

1-1-2004

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Recommended Citation

Robert B. McKinstry Jr., Esq., *Laboratories for Local Solutions for Global Problems: State, Local and Private Leadership in Developing Strategies to Mitigate the Causes and Effects of Climate Change*, 12 *Penn St. Envtl. L. Rev.* 15 (2004).

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Laboratories for Local Solutions for Global Problems: State, Local and Private Leadership in Developing Strategies to Mitigate the Causes and Effects of Climate Change

Robert B. McKinstry, Jr., Esq.*

I. Introduction—Emerging State Leadership in Climate Change Mitigation

Although the United States joined with the rest of the world in signing and ratifying the Framework Convention on Climate Change¹ and in signing the Kyoto Protocol to the Framework Convention,² concerns about possible, adverse short-term economic impacts from control of greenhouse gases has stymied further participation by the federal government in global efforts. These concerns have generated pressures that have prevented the United States from ratifying the Kyoto Protocol, participating in the Bonn, Germany in 2001 negotiations, or meeting some of its obligations under the Framework Convention. The federal government's withdrawal from active engagement in the global response to climate change has not, however, eliminated all response to climate change in the United States. It has simply moved the locus of the response from the federal government to state and local governments and the private sector.

State leadership in environmental issues has not been uncommon historically. In a frequently quoted dissent, Justice Brandeis observed

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1. United Nations Framework Convention on Climate Change, May 29, 1992, U.N. Doc. A/AC.237/18 (1992), reprinted in 31 I.L.M. 849 (1992), available at <http://unfccc.int/resource/docs/convkp/conveng.pdf> [hereinafter *Framework Convention*].

2. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, U.N. Doc. FCCC/CP/1997/L.7/Add. 1 (1998), available at <http://unfccc.int/resource/docs/convkp/kpeng.pdf> [hereinafter *Kyoto Protocol*].

that “[i]t is one of the happy incidents of the federal system that a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.”³ Results from state “laboratories” have often generated the models for federal legislation governing the United States’ national response to environmental problems. For example, California state air regulation provided a model for the Clean Air Act.⁴ Regulation of water quality by the interstate Delaware River Basin Commission (“DRBC”)⁵ provided the model for the system of federal regulation implemented by the Clean Water Act.⁶ Pennsylvania’s system of surface mining regulation served as the model for the federal Surface Mining Control and Reclamation Act.⁷ The hazardous site remediation program established by New Jersey pursuant to the New Jersey Spill Compensation and Control Act⁸ was copied by Congress in enacting the federal Comprehensive Environmental Response Compensation and Liability Act.⁹

While state and local leadership on environmental issues has been so common as to be the norm, state programs addressing issues transcending state and national boundaries and governed by international treaties, where the federal government has exclusive jurisdiction, present a unique set of issues. Despite these problems, many states and localities are responding to the lack of federal leadership on the issue of climate change by establishing their own programs to limit emissions of greenhouse gases (“GHGs”) and to sequester those gases. These “courageous” states are joining other states and foreign provinces to coordinate responses. Many responsible industries have also recognized the need for long-term planning, responded to shareholder or customer demand, or responded to the perception that a GHG control program will be inevitable by initiating programs to limit their emissions of greenhouse gases or otherwise to sequester carbon. The results of these experiments are generating lessons for both other states and for a national response that many view as inevitable and even required by international law.

3. *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting).

4. Clean Air Act, 42 U.S.C. § 7401 *et seq.* (2003).

5. DRBC is an interstate commission established pursuant to an interstate compact among Delaware, New Jersey, New York and Pennsylvania to manage water quantity and quality in the Delaware River.

6. Clean Water Act, 33 U.S.C. §§ 1251-1387 (2003).

7. Surface Mining Control and Reclamation Act, 30 U.S.C. §§ 1201-1328 (2003).

8. N.J. STAT. ANN. § 58:10-23.11a *et seq.* (2003).

9. Comprehensive Environmental Response Compensation and Liability Act, 42 U.S.C. §§ 9601-9675 (2003).

II. The International Context: the Framework Convention on Climate Change and the Kyoto Protocol

International concerns regarding the impacts of climate change appeared as early as the 1970's and escalated through the 1980's, as more information confirmed fears that man's activities might be affecting world climate. These concerns coalesced at the Earth Summit held in Rio de Janeiro, Argentina, in 1992, where the nations of the world endorsed the United Nations Framework Convention on Climate Change.¹⁰ The United States joined in that effort. The Framework Convention was signed and ratified by the United States in 1992 and became effective in 1994.¹¹

The Framework Convention was followed by one major international "Protocol" giving further definition to the Framework Convention's terms and a series of annual meetings of the parties further defining both the Convention and that Protocol. In 1997, the parties to the Framework Convention negotiated and signed the "Kyoto" Protocol, which further defined the specific greenhouse gas emissions reductions required by the Framework Convention.¹² The United States signed the Kyoto Protocol in 1998, but, to date, the Senate has failed to ratify the Protocol and the Protocol has not yet become effective.¹³ Nevertheless, the Framework Convention, which is the framework treaty underlying the Kyoto treaty, is both effective internationally and binding on the United States. Although many take the position that the Framework Convention is largely aspirational, it includes many provisions which can be read to create binding obligations, particularly if read in conjunction with other requirements of United States law.

A. *The Requirements of the Framework Convention*

The Framework Convention establishes the overall objective of stabilizing GHG gases at levels that will prevent "dangerous anthropomorphic interference with the climate system" and defines, in terms of effect, what such a level might be.¹⁴ It also articulates a series of underlying

10. *Framework Convention*, *supra* note 1.

11. Convention Parties & Observers, at <http://unfccc.int/resource/country/country.html?226> (last visited Nov. 18, 2003) [hereinafter Convention Parties & Observers].

12. *Kyoto Protocol*, *supra* note 2.

13. Convention Parties & Observers, *supra* note 11.

14. "The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not

principles, including the principle that developed nations should take the lead in reducing emissions with the aim of stabilizing “dangerous anthropogenic interference with the climate system”,¹⁵ and the so-called “Precautionary Principle.” The Convention provides:

The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors. Efforts to address climate change may be carried out cooperatively by interested Parties.¹⁶

Consistent with the principle of developed nations taking the lead, the Framework Convention includes two sets of express requirements, one set applicable to all parties and the other applicable only to developed nations, to which it refers as the “Annex 1” nations. All parties to the Convention are required, *inter alia*, to prepare national inventories of anthropogenic sources and sinks of greenhouse emissions, to adopt and implement programs to control greenhouse gas levels through emissions controls and sinks,¹⁷ to engage in measures to conserve important greenhouse gas sinks, to cooperate in preparations for adaptation to the inevitable effects of climate change, and, finally, to cooperate in research, development of control technologies, and education.¹⁸

By contrast, the Framework Convention requires each developed (Annex 1) nations to implement national policies to mitigate climate change by “limiting its anthropogenic emissions of greenhouse gases” and preserving and enhancing sinks and reservoirs.¹⁹ Although specific

threatened and to enable economic development to proceed in a sustainable manner.”
Framework Convention, supra note 1, at art. 2.

15. *Id.* at art. 3, § 1.

16. *Id.* at art. 3, § 3.

17. Specifically, the Convention requires the parties to “Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change.” *Id.* at art. 4, § 1(b).

18. *Id.* at art 4, § 1.

19. “Each of these Parties shall adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs.

nation-by-nation emissions reduction targets are not established, the Convention articulates the "aim of returning [greenhouse gas emissions] individually or jointly" to their 1990 levels.²⁰ The Framework Convention further establishes requirements for reporting and setting up a framework and means for establishing reduction targets,²¹ providing assistance and technology to developing nations for undertaking mitigation programs and adapting to climate change,²² and continuing scientific research and education.²³

B. Requirements of the Kyoto Protocol

In 1997, the parties to the Framework Convention reached agreement on the specific reductions required of the Annex 1 parties to achieve the Framework Convention's "aim" of returning worldwide GHG emissions to their 1990 levels and the means whereby those reductions would be achieved. This agreement was incorporated into the Kyoto Protocol,²⁴ which was executed by the United States and other Annex 1 parties, but which has not yet been ratified by the United States.²⁵ The Kyoto Protocol would require that the United States reduce its GHG emissions to 93% of their 1990 levels by 2012,²⁶ showing demonstrable progress towards that goal by 2005.²⁷ The Protocol enumerates alternative means whereby the Annex 1 parties may achieve the required reduc-

These policies and measures will demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention, recognizing that the return by the end of the present decade to earlier levels of anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol would contribute to such modification, and taking into account the differences in these Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances, as well as the need for equitable and appropriate contributions by each of these Parties to the global effort regarding that objective. These Parties may implement such policies and measures jointly with other Parties and may assist other Parties in contributing to the achievement of the objective of the Convention and, in particular, that of this subparagraph."

Framework Convention, supra note 1, at art. 4, § 2(a).

20. *Id.* at art. 4, § 2(b).

21. *Id.* at art. 4, § 2(b)-(f).

22. *Id.* at art. 4, §§ 3-5.

23. *Id.* at arts. 5-6.

24. *Kyoto Protocol, supra* note 2.

25. As of this date the Protocol is neither effective in the United States nor internationally. With ratification by either the United States or Russia, the Protocol will become effective internationally. Withdrawal by the United States from the Protocol does not prevent the United States from acceding to the Protocol again and proceeding with ratification. There is no deadline for ratification.

26. *Kyoto Protocol, supra* note 2, at art. 3, § 1 (establishing requirement); Annex B (setting forth limitations).

27. *Id.* at art. 3, § 2.

tions, including (1) enhancement of energy efficiency, (2) implementation of measures to limit or reduce gas emissions from transportation sector, (3) promotion of sinks and reservoirs, (4) promotion of sustainable agriculture, (5) control of methane emissions, (6) removing market imperfections, taxes and subsidies encouraging greenhouse gas emissions and energy inefficiency, and (7) “[e]ncouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases,” presumably including express limitations and caps.²⁸ The Protocol further allows these reductions to be achieved through emissions reduction “trading” among Annex 1 parties or between Annex 1 parties and developing countries through the “clean development mechanism,” with the precise rules for trading to be determined later.²⁹ Thus, an Annex 1 nation can require internal reductions or purchase reductions elsewhere. The Protocol further specifies requirements for calculating baselines and emissions reductions and other administrative mechanisms.³⁰

C. *The United States’ Response to Climate Change*

The extent of the United States’ response to climate change has roughly paralleled the extent of its engagement in these international efforts. The United States showed initial leadership in addressing climate change, but has increasingly fallen behind as it has become more and more reluctant to take meaningful measures to limit greenhouse gas emissions. In 1978, Congress established a program for assessing effects of climate to gain an understanding of climate processes, both natural and man induced.³¹ By 1987, concerns about changes in climate caused by anthropogenic emissions of greenhouse gases had advanced sufficiently to induce Congress to pass the Global Climate Protection Act of 1987,³² which directed the National Climate Program towards research concerning climate change. The Congressional findings recite evidence that “manmade pollution” may be producing a long term and substantial increase in temperatures, that these increases could both adversely affect agricultural production and habitability of “large portions of the Earth” and cause rising sea levels, that “ongoing pollution and deforestation may be contributing now to an irreversible process,” and that a global process with “United States leadership” would be necessary to address the prob-

28. *Id.* at art. 2, § 1(a).

29. *Id.* at arts. 12 (clean development mechanism), 17 (trading, to be defined later).

30. *Id.* at arts. 5-8.

31. National Climate Program Act, Pub. L. No. 95-367, 92 Stat. 601 (1978), amended by Global Climate Protection Act of 1987, Pub. L. No. 100-204, 101 Stat. 1407 (1987) (codified at 15 U.S.C. §§ 2901-2908 (2003)).

32. Pub. L. No. 100-204, 101 Stat. 1407 (1987).

lem.³³ To respond to these concerns, the Act called for the National Climate Program to focus upon research into the causes and effects of climate change, research into methods for control of emissions and sequestration methods, and cooperation in international efforts to control climate.³⁴

In 1990, Congress acted again, passing the Global Change Research Act of 1990.³⁵ That law called for the establishment of a global climate change research plan,³⁶ the creation of a national and international research program into the causes and effects of climate change as well as research on methods to promote alternative energy and energy efficiency,³⁷ research on the implications of urban and suburban growth and development,³⁸ and the submission of annual reports to Congress and a quadrennial scientific assessment.³⁹ Congress further directed that the United States enter into international discussions with the aim of coordinating global climate change research.⁴⁰ In accordance with this directive, the Framework Convention includes measures calling for such an international research program.

Congress acted again to address climate change, in the Energy Policy Act of 1992, following the negotiation of the Framework Convention.⁴¹ Title 16 of that Act⁴² called for a number of actions related to global climate change, including the preparation of both a report to Congress on the feasibility of stabilizing greenhouse gas emissions by the year 2005 and of reducing 1988 emissions of carbon dioxide by 20% by the year 2005⁴³ and a report comparing various policy mechanisms for stabilizing greenhouse gases.⁴⁴ That Act also called for the preparation of a "least-cost energy strategy" designed, *inter alia*, to stabilize and eventually reduce "the generation of greenhouse gases."⁴⁵ The Act further required that the strategy be designed to increase the percentage of energy generated from renewable sources by 75% by the year 2005, to reduce the United States' oil consumption from the 1990 level of 40% of total consumption to 25% of total consumption by the year 2005, and to

33. *Id.* at § 1102.

34. *Id.* at § 1103.

35. Global Change Research Act of 1990, Pub. L. 101-606, 104 Stat. 3096 (codified at 15 U.S.C. §§ 2921-2961 (1990)).

36. 15 U.S.C. § 2934.

37. *Id.* at §§ 2934, 2952.

38. *Id.* at § 2961.

39. *Id.* at §§ 2936-37.

40. *Id.* at § 2952(a).

41. Energy Policy Act of 1992, Pub. L. 102-486, 106 Stat. 2776 (1992).

42. *Id.* at §§ 1601-1609 (codified at 42 U.S.C. §§ 13381-13388 (2003)).

43. 42 U.S.C. § 13381.

44. *Id.* at § 13384.

45. *Id.* at § 13382.

increase energy efficiency by 30% over 1988 levels by the year 2010.⁴⁶

Most notably, Section 1605 the Energy Policy Act of 1992 required the development of a national inventory of greenhouse gas emissions and called for the creation of registry for voluntary reporting of greenhouse gas emissions and reductions.⁴⁷ That section called for the Department of Energy to establish guidelines for voluntary reporting of greenhouse gas emissions “for the baseline period of 1987 through 1990” and annual reporting of emissions and emissions reductions for “subsequent calendar years.” The Act specified that such reportable reductions could be achieved “through any measures” including a variety of emission reduction, sequestration, and energy efficiency mechanisms as well as voluntary reductions and plant closures.⁴⁸ The guidelines were to take account of differing warming potentials of the various gases and establish reporting procedures. A registry is important to assure that those who act early to reduce emissions before the enactment of a mandatory emissions reduction regime are given appropriate credit for such reductions so that their “baseline” from which mandatory reductions are calculated is their pre-reduction baseline rather than the new, lower emissions level. However, the Act did not expressly provide for or guarantee such credit.

Pursuant to these authorities, the United States has engaged in an active research program that has resulted in compliance with many of the requirements of the Framework Convention relating to research and assessment. In compliance with the Framework Convention, the United States has participated in the international assessment of the effects of climate change, has completed a national assessment of impacts,⁴⁹ and either has completed or is completing a series of regional and local assessments.⁵⁰ The United States has also prepared three U.S. Climate Ac-

46. *Id.*

47. *Id.* at §13385.

48. 42 U.S.C. §13385(b).

49. NAT'L ASSESSMENT SYNTHESIS TEAM, US GLOBAL CHANGE RESEARCH PROGRAM, CLIMATE CHANGE IMPACTS ON THE UNITED STATES: THE POTENTIAL CONSEQUENCES OF CLIMATE VARIABILITY AND CHANGE, OVERVIEW, (Cambridge University Press, 2000) [hereinafter NAT'L ASSESSMENT SYNTHESIS TEAM, OVERVIEW]; NAT'L ASSESSMENT SYNTHESIS TEAM, US GLOBAL CHANGE RESEARCH PROGRAM, CLIMATE CHANGE IMPACTS ON THE UNITED STATES: THE POTENTIAL CONSEQUENCES OF CLIMATE VARIABILITY AND CHANGE, FOUNDATION, (Cambridge University Press 2001) [NAT'L ASSESSMENT SYNTHESIS TEAM, FOUNDATION].

50. *See, e.g.* MID-ATLANTIC REGIONAL ASSESSMENT TEAM, MID-ATLANTIC REGIONAL ASSESSMENT, U.S. GLOBAL CHANGE RESEARCH PROGRAM, PREPARING FOR A CHANGING CLIMATE: THE POTENTIAL CONSEQUENCES OF CLIMATE VARIABILITY AND CHANGE, MID-ATLANTIC OVERVIEW, The Pennsylvania State University, University Park, PA (2000) [hereinafter MARA Assessment]; NEW ENGLAND REGIONAL ASSESSMENT GROUP, U.S. GLOBAL CHANGE RESEARCH PROGRAM, PREPARING FOR A CHANGING CLIMATE: THE POTENTIAL CONSEQUENCES OF CLIMATE VARIABILITY AND CHANGE, NEW ENGLAND REGIONAL OVERVIEW, University of New Hampshire (2001).

tion Reports for submission to the UNFCCC Secretariat.⁵¹ Finally, the United States Environmental Protection Agency has conducted a series of inventories of greenhouse gas emissions and sinks and submitted reports of these inventories to the UNFCCC Secretariat.⁵²

The United States also adopted a number of measures to encourage voluntary reductions in greenhouse gas emissions. These included both the release of a Climate Change Action Plan ("CCAP") in 1993 and the establishment of the "Climate-Wise" program by the United States Environmental Protection Agency in 1993⁵³ and the release of Section 1605(b) "Guidelines for Voluntary Reporting of Greenhouse Gas Emissions and Reductions, and Carbon Sequestration" by the Department of Energy in 1994.⁵⁴ The latter guidelines sought to encourage voluntary reporting by providing significant flexibility in determining what emissions and reductions were to be reported and in allowing self-certification. However, this lack of specificity has undermined public confidence in the accuracy of the data in this registry, particularly its "measurement accuracy, reliability and verifiability."⁵⁵ As a result, the President directed the Department of Energy to revise the program,⁵⁶ so that registration will provide the registering companies with a "transferable credit."

As a result of the widespread dissatisfaction with the federal registry, as discussed further below, a number of states have also moved to develop registries which provide greater reliability and verifiability, to meet the demands of the international community and to provide assurances to voluntary reporters that their measures will be given adequate credit under the Framework Convention and the Kyoto Protocol, as well as any future mandatory reduction regime adopted in those states.

The proposed modifications to the DOE 1605(b) registry are part of the United States' current greenhouse gas strategy, as announced by the

51. See, e.g., 61 Fed. Reg. 66341 (Dec. 17, 1996) (soliciting public comments on the Second U.S. Climate Action Report); 66 Fed. Reg. 15470 (Mar. 19, 2001) (soliciting public input in connection with preparation of the Third U.S. Climate Action Report); 66 Fed. Reg. 57456 (Nov. 15, 2001) (soliciting public comments on the Third U.S. Climate Action Report).

52. USEPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2001*, EPA430R03004 (Apr. 15, 2003), available at <http://unfccc.int/program/mis/ghg/submis2003.html> (last visited Nov. 19, 2003); see 68 Fed. Reg. 6450 (Feb. 7, 2003) (soliciting public comment on draft inventory) [hereinafter USEPA].

53. 58 Fed. Reg. 6357 (Dec. 2, 1993).

54. 59 Fed. Reg. 28345 (June 1, 1994) (draft guidelines); 59 Fed. Reg. 52769 Oct. 19, 1994) (final guidelines); see also 60 Fed. Reg. 35385 (July 7, 1995) (announcing availability of reporting forms).

55. 67 Fed. Reg. 30370 (May 6, 2002), quoting from WHITE HOUSE, GLOBAL CHANGE POLICY BOOK 2 (Feb. 12, 2002).

56. *Id.*

President in February 2002.⁵⁷ This policy continues the United States' prior policy of pursuing research and measurement and relying upon measures to encourage voluntary greenhouse gas reductions, without mandatory measures or significant requirements to discourage increases in greenhouse gas emissions. In addition to proposing improvements in the 1605(b) registry to provide more meaningful protection to industries obtaining early greenhouse gas emissions reductions, the policy calls for the enactment of a number of tax incentives to encourage use of renewable energy and cogeneration projects and greenhouse gas sequestration projects. These include proposals for (1) a 10% tax credit for cogeneration projects, (2) extension and expansion of the tax credits for wind power and biomass power projects, (3) a 15% tax credit for residential solar energy projects, (4) credits for projects for recovery of methane gas from land files, (5) a tax credit for hybrid and fuel cell vehicles, and (6) funding for geothermal projects. The policy also calls for increased funding for energy conservation and sequestration projects and continued funding of international climate change efforts and a variety of research efforts.

