Order Code RL30024

CRS Report for Congress

U.S. Global Climate Change Policy: Evolving Views on Cost, Competitiveness, and Comprehensiveness

Updated January 28, 2008

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Summary

U.S. policy toward global climate change evolved from a "study only" to a more "study and action" orientation in 1992 with ratification of the U.N. Framework Convention on Climate Change (UNFCCC). The Convention committed developed countries to aim at returning their greenhouse gas emissions to their 1990 levels by the year 2000. The U.S. decision to ratify the UNFCCC reflected both the nonbinding nature of the accord and analyses that suggested that the United States could achieve the necessary reduction at little or no cost. Under the UNFCCC, developed countries were to adopt national plans and policies to reduce greenhouse gas emissions. The United States submitted such plans in 1992, 1994, 1997, 2002, and 2006.

The Energy Policy Act of 1992 (EPACT) has been the principal U.S. statutory response to the UNFCCC. Primarily an energy policy response to the Iraqi takeover of Kuwait and the U.S.-led reaction, EPACT's energy conservation, renewable energy, and other titles were also seen as having a beneficial effect on global climate change concerns. In addition, the George H.W. Bush and Clinton Administrations encouraged voluntary reductions by industry through administrative initiatives, such as EPA's various "green" programs. This largely voluntary approach to complying with UNFCCC allowed the two Administrations to implement a climate change policy without having to ask Congress for new authorities.

However, the subsequent inability of nations, including the United States, to achieve reduction goals under the UNFCCC led to negotiations on the Kyoto Protocol, which established mandatory limits on emissions for developed countries. While the United States signed the Protocol, the Clinton Administration did not submit it to the Senate, which earlier had specified (S.Res. 98) that any such agreement had to include reductions by developing countries and must "result in no serious harm to the economy of the United States." In 2001, the George W. Bush Administration announced that it was abandoning the Kyoto treaty process because of concerns about cost, competitiveness, and the comprehensiveness of the treaty with respect to third world countries, and that it would focus on voluntary programs to reduce the intensity of greenhouse gas emissions per unit of economic activity. Also, it launched a six-nation Asia-Pacific Partnership to coordinate voluntary actions to address greenhouse gas emissions and in 2007 convened a meeting of the major economies to discuss approaches to climate change.

The reluctance to adopt mandatory actions reflects concerns about costs. If one believes that the costs of greenhouse gas reductions are modest, action to reduce emissions poses little risk. However, if one perceives substantial costs from reducing carbon emissions, the uncertainty about any benefits raises serious questions as to the prudence of such action. This clash of perspectives is likely to ensure that costs remain a pivotal issue, along with scientific uncertainty, as the climate change policy debate continues. Momentum for action may be accelerating: the Senate in 2005 passed a Sense of the Senate resolution that Congress should proceed with mandatory, market-based limits and incentives on greenhouse gases. In the 110th Congress, deliberations on comprehensive climate change bills have been initiated.

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From Study to Commitment: The UNFCCC

U.S. policy toward global climate change evolved from a "study only" to a more "study and action" orientation in 1992 with ratification of the U.N. Framework Convention on Climate Change (UNFCCC). During the protracted deliberations on the UNFCCC, the National Academy of Sciences (NAS) released an influential report on global warming. In the report entitled, *Policy Implications of Greenhouse Warming*, the NAS stated "The United States could reduce or offset its greenhouse gas emissions by between 10 and 40 percent of 1990 levels at low cost, or at some net savings, if proper policies are implemented."[1] The NAS's energy policy recommendations focused on increasing energy conservation and efficiency, incorporating greenhouse warming as a factor in future energy planning, and studying and eventually implementing "full social cost pricing" of energy.

Although widely publicized and promoted, this premise was not sufficient for the U.S. to commit to firm targets and time frames for carbon dioxide (CO_2) reductions, as witnessed by the U.S. negotiation and ratification of the UNFCCC.[2] Driven by concerns about scientific uncertainty with respect to global climate, the George H. W. Bush Administration — against the wishes of most environmentalists and some vocal Members of Congress — refused to commit to a binding agreement to reduce the nation's CO_2 emissions by a specific date. The UNFCCC reflects this negotiating position of the United States and some other countries in that it calls for voluntary control measures. Senate floor debate on ratification of the treaty brought out concerns by some Senators about the *cost* of compliance, its impact on the country's *competitiveness*, and the *comprehensiveness* with respect to the developing countries — concerns that were overcome because of the non-binding nature of the reduction goals.[3] Those arguing for more binding commitments argued that emissions controls could create jobs and enhance economic health, and that emissions were an indicator of inefficiency.

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[1] National Academy of Sciences, *Policy Implications of Greenhouse Warming*, (Washington, D.C.: National Academy Press, 1991), p. 73.

[2] The United States signed the UNFCCC on June 12, 1992, and ratified it on October 15, 1992. The UNFCCC entered into force on March 21, 1994. For a review of the negotiations, see CRS Report 92-374, *Earth Summit Summary: United Nations Conference on Environment and Development (UNCED), Brazil, 1992*, by Susan R. Fletcher.

[3] *Congressional Record*, Vol. 138 (October 7, 1992), 33520-33527

As finally negotiated, the objective of the Convention is to:

> ... achieve ... 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 with a time frame sufficient to allow ecosystems to adapt naturally to climate change to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner.[4]

Arguing that "the developed country Parties should take the lead" in reducing emissions, the Convention states that developed countries shall aim toward returning their greenhouse gas emissions to their 1990 levels by the year 2000. In line with this goal, developed countries were to adopt national plans and policy options to mitigate climate change by reducing anthropogenic emissions and enhancing sinks. As discussed later, the United States submitted such plans in 1992, 1994, 1997, 2002, and 2006.

