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Climate Change: Federal Laws and Policies Related to Greenhouse Gas Reductions

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Summary

Climate change is generally viewed as a global issue, but proposed responses generally require action at the national level. In 1992, the United States ratified the United Nations' Framework Convention on Climate Change (UNFCCC), which called on industrialized countries to take the lead in reducing greenhouse gases. Over the past decade, a variety of voluntary and regulatory actions have been proposed or undertaken in the United States, including monitoring of electric utility carbon dioxide emissions, improved appliance efficiency, and incentives for developing renewable energy sources. This report provides background on the evolution of U.S. climate change policy from ratification of the UNFCCC to the Bush Administration's 2001 rejection of the Kyoto Protocol, and up to the present. The report focuses on major regulatory programs that monitor or reduce greenhouse gas emissions, along with their estimated effect on emissions levels. Additionally, proposed legislation in the 109th Congress calling for monitoring or reducing greenhouse gas emissions is identified and examined.

The earlier Bush, Clinton, and current Bush Administrations have largely relied on voluntary initiatives to reduce the growth in greenhouse gas emissions. This focus is particularly evident in the current Administration's 2002 Climate Action Report (CAR), submitted under the provisions of the UNFCCC. Of the 50-plus programs summarized in the 2002 CAR, six are described as "regulatory." However, this small subset of the total U.S. effort accounts for a large share of greenhouse gas emission reductions achieved over the past decade. In general, these efforts were established and implemented in response to concerns other than climate change, such as energy efficiency or air quality.

Proposals to advance regulatory or market-oriented programs that reduce greenhouse gases have been introduced in the 109th Congress. These efforts have generally followed one of three tracks. The first would improve the monitoring of greenhouse gas emissions as a basis for research and development and any future reduction scheme. The second would enact a market-oriented greenhouse gas reduction program along the lines of the current acid rain reduction program established by the 1990 Clean Air Act Amendments. The third would enact energy and related programs, such as appliance efficiency standards, that would also have the effect of reducing greenhouse gases.

Omnibus energy legislation in the 109th and earlier Congresses has included provisions indirectly related to greenhouse gas emissions, such as energy efficiency and renewable energy. Other legislation has been introduced to establish mandatory emissions reductions, create mandatory or voluntary emissions registries, tighten efficiency standards for appliances and automobiles, and/or establish requirements for the use of renewable energy. This report will be updated as events warrant.

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Introduction

Climate change is generally viewed as a global issue, but proposed responses generally require action at the national level. In 1992, the United States ratified the United Nations' Framework Convention on Climate Change (UNFCCC) which called on industrialized countries to take the lead in reducing greenhouse gases. Over the past decade, a variety of voluntary and regulatory actions have been proposed or undertaken in the United States, including monitoring of utility carbon dioxide emissions, improved appliance efficiency, and incentives for developing renewable energy sources.

In 2001, President George W. Bush rejected the Kyoto Protocol to the UNFCCC, which called for legally binding commitments by developed countries to reduce their greenhouse gas emissions.[1] He also rejected the concept of mandatory emissions reductions. Since then, the Administration has focused U.S. climate change policy on voluntary initiatives to reduce the growth in greenhouse gas emissions. This focus is particularly evident in the Administration's 2002 Climate Action Report (CAR) submitted under the provisions of the United Nations' Framework Convention on Climate Change (UNFCCC). Of the over 50 programs summarized in the 2002 CAR, only six are described as "regulatory."[2] These regulatory programs were generally implemented to achieve energy or environmental goals other than the reduction of greenhouse gas emissions, but produced a concomitant emissions reduction. In this sense, they could be considered the results of a "no regrets"[3] policy where climate change effects resulting from related air quality and energy policies are included in the decision-making process on new or modified rules.

A number of congressional proposals to advance programs that reduce greenhouse gases have been introduced in the 109th Congress. These efforts have generally followed one of three tracks. The first would improve the monitoring of greenhouse gas emissions — as a basis for research and development and any future

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[1] For further information see CRS Report RL30692, *Global Climate Change: The Kyoto Protocol.*

[2] Most of the programs outlined in the report involve research, technical assistance, information gathering, or technical assistance programs initiated by the federal government, or voluntary emissions reduction programs coordinated by the government.

[3] The "no regrets" policy was one of establishing programs for other purposes, that would have concomitant greenhouse gas reductions. Therefore, only those policies that reduced greenhouse gas emissions at no cost were considered.

reduction scheme. The second would enact a market-oriented greenhouse gas reduction program along the lines of the trading provisions of the current acid rain reduction program established by the 1990 Clean Air Act Amendments. The third would enact energy and related programs that would also have the added effect of reducing greenhouse gases. An example would be a requirement that electricity producers generate a portion of their electricity from renewable resources (a renewable portfolio standard).