Although several bills have been introduced in Congress calling for mandatory controls on greenhouse gas emissions and the creation of a national cap and trade program similar to that created for sulfur dioxide under Title IV-A of the Clean Air Act,⁵⁸ current United States policy has also sought to encourage voluntary industry programs for greenhouse gas reduction measures, through the Climate Vision program. Companies from most of the energy intensive sectors in the United States are participating in these voluntary programs, led by a number of NGOs and encouraged by the Environmental Protection Agency.⁵⁹

The Administration has adopted a goal of reducing "greenhouse gas intensity" by 18% by 2012.⁶⁰ This concept of greenhouse gas intensity relates to the ratio of greenhouse gas emissions to GNP. As such, it bears, at best, an incidental relationship, to the goals of the Framework Convention of stabilizing atmospheric levels of greenhouse gases. For example, the 18% reduction goal would translate into a 10% emissions *increase* at an annual 2.5% GNP growth rate, and only a 2% decrease at a 1.5% annual growth rate. Moreover, the intensity concept is a two-edged sword, since it would require greater levels of emissions control at

57. WHITE HOUSE, U.S. CLIMATE CHANGE STRATEGY: A NEW APPROACH (Feb. 14, 2002) [hereinafter WHITE HOUSE].

58. See 42 U.S.C. §§ 7651 (2002). A "cap and trade" program establishes some specific areawide limitation for a specific pollutant or pollutants and allows trading of the right to emit increments of that pollutant among emitters.

59. Kerr, *supra* note 57 at 372-73.

60. *Id.* at 272; WHITE HOUSE, *supra* note 58.

times of lowest economic growth, when less money may be available for investment in technologies which might increase energy efficiency or control emissions.

Although the United States has complied with the Framework Convention some respects, overall, the United States record evidences substantial non-compliance with both the intent and many of the specific requirements of the Framework Convention. The United States' report on greenhouse gas emissions for the year 2001 showed a thirteen percent increase in net emissions above 1990 levels.⁶¹ Despite this significant increase, the United States has failed to impose any federal controls on sources of carbon dioxide emissions. It has also failed to impose controls on the transportation sector other than the corporate average fuel economy standards,⁶² which Congress has repeatedly failed to reduce, despite increases in vehicle miles traveled. In fact, in 2003, the United States Environmental Protection Agency denied a petition to regulate greenhouse gas emissions from motor vehicles under the Clean Air Act⁶³ on the basis of its conclusion that it lacked the authority to do so under that statute, thereby reversing the interpretation of the statute articulated by the Agency's previous General Counsels on at least two prior occasions.⁶⁴ These failures appear inconsistent with the United States' obligations to "take . . . measures on the mitigation of climate change, by limiting . . . anthropogenic emissions of greenhouse gases"⁶⁵ and to develop a "national . . . program. . . containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks."⁶⁶ Similarly, the United States maintains a variety of subsidies that encourage use of fossil fuels and contribute to increasing levels of

61. USEPA, *supra* note 52, at ES2. Although 2001 witnessed a 1.6% decrease in emissions, this was attributed primarily to decreases in fossil fuel combustion caused by the economic recession in 2001, with some decreases attributable to increased generation of electricity from nuclear energy. *Id.* The reduction is *not* attributed to the climate change strategies that have been articulated above.

62. 49 U.S.C. 32901-32919. The CAFÉ statute specifies a CAFE standard of 27.5 miles per gallon for passenger cars in model years 1984 and beyond, *id.* at § 32902(b), and authorizes the United States Department of Transportation to modify the standard to the "maximum feasible average fuel economy level" for a given model year, subject to a Congressional veto, *id.* at § 32902(c).

63. 42 U.S.C. §§ 7401-7671q (2003).

64. Proposed Consent Decree, Clean Air Act Citizen Suit, 68 Fed. Reg. 52922 (Sept. 8, 2003). As discussed *infra*, the rationale articulated in the Federal Register notice is unconvincing and has been appealed by a number of states. The better view, an one more consistent with prior consistent interpretation and application of the Clean Air Act and the requirements of the *Framework Convention*, would require listing of greenhouse gases as air pollutants under section 108 of that Act, 42 U.S.C. § 7408, and establishment of air quality standards under section 109 of the Act 42 U.S.C. § 7409.

65. *Framework Convention*, *supra* note 1, at art. 4, § 2(a).

66. *Framework Convention*, *supra* note 1, at art. 4, § 1(b).

greenhouse gas emissions,⁶⁷ despite its obligation under the Framework Convention to “[i]dentify and periodically review its own policies and practices which encourage activities that lead to greater levels of anthropogenic emissions of greenhouse gases . . . than would otherwise occur.”⁶⁸ As discussed below, even the successes that have been achieved through voluntary measures, although not enough to date even to stabilize emissions, are likely due to the widespread perception within the corporate community that mandatory controls are inevitable.

III. State, Local and Private Responses

Although this federal failure to implement the Framework Convention through ratification of the Kyoto Protocol and meaningful regulatory or fiscal policy may have led to an international perception of inactivity in the United States, this perception is incorrect. In fact, many states, localities and private industry groups have taken action to fill the void left by the federal government.⁶⁹ They have taken the lead in the United States in developing and implementing programs to mitigate greenhouse gas emissions and to deal with the anticipated effects of climate change. Many have established independent programs to achieve goals based upon or consistent with the requirements of the Kyoto Protocol. A number of non-profit organizations have emerged to assist and to coordinate this process. Many of these organizations are critical to the successes that the United States’ voluntary program has achieved.

By way of example, the Center for Clean Air Policy (“CCAP”) is a non-profit “think tank” involved in the development and promotion of market-based solutions to greenhouse gas and other air pollution emissions problems at state, regional, national and international levels. CCAP has been involved in the efforts of the Ozone Transport Assessment Group to implement trading programs for control of ozone within the ozone transport region created by the Clean Air Act,⁷⁰ in international climate change policy negotiations, and in assisting a number of state governments to develop programs to implement reductions called for by

67. See Doug Koplou & John Dernbach, *Federal Fossil Fuel Subsidies and Greenhouse Gas Emissions: A Case Study of Increasing Transparency for Fiscal Policy*, 26 ANN. REV. ENERGY & ENV'T 361 (2001). Koplou and Dernbach point out that many of these subsidies are scattered through the tax code, various government lending and insurance programs, government-owned enterprises and to some extent in regulatory exemptions as well, and, thus are often hidden from public view. *Id.* at 379.

68. Framework Convention, *supra* note 1, art. IV, § 2(e)(ii).

69. Opportunities for a meaningful response to climate change at the state level were identified in John Dernbach, *Moving the Climate Change Debate from Models to Proposed Legislation: Lessons from State Experience*, 30 ENVTL. L. REP. NEWS & ANALYSIS 10933 (2000). Many of the tools identified by Dernbach have since been incorporated into the state programs addressing climate change described in this article.

70. See, 42 U.S.C. §§ 7506a, 7511c (2002).

the Framework Convention and the Kyoto Protocol, using the methodology described further below.⁷¹ A second non-profit organization, the International Council for Local Environmental Initiatives ("ICLEI"), has developed the "Cities for Climate Protection ("CCP") Campaign," a program designed to help local governments take steps that reduce greenhouse gas emissions, while saving money, reducing pollution,⁷² and improving the quality of life in their communities.⁷³

Many organizations have emerged to facilitate private sector efforts to reduced greenhouse gas emissions. The Pew Center on Global Climate Change promotes voluntary programs by private industries to address climate change by providing information and innovative solutions in support of their efforts to address global climate change.⁷⁴ The Pew Center has established the Business Leadership Council to promote voluntary climate change reductions. Environmental Defense has established the ED Partnership for Climate Action, and the World Wildlife Fund has established the WWF Climate Savers Program.⁷⁵ The Business Round Table has established the Climate RESOLVE Program, as a private sector initiative.⁷⁶ In fact, a Chicago Climate Exchange has emerged to allow market exchanges of the emissions reductions encouraged by these programs, as well as state and international efforts.⁷⁷

Existing regional entities have expanded their programs to include climate change initiatives. One such organization is the Northeast States for Coordinated Air Use Management ("NESCAUM"), an interstate as-

71. NED HELME, STATE AND NATIONAL CLIMATE CHANGE POLICY INNOVATIONS, at 1 (Apr. 17, 2002) *reprinted in* THE 2ND ANNUAL GODDARD FORUM, GLOBAL WARMING: CAUSES, EFFECTS AND MITIGATION STRATEGIES FOR STATES AND LOCALITIES (Apr. 17 - 18, 2002) [hereinafter *Helme PowerPoint*]. CCAP website, <http://www.ccap.org/>.

72. Reductions of other pollutants are frequently cited as a collateral benefit of GHG emissions reductions. This is so because the same process producing GHG emissions also produces other types of air pollution. Nitrogen oxides and carbon monoxide are produced by the combustion of fossil fuels at the same time the greenhouse gas, carbon dioxide is produced. Sulfur dioxide is also produced by the combustion of fossil fuels having some sulfur content. Combustion of coal can produce emissions of mercury and a variety of other heavy metals and radionuclides, in addition to nitrogen oxides, sulfur dioxide, and carbon monoxide.

73. INT'L COUNCIL FOR LOCAL ENVTL. INITIATIVES, CITIES FOR CLIMATE PROTECTION CAMPAIGN - US, at 1 (2002), *reprinted in* THE 2ND ANNUAL GODDARD FORUM, GLOBAL WARMING: CAUSES, EFFECTS AND MITIGATION STRATEGIES FOR STATES AND LOCALITIES (Apr. 17 - 18, 2002) [hereinafter *ICLEI Brochure*].

74. Pew Center on Global Climate Change, *About Us*, available at: <http://www.pewclimate.org/about/index.cfm> (last visited Nov. 19, 2002) [hereinafter *Pew Center on Global Climate Change*].

75. Kerr, *supra* note 57, at 373.

76. *Id.*

77. *Id.*; *Chicago Climate Exchange Announces Result of First Auction*, (Sept. 30, 2003), at <http://www.chicagoclimateexchange.com/news/pdf/CCXAuction.pdf>. In the Chicago Climate Exchange's first auction, 125,000 tons of CO² were sold at an average price of less than \$1 per ton.

sociation consisting of the air quality control divisions of eight northeast states⁷⁸ formed in 1967.⁷⁹ NESCAUM has established a number of collaborative efforts with various other state, federal, and private non-profit and for profit organizations directed at state, private and local early action. These include a Greenhouse Gas Early Action Demonstration Project, a GHG State Registry Collaborative, and a GHG Trading Demonstration Project.⁸⁰

A. Structuring State and Local Programs

The efforts of these groups have produced a variety of methodologies for designing state, local and private programs, which bear certain common elements. While there are a number of approaches,⁸¹ the approach taken by the Center for Clean Air Policy ("CCAP"), has been employed in a variety of states, including Massachusetts, New Jersey and, most recently, New York, and provides an example of a practical approach to development of a state strategy addressing climate change and reductions in greenhouse gas emissions, including most of the elements actually employed in the various state and local programs.⁸²

CCAP's vision for state action begins with two elements: the establishment of a statewide target and sectoral targets⁸³, and the development of a system to inventory and report emissions to establish a baseline and to track emissions reduction progress.⁸⁴ The establishment of an inventory and targets will often need to proceed simultaneously.

One of the more controversial steps in developing a statewide strat-

78. Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont are the eight states that make up NESCAUM. Northeast States for Coordinated Air Use Management, About NESCAUM, at <http://www.nescaum.org/about.html> (last visited Nov. 18, 2003).

79. *Id.*

80. Northeast States for Coordinated Air Use Management, *NESCAUM Greenhouse Gas Early Action Demonstration Project*, at <http://www.nescaum.org/Greenhouse/index.html> (last visited Nov. 18, 2003).

81. See, e.g., Adam Rose, *Greenhouse Gas Mitigation Action Planning: An Overview*, 12 PENN ST. ENV'T L. REV. 153, 153-172 (2004) (providing a description of the elements of a state strategy); John Dembach, *Toward a Climate Change Strategy for Pennsylvania*, 12 PENN ST. ENV'T L. REV. 181, 181-205 (2004) (presenting an inventory of tools that might be used in Pennsylvania to develop a strategy).

82. TOM PETERSON, STATE, NATIONAL AND INTERNATIONAL CLIMATE CHANGE POLICY DEVELOPMENT, at 1 (Apr. 17, 2002) reprinted in THE 2ND ANNUAL GODDARD FORUM, GLOBAL WARMING: CAUSES, EFFECTS AND MITIGATION STRATEGIES FOR STATES AND LOCALITIES (April 17 - 18, 2002) [hereinafter *Peterson PowerPoint*; see also, *Helme PowerPoint* at 1.

83. Sectoral actions include power generation, industry, transportation, residential, commercial, agriculture and forestry. *Peterson PowerPoint*, supra note 82, at 3.

84. *Helme PowerPoint*, supra note 71, at 2; *Peterson PowerPoint*, supra note 82, at 7.

egy for greenhouse gas emission reductions is the development of state-wide and sectoral reduction targets.⁸⁵ Targets vary according to the timing of the target and the transition scheme, if any, such that shorter term targets often seek modest reductions and very long term targets may set very ambitious targets. Targets will also vary based upon the state inventory and ease or difficulty of achieving compliance.⁸⁶ To establish targets, a state may use a "top down" approach" looking to targets set elsewhere, a "bottom-up" approach based on analysis of conditions in the state or some combination of the two. The "bottom-up" approach relies upon an analysis of the results of a series of small, specific actions that might be taken within the state to set the target. A "top-down" approach, on the other hand, uses reference points outside of the state to establish the statewide target or targets.⁸⁷ A third strategy is to combine elements of both the bottom-up and the top-down strategy, starting with emissions targets taken from out-of-state reference points and analyzing the feasibility of achieving those or a more ambitious target based upon particular strategies available within the state being considered. These processes have produced a wide variety of targets, all of which are, nevertheless, based upon the 1990 baseline established in the Framework Convention on Climate Change.⁸⁸

The development of sectoral reduction targets is also important. The ability to meet these more focused goals can contribute to the overall ability of a state to reach its established statewide target. Sectoral goals are typically focused on the reduction of aggregate sector emissions by a certain percentage within a specified time frame, usually running from 1990.⁸⁹

An emissions inventory is essential to a state's ability to identify emissions and sectors to be reduced to meet the target, to plan for GHG emissions reductions and track its progress in reducing GHG emissions.⁹⁰

85. *Peterson PowerPoint*, *supra* note 82, at 2-3.

86. *Id.*

87. A top down approach starts with the emissions reductions that one wishes to achieve and then determines how they can be achieved and a bottom down looks first at what can be done to reduce emissions and derives the target from a consideration of the costs and desirability of implementing those reduction measures.

88. *Framework Convention*, *supra* note 1, art. IV, § 2(a),(b). A spectrum of targets has been established. Examples include the following: Toronto - 10% below 1990 by 2005, Seattle -7 to 40% below 1990 by 2012, San Francisco, 20% below 1990 by 2012 (proposed), Salt Lake City - 7% below 1990 by 2012, Marrakesh '01/UNFCCC - 5.2% below 1990 by 2012, New England Governors and Eastern Canadian Premiers - 1990 levels by 2010, 10% below by 2020, and 75% or more below in the long term. By contrast, the Bush Administration's proposed U.S. Climate Change Strategy: would call for actual emissions 32% above 1990 levels by 2012. *Helme PowerPoint*, *supra* note 71, at 3.

89. *Helme PowerPoint*, *supra* note 71, at 2.

90. *Helme PowerPoint*, *supra* note 71, at 7.

The inventory can also help states to keep track of tradable and transferable credits where a trading or market based strategy is to be implemented.⁹¹ According to CCAP, the ideal structure for completion of this inventory includes multiple means of calculating present and future emissions. It includes a comprehensive component, in which all sectors are accounted for and a state total is determined. This requires a “disaggregated component,” where emissions are calculated by sector and are based on both upstream data on fuel type and use and downstream data regarding actual emissions or production rates. Finally, an emissions inventory strategy often includes a “mandatory component”, requiring actual reporting of emissions. For example, as a part of its strategy for inventorying emissions and tracking its progress, New Jersey had adopted a rule requiring large facilities to report their greenhouse gas emissions.⁹²

Based on the inventory, CCAP develops a range of strategies for achieving reductions, based on the wide variety of tools available. The range of potential tools is significant.⁹³ Based upon the characteristics of each individual state, CCAP identifies which tools within five classes of tools may appropriate for each of five major sectors – electric power, industry, transport and land use, residential and commercial, and agriculture and forestry. For each sector, CCAP and stakeholders examine individual tools within five classes of tools: inventory and registry, cap and trade, negotiated agreements, regulatory approaches, funding mechanisms, and voluntary programs.⁹⁴

An example of this approach is presented by the process recently undertaken in New York. There, the inventory and registry was found applicable to all sectors. A cap and trade mechanism was found applicable to all sectors other than the commercial/residential sector. Regulatory approaches and funding mechanisms were found that might be applicable to all sectors other than industry. Voluntary programs were determined to be appropriate for all sectors other than the electric power sector. Finally, negotiated agreements were found to be applicable to the industrial and land use/transportation sectors. Based on this analysis, a range of possible tools, approaches and targets are identified for each sector and each class of tool. The state could then select appropriate tools from this menu.

A final component of the CCAP's overall vision for state action with respect to reduction in emissions of greenhouse gases includes a

91. *Helme PowerPoint*, *supra* note 71, at 9.

92. N.J. ADMIN. CODE tit. 7, § 27-21.3(b)(2) (2002).

93. See John Dernbach, *Moving the Climate Change Debate from Models to Proposed Legislation: Lessons from State Experience*, 30 ENVTL. L. REP. NEWS & ANALYSIS 10933 (2000).

94. *Peterson PowerPoint*, *supra* note 82, at 3, 5, 6.

registry for keeping track of and “scoring” the reductions that result from the state’s emission reduction strategy. The registry will also serve as the foundation for a cap and trade market based program. The scoring component for market-based systems includes an accounting for allowances, credits and offsets. According to CCAP, such a registry ideally bears certain characteristics. The registry will not only be tied to the targets, but it will also be tied to the policy mechanisms and emissions inventory. The registry will be a closed system under a binding cap, will be measured against a specified base year and will acknowledge trading between sectors.⁹⁵

B. New England Governors and Eastern Canadian Premiers Climate Change Action Plan

The Conference of New England Governors and Eastern Canadian Premiers (“NEGC/ECP Group”) has developed and endorsed a joint Climate Change Action Plan.⁹⁶ The NEGC/ECP Group has been working together for 26 years to craft environmental agreements for joint regional action, including agreements on mercury and acid rain.⁹⁷ Due to the number of states endorsing the Climate Change Action Plan, it now represents the most common program adopted by states taking action on climate change.

The Climate Change Action Plan represents a non-binding commitment by each of the six New England states⁹⁸ and the five eastern Canadian provinces⁹⁹ to achieve specific GHG reduction goals and to accomplish these goals through a coordinated implementation plan consisting of nine specific action items. The Plan is not an international agreement or treaty, since all specific requirements must be established and implemented by the individual states and provinces.¹⁰⁰ Because there are no binding requirements, the Plan is not subject to the Constitutional requirement for Congressional approval under the Compacts

95. *Peterson PowerPoint*, *supra* note 82, at 7.

96. The Committee on the Environment and Northeast International Committee on Energy of the Conference of New England Governors and Eastern Canadian Premiers, *New England Governors/Eastern Canadian Premiers Climate Change Action Plan 2001* (Aug. 21, 2001) [hereinafter *Climate Change Action Plan*].

97. Sonia Hamel, Recent Climate Change Initiatives in Massachusetts and the Northeastern U.S. (Apr. 17, 2002) *reprinted in* THE 2ND ANNUAL GODDARD FORUM, GLOBAL WARMING: CAUSES, EFFECTS AND MITIGATION STRATEGIES FOR STATES AND LOCALITIES (Apr. 17 – 18, 2002) [hereinafter *Hamel PowerPoint*].

98. Maine, Vermont, New Hampshire, Rhode Island, Massachusetts, and Connecticut.

99. Quebec, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland.

100. *Hamel PowerPoint*, *supra* note 97, at 2.

Clause.¹⁰¹

Adopting a coordinated approach provides a number of advantages that will encourage compliance with the goals of the Climate Change Action Plan. First, this Plan will allow them to establish a regional greenhouse gas emission reduction trading network that would put the market to work increasing the efficiency of the program and spurring new investment and technology. By coordinating actions and policies, the participants can generate a common market for similar products that will stimulate formation of new businesses to satisfy the demand and can result in GHG emissions reductions being achieved at a lower price. Finally, adopting a common approach makes it more likely that any federal program will employ similar mechanisms. New Jersey and New York have developed climate change programs and are considering joining their neighbors by endorsing the Climate Change Action Plan to take advantage of this market.