Developing Programs: EPACT

The Energy Policy Act of 1992 (EPACT), P.L. 102-486, has been the principal statutory basis for programs making up the U.S. response to the UNFCCC. Primarily crafted as an energy policy response to the Iraqi takeover of Kuwait and the U.S.-led response, its energy conservation, renewable energy, and other titles were also seen as having a beneficial effect on global climate change concerns being debated at this time in international circles. In its 1992 submission to the UNFCCC, the George H. W. Bush Administration listed 11 different titles of EPACT as "extremely important" to its overall strategy of reducing greenhouse gases.[5]

The aforementioned recommendations of the NAS were embodied in several sections of EPACT. These sections included provisions to establish energy-efficiency standards, promote dissemination of energy-saving information, establish several national research and development programs related to deployment of energy-efficiency technologies, and authorize the Department of Energy (DOE) to evaluate cost-effective energy efficiency technologies. In addition to these activities to improve energy efficiency, EPACT includes a separate title to incorporate global warming concerns in energy policy planning. Title XVI was designed to assist the government in making informed decisions on global warming by collecting, analyzing, and reporting information on climate change through DOE. Activities included a report on the various economic, energy, social, environmental, and competitive implications of reducing greenhouse gas emissions; developing a least-cost energy strategy designed to achieve "the stabilization and eventual reduction in the generation of greenhouse gases"; creating a Director of Climate Change; and developing an inventory of greenhouse gases and early reductions in such gases.

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[4] *United Nations Framework Convention on Climate Change (UNFCCC),* Article 2.

[5] Department of State, *National Action Plan for Global Climate Change* (Washington, DC: Department of State, 1992), p. 73.

Indeed, the passage of EPACT was anticipated by its authors to stabilize or even reduce emissions of greenhouse gases at little cost, in line with the 1991 NAS report. As stated by the House Report:

> The committee expects that, if fully implemented, H.R. 776 will result in a substantial reduction in U.S. greenhouse gas emissions relative to forecasted levels. The bulk of these reductions result from the programs that will demonstrate and transfer advanced clean coal and renewable technologies abroad, and from the domestic energy efficiency and renewable energy initiatives. The provisions on electric utilities, alternatives fuels and coalbed methane are also significant.[6]

Comparing EPACT and the UNFCCC

EPACT and the UNFCCC were debated during the same time period. **Table 1** compares EPACT, title XVI, as enacted, and UNFCCC, as signed and ratified by the United States. Essentially, the UNFCCC establishes policies, and EPACT establishes program responses. Thus EPACT is silent on the nature of the problem, on the need for an immediate response, or whether the United States should take the lead in any such response. But, as **Table 1** shows, EPACT's portfolio of domestic strategies and program options — technology development/transfer, financial assistance to developing countries, and least-cost solutions — closely track the provisions of the UNFCCC. With the authorization of these programs and activities, EPACT effectively constitutes implementing legislation for the U.S. commitment made in signing and ratifying the UNFCCC. It should be noted, however, that typically the programs are relatively specific, not broad authorizations; that for many the benefit of reducing greenhouse gases is a "bonus" in achieving other goals (e.g., "substantially reduce environmental pollutants, including greenhouse gases..." [sec. 1608]) ; and that in at least one case the act explicitly denies new authority (i.e., "This subsection does not provide any new data collection authority" [sec. 1605(a)]). Such an approach reflects the voluntary nature of the Rio commitments, and the "no regrets" policy position of the George H. W. Bush Administration, as discussed in the next section.

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[6] Committee on Energy and Commerce, *Comprehensive National Energy Policy Act*, House Rept. 102-474, Part 1, March 30, 1992, p. 152.

Table 1. U.N. Framework Convention on Climate Change and the Energy Policy Act of 1992: Correspondences of Selected Provisions

	UNFCCC	EPACT
Problem	Concerned 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 ... (preamble)	
Planning/Strategy	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 ... (Art. 4, 4(a)).	The ... National Energy Policy Plan ... shall include a least-cost energy strategy ... designed to achieve [among other goals] ... the stabilization and eventual reduction in the generation of greenhouse gases ... (sec. 1602(a)).
Precautionary	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 ... (Art. 3, 3).	

	UNFCCC	EPACT
Policy Options	All Parties ... shall ... Formulate, implement, publish and regularly update national ... programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases... (Art. 4, 1(b)).	... the Secretary [of Energy] shall transmit a report to Congress containing a comparative assessment of alternative policy mechanisms for reducing the generation of greenhouse gases (sec. 1604).
Least Cost	... policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost (Art. 3, 3).	In developing the least-cost energy strategy, the Secretary [of Energy] shall take into consideration the economic, energy, social, environmental, and competitive costs and benefits, including costs and benefits for jobs, of his choices (sec. 1602(a)).
Developed Nations Take Lead	... the developed country Parties should take the lead in combating climate change... (Art. 3, 1).	
Technology Development/ Transfer	All Parties ... shall ... Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases ... (Art. 4, 1(c)).	The Secretary [of Energy] ... shall establish a technology transfer program to carry out the [following] purposes [among others]: ... encourage the export of United States technologies ... that substantially reduce environmental pollutants, including greenhouse gases; develop markets for United States technologies ... that substantially reduce environmental pollutants, including greenhouse gases; provide financial assistance by the Federal Government to foster greater participation by United States firms in the financing, ownership, design, construction, or operation of technologies or services that substantially reduce environmental pollutants, including greenhouse gases (sec. 1608).

