. 1147; see also Mona L. Hymel, *Consumerism, Advertising, and the Role of Tax Policy*, 20 VA. TAX REV. 348, 352 (2000) (arguing that the Internal Revenue Code actively encourages waste). Hymel further states:

Congress should not subsidize advertising . . . through tax deductions. Rather, tax policies should reinforce, rather than contradict, other national policies, such as conservation. My claim is simple: advertising leads us to believe that ever-increasing consumption will make us happy; science overwhelmingly suggests otherwise, and in fact, suggests that our high and increasing consumption cannot be sustained. Existing federal tax laws encourage advertising through preferential tax treatment that, in essence, subsidizes advertisers. Given growing concerns over our consumptive lifestyles, I argue that the federal government should not subsidize advertising and that the tax treatment of advertising costs should be reevaluated.

Id. (footnotes omitted).

492. See, e.g., Harry Bruse, *We're Drowning in this Paperless World*, THE RECORD (Kitchener-Waterloo), Jan. 17, 2002, at A9.

493. H.R. 251, 105th Cong. (1997).

494. H.R. REP. NO. 119, 105th Cong. (1997).

495. S. 3271, 106th Cong. § 13 (2000).

III. ENVIRONMENTAL TAXES

A. *In General*

I have discussed a number of proposals that could help preserve forests and thereby reduce GHG emissions.⁴⁹⁶ Environmental taxes could provide another method to reduce GHG emissions. Classic evaluation of tax provisions involves consideration of equity, economic efficiency, and ease of administration.⁴⁹⁷ Equity has two components: horizontal equity, which requires that similarly situated taxpayers be taxed similarly;⁴⁹⁸ and vertical equity, which requires taxpayers to be taxed according to their ability to pay.⁴⁹⁹ Economic efficiency requires that a tax provision be economically neutral.⁵⁰⁰ Ease of administration means that a provision should be easy for the I.R.S. to enforce and easy for the taxpayer to understand.⁵⁰¹

If the provision under consideration is a tax expenditure, the concepts of equity and efficiency may need to be modified. Tax expenditures are provisions that provide tax reductions to particular groups of beneficiaries, creating a targeted economic benefit like a direct expenditure.⁵⁰² In a recent paper, Professor Paul McDaniel posits that the relevant equity inquiries for tax expenditure provisions are (1) is it “fair” to grant a financial subsidy or incentive only to a particular group of individuals or businesses to the exclusion of others; and (2) if so, are the financial benefits distributed “fairly” among those who are potential beneficiaries of the program.⁵⁰³ The relevant efficiency inquiries include (1) is the subsidy correcting a market failure or generating “externalities” of value to the general public; (2) is the full amount of the tax expenditure being received by the intended beneficiaries; (3) is the subsidy being provided at the lowest administrative cost to the government and the program

496. See generally *supra* Part III.A.3.

497. See generally SURREY & MCDANIEL, *supra* note 18, at 70-98.

498. See WILLIAM A. KLEIN & JOSEPH BANKMAN, FEDERAL INCOME TAXATION 19 (11th ed. 1997) (describing how the different notions of equity need to be considered when evaluating a tax provision).

499. *Id.*

500. See generally SURREY & MCDANIEL, *supra* note 18. Of course, few tax provisions achieve economic neutrality. Indeed, many are enacted specifically to alter the economic consequences of a given action. See, e.g., 26 U.S.C. § 38 (2000) (the “general business credit”) (listing a number of tax credits designed to encourage certain types of investments, such as investment in the steel industry).

501. See generally SURREY & MCDANIEL, *supra* note 18 (explaining that the ease of administration leads to more overall efficiency).

502. See J. COMM. PRINT, *supra* note 199 (explaining tax expenditures).

503. Paul R. McDaniel, Tax and Spend 9 (Apr. 16, 2002) (unpublished manuscript, on file with author).

beneficiaries; and (4) does the subsidy create undesirable economic distortions within the affected industry.⁵⁰⁴

The difficult problem of global warming suggests another criteria should be used for evaluating tax provisions, in addition to equity, efficiency, and ease of administration: whether the provision is friendly to the environment. To meet this goal, a tax provision should encourage (or at least not discourage) resource conservation and pollution prevention.⁵⁰⁵ As discussed above, the tax provisions relating to energy and timber production generally fail the environmental criteria.⁵⁰⁶ These provisions also fail from an economic efficiency standpoint under either the classic or the new McDaniel criteria: they do not account for the economic costs of environmental damage and health effects of pollution.⁵⁰⁷ If a provision creates an incentive to emit GHGs, it is not only environmentally damaging but arguably economically inefficient, as it benefits industries that do not bear the cost of the environmental damage they create. Because the global atmosphere is a CPR, polluters can avoid the full cost of their activities. Rather, the costs of pollution are diffused over all of the users of the global atmosphere. Thus, market forces fail to require the polluter to bear the cost. A policy of taxing the negative externalities of “environmental bads” could correct for this market failure.⁵⁰⁸ The OECD considers taxes on pollution to have “negative excess burden: they improve rather than distort the functioning of the market economy.”⁵⁰⁹ Conversely, the

504. *Id.*

505. ALAN THEIN DURNING & YORAM BAUMAN, TAX SHIFT 15 (1998).

506. *See supra* notes 505-10 and accompanying text.

507. *See* Durning, *supra* note 505, at 39 (stating that “the ideal tax rate, according to economists, charges polluters for the costs they impose on others.”); *see also* Repetto, *supra* note 114, at 8:

Under some conditions, an environmental charge cannot only minimize the costs of meeting any given target for control of total emissions but also lead to an overall level of control that minimizes the sum of environmental damages and control costs. The key is setting the rate to equal the marginal damages from an additional unit of the offending activity, at just that overall level of control at which the marginal damage from an additional 1 unit equals the marginal cost of abating it.