This report provides background on the evolution of U.S. climate change policy from ratification of the UNFCCC to the current Bush Administration's rejection of the Kyoto Protocol programs, to the present. Current major regulatory programs that monitor or reduce greenhouse gas emissions are identified, along with their estimated effect on greenhouse gas emissions. Finally, proposed legislation in the 109th Congress to monitor or reduce greenhouse gases (directly or indirectly) is identified and discussed.

Background to Federal Climate Change Policy: From "No Regrets" Back to "No Regrets"

The International Framework. U.S. policy toward global climate change evolved from a "study only" to a "study and action" orientation in 1992 with completion of the UNFCCC in Rio de Janeiro.[4] Both nationally and internationally, much of the debate over policies to address climate change has focused on energy use, because fossil fuel consumption is the main source of greenhouse gas emissions in most countries. During the deliberations on the UNFCCC, the National Academy of Sciences (NAS) released a report on global warming. In this report, *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."[5] The NAS's energy policy recommendations focused on increasing energy conservation and efficiency, incorporating global warming as a factor in future energy planning, and studying and eventually implementing "full social cost pricing" of energy.

Although the report was widely publicized, its recommendations were not applied.[6] Driven by concerns about scientific uncertainty and the potential costs to the economy of measures to reduce greenhouse gas emissions, the previous Bush

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[4] For further information on global climate change, see the CRS Issue Brief IB89005, *Global Climate Change.*

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

[6] For a review of the UNFCCC negotiations, see archived CRS Report 92-374, *Earth Summit Summary: United Nations Conference on Environment and Development (UNCED), Brazil, 1992*, available from Brent Yacobucci and Larry Parker upon request. For previous activities, see archived CRS Report 98-431, *Global Climate Change: A Concise History of Negotiations and Chronology of Major Activities Preceding The 1992 U.N. Framework Convention*, also available from Brent Yacobucci and Larry Parker.

Administration — contrary to the views of most environmentalists and some vocal Members of Congress — refused to agree to the negotiation of a binding agreement to reduce the nation's CO_2 emissions by a specific date. The UNFCCC reflects the negotiating position of the United States and many other countries in that it called only for voluntary control measures. Senate floor debate on ratification of the UNFCCC brought out concerns by some Senators about the *cost* of compliance, its impact on the country's economic *competitiveness*, and the *comprehensiveness* with respect to the omission of reduction commitments for developing countries — concerns that were lessened because of the non-binding nature of the reduction goals.[7] Those arguing for emissions controls argued that controls could create jobs and enhance economic health, and that high emissions indicated inefficiency.

Asserting that "the developed country Parties should take the lead" in reducing emissions, the UNFCCC set the goal that developed countries aim to return their greenhouse gas emissions to 1990 levels by the year 2000.[8] In line with this goal, developed countries agreed in principle to adopt national plans and policy options to mitigate climate change by reducing anthropogenic emissions and enhancing sinks. The United States submitted such plans in 1992, 1994, 1997, and 2002, as discussed below.[9]

Developing Programs: EPACT and Climate Action Plans. The Energy Policy Act of 1992 (EPACT)[10] is the principal statutory basis for programs that constitute the U.S. response to the UNFCCC.[11] Programs developed pursuant to EPACT, including appliance energy efficiency standards and updated building codes, are discussed below. Primarily crafted as part of an energy policy response to the Persian Gulf War of 1991, its energy conservation, renewable energy, and other titles were also seen as having a beneficial effect on global climate change concerns being debated at that time in international circles. In its 1992 submission to the UNFCCC, the previous Bush Administration listed 11 different titles of EPACT as "extremely important" to its overall strategy of reducing greenhouse gases.[12]

The previously referenced 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

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

[8] *United Nations Framework Convention on Climate Change (UNFCCC)*, Article 3, Section 1.

[9] For a more detailed discussion, see Larry B. Parker and John E. Blodgett, *Global Climate Change Policy: Cost, Competitiveness, and Comprehensiveness*, CRS Report RL30024.

[10] For a summary of provisions, see *Energy Policy Act of 1992: Summary and Implications*, CRS Report 93-134.

[11] The other primary source of greenhouse-gas related regulations is the Clean Air Act, particularly the 1990 Amendments. Clean Air Act regulations — concerning mandatory carbon dioxide monitoring by electricity generators, landfill emissions reductions, and the control of ozone depleting substances — are discussed below.