The goals established by the Climate Change Action Plan are consistent with the Framework Convention and exceed those set in Kyoto. The Plan establishes three common goals: (1) the short term goal of reducing regional GHG emissions to 1990 levels by 2010, (2) the mid-term goal of reducing regional GHG emissions to 10% below 1990 levels by 2020, with 5 year reassessments to review goals, and (3) the long-term goal of reducing regional GHG levels to 75-85% below current levels. The Plan states:

The ultimate goal mirrors that of the United Nations Framework Convention on Climate Change, to which both the United States and Canada are signatories. Over the long term, anthropogenic GHG emissions must be reduced to levels that no longer pose a dangerous threat to the climate. The best science available at present indicates that attaining this goal will require reductions in GHG emissions of approximately 75-85% below current levels. The long-term goal will be modified as the understanding of climate science advances.¹⁰²

The Plan further calls for each subscribing state or province to implement nine specific action items to achieve these short, intermediate and long term goals.

101. "No State shall, without the consent of Congress, . . . enter into any Agreement or Compact with another State, or with a foreign Power. . ." U.S. CONST. art. I, § 10, cl. 3, see *United States Steel Corp. v. Multistate Tax Comm'n*, 434 U.S. 452, 470 (1978) (upholding, against Compacts Clause challenge, formation of multi-state tax commission formed to develop tax policy for various states which would be implemented by each state individually, finding that Clause is "directed to the formation of any combination tending to the increase of political power in the states, which may encroach upon or interfere with the just supremacy of the United States.")

102. *Climate Change Action Plan*, *supra* note 96, at 6.

Action Item 1 calls for the development of Regional standardized GHG emissions inventory. As CCAP has found in developing state programs, it is critical to develop a consistent, fair inventory of greenhouse gas sources in order to measure reductions and to facilitate trades. The Plan calls for coordinating this regional effort with programs outside the region and any federal initiatives.¹⁰³

Action Item 2 calls for each participant to establish its own plan for reducing GHG emissions and conserving energy, consistent with the Climate Change Action Plan. The plan for achieving the goals is left to individual states, choosing among a variety of policy options, although each plan should include the common elements spelled out in the various action items. Reporting is required to allow coordination, sharing of ideas, and development of common conversion facts, but each participant may "choose the measures and programs that will benefit its own economy and work most smoothly for its citizens and businesses."¹⁰⁴

Action Item 3 calls promotion of public awareness of the impacts of climate change and actions that can be taken to reduce GHG emissions and to adapt to the inevitable effects of climate change.¹⁰⁵ There is widespread misunderstanding of the issues surrounding climate change. Education is essential to assist implementation and to let people know what they can do at home and in their businesses. Education, support of research and support of independent, private organizations involved in education and research can both promote GHG emissions reductions through voluntary actions and facilitate identification of new mechanisms for GHG emissions reductions.

Action Item 4 calls for state and provincial governments to lead by example.¹⁰⁶ The Plan calls for the public sector to take the lead in demonstrating energy efficiency, clean energy technologies and sustainable practices. To that end, the Plan directs that the public sector reduce end-use emissions of GHGs by 25% by 2012. The Plan further specifies measures to be employed to achieve this goal, including: (1) implementation of a public sector energy reduction program, (2) institution of policies to purchase fuel-efficient vehicles, (3) establishment of policies to implement all energy conservation and efficiency measures with a ten-year payback, (4) requiring green building design wherever feasible and cost-effective, (5) education of employees about operational changes to reduce greenhouse gases through measures such as car pooling, telecommuting and use of public transportation and purchase of energy efficient appliances, (6) buying "green" products, and (7) creating a clearing

103. *Id.* at 8.

104. *Id.* at 9.

105. *Id.* at 10.

106. *Id.* at 11.

house of “best practices”. These measures will reduce emissions directly, encourage voluntary reductions in the private sector, and stimulate demand for products that will result in GHG emission reductions.

The two largest sources of anthropogenic GHG emissions are the electric generation sector and the transportation sector. Action Items 5 and 8 of the Climate Change Action Plan target these two sectors. Action Item 5 calls for reduction of greenhouse gases from the electricity sector by 20% by the year 2025 through a combination of new renewable energy sources, using lower carbon fuels and increased efficiency of generation and transmission systems.¹⁰⁷ Action Item 8 calls for taking action to decrease the transportation sector's growth in GHG emissions.¹⁰⁸ To accomplish this, the Climate Change Action Plan calls for measures such as promoting use of higher efficiency vehicles and disclosing the GHG impacts of publicly funded transportation and freight projects, including the impacts of alternatives. The Plan further calls for investing in mass transit infrastructure and increasing and enhancing its use, reducing community transportation demand, promoting compact development that will prevent sprawl, encouraging greenways and bike/pedestrian transportation, and investigating actions to improve the efficiency of freight.

Action Item 6 calls for reduction of total energy demand through conservation.¹⁰⁹ The Climate Change Action Plan establishes the goal of increasing energy saved through conservation by 20% through programs to encourage residential, commercial, industrial and institutional energy conservation programs. The Plan specifies that such actions could include encouraging use of green building design, the U.S. Energy Star Program and demand side actions.

Action Item 7 calls for the participants to begin to take actions to reduce or to adapt to the negative social, economic and environmental impacts of climate change.¹¹⁰ This should include the establishment of monitoring programs to measure changes and planning to avoid adverse impacts. Many of the adaptive actions for which the Plan calls will be consistent with actions to arrest sprawl and promote sound land development. Examples include land planning to move development further away from flood plains and to encourage reforestation of these areas.

Finally, Action Item 9 calls for creation of a regional emissions registry and the exploration of a trading mechanism.¹¹¹ Establishment of any trading program requires a registry that will document creditable pol-

107. *Climate Change Action Plan*. *supra* note 96, at 13.

108. *Id.* at 17.

109. *Id.* at 14.

110. *Id.* at 15.

111. *Id.* at 18.

lutant emissions reductions. Establishment of a registry and a regional trading system will allow participating states and provinces to join in the regional and international programs for trading carbon reductions through control measures and sequestration programs. Markets will allow the most efficient reductions to be achieved at the lowest cost and will encourage investment in new, efficient methods for sequestration, control and reduction of GHG emissions.

One of the participants in the Climate Change Action Plan, the State of Maine has incorporated the requirements of the Plan into legislation. The Maine Act to Provide Leadership in Addressing the Threat of Climate Change¹¹² adopts the overall goals of the Climate Change Action Plan as legislatively mandated goals.¹¹³ It also requires that the state lead by example, establish an inventory, participate in the regional efforts,¹¹⁴ develop a state climate action plan,¹¹⁵ and biennially evaluate progress and reevaluate the goals.¹¹⁶

C. Implementation of the Climate Change Action Plan in Massachusetts and New Hampshire: Aggressive State Strategies Including Regulatory Initiatives

Massachusetts, another participant in the Climate Change Action Plan, has taken one of the most aggressive responses to climate change, including regulatory initiatives which seek to integrate policies across programs. Massachusetts has sought to implement the plan through three initiatives: (1) four pollutant legislation requiring Massachusetts power plants to limit emissions of carbon dioxide, nitrogen oxides, sulfur dioxide and mercury, (2) a "green restructuring" consisting of renewable portfolio standards, a renewable trust fund, efficiency funds, new power plant siting rules for clean plants and emissions disclosure, and (3) pursuing litigation to force clean up of aging mid-western coal fired power plants, based on their contribution to ozone formation in Massachusetts, and to compel federal regulation of GHG emissions under the Clean Air Act.¹¹⁷

1. The Massachusetts "Four-Pollutant" Regulatory Strategy for the Power Industry

Massachusetts has targeted the power generation sector as the centerpiece for its GHG emissions reduction strategy because of that sector's

112. ME. REV. STAT. ANN. tit. 38, §§ 574-578 (2003).

113. *See id.* at § 576.

114. *See id.* at § 575.

115. *See id.* at § 577.

116. *See id.* at § 578.

117. *Hamel PowerPoint, supra* note 97, at 9.

significant contribution to multiple sources of contamination, representing a significant percentage of the statewide emissions of carbon dioxide, as well as nitrogen oxides, sulfur dioxide and mercury.¹¹⁸ Massachusetts has utilized its authority under existing air pollution legislation to promulgate a regulation establishing air emissions standards for existing power plants for those four pollutants, based on electric output¹¹⁹ and to require carbon dioxide offsets for new power plants.¹²⁰ These standards represented the first carbon dioxide controls nationally and first limitations on mercury emissions from power plants nationally.¹²¹

The Massachusetts standard for existing plants applies to fossil fuel electricity generation plants, in existence before 1977 and not having subsequently received a new source review approval, having a capacity of 100 MW or more, subject to the federal acid rain program, and having emitted more than 500 tons of sulfur dioxide and nitrogen oxides between 1997 and 1999.¹²² This applies, in fact, to six facilities responsible for 87% of the power plant carbon dioxide emissions in Massachusetts. Those six facilities emit nearly 2,000 pounds of carbon dioxide per megawatt hour ("MWhr") of electricity produced, as opposed to an average rate of 760 pounds of carbon dioxide per MWh emitted by new power plants.¹²³ The regulation caps carbon dioxide emissions from the affected existing plants at existing levels and requires a reduction of carbon dioxide emissions to no more than 1800 lbs/MWhr, thus requiring a 10 percent reduction.¹²⁴ The standards for these existing plants may be met either by increased efficiency at the plant or by the purchase of credits from other carbon dioxide reduction programs, where the state Department of Environmental Protection ("DEP") determines that the reductions are "real, surplus, verifiable, permanent, and enforceable."¹²⁵ The Massachusetts DEP began the process of developing a carbon dioxide emissions trading program for the exchange of these credits in January, 2002.

For new power plants, Massachusetts also requires carbon dioxide offsets in connection with its facility siting program. The Commonwealth requires that each new power plant purchase offsets equaling 1 to 3% of carbon dioxide emissions to be produced by the plant over the first twenty years of its life, at a cost of \$1.50 per ton. This money is contrib-

118. *Id.* at 2.

119. MASS. REGS. CODE tit. 31, § 7.29 (2003).

120. *Hamel PowerPoint*, *supra* note 97, at 2.

121. *Id.*

122. MASS. REGS. CODE tit. 31, § 7.29(3) (2003); *see id.* at § 7.29(2) (definition of "affected area").

123. *Hamel PowerPoint*, *supra* note 97, at 13.

124. MASS. REGS. CODE tit. 31, § 7.29(5)(a)5a,b (2003).

125. *See id.* at § 7.29(5)(a)5c,d.

uted to a fund supporting cost-effective programs for carbon dioxide mitigation. Programs to be funded under this program are selected in consultation with the Energy Facilities Siting Board. Plants nearing completion as of April 2002 were expected to generate \$3 million for this fund.¹²⁶

2. The Massachusetts Renewable Energy Trust

Massachusetts' program also calls for increases in uses of renewable sources of energy. Massachusetts, like many states, now provides for retail competition in electricity generation, and the Commonwealth requires generators to disclose to consumers their emissions, including emissions of carbon dioxide.¹²⁷ It has established the Massachusetts Renewable Energy Trust, which seeks to shift electric energy consumption from conventional energy sources to renewable resources by increasing generating capacity from renewable resources. The Trust provides funding to expand the renewable energy sector in Massachusetts, including developers, manufacturers, equipment vendors, architects and engineers, service providers and research organizations. The initial focus of the Trust is to promote development of the renewable energy sector such as wind projects in Massachusetts and Maine, to provide support to educational institutions for renewable energy programs and green buildings, and to pursue other specific opportunities.¹²⁸

Funding from the Trust is supplemented by a variety of state tax credits and deductions, which also supplement federal tax incentives. These include a state income tax credit for individuals installing residential renewable energy systems¹²⁹ and a corporate income tax deduction for a business purchasing a solar or wind-powered "climatic control unit" or "water heating unit."¹³⁰ Equipment relating to residential solar, wind, or heat pump systems is exempt from state sales tax.¹³¹ Massachusetts provides local property tax exemptions for solar or wind-powered systems¹³² and for hydro-power facilities.¹³³ Finally, Massachusetts encourages innovation by exempting income from a patent "useful for energy conservation and related purposes or . . . useful for alternative energy development " and sales of property manufactured subject to such a patent from state income and sales taxes for five years from patent issuance.¹³⁴

126. *Hamel PowerPoint*, *supra* note 97, at 15.

127. MASS. GEN. LAWS ch. 164, § 1F(5)(i), (6) (2003).

128. *Hamel PowerPoint*, *supra* note 97, at 13.

129. MASS. GEN. LAWS ch. 62, § 6(d) (2003).

130. *See id.* at § 38H.

131. MASS. GEN. LAWS ch. 64H, § 6(dd) (2003).

132. MASS. GEN. LAWS ch. 59, § 5, cl. 45 (2003).

133. *See id.* at § 5, cl. 45A.

134. MASS. GEN. LAWS ch. 62, § 2(a)(2)(G) (2003).

3. The Massachusetts Renewable Energy Portfolio Standard ("RPS")

Massachusetts has supplemented these tax incentives for renewable power and conservation with a regulatory initiative requiring development of new sustainable energy sources. It has established a renewable energy portfolio standard ("RPS") requiring all retail suppliers of electricity within the Commonwealth to increase the percentage of renewable sources of energy within their portfolio.¹³⁵ Massachusetts requires each retail supplier to assure that a minimum of one percent of the power which it supplies to retail customers within Massachusetts be supplied by *new* renewable energy sources by December 31, 2003. That percentage must increase by one-half percent each year thereafter through 2009 and increase by one percent each year thereafter, until the Commonwealth suspends the requirement.¹³⁶ Renewable resources include solar, wind, ocean, biomass, some small scale hydroelectric, fuel cells and landfill gases.¹³⁷ Suppliers are now further required to track their sources of generation and provide annual reports on those sources.¹³⁸

4. The New Hampshire "Four-Pollutant" Regulatory Strategy for the Grandfathered Power Plants and State GHG Registry

New Hampshire, another participant in the Climate Change Action Plan, has also implemented a strategy including regulatory controls. Like Massachusetts, New Hampshire has adopted legislation implementing a "four pollutant" strategy limiting emissions of sulfur dioxide, nitrogen oxides, mercury and carbon dioxide at fossil fuel power plants built before 1977 and therefore "grandfathered" and not subject to the more stringent emission limitations applicable to steam electric power plants built after that date.¹³⁹ This legislation implemented an agreement reached with the owner of the three grandfathered plants¹⁴⁰ and caps the carbon dioxide emissions at those plants at 1990 levels until 2010, with a lower limit to be imposed thereafter.¹⁴¹ The legislation specifically authorizes use of trading to achieve compliance, including trading through

135. MASS. GEN. LAWS ch 25A, § 11F (2003).

136. MASS. REGS. CODE tit. 225, § 14.07 (2003).

137. *See id.* at § 7.29(5)(a)5a,b; *see also Hamel PowerPoint, supra* note 97, at 17.

138. MASS. REGS. CODE tit. 225, § 14.09 (2003).

139. N.H. REV. STAT. ANN. § 125-O (2003).

140. N.H. DEPARTMENT OF ENVIRONMENTAL SERVICES, Air Resources Division Press Release, OVERVIEW OF HB 284, THE NEW HAMPSHIRE CLEAN POWER ACT, GROUND-BREAKING LEGISLATION TO REDUCE MULTIPLE HARMFUL POLLUTANT FROM NEW HAMPSHIRE'S ELECTRIC POWER PLANTS, (Nov. 2002), *available at* www.des.state.nh.us/ard/cleanpoweract.htm [hereinafter *NHDES Press Release*].

141. N.H. REV. STAT. ANN. § 125-O:3(III)(c); *see also NHDES Press Release, supra* note 140.

existing national and regional trading and banking programs.¹⁴² The legislation provides that funds derived from system benefit charges may be used for energy efficiency and renewable energy projects, which may generate credits to be applied by the utilities to the carbon dioxide cap.¹⁴³

New Hampshire has also enacted legislation requiring its Department of Environmental Services (“DES”) to establish a voluntary GHG emissions reduction inventory.¹⁴⁴ Pursuant to that authority, the New Hampshire DES has enacted rules establishing a registry with procedures and prescribed standards for registration, calculation of reductions, record-keeping and verification by third parties or the DES.¹⁴⁵ Although the registry is designed to assure credit for emissions reductions in existing or future regulatory programs,¹⁴⁶ the regulations provide that reductions registered under the program may not be converted to tradable credits absent further rule-making¹⁴⁷ and reserve action on registration of sequestration projects.¹⁴⁸

D. New Jersey’s Greenhouse Gas Action Plan: Emphasis on Sustainability and Voluntary Action

New Jersey, a heavily populated state with an extensive and valuable coastline that will likely experience a two-foot rise in sea level by the year 2100, can expect to suffer particularly from the impacts of climate change. New Jersey has also acted early to develop a multi-faceted climate change mitigation strategy incorporated into the New Jersey Sustainability Greenhouse Gas Action Plan.¹⁴⁹ That Plan was established as part of an larger overall state sustainability program instituted pursuant to an Executive Order issued by Governor Christine Whitman requiring all state agencies to initiate sustainability programs to achieve goals in the

142. N.H. REV. STAT. ANN. §§ 125-O:3(II), 125-O:4(IV)(c) (2003).

143. N.H. REV. STAT. ANN. § 125-O:5 (2003).

144. N.H. REV. STAT. ANN. § 125-L:3 (2003).

145. N.H. CODE ADMIN. R. ANN. ENV. A-3800 (2003).

146. N.H. CODE ADMIN. R. ANN. ENV. A-3801 (2003).

147. N.H. CODE ADMIN. R. ANN. ENV. A-3807 (2003).

148. N.H. CODE ADMIN. R. ANN. ENV. A-3810 (reserved) (2003).

149. NEW JERSEY CLIMATE CHANGE WORKGROUP, NEW JERSEY SUSTAINABILITY GREENHOUSE GAS ACTION PLAN (Dec. 1999, revised Mar. 2002) [hereinafter *New Jersey GHG Action Plan*], available at <http://www.state.nj.us/dep/dsr/gcc/GHG02revisions.pdf> (last visited Nov. 19, 2003). The program was described at the Forum by Michael Winka, the Administrator of the Office of Innovative Technology and Market Development, Division of Science and Research Technology, the New Jersey Department of Environmental Protection. This discussion is taken from that plan and Mr. Winka’s PowerPoint® presentation at the Forum. See Michael Winka, WHAT IS BEING DONE BY OTHERS: NEW JERSEY’S CLIMATE CHANGE AND GHG REDUCTION PROGRAM, 2nd Goddard Forum, *Global Warming: Causes, Effects and Mitigation Strategies for States and Localities*, University Park, PA (Apr. 17-18, 2002) [hereinafter *Winka PowerPoint*].

areas of “economic vitality, transportation and land use efficiency, public health, equity, education quality, nature resource protection, ecological integrity, pollution prevention, housing, good government, and strong communities, culture and recreation” and to develop and track specific indicators of progress.¹⁵⁰ Although New Jersey has utilized regulatory tools such as the RPS, New Jersey has not sought to impose mandatory emissions controls, relying upon voluntary efforts by the private sector in partnership with state leadership in energy efficiency and conservation programs. Although these policies aim to encourage primarily voluntary reductions, voluntary actions are encouraged with support from state regulatory programs, such as the establishment of standards and procedures for a GHG registry and trading.

The New Jersey Department of Environmental Protection’s efforts to establish a greenhouse gas strategy predated the Governor’s Executive Order, commencing with the establishment of the Global Change Workgroup in 1997.¹⁵¹ With input from this workgroup, the Commissioner of the New Jersey Department of Environmental Protection issued an Administrative Order in 1998 that enunciated the policy goals of supporting “the implementation of emission reduction strategies in support of the protocols established at Kyoto” and to support and advocate state and federal legislation to achieve those reductions.¹⁵² Most importantly, that Executive Order established the goal:

to reduce the level of emissions of the six major greenhouse gases i.e. carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons [*sic*] and fully fluorinated compounds, to 3.5% below 1990 emission levels by the year 2005.¹⁵³

Towards that end, the Order further called for interagency coordination, establishment of an emissions banking system in coordination with international efforts, development of clean fuel fleets, energy conservation efforts and GHG monitoring.¹⁵⁴

The Action Plan adopted pursuant to both Executive Orders, released in 1999 and amended in 2002,¹⁵⁵ was based upon the New Jersey emissions inventory. That inventory identified fossil fuel combustion as the source of 80% of 1990 GHG emissions, with methane emissions from landfill and fossil fuel extraction and distribution contributing 6%

150. N.J. Exec. No. 96 (May 20, 1999), reprinted in *New Jersey GHG Action Plan*, supra note 149, app. A, at A1-2.

151. *New Jersey GHG Action Plan*, supra note 149, at E3 and app. B, at A3-7.