508. *See* ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD), ENVIRONMENTALLY RELATED TAXES IN OECD COUNTRIES: ISSUES AND STRATEGIES 21 (2001) [hereinafter OECD TAX 2001]:

[A] negative externality is a cost that one economic agent imposes on another but does not take into account when making production or consumption decisions. When the costs of pollution or resource use are not reflected in prices, market inefficiencies result with excessive production or consumption of products and activities that impose social costs. Externalities exist because of the public goods nature of the environment.

509. OECD, ENVIRONMENT AND TAXATION: THE CASES OF THE NETHERLANDS, SWEDEN AND THE UNITED STATES 109 (1994).

subsidy for fossil fuel production provided by the Internal Revenue Code not only fails to tax environmental bads, it actively encourages them.⁵¹⁰

B. Market-Based Incentives

While early attempts at pollution regulation generally involved “command and control regulation,” there is a growing consensus for using market-based instruments to effect environmental reform.⁵¹¹ Market based instruments include pollution taxes, pollution subsidies, and tradable permits.⁵¹² Pollution taxes are generally considered the “gold standard” of market-based instruments.⁵¹³ Pollution taxes allow polluters the flexibility to use the most cost-effective means of reducing their emissions, in contrast with command and control regulations, which typically specify standards for the means of reducing pollution.⁵¹⁴ Pollution subsidies work in

510. See Maureen B. Cavanaugh, *On the Road to Incoherence: Congress, Economics, and Taxes*, 49 UCLA L. REV. 685, 688 (2001) (assessing Congress' confusion about the role of taxation in curbing externalities). Professor Cavanaugh describes the principles of Pigouvian taxation, that is, the use of tax to correct for externalities, originally espoused by A.C. Pigou in 1912. *Id.* at 688. Citing the example of tax-subsidized transportation benefits, Professor Cavanaugh notes that Congress is subsidizing rather than penalizing an activity (driving) with significant negative social costs. *Id.* at 688, 717-23. The same analysis applies to the tax treatment of the fossil fuel industry.

511. See Johnson, *supra* note 15, at 112 (stating that “critics . . . argue that command and control regulation (i) imposes unreasonable information-gathering and exorbitant costs on government; (ii) often imposes disproportionate burdens on new pollution sources; and (iii) provides no incentives to polluters to develop new strategies to reduce their pollution beyond the levels required by law.”) (footnotes omitted).

512. See *infra* notes 513-24.

513. Jonathan Baert Wiener, *Global Environmental Regulations*, 108 YALE L.J. 677, 682 (1999) (noting that “the standard analysis crowns taxes as the presumptive first choice for optimal environmental regulation”). Professor Wiener ultimately concludes, however, that in a global context where law cannot be imposed by “unitary fiat” but rather must be assented to voluntarily, tradable allowances become the best choice because they maximize participation efficiency. *Id.* at 798. *But see* David M. Driesen, *Choosing Environmental Instruments in a Transnational Context*, 27 ECOLOGY L.Q. 1, 4 (2000) (analyzing Professor Wiener's approach, and concluding that a transnational approach does not necessarily lead to the choice of a particular instrument). Driesen doubts that international allowance trading creates greater “participation efficiency” than pollution taxes or traditional regulation. *Id.* at 24. Rather, he advocates a “transnational pluralist approach,” which would permit domestic allowance trading without requiring international coordination. *Id.* at 35. Under a transnational pluralist approach, “the private parties receiving payments subsidizing environmental improvement are not the same private parties that must pay the tax. Under these scenarios, the cheapest mechanism (taxes) should produce the cheapest aggregate reductions.” *Id.* at 35. Although global warming is certainly a global problem, this Article's approach focuses on U.S. law and thus avoids the concern about applicability in a global context.

514. TAXATION FOR ENVIRONMENTAL PROTECTION: A MULTINATIONAL LEGAL STUDY 4 (Sanford E. Gaines & Richard A. Westin eds., 1991).

much the same way as pollution taxes: the polluter can use any cost effective means of reducing emissions and has an incentive to do so if the cost is less than the amount of the subsidy.⁵¹⁵ However, pollution subsidies can create perverse incentives. Because a subsidy reduces the costs of entering a pollutive industry, it may encourage greater investment in the industry and thus more pollution.⁵¹⁶ Tradable allowances, or permits, set a quantity limit for emissions and permit market forces to determine who will use the allowances.⁵¹⁷

The effect of a pollution tax is to cap the costs of abatement.⁵¹⁸ Alternately, the effect of a tradable allowance is to cap the quantity of emissions.⁵¹⁹ Cost restrictions, such as pollution taxes, work better than quantity restrictions when “health or environmental damages are not very sensitive to short term emissions levels or when concerns exist about potentially high costs.”⁵²⁰ As the damages from GHG emissions result from cumulative exposure, short term increases in GHG emissions cannot be traced to large environmental damages.⁵²¹ Accordingly, for abating GHG emissions, price instruments such as carbon taxes can be expected to be more efficient and effective than quantity instruments such as tradable allowances.⁵²² Tradable allowances may lead to environmental hot spots in low-income communities,⁵²³ and diminish the pressure on emitting companies to make technological changes to restrict GHG emissions.⁵²⁴

515. See Johnson, *supra* note 15, at 115 (stating that the amount of the subsidy is critical in the effectiveness of the policy because the polluter still has little incentive to desist, even with the subsidy, if they are going to lose money).

516. See Wiener, *supra* note 513, at 727 (describing the way in which an environmental protection action can in effect encourage more capital inflow into the polluting industry).

517. TAXATION FOR ENVIRONMENTAL PROTECTION: A MULTINATIONAL LEGAL STUDY, *supra* note 514, at 5. The sulfur dioxide emission trading program created by the 1990 Clean Air Act Amendments exemplifies a tradable allowance program. See 42 U.S.C. 7651-7651o (2001).

518. See TAXATION FOR ENVIRONMENTAL PROTECTION: A MULTINATIONAL LEGAL STUDY, *supra* note 514 (discussing pollution tax).