	UNFCCC	EPACT
Financial Assistance to Developing Nations	The developed country Parties ... shall provide new and additional financial resources to meet ... costs incurred by developing country Parties in complying with their obligations ... and shall take all practicable steps to promote, facilitate and finance ... the transfer of, or access to, environment-ally sound technologies and know-how to other Parties, particularly developing country Parties ... (Art. 4, 5).	The Secretary of the Treasury ... shall establish a Global Climate Change Response Fund to act as a mechanism for United States contributions to assist global efforts in mitigating and adapting to global climate change (sec. 1609(a)).
Inventory; Research and Monitoring	All Parties ... shall ... Develop, periodically update, publish and make available to the Conference of the Parties, ... national inventories of anthropo-genic emissions by sources and removals by sinks of all greenhouse gases ... (Art. 4, 1(a)). Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies (Art. 4, 1(g)).	The Secretary [of Energy] ... shall develop ... an inventory of the [annual] national aggregate emissions of each greenhouse gas for ... the baseline period of 1987 through 1990.... The Administrator of the Energy Information Administration shall annually update and analyze such inventory using available data. This subsection does not provide any new data collection authority (sec. 1605(a)).

	UNFCCC	EPACT
Emissions Reduction	[The developed country] Parties shall communicate ... information on its policies and measures ... with the aim of returning individually or jointly to their 1990 levels ... anthropogenic emissions of carbon dioxide and other greenhouse gases (Art. 4, 2(b)).	The ... National Energy Policy Plan ... shall include a ... strategy ... designed to achieve ... the stabilization and eventual reduction in the generation of greenhouse gases ... (sec. 1602(a)).
Education	Promote and cooperate in education, training and public awareness related to climate change and encourage the widest participation in this process, including that of non-governmental organizations (Art. 4, 1(i)).	

UNFCCC Results: Action Plans

The notion that the U.S. could meet modest CO_2 emission reduction goals at little or no cost underlay many of the global climate change initiatives during the George H. W. Bush and Clinton Administrations, including the George H. W. Bush Administration's "No Regrets" policy and 1992 Climate Action Plan, and the Clinton Administration's 1994 and 1997 Climate Action Plans.[7] This approach to climate change policy allowed the two Administrations to avoid requesting regulatory authority from Congress to implement a climate change policy. This left them with the option of undertaking governmental implementing actions that could be done administratively, unless Congress legislated otherwise, and creating incentives for private industry to voluntarily undertake emissions reduction initiatives.

The George H. W. Bush Administration's National Action Plan: "No Regrets". To meet the obligation of the UNFCCC, the George H. W. Bush Administration issued in December, 1992, the first U.S. plan, *National Action Plan for Global Climate Change.* This plan consisted primarily of (1) estimating U.S. emissions of greenhouse gases and (2) describing then-existing activities affecting them. These activities were dominated by research initiatives supplemented by

[7] On the "no regrets" policy of the George H. W. Bush Administration, see C. Boyden Gray and David B. Rivkin, Jr., "A 'No Regrets' Environmental Policy," *Foreign Policy*, summer 1991, pp. 47-65; for the various action plans, see U.S. Department of State, *National Action Plan for Global Climate Change*, Department of State Publication 10026, December 1992; U.S. Department of State, *Climate Action Report*, Department of State Publication, 1994; and U.S. Department of State, *Climate Action Report*, Department of State Publication 10496, July 1997.

programs proposed in the National Energy Strategy[8] or anticipated as resulting from the recent passage of EPACT, along with the Environmental Protection Agency's (EPA) various pollution prevention, "green" initiatives begun in 1991.[9] These mostly voluntary initiatives, led by EPA's "Green Lights" program, formed the core of the George H. W. Bush Administration's "No Regrets" policy and followed the recommendations of the 1991 Intergovernmental Panel on Climate Change (IPCC) report for countries to consider taking actions on global climate change that were:

- Beneficial for reasons other than climate change and justifiable in their own right — for example, increased energy efficiency....
- Economically efficient and cost-effective, in particular those that use market-based mechanisms.
- Able to serve multiple social, economic and environmental purposes.
- Flexible and phased, so that they can be easily modified to respond to increased understanding of ... climate change.
- Compatible with economic growth and the concept of sustainable development.
- Administratively practical and effective in terms of application, monitoring, and enforcement.
- Mindful of the obligations of both industrialized and developing countries in addressing this issue, while aware of the special needs of developing countries, in particular in the areas of financing and technology.

As codified by the national action plan, the combination of EPA and DOE programs were forecasted to hold U.S. greenhouse gas emissions at near their 1990 levels in the year 2000. Emissions were projected to rise by only 1.4%-6% over that time period, compared to a projected rise of 13% under a "business as usual"

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[8] Department of Energy, *National Energy Strategy*, Washington, DC: U.S. Govt. Print. Off., February 1991.

[9] For a summary of these and other voluntary pollution control programs, see CRS Report 95-817, *Voluntary Programs to Reduce Pollution*, by James E. McCarthy. When challenged on the explicit statutory basis for these voluntary programs, EPA cites several authorities, including the Clean Air Act (section 103), the Pollution Prevention Act of 1990 (sections 6602 and 6606), and the Global Climate Protection Act of 1987 (section 1103). House, Subcommittee on VA, HUD, and Independent Agencies, Committee on Appropriations, *Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations for 1999*, part 7, Environmental Protection Agency (105th Congress, 2nd session), pp. 55-59, 196-206, 1056-1063.

scenario.[10] **Table 2** summarizes the principle actions the George H. W. Bush Administration envisioned and the anticipated reductions in greenhouse gases in millions of metric tons of carbon-equivalent (MMTCE) — a common unit for the global warming potential of different greenhouse gases.