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

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 Title XVI aims to incorporate global warming concerns in energy policy planning. It was designed to assist the government in making informed decisions on global warming by authorizing DOE to collect, analyze, and report information on climate change. DOE activities included preparing 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 gas emissions and early reductions in such emissions.

Indeed, EPACT's authors anticipated that it would help 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, alternative fuels and coalbed methane are also significant.[13]

The notion that the United States could meet modest CO_2 emission reduction goals at little or no cost underlies many of the global climate change initiatives during the previous Bush and Clinton Administrations, including the previous Bush Administration's "No Regrets" policy and 1992 Climate Action Plan, and the Clinton Administration's 1994 and 1997 Climate Action Plans.[14] Using such an approach to climate change policy, neither of these administrations requested regulatory authority from Congress to implement a climate change policy. Both advocated strategies of undertaking governmental implementing actions that could be done administratively, (unless Congress legislated otherwise) and of creating incentives for private industry to voluntarily undertake emissions reduction initiatives.

The Clinton Action Plans were similar to the plan 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

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

[14] 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.

were also designed to strengthen selected regulatory standards that concomitantly also reduced greenhouse gas emissions — such as landfill regulations that curtail methane releases. Several actions in the 1994 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 to ride transit, car pool, or find other ways to commute; and a program to promote more efficient nitrogen fertilizer use.[15]

Rejection of the Kyoto Protocol. As it became clear that the voluntary 1992 greenhouse gas emission reduction goals would not be met, parties to the UNFCCC began negotiations that culminated in the 1997 Kyoto Protocol to the UNFCCC. This protocol outlined legally binding emissions reductions for developed countries to specified amounts below 1990 levels, averaged over the years 2008 to 2012. The Clinton Administration committed to a 7% reduction below 1990 levels. The Kyoto Protocol, if it had been submitted to the Senate and ratified, would have changed the U.S. commitment from a voluntary one to a binding commitment. Critics of the Kyoto Protocol raised concerns similar to those debated in connection with the UNFCCC in 1992: concerns about cost, comprehensiveness, and competitiveness. The possibility of failing to comply with a binding commitment intensified the focus on potential costs of the U.S. global climate change policy. The United States, along with most of the world, failed to meet the goal set at Rio of returning 2000 emissions to the level that existed in 1990; a fact that raises questions about the premise that significant greenhouse gas reductions can be achieved at little or no costs.[16] For those who believe substantial reductions in greenhouse gas emissions would entail substantial costs, the Kyoto Protocol's potential costs lead to concerns about its effects on the country's competitiveness and its exclusion of developing countries from mandatory emission reductions (comprehensiveness).

That cost, competitiveness, and comprehensiveness remain pivotal factors in climate change policy is illustrated by the current Bush Administration's rejection of the Kyoto Protocol early in 2001. 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 large developing countries from its emissions reduction provisions. This "comprehensiveness" concern was closely followed by "cost" and "competitiveness" concerns. President Bush stated:

> 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

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[15] President Clinton and Vice President Gore, *The Climate Change Action Plan*, White House, October 1993.

[16] Indeed, U.S. emissions of greenhouse gases were 14% above 1990 levels in the year 2000. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, Washington, D.C., April 2002, p. ES-3.

> 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.[17]

To respond to global climate change, President Bush called for a new approach focused on science and on 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 citizens 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.[18]

The Administration's 2001 proposal initiated a new voluntary greenhouse gas reduction program, similar to ones introduced in previous administrations. The plan focuses on improving the carbon intensity of the economy, reducing current emissions of 183 metric tons of carbon equivalent per million dollars of GDP to 151 metric tons per million dollars of GDP by 2012. The plan proposed several voluntary initiatives, along with increased spending and tax incentives, to achieve this goal. However, the Administration stated that three-quarters of the projected reduction would be achieved through current efforts underway, not by new initiatives. The Administration projected that by 2010, the program could result in an emissions reduction of approximately 4.5% relative to "business as usual." However, this level would still be approximately 28% higher than the 1990 level defined by the UNFCCC. Further, without explicit requirements, it is unclear whether the targets set by the Administration will be met.

A key piece of the Administration's proposal was announced on February 12, 2003.[19] Climate, Voluntary Innovative Sector Initiatives: Opportunities Now (Climate VISION) was created in response to President Bush's goal of reducing greenhouse gas intensity of the U.S. economy.[20] Climate VISION aims to assist energy-intensive sectors in developing plans to reduce greenhouse gas intensity, and to publicly recognize the efforts of those sectors.