519. See Wiener, *supra* note 513, at 728 (discussing how tradable allowances put a limit on the amount of pollution that the industry as a whole can produce).

520. Richard D. Morgenstern, Reducing Carbon Emissions and Limiting Costs 3-4, (Feb. 2002), available at <http://www.rff.org/climatechangemorganstern.pdf> (last visited Aug. 29, 2002).

521. See *id.* (discussing cumulative exposure).

522. See *id.* (discussing effectiveness of price instruments).

523. See Johnson, *supra* note 15, at 129 (explaining that tradable allowances could lead to certain industries or areas, which may not be able to economically reduce pollution, trading for more allowances rather than make pollution reducing improvements).

524. See *id.* (stating that it may be cheaper for industries to trade for allowances if they can do so, rather than make improvements).

1. *Scientific effectiveness*

The scientific effectiveness of a tax proposal is another important consideration. The scientific effectiveness of a proposal needs to be evaluated both before it is adopted (ex ante) and after it has been implemented (ex post).⁵²⁵ An ex ante evaluation would be based on price elasticities of the affected products (such as energy and energy intensive products, such as steel) and the costs of abatement.⁵²⁶ The demand for total energy use is somewhat inelastic in the short term, but becomes more elastic in the long term.⁵²⁷ Cross-price elasticities measure the effect that the change in price in one product has on the price of a competing product.⁵²⁸ In crafting a GHG mitigation instrument, governments should consider the environmental impacts of cross-price elasticity, and design the instrument to shift use from high emitting sources to low emitting sources.⁵²⁹ The OECD concludes that environmentally related taxes, by raising the price of certain fuels, can result in significantly lower demand and pollution.⁵³⁰ However, competing provisions, such as oil and gas subsidies, can complicate the ex ante evaluation of a GHG mitigation proposal.⁵³¹

Ex post evaluation, which is typically more reliable, cannot be done until the proposal is implemented.⁵³² Examining the results of carbon taxes implemented in other countries can approximate an ex post evaluation of a proposal. Finland, Sweden, Denmark, the Netherlands, and Norway have all imposed carbon taxes for at least ten years.⁵³³ Belgium, Austria, and Germany impose taxes on energy use.⁵³⁴ These countries also cut some combination of personal income tax, social security contributions, corporate tax, or the tax on capital with the increased revenues raised by the carbon tax.⁵³⁵ The average revenue raised by environmentally related taxes imposed by OECD countries is two percent of GDP and six percent of total tax

525. OECD TAX 2001, *supra* note 508, at 46.

526. *Id.*

527. *Id.* at 100.

528. *Id.*

529. *See id.* at 102-03 (describing how governments should consider the elasticity of whatever society would use as an alternative to the pollution industry and craft their policies to increase use of these alternatives).

530. *See id.* at 103 (describing how the elasticity of a product may be low in the short term, but in the long term the elasticity is greater and the environmental policy is more effective at curbing demand).

531. *See* OECD TAX 2001, *supra* note 508, at 46 (showing how other policy tools can complicate the evaluation of an environmental policy).

532. *See id.* (stating that results need to be observed to make this type of analysis).

533. *Id.* at 51.

534. *Id.* at 52.

535. *Id.* at 40.

revenues.⁵³⁶ Sweden, Norway, and Finland have conducted ex post studies of the effectiveness of their carbon taxes.⁵³⁷ The Swedish study showed that CO[2] emissions from the heating, industrial and housing sectors were about nineteen percent lower in 1994 than in 1987.⁵³⁸ The Norwegian study showed a twenty-one percent decrease in CO[2] emissions from stationary combustion plants.⁵³⁹ The Finnish study concluded that carbon emissions would have been seven percent higher in 1998 if carbon taxes had not been implemented.⁵⁴⁰

As discussed above, many Americans fear that GHG mitigation would place U.S. industry at a competitive disadvantage.⁵⁴¹ Studies cited above show that the U.S. economy as a whole could improve as a result of GHG mitigation, but energy intensive industries are likely to argue for exemptions from a tax on CO[2] emissions to preserve their competitive position.⁵⁴²

The OECD concluded that “the negative environmental impacts of exemptions and rebates in many cases will be highly problematic as the sectors given special treatment tend to be the largest polluters.”⁵⁴³ One study found that exemptions for high emitting industries would raise the total cost of GHG reduction by twenty percent.⁵⁴⁴ Exemptions also reduce incentives to invest in research and development of less carbon intensive alternatives.⁵⁴⁵

2. *Political considerations*

The foregoing analysis suggests that the United States should adopt a carbon tax to reduce GHG emissions.⁵⁴⁶ While economic theory might favor such a tax, practical political considerations make its

536. *Id.* at 100.

537. *Id.* at 102.

538. *Id.* at 105.

539. *Id.*

540. *Id.*

541. *See generally supra* Part II.B.2 (discussing opinion of some that mandatory greenhouse gas reductions will harm the U.S. economy or put it at a competitive disadvantage).

542. *Id.*

543. OECD TAX 2001, *supra* note 508, at 79.

544. *Id.* at 80.