152. NJDEP Administrative Order 1998-09 (Mar. 17, 1998), reprinted in *New Jersey GHG Action Plan*, supra note 149, app. C, at A9.

153. *Id.*

154. *Id.*

155. *New Jersey GHG Action Plan*, supra note 149.

and 3% respectively.¹⁵⁶ The greatest contributor of fossil fuel emissions was the transportation sector (38%). The residential and commercial sectors contributed 24% and 22% of emissions, respectively, with the most heavily regulated industrial sector contributing only 16%. This inventory was used to identify “no regrets” strategies that were readily available, could pay for themselves in the short term and could provide environmental benefits. The strategies selected by New Jersey seek to encourage actions to promote (1) energy conservation, (2) innovative technologies, (3) pollution prevention, (3) municipal solid waste recycling and recovery and use of landfill gas (methane) for energy production, and (5) GHG sequestration through afforestation, conservation of natural resources and open space.

1. New Jersey Reporting Requirements

In February 2003, New Jersey provided for the collection of accurate and timely information to update its inventory by adopting a regulation requiring all larger emitting facilities to report emissions of carbon dioxide and methane on annual emissions statements.¹⁵⁷ The rule proposal stated that the reporting would assist New Jersey in tracking its progress towards meeting its 3.5% reduction goal and in tracking greenhouse gas trends as a part of New Jersey’s larger environmental indicators program.¹⁵⁸ The information would also assist the State in determining whether its approach “is sufficiently protective of public health and welfare, animal and plant life, and property, or whether other measures (voluntary or mandatory) should also be taken.”¹⁵⁹

2. The New Jersey GHG Registry and Open Market Trading Rule

The centerpiece of New Jersey’s regulatory support for voluntary reductions in GHG emissions is its establishment of a GHG registry as a part of Comprehensive Open Market Trading (“OMET”) program integrated into Open Market Emissions Trading regulations.¹⁶⁰ These new rules create mechanisms for generating and banking GHG credits, while creating additional opportunities for trading VOCs and NO_x credits. The regulation prescribes procedures and standards for banking of credits in GHG, VOC and NO_x reductions in a registry that is maintained by a third

156. *Id.* at E4.

157. N.J. ADMIN. CODE tit. 7, § 27-21.3(b)(2)(ii) (2003).

158. 34 N.J. Reg. 695(a) (Feb. 14, 2002).

159. *Id.* at 25.

160. 28 N.J. Reg. 3414(a) (June 3, 1996), *amended by* 32 N.J. Reg. 1808(a) (May 15, 2000). The OMET trading program appears at N.J. Admin. Code tit. 7, §§ 27-30.1 to 30.30 (2002).

party contractor.¹⁶¹ These credits are verified and may be transferred, banked, used, or retired, with notice and recording in the registry. The credits may be generated, transferred or voluntarily retired without government approval.¹⁶² Regulatory provisions for the use of GHG credits are reserved, pending development of a program,¹⁶³ GHG credits are based upon the equivalent of one metric ton of carbon equivalent.¹⁶⁴ Only reductions occurring after the June 6, 2000, effective date of the regulations may create credits, although reductions may be based on a strategy whose implementation began after the 1990 baseline year.¹⁶⁵ GHG credits are awarded only for reductions which are real, surplus and quantified¹⁶⁶ pursuant to specific quantification standards prescribed in the regulations.¹⁶⁷ The regulations suffer, however, in failing to allow parties to claim credits for both GHG reductions and VOC reductions, where a VOC is also a GHG¹⁶⁸ and in failing to recognize an express property right in emissions reductions,¹⁶⁹ either of which could encourage further voluntary action.

3. The New Jersey RPS

New Jersey, like Massachusetts, has also relied on regulatory policy to reduce GHG emissions from the utility industry through adoption of an RPS¹⁷⁰ pursuant to the New Jersey Electric Discount and Energy Competition Act ("NJEDECA").¹⁷¹ Two sections of NJEDECA promote use of energy efficiency and renewable energy technology such as photovoltaics, wind energy and fuel cells, that will reduce GHGs, as well as other pollutants. One section creates the RPS and the second establishes a renewable energy fund.¹⁷² New Jersey's promulgation of the RPS and establishment of a renewable energy fund are both elements of an overall four pollutant strategy for control of power plant emissions, based on recognition of the fact that each ton reduction of avoided carbon dioxide emissions from the combustion of fossil fuel will also reduce emissions of nitrogen oxides, sulfur dioxide and mercury.¹⁷³ These pro-

161. N.J. ADMIN. CODE tit. 7, § 27-30.8 (2002). The credits are known as "DER credits." See N.J. Admin. Code tit. 7, § 27-30.2 (2000) (defining "DER credit" or "credit").

162. N.J. ADMIN. CODE tit. 7, § 27-30.3(b) (2000).

163. N.J. ADMIN. CODE tit. 7, § 27-30.17 (2000).

164. N.J. ADMIN. CODE tit. 7, § 27-30.2 (2000) (defining "GHG credit"). One metric ton equals 2,205 pounds.

165. N.J. ADMIN. CODE tit. 7, § 27-30.6(d) (2000).

166. N.J. ADMIN. CODE tit. 7, § 27-30.4(a) (2000).

167. N.J. ADMIN. CODE tit. 7, § 27-30.4(e) (2000).

168. N.J. ADMIN. CODE tit. 7, § 27-30.4(f) (2000).

169. N.J. ADMIN. CODE tit. 7, § 27-30.3(a) (2000).

170. N.J. STAT. ANN. § 48:3-87 (2003).

171. N.J. STAT. ANN. § 48:3-49 (2003).

172. *New Jersey GHG Action Plan*, *supra* note 149, at E8-9.

173. *Winka PowerPoint*, *supra* note 149, at 4.

grams reduced carbon dioxide emissions by 1.8 metric tons reduction over the first three years of operation, with corresponding reductions in nitrogen oxides, sulfur dioxide and mercury.¹⁷⁴

The RPS required that at least 2.5% of the kilowatt hours sold by each electricity and generation supplier in the New Jersey market be generated with renewable energy sources by the year 2000.¹⁷⁵ The standard further required each supplier to increase the amount of electricity generated with "Class I" renewable energy sources¹⁷⁶ by ½% by 2001, and requires that amount to be increased by an additional ½% by January 1, 2006, and by ½% per year thereafter until January 1, 2012, by which time every supplier will be required to produce 6.5% of its energy with renewable sources.¹⁷⁷ These requirements may be satisfied through trading.¹⁷⁸

NJEDECA also mandates the imposition and collection of a Societal Benefit Charge ("SBC"), and dedicates a portion of the SBC revenues to the support of Class I renewable energy and energy efficiency projects (including demand side management), with at least 25% dedicated to Class I renewable energy projects.¹⁷⁹ The revenues dedicated to "such projects" increase until the minimum amount of funding equals \$140,000,000.¹⁸⁰ The funds are placed in the Energy Efficiency and Renewable Energy Fund, the terms of whose use is determined jointly by the New Jersey Department of Environmental Protection and Board of Public Utilities.¹⁸¹

4. The New Jersey Voluntary Partnerships Program

New Jersey has also established a program encouraging industrial and utility companies and colleges and universities to enter into partnerships wherein they establish voluntary commitments to GHG reduction programs. Under New Jersey's "Sustainability Covenant-GHG Initiative," participating companies¹⁸² have entered into agreements with the

174. *Id.* at 5. These reductions amounted to 5,325, 8,510, and 0.04 metric tons, respectively.

175. N.J. STAT. ANN. § 48:3-87(d)(1) (2003).

176. Class I renewable energy includes that produced by solar technologies, photovoltaic technologies, wind, fuel cells, geothermal technologies, wave or tidal action and methane from landfills or a biomass facility using sustainably produced biomass. Class II renewable energy includes power produced from hydroelectric and resource recovery facilities. N.J. STAT. ANN. § 48:3-51; *see also New Jersey GHG Action Plan, supra* note 149.

177. N.J. STAT. ANN. § 48:3-87(d)(2) (2003).

178. *Id.*

179. N.J. STAT. ANN. § 48:3-60(3) (2003).

180. *Id.*

181. *New Jersey GHG Action Plan, supra* note 149.

182. As of April 2002, participating companies included Cosmair, Inc. Clark Manufacturing, DuPont, Johnson & Johnson, Lucent Technologies, Philips Lighting Company,

State Department of Environmental Protection, witnessed by several NGOs,¹⁸³ to implement GHG emissions reduction programs that will help achieve New Jersey's 3.5% reduction goal. As of April 2002, five companies had reported GHG reductions ranging from 18.5% to 55.5% as of 2002, with a cumulative 1.1 million ton reduction.¹⁸⁴ All New Jersey colleges and universities have also signed the sustainability covenant. During the decade 1990 to 2000, these institutions increased floor space by 17% and students and staff by 14% with no increase in GHG emissions, due to implementation of voluntary GHG reduction measures.¹⁸⁵

The final element of New Jersey's voluntary strategy is having the State lead by example.¹⁸⁶ The State has implemented this commitment by purchasing 15% of its electricity from a certified supplier whose generation mix includes 50% renewable power. The State has further committed to construction of all public buildings and publicly funding projected to meet standards established by the United States Green Building Council Leadership in Energy and Environmental Design ("LEED"), United States Department of Energy Smart Schools Initiative and United States Environmental Protection Agency Energy Star Program.¹⁸⁷ The State has provided support for this construction in public schools through the commitment of \$8.6 billion in assistance over 10 years by way of the School Construction Act. The New Jersey public school system has further adopted a formal statewide policy that "[a]ll reasonable efforts to implement voluntary programs and initiatives to accomplish the reduction of greenhouse gas emissions should be supported."¹⁸⁸

Schering-Plough, Lakehurst Naval Air Station. Their agreement is "facilitated by PSE&G and JCPL/GPA. *Winka PowerPoint*, *supra* note 149, at 4.

183. The NGO's are EDF, NRDC, The Nature Conservancy, and the Center for Clean Air Policy. *Id.*

184. *Id.* at 5. As reported to the voluntary federal GHG registry created pursuant to section 1605(a) of the Energy Policy Act of 1992. 42 U.S.C. § 13385(b) (2003) (Section 1605(a) reporting).

185. *Winka PowerPoint*. *supra* note 149, at 6.

186. The principle of State leadership in environmental improvement was established by Executive Order in 1989. N.J. Exec. Order No. 215 (Sept. 1989), *available at* <http://www.nj.gov/infobank/circular/eok215.htm>; *see*, *Winka PowerPoint*, *supra* note 149, at 8.

187. N.J. Exec. Order No. 215 (Sept. 1989), *available at* <http://www.nj.gov/infobank/circular/eok215.htm>.

188. New Jersey School Boards Association, Policy FC 5141 Health, *NJSBA Manual for Positions and Policies on Education*, *available at* http://www.njsba.org/members_only/poicy_information_systems/ppm/5000/5141pp.html (*quoted in Winka PowerPoint*, *supra* note 149).

E. The California Program: Providing a Model Registry and Targeting the Transportation Sector for Regulatory Controls

California is yet another coastal state with a history of environmental activism that has adopted an aggressive climate change program. California's program has been largely driven by legislation and includes a significant regulatory content. The California program is nationally significant in three respects. First, many are looking to California's GHG registry as a model for other state registry programs and an improved federal program. Second, California has reached agreement with Oregon and Washington to develop a coordinated approach to greenhouse gas reductions, with coordinated purchasing policies, inventory mechanisms and other policies.¹⁸⁹ Third, California, unlike many other programs, has targeted the transportation sector for regulatory controls.¹⁹⁰

Early concern about climate change motivated the California legislature in 1988 to direct the California Energy Commission to study global warming trends and their impacts on energy supply and demand, water supply, the environment, agriculture, and the economy.¹⁹¹ That report, published in 1991,¹⁹² and results of the national and global assessment efforts identified significant potential effects of climate change in California that motivated further legislative action.

Those concerns are reflected in legislative findings.¹⁹³ California, like New Jersey and Massachusetts is a coastal state with population centers that will likely suffer from sea level rise and increasing storm frequency.¹⁹⁴ Reduction in snow pack can adversely affect water supplies and disrupt agricultural production.¹⁹⁵ Increased heat could further exacerbate California's already severe ozone pollution problems as well as

189. Governors Davis, Locke and Kulongoski Announce Tri-State Strategy to Reduce Global Warming, California Governor's Press Release PR03-437 (Sept. 22, 2003), available at <http://www.governor.ca.gov> (The Press Release stated, "Due to federal inaction, the governors concluded that states must act individually and interactively to protect their residents and economies").

190. Many of the most significant initiatives, including the Tri-State Strategy (Sept. 22, 2003), the California legislation requiring GHG emissions controls on automobiles, 2002 Cal. Stat. Ch. 200 (July 22, 2002), and a law requiring the California Climate Action Registry to include provision for carbon sequestration, 2002 Cal. Stat. Ch. 423 (Sept. 9, 2002) were enacted after Apr. 2002, when many of the presentations cited here from the Goddard Forum on Global Warming occurred. The discussion here is based, in part, on a speech and PowerPoint presentation presented by Winston H. Hickox, Secretary of the California Environmental Protection Agency Winston H. Hickox, Speech and PowerPoint Presentation at the 20th MIT Global Change Forum (2003) [hereinafter Hickox Speech], available at www.calepa.ca.gov/About/Speech/Hickox.htm.

191. Hickox Speech, *supra* note 190, at slide 7.

192. Hickox Speech, *supra* note 190, at slide 7.

193. See 2001 Cal. Stat. 200, § 1.

194. *Id.* at § 1(a)(5).

195. *Id.* at § 1(a)(1), (3).

wildfires.¹⁹⁶

1. The California Climate Action Registry

One of California's first substantive responses to these concerns was the establishment of a GHG emissions reduction registry that is becoming the model for registries in the United States. The California Climate Action Registry was created by legislation adopted in 2000, shortly after the 1998 completion of California's greenhouse gas emissions inventory serving as the basis for the development of the State's strategy.¹⁹⁷ The bill requiring the establishment of the registry also directed the California Energy Commission to update the 1998 emissions inventory and to establish trends. A second bill, adopted in 2002, directed that the California Climate Action Registry include mechanisms for accounting for carbon sequestration in native forestland.¹⁹⁸

The California Climate Action Registry is administered by a non-profit public benefit corporation of that name, created by the legislature and governed by a seven-person board including the California Secretaries of Environmental Protection and Public Resources and five representatives from business, local government, and environmental organizations.¹⁹⁹ The findings and legislative purposes for the Registry succinctly summarize the reasons underlying the establishment of all such registries. In establishing the Registry, the legislature found that actions to control greenhouse gases should be taken and were inevitable. Moreover, the Registry would document the State's continuing leadership in environmental issues while providing protection, to the extent feasible, to companies acting early.²⁰⁰ The legislative purposes enumerate the spe-

196. *Id.* at § 1(a)(2), (4).

197. Act of Feb. 23, 2000, 2000 Cal. Stat. 1018 (2000) (codified at CAL. HEALTH & SAFETY CODE §§ 42800-42870).

198. S.B. 812, 2001-2002 S., Reg. Sess. (Cal. 2002) (codified at CAL. HEALTH & SAFETY CODE §§ 42800-42841).

199. CAL. HEALTH & SAFETY CODE §§ 42800-01 (2003)

200. CAL. HEALTH & SAFETY CODE § 42801 (2003). The text reads: "(a) It is in the best interest of the State of California, the United States of America, and the earth as a whole, to encourage voluntary actions to achieve all economically beneficial reductions of greenhouse gas emissions from California sources.

(b) Mandatory greenhouse gas emissions reductions may be imposed on California sources at some future point, and in view of this, the state has a responsibility to use its best efforts to ensure that organizations that voluntarily reduce their emissions receive appropriate consideration for emissions reductions made prior to the implementation of any mandatory programs.

(c) Past initiatives in the state that took early and responsible action to reduce air pollution and ozone smog have demonstrated political, economic, and technological leadership, and have proven to benefit the state.

(d) The state's tradition of environmental leadership should be recognized through the establishment of a registry to provide documentation of those greenhouse gas emissions reductions that are voluntarily achieved by sources in the state.

cific functions served by any registry:

- (a) Help various entities in the state to establish emissions baselines against which any future federal greenhouse gas emission reduction requirements may be applied.
- (b) Encourage voluntary actions to increase energy efficiency and reduce greenhouse gas emissions.
- (c) Enable participating entities to record voluntary greenhouse gas emissions reductions made after 1990 in a consistent format that is supported by third-party verification.
- (d) Ensure that sources in the state receive appropriate consideration for verified emissions reductions under any future federal regulatory regime relating to greenhouse gas emissions.
- (e) Recognize, publicize, and promote registrants making voluntary reductions.
- (f) Recruit broad participation in the process from all economic sectors and regions of the state.²⁰¹

The legislation requires the Registry both to record emissions reductions and proactively to set goals and to design programs. The Registry must establish the standards for recording emissions reductions, carbon sequestration through forestry, reporting, and certification. The Registry relies upon certifications of emissions reductions by independent third parties approved by the Registry. The Registry further maintains records of emissions baselines and reductions, and reports on progress in achieving emissions reductions.²⁰²

The Registry promotes GHG emission reductions and sequestration. It sets emissions reductions goals by industry and economic sector. It also provides various types of assistance. This includes the service of providing referrals to firms qualified in designing emissions reductions programs, actually designing plans for energy efficiency and GHG emissions reductions for individual organizations, and designing plans for

(c) The state hereby commits to use its best efforts to ensure that organizations that establish greenhouse gas emissions baselines and register emissions results that are verified in accordance with this chapter receive appropriate consideration under any future international, federal, or state regulatory scheme relating to greenhouse gas emissions. The state cannot guarantee that any regulatory regime relating to greenhouse gas emissions will recognize the baselines or reductions recorded in the registry." *Id.*

201. CAL. HEALTH & SAFETY CODE § 42810.

202. CAL. HEALTH & SAFETY CODE § 42823.

carbon sequestration through native forest conservation plans. The Registry actively promotes those firms that participate in emissions reductions recorded in the Registry.²⁰³

The legislation includes detailed requirements for participation in the Registry, including detailed reporting, monitoring and verification requirements designed to prevent "leakage" and avoidance of real GHG emissions reductions through "export."²⁰⁴ Participants must establish a baseline year in any year for which they have complete energy use or fuel consumption data after January 1, 1990. They must then report certified emissions results for each year thereafter.²⁰⁵ The Participants must report both "direct" emissions from combustion, mobile sources, fugitive emissions and process emissions and "indirect emissions" from the generation of electricity or steam that they purchase.²⁰⁶ A Participant is required to report only carbon dioxide emissions during the first three years and, thereafter, to report all six Framework Convention GHGs, in carbon dioxide equivalents.²⁰⁷ The Registry includes 23 Charter members.²⁰⁸

Other requirements beyond the requirement to report "indirect" GHG emissions seek to address problems of leakage and export. All sources within California must be reported and participants are encouraged to register all emissions throughout the United States and the world. Those limiting their reports to California are warned that they may not receive full credit in future regulatory programs.²⁰⁹ Where production is outsourced, all GHG emissions by the outsourced activity must be reported.²¹⁰ Mergers, divestitures, and shifts in operations to and from California must be reported and the emissions baseline adjusted accordingly.²¹¹

2. The California RPS and Energy Efficiency Legislation

California has adopted other legislation intended to increase energy efficiency and reduce dependence upon fossil fuels. Like both Massachusetts and New Jersey, California has adopted a Renewables Portfolio Standard Program.²¹² California's RPS requires each retail seller of elec-

203. *Id.*

204. CAL. HEALTH & SAFETY CODE § 42840.

205. *Id.* at (a).

206. *Id.* at (b).

207. *Id.* at (c) (the emissions of the other GHGs are adjusted according to their relative contribution to the greenhouse effect).

208. Hickox Speech, *supra* note 190, at Slide 11.

209. CAL. HEALTH & SAFETY CODE § 42840(d) (the Registry is also required to submit a report to the legislature regarding the advisability of requiring national reporting).

210. *Id.* at § 42840(d)(4).

211. *Id.* at § 42840(d)(5), (7).

212. 2002 Cal. Stat. Ch. 516 (Sept. 12, 2002), codified at CAL. PUB. UTIL. CODE §§

tricity to increase its procurement of eligible renewable energy resources by one percent per year so that California will be procuring at least 20% of its electricity supply from renewable sources by December 31, 2017.²¹³ Renewable energy resources include:

biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and any additions or enhancements to the facility using that technology.²¹⁴

Although this twenty percent goal may seem ambitious, California already produces significantly more electric energy from renewable sources than the rest of the nation. California is currently producing 12% of its energy from sources that largely fall within the narrow definition of the RPS.²¹⁵

California's per capita emissions of carbon dioxide and its "carbon intensity" is far lower than that in the rest of the nation. Transportation emissions accounted for 58% of the state's emissions, with 37% coming from motor fuel alone.²¹⁶ In light of this, California is focusing attention on measures to reduce GHGs in the transportation sector, generally, and use of petroleum. In 2000, the California legislature directed the State

399.11 - 399.15.

