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

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Summary

The nature of greenhouse gas (GHG) emissions (particularly carbon dioxide (CO_2) emissions) makes their control difficult to integrate with the U.S economy and traditional U.S. energy policy. Despite the obvious interrelationship between energy policy and greenhouse gas (GHG) emissions, the United States has struggled to integrate the two. For a country that has traditionally used its relatively cheap supply of energy to substitute for more expensive labor and capital costs to compete internationally, this linkage is particularly strong, as witnessed by the nation's high GHG emissions per capita. In the face of this economic reality, along with continuing scientific uncertainty, debate over a greenhouse gas (GHG) reduction program can be categorized by three inter-related Cs: **C**ost, **C**ompetitiveness, and **C**omprehensiveness.

Cost typically refers to some monetary estimate of what a GHG reduction program would require, often expressed as a gross dollar amount or as a percentage reduction in gross domestic product for some period of time. **Competitiveness**, at the simplest level, reflects concerns about what firms would be disadvantaged by cost increases as a result of GHG reduction requirements. **Comprehensiveness** concerns the extent to which all nations have to meet comparable GHG reduction requirements—in contrast to the current situation in which developing nations, such as China, have no obligation to actually reduce emissions.

Fundamental policy assumptions regarding each of the three Cs have changed between the U.S. ratification of the 1992 UNFCCC and key events of the first decade of the 21st century—the George W. Bush Administration's 2001 decision to abandon the Kyoto Protocol process and the 2009 negotiations at Copenhagen.

First, 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 that the treaty could have deleterious effects on U.S. competitiveness. Further ameliorating this concern, compliance with the treaty was voluntary. But the assumption has never lacked critics; and their views—and to some extent, experience based on alternative energy costs—have rendered the "low cost" assumption tenuous in the eyes of many.

Second, the UNFCCC was approved at a time when salient competitiveness issues were focused as much or more on developing nations, rather than developing ones. But the competitiveness issue has increasingly refocused on the rapidly growing economies, especially of India and China—shifting the competitiveness concern to countries that have been absolved from mandatory reduction requirements while they grow their economies.

And third, the UNFCCC was approved at a time when the developed nations dominated GHG emissions, and it was assumed comprehensiveness could be subordinated temporarily to the imperative for developing nations to grow their economies. But by 2005 China had passed the United States to become the world's largest emitter.

The Copenhagen Agreement tried to preserve the twin goals of economic development and emissions reductions by allowing each nation to determine the costs it would accept; and also by establishing a mechanism by which the developed nations would provide funds for greenhouse gas reduction actions by developing nations. What remains to be seen is whether any voluntary program can successfully reduce emissions sufficiently to meet the UNFCCC goal of holding the increase in global temperatures to 2 degrees C.

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Introduction: The Three Cs

The nature of greenhouse gas (GHG) emissions (particularly carbon dioxide (CO_2) emissions) makes their control difficult to integrate with the U.S. economy and traditional U.S. energy policy. There is a strong linkage between industrialization and GHG emissions, particularly between energy consumption and GHG emissions. In 2008, energy-related activities contributed 86% of U.S. greenhouse gases. Despite the obvious interrelationship between energy policy and greenhouse gas (GHG) emissions, the United States has struggled to integrate the two. For a country that has traditionally used its cheap supply of energy to substitute for more expensive labor and capital costs to compete internationally, this linkage is particularly strong, as witnessed by the nation's high GHG emissions per capita. The country continues to increase how efficiently it uses energy to create economic goods and services, thus reducing energy-related emissions per unit of output. Two factors contributing to this trend are a two-decade preference for using natural gas (rather than coal) for new electric generating facilities and a steady structural change in the economy away from heavy manufacturing and toward high technology and services. Overall, however, U.S. GHG emissions rose from about 6 billion metric tonnes in 1990, to about 7 billion metric tonnes in 2008.[1]

In the face of this economic reality, along with continuing scientific uncertainty, debate over a greenhouse gas (GHG) reduction program can be categorized by three inter-related Cs: **C**ost, **C**ompetitiveness, and **C**omprehensiveness. In the debate each of these terms frequently represents a "sound-bite" for a concern; but in program development, each represents an interwoven complex of issues.