545. *Id.*

546. *See* LARRY PARKER, U.S. CONG. RESEARCH SERV., ISSUE BRIEF, GLOBAL CLIMATE CHANGE: MARKET-BASED STRATEGIES TO REDUCE GREENHOUSE GASES 11 (Mar. 12, 2002), *available at* <http://www.cnrc.org/nle/crsreports/climate/clim-5.pdf>:

Estimates of the carbon tax necessary to stabilize U.S. CO₂ emissions at their 1990 level by the year 2000 range from under \$30 per ton to over \$100 per ton. . . . [t]he impact of the carbon tax on the economy would depend to some degree on how the government disposed of generated revenues.

enactment doubtful.⁵⁴⁷ Congress has proposed a carbon tax several times, but none has come close to enactment.⁵⁴⁸ One proposal would impose different rates on different types of fuels according to their carbon content.⁵⁴⁹ Another proposal would impose a tax of \$50 per ton of carbon dioxide emitted by power generating units with a generating capacity of five or more megawatts.⁵⁵⁰ This tax would be used to establish a Clean Air Trust Fund, which would pay for, *inter alia*, the development of a carbon sequestration strategy to offset growth in U.S. carbon dioxide emissions and for carrying out methods of biologically sequestering carbon dioxide.⁵⁵¹ A newer version of this proposal drops the carbon dioxide tax, but imposes an excise tax of thirty cents per megawatt of power produced by fossil fuel burning plants.⁵⁵²

Conservative politicians, who currently make up a majority of the House of Representatives and control the Administration, generally look with disfavor on increasing taxes on business. Frequently opposition to taxation is couched in terms of protecting private property rights.⁵⁵³ However, one conservative commentator notes that “[a]ll forms of pollution violate the property rights of all of their victims.”⁵⁵⁴ Another argues that “[a] society that takes property rights and consent seriously, such as ours, will then at least enact environmental laws that seek to minimize and eventually eliminate

547. Depending on its structure, a carbon tax could also fall disproportionately on low income taxpayers, as they pay a higher percentage of their income for energy usage. Also, as low income taxpayers tend to rent rather than own property, they would be unable to increase the energy efficiency of their dwelling units. However, recycling carbon tax revenues to offset other regressive taxes, such as the payroll tax, could ameliorate this regressive effect. A regressive tax fails the vertical equity criterion. The OECD calls this tax shift a “double dividend.” See OECD TAX 2001, *supra* note 508, at 37.

548. See *infra* notes 549, 550, 552 and accompanying text (discussing recent legislative proposals).

549. See H.R. 1086, 102d Cong. (1991); H.R. 804, 103d Cong. (1993) (reintroducing H.R. 4805, 101st Cong. (1990) in virtually identical form); see also Repetto, *supra* note 114, at 54 (describing a tax on the carbon content of fuel as “the equivalent of a charge on emissions,” and further asserting that the administrative and enforcement costs of imposing and collecting a tax on individual sources of CO[2] emissions would be prohibitive).

550. S. 2636, 105th Cong. § 9 (1999).

551. *Id.* § 8.

552. See S. 1131, 107th Cong. § 7 (2001) (reintroducing in virtually identical form S. 1949, 106th Cong. (1999)); cf. H.R. 1335, 107th Cong. (2001) (creating tradable CO[2] allowances).

553. See, e.g., James A. Dorn, *Ending Tax Socialism* (arguing that under a progressive tax system, property is not safe from the hands of the state), at <http://www.cato.org/dailys/9-13-96.html> (last visited Aug. 9, 2002) (on file with the American University Law Review).

554. Bliese, *supra* note 119, at 17.

pollution.”⁵⁵⁵ Conservatives should embrace market based pollution controls, as such policies could be designed to meet the goal much more effectively and efficiently than could bureaucratic regulatory policies.⁵⁵⁶

One commentator advocates the adoption of a tradable permit system to control GHG emissions, arguing that “the political system in the United States . . . has revealed its strong preferences for quantity instruments in their grandfathered form.”⁵⁵⁷ Several researchers have examined hybrid instruments that combine quantity restrictions with a “safety valve” price cap.⁵⁵⁸ Some of these proposals involve a guarantee that if freely traded emissions permits exceed a specified price, the government will issue more permits at a lower, pre-determined price.⁵⁵⁹ If the target price is set low enough so that emissions usually exceed the quantity limit, the extra cost of the government guaranteed permits has the economic effect of an emissions tax.⁵⁶⁰

Recent proposals that create voluntary incentives to reduce GHG emissions may be more politically palatable, but none has gotten out of committee yet.⁵⁶¹ One proposal would add a reduced greenhouse gas emissions facilities credit to the investment tax credit, in an amount equal to the applicable percentage of qualified investment in a reduced greenhouse gas emissions facility for a taxable year.⁵⁶² The

555. Mark Sagoff, *Some Problems with Environmental Economics*, 10 ENVTL. ETHICS 55, 61 (1988).

556. See Bliese, *supra* note 119, at 4 (“[I]t is not the conservative’s job to help the business world get whatever it wants. It is the conservative’s job to try to devise a proper system in which businesses are forced to compete (and to assume responsibility for their actions), whether they like it or not.”). Bliese also notes the basic inconsistency of certain “conservative values,” citing as an example the western rancher who considers himself a “paradigm American conservative,” and yet vociferously opposes any attempt to increase subsidized grazing fees on Federal land to market value. *Id.*

557. Robert N. Stavins, *Policy Instruments for Climate Change: How Can National Governments Address a Global Problem?*, 1997 U. CHI. LEGAL FOUND. 293, 321 (1997) (citations omitted).

558. See Jenry D. Jacoby & A. Denny Ellerman, *The “Safety Valve” and Climate Policy*, MIT Joint Program on the Science and Policy of Global Change, REP. NO. 83 (Feb. 2002), available at <http://web.mit.edu/globalchange/www/reports.html#pubs>; see also CONG. BUDGET OFFICE, AN EVALUATION OF CAP-AND-TRADE PROGRAMS FOR REDUCING U.S. CARBON EMISSIONS 17 (June 2001) [hereinafter CAP-AND-TRADE EVALUATION] (presenting hybrid cap-and-trade/safety valve approach).

559. Jacoby & Ellerman, *supra* note 558, at 1. *But see* CAP-AND-TRADE EVALUATION, *supra* note 558, at 17 (describing a proposal where additional permits are sold at the specified price, not a lower pre-determined price).