213. CAL. PUB. UTIL. CODE § 399.15(b)(1).

214. *Id.* at § 383.5, incorporated by reference *id.* at § 399.12(a). However, most municipal solid waste trash-to-steam plants are excluded and no new small hydroelectric or trash-to-steam plants may qualify. *Id.* at § 399.12(a).

215. California already produces 5% of its energy from geothermal sources, 3% from small hydroelectric, 2% from wind/solar, and 2% from biomass/waste, Hickox Speech, *supra* note 190, at slide 27. It also produces 15% of its energy supply with large hydroelectric projects and imports another 7% of its energy from hydroelectric sources, which would not qualify as renewable sources under the RPS. *Id.* Thus, strictly speaking, 34% of California's energy is currently generated with these renewable sources as compared with national figures of 9% hydroelectric and 2% other "renewables". *Id.* With the RPS, that figure must increase by 8% to 42%. *Id.* The remainder of California's energy mix produces lower GHG emissions than that in the remainder of the nation, since the majority of the remaining electricity is generated with nuclear sources (12%), which produce no GHG emissions, and natural gas (38% in-state plus 3.7% imported), which produces lower GHG emissions than other fossil fuels. *Id.* GHG intensive coal is used only in the generation of about 12% of California's electricity (all of which coal-generated electricity is imported). *Id.* Thus, California currently supplies 46% of its electricity from sources not producing a net increase in GHG gases and 41.7% with low GHG fuel and, assuming that renewables replace fossil fuel production, could increase the percentage of its electricity generated with non-GHG producing sources to 54% of its mix. *Id.*

216. Hickox Speech, *supra* note 190, at slides 14-16. These figures are taken from the draft report required by the 2000 legislation establishing the Registry. 2000 Cal. Stat. Ch. 1018, § 2 (Feb. 23, 2000), codified at 15 CAL. PUB. RES. CODE § 25730. That report updated the 1998 emissions inventory that served as the basis for the focus on transportation issues.

Energy Resources Conservation and Development Commission to prepare a report on a strategy to reduce California's petroleum dependence. The legislation required that the strategy include goals for reduction in the rate of growth of gasoline and diesel fuel consumption, increased transportation efficiency and utilization of non-petroleum based fuels, including alternative fueled vehicles, hybrid vehicles and high fuel efficiency vehicles.²¹⁷

3. California Legislation Limiting GHG Emissions from Motor Vehicles

Information in the draft of the report required by the 2000 legislation has been used to design a unique regulatory program aimed at reduction of GHG emissions from the transportation sector.²¹⁸ That program was created by legislation enacted in July, 2002, requiring the California Air Resources Board to develop and to adopt by January 1, 2005, regulations requiring the reduction of GHG emissions from cars and light duty trucks.²¹⁹

These regulations must "achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions"²²⁰ that can be achieved by the 2009 model year deadline,²²¹ "taking into account environmental, economic, social, and technological factors."²²² The regulations cannot achieve these emissions reductions by imposing additional taxes, banning any vehicle category, requiring vehicle weight reductions, or limiting speed limits or miles traveled.²²³ The reductions will be calculated from the model year 2000 baseline and manufacturers may take credit for early reductions.²²⁴ The Board was required submit a report to the Legislature by July 1, 2003, on the content of regulations and GHG emissions reduction technologies identified. However, if the federal government adopts an equivalent or more effective standard with an equivalent or shorter time frame, the Board may eschew adoption of the standards.

The California model is important in that it addresses a very significant and growing source of GHG emissions, the transportation sector. However, it is subject to both actual and likely challenges. Many other state "experiments" may also be subject to these challenges, at least one

217. 2000 Cal. Stat. Ch. 936 (Sept. 30, 2000), codified at CAL. PUB. RES. CODE §§ 25720-25721.

218. Hickox Speech, *supra* note 190, at slides 21-23.

219. 2002 Cal. Stat. Ch. 200 (July 22, 2002), codified at CAL HEALTH & SAFETY CODE § 43018.5.

220. CAL HEALTH & SAFETY CODE § 43018.5(a).

221. *Id.* at § 43018.5(b)(1).

222. *Id.* at § 43018.5(i)(2).

223. *Id.* at § 43018.5(d).

224. *Id.* at § 43018.5(c)(5).

of which will create greater difficulties for states other than California. Thus, another model may be more appropriate for other states and may ultimately be required in California.²²⁵

F. *Other State Programs*

Although Massachusetts and other Climate Change Action Plan States, such as New Jersey and California, present examples of situations where states have developed integrated and far reaching plans for limiting GHG emissions, these do not represent the only cases where states are acting now to address greenhouse gas emissions. Some states, such as New York, Oregon, and Wisconsin, are in the process of adopting or have already adopted an integrated approach to limiting GHG emissions, including multiple strategies addressing several sectors.²²⁶ Other states have adopted individual laws, regulations or policies that will reduce GHG emissions while promoting one or more other, often overlapping goals, such as energy efficiency, use of renewable energy, limitation of sprawl and undesirable land uses, or limitation of other air pollutants such as ozone, nitrogen oxides or sulfur dioxide.²²⁷

Oregon, which recently joined with California and Washington to implement a western coastal regional response to climate change, has also adopted a number of programs aimed at addressing climate change, including regulatory and non-regulatory elements. As early as 1992, the Oregon Progress Board established a statewide goal of stabilizing GHG emissions at their 1990 levels, although the State has since concluded that the benchmark goal cannot be achieved through state action alone and has recommended a combination of state and national actions.²²⁸ Oregon has established a program for registering, transferring or selling carbon offsets from carbon sequestration in forests.²²⁹ It has enacted a carbon dioxide emissions standard for emissions from new energy facilities as part of its energy facilities siting requirements.²³⁰ The law provides that, in addition to meeting the standard through direct emissions controls, the standard may be met by employing co-generation reducing emissions from another existing source, the creation of offsets through "avoidance, displacement or sequestration" or payment of money into a

225. *See, infra* discussion at Section IV.B.

226. *See*, JAKE SCHMIDT, ET AL., CENTER FOR CLEAN AIR POLICY, Washington, D.C. *State and Local Climate Change Policy Actions*, (Oct. 11, 2002), available at www.ccap.org/pdf/State_Actions.pdf.

227. *Id.*

228. SCHMIDT ET AL., *supra* note 226, at 5-6.

229. OR. REV. STAT. §§ 526.005, 526.725, 530.050 & 530.500.

230. 1997 Or. Laws 428, codified at OR. REV. STAT. §§ 469.310, 469.370, 469.501, 469.503 & 469.505.

fund to generate such offsets.²³¹ Oregon also provides state tax credits for hybrid vehicles,²³² residential energy efficiency projects,²³³ and for business investment in projects saving energy or producing renewable energy.²³⁴

New York, with the assistance of CCAP, is in the process of developing a comprehensive GHG reduction strategy and has already implemented a number of measures. Its State Energy Planning Board adopted a statewide goal of reducing GHG emissions to 5% below 1990 levels by 2010 and 10% below 1990 levels by 2020.²³⁵ The governor has issued an executive order requiring state agencies to meet 5% of their energy needs from "green," renewable sources by 2005, and 20% by 2010, and to reduce energy consumption in state buildings by 35% by that date.²³⁶

New York offers a variety of tax credits for low GHG emission vehicles, which also reduce NO_x and carbon monoxide emissions,²³⁷ and the state has made a commitment to acquire biodiesel fuel for state vehicles.²³⁸ The State released a State Energy Plan directed to reducing GHG emissions with measures such as redirecting the state transportation spending to more energy efficient alternatives such as mass transit, bicycling and pedestrian alternatives, encouraging reduction of vehicle miles driven by smart growth initiatives, such as open space preservation, and specifically tracking carbon dioxide emissions in transportation planning and decision-making.²³⁹ The State's Energy Smart Program directs utility public benefit charges to energy efficiency projects.²⁴⁰

Wisconsin also acted early to implement GHG control measures. A far reaching program was developed by the Wisconsin Public Service Commission ("PSC") in 1992, when PSC required electric utilities to integrate a number of measures to limit GHG emissions into their integrated resource plans.²⁴¹ This action required public utilities to monetize the risk of future regulation of GHG gases by incorporating projected costs of these emissions into their planning,²⁴² allowing them to account

231. OR. REV. STAT. § 467.503(a).

232. SCHMIDT ET AL., *supra* note 226, at 17.

233. *Id.* at 19.

234. *Id.*

235. Schmidt et al., *supra* note 226, at 9.

236. *Id.* at 10, 18-19; *see also* www.nyserda.org/exorder111guidelines.pdf.

237. SCHMIDT ET AL., *supra* note 226, at 12.

238. *Id.* at 13.

239. *Id.* at 14.

240. *Id.* at 18.

241. *Re Advance Plans for Construction of Facilities*, 136 P.U.R. 4th 153 (Wis. PSC, 1992).

242. The Order required utilities to calculate the costs at \$15 per ton for carbon dioxide, \$150 per ton for methane and \$2,700 a ton for nitrous oxide. *Id.* at 175-76, 196.

for offset projects as well.²⁴³ The action also required the utilities to plan to develop renewable energy sources, to emphasize cogeneration, and to consider other technologies to improve efficiency.²⁴⁴ The utilities were required to offer incentives for solar hot water heating²⁴⁵ and were encouraged to “propose revenue incentives for aggressive demand-side programs.”²⁴⁶ Finally, finding that “conventional pulverized coal generating plants are more polluting and less efficient than other available options in the same price range,” PSC effectively prohibited utilities from including such plants in future planning.²⁴⁷

This administrative response was followed by legislative and other administrative initiatives. The Wisconsin legislature has created a Wisconsin RPS requiring each retail electric provider to derive at least 2.2% of its electricity from renewable sources,²⁴⁸ and establishing a system for tradable renewable resources credits pursuant to rules to be established by the PSC.²⁴⁹ The Wisconsin Department of Natural Resources has established a voluntary GHG emissions reduction registry, pursuant to state legislation requiring a registry.²⁵⁰ The Wisconsin PSC has also promulgated rules requiring an energy audit and establishing standards for residential electric and gas conservation that must be met before service can be provided or certain new appliances installed.²⁵¹

Other states have implemented a variety of programs addressing climate change and other issues simultaneously. There have been many state programs promoting energy conservation and efficiency or alternative fuels as a mechanism to achieve GHG emissions reductions while serving other purposes. As of October 2002, fourteen states either had established or were in the process of establishing public benefit charges where funds were established to fund renewable energy projects.²⁵² Texas has promulgated a regulatory Renewable Energy Mandate that calls for 2000 MW of new renewable energy sources by 2009, establishes a trading program for renewable energy credits, and establishes renewable energy purchase requirements for companies providing electric generation on a competitive basis in the state.²⁵³ Pennsylvania established a goal of meeting 5% of the state government’s energy needs using

243. *Id.* at 177.

244. *Id.* at 164-67, 204-05.

245. *Id.* at 205.

246. *Id.* at 203.

247. *Id.* at 194.

248. WIS. STAT. § 197.378(2).

249. WIS. STAT. § 197.378(3),(4); WIS. ADMIN. CODE 118 (2003).

250. 1999 Wis. Laws 195, codified at WIS. STAT. § 285.78.

251. WIS. ADMIN. CODE Chapter PSC 136.

252. SCHMIDT ET AL., *supra* note 226, at 8.

253. 16 TEX. ADMIN. CODE § 25.173 (2003).

green energy during the years 2001 and 2002.²⁵⁴ Washington and Maryland have required state agencies to implement green building programs, energy audits, and other measures to reduce energy consumption and GHG emissions from the public sector.²⁵⁵ Maryland's Clean Energy Incentive Act removes the State's sales tax on a variety of energy efficient products.²⁵⁶ A number of states also have programs encouraging low emission vehicles,²⁵⁷ bio-fuels manufactured from renewable resources,²⁵⁸ and smart growth or programs for reduced use of vehicles in commuting,²⁵⁹ all of which will reduce GHG emissions while assisting in reducing other vehicle related air pollution, traffic and sprawl.

IV. GHG Mitigation Programs Developed by Local Governments and Industry

Local governments and private industry are joining these states in developing their own GHG mitigation programs. Both the federal voluntary reduction program and many of the state programs discussed above build upon these local and private programs. The principal strategy of the New Jersey partnership program is to encourage development of such private and local programs. State registries are created to encourage private and local programs. Registries encourage these programs by removing a barrier to their implementation (*viz* the concern that lowering emissions early will create a new lower baseline if a federal program is implemented) and by promoting the accomplishments of registry participants.

A. Municipal GHG Mitigation Programs

A number of the municipal programs have been organized and facilitated by the International Council for Local Environmental Initiatives ("ICLEI"), whose international program to assist local governments in developing programs and policies to reduce GHG emissions²⁶⁰ provides a

254. SCHMIDT ET AL., *supra* note 226, at 10.

255. *Id.* at 18.

256. *Id.*

257. *Id.* at 11. To encourage low emission vehicles, Maryland provides an excise tax exemption on certain hybrid vehicles. *Id.*

258. *Id.* at 12. Minnesota requires that all gasoline in the state contain 10% ethanol oxygenate and will require that 2% of the diesel fuel be biodiesel beginning in 2005. *Id.*

259. SCHMIDT ET AL., *supra* note 226, at 12-13. Maryland has multiple smart growth initiatives and offers a tax credit for employers who help pay for their employees to use mass transit for commuting, and the State of Washington has enacted a Commute Trip Reduction Law. *Id.*

260. ICLEI Brochure, *supra* note 73, at 1; see also ICLEI, About the CCP, at <http://www.iclei.org/co2/background.htm> (last visited Nov. 19, 2003); see also Interview with Bill Drumheller, Director, ICLEI [hereinafter ICLEI].

useful model for the scope, methods and procedures implemented in these programs. The ICLEI "Cities for Climate Protection ("CCP") Campaign" has involved hundreds of municipal governments, including jurisdictions in the United States who are cumulatively responsible for eighteen percent of the GHG emissions in the United States.²⁶¹ ICLEI recruits cities and counties to participate in a worldwide network of local governments²⁶² that reduce greenhouse gas emissions using tools that include programs to increase energy efficiency, renewable energy, waste reduction, recycling, urban planning techniques that will reduce energy demand, and sustainable transportation practices.²⁶³ The CCP grew out of ICLEI's Urban CO₂ Reduction Project (1991-1993), which developed a municipal "planning framework for greenhouse gas (GHG) reduction and strategic energy management."²⁶⁴

Through its experience in both programs, CCP has developed a "five-step milestone process" that can be readily implemented by local governments to establish programs using a variety of tools. To assure success, ICLEI identifies and involves a range of significant stakeholders, including local government staff, elected officials, citizen advisory commissions, community-based organizations, other environmental organizations, state air and energy offices, federal government agencies, and private sector representatives.

CCP focuses its efforts on GHG emissions that are the most significant globally and can be most cost effectively reduced through local government efforts. Although local governments are free to direct their programs to any combination of GHG emissions, CCP focuses its software and its program evaluations on emissions that it describes as follows:

- "Carbon dioxide (CO₂), emitted by energy consumption of fossil fuels by municipal buildings and facilities, households, institutional and commercial buildings, auto transportation, industrial and manufacturing process. It can also be sequestered through urban forestry;
- Methane (CH₄), a GHG emitted in urban areas by local waste disposal, especially landfills and waste water treatment; and
- Conventional air pollutants such as nitrogen oxides, carbon monoxide, and non-methane volatile organic compounds,

261. ICLEI, About the CCP, *supra* note 260.

262. See ICLEI, Participants of the Cities for Climate Protection Campaign, at <http://www3.iclei.org/co2/ccpmems.htm> (last visited Nov. 19, 2003). As of November 2003, there were 571 participants in the program worldwide. *Id.*

263. ICLEI Brochure, *supra* note 73, at 1.

264. ICLEI, About the CCP, *supra* note 260.

compounds that are precursors of ground-level ozone and smog, as well as by-products of fossil fuel combustion.”²⁶⁵

To become a CCP participant, the local government must make a commitment to develop a climate action program, either by way of the adoption of a “Local Government Resolution” by the elected entity responsible for adopting legislation, or by way of the entry of an executive order by the chief executive officer. Like the Climate Change Action Plan, this resolution or executive order does not include a commitment to adopt a particular set of policies or laws, but to enter into a process that will assure that an effective program tailored to the municipality’s needs can be designed and implemented. In the Local Government Resolution or executive order, the municipality is required to commit to undertake five “performance milestones” as a precondition to participation in the Campaign. These “performance milestones” focus on energy use and have been designed to enable municipal governments to gain an understanding of how municipal decisions affect energy use and how their decisions can be used to mitigate global climate change while improving community quality of life.²⁶⁶ Specifically, the municipality must commit to accomplish the following, with ICLEI assistance:²⁶⁷

- “Conduct an energy and emissions inventory and forecast;
- Establish an emissions target;
- Develop and obtain approval for the Local Action Plan;
- Implement policies and measures; and
- Monitor and verify results.”²⁶⁸

The manner and the pace whereby the local government accomplishes these milestones are left to the local government. Although implementation mechanisms are left to local decision makers, CCP local governments have focused their plans upon energy efficiency, transportation, and municipal waste issues.²⁶⁹

The experience gained in implementing this program in a variety of jurisdictions has shown that implementation of climate change programs locally can result in reduced GHG emissions, while producing a number of collateral environmental and fiscal benefits which enure to the imme-

265. *Id.*

266. *Id.*

267. ICLEI also provides participating local governments with assistance in implementing this program. It does so by providing a locale for networking, training, software, technical assistance, publications, recognition and policy assistance. Participants may use CCP Greenhouse Gas Emissions Software to conduct the emissions analysis, to evaluate emissions reduction measures that best meet the strategies of the community and to track measures to determine if emissions reductions are being reached. *ICLEI Brochure*, *supra* note 73, at 3.

268. ICLEI, *About the CCP*, *supra* note 260.

269. *Id.*

diate benefit of the municipality and its citizens. For example, Portland Oregon established a goal of reducing GHG emissions ten percent below 1990 levels by 2010.²⁷⁰ Implementation of a local program there reduced per capita CO₂ emissions from 16.9 tons in the baseline year 1990 to 15.6 metric tons in 2001, a decrease of 7% during a period that United States emissions grew by one percent,²⁷¹ increased transit ridership by 30%, cut auto commutes to the central business district by 15%, and reduced solid waste disposal per household by 13%.²⁷² These measures in Oregon thus produced collateral improvements in reduced energy demand, reduced traffic and congestion, reduced air pollution caused by automobiles, and reduced fiscal demands upon the municipality.

Other local programs have established similar goals and achieved similar results. Seattle, Washington, Salt Lake City, Utah, and Austin, Texas, have established local programs with goals of achieving GHG reductions from 1990 levels of 7% by 2010, 7% by 2012, and 20% by 2010, respectively. These municipal programs have relied upon a mix of use and purchase of alternative energy, increased energy efficiency in local buildings, transportation and anti-sprawl planning, and urban forestry initiatives.²⁷³

ICLEI has identified a wide range of potential collateral benefits that can be generated by the various planning, transportation and development mechanisms employed by local governments implementing climate change programs. These include the following:

- financial savings through energy and fuel
- green space preservation
- local economic development and job creation through the demand for energy efficiency and new energy systems
- air pollution reductions
- traffic congestion
- community livability improvements.²⁷⁴

These collateral benefits have not been insubstantial. As of April 2002, CCP estimated that its participating communities were reducing CO₂ emissions by 10.3 million tons per year while also cutting about 170,000 tons of criteria air pollutants per year and saving approximately

270. SCHMIDT ET AL., *supra* note 226, at 5.

271. CITY OF PORTLAND OFFICE OF SUSTAINABLE DEVELOPMENT, GLOBAL WARMING Update, *at*

http://www.sustainableportland.org/engery_global_warming_2001_emissions.pdf (last visited Nov. 19, 2003).

272. ICLEI, About the CCP, *supra* note 260.

273. SCHMIDT ET AL., *supra* note 226, at 5.

274. ICLEI, Climate Change and Local Governments, *at* http://www.iclei.org/co2/cchange_localgov.htm (last visited Nov. 19, 2003).

\$242 million in fuel and energy costs annually.²⁷⁵ These collateral benefits suggest that the economic and cost assumptions of the critics of Kyoto and GHG mitigation programs may be unfounded.²⁷⁶

B. Voluntary Mitigation Programs Undertaken by Private Industry

A significant number of the largest companies operating within the United States have also undertaken voluntary GHG emissions mitigation programs, while participating in voluntary state programs and registries. The Pew Center on Global Climate Change, a non-governmental organization that has focused its efforts on proactive industry programs addressing climate change²⁷⁷ has organized a group of thirty-eight major companies²⁷⁸ into the Business Environmental Leadership Council ("BELC") to assist corporations in developing proactive programs to reduce GHG emissions.²⁷⁹ Many of these companies also participate in similar programs, such the ED Partnership for Climate Action, the WWF Climate Savers Program, the Business Round Table's Climate RESOLVE Program,²⁸⁰ the federal governments Climate Leader program,²⁸¹ the voluntary reduction programs developed by the states discussed above, and have implemented emissions reduction programs while participating in the state and federal registries.