Table 2. Selected Major Reduction Strategies Listed by the George H. W. Bush Administration's Action Plan

Program	Carbon Reduction (MMTCE)	Percentage of Total	Gas Reduced
Commercial/industrial "Green Lights," DSM, standards	17.0-50.1	11.3-25.1%	CO_2
Green Building/Standards	8.8	5.9-4.4%	CO_2
Green Motors/Standards	8.3	5.5-4.2%	CO_2
Energy Star Computers	5.5	3.7-2.8%	CO_2
"America the Beautiful" and other forestry programs	5-9	3.3-4.5%	CO_2 (sequestration)
Landfill standards	39	26.0-19.5%	CH_4
Livestock Waste Lagoons	7	4.7-3.5%	CH_4
Reducing N_2O from Nylon Manufacturing	8-12	5.3-6.0%	N_2O
Totals[a]	98.6-139.7	65.7- 69.9%	

a. Based on a projected reduction of 150-200 MMTCE as presented in Table 12 of George H. W. Bush National Action Plan (adjusted for CH_4 at GWP of 22).

Basically, the George H. W. Bush Administration's plan was a "compendium" of what was then known about greenhouse gas emissions and of existing or planned domestic actions that affected those gases. The primary reason for these actions were to conserve energy and to reduce air pollution — any global climate change benefits would be a bonus. (Thus exemplifying "no regrets" — the action is one that is justified for other reasons.) The goal of the George H. W. Bush plan was to present a baseline that "should assist in measuring and evaluating existing policies and measures and in establishing a basis for future actions." The plan expressly "does not seek to identify or recommend additional policies and measures that might be taken." Underlying this approach, it appeared, was the presumption that uncertainties about global climate change were too great to justify actions beyond research except for so-called "no-regrets" initiatives justifiable on other grounds, such as selected energy

[10] Actual U.S. greenhouse gas emissions exceeded those projected under the George H. W. Bush Administration's plan. In 2000, emissions were 14.3% higher than 1990 levels. See U.S. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2004* (EPA 430-R-06-002) (April 15, 2006), Table ES-2.

conservation measures. Reflecting this attitude, the George H. W. Bush plan was explicit about a number of uncertainties, for example, in using two estimates of the global warming potential (GWP) for methane; additionally, the George H. W. Bush plan discussed adaptive measures before discussing mitigation measures.

The Clinton Administration's National Action Plans: Industrial Strength "No Regrets". Following a June 1993 White House Conference on Global Climate Change, the Clinton Administration in October 1993 issued a new plan, *The Climate Change Action Plan*.[11] This plan explicitly set a goal of reducing U.S. greenhouse gas emissions to 1990 levels in the year 2000; and laid out of series of nearly 50 program activities to achieve the goal, including both enhancement of earlier programs and new, mostly voluntary, initiatives. It was not submitted to the UNFCCC, but was described as the core of a forthcoming submission to meet the obligations of the convention. In March 1994, the Clinton Administration issued a technical supplement that documented the assumptions and parameters used in developing the supporting analysis for the plan.[12] Also in 1994 the Clinton Administration submitted its *Climate Action Report* to the convention, and a revised version was submitted in 1997.

Philosophically, the Clinton Action Plans were similar to that developed under the George H. W. Bush Administration. Both were designed to foster market choices that would conserve energy, increase energy efficiency, and encourage natural gas use. Both were also designed to strengthen selected regulatory standards that concomitantly also reduced greenhouse gas emissions — such as landfill regulations that curtail methane releases. As indicated in table 3, several actions in the 1993 Clinton plan expanded programs listed in the George H. W. Bush Administration's plan by augmenting funding or technical support to increase anticipated reductions. Other Clinton proposals were new; examples included a "Golden Carrot" program to induce efficiency improvements of industrial equipment, a renewable energy consortium, a program to encourage employers to replace parking subsidies with cash incentives for solo commuting, and a program to promote more efficient nitrogen fertilizer use.

Under the 1993 Clinton plan, total greenhouse gas emissions were projected to return to their 1990 levels by the year 2000, although CO_2 emissions alone would rise about 2 percent. By 1997, the projected greenhouse gas emission reductions of the Clinton plan was revised downward to 76 MMTCE, from 109 MMTCE in the 1993 plan. In addition, the baseline for greenhouse gas emissions in the year 2000 was increased by 157 MMTCE from that projected in 1993. Thus, rather than returning

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[11] This plan became the basis for the 1994 submission to the UNFCCC. For a further discussion of the plan, see CRS Report 94-404, *Climate Change Action Plans*, by Larry B. Parker and John E. Blodgett.

[12] U.S. Department of Energy, *The Climate Change Action Plan: Technical Supplement*, Washington, D.C.: DOE/PO-0011. March 1994. As noted in footnote 13, actual U.S. greenhouse emissions for 2000 were 14.2% higher than 1990 levels.

emissions to their 1990 levels in the year 2000, the 1997 plan projected a 188 MMTCE increase in emissions, or 13% above 1990 levels.[13]

Table 3. Selected Major Reduction Strategies Under the 1993 Clinton Action Plan

Program	Carbon Reduction (MMTCE)	Percent of Total	Gas Reduced
Form "Golden Carrot" Market Pull Partnerships/Enhanced Residential Appliance Standards	11.8	10.9%	CO_2
Create a "Motor Challenge" Program	8.8	8.1%	CO_2
Reform Federal Tax Subsidy for Employer-provided Parking/Adopt a Transportation System Efficiency Strategy/Promote Greater Use of Telecommuting	6.6	6.1%	CO_2
Accelerate Source Reduction Pollution Prevention, and Recycling	9.2	8.5%	CO_2 (5.0 by sequestration)
Reduce Use of Fertilizers/Reduce Use of Pesticides	7.2	6.6%	CO_2 - 2.7 N_2O - 4.5
Narrow Use of High GWP Chemicals Using the Clean Air Act and Production Stewardship to Reduce Emissions	5.0	4.6%	HFC, PFC
Create Partnerships with Manufacturers of HFC-22 to Eliminate HCFC-23 Emissions	5.0	4.6%	HFC
Totals	53.6	49.4%	

The Clinton Administration blamed this failure to reduce emissions in 2000 to the 1990 level primarily on unanticipated economic growth and on Congress not fully funding the programs.[14] Despite this, the basic rationale of the Clinton plan remained: the plan "combines an array of public-private partnerships to stimulate the deployment of existing energy-efficient technologies and accelerate the introduction of innovative technologies. The goal of these programs was to cut CO_2 emissions,

[13] *Climate Action Report* (1997), p. 125.