Cost, as a sound-bite, commonly refers to some monetary estimate of what a GHG reduction program would require, typically expressed as a gross dollar amount or as a percentage reduction in gross domestic product for some period of time. Costs most often are cited by a number or percentage, but costs actually embrace a multifaceted set of changes in economic relationships, involving producers, consumers, and government entities. At a program level, "costs" have many ramifications: federal outlays for research and monitoring; regulatory program operation and oversight; potential public and private sector increases in expenses (for example if energy prices rise); and so on. Furthermore, in a nuanced view, costs would be offset by benefits. But benefits, such as commercialization of breakthrough technologies and reductions in related, more conventional pollutants (e.g., sulfur dioxide, nitrogen oxides, and mercury), can be difficult to quantify (and are frequently ignored).

Competitiveness, at the simplest level, most typically reflects concerns about what firms would be disadvantaged by cost increases as a result of GHG reduction requirements. More broadly, however, competitiveness reflects changes in the competitive relationships of producers of goods and services—some facing serious product cost and product substitution issues, others seeking to capitalize on new markets or new cost advantages resulting from legislation. Moreover,

[1] The first attempt to integrate energy and climate change policy, the Energy Policy Act of 1992, called for a least-cost energy strategy that would stabilize and eventually reduce U.S. GHG emissions. However, in 2008, U.S. emissions were 19% above the 1988 levels referenced in the law. Over time, periodic short-term drops in U.S. GHG emissions have been related more to short-term economic slowdowns rather than any suite of policy initiatives. While policy initiatives may have slowed the steady increase in emissions, they have not stopped it. The cost, competitiveness, and comprehensiveness challenges surrounding energy and climate change policy remain.

competitiveness concerns arise at both the domestic and international levels, depending on the details of the proposed legislation.

Comprehensiveness, in the debating arena, relates to the disconnect between individual national responses and a problem that is global in nature—particularly as an individual country's action or inaction affects international competitiveness and growth in GHG emissions. Specifically, if the United States were to require GHG reductions that impose costs on its industry while some other countries do not, domestic firms might be competitively disadvantaged, perhaps substantially, and global GHG emissions would not be significantly affected. Only a "comprehensive" GHG reduction requirement—all nations having to meet comparable GHG reduction requirements—would result in a "level playing field" in which no nation would be at a competitive disadvantage in world markets.[2] However, what would represent "comparable" GHG reduction requirements is problematic, given the diverse resource endowments and disparate economic conditions of the world's nations. The United Nations Framework Convention on Climate Change (UNFCCC) specifically provides for "differentiated" responsibilities between designated developed nations and developing nations with the developing countries taking the lead.[3] The complexity involved in developing a fair and effective comprehensive approach to reducing GHG emissions that encompasses these features has stymied the international community for almost two decades.

Because cost, competitiveness, and comprehensiveness are inter-related, **C**ost frequently becomes the overriding soundbite. Nevertheless, it should be recognized that the term *cost* alone may embody many ramifications.

UNFCCC: Containing the Three Cs with a Voluntary Commitment

Costs have been a major concern in GHG policy deliberations, beginning with U.S. negotiations on, and 1992 ratification of, the United Nations Framework Convention on Climate Change, and continuing to the current debate in Congress. During the protracted deliberations on the UNFCCC, the National Academy of Sciences (NAS) released a report, *Policy Implications of Greenhouse Warming*, in which the expert panel stated that "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."[4] The NAS's energy policy

[2] For a further discussion, see CRS Report R40100, *"Carbon Leakage" and Trade: Issues and Approaches*, by Larry Parker and John Blodgett.

[3] The UNFCCC states as its first principle in Article 3:

> The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

U.S. policymakers have struggled with the "common but differentiated responsibilities" of all nations and with the pledge for the developed countries to "take the lead in combating climate change." Under the UNFCCC and the subsequent Kyoto Protocol, common actions include the responsibility to monitor and report emissions; differentiated actions include the commitment to reduce emissions for designated developed nations (including the United States), listed on Annex I to the UNFCCC (and hence known as Annex I nations).

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

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.[5] 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.[6] 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.

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.[7]

Arguing that "the developed country Parties should take the lead" in reducing emissions, the Convention set the goal that developed countries 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.

The Energy Policy Act of 1992 (EPACT), P.L. 102-486, was 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 UNFCCC National Action Plan 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.[8]

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[5] 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.

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

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

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

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 included 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.[9]

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.[10]

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)]).

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 programs proposed in the National Energy Strategy[11] 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. These mostly voluntary

[9] The voluntary program of GHG reporting took over a decade to develop; see http://www.eia.doe.gov/oiaf/1605/. The current requirements were published in 71 *Federal Register* 20783-20817, April 21, 2006: 10 CFR Part 300 RIN 1901-AB11 Guidelines for Voluntary Greenhouse Gas Reporting.