275. *ICLEI Brochure*, *supra* note 73, at 2. These results have been achieved through the more than 400 programs implemented by CCP communities. As of April, 2002, there were 119 U.S. Cities and Counties participating in CCP, representing 45 million people and 17 % of the U.S. population, as well as 323 private companies cooperating with the local governments. *Id.*

276. The *ICLEI Brochure* does not provide information on the cost of the programs. *Id.*

277. See SALLY ERICSSON, REDUCING GHG EMISSIONS: BUSINESS LEADERSHIP (Apr. 17, 2002), *reprinted in* THE 2ND ANNUAL GODDARD FORUM, GLOBAL WARMING: CAUSES, EFFECTS AND MITIGATION STRATEGIES FOR STATES AND LOCALITIES (Apr. 17-18, 2002)[hereinafter *Ericsson PowerPoint*]. The Pew Center on Global Climate Change was founded in May 1998 by a group of charitable foundations to act as an independent, non-partisan organization which would work with private industry to address climate change. *Id.* To that end, the Pew Center will "(1) release reports on environmental impacts, economics and policy issues, (2) educate the public through advertising, public-speaking events and conferences, and (3) advance international negotiations on climate change by coordinating cross-country policy, industry and government discussions." Pew Center on Global Climate Change, *supra* note 74.

278. These include ABB, Air Products, ALCOA, American Electric Power, Baxter International, Boeing, BP, CH2M Hill, Cinergy, Deutsche Telekom, DTE Energy, Dupont, Entergy, Georgia-Pacific, Hewlett Packard, Holcim, IBM, Intel, Interface, Inc., John Hancock, Lockheed Martin, Maytag, Novartis, Ontario Power Generation, PG&E, Rio Tinto, Sun Company, TransAlta, Weyerhaeuser, Whirlpool, Rohm & Haas, Royal Dutch/Shell, Toyota, Transalta, United Technologies, and Wisconsin Energy Corporation. *Ericsson PowerPoint*, *supra* 276, at 3.

279. Pew Center on Global Climate Change, *supra* note 74.

280. See *supra* text accompanying note 19.

281. See Kerr, *supra* note 57.

These companies have undertaken early GHG reduction programs, despite the absence of a mandate, for reasons similar to those motivating early actions by states and localities. Early industry action is often motivated by the emerging belief in many important constituencies that reducing GHG emissions is “the right thing to do.”²⁸² Shareholders, officers and directors are all motivated by these sentiments. The Pew Center has found that companies generally want to lead their industry in being sustainable.²⁸³ By taking early action they can “stand out in their industry.”²⁸⁴ This can assist the companies in employee recruitment and retention and foster public relations.²⁸⁵

There are practical, economic reasons for undertaking early action. Most companies developing proactive programs have concluded that the “issue of climate change is not going away” and regulation is inevitable. These companies have further concluded that, because emissions have a “long life” and significant reductions will eventually be required, early action will most likely ultimately create economic benefits.

Likewise, many companies have found that they have achieved many benefits in staying “ahead” of regulations. Early actors may be able to take advantage of the cheapest and easiest reductions. They can also benefit in the long run by integrating GHG emission reduction and sequestration measures into their capital plans as capital improvements are made in the course of doing business, rather than in response to a government mandate.²⁸⁶ Thus, as long as these companies can register their reductions with a reasonable expectation that early reductions will be “counted” in the ultimate regulatory program, it can be a sound investment to act early.

Many of the companies taking early action operate internationally and are already subject to GHG emissions requirements in other nations that can be satisfied by reductions in the United States.²⁸⁷ Reduction of GHG emissions is important to consumers, voters, and governments outside of the United States. Companies with significant international operations or sales often want to demonstrate leadership in achieving reductions to protect or enhance their operations and sales in these markets.²⁸⁸

282. *Ericsson PowerPoint*, *supra* note 277; SALLY ERICSSON, *What is being done by Other Countries, States and Municipalities and by Private Industry to Implement Kyoto Reductions*, GLOBAL WARMING: CAUSES, EFFECTS, AND MITIGATION STRATEGIES FOR STATES AND LOCALITIES 1 (2nd Goddard Forum, 2002) [hereinafter *Ericsson Abstract*].

283. *Ericsson Abstract*, *supra* note 282, at 1.

284. *Id.*

285. *Ericsson PowerPoint*, *supra* note 277, at 5.

286. *Id.*; *Ericsson Abstract*, *supra* note 282, at 1.

287. *Ericsson PowerPoint*, *supra* note 277, at 5; *Ericsson Abstract*, *supra* note 282, at 1

288. *Ericsson Abstract*, *supra* note 282, at 1.

In addition, many of these BELC companies have identified economic opportunities in the emerging emissions trading schemes or from investments in technology. The combination of requirements for GHG reductions internationally, state programs, and the expectation of future federal action have created markets for GHG reduction credit trading. The existence of the private GHG trading program on the Chicago Exchange, where carbon reduction credits were sold for slightly less than \$1 per ton, reflects the existence of such demand.²⁸⁹ Investors in the credits can conclude that credits for use abroad or for banking and use at later time may be obtained at the lowest expense now, before the United States has established uniform requirements for reductions.²⁹⁰ Moreover, technology that will reduce GHG emissions will usually reduce fuel or energy consumption and emissions of other regulated pollutants per unit production, thereby generating investment returns independent of the value that might be attributed to any GHG emissions reductions.

Participation in the BELC program does not involve the prescription of particular strategies, but does require the company to subscribe to a common set of principles. To participate in the program, the BELC companies subscribe to four principles:

First, we accept the views of most scientists that enough is known about the science and environmental impacts of climate change for use to take actions to address its consequences.

Second, businesses can and should take concrete steps now in the U.S. and abroad to assess opportunities for emission reductions, establish and meet emission reduction objectives, and invest in new,

289. *Id.*; Chicago Climate Exchange, *Chicago Climate Exchange (CCX) Announces Results of First Auction* (September 30, 2003), available at <http://www.chicagoclimateexchange.com/news/pdf/CCXAuction.pdf>.

290. By way of example, modeling by Adam Rose, for a still unpublished study by the author and Dr. Rose, has determined that, using an "upper bound" curve, a greenhouse gas tax of \$28.66 per ton would be required to guarantee that Pennsylvania would achieve the reductions called for by the Kyoto Protocol. Since the tax would also reflect the marginal cost of carbon credits in a mandatory cap and trade program aimed at achieving the reductions called for under the Kyoto Protocol, if the upper bound curve reflects what will occur, acquiring these credits today could prove a wise investment, *provided* such a mandatory program is ultimately established. ROBERT B. MCKINSTRY, JR., ADAM ROSE, & COREEN RIPP, *Incentive-Based Approaches to Greenhouse Gas Mitigation in Pennsylvania: Protection the Environment and Promoting Fiscal Reform*, ___ WIDENER L. J. [publication pending]. On the other hand, the lower bound curve suggests that the Kyoto reductions can be achieved at zero cost. The market clearing price likely falls somewhere between the upper and lower bound curves. Moreover, the value of reductions is likely to increase in time, in light of both economic growth and the fact that the Kyoto reductions are only contemplated as a first step, with additional reductions required to achieve the Framework Convention's goal of avoided dangerous anthropogenic climate change.

more efficient products, practices and technologies.

Third, the Kyoto agreement represents a first step in the international process, but more must be done both to implement the market-based mechanisms that were adopted in principle in Kyoto and to more fully involve the rest of the world in the solution.

Fourth, we can make significant progress in addressing climate change and sustaining economic growth in the United States by adopting reasonable policies, programs and transition strategies.²⁹¹

Although these principles do not include binding commitments, these recitations represent a formal position that may have the binding practical effect upon companies to uphold the position that climate change is an important problem caused by anthropogenic emissions and that measures can and should be taken to reduce those emissions. The principles afford the BELC companies a great deal of flexibility in implementing programs. Many companies are conducting greenhouse gas inventories and setting greenhouse gas reduction targets.²⁹² The targets vary considerably in the deadlines for achievements, the reduction targets, the measure whereby reductions will be calculated, or contingencies. For instance, some companies commit to reductions in carbon dioxide emissions, others to reductions in PFC emissions, and others to reduction in use of energy from non-renewable sources. In some cases, the emission reductions relate to total emissions and in other cases by unit of production (*e.g.* by percentage of sales or energy production).²⁹³ Measures implemented will vary even more considerably, given the range of the types of companies, products and raw materials.

The experiences of some of the companies participating in these programs exemplifies the motivations for and advantages of early action and provides information on both the achievability of realistic GHG reduction goals and reduction methods. One BELC company, S. C. Johnson & Sons, Inc., a family owned company, made GHG reduction one of seven corporate strategic objectives in its five year Strategic Environmental Plan for 2001-2005, because it was the right thing to do and made good business sense.²⁹⁴ The company focused on operations first, establishing the goal of having all plants cut air emissions by 15% and reduce fossil fuel usage by 10% and having the top seven plants reduce GHG

291. *Ericsson PowerPoint*, *supra* note 282, at 3.

292. *Ericsson Abstract*, *supra* note 282, at 1.

293. *Ericsson PowerPoint*, *supra* note 282, at 4-5.

294. Scott E. Johnson, *Climate Change Strategy at SC Johnson*, 371 AM. BAR. ASS'N SEC. ENV'T, ENERGY, & RESOURCES 361, 363-64 (2003).

emissions by 5% for each of the five years of the Plan.²⁹⁵ These goals were initially set as an "intensity" goal. Use of intensity, however, proved to be a two-edged sword. While the company achieved a 6.2% reduction in intensity in year one, with a 0.5% reduction in actual GHG emissions, it did not achieve its intensity goal in year two, despite a higher 0.7% decrease in actual emissions.²⁹⁶ Accordingly, for its Climate Leaders Goal, the company revised its 2005 goal to an 8% reduction in actual emissions. The latter goal will be achieved by installation of a landfill gas recovery green energy cogeneration project which will reduce methane emissions, cut fossil fuel use at the company's plant in half, and generate estimated annual savings of \$1,200,000.²⁹⁷ The Company also reports benefits from publicity and public relations, increased operational efficiencies, and experience in evaluating its operations.²⁹⁸

Cinergy, a utility relying on coal fired generation plants producing approximately 1% of worldwide carbon dioxide emissions, is another BELC participant and a participant in the federal voluntary program.²⁹⁹ Cinergy undertook a GHG reduction program in response to shareholder resolutions that were gaining increasing levels of support. Through this program, Cinergy's management also sought to gain experience in GHG emissions reduction methods and GHG trading markets and thereby be put in a position where it could better influence emerging federal policy.

Cinergy has established a goal of reducing its GHG intensity by 5% from a 2000 baseline by the target years 2010-2012. Through this intensity goal, Cinergy is seeking to stabilize its emissions through that period, and intends to establish of an ultimate goal after that date. It has planned to spend \$21 million for GHG reduction and offset projects between 2004 and 2012 to achieve these goals. It has established sequestration partnerships with a number of groups active in land and biodiversity conservation. It also plans to implement a number of fuel switching and energy efficiency projects, including projects to repower with natural gas, to increase renewable power generation, and to implement energy efficiency programs at its own power plants and the plants of its largest customers.

To enable it to achieve more significant GHG emissions reductions in the future, Cinergy is focusing its research and development efforts on integrated gasification combined cycle electric generation plants. These

295. *Id.* at 364.

296. *Id.* at 365.

297. *Id.* at 366-67.

298. *Id.* at 365.

299. Eric C. Kuhn, *Cinergy Climate Change Program*, 11th Section Fall Meeting of the AM. BAR ASS'N SEC. ENV'T, ENERGY, & RESOURCES (Oct. 2003) [hereinafter *Kuhn PowerPoint*].

plants convert coal, waste or other organically based materials into synthetic gas, which is run through a gas turbine electric generation unit and then into a steam generation facility (which can also be a cogeneration facility). This process can achieve considerably higher conversion efficiencies than are achieved in convention coal fired plants. These plants also provide greater opportunity for carbon dioxide emissions capture and control and significantly reduce other air pollutants.

Some of the advantages of early action on climate change are presented by an agreement in principle between the Pennsylvania utility, PPL Corporation, the State of New Jersey and the Commonwealth of Pennsylvania announced in 2002. In the agreement, parties agreed that PPL would close an older coal fired power plant and would replace that power plant with a new natural gas fired power plant whose Pennsylvania air permit had been appealed by New Jersey. At the same time, PPL would obtain NO_x and SO₂ reduction credits that it would donate to the Pennsylvania Environmental Council, a non-profit environmental organization, who would retire the credits.³⁰⁰ PPL also announced its intention to record GHG emissions reductions in the federal 1605(b) Registry.³⁰¹ Through this agreement, PPL, as has been said of Pennsylvania's early Quaker settlers, will "do well by doing good" in a number of respects. PPL will achieve significant reductions in air pollution emissions. The company will be able to complete replacement of an older, less efficient plant with a newer state of the art facility, while resolving litigation. PPL has already improved its image with the public, its shareholders, and state regulators, PPL will generate a current tax deduction for its donation of the credits to a charitable organization.³⁰² In doing this, PPL enhanced its position with respect to any future GHG reduction requirements.

The successes achieved in the BELC program and state voluntary programs might, at first blush, appear to validate the United States' current position against embracing concrete reduction targets under the Kyoto Protocol or implementing mandatory reduction requirements through regulatory or legislative action. However, examination of the motivations and expectations underlying the participating companies' responses leads to the opposite conclusion. These companies are acting now based on their conclusion that mandatory reductions are necessary

300. Announcement by PPL Vice-President James Seif, NJDEP Secretary Bradley Campbell, PADEP Secretary Kathleen McGinty, Pennsylvania Environmental Council President Andrew McElwaine, and PEC Annual Dinner, Philadelphia, PA (2002); Personal communications by Arundhati Khanwalkar, Esq.

301. Pennsylvania does not yet have a GHG registry.

302. See 26 U.S.C. §170 (2003). Credits were, by that time, trading in markets, including a market established in the Chicago Exchange, despite the absence of a federal program.

and inevitable and that early action will redound to their benefit. Continued inaction by the United States will have adverse impacts on these companies to the extent their competitors benefit.

In addressing the theme of corporate environmental responsibility, the keynote speaker at the ABA 32nd Annual Conference on Environmental Law emphasized that corporate environmental leaders need and expect governmental consistency in establishing, maintaining and enforcing predictable environmental achievements targets. Relaxing standards or failing to implement standards will often work to the disadvantage of responsible corporate citizens who will suffer a competitive disadvantage vis-à-vis their irresponsible competitors.³⁰³ Consistent with this observation, the Pew Center's work with the BELC companies has identified four elements that business entities "require" from climate change regulators. They require reasonable targets and time lines. Waiting now and hurrying later will reduce the ability to establish such targets and time lines. They require regulatory certainty. They require protection for early action, such that the establishment of a new, lower baseline based on its early action will not punish an early actor. Finally, they require internationally compatible trading systems. This goal too will be undermined by lack of a common federal system, despite actions by the states.

V. Conclusions from the Laboratory Results to Date: The Imperative for Federal Action

A. *Lessons Learned from State and Local Programs*

We, thus, have some preliminary results from several state, local and private laboratories regarding mechanisms for slowing and eventually reversing the buildup of GHG gases in our atmosphere. These results include some important lessons for other states and localities designing climate change response programs and for the federal government's future response. However, the results are preliminary. It is, therefore, essential that we do not conclude that these models provide the only mechanisms for a response or that they be interpreted without consideration of their context.

In light of the many ways in which our society uses fossil fuel and the contribution of fossil fuel combustion to the build-up of greenhouse

303. At the Keynote Address at the ABA 32nd Annual Conference on Environmental Law in Keystone, Colorado on March 13, 2003, Ross J. Pillari, President of BP America, Inc., gave an example of a situation where his company had made a considerable investment to meet new gasoline standards in Georgia a year early while "another major oil company" did nothing and then successfully lobbied the legislature to remove the standards. This legislative action put companies such as BP at a competitive disadvantage.

gases, there are a wide variety of tools available that can reduce emissions. Many approaches can yield benefits in other areas such as encouraging energy and, hence, economic efficiency, encouraging innovation, or discouraging sprawl. There is also considerable public demand for action to reduce GHG emissions. This demand has translated into stockholder and consumer demands that have encouraged and resulted in voluntary efforts by individuals, private companies, and industry.

The wide variety of available approaches and responses make several elements to any approach crucial and other approaches attractive. First, it is crucial that an adequate inventory establish a baseline and identify areas where reductions can be achieved. The inventory efforts must continue with required reporting to track progress, give credit for reductions, and reduce leakage. This militates in favor of the New Jersey mandatory reporting requirement. However, that requirement, which is limited to the larger sources requiring air pollution discharge permits, misses the sectors responsible for the largest share of GHGs, the residential, commercial, and transportation sectors. These are the sectors where increases are expected and where reductions therefore most readily be achieved.³⁰⁴ These unregulated sectors will likely require "up-stream" fuel sale/fuel use reporting to provide a more complete inventory.

Second, all of the state programs have relied heavily on incentives to encourage voluntary actions to reduce GHG emissions. These have included general educational programs, programs to provide information to consumer, and the establishment of elements essential to begin use of market based approaches to GHG reductions. In light of the wide variety of means for GHG reductions, market based approaches that provide flexibility will allow the maximum reduction at the least cost.

States have focused on two such market based mechanisms. Virtually all states with an active GHG reduction programs have established or are in the process of establishing registries to record reductions. Without such registries, any company or individual reducing GHG emissions early does so at the risk of starting for a new, lower baseline if mandatory federal controls are imposed. Registries are also necessary to allow trading. Second, states and private parties are developing requirements or mechanisms to facilitate GHG reduction trading.

These voluntary and informational-based approaches are producing

304. According to the Department of Energy's Energy Information Administration, as of the year 2000 the transportation, commercial and residential sectors represented slightly over 66% of GHG emissions in 1990, had grown to approximately 69% of the 1.578 billion metric tons of GHG emissions in 2000, and are predicted to contribute over 73% of the 2.237 billion metric tons of GHG emissions by 2025. See U.S. DEPT. OF ENERGY INFORMATION ADMINISTRATION, ANNUAL ENERGY OUTLOOK 2003 WITH PROJECTIONS TO 2025, Table 1 and Figure 7, available at <http://www.eia.doe.gov/oiaf/aeo/index.html>.

results. However, these results must be considered in context. The voluntary and informational-based approaches are occurring in the context of the expectation that mandatory controls, similar to those called for by the Kyoto Protocol, will be implemented. Currently, mandatory reductions are required by many nations subscribing to Kyoto and some mandatory reduction requirements have been adopted by a variety of states, including California, Massachusetts, New Hampshire, and New Jersey.

Although market incentive-based programs can be efficient, they ultimately require a "command and control" mandatory requirement to create both a market demand and the uniformity to assure that market forces do not work against those who elect to reduce emissions.³⁰⁵ The global atmosphere is a global "commons" and, unless measures are implemented to limit common use of that resource, market forces will favor those who do not restrict emissions to the detriment of those who take responsible action.³⁰⁶ For example, within sectors, absent uniform mandatory requirements, a company that incurs costs to make investments for reductions may put itself in a short-term competitive disadvantage vis-à-vis its competitor who does not act, at least in the short term.³⁰⁷ Similarly, reduction in demand for fossil fuel in the industrial sector may keep prices down and encourage growth in the transportation sector. Similarly, in the short run, reductions required in one state may benefit competitors operating in states that do not require reductions.

These considerations militate towards several conclusions. First, without some mandatory requirements for GHG emissions reductions that are applied uniformly, those acting voluntarily now, with the expectation of such controls, will suffer some disadvantage. Second, requirements must be designed across sectors, so that reductions in regulated industrial/utility sectors are not erased by increases in the transportation, commercial and residential sectors. Third, requirements should be consistent across state lines.

Many states are presently experimenting with some mandatory controls. However, the controls currently in place remain spotty and fail to cover sources within a sector uniformly. They frequently fail to control certain sectors altogether.³⁰⁸ State programs will ultimately need to in-

305. See, e.g., DAVID M. DRIESEN, *Is Emissions Trading an Economic Incentive Program?: Replacing the Command and Control/Economic Incentive Dichotomy*, 55 WASH & LEE L REV 289 (1988).

306. See Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243-48 (1968).

307. Even absent controls, the use of alternative fuels and increased efficiency may benefit a company, in the long run, as fossil fuels become scarce and more costly. In the short term, it may reduce demand and cost for competitors who do not make investments in GHG emissions reductions.

308. Mandatory requirements can include uniform cross-sectoral caps with the opportunity for trading, particularized requirements for reductions, or taxes or subsidies to cre-

corporate more comprehensive approaches. Although nascent regional approaches have emerged in New England and the West Coast, current requirements remain inconsistent across state lines.