[14] *Climate Action Report* (1997), p. 10.

while enhancing productivity domestically and U.S. competitiveness aboard."[15] The echo of the 1991 NAS report was clear: the cost to control greenhouse gas emissions would net out to zero, or even save money, depending on how the benefits from increased efficiency were estimated.

Kyoto and S.Res. 98

A central component of the UNFCCC was its establishment of a conference of parties (COP) to negotiate further agreements to counter global climate change. The first two COPs were held in Berlin in 1995 and 1996. At COP-1, several industrialized countries, including the United States, expressed concern that newly industrializing countries, such as Brazil and China, would continue to be classified as non-annex 1 countries (i.e., developing countries, exempt from possible future legally binding reduction requirements) despite their projected large increases in greenhouse gas emissions in the future. This issue of exempting such countries from future binding reduction requirements took on heightened importance when ministerial participants at COP-2 signed a declaration calling for "legally binding mid-term targets." Such targets were the subject of COP-3, held in Kyoto in December 1997.[16]

In anticipation of the Kyoto negotiations, the U.S. Senate debated the appropriate U.S. position vis a vis any legally binding agreement to reduce greenhouse gas emissions. On July 25, 1997, the Senate voted 95-0 to approve Senate Resolution 98 (S.Res. 98), expressing the sense of the Senate regarding the conditions under which the United States should become a signatory to any international agreement on greenhouse gases under the UNFCCC.[17] Specifically, the resolution states that the U.S. should not sign any agreement limiting developed countries' greenhouse gas emission (e.g., the United States) unless that agreement also includes specific schedules to limit developing countries' greenhouse gas emissions over the same period. In addition, no agreement should be signed that would "result in serious harm to the economy of the United States."

S.Res. 98 also states that any agreement sent to the Senate for advice and consent should include a detailed discussion of required legislative and regulatory actions to implement the treaty and a cost analysis of an implementation strategy. These conditions for Senate consideration of a treaty illustrate the Senate's concern about the cost of any agreement to the U.S. economy and consumers, the competitive effects on U.S. trade, and the environmental effectiveness of a treaty that exempts increasingly important greenhouse emitting developing countries. By requiring re-analysis of the costs of implementing binding reduction requirements, the Senate was in effect calling for a reexamination of the NAS report's argument that greenhouse gas emissions could be reduced at modest cost.

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[15] *Climate Action Report* (1997), p. 90.

[16] For further discussion, see CRS Report RL33826, *Climate Change: The Kyoto Protocol, Bali "Action Plan," and International Actions*, by Susan R. Fletcher and Larry Parker.

[17] Senate Committee on Foreign Relations, *Conditions Regarding U.N. Framework Convention on Climate Change*, S.Rept. 105-54, July 21, 1997.

That the Kyoto Protocol did not meet the conditions of Senate Resolution 98 is not in dispute: it does not bind developing countries to any schedule of reductions. For many critics, no commitment may be comprehensive until the developing world's largest emitters, China and India, sign on.

The George W. Bush's Administration's National Action Plan: Abjuring an Emissions Reduction Goal

The George W. Bush Administration has abandoned both the Kyoto Protocol and its negotiation process. In his June 11, 2001 speech on global climate change, the President stated that the Kyoto Protocol was "fatally flawed in fundamental ways." A primary flaw outlined by the President is the exemption of China and other developing countries from its provisions. This "comprehensiveness" concern was closely followed by "cost" and "competitiveness" concerns:

> Kyoto is, in many ways, unrealistic. Many countries cannot meet their Kyoto targets. The targets themselves are arbitrary and not based upon science. For America, complying with those mandates would have a negative economic impact with layoffs of workers and price increases for consumers. And when you evaluate all these flaws, most reasonable people will understand that it's not sound public policy.[18]

To respond to global climate change, President Bush called for a new approach focused on the science and with flexible control mechanisms that employ market-based incentives. Among the principles that the President argued should guide such a program were the following:

> We must always act to ensure continued economic growth in prosperity for our citizens and for citizen throughout the world.... And finally, our approach must be based on global participation, including that of developing countries whose net greenhouse gas emission now exceed those in the developed countries.

In its 2006 action plan submitted under UNFCCC, the George W. Bush Administration outlines six principles in building a climate change policy:[19]

- be consistent with the long-term goal of stabilizing greenhouse gas concentrations;
- be measured and continually build on new scientific data;
- ensure continued economic growth and prosperity;
- pursue market-based incentives and spur technological innovation;
- be flexible to adjust to new information and take advantage of new technology; and
- promote global participation, including developing countries.

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[18] President George W. Bush, *President Bush's Speech on Global Climate Change*, June 11, 2001.

[19] U.S. Department of State, *U.S. Climate Action Report 2006*, Washington, DC, July 2007, p. 381.

Several of these principles mirror those cited as influencing the "no regrets" policy of the George H. W. Bush Administration. As shown in Table 4 below, the focus on reducing greenhouse gases without interfering with economic growth is the basis of both policies. In this sense, the objectives of the George W. Bush Administration's climate change policy are similar to those of the George H. W. Bush and Clinton Administrations.