560. Jacob & Ellerman, *supra* note 558, at 2.

561. See *infra* notes 562, 565, 568, 574 and accompanying text (discussing recent legislative proposals).

562. See S. 1293, 107th Cong. § 3 (2001) (reintroducing in virtually identical form S. 1777, 106th Cong. (1999)).

bill would also create a research and development tax credit for qualified research expenses for reducing or sequestering GHG.⁵⁶³ This proposal would constitute a pollution subsidy.⁵⁶⁴ Another proposal would create tradable CO[2] allowances, authorizing the carryover and trading of unused allowances, requiring surrender of a number of CO[2] allowances equal to the total tonnage emitted during the calendar year and permitting the performance standard to be exceeded if the plant has sufficient emissions credits.⁵⁶⁵

Even Senators with significant ties to fossil fuel industries support research into GHG mitigation.⁵⁶⁶ As Robert Stavins noted: “[t]he ultimate test of any greenhouse policy instrument—whether domestic or international—will be whether it is scientifically effective, economically rational, and politically feasible.”⁵⁶⁷ Perhaps the most acceptable compromise of political feasibility, scientific efficiency, and economic rationality is sponsored by Senator Sam Brownback (R-KN), who proposes to create a carbon sequestration credit.⁵⁶⁸ Under the proposal, an eligible taxpayer could take a carbon sequestration investment credit which would amount to \$2.50, multiplied by the number of tons of carbon sequestered annually, limited to fifty percent of the investment attributable to the eligible taxpayer with respect to the sequestration project throughout such taxable year.⁵⁶⁹ The bill requires the formation of an “implementing panel,” which would approve the sequestration project and award an aggregate

563. *Id.* § 2.

564. *See supra* notes 505-10 and accompanying text.

565. H.R. 1335, 107th Cong. § 5 (2001) (imposing an excess emissions penalty and requiring units to offset such emissions).

566. *See* S. 1294, 107th Cong. § 5 (2001) (establishing, as introduced by Senator Frank Murkowski (R-AK), a long-term Climate Technology Research, Development, Demonstration, and Deployment Program “to foster technologies and practices that—(1) reduce or avoid anthropogenic emissions of greenhouse gases; (2) remove and sequester greenhouse gases from emissions streams . . . (3) remove and sequester greenhouse gases from the atmosphere . . .”); *id.* § 6 (“(4) provide for a pilot program for financial assistance for qualifying international energy deployment projects”); *id.* § 8 (“(5) assess the status and readiness (including potential commercialization) of each energy technology and any regulatory or market barriers to deployment; and (6) establish an information clearinghouse to facilitate the transfer and dissemination of the results of federally funded research and development activities being carried out on energy technology.”).

567. Stavins, *supra* note 557, at 327.

568. S. 765, 107th Cong. (2001) (reintroducing Senate 2982, 106th Cong. (2000)).

569. *Id.* § 2 (giving priority in allocation of credits to carbon sequestration projects that accomplish the following objectives: (i) native forest preservation; (ii) reforestation of former forest land that has not been forested for at least ten years; (iii) biodiversity enhancement; (iv) prevention of greenhouse gas emissions through preservation of carbon storing plants and trees; (v) soil erosion management; and (vi) soil fertility restoration).

amount up to \$200 million in tax credits each year.⁵⁷⁰ It also requires the credit to be recaptured “if the eligible taxpayer violates a term or condition of the approval of the project by the implementing panel at any time” or “the eligible taxpayer adopts a practice which the implementing panel has specified in its approval of the project as a practice which would tend to defeat the purposes of the carbon sequestration program.”⁵⁷¹

A targeted credit like the carbon sequestration credit proposed by Senator Brownback does not advance the tax policy goal of ease of administration.⁵⁷² The credit requires a new layer of bureaucracy to determine qualification for the credit and to monitor whether a recapture event has occurred.⁵⁷³ However, other bills that Senator Brownback proposes would be effective in stimulating private investment in carbon sequestration. One of his proposals provides cost-sharing payments to investors in qualified sequestration projects.⁵⁷⁴ As discussed above, cost-sharing payments to NIPFs have been successful in stimulating participation and investment in forestry planning.⁵⁷⁵ Adding carbon sequestration to the list of forestry goals and providing cost-sharing payments would help tap the under-utilized carbon storage capacity in privately held forestland.

570. *Id.*

571. *See id.* The recapture percentage is set at 100%, if the recapture event occurs during the first 10 years of the project, 66 2/3% if the recapture event occurs during the second 10 years of the project, 33 1/3% if the recapture event occurs during the third 10 years of the project, and 0% if the recapture event occurs at any time after the 30th year of the project.

Id.

572. *See supra* note 568 and accompanying text.

573. S. 769, 107th Cong. § 2 (2001). The bill created: within the National Institute of Standards and Technology of the Department of Commerce an implementing panel consisting of: (1) the Director of the National Institute of Standards and Technology, (2) the Secretary of Agriculture, (3) the Secretary of State, (4) the Secretary of Energy, (5) the Chief of the Forest Service, and (6) representatives of nongovernmental organizations who have an expertise and experience in carbon sequestration practices, appointed by the Secretary of Agriculture. The Chief of the Forest Service shall act as chairperson of the implementing panel.

Id.

574. S. 785, 107th Cong. (2001).

575. *See supra* note 451 (discussing cost-sharing payments).