B. There is an Ultimate Need for a Mandatory and Comprehensive Federal GHG Reduction Program to Support State and Private Initiatives and to Eliminate Practical and Legal Barriers

States and private industries acting now ultimately do so with the expectation that a uniform federal program will emerge, based on a model derived from these state and private programs. Early state actors may benefit their residents and economies by encouraging industries and sectors that will benefit from mandatory GHG controls and discouraging those that are energy inefficient and generate more pollution. Similarly, early actors may grab "low hanging fruit," such as opportunities for inexpensive sequestration projects. However, absent some federal action, these benefits may never be realized, and industry and economic activity may flee from states requiring reductions to states taking no action. For example, with new opportunities for competition in retail electricity generation markets, consumers might seek to use cheaper, untaxed or unregulated electricity generated in a state without greenhouse gas controls or taxes, absent either a uniform federal requirement or a state program with features aimed at keeping the playing field equal for in-state and out-of-state generators.

The absence of federal action also presents certain legal constraints to some forms of state action. These constraints arise from both the federal Constitutional restrictions applicable to states and a variety of state constitutional law constraints inapplicable to federal action. Possible federal constraints on state action arise from three sources. First, innovative state programs will likely face challenges based upon the contention that they will interfere with interstate commerce in contravention of the restrictions on state action under the "dormant" commerce clause restrictions,³⁰⁹ particularly where the state attempts to deal with attempts to escape controls by switching production to other states. Second, attempts to forge interstate and international cooperation, through mechanisms such as the Climate Change Action Plan may face challenges based upon the compacts clause of the Constitution.³¹⁰ Finally, these programs may face challenges based on the contention that federal laws preempt state action under the Supremacy Clause of the Constitution,³¹¹ particularly

ate disincentives for GHG emissions and incentives for reductions.

309. U.S. CONST. art. I, § 8, cl. 3. *See* *Gibbons v. Ogden*, 22 U.S. 1, 203 (1824).

310. U.S. CONST. art. I, § 10, cl. 3.

311. U.S. CONST. art. VI, cl. 2.

where measures attempt to capture mobile source³¹² emissions where the Clean Air Act³¹³ or the corporate average fuel economy standards³¹⁴ may apply.

State attempts to create regulatory programs or taxes affecting interstate commerce have repeatedly been subject to challenges based upon the premise that these unilateral state actions unconstitutionally "discriminate against commerce under the restrictions imposed by the "so-called" dormant commerce clause.³¹⁵ State tax and regulatory programs that regulate even-handedly and that either do not discriminate against interstate commerce or advance a legitimate state purpose that could not

312. Emissions by trucks and automobiles.

313. See 42 U.S.C. § 7543 (2003).

314. See, 49 U.S.C. § 32919 (2003).

315. Most recently attempts to regulate or to tax disposal of solid and hazardous wastes have been repeatedly challenged under the commerce clause. See, e.g., *C & A Carbone, Inc. v. Town of Clarkstown*, 511 U.S. 383 (1994) (ordinance requiring disposal of all MSW generated in a New York town at a local waste transfer facility to support financing of the facility was a "local processing requirement" that discriminated against interstate commerce in violation of dormant commerce clause restrictions); *Fort Gratiot Sanitary Landfill, Inc. v. Michigan Dep't of Natural Res.*, 504 U.S. 353 (1992) (waste import restrictions imposed by a county as a part of its municipal waste planning scheme violated the dormant commerce clause restrictions); *Chemical Waste Mgmt. v. Hunt*, 504 U.S. 334, 342 (1992) (invalidating tax on hazardous waste generated out of state as violative of the commerce clause, while noting that uniform fee on all hazardous waste disposed in Alabama would have been valid); *City of Philadelphia v. New Jersey*, 437 U.S. 617 (1978) (holding that solid waste is an article of commerce and that a state could not prohibit its interstate flow under the "dormant" restriction of the commerce clause); *Maharg, Inc. v. Van Wert Solid Waste Mgmt. Dist.*, 249 F.3d 544 (6th Cir. 2001) (upholding uniform waste generation fee coupled with landfill designation program against commerce clause challenge); *Red River Serv. Corp. v. City of Minot, N.D.*, 146 F.3d 583 (8th Cir. 1998) (upholding a municipality's ability to restrict disposal of waste within a municipally-owned facility to the municipality's residents against commerce clause challenge); *Gary D. Peake Excavating Inc. v. Town Bd. of Town of Hancock*, 93 F.3d 68 (2d Cir. 1996) (upholding law uniformly banning all landfill operation within a municipality against commerce clause challenge). However, successful and unsuccessful commerce clause challenges have been raised to a wide variety of regulatory programs. See, e.g., *Maine v. Taylor*, 477 U.S. 131, 148 (1986) (prohibition on importation of live bait fish upheld); *Sporhase v. Nebraska ex rel. Douglas*, 458 U.S. 941, 958-960 (1982) (groundwater rights allocation overturned); *New England Power Co. v. New Hampshire*, 455 U.S. 331 (1982) (state prohibition of interstate sale of hydroelectric power generated within the state by private generator overturned); *W. & S. Life Ins. Co. v. State Bd. of Equalization*, 451 U.S. 648, 652-655 (1981) (state insurance tax equalizing treatment created by taxes imposed by foreign insurers home states upheld); *Lewis v. BT Inv. Managers, Inc.*, 447 U.S. 27, 35 (1980) (prohibition on out-of-state banks and trusts from owning business in-state providing investment advice overturned); *Hughes v. Oklahoma*, 441 U.S. 322, 326 (1979) (prohibition of sale of minnows out-of-state overturned); *Pike v. Bruce Church, Inc.*, 397 U.S. 137 (1970) (law requiring processing of cantaloupes in-state overturned); *H.P. Hood & Sons, Inc. v. Du Mond*, 336 U.S. 525, 534-38 (1949) (milk processing licensing program overturned); *Prudential Ins. Co. v. Benjamin*, 328 U.S. 408 (1946); *S. Pac. Co. v. Arizona*, 325 U.S. 761, 769 (1945) (tax on foreign insurers upheld); *Cooley v. Bd. of Wardens*, 53 U.S. 299 (1852) (Pennsylvania law regulating river pilots on Delaware River upheld).

be advanced by a less discriminatory alternative will withstand scrutiny under the commerce clause.³¹⁶ Most regulatory and tax programs designed to limit greenhouse gas pollutant emissions within a state could readily withstand such challenges.

However, given the contribution by utilities to greenhouse gas emissions and the many recent experiments in allowing competition in electric generation, states will need to adopt measures to assure that out-of-state sources face equal restrictions or costs if they also wish to maintain an equal playing field for in and out-of-state electricity generators and to prevent generators from fleeing to other states to avoid controls. Such measures may make the state programs more vulnerable to a commerce clause challenge. Programs to maintain an equal playing field for utilities may withstand commerce clause scrutiny, because Congress has authorized extensive state monopoly regulation.³¹⁷ The challenges should pass muster if they are properly designed to maintain a level playing field, although the concept of what constitutes a level playing field, as opposed to an unfair advantage to local generators, may be decided by the predilections of the judges hearing the case or the skill of the attorneys in framing the issues. Congress could resolve these difficulties by either adopting a comprehensive federal program or specifically authorizing comprehensive state regulation.³¹⁸

It is also possible that the voluntary state agreements to cooperate on climate change, such as the Climate Action Plan or the plan by Cali-

316. See *Pike v. Bruce Church, Inc.*, 397 U.S. 137 (1970).

317. Comprehensive state utility regulation has withstood commerce clause challenges because such monopolies are intrastate, and Congress has specifically recognized the authorization of state utility commissions to regulate utility rates in the Federal Power Act. See, e.g. 16 U.S.C. 2621. Indeed, separate interstate sales and competition for generation has been authorized by Congress as an exception to this state regulation, and state utility regulators assure that reliable utility generation is not disrupted by this competition, as the Pennsylvania PUC did by authorizing utilities to recover stranded costs upon initiation of the current system of competitive generation sales. State attempts to maintain an equal playing field rather than to gain an advantage for in-state industries have been upheld in a similar situation, where comprehensive state regulation has long been authorized by Congress. See *W. & S. Life Ins. Co. v. State Bd of Equalization*, 451 U.S. 648, 652-55 (1981) (state insurance tax equalizing treatment created by taxes imposed by foreign insurers home states upheld, where federal law authorized state taxation of insurance). It is conceivable, but unlikely, that the Senate's ratification of the Framework Convention on Climate Change could be perceived as a Congressional authorization for measures aimed at reduction of GHG emissions. It is more likely that this will not be deemed to be a sufficiently "explicit" Congressional authorization. See *C & A Carbone, Inc. v. Town of Clarkstown, New York*, 504 U.S. at 410, *supra* note 315 (O'Connor, concurring). This is especially so if a court has already found that a requirement to level the playing field and further found no Congressional authorization in the extensive authorization for state regulation provided under the Federal Power Act.

318. Where there is authorization by Congress, the dormant commerce clause restrictions do not apply. *S.-Cent. Timber Dev., Inc. v. Wunnicke*, 467 U.S. 82, 87-88 (1984).

ifornia, Oregon, and Washington to cooperate on addressing climate change, could be subject to a challenge based on the contention that state cooperation in the absence of Congressional authorization contravenes the compacts clause of the Constitution.³¹⁹ The wholly voluntary nature of the current arrangements makes the likelihood of such a challenge succeeding remote. Such voluntary arrangements do not require Congressional approval under the compacts clause.³²⁰ Nevertheless, the compacts clause will limit the enforceability of these relationships, absent federal action.

The most serious limitation on enforceable state programs to limit GHG pollution emissions is created by federal preemption of state regulation of mobile source air pollution emissions under two statutes, the federal Clean Air Act and the federal law establishing corporate average fuel economy standards. Preemption arises in two situations. A state law will be preempted where Congress has evidenced an intent to displace state law in an area altogether, either through express preemption or by implication. Preemption also arises upon a showing that there is an actual conflict between the federal standard and the state standard.³²¹

There would be no actual conflict between state regulatory initiatives to address climate change and federal law, given the requirements of the Framework Convention and the federal failure to implement these requirements. However, there are two sources of express preemption which could seriously impair the states' ability to affect emissions from the transportation sector. Specifically, the Clean Air Act expressly preempts most state regulation of vehicle emissions standards.³²² The federal corporate average fuel economy ("CAFE") act³²³ preempts state regulations "related to fuel economy standards or average fuel economy standards for automobiles."³²⁴ These provisions will pose barriers to most states' attempts to regulate emissions from the transportation sector, which represents a major and growing source of GHG emissions. Al-

319. U.S. CONST. art. I, § 10, cl. 2.

320. See *United States Steel Corp. v. Multistate Tax Comm'n*, 434 U.S. 452, 470 (1978) (upholding, against compacts clause challenge, formation of a multi-state tax commission formed to develop tax policy for various states which would be implemented by each state individually; and finding that Clause is "directed to the formation of any combination tending to the increase of political power in the states, which may encroach upon or interfere with the just supremacy of the United States.").

321. See *Alexis Geier v. Am. Honda Motor Co., Inc.*, 529 U.S. 861 (2000) (striking down tort claim based on a safety standard inconsistent with federal decision); *Shell Oil Co. v. City of Santa Monica*, 830 F.2d 1052 (9th Cir. 1987) (upholding local state pipeline franchise fee and contractual safety requirements against contract clause claims and claims of federal preemption).

322. 42 U.S.C. § 7543(a).

323. 49 U.S.C. §§ 32901-32919.

324. 49 U.S.C. § 32919.

though these provisions do not constrain California to the extent other states are constrained, California's attempt to regulate mobile source emissions through regulatory controls has already encountered challenges based upon claims of preemption, and it, like other states, may need to consider implementing a different model for addressing the transportation sector.

California is unique, in that EPA may waive a federal Clean Air Act provision prohibiting states from establishing "any standard relating to the control of emissions from new motor vehicles or new motor vehicles subject to this part" or requirements for "certification, inspection, or any other approval"³²⁵ in California.³²⁶ While this prohibition may be found inapplicable to efforts to control greenhouse gases that are not regulated under the Clean Air Act mobile source provisions, to the extent this is held applicable to GHG emissions, other states would not be eligible for a waiver. Although California has routinely obtained waivers under this section,³²⁷ if it is deemed applicable to GHG emissions, it still remains possible that EPA could elect not to grant a waiver or its grant of a waiver overturned.³²⁸

The California statute and any other similar state statute may also be vulnerable to attack under the CAFE standards act. That law has, in fact, already been raised in challenges to the California law.³²⁹ The CAFE act expressly preempts state regulations "related to fuel economy standards or average fuel economy standards for automobiles" covered by any standard under that act.³³⁰ The CAFE act's definition of fuel economy standards does not, on its face, apply to controls on emissions of carbon dioxide.³³¹ Nevertheless, the Bush Administration has supported litigation brought by the automobile industry challenging the California's imposition of greenhouse gas emissions standards on mobile sources and has asserted that the CAFE Standards Act preempts all state regulations

325. 42 U.S.C. § 7543(a).

326. 42 U.S.C. § 7543(b); *see also*, Oxygenated Fuels Ass'n v. Davis, 2003 U.S. App. LEXIS 1110, 2003 Cal. Daily Op. Service 4678 (9th Cir. 2003) (upholding California's ban on the fuel additive MTBE against (1) express preemption challenge under parallel express preemption provision contained in 42 U.S.C. § 7545(4)(A) on the basis of conclusions that parallel exemption for California contained in 42 U.S.C. § 7545(c)(4)(B) applied and that preemption was inapplicable where ban was intended to address ground water contamination and (2) implied preemption challenge).

327. *See, e.g.*, 68 Fed. Reg. 19811 (Apr. 22, 2003).

328. Judicial review of EPA's final action could be obtained under 42 U.S.C. § 7607.

329. Press Release, Bush Backs Emissions Law Opponents, Associated Press (Oct. 10, 2002).

330. 49 U.S.C. § 32901.

331. "[A]verage fuel economy standard" means a performance standard specifying a minimum level of average fuel economy applicable to a manufacturer in a model year." 49 U.S.C. § 32901(a)(6).

of carbon dioxide emissions from mobile sources.³³² This position appears premised on the argument that, since carbon dioxide is a direct product of gasoline combustion, a standard for carbon dioxide emissions is "related to fuel economy standards." While the better reading of the clear words of the statute ought not find preemption, for other states, it might be better to avoid the issue by adopting another approach.

An alternative approach that would deal effectively include the transportation sector in a climate change strategy without running afoul of challenges based on preemption would be one relying upon price mechanisms. This could be accomplished either by way of a state tax on GHG emissions or a cap and trade program with a sale and auction of GHG emission credits similar to the sulfur dioxide program established by the 1990 Amendments to the federal Clean Air Act.³³³ Even though direct regulation of emissions of multiple mobile sources may be practically impossible, the same effect could be achieved by imposing the tax or requiring the "credits" acquired at auction "upstream" at the point of sale of the fuel, while allowing credits and reductions where emissions are captured or sequestration projects employed.

Neither federal preemption of mobile source emissions standards under the Clean Air Act nor federal preemption of state fuel economy standards under the federal CAFE standards act should prohibit a state GHG tax, because it is a tax and not a "standard." A tax, therefore, would not fall within the class of state actions subject to express preemption provisions of those statutes.³³⁴ It would also be unlikely for a tax to be held preempted by implication under either statute. Neither statute evidences any intent to displace a state's ability to adopt taxes that have the effect of encouraging voluntary actions to reduce emissions or energy

332. Press Release, Bush Backs Emissions Law Opponents, Associated Press (Oct. 10, 2002).

333. 42 U.S.C. § 7651. For a discussion of an application of these alternatives, see MCKINSTRY ET AL., *Incentive-Based Approaches to Greenhouse Gas Mitigation in Pennsylvania: Protection the Environment and Promoting Fiscal Reform*, *supra*, note 290.

334. The Clean Air Act defines "emission limitation" and "emission standard" as "a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis . . ." 42 U.S.C. § 7602(k). Neither a tax nor an auction is a requirement limiting the quantity, rate or concentration of emissions on a continuous basis. No quantity, rate or concentration is specified or required whatsoever (other than a cumulative statewide maximum in the cap and trade). Although a tax may discourage higher emissions, it does not regulate them or limit them; it simply requires that a payment be made to the state if any emissions occur. Moreover, there are no express federal standards for GHGs under the Clean Air Act. The same rationale applies to the issue of preemption by the CAFE statute, which preempts "a performance standard specifying a minimum level of average fuel economy applicable to a manufacturer in a model year." 49 U.S.C. § 32901(a)(6). Again, no performance standard and no minimum level whatsoever is prescribed by a GHG tax or a cap and trade with an auction. Indeed, a GHG emissions tax relates to emissions, not fuel economy.

efficiency. It is clearly possible for all regulated parties to comply with both the federal requirements and to pay the tax.³³⁵ The same reasoning should apply to a cap and trade program with an auction in that the only “standard” is the “cap”, which does not apply to individual automobiles or fleets.

Finally, state programs can still run afoul of idiosyncratic state constitutional and statutory restrictions, which would not apply to a federal program. For example, in Pennsylvania, use of a tax to capture mobile sources in a state program would need to comply with the requirements of that state's uniformity clause³³⁶ that all taxes be uniform and a state constitutional limitation on uses of taxes on products used by automobiles.³³⁷ Although a greenhouse gas pollution emission tax can likely be crafted that will be consistent with or avoid these restrictions, one can never predict with confidence how courts will decide an issue of first impression. Moreover, many state laws prohibit state restrictions that are more stringent than federal restrictions, raising questions as to whether, how, and the extent to which these states can address greenhouse gas emissions in the absence of a federal mandate. A federal program with mandatory elements would not be hindered by and would overcome many possible state law restrictions.

C. State Leadership in Compelling a Federal Response

In light of these constraints on state action to address climate change, the real risk of a “race to the bottom” among the various states, and the strong need for the certainty that would be provided by a federal response, a number of the same states that have taken the lead in establishing GHG mitigation programs have also taken the lead in litigation seeking to compel a federal regulatory response under the Clean Air Act.³³⁸ Three suits³³⁹ have been filed with the aim of compelling the federal government to list carbon dioxide or GHG gases as a criteria pollutant under Section 108(a)(1) of the Clean Air Act³⁴⁰ and proceed to issue

335. If this type of approach were preempted by these laws, one might argue that all state gasoline and fuel taxes were equally preempted because they also have the effect of encouraging both voluntary emission reduction and use of more fuel efficient vehicles.

336. PA CONST. art. VIII, § 1. “All taxes shall be uniform, upon the same class of subjects, within the territorial limits of the authority levying the tax”

337. PA CONST. art. VIII, § 11. That amendment requires “gasoline and other motor fuel excise taxes, motor vehicle registration fees and license taxes, operators’ license fees and other excise taxes imposed on products used in motor transportation” to be used for highway and automobile related expenditures only and “aviation fuel excise taxes” to be used for airport and air travel related expenditures only.

338. 42 U.S.C. §§ 7401-7671q (2002).

339. See notes 347 and 350, *infra*.

340. 42 U.S.C. § 7408(a)(1).

air quality criteria under that section. Listing would trigger requirements for development of at least a secondary and perhaps a primary National Ambient Air Quality Standard ("NAAQS") for these pollutants under Section 109 of the Clean Air Act,³⁴¹ submission of State Implementation Plans under section 110,³⁴² and development of GHG emissions standards for new sources.³⁴³

Such federal action under the Clean Air Act would facilitate state action to address climate change in a number of ways. It would eliminate many of the potential legal barriers to independent state action addressing climate change that are discussed above. Listing could still leave the states with considerable leeway in crafting innovative responses, since the states would be responsible for developing State Implementation Plans to achieve required reductions.³⁴⁴ Most importantly, uniform requirements for reductions in emissions will prevent a "race to the bottom" among the states.

The state lawsuits to compel regulation under the Clean Air Act arise not only from the continued federal failure to begin implementation of a regulatory program to limit GHG emissions, but also from the Administration's departure from its position that it has the authority to adopt regulatory measures under the Clean Air Act to comply with the requirements of the Framework Convention. Article 4, Section 2 of the Framework Convention requires that Annex 1 parties undertake emissions control measures with the goal of returning global emissions levels to "earlier levels of anthropogenic emissions" by 2000, as follows:

Each of these Parties shall adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs.

There is legislative history that has led many to conclude that the foregoing language is not "legally binding."³⁴⁵ However, this language

341. *Id.* at § 7409(a).

342. *Id.* at § 7410.

343. *Id.* at § 7411.

344. Some might argue that regulation under the SIP and new source review mechanisms of the Clean Air Act may not represent the soundest method to address GHG emissions. These criticisms may arise from the way in which EPA has established and applied SIP criteria in the past, rather than from the structure of the statute, which could permit considerable flexibility in crafting mechanisms to achieve reductions in a global sink of pollutants. Regardless, settling the issue of whether GHG emissions should be limited by regulatory action in a judicial forum would shift the debate in a closely divided Congress from whether there should be a regulatory response to the question of the most effective means to respond.