Table 4. Principles Behind the George H. W. Bush Administration's and George W. Bush Administration's Climate Action Plans

George H. W. Bush Administration	George W. Bush Administration
Beneficial for reasons other than climate change and justifiable in their own right — for example, increased energy efficiency....	Be consistent with the long-term goal of stabilizing greenhouse gas concentrations
Economically efficient and cost-effective, in particular those that use market-based mechanisms.	Pursue market-based incentives and spur technological innovation; Take advantage of new technology
Able to serve multiple social, economic and environmental purposes.	
Flexible and phased, so that they can be easily modified to respond to increased understanding of ... climate change.	Be measured and continually build on new scientific data
Compatible with economic growth and the concept of sustainable development	Ensure continued economic growth and prosperity
Administratively practical and effective in terms of application, monitoring, and enforcement	
Mindful of the obligations of both industrialized and developing countries in addressing this issue, while aware of the special needs of developing countries, in particular in the areas of financing and technology	Promote global participation, including developing countries

However, unlike the action plans developed by the George H.W. Bush and the Clinton Administrations, the George W. Bush Administration's plan makes no attempt to suggest that it will achieve the UNFCCC goal of returning greenhouse gas emissions to their 1990 levels. In fact, the Administration's voluntary program shifts the focus from reducing greenhouse gas emissions per se to reducing the intensity of

emissions per unit of economic activity.[20] As announced by President George W. Bush in February 2002,[21] his voluntary plan would reduce greenhouse gas intensity in the U.S. by 18% in 2012 (three-quarters of which would occur from projected business-as-usual trends); concomitantly, greenhouse gas emissions were projected to increase from 14.2% above 1990 levels in 2000 to 28.3% above 1990 levels in 2010 — some 4.5% below projected business-as-usual levels.[22]

In addition, on July 27, 2005, the Bush Administration announced formation of a six-nation Asia-Pacific Partnership on Clean Development and Climate (APP). The members are the United States, China, India, Japan, Australia, and South Korea. The purposes of the Partnership are to

> create a voluntary, non-legally binding framework for international cooperation to facilitate the development, diffusion, deployment, and transfer of existing, emerging and longer term cost- effective, cleaner, more efficient technologies and practices among the Partners through concrete and substantial cooperation so as to achieve practical results.[23]

It has the goal of meeting "national pollution reduction, energy security and climate change concerns, consistent with the principles of the U.N. Framework Convention on Climate Change (UNFCCC)."[24]

Notably, unlike the Kyoto Protocol requirements, the partnership engages both developed and developing nations as equals. Also notably, consistent with the Bush Administration's rejection of the Kyoto Protocol's mandatory reduction requirements, the Partnership's initiatives are voluntary.

This international initiative was followed in May 2007 by the President's announcement that the United States would convene a meeting of the world's "major economies" that are responsible for most greenhouse gas emissions. Held in September 2007 the final statements of the "Major Economies Meeting on Energy Security and Climate Change" emphasized the need to integrate such meetings into the overall UNFCCC negotiations. The U.S. summary of the meeting focused on the "aspirational" nature of reduction goals, reflecting the Administration's rejection of mandatory reduction targets.

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[20] While the U.S. is the world's largest emitter of greenhouse gases, the carbon efficiency of its economy is better than many.

[21] See [http://www.whitehouse.gov/news/releases/2002/02/climatechange.html].

[22] See CRS Report RL31779, *Air Quality: Multi-Pollutant Legislation in the 108th Congress*, by Larry Parker and John Blodgett. (The 2010 and 2012 projections have been conflated.)

[23] Charter for the Asia-Pacific Partnership on Clean Development and Climate (January 12, 2006), "Purposes," 2.1.1. For additional information, see [http://www.asiapacificpartnership.org/]

[24] "Asia-Pacific Partnership on Clean Development and Climate: New Vision Statement of Australia, China, India, Japan, the Republic of Korea, and the United States of America" [http://www.state.gov/g/oes/climate/app/75320.htm]

Looking for a New Direction: Senate Amendment 866

While global climate change was an important element in the legislative drafting and debates that led to Energy Policy Act of 1992, global climate change was largely peripheral during the drafting of and deliberating on the bills (predominately, H.R. 6 in both the 108th and 109th Congresses) that ultimately became the Energy Policy Act of 2005 (P.L. 109-58) — indeed, the drafters and managers of the legislation focused on energy security and energy supply and preferred to avoid engaging in debate on climate implications. However, energy policy inevitably has greenhouse gas implications (e.g., P.L. 109-58 includes provisions to foster nuclear power and to encourage alternative fuels); at the same time, other provisions encourage coal use.

Some Members did seek to inject explicit consideration of climate change into the debate on energy policy, however, and as a result, the issue of mandatory versus voluntary efforts to address global climate change was again debated. In the 108th Congress, in the Senate a bill (S. 139) that would have imposed a mandatory cap-and-trade greenhouse gas reduction program failed in 2003 on a 43-55 vote. In 2005, a similar initiative was considered as an amendment during the Senate debate on the Energy Policy Act of 2005 and defeated on a 38-60 vote. These proposals would have placed a cap on U.S. greenhouse gas emission based on a 2001 baseline. The cap would have been implemented through a tradeable permit program to encourage efficient reductions.

However, concern that global climate change should be addressed explicitly during the debate on energy policy in the 109th Congress led 13 Senators to introduce S.Amdt. 866 — a Sense of the Senate resolution on climate change. The resolution finds that (1) greenhouse gases are accumulating in the atmosphere, increasing average temperatures; (2) there is a growing scientific consensus that human activity is a substantial cause of this accumulation; and (3) mandatory steps will be required to slow or stop the growth of greenhouse gas emissions. Based on these findings, the resolution states it is the Sense of the Senate that the Congress should enact a comprehensive and effective national program of mandatory, market-based limits and incentives on greenhouse gases that slow, stop, and reverse the growth of such emissions. This should be done in a manner that will not significantly harm the U.S. economy and will encourage comparable action by other countries that are our major trading partners and contributors to global emissions. The resolution passed by voice vote after a motion to table it failed on a 43-54 vote.