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

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

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" scenario.[12]

The Clinton Administration followed a June 1993 White House Conference on Global Climate Change by issuing a new plan, *The Climate Change Action Plan*, in October 1993.[13] 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.[14] 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. They were designed to foster market choices that would conserve energy, increase energy efficiency, and encourage natural gas use. They were also designed to strengthen selected regulatory standards that concomitantly also reduced greenhouse gas emissions—such as

[12] 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.

[13] This plan became the basis for the 1994 submission to the UNFCCC.

[14] U.S. Department of Energy, *The Climate Change Action Plan: Technical Supplement*, Washington, D.C.: DOE/PO-0011. March 1994. As noted in footnote 15, actual U.S. greenhouse emissions for 2000 were 14.2% higher than 1990 levels.

landfill regulations that curtail methane releases. 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%. By 1997, revisions both to the reductions expected and to the baseline being used resulted in the projection that rather than emissions returning to their 1990 levels in the year 2000, emissions would in fact increase about 13% above 1990 levels.[15]

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.[16] 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, while enhancing productivity domestically and U.S. competitiveness aboard."[17] 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.

The U.S. and Kyoto: The Three Cs Prevent Mandatory Reductions

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 about the lack of comprehensiveness of reduction expections: 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.

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 S.Res. 98, expressing the sense of the Senate regarding the conditions under which the United States should become a signatory to any international

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

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

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

agreement on greenhouse gases under the UNFCCC.[18] 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 is not comprehensive, exempting 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.

That the Kyoto Protocol did not meet the conditions of S.Res. 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.

Although the Clinton Administration signed the Kyoto Protocol, it did not submit it to the Senate for ratification. Subsequently, the George W. Bush Administration abandoned both the Kyoto Protocol and its negotiation process. In a 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 was 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.[19]

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 emissions now exceed those in the developed countries.[20]

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

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

[20] Ibid.

In its 2006 action plan submitted under UNFCCC, the George W. Bush Administration outlined six principles in building a climate change policy:[21]

- 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.

These are principles that follow closely those that underlay the "no regrets" policy of the George H. W. Bush Administration and the initiatives of the Clinton Administration.

However, unlike the action plans developed by the George H.W. Bush and the Clinton Administrations, the George W. Bush Administration's plan made no attempt to suggest that it would achieve the UNFCCC goal of returning greenhouse gas emissions to their 1990 levels. In fact, the Administration's voluntary program shifted the focus from reducing greenhouse gas emissions per se to reducing the intensity of emissions per unit of economic activity.[22] As announced by President George W. Bush in February 2002,[23] 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.

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.[24]

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)."[25]

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

[22] Although the U.S. is basically tied with China as the world's largest emitter of greenhouse gases, the carbon efficiency of the U.S. economy is better than many.

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

[24] 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/.

[25] "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.

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—removing any perception that costs would be imposed.

While global climate change had been 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. Nevertheless, some Members did seek to inject explicit consideration of climate change into the debate on energy policy, and as a result, the issue of mandatory versus voluntary efforts to address global climate change was again debated. In 2003, a Senate bill (S. 139) that would have imposed a mandatory cap-and-trade greenhouse gas reduction program failed 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.

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 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 was estimated to reduce greenhouse gas emissions 19% below 2005 levels by 2020 and 63% below 2005 levels by 2050. The bill would have capped greenhouse gas emissions from the electric generation, industrial, transportation, and natural gas sectors. The program would have been implemented through an expansive allowance trading program to maximize opportunities for cost-effective reductions. However, an attempt to proceed to the bill and amendments on the Senate floor failed on a procedural vote.

Copenhagen: A Comprehensive but Voluntary Approach to the Three Cs

Domestic Positioning

As candidates, then-Senators Obama and Biden outlined several climate change initiatives in a "New Energy for America" plan,[26] highlighted by a pledge to "implement an economy-wide cap-and-trade program to reduce greenhouse gas emissions 80 percent by 2050." They also promised to "re-engage" the UNFCCC (with a Conference of Parties to meet in Copenhagen in December 2009 to negotiate a post-Kyoto program), to "invigorate" the Major Economies effort, to "establish a National Low Carbon Fuel Standard to speed the introduction of low carbon non-petroleum fuels," and to "instruct DOE to enter into public private partnerships to develop 5 'first-of-a-kind' commercial scale coal-fired plants with carbon capture and sequestration."