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

[18] Ibid.

[19] Environmental Protection Agency, *Bush Administration Launches "Climate VISION."* February 12, 2003.

[20] Greenhouse gas intensity is a measure of emissions per unit of economic activity (often expressed as tons of emissions per thousand or million dollars of Gross Domestic Product). For more on greenhouse gas intensity, see CRS Report 98-235, *Global Climate Change: U.S. Greenhouse Gas Emissions — Status, Trends, and Projections.*

Regulatory Programs Affecting Emissions of Greenhouse Gases

As described above, current federal actions with respect to greenhouse gases focus on research, information, and voluntary programs. Each of the Climate Action Reports submitted by the United States to the UNFCCC has included a compilation of the several dozen programs that various administrations have felt are relevant to reducing U.S. greenhouse gas emissions.[21] Regulatory measures that have reduced greenhouse gas emissions are a small subset of the total U.S. effort numerically, but are responsible for a proportionally larger share of greenhouse gas emission reductions.[22] In general, they were established and implemented primarily for reasons other than climate change concerns. This is a "no regrets" policy in action. The list of federal regulatory programs discussed here is primarily drawn from activities listed by the George W. Bush Administration in its most recent (2002) submission to UNFCCC.[23] The submission to UNFCCC focuses on mandatory programs, but numerous voluntary programs have also been implemented over the past ten years. This section discusses the six regulatory programs listed in the Climate Action Report, as well as one additional regulatory program (automotive fuel economy standards) not included in the list.

Monitoring Rules

Carbon Dioxide Monitoring by Electric Generating Facilities. Section 821 of the 1990 Clean Air Act Amendments requires electric generating facilities affected by the acid rain provisions of Title IV to monitor carbon dioxide in accordance with EPA regulations.[24] This provision was enacted for the stated purpose of establishing a national carbon dioxide monitoring system.[25] As promulgated by EPA, regulations permit owners and operators of affected facilities to monitor their carbon dioxide emissions through either continuous emission monitoring (CEM) or fuel analysis.[26] The CEM regulations for carbon dioxide are similar to those for the acid rain program's sulfur dioxide CEM regulations. Those choosing fuel analysis must calculate mass emissions on a daily, quarterly, and annual basis, based on amounts and types of fuel used.

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[21] For the most recent compilation, see U.S. Department of State, *U.S. Climate Action Report*, Washington, D.C., May 2002.

[22] For example, EPA regulations on landfills and Significant New Alternatives Policy Determinations (SNAP) account for 65 million metric tons of the 242 million metric tons (carbon dioxide equivalent) in claimed reductions by the George W. Bush Administration for the year 2000 (27% of total). U.S. Department of State, *U.S. Climate Action Report*, Washington, D.C., May 2002. Both the landfill regulations and SNAP are discussed below.

[23] Ibid.

[24] Section 821, *1990 Clean Air Act Amendments* (P.L. 101-549, 42 USC 7651k).

[25] S.Rept. 101-952.

[26] See 40 CFR 75.13, along with appendix G (for CEMs specifications) and appendix F (for fuel analysis specifications.

Although this regulation does not actually reduce carbon dioxide emissions, it does expressly target the global climate change issue. Also, it represents a necessary first step toward any future market-oriented greenhouse gas reduction program. Whether a market-oriented control program were to be based on tradeable emissions credits or a carbon tax, accurate emissions data would be the foundation for developing the allocation systems, reduction targets, and enforcement provisions.

Energy and Environmental Programs Related to Emissions Reductions

Emissions Reductions from Landfills. Section 305 of the 1990 Clean Air Act Amendments requires EPA to control emissions of a variety of air pollutants from new and existing large solid waste landfills.[27] Specifically, the section requires EPA to promulgate New Source Performance Standards (NSPS) for new municipal solid waste landfills, and emissions guidelines for existing landfills to reduce emissions of non-methane organic compounds (NMOC), including ozone-producing volatile organic compounds (VOCs) and air toxics. Regulations promulgated in 1996 require large landfills that emit landfill gases in excess of 50 megagrams per year to control emissions.[28]

The primary driver for the landfill regulations was reducing formation of ground/surface level ozone (smog), and air toxics. However, in promulgating the rule, the Clinton Administration noted that landfills were the largest U.S. source of emissions of the greenhouse gas methane (40%), and that the rule would have the indirect benefit of reducing methane emissions by 50%, equivalent to a 37.1 million metric ton reduction in carbon by the year 2000.[29] In its 2002 Climate Action Report, the current Administration estimated that the year 2000 methane emissions reductions achieved by the rule were 15 million metric tons of carbon dioxide equivalent, predicted to increase to 33 million metric tons by 2010.[30]

Significant New Alternatives Policy (SNAP) Determinations. Because many ozone-depleting substances are also greenhouse gases (such as perfluorocarbons), efforts to protect the ozone layer also tend to reduce greenhouse gas emissions. Title VI of the 1990 Clean Air Act Amendments represents the United States' primary response on the domestic front to the ozone depletion issue.[31]

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[27] Landfill gas contains methane, carbon dioxide, and numerous Non-methane Organic Compounds (NMOC), including vinyl chloride, toluene, and benzene.