3. *Piety, prudence, and other non-economic considerations*

Eliminating subsidies for fossil fuel use⁵⁷⁶ and adding tax incentives for carbon sequestration would encourage conservation, enhance public welfare, possibly avert the potential catastrophe of global warming, and may even be considered a moral imperative. John Bliese gives two other “conservative” reasons for adopting policies that preserve the environment: piety and prudence.⁵⁷⁷ He asserts that “attempting to conquer nature is, thus, ‘theologically wrong’ and the modern attack on nature is not merely poor policy but is nothing less than ‘sin.’”⁵⁷⁸ He argues that piety would preclude the common forestry practice of clear-cutting.⁵⁷⁹ An example of a pious man atoning for his “ecosins,” Karl Peter Hasenkamp determined how much carbon dioxide he and his family produce by driving their automobile, heating their home, and buying energy-intensive products and “then sent a donation to Global ReLeaf to plant enough trees to scrub the air of a compensatory amount of CO₂.”⁵⁸⁰ Prudence would require reducing GHG emissions to mitigate the potentially significant effects of global warming.⁵⁸¹ Similarly, climatologist Stephen Schneider stated:

if there are things we can do to slow down this rate of change that simultaneously will provide multiple benefits, then it would seem logically compelling to take them seriously Using fuel efficiently not only reduces CO₂ injection, but also cuts acid rain, reduces the health effects of air pollution in cities, reduces the dependence of our energy security on unreliable resources, and improves our long-term competitiveness by cutting the energy cost of manufactured products.⁵⁸²

576. See Joe Thorndike, *Tax History—Civilization at a Discount: The Morality of Tax Avoidance*, 2002 TAX NOTES MAG. 83-84 (Apr. 29, 2002) (retelling statement of President Franklin Delano Roosevelt’s Treasury Secretary, Henry Morgenthau Jr., who called percentage depletion “the best example of legalized theft from the United States Treasury which the revenue laws still permit”).

577. Bliese, *supra* note 119, at 7 (describing piety as an essential conservative value, defined as “the humble acknowledgment that we live in a world which we did not create, and that we inhabit it for only a brief span of time”).

578. *Id.* at 8 (footnotes omitted).

579. See *id.* (describing the various ecological difficulties logging causes) (footnotes omitted).

580. Norah Deaking Davis, *Decade of the Tree; Meditation on Trees and Tree Planting*, 97 AM. FORESTS 21, 24-25 (Jan. 1991).

581. Bliese, *supra* note 119, at 12 n.76 (discussing the various deleterious effects of the continued emission of enormous amounts of greenhouse gas into the atmosphere, including but not limited to a rise in sea level, the flooding of coastal cities, an increase in the number of catastrophic storms, a dramatic decrease in agricultural productivity, and an expansion of “desertification”).

582. STEPHEN H. SCHNEIDER, GLOBAL WARMING: ARE WE ENTERING THE

Global warming qualifies as an “ecological horror story.”⁵⁸³ In a recent article, Professor Holly Doremus argued that economic, esthetic, and ethical explanations of ecological concerns are all limited in political persuasiveness.⁵⁸⁴ Doremus claims economic arguments concentrate solely on the material value of nature’s products and services, ignoring other values, and suggest that no action need be taken until disaster looms.⁵⁸⁵ Although esthetic arguments work well when dealing with specific spectacular locales, such as Yellowstone or Yosemite, they are subject “to charges of arbitrariness, elitism, and dictating tastes that should be left to individual choice.”⁵⁸⁶ Global warming may slowly change particular scenic places, as tropical islands sink under a rising sea,⁵⁸⁷ but obviously many of the consequences of global warming are more diffuse.⁵⁸⁸ Like John Bliese,⁵⁸⁹ Professor Doremus acknowledges the value of religion in bringing conservatives into the ecological movement.⁵⁹⁰ However, she argues that even a combination of economic, esthetic, and ethical arguments might fail to be persuasive.⁵⁹¹ Ultimately, she concludes by stating that any argument

GREENHOUSE CENTURY? 283-84 (1989).

583. See Holly Doremus, *The Rhetoric and Reality of Nature Protection: Toward a New Discourse*, 57 WASH. & LEE L. REV. 11, 19 (2000) (categorizing ecological concerns that could potentially erase mankind from the earth as an ecological horror story). Doremus suggests that an ecological horror story has limited political effectiveness because it “call[s] for nature protection only at a high level of generality.” *Id.* Stating that the increased levels of carbon dioxide as a result of human behavior may cause significant changes in global temperatures, drastically affecting sea levels, weather patterns, and ecosystem services, Doremus emphasizes the difficulty in translating this insight into a concrete argument against any of the many local decisions that are made that contribute to the overall problem. *Id.*

584. See *id.* at 14 (stating that the environmentalists have gotten what they have asked for from legislators, the problem is that framing a request in one of these discourses does not ask legislators for what they really want).

585. See *id.* at 47, 48 (stating that the key limitation of the economic discourse is that it ignores and devalues the reasons why people want to preserve nature).

586. See *id.* at 49 (indicating that opponents to nature conservation can easily defeat this discourse by convincing legislators that modifying nature will actually increase, not decrease, its beauty).

587. See McKibben, *supra* note 28, at 111-12 (describing the disastrous effects of global warming on the Maldivian Islands).

588. See Doremus, *supra* note 583, at 51 (using the parable of Noah to illustrate the potential extreme result of global warming in an attempt to grab the attention of both the Judeo-Christian religious community and legislators in general).

589. See Bliese, *supra* note 119.

590. See Doremus, *supra* note 583, at 51 (identifying the notable gap that has opened between nature advocates and the more conservative political community). But see Robert J. Goldstein, *Green Wood in the Bundle of Sticks: Fitting Environmental Ethics and Ecology into Real Property Law*, 25 B.C. ENVTL. AFF. L. REV. 347, 388-89 (1998) (noting that religious beliefs in an omnipotent deity that exercises power over nature may have lowered the level of responsibility felt by humans for preserving nature, and fostered complacency about the environment).

591. See Doremus, *supra* note 583, at 63 (stating that the combination of the three

about ecological preservation must acknowledge that humans are part of nature in a broader sense.⁵⁹²

IV. RECOMMENDATIONS AND ALTERNATIVES

Tax policy can present an economic solution to the problem of global warming. The federal tax system has long been successfully employed to apply economic pressure to accomplish social change.⁵⁹³ However, the reasons for changing tax policy must be not only economic, but esthetic and ethical as well. Providing a carbon sequestration credit will give GHG emitters an economic incentive to invest in forest conservation. That investment will provide economic, esthetic, and moral dividends. The economic dividends of reducing GHG emissions will also accrue to the economically disadvantaged, who will realize a benefit in the form of reduced disease rates.