President Obama quickly signaled that his Administration was shifting directions. He appointed John Holdren, a strong proponent of engaging climate change, as Science Advisor; he designated an Assistant to the President for Energy and Climate Change and appointed former EPA Administrator Carol Browner to the post; and he nominated Steven Chu, a proponent of alternative energy research, to be the Secretary of Energy. Another signal was that on January 26, 2009, Obama sent EPA a memorandum directing the agency to reconsider the Bush Administration decision to disallow a California waiver so the state could regulate carbon dioxide emissions from autos.[27]

In this changed atmosphere, and with the UNFCCC process set to meet on post-Kyoto climate change actions in Copenhagen in December 2009, the House during the first session of the 111th Congress passed H.R. 2454, a 1,428-page bill addressing a number of interrelated energy and climate change issues. The bill would amend the Clean Air Act to establish a cap-and-trade program for greenhouse gas (GHG) emissions, beginning in 2012. The emissions cap would gradually decline until the year 2050, at which point the emissions cap for covered sources would be 83% below the level of 2005. The cap could be met by actual reductions in emissions or the purchase of offsets (reductions by sources not covered by the cap). In addition to the cap-and-trade program, the bill establishes renewable energy and energy efficiency requirements, mandates carbon capture and sequestration by new coal-fired electric generating units, and requires EPA to set GHG emission standards for various sources. The bill distributes the cap-and-trade program's emission allowances to a wide array of sectors in an effort to address potential impacts on low income households, protect industries that might be subject to import competition from countries with less stringent GHG requirements, and encourage the use of offsets.

Meanwhile, in the Senate, the Environment and Public Works Committee approved S. 1733, which would establish a cap-and-trade program similar to that in H.R. 2454, on November 5, 2009. Separately, the Energy and Natural Resources Committee reported on July 16, 2009, the

[26] http://my.barackobama.com/page/content/newenergy

[27] "In order to ensure that the EPA carries out its responsibilities for improving air quality, you are hereby requested to assess whether the EPA's decision to deny a waiver based on California's application was appropriate in light of the Clean Air Act. I further request that, based on that assessment, the EPA initiate any appropriate action." http://www.whitehouse.gov/the_press_office/Presidential_Memorandum_EPA_Waiver/

American Clean Energy Leadership Act (S. 1462), a comprehensive energy policy bill that would, among its provisions, establish renewable energy requirements for electric utilities, but would not establish a mandatory GHG control program.

But the momentum of 2009 began to flag as opponents to climate change legislation and critics of climate change control programs focused on the potential costs, on the competitive disadvantages that might ensue, and on the fast-rising emissions of the developing nations that meant any non-comprehensive agreement would fail to stop the increase in atmospheric concentrations of GHGs.

An especially confounding element of the debate concerned how to assess costs of the cap-and-trade program. From one perspective, this program—for which experience has been gained in the acid rain program of the Clean Air Act (Title V) and in the climate change program of the European Union—is intended to ensure the cost-effectiveness of emission reductions. In brief, a cap and trade program should reduce the costs of a "command and control" approach by allowing the most cost-effective reductions to be taken first. The program does so by creating a market in allowances for emitting GHGs and setting a cap on how many allowances are available. As a limited resource, the allowances have value; and emitters have the choice of reducing emissions, or buying allowances, whichever is in their economic interest. Overall, the total value of allowances in U.S. cap-and-trade program could reach many tens of billions of dollars per year. The confounding element is that the actual costs of reducing emissions are considerably less than the total value of the allowances: but in debate, the difference between control costs and allowance value has at times been misunderstood or misrepresented.[28] Measuring the cost of a climate change program by the value of allowances gives a much, much higher cost of addressing climate change than measuring the costs of control. Thus, a mechanism designed to reduce costs that would be imposed by a command and control regimen has in some debates been distorted into a massive cost.[29]

The citing of such large costs has combined with the rising emissions of developing countries, particularly China (which passed the United States as the world's largest emitter of GHGs in about 2005) to slow passage of control legislation.

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[28] See CRS Report R40809, *Climate Change: Costs and Benefits of the Cap-and-Trade Provisions of H.R. 2454*, by Larry Parker and Brent D. Yacobucci.

[29] This concern about costs has led some to promote the cost-limiting benefit of a carbon tax, either as the primary strategy or as a component of a tradeable permit system. 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 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 a carbon tax depends on how one views the uncertainty of costs involved and benefits to be received.