[28] *61 Federal Register* 9905-9944 (March 12, 1996)

[29] EPA, *Fact Sheet: Final Air Regulations for Municipal Solid Waste Landfills*, March 1, 1996. This is due to the fact that techniques to reduce methane and non-methane organic compounds are basically the same.

[30] U.S. Department of State, *U.S. Climate Action Report 2002*, Washington D.C., May 2002, p. 60.

[31] There is a complex scientific relationship between ozone depletion, ozone-depleting chemicals and climate change. This section focuses on the global warming potential of various substitutes being used in place of the ozone-depleting chemicals banned under the

(continued...)

It also implements this country's international responsibilities under the Montreal Protocol to Reduce Ozone-Depleting Substances.[32] Section 612 requires EPA to develop a program to identify alternatives to ozone depleting substances banned under the Montreal Protocol. In determining the acceptability of an alternative, EPA is to assess the overall risk to human health or the environment that the alternative poses, compared with other alternatives. In promulgating the implementing regulation for the program in 1994, EPA identified increased global warming as one of the risk criteria that it would use in determining the acceptability of an alternative.[33]

Under the regulation, EPA has restricted or narrowed the use of hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) where alternatives with lower global warming potentials exist. EPA estimates that the restrictions reduced greenhouse gas emissions by 50 million metric tons of carbon dioxide equivalent in 2000, and projects a further reduction of 156 million tons (for a total of 206 million tons) by 2010.[34]

Residential Appliance Standards. The 1987 National Appliance Energy Conservation Act (NAECA)[35] set minimum efficiency standards for many major appliances.[36] The Energy Policy Act of 1992 (EPACT) expanded the list of covered appliances and allowed for future standards development for other products.[37] Under NAECA and EPACT, the Department of Energy must develop mandatory energy efficiency standards for these appliances, and review them in accordance with a statutorily set schedule to determine whether they are sufficiently stringent. DOE is required to set standards designed to achieve the maximum improvement in energy efficiency it believes is "technically feasible and economically justifiable."[38]

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[31] (...continued)
Montreal Protocol, not on the global warming potential of the banned ozone-depleting chemicals themselves.

[32] It should be noted that emissions controlled under the Montreal Protocol are separate from those controlled by the Kyoto Protocol, and any reductions in ozone-depleting compounds would not count toward Kyoto Protocol targets.

[33] 59 *Federal Register* 13049 (March 18, 1994).

[34] U.S. Department of State, *U.S. Climate Action Report 2002*, Washington D.C., May 2002, p. 209.

[35] P.L. 100-12.

[36] As amended in 1988, appliances included refrigerators, refrigerator-freezers, freezers, room air conditioners, fluorescent lamp ballasts, incandescent reflector lamps, clothes dryers, clothes washers, dishwashers, kitchen ranges and ovens, pool heaters, television sets (withdrawn in 1995), and water heaters.

[37] Additional appliances included commercial building heating and air conditioning equipment, water heaters, certain incandescent and fluorescent lamps, distribution transformers, and electric motors.

[38] *10 CFR Chapter II, Part 430.* For a summary of resulting standards, see [http://www.eere.energy.gov/buildings/appliance_standards/residential_products.html].

The primary driver for residential appliance standards has been energy conservation. In 1997, the Clinton Administration estimated that the appliance standards would save almost a quad (1 quadrillion Btu) of energy, resulting in a 21.6 million metric ton reduction in carbon emissions by the year 2010.[39] The current Bush Administration has provided no specific estimate for carbon emission reductions from residential appliance standards. However, for the entire category of commercial and residential energy, the Bush Administration in the 2002 Climate Action Report estimates reductions of 56.8 million tons of carbon dioxide in 2002.[40]