A tax policy solution to global warming has three parts: (1) ending the current law subsidies for fossil fuel use; (2) imposing a carbon tax on GHG emitters; and (3) providing incentives to mitigate GHG emissions.

A. *Repealing Current Law Subsidies for Fossil Fuels*

Current law subsidies, discussed above,⁵⁹⁴ include provisions for percentage depletion, exceptions to the general rule of capitalization for certain exploration costs, and the EOR.⁵⁹⁵ As David Driesen argues, “[s]ociety tends to rely on fossil fuel burning to generate

discourses could encounter conflicts and will render all of them ineffective).

^{592.} *Id.* at 65.

Today the nature problem is as much about who we are, and who we aspire to be, as it is about how to save species or ecosystems. The new discourse, therefore, should be as much about people as it is about nature. It should explain how people can fit into nature and fit nature into their lives. It should address not only the ways nature can shape individual identity and character, but the ways it can shape, and be shaped by, human communities. In order to provide guidance for local action, the discourse should focus on ways in which frequent contact with nature can make a difference to people, and make people different. It should acknowledge that nature can, and should, be found even in places heavily modified by human action. It should recognize the potential for conflicts, helping people understand how and when human comfort, economic advantage, and even esthetic enjoyment of nature ought to give way to nature protection. Finally, it should be sensitive to the real costs of limiting or reversing human control of nature, and take seriously the fair distribution of those costs.

Id.

^{593.} See *supra* note 18 (citing Surrey & McDaniel and others, discussing valid reasons for using federal tax policy to accomplish important governmental goals).

^{594.} See *supra* notes 384-86 and accompanying text (discussing how tax code subsidizes fossil fuels).

^{595.} See I.R.C. § 43 (West 2002) (setting up the framework and specifically explaining the enhanced oil recovery credit).

energy, because fossil fuel traditionally costs less than renewable forms of energy. Policies tending to perpetuate this cost differential pose a serious barrier to reducing reliance on fossil fuels. . . .⁵⁹⁶ Ending the current law subsidies for fossil fuel use will be difficult, given the nature of our political system. While recent proposals for campaign finance reform⁵⁹⁷ may limit future influence of key fossil fuel industries by restricting their ability to contribute to political campaigns, the entrenched nature of these special interests presents significant challenges to reform.⁵⁹⁸ Even if campaign finance reform curtailed all corporate political donations, politicians are still susceptible to the political pressure of companies that employ large numbers of constituents or invest significant amounts of money in their districts. Senator Mitch McConnell calls trying to push big-money influence out of political campaigns “like putting a rock on Jell-O. You can squeeze it down, but it just goes in other directions.”⁵⁹⁹ Rep. Tom Davis (R-VA), chairman of the National Republican Congressional Committee, echoes that sentiment by stating that “[we] are empowering interest groups to a level we have never seen.”⁶⁰⁰ Campaign finance reform may help incumbents, who may have pre-existing relationships with special interest groups, remain in office.⁶⁰¹ If the present laws are changed, industries could be expected to argue for generous transition rules, which would blunt the effectiveness of the changes. Accordingly, it appears that repealing current law subsidies is not politically practical at this time, and it even appears likely that new proposals will continue to add benefits for fossil fuel producers.

Applying a carbon tax and incentives for GHG reduction without repealing existing subsidies for fossil fuel use just puts window dressing on the greenhouse effect. It is hard to see what could be less economically efficient than paying for both incentives to use and

596. Driesen, *supra* note 273, at 47.

597. See The Bipartisan Campaign Reform Act of 2001, H.R. 2356, 107th Cong. (restricting the use of soft money, prohibiting its use by national party committees and limiting contributions to state party committees to \$10,000, which can only be spent for get-out-the-vote and registration efforts); see also Juliet Eilperin & Helen Dewar, *Campaign Finance Bill Passes*, WASH. POST, Feb. 14, 2002, at A3.

598. See Daniel L. Simmons, *An Essay on Federal Income Taxation and Campaign Finance Reform*, 54 FLA. L. REV. 1, 33-81 (2002) (analyzing the potential results of campaign finance reform on federal income taxation).

599. Editorial, *Squash the Jell-O*, WASH. POST, Feb. 13, 2002, at A26.

600. See *id.* (discussing the difficulty in suppressing the contribution of soft money to political organizations).

601. See, e.g., Kathleen M. Sullivan, *Political Money and Freedom of Speech*, 30 U.C. DAVIS L. REV. 663, 686 (1997) (arguing that limiting contributions insulates the incumbent by limiting challengers' ability to overcome the reputation related advantages of incumbency).

incentives to stop using fossil fuels. Instead, the Code should be amended to return to the 1991 rules limiting percentage depletion to fifty percent of net income,⁶⁰² the oil and gas industry should again be subject to the alternative minimum tax rules,⁶⁰³ and marginal oil well production should not be encouraged by preferential treatment of expenses.⁶⁰⁴ Likewise, oil and gas exploration costs should not be subsidized⁶⁰⁵ and, to prevent Americans from turning to cheaper, foreign sources of fossil fuels, higher import tariffs could be imposed.⁶⁰⁶

B. Imposing a Carbon Tax

The United States has the lowest environmental taxes of all OECD countries.⁶⁰⁷ Imposing a carbon tax would provide revenue for increased reductions in other forms of taxes, while providing collateral benefits. The collateral benefits would include decreased health risks, lowered chance of catastrophic flooding, and preservation of climate dependent ecosystems. A carbon tax would not necessarily reduce American industry's competitiveness. The OECD notes that competitive concerns are lessened when substitutes are available (such as fuel cell technology) and when the carbon tax revenues are recycled back into the business sector.⁶⁰⁸ A carbon tax would provide the "stick" to go along with the "carrot" of tax incentives for alternative energy sources and carbon sequestration. Furthermore, pollution taxes avoid some of the pitfalls of other market-based instruments.⁶⁰⁹ The Bush Administration appears to favor voluntary emission reductions over mandatory caps.⁶¹⁰ While a carbon tax is theoretically a voluntary measure because industry can choose to reduce emissions to avoid the tax, it seems unlikely that this Congress would impose another tax on business, even if it planned to recycle the revenues from that tax to reduce other tax burdens.⁶¹¹

602. See *supra* note 179 (discussing percent depletion).

603. See *supra* note 187 (discussing the alternative minimum tax).

604. See *supra* notes 189-90 (discussing marginal oil wells/preferential treatment).

605. See *supra* notes 384-86 (discussing subsidies for oil and gas exploration).

606. *But see* General Agreement on Tariffs and Trade (GATT) October 30, 1947, 61 Stat. A-11, T.I.A.S. 1700, 55 U.N.T.S. 194 (discussing World Trade Organization's ability to limit tariffs).