Although a carbon tax has long been favored by some in the academic community, in general there has been a perception that any greenhouse gas control approach that could be labeled a "tax" was politically infeasible. As a result, attention has focused on conjoining the cost-limiting feature of a carbon tax with the cap and trade system through a *safety valve* that would limit the upside risk of high permit prices. It should be noted, however, that in a hybrid system (such as cap and trade with a safety valve), ultimately one system will dominate. Either the safety valve will be too high so the cap-and-trade system operates without triggering it, or allowance prices become too high and the safety valve becomes a de facto carbon tax.

For further information, see CRS Report RL33799, *Climate Change: Design Approaches for a Greenhouse Gas Reduction Program*, by Larry Parker; and CRS Report R40242, *Carbon Tax and Greenhouse Gas Control: Options and Considerations for Congress*, by Jonathan L. Ramseur and Larry Parker.

International Initiatives

The crux of the 2009 Copenhagen Conference, to plot a post-Kyoto course for addressing global climate change, was how to engage the two largest emitters, the United States and China—the former having rejected Kyoto in part because developing nations were not obligated to curtail emissions; and the latter having become the world's largest emitter of greenhouse gases. Politically, while the George W. Bush Administration was a reluctant partner in the UNFCCC process, including early negotiations pointing toward Copenhagen, President Obama has been a vigorous proponent of engagement. At the Copenhagen Conference, he met twice with Chinese Premier Wen Jiabao in an effort to move the negotiations forward.

At Copenhagen, only a last-minute effort by a subset of nations, including the United States, led to an agreement. The outcome showed both some progress in bridging the gap between the developed and developing nations, and continuing difficulties in finding common ground on how to reduce greenhouse gas emissions. The accord[30] did not mandate specific reductions, but set a goal of reducing global emissions "so as to hold the increase in global temperature below 2 degrees C, and take action to meet this objective consistent with science and on the basis of equity." Developed, Annex I nations, including the United States, commit to implement "quantified economy-wide emissions targets for 2020" and non-Annex I nations, including China, commit to implement "mitigation actions." Both sets of nations commit to reporting and verification procedures "in accordance with guidelines adopted by the Conference of the Parties." (Monitoring, reporting, and verification were a key demand of the United States of developing nations.) Also, the accord contained the promise of $100 billion a year by 2020 "to address the needs of developing countries."

In the end, the Copenhagen agreement hinged on mitigating concerns about the costs of controlling GHG by making targets voluntary; and on getting comprehensive buy-in by allowing each country to set its own targets. The United States and China have submitted their commitments:

For the United States, the quantified emissions reduction target for 2020, from a baseline of 2005, is

> In the range of 17%, in conformity with anticipated U.S. energy and climate legislation, recognizing that the final target will be reported to the Secretariat in light of enacted legislation. [Note: The pathway set forth in pending legislation would entail a 30% reduction in 2025 and a 42% reduction in 2030, in line with the goal to reduce emissions 83% by 2050.][31]

For China, the nationally appropriate mitigation action of a developing country, is

> China will endeavor to lower its carbon dioxide emissions per unit of GDP by 40-45% by 2020 compared to the 2005 level, increase the share of non-fossil fuels in primary energy consumption to around 15% by 2020 and increase forest coverage by 40 million hectares and forest stock volume by 1.3 billion cubic meters by 2020 from the 2005 levels. [China's submission adds:] Please note that the above-mentioned autonomous domestic mitigation

[30] UNFCCC, *Report of the Conference of Parties on its Fifteenth Session*, held in Copenhagen December 7-19, 2009 [30 March 2010], http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf.

[31] http://unfccc.int/home/items/5264.php

actions are voluntary in nature and will be implemented in accordance with the principles and provisions of the UNFCCC, in particular Article 4, paragraph 7.[32]

The Three-Cs: Re-evaluating the Policy Assumptions

Three fundamental policy assumptions changed between the U.S. ratification of the 1992 UNFCCC and key events of the first decade of the 21st century—the George W. Bush Administration's 2001 decision to abandon the Kyoto Protocol process and the 2009 negotiations at Copenhagen.

First, 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 George H.W. 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?[33] The George W. 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.[34]

While the Obama Administration is moving ahead on climate change initiatives, at the same time its has recognized the cost issue—for example by addressing them through efficiency gains, through a cap-and-trade approach, and through the voluntary goals agreed to at Copenhagen.