Updating State Commercial Building Codes. Section 101 of EPACT requires DOE to review and update provisions of the commercial building code with respect to energy efficiency.[41] Specifically, DOE is directed to determine whether revisions to the ASHRAE[42] Standard 90.1 — 1989 (and any future revisions) would improve energy efficiency in commercial buildings. If DOE determines that revisions would improve energy efficiency, states are required to review and update their commercial building codes accordingly, with respect to improving energy efficiency. In July 2002, DOE determined that ASHRAE/IESNA Standard 90.1 — 1999 would save energy in commercial buildings.[43] Thus, states were required to review and update their commercial building codes by July 15, 2004.[44]

In announcing its July 2002 determination, the DOE focused on the energy savings that state adoption of the standard would entail, estimated at 130 million barrels of oil equivalent over 10 years.[45] The DOE announcement does not mention any carbon dioxide reduction that could result from the improved energy efficiency. In its Climate Action Plan, the current Bush Administration provides no specific estimate concerning carbon dioxide emissions reductions from updating commercial building codes.[46] However, any real reduction in fossil fuel use would have concomitant greenhouse gas emissions reductions.

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[39] U.S. Department of State, *U.S. Climate Action Report 1997*, Washington D.C., July 1997, p. A-7.

[40] U.S. Department of State, *U.S. Climate Action Report 2002*, Washington D.C., May 2002, p. 64.

[41] Section 101, *1992 Energy Policy Act*, P.L. 102-486. The section contains provisions for updating residential building codes; however, those provisions only require states to review any DOE determination with respect to updating codes. Adoption of the revisions is not mandatory.

[42] American Society of Heating, Refrigeration, and Air Conditioning Engineers.

[43] 67 *Federal Register* 46464 (July 15, 2002).

[44] As of March 2005, ten states had not updated their commercial building energy codes, according to the Building Codes Assistance Project. See [http://www.bcap-energy.org].

[45] DOE, *Energy Department Determines that Model Commercial Building Code Will Save Energy & Benefit Consumer*, July 15, 2002. Available at [http://www.energycodes.gov/implement/determinations_com_news.stm].

[46] U.S. Department of State, *U.S. Climate Action Report 2002*, Washington D.C., May 2002, p. 64.

Promoting Renewable Energy through PURPA. The 1978 Public Utility Regulatory Policies Act (PURPA) is designed to encourage the development of cogeneration and small power production (called "qualifying facilities" or QFs).[47] In particular, Section 210 contained a mandatory purchase clause requiring utilities to buy power from QFs at the utilities' avoided cost. PURPA exempted from the full breadth of federal and state regulation certain small power producers, including those using geothermal, solar, wind, and waste energy.[48] This regulatory exemption, along with the mandatory purchase requirement contained in Section 210, has proven to be a strong incentive for development of renewable energy, particularly biomass. QF renewable capacity represents a substantial majority of U.S. non-hydroelectric renewable energy capacity.[49] Congressional proposals to repeal section 210 are discussed below in the section on "Legislative Proposals in the 109th Congress."

PURPA was enacted to promote energy security through energy conservation and the development of alternative energy sources in the aftermath of the 1974 oil crisis. As events have unfolded, the effort to reduce dependence on fossil fuels has had the additional perceived benefit of reducing carbon dioxide emissions. In 1997, the Clinton Administration estimated that its renewable energy commercialization efforts with respect to biomass, geothermal, and wind would reduce greenhouse gas emissions by 17.6 million metric tons of carbon equivalent by the year 2010.[50] The current Bush Administration provides no specific estimate of reductions from the use of renewable energy in its Climate Action Report. However, for the general category of energy supply, the Administration estimated the year 2000 effect to have been a saving of 14.7 million metric tons of carbon dioxide equivalent.[51]

Transportation-Related Programs

Corporate Average Fuel Economy (CAFE). Although not listed as a regulatory program in the Administration's Climate Action Report, federal fuel economy standards directly affect greenhouse gas emissions from the transportation sector. The Energy Policy and Conservation Act of 1975 (EPCA) established corporate average fuel economy (CAFE) standards for new passenger cars, and gave the Department of Transportation (DOT) the authority to set standards for other vehicles, including "light trucks," which consist of pickups, vans, and sport utility

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[47] *P.L. 95-617* (1978)

[48] As originally enacted, the law limited most small power producers to 30 Mw, with geothermal energy limited to 80 MW. The Solar, Wind, Waste, and Geothermal Production Incentives Act of 1990 (P.L. 101-575) removed the size limitations.

[49] Energy Information Administration, *Renewable Energy 2000: Issues and Trends*, Washington, D.C., February 2001, p. 10.

[50] U.S. Department of State, *U.S. Climate Action Report 1997*, Washington D.C., July 1997, pp. A-23, A-24, and A-27.