607. OECD TAX 2001, *supra* note 508, at 54 fig. 4.

608. *Id.*

609. See *supra* notes 514-17 and accompanying text (discussing market based instruments).

610. See Eric Pianin, *Bush Touts Greenhouse Gas Plan*, WASH. POST, Feb. 14, 2002, at A1 (discussing the details of Bush's proposals to reduce emissions of greenhouse gases).

611. See H.R. 438, 101st Cong., 1990 ("Resolved, that it is the sense of the House of Representatives that Federal excise taxes upon emissions from fossil fuels or upon

Switzerland has implemented an alternative that might be politically possible: the Swiss rule provides for a carbon tax to be imposed only if industry fails to attain emission abatement objectives by voluntary means.⁶¹² The Swiss rule is economically similar to the cap-and-trade proposals⁶¹³ combined with a safety valve discussed above.⁶¹⁴

Finally, the United States should listen to other countries and cooperate in the Kyoto Protocol.⁶¹⁵ Taking a unilateral stance against the Protocol damages America's reputation and may inspire other countries to deny cooperation in other important international initiatives. The voluntary emissions "intensity" reductions proposed by the President as an alternative to Kyoto cannot be relied upon to actually reduce emissions, as the target would increase as GDP increases.⁶¹⁶

C. Incentives for GHG Mitigation

A tax credit for carbon sequestration would preserve forests and wildlife as it helps control climate change. The President's global climate plan appears to support incentives for carbon sequestration, although details have yet to be revealed.⁶¹⁷ Carbon-intensive industries would be persuaded to invest in afforestation and forest conservation programs. Such a credit would have to be carefully crafted so that the forestry projects effectively sequester carbon. Senator Brownback's proposal to create an implementing panel would provide effective safeguards.⁶¹⁸ Making the credit transferable could enhance its attractiveness. Transferability facilitates low cost compliance.⁶¹⁹

the carbon content of fuels should not be imposed.").

612. OECD TAX 2001, *supra* note 508, at 78.

613. See *supra* notes 272-75 (discussing advantages and disadvantages of cap-and-trade policy).

614. See *supra* notes 522-24, 562 and accompanying text (discussing "safety valve" concept).

615. See Kyoto Protocol, *supra* note 9 (listing signatories to Kyoto Protocol). While the United States has signed the protocol, it has not been ratified by the U.S. Senate.

616. Ken Guggenheim, *President Proposes Kyoto Option*, CHARLOTTE OBSERVER, Feb. 15, 2002, at 16A (claiming that environmental groups say that Bush's proposal to cut GHG "intensity" by eighteen percent over the next ten years would actually mean that more GHG will be emitted than at present).

617. See Press Release, The White House, President Bush Announces Clear Skies & Global Climate Change Initiatives (Feb. 14, 2002) (discussing the desire to offer incentives to reduce the amount of greenhouse gas emissions), available at <http://www.whitehouse.gov/news/releases/2002/02/20020214-5.html>.

618. See *supra* note 570 (discussing Senator Brownback's proposal to create implementing panel).

619. See Driesen, *supra* note 273, at 3 (noting, in the context of tradable emission permits, that such trading schemes may constitute a "cheap fix" rather than a "free

While I recommend providing a credit for domestic carbon sequestration, a credit could be extended to international sequestration projects. For example, the Brazilian Amazon contains about forty percent of the world's remaining tropical rainforest and has the world's highest forest destruction rate.⁶²⁰ Researchers note that carbon-offset funds paid to developing countries could help promote forest conservation by changing the economic forces driving forest destruction.⁶²¹ A domestic credit is preferable because the benefits of conserving forests would then stay at home, thereby enabling local residents to forge a bond with nature. That bond must exist to justify taking action to protect nature and, ultimately, our own quality of life.

The tax system is an appropriate and effective way to encourage businesses to adopt an environmental ethic and take action to reverse global warming.⁶²² Strong economic, aesthetic, and moral arguments support changing our tax system to protect the environment from global warming. For maximum effectiveness, all prongs of the three-part strategy outlined above should be employed. Anything less would be window dressing on the greenhouse, and possibly curtains for biodiversity, survival of species, and human health.

lunch"). Driesen argues further that tradable emissions permits discourage innovation. *See id.* at 4.

620. William F. Laurance et al., *The Future of the Brazilian Amazon*, 291 *SCI.* 438, 438 (2001) (noting that the average rate of forest destruction in the Brazilian Amazon is two million hectares per year), available at <http://www.sciencemag.org/cgi/content/full/291/5503/438>.

621. *Id.* In addition, the preserved forest would reduce flood damage, conserve soils, maintain a stable regional climate, preserve biodiversity, and support indigenous communities and ecotourism activities. *See id.* (explaining the advantages of allowing carbon offset funds to be used to promote forest conservation).

622. *See generally* Christopher Bergin, *Summers Says It's Important to Promote "Values" through the Code*, 2000 *TAX NOTES TODAY* 223-3 (Nov. 16, 2000) (reporting that Treasury Secretary Laurence H. Summers advocated the use of the tax code to promote social values).