As with the Energy Policy Act of 2005, the Energy Independence and Security Act of 2007 (P.L. 110-140) included floor debates about climate change. But also as with the earlier enactment, direct climate change initiatives were omitted in the final bill, although such provisions as those promoting energy conservation and more stringent auto efficiency standards were seen as consistent with climate change initiatives.

Explicit climate change legislation has progressed in the 110th Congress, however: consistent with Senate Amendment 866, the Committee on Environment and Public Works reported out a revised version of S. 2191 — America's Climate Security Act of 2007 — by an 11 to 8 vote on December 5, 2007. As reported, S. 2191 is estimated to reduce greenhouse gas emissions 19% below 2005 levels by

2020 (up from 15% as introduced) and 63% below 2005 levels by 2050. The bill would cap greenhouse gas emissions from the electric generation, industrial, transportation, and natural gas sectors. The program would be implemented through an expansive allowance trading program to maximize opportunities for cost-effective reductions. Credits obtained from increases in carbon sequestration and acquisition of allowances from foreign sources could be used to comply with 30% of reduction requirements. The bill also establishes a Carbon Market Efficiency Board to observe the allowance market and implement cost-relief measures if necessary.

Addressing the Three-Cs: Emerging Price Versus Quantity Debate

In the face of scientific uncertainty, congressional debate with respect to beginning a mandatory CO_2 reduction program can be categorized by the three-Cs: **C**ost, **C**ompetitiveness, and **C**omprehensiveness. These concerns, as indicated earlier, can be traced throughout the debate on global climate change.

The fundamental policy assumption that changed between the U.S. ratification of the 1992 UNFCCC and the current Bush Administration's decision to abandon the Kyoto Protocol process concerns costs. The ratification of the UNFCCC was based at least partially on the premise that significant reductions could be achieved at little or no cost. This assumption helped to reduce concern some had (including those of the former Bush Administration) that the treaty could have deleterious effects on U.S. competitiveness — a significant consideration because developing countries are treated differently from developed countries under the UNFCCC. Further ameliorating this concern, compliance with the treaty was voluntary. While the United States could "aim" to reduce its emissions in line with the UNFCCC's goal, if the effort indeed involved substantial costs, the United States could fail to reach the goal (as has happened) without incurring any penalty under the treaty.

This flexibility would have been eliminated under the Kyoto Protocol with its mandatory reduction requirements. The possibility of failure to comply with a binding commitment intensifies one's perspective on potential costs: How confident can one be in the claim that carbon reductions can be achieved at little or no costs?[25] Compliance cost estimates ranging from $5.5 billion to $200 billion annually cause some to pause.[26] The current Bush Administration was sufficiently concerned about potential CO_2 control costs to reverse a campaign pledge to seek CO_2 emissions reductions from power plants, in addition to its decision to abandon the Kyoto Protocol process.[27]

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[25] For a further discussion of the foundations for such divergent cost estimates, see CRS Report 98-738, *Global Climate Change: Three Policy Perspectives*, by Larry Parker and John Blodgett.

[26] For a review of several cost analyses, see Energy Information Administration, *Impacts of the Kyoto Protocol on U.S. Energy Markets and Economic Activity*, DOE Report SR/OIAF/98-03, October 1998, pp. 137-151.

[27] President George W. Bush, *Letter to Senators Hagel, Helms, Craig, and Roberts*, Office
(continued...)

As a stalemate has continued on mandatory strategies to control CO_2 emissions, particularly because of costs fears, attention increasingly focuses on the cost-limiting benefit of a carbon tax, either as the primary strategy or as a component blending a carbon tax with the reduction certainty of the tradeable permit system. The object is to create a *safety valve* to avert unacceptable control costs, particularly in the short-term. These safety valves limit unit (per ton) costs of reducing emissions.

A safety valve bounds the costs of any climate change control program (price) at the expense of reductions achieved (quantity).[28] In general, market-based mechanisms to reduce CO_2 emissions focus on specifying either the acceptable emissions level (quantity), or compliance costs (price), and allowing the marketplace to determine the economically efficient solution for the other variable. For example, a tradeable permit program sets the amount of emissions allowable under the program (i.e., the number of permits available caps allowable emissions), while letting the marketplace determine what each permit will be worth. Likewise, a carbon tax (or safety valve) sets the maximum unit (per ton of CO_2) cost that one should pay for reducing emissions, while the marketplace determines how much actually gets reduced. In one sense, preference for a pure tradeable permit system or inclusion of a safety valve depends on how one views the uncertainty of costs involved and benefits to be received.

An impetus for this new debate is a report by the National Commission on Energy Policy (NCEP).[29] The NCEP report called for a mandatory, economy-wide tradeable permit program to begin limiting greenhouse gases. The mechanism for limiting such emissions involves a progressively lower limit on greenhouse gas intensity over time tied to the projected increase in GDP. Thus, the target is not fixed, but increases to the degree that projected economic growth exceeds the mandated reduction in greenhouse gas intensity. The NCEP recommends the reduction rate for greenhouse gas intensity be set at 2.4% annually beginning in 2010, increasing to 2.8% beginning in 2020.

In addition, to limiting potential costs, the scheme includes a safety valve. The NCEP recommends this safety valve be set at $7 a ton of carbon dioxide equivalent in 2010 dollars. This would be equivalent to about $5.90 a ton in 2001 dollars. This safety valve puts an upper limit on the marginal cost that an affected entity should pay for greenhouse gas reductions. If control costs exceed $7 a ton, the entity could pay the safety value price instead.