[51] U.S. Department of State, *U.S. Climate Action Report 2002*, Washington D.C., May 2002, p. 65.

vehicles.[52] The goal of EPCA was to reduce the dependence on foreign oil after the Arab oil embargo of the 1970s. The current standard is 27.5 miles per gallon for passenger cars and 21.0 miles per gallon for light trucks.

Increasing CAFE standards would lead to reductions in fuel consumption and greenhouse gas emissions as older, less efficient vehicles were replaced with more efficient models. However, concerns associated with increased CAFE standards include questions of occupant safety and vehicle choice. In 1994, the Clinton Administration considered raising the CAFE standard for light trucks. However, Congress included language in the annual FY1996-FY2001 DOT Appropriations Acts[53] prohibiting the use of appropriated funds for any rulemaking on CAFE, effectively freezing the standards. However, the Senate conferees on the FY2001 appropriations insisted upon a study of CAFE by the National Academy of Sciences (NAS). That study, released on July 30, 2001, concluded that it would be possible to achieve a more than 40% improvement in light truck fuel economy over a 10 to15-year period at costs that would be recoverable over the lifetime of vehicle ownership, without compromising safety.

On April 1, 2003, the Department of Transportation announced a final rule to increase light truck CAFE standards to 22.2 miles per gallon by model year 2007.[54] DOT estimates that this measure will save approximately 3.6 billion gallons of gasoline over the life of the vehicles. This translates to an emission reduction of roughly 8 to 10 million metric tons of carbon equivalent.

Legislative Proposals in the 109th Congress

As evidenced in recent legislative proposals, some Members of Congress believe that additional emissions reduction efforts are needed. Therefore, several proposals have been introduced in the 109th Congress. These include bills on comprehensive energy legislation, greenhouse gas emissions monitoring and reduction programs, and programs to increased energy efficiency in various sectors.

Market-Oriented Emissions Reduction Programs

Greenhouse Gas Emission Reduction Legislation. Two companion bills introduced in the 109th Congress focus directly on reducing greenhouse gases emissions. S. 342, introduced by Senators McCain and Lieberman, and H.R. 759, introduced by Representatives Gilchrest and Olver, would cap emissions of carbon dioxide, at reduced levels, from electricity generation and from the industrial and commercial sectors. The bills would reduce emissions of the six greenhouse gases covered under the Kyoto Protocol from anticipated levels with an emissions cap in the year 2010 based on affected facilities' 2000 emissions (for any entity that emits

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[52] P.L. 94-163.

[53] P.L. 104-50 (FY1996), P.L. 104-205 (FY1997), P.L. 105-66 (FY1998), P.L. 105-277 (FY1999), P.L. 106-69 (FY2000), and P.L. 106-346 (FY2001).

[54] 68 *Federal Register* 16867-16900. April 7, 2003.

from a single facility more than 10,000 metric tons of greenhouse gases (carbon dioxide equivalent)) The program would be implemented through an expansive allowance trading program that would allow cross-sector trading, increases in carbon sequestration, and limited acquisition of allowances from foreign sources.[55]

Multi-Pollutant Legislation. Interest has been expressed in finding mechanisms to achieve public health and environmental goals in simpler, more cost-effective ways. One proposed approach is a "multi-pollutant" strategy — a framework based on a consistent set of emissions caps, implemented through emissions trading. During the 109th Congress, four bills have been introduced to reduce emissions from electric utility facilities.[56] Two of those bills include carbon dioxide among the emissions to be reduced.

S. 150, introduced by Senator Jeffords, is a modified version of the multi-pollutant bill (S. 556) reported out by the Senate Environment and Public Works Committee during the 107th Congress. Placing emission caps on nitrogen oxides, sulfur dioxide, and carbon dioxide, S. 150 would require electric generating facilities producing 15 MW or greater to meet an aggregate carbon dioxide emissions cap in the year 2010. The national emissions cap would be set at 1990 emissions levels for electric generating facilities, would be implemented through a tradeable allowance program, and would include significant penalties for non-compliance. In addition to these emission caps, S. 150 would place facility-specific emission limitations on mercury.

H.R. 1451, introduced by Representative Waxman, is similar to H.R. 2042 in the 108th Congress. Placing emission caps on nitrogen oxides, sulfur dioxide, and carbon dioxide, H.R. 1451 would require electric generating facilities producing 15 MW or greater to meet an aggregate carbon dioxide emissions cap in the year 2010. The national emissions cap would be set at 1990 emissions levels for electric generating facilities, and would be implemented through a tradeable allowance program. In addition to these emission caps, H.R. 1451 would place facility-specific emission limitations on mercury.