But the technological breakthroughs on which the "low cost" presumption relies remain difficult to confirm; for many energy alternatives the actual experience is of continuing high costs and/or limited commercialization. But the presumption has never lacked critics; and their views—and to some extent, experience based on alternative energy costs—have rendered the "low cost" assumption tenuous in the eyes of many.

Second, the UNFCCC was debated and ratified at a time when salient **competitiveness** issues were as much focused on Japan[35] and Europe as on developing nations. However, since these

[32] http://unfccc.int/home/items/5265.php

[33] 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.

[34] President George W. Bush, *Letter to Senators Hagel, Helms, Craig, and Roberts*, Office of the Press Secretary, March 13, 2001.

[35] E.g., Clyde V. Prestoweitz, Jr., *Trading Places: How We Are Giving our Future to Japan and How to Reclaim It* (continued...)

countries ratified the Kyoto Protocol, and the European Union (EU), in particular, has begun implementing reduction policies, the issue with U.S. competitiveness among Annex I nations has been addressed. Indeed, it is the EU that has raised the prospect of a trade barrier with the United States because of the lack of U.S. carbon policies, not the other way around. Instead, those concerns about international competitiveness have refocused on rapidly growing economies in the developing world, particularly those of India and China.[36] In response to these concerns, competitiveness has received specific attention in legislation introduced in both the House and Senate; legislation that contains provisions providing financial assistance to firms that might be adversely affected by climate change mandates, and requirements that could affect imports from nations without comparable climate change mandates.[37]

And third, the UNFCCC was debated and ratified at a time when the developed, Annex I nations dominated GHG emissions; at that point, it was assumed **comprehensiveness** could be delayed as non-Annex I nations pursued greater economic development and while more environmentally friendly technologies were commercialized and transfered to them. However, time has begun to overtake this strategy. In 2005 China passed the United States to become the world's largest emitter, and 9 of the 20 largest GHG emitting countries were non-Annex I countries. Without a comprehensive approach, any reductions in emissions from developed countries could be offset by emission increases by developing countries. The UNFCCC's twin goals of reducing GHG emissions and preserving the right for non-Annex I nations to pursue traditional economic policies is increasingly challenged. Annex I countries' promises to provide financial and technical assistance have yet to produce the desired results, and the situation may require more fundamental changes in the relationship between Annex I and non-Annex I countries.

Copenhagen tried to preserve the twin goals by allowing each nation to set its own emissions reduction (Annex I) or mitigation action (non-Annex I) goal—thereby allowing each nation to determine the costs it would accept; and also by establishing a mechanism by which the developed nations would provide funds for GHG reduction actions by non-Annex I nations. What remains to be seen is whether any voluntary program can successfully reduce GHG emissions sufficiently to meet the goal of holding the increase in global temperatures to 2 degrees C. What also remains to be seen is whether the Agreement's provision by which Annex I countries set actual reduction targets, while non-Annex I countries establish nationally appropriate mitigation actions, will be enough to lessen the competitiveness and comprehensiveness concerns—given that the mitigation actions, such as China's, will not necessarily actually reduce emissions.

The Kyoto Protocol is now being implemented, and as a policy initiative it represents an effort to resolve the failure of developed nations to voluntarily reduce emissions, as agreed to in the original UNFCCC. Also, the Kyoto process is providing experience in programs for reducing emissions, such as the European emissions trading scheme. The question is whether the lessons learned will inform a truly global effort beyond 2012. Likewise, it remains to be seen what the Copenhagen agreement will lead to; just as it remains to be seen what the world's two largest

(...continued)

(1989).

[36] E.g., Martin Jacques, *When China Rules the World: The End of the Western World and the Birth of a New Global Order* (2009).

[37] CRS Report R40914, *Climate Change: EU and Proposed U.S. Approaches to Carbon Leakage and WTO Implications*, by Larry Parker and Jeanne J. Grimmett.

emitters, China and the United States, will do—whether the goals that they have submitted under the Copenhagen agreement will be met.

In ratifiying the UNFCCC, the United States committed itself to lead, along with other developed countries, in reducing emissions of greenhouse gases. Meeting that commitment while addressing the cost, competitiveness, and comprehensiveness issues that commitment raises has proven elusive over the past two decades. Success may depend on not only crafting appropriate domestic responses, but also on the attitudes and actions of other major greenhouse gas emitters and whether they reinforce or detract from domestic initiatives.

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