The effects of the safety valve on the price vs. quantity equation can be seen in Table 5 below. The safety valve increases uncertainty with respect to emission reductions achieved while increasing certainty with respect to price. Allowing some

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[27] (...continued)
of the Press Secretary, March 13, 2001

[28] See CRS Report RS21067, *Global Climate Change: Controlling CO_2 Emissions — Cost-Limiting Safety Valves*, by Larry Parker.

[29] The National Commission on Energy Policy, *Ending the Energy Stalemate: A Bipartisan Strategy to Meet America's Energy Challenges* (December 2004).

flexibility in the quantity of emissions reduced is a concession to the three-C that have prevented legislative movement on mandatory greenhouse gas emissions. Whether it represents the start of a new dialogue on reducing greenhouse gas emissions remains to be seen.

Table 5. Comparison of Trading Program With and Without Safety Valve

Variable	Impact on Emissions (Quantity)		Impact on Cost (Price)	
	Tradeable Permits with fixed cap	**Tradeable Permits with safety valve**	**Tradeable Permits with fixed cap**	**Tradeable Permits with safety valve**
GDP Growth	No impact on emissions cap	Potentially increases emissions target and possibility of safety valve being used	Increases costs as more emissions have to be reduced to maintain cap	Increases costs only to the level of the safety valve
Availability of Cost-effective Control Technologies or Natural Gas	No impact on emissions cap	Lack of cost-effective control technologies increases the possibility of the safety valve being used	Lack of cost-effective control technologies increases costs	Lack of cost-effective control technologies increases costs only to the level of the safety valve
Effectiveness of trading system	No impact on emissions cap	Lack of effective permit market may increase the possibility of the safety valve being used	Lack of effective permit market will increase costs; an effective permit market will reduce cost	Lack of effective permit market will increase cost only to the level of the safety valve; an effective permit market will reduce cost

Source: Congressional Research Service.

Conclusion: Battle of Policy Perspectives[30]

Up to the Kyoto Protocol, the thrust of U.S. climate change policy, as represented by its national action plans, focused on technological and efficiency improvements[31] — improvements that promised to reduce carbon emissions at little or no cost, and with "no regrets." The Clinton Administration's 1997 Climate Change Action Plan continued to base the Administration's climate change policy on technology development and efficiency improvement as a means of reducing emissions at little or no cost. This position was reiterated in President Clinton's 1998 $6 billion Climate Change Technology Initiative. As summarized by National Economic Council Chairman Gene Sperling on the introduction of the President Clinton's initiative:

> We think that this package is a very good example of what we spoke about when we said that there were win-win opportunities for positive incentives that would clearly show how we can address the issue of climate change and strengthen our economy at the same time.[32]

For those who hold to this technological perspective, a global agreement to reduce greenhouse gas emissions — such as the Kyoto Protocol — would improve the possibilities for improved efficiency and technology by creating a stronger market for such innovations. They see concerns that increased costs would destroy U.S. competitiveness as unfounded; indeed, they see increased efficiency and innovation as improving U.S. competitiveness. They contend that United States not only can afford to take the lead in carbon reductions (negating the comprehensiveness concern), but should do so in order to increase its technological leadership as well as to provide an example to the third world.

To those who are skeptical of this perspective but who may have been willing to accept it when it was part of a voluntary framework, the scenario appears too risky and overly optimistic in the context of a mandatory scheme. Looking at economic analyses from various sources, these skeptics do not see the potential economic costs of mandatory schemes resulting in commensurate environmental benefits, particularly in the case of the Kyoto Protocol where developing nations are excluded from controls. From their perspective, the reward does not appear to be worth the risk, and until it does, the country would be better off keeping its options open rather than moving down an unsure and potentially very expensive track. This appears to be the position of the George W. Bush Administration, which is prepared to encourage technological development — as through the Asia-Pacific Partnership — but is not prepared to commit to a binding reduction target such as that embodied in the Kyoto Protocol.

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[30] For an analysis of the impacts of policy perspectives on costs, see CRS Report 98-738, *Global Climate Change: Three Policy Perspectives*, by Larry Parker and John Blodgett.

[31] See CRS Report 98-738, *Global Climate Change: Three Policy Perspectives*, by Larry Parker and John E. Blodgett.

[32] As reported in *Daily Environment Report*, "Administration Announces $6.3 Billion Plan of Spending, Tax Credits to Curb Emissions," February 2, 1998, p. AA-1.

With the Bush Administration having rejected the Kyoto Protocol in 2001, what does the Senate passage in 2005 of a Sense of the Senate resolution calling for mandatory steps to reduce climate change mean for the future direction of U.S. climate change policy? The Sense of the Senate resolution has spurred renewed discussion on directly incorporating cost considerations (e.g., a safety valve or a Carbon Market Efficiency Board) into any mandatory greenhouse gas reduction program.

From a policy perspective, the debate on incorporating a safety valve into a mandatory reduction scheme represents an attempt to quantify the risks involved in addressing global climate change. As a safety valve has the effect of allowing emissions that otherwise would be reduced, those who see great risk in climate change will want to see a substantial price attached to the safety valve — so emitters would invest in more reductions before it would be cheaper for them to pay for releasing greenhouse gases instead. In contrast, those more concerned about the costs will want to set the safety valve at a lower price level — accepting more emissions.

A second approach beginning debate would create a board to observe the allowance market and implement cost-relief measures if necessary. Seen as a more flexible response with the potential for avoiding or mitigating the environmental impacts of a safety valve, a Carbon Market Efficiency Board would not provide the certainty of a safety valve. The price versus quantity debate is likely to continue.