345. See David R. Hodas, et al., *Special Committee on Climate Change and Sustainable Development of the American Bar Association Section of Natural Resources, Energy and Environmental Law*, White Paper on Climate Change (Sept. 1996), Part IV, n. 48,

appears only to suggest that there is no specific or "hard" reduction target that is binding internationally. The use of the mandatory "shall" in Article 4, Section 2, makes it clear that the United States is required to take action to limit its anthropogenic emissions of greenhouse gases. It is also clear that the limitations on emissions to be established could be no greater than the level of emissions existing in 1992 and probably, and that the limits must be sufficient to stabilize global levels of GHGs eventually.

Until September 2003, EPA had taken the position that it had the regulatory authority to impose mandatory restrictions necessary to satisfy the foregoing requirements. The EPA General Counsel rendered a legal opinion on March 11, 1998, setting forth EPA's legal authority for regulating greenhouse gases under the Clean Air Act in response to a request from Congress for such an opinion. A second EPA General Counsel reiterated that position on October 6, 1999, in testimony to Congress. This position was renounced by the current Administration in a number of informal public announcements not constituting final agency action.

In an August 29, 2003, opinion rendered by a third EPA General Counsel, EPA first took the position that it lacked authority to regulate these pollutants under the Clean Air Act and formally denied a petition to regulate greenhouse gas emissions from mobile sources.³⁴⁶ Eleven states, two territories and the District of Columbia by way of two petitions for review filed before the United States Court of Appeals for the District of Columbia have challenged both actions.³⁴⁷ Even before EPA

citing S. Exec. Rep. 55, 102nd Cong., 2nd Sess. 1 (1992) (the "aim [of] the reporting section of article 4.2 . . . is not legally binding"); Letter of submittal of Framework Convention on Climate Change from the White House to the Department of State *as reported in* S. Treaty Doc. 38, 102d Cong., 2d Sess. Viii (Aug. 28, 1992) ("subparagraph [2(b)] does not create a legally binding target"); *see also*, John Knox, *The International Legal Framework for Addressing Climate Change, or The Kyoto Protocol and Its Discontents*, 12 PENN ST. ENV'T'L LAW REV. 1, at 137 (2004) [p. 2 of draft] ("Although the argument is occasionally made that this provision binds the Annex I parties to return to their 1990 levels of greenhouse gas emissions, the better, and generally accepted, interpretation is that the italicized language is at most aspirational.")

346. 68 Fed. Reg. 52922 (Sept. 8, 2003). That denial relies upon and incorporates the reasoning of an August 29, 2003, opinion of the EPA General Counsel, which rejected the interpretation of the Act expressed in two previous General Counsel Opinions. *Id.* at 52925.

347. Commonwealth of MA.; States of CT., IL., ME., N.J., N.M., N.Y., OR., R.I., VT., & WA.; Am. Samoa Gov't; and D.C. v. United States Prot. Agency, Dkt. No. 03-1361 (D.C. Cir.) (Petition for review of denial of petition for rulemaking seeking regulation of emission of greenhouse gases from mobile sources); Commonwealth of MA.; States of CT., IL., ME., N.J., N.M., N.Y., OR., R.I., VT., & WA.; Am. Samoa Gov't; & D.C. v. United States Prot. Agency, Dkt. No. 03-1365 (D.C. Cir.) (Petition for review of August 29, 2003, General Counsel's opinion). The appeals were filed pursuant to section 307(b) of the Clean Air Act, 42 U.S.C. § 7607(b) and the Administrative Procedure Act, 5 U.S.C. §§ 701-06. On October 30, 2003, unopposed motions to amend the petitions for

took these actions and the petitions for review were filed, in June 2003, three of the petitioners, Massachusetts, Connecticut and Maine, had filed a citizen suit under the federal Clean Air Act³⁴⁸ to compel EPA to comply with its mandatory duty to list carbon dioxide as a criteria pollutant under Section 108³⁴⁹ of the Clean Air Act.³⁵⁰ The plaintiffs have since voluntarily dismissed that suit and elected to proceed before the Court of Appeals in the two petitions for review.

The allegations in the complaint set forth the basis of the plaintiffs' contentions in the petitions for review, outlining the issues that will be involved in the litigation there. The plaintiffs cite findings in the Framework Convention, reports made EPA, and prior statements by the Administrator of EPA and its General Counsel that carbon dioxide is a pollutant subject to regulation under the Clean Air Act, that emissions carbon dioxide and other greenhouse gases will cause elevated atmospheric levels causing changes in climate, and that these changes will have numerous adverse effects. The complaint further recites many adverse impacts on the states and their citizens. The complaint claims that, by virtue of the reports and findings, the Administrator "has made a 'judgment' that emissions of carbon dioxide cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare with the meaning of Section 108(a)(10(A) of the Act, 41 U.S.C. § 7408(a)(1)(A)."³⁵¹ The complaint further alleges that there are "numerous or diverse mobile or stationary" sources within the meaning of Section 108(a)(1)(B) of the Clean Air Act,³⁵² and, therefore, the Administrator's failure to list carbon dioxide as a criteria air pollutant violates his mandatory duty to list criteria air pollutants under Section 108.³⁵³ The complaint requests relief in the form of an order requiring the Administrator to list carbon dioxide as a criteria air pollutant.

The states' approach in the Clean Air Act citizen suit, which will likely reflect their position in the petitions for review, is consistent with the approach whereby EPA was compelled to list lead as a criteria air pollutant.³⁵⁴ In that case, as here, the agency had made findings that

review to add the Commonwealth of the Northern Mariana Islands were filed.

348. 42 U.S.C. § 7604(a)(2).

349. *Id.* at § 7408.

350. *Commonwealth of Mass., et al. v. Whitman*, Civ. Action No. 3:03 CV 984 (PCD) (D. Ct.), *voluntarily dismissed* (Sept. 3, 2003).

351. *Id.* Complaint, ¶ 118.

352. *Id.* at ¶ 121.

353. *Id.* at ¶ 122.

354. *Natural Resources Defense Council, Inc. v. Train*, 545 F.2d 320 (2d Cir. 1976), *aff'd*, 411 F. Supp. 864 (S.D.N.Y. 1976). This represents the only instance where the EPA has listed a pollutant not identified in the original 1970 Amendments to the Clean Air Act as a criteria pollutant. Where the EPA has listed "new" criteria pollutants without being judicially compelled to do so, they have been variants of the originally identified

emissions of lead cause adverse impacts on health and welfare. The Second Circuit held that those findings, coupled with the fact that lead was emitted from many sources (*viz.* automobiles and industrial sources), triggered a nondiscretionary duty to list lead.³⁵⁵ In the case of lead, EPA then proceeded to establish air quality criteria and National Ambient Air Quality Standards for Lead, which were challenged by the lead industry. In rejecting that challenge in *Lead Industries Association, Inc. v. Environmental Protection Agency*³⁵⁶ the Court of Appeals for the District of Columbia held that EPA “is not required or allowed to consider economic or technological feasibility in setting air quality standards.”

The facts presented to the court in *Lead Industries* appear indistinguishable from the factual situation supporting the states’ argument that carbon dioxide should be listed as a criteria air pollutant in the states’ challenges to EPA’s refusal to regulate greenhouse gases. The provisions of the Framework Convention appear to provide an even more compelling case for listing greenhouse gases than was presented to the court in *Lead Industries*.

Carbon dioxide and the other greenhouse gases clearly fall within the Clean Air Act’s definition of an “air pollutant.”³⁵⁷ Similarly, there is little doubt that carbon dioxide and other greenhouse gases in the ambient atmosphere arise from numerous and diverse mobile and stationary sources.

The findings incorporated into the Framework Convention and the findings in various global, national and regional assessments of the impacts of climate change further establish that emissions of carbon dioxide and other greenhouse gases “cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare.”³⁵⁸ Under the Clean Air Act “[a]ll language referring to effects on welfare

pollutants.

355. *Id.*

356. 647 F.2d 1130, 1149, n. 37 (D.C. Cir. 1980).

357. 42 U.S.C. § 7602(g) (“The term ‘air pollutant’ means any air pollution agent or combination of such agents, including any physical, chemical biological radioactive . . . substance or matter which is emitted into or other enters the ambient air.”). In fact, section 103(g), 42 U.S.C § 7602(g), specifically identifies carbon dioxide as an air pollutant. The EPA General Counsel’s opinion serving as the basis of the denial of the petition to regulate mobile source GHG emissions concluded that “the CAA does not authorize EPA to regulate for global climate change purposes, and accordingly that CO₂ and other GHGs cannot be considered “air pollutants” subject to the CAA’s regulatory provisions for any contribution they may make to global climate change.” 68 Fed. Reg. 52922, 52925 (Sept. 8, 2003). That conclusion, however, is not based on the definition of air pollutant but the entirely circular argument that greenhouse gases cannot be regulated as pollutants because there is an intent, unstated explicitly in the statute, not to regulate these substances and that therefore they are not pollutants.

358. 42 U.S.C. §7408(a)(1)(A).

includes, but is not limited to, effects on . . . weather . . . and climate."³⁵⁹
The Framework Convention specifically recites the concern that

human activities have been substantially increasing the atmospheric concentrations of greenhouse gases, that these increases enhance the natural greenhouse effect, and that this will result on average in an additional warming of the Earth's surface and atmosphere and may adversely affect natural ecosystems and humankind.³⁶⁰

This, by itself, may establish the reasonable anticipation that greenhouse gas emissions may endanger welfare.

Although the precise effects of climate change cannot yet be confidently predicted, the Framework Convention further dictates that such uncertainty cannot be used as the basis for failing to act and listing greenhouse gases as criteria pollutants. The Framework Convention provides that "[w]here there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing" "precautionary measures to anticipate, prevent or minimize the causes of climate change."³⁶¹ This articulation of the precautionary principle would reverse the burden of proof that might otherwise apply under the Clean Air Act for pollutants other than GHGs, requiring precautionary actions in the absence of scientific certainty that there will *not* be adverse effects. Thus, the criteria for listing carbon dioxide and other greenhouse gases under Section 108 are met.

EPA's rationale for not moving to list carbon dioxide or greenhouse gases, generally, as criteria pollutants is articulated in its denial of the petition to regulate greenhouse gas emissions from mobile sources, which incorporates the August 29, 2003, General Counsel's opinion.³⁶² The 2003 General Counsel's opinion bases its departure from the Agency's prior interpretation of the Act on the Supreme Court's decision in *Food and Drug Administration v. Brown & Williamson Tobacco Corp.*³⁶³ In *Brown & Williamson*, the Supreme Court invalidated the Food and Drug Administration's ("FDA") action regulating minors' use tobacco under the Food, Drug and Cosmetic Act ("FDCA"). The Supreme Court based its invalidation of the regulation on the structure of FDCA, which requires that unsafe or ineffective drugs be *removed* from the market rather than regulated, coupled with a series of six Congressional enactments

359. 42 U.S.C. § 7602(h).

360. *Framework Convention*, *supra* note 1.

361. *Framework Convention*, *supra* note 1, at art. 3, § 3.

362. 68 Fed. Reg. 52922 (Sept. 8, 2003). That denial relies upon and incorporates the reasoning of an August 29, 2003, opinion of the EPA General Counsel, which rejected the interpretation of the Act expressed in two previous General Counsel Opinions. *Id.* at 52925.

363. 146 L.Ed.2d 121 (2000).

since 1965 finding that tobacco use threatened health but should be permitted nonetheless and a prior, consistent and repeated FDA interpretation of the statute since at least 1938. By contrast, the positions adopted in the 2003 General Counsel's opinion and the rationale for denying the petition to regulate GHG emissions is inconsistent with the prior interpretation of the Clean Air Act adopted by EPA and expressed in two opinions expressed by two prior EPA General Counsels,³⁶⁴ are not based on a straightforward interpretation of Section 108 or any other specific language found in the statute, and rely primarily on a series of Congressional enactments that do not compel a *new* regulatory program outside of the existing the regulatory program under the Clean Air Act and fail to support the conclusion that previously enacted provisions of the Act do not authorize regulation of GHGs. As a result, the rationale for EPA's action is less than compelling.

EPA's 2003 rationale points to the series of Congressional enactments requiring further study of climate change and the establishment of the Section 1605 GHG emissions reduction registry as *post hoc* indicia of Congressional intent that the Clean Air Act did not authorize regulation of GHG emissions. These actions appear better to support the conclusion that Congress was acting under the assumption that regulation could occur under the existing Clean Air Act program. Regulation of air pollutants under the Clean Air Act requires scientific study as the first step that will eventually support listing and development of specific regulatory standards. The purpose for establishing a registry is to assure that early actors get credit for early reductions in any regulatory program, and, therefore, is consistent with the notion that Congress contemplated that such regulation would occur, either pursuant to existing authority under the Clean Air Act or under another program.

EPA's 2003 rationale also points to two provisions of the Clean Air Act specifically mentioning carbon dioxide or greenhouse gases and mandating further study and non-regulatory approaches. These provisions are also equally consistent with a contemplation that regulation could and would occur under Section 108 and other portions of the Clean Air Act. Section 103(g)³⁶⁵ requires that EPA, in carrying out its authority to encourage cooperative programs, to develop non-regulatory strategies, and, in particular, those dealing with a list of multiple pollutants which include, by name, other criteria pollutants and carbon dioxide. This is consistent with and contemplates *other* regulatory requirements, since it

364. The EPA General Counsel rendered a legal opinion on March 11, 1998, setting forth EPA's legal authority for regulating greenhouse gases under the Clean Air Act in response to a request from Congress for such an opinion. The position was articulated by a second EPA General Counsel on October 6, 1999, in testimony to Congress.

365. 42 U.S.C. § 7403(g).

pertains to pollutants where regulation exists and, indeed, is required. Section 602(e)³⁶⁶ requires EPA to determine the global warming potential of the ozone-depleting substances banned under the Clean Air Act. Both Sections 103(g) and 602(e) include provisions indicating that nothing in *those provisions* should be read to authorize imposition of regulatory requirements. However, each disclaimer relates to the authority provided by the provision within which the disclaimer appears and does *not* pertain to EPA's power to regulate under other sections of the Clean Air Act.

EPA's 2003 actions also rely on Congressional failure to pass various proposals to create new regulatory programs for GHG emissions or to ratify the Kyoto Protocol. This Congressional inaction does not necessarily lead to the conclusion reached in the 2003 General Counsel's opinion, and, in one instance, supports the contrary position. Failure to amend a statute or pass new legislation is a notoriously unreliable indicia of statutory intent.³⁶⁷ This is particularly the case with the bills dealing with climate change, since Congressional inaction could indicate a view that existing authority is sufficient, a disagreement with the regulatory approach taken by the new legislation, a desire to await additional evidence before creating a new or different legislation, or any combination of the foregoing. Failure to ratify the Kyoto Protocol raises no implication, especially considering the crucial fact that EPA acknowledges that it has not even been submitted to Congress. Even if the Protocol had been rejected, the Framework Convention *requires* a regulatory approach and disagreement with the Protocol could (and probably does) reflect concern about the Protocols specific limitations, its applicability to other nations and timing, and Congressional rejection would have nothing to do with whether EPA has authority to regulate under the Clean Air Act. EPA's citation to an appropriation act forbidding EPA to take action to implement the Kyoto requirements *after* receiving the General Counsel's opinion asserting such authority appears an endorsement of that interpretation of the Clean Air Act, since Congress did not act to amend the statute, but simply prohibited EPA from spending money to take actions exercising existing authority that might be used to implement Kyoto.

366. *Id.* at §7671a(e).

367. *See Alexander v. Sandoval*, 532 U.S. 275, 293 (2001) (argument based on subsequent Congressional inaction "deserves little weight in the interpretive process" *Cent. Bank of Denver, N. A. v. First Interstate Bank of Denver, N. A.*, 511 U.S. 164, 187 (1994). And when, as here, Congress has not comprehensively revised a statutory scheme but has made only isolated amendments, we have spoken more bluntly: 'It is 'impossible to assert with any degree of assurance that congressional failure to act represents' affirmative congressional approval of the Court's statutory interpretation.' *Patterson v. McLean Credit Union*, 491 U.S. 164, 175, n. 1 (1989) (quoting *Johnson v. Trans. Agency, Santa Clara County.*, 480 U.S. 616, 671-672 (1987) (Scalia, J., dissenting)).

EPA's 2003 rationale also points to the CAFE standards act and other energy legislation that EPA concludes indicate a congressional preference for addressing climate change under energy legislation and, by implication, precluding regulation under the Clean Air Act. There is no such implication. As evidenced by the multiple state programs discussed above, energy regulation and air pollution regulation can proceed in a complementary and independent manner. Improvements in fuel economy will assist in reduction of greenhouse gas emissions, as well as emissions of NO_x, carbon dioxide and other pollutants long regulated under the Clean Air Act. The CAFE standards and other energy legislation deal with independent concerns, such as reducing reliance on oil imports and stabilizing oil prices, and involve a different balancing from regulation under the Clean Air Act.

Finally, EPA's 2003 rationale is founded upon a "penumbral" argument that the Clean Air Act's structure limits its applicability to emissions at the surface or contaminants that are not of global concern. This does not appear to have any basis in the Act. After listing occurs, EPA must establish ambient air quality standards at a level that is "requisite to protect public health" with an "adequate margin of safety" in the case of primary standards³⁶⁸ and "requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air" in the case of secondary standards.³⁶⁹ These statutory directives do *not*, in any way, limit their applicability to concentrations at the surface, or suggest that a pollutant should not be listed, or a standard not established, because compliance will require a significant period of time. Indeed, the United States has still not achieved compliance with many of the NAAQS established following the 1970 enactment of these requirements, thirty-three years later.³⁷⁰ Accordingly, an NAAQS could be established consistent with the Clean Air Act and the Framework Convention consistent with the global levels of greenhouse gases experienced historically,³⁷¹ with recognition that achievement of the standards would require long-term actions, as contemplated by the phased goals of the Climate Change Action Plan.³⁷²

368. 42 U.S.C. § 7409(b)(1).

369. *Id.* at § 7409(b)(2).

370. Clean Air Act Amendments of 1970, Pub. L. 91-604, 84 Stat. 1676 (Dec. 31, 1970).

371. As noted, this level was approximately 280 ppmv, and had increased to approximately 370 ppmv, as of 2000. NAT'L ASSESSMENT SYNTHESIS TEAM, OVERVIEW, *supra* note 49, at 12-13d.; *see also*, Alley, Richard B., *The Two-Mile Time Machine; Ice Cores, Abrupt Climate Change and Our Future*, Princeton University Press, Princeton, NJ (2000) at 170-179.

372. This would have the implication of placing all portions of the United States in non-attainment for the secondary standard. This would simply mean that somewhat more stringent regulatory review mechanisms would be required, including measures such as

The types of response, economic implications and other concerns expressed by the General Counsel are addressed in State Implementation Plans and development of specific regulatory standards under a variety of programs.³⁷³

VI. Applying the Laboratories' Results Nationally

Thus, it appears likely that the states that are in the vanguard of the response to climate change will be successful in their efforts to compel some federal response under the Clean Air Act. There is little doubt that, in the case of GHG emissions, a regulatory approach different from that adopted for other criteria pollutants will be warranted. Sufficient flexibility may exist within the current Clean Air Act to accommodate such an approach. It is also likely that Congress will ultimately need to establish a different regulatory program better tailored to the problems posed by GHG emissions. Modifications to the basic regulatory approach established under the Clean Air Act have been made by Congress to address acid rain generated by emissions of pollutants regulated under the NAAQS, ozone depleting substances, and the inability to attain NAAQS for ozone and other listed priority pollutants under the basic regulatory program established in 1970. In crafting such regulatory programs, EPA can and should look to the examples presented by the ozone and acid rain experiences and use the data generated by the state, local, and private programs already underway and discussed here.

Perhaps even more importantly, the experiences gained in the state and private laboratories will inform both the states that have already acted and states that have not in crafting state implementation plans and state regulatory responses. These experiences will also assist industry in achieving compliance with the program ultimately implemented by the federal government, whether through regulatory initiatives under existing regulation or new legislation. Nevertheless, without federal certainty and a federal floor, progressive and multi-national industries, states, and localities alike, are likely to suffer, along with the global environment.

offsets, which could incorporate sequestration programs and trading. It would also level the playing field among various regions in the country. Specifically, it would mean that the program would not have the counterproductive effect of causing the sprawl development that can arise when industry to move out of developed "non-attainment" areas to "greenfields" sites in areas that are in attainment with NAAQS.

373. See *Lead Indus. Ass'n, Inc. v. Env'tl. Prot. Agency*, 647 F.2d 1130, 1149 n. 37 (D.C. Cir. 1980) (economic and technological feasibility not considered in NAAQS standard setting, but under other specific regulatory provisions).