Based on the estimate provided by the Administration's climate change proposal, and using the 2002 *Climate Action Report*[57] (CAR) for projections to 2010, **Table 1** presents estimates of U.S. greenhouse gas emissions in 2010, assuming the Administration's voluntary program reaches its goals.[58] This should not be taken as a given, as neither the George H. W. Bush Administration's program nor the Clinton

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[55] For a further discussion, see CRS Report RS22076, *Climate Change: Summary and Analysis of the Climate Stewardship Act (S. 342 and H.R. 759)*, by Larry Parker.

[56] For a side-by-side comparison of these bills, see CRS Report RL32755, *Air Quality: Multi-Pollutant Legislation in the 109th Congress*, by Larry Parker.

[57] *Climate Action Report — 2002*, at [http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterPublicationsUSClimateActionReport.html]. This is the U.S. report to the UNFCCC Secretariat on U.S. emissions and measures taken to reduce them.

[58] For a discussion of emission projections and trends, see CRS Report 98-235 ENR, *Global Climate Change: U.S. Greenhouse Gas Emissions — Status, Trends, and Projections*.

Administration's program achieved their stated goals. Thus, in one sense, comparing a mandatory reduction program such as that proposed by S. 342/H.R. 759, S. 150, or H.R. 1451 with the Administration's voluntary program is comparing apples to oranges. The first is legally binding, the second is the expression of a planning goal.

While S. 150 and H.R. 1451 focus on electric utility emissions, the mandated reductions would result in lower total greenhouse gas emissions in 2010 than those projected to occur under the Administration's initiative that includes all sources of all greenhouse gases.[59] However, neither the Congressional proposals nor the Administration's initiative would be sufficient to bring U.S. emissions near the level committed to in the 1992 UNFCCC.

Table 1. Comparison of Administration's Voluntary Program with Proposed Legislation

	Percentage Change v. Business as Usual (2010)	Percentage Change v. 1990 levels per UNFCCC
S. 150	-7.5%	+24.2%
S. 342/H.R. 759*	-5.0%	+27.7%
H.R. 1451	-9.5%	+21.7%
Administration's Voluntary Program**	-4.4 to -4.5%	+28.3%
Business as Usual	0	+34.4%

Source: CRS calculations based on projections contained in 2002 CAR.
* Depending on S. 139's actual coverage and the implementation strategies employed by affected sources, reductions achieved by S. 342/H.R. 759 could be above the 5% estimate presented here. CRS estimates reductions based on 85% coverage and U.S.-only implementation would be about 8.8% below anticipated 2010 levels, 22.6% above 1990 levels.
**Assumes goal of the Administration's voluntary program is achieved in 2010, rather than 2012.

Emissions Monitoring Proposals

H.R. 955 (Olver) would require entities with yearly emissions of 10,000 metric tons or more of greenhouse gases (carbon dioxide equivalent) to monitor and report their greenhouse gas emissions. This bill would not require emissions reductions.[60]

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[59] The assessment assumes that the Administration's proposal actually achieves its goal in 2010, rather than 2012. Depending on S. 342/H.R. 759's actual coverage and implementation strategies employed by affected sources, achieved reductions could be greater than the 5% estimate presented in Table 1. CRS estimates reductions based on 85% coverage and U.S.-only implementation plans would be about 8.8% below anticipated 2010 levels, 22.6% above 1990 levels.

[60] H.R. 759 and S. 342, discussed above, would require reductions.

Omnibus Energy Legislation

The 109th Congress is currently working on omnibus energy legislation with provisions that are indirectly related to greenhouse gas emissions. On April 21, 2005, the House passed H.R. 6, the Energy Policy Act of 2005, and the Senate is expected to introduce a bill during the first session. H.R. 6 contains several greenhouse gas-related provisions, including provisions on appliance energy efficiency, renewable energy, and research development, and a repeal of the mandatory renewable energy purchase requirements under section 210 of PURPA.[61] The debate over the bill included proposals to increase CAFE standards and to establish a renewable portfolio standard.

Energy and Environmental Related Proposals

Renewable Portfolio Standard. One approach to reducing greenhouse gas emissions is to require the use of renewable energy resources in power generation. H.R. 983 (Udall) would require retail electric suppliers to produce 20% of their power from renewable resources by 2027. Renewable resources include solar, wind, geothermal, biomass, and incremental hydroelectric power. S. 427 (Jeffords) would require a standard of 20% by 2020.

Appliance Efficiency. Increasing appliance efficiency is seen as another way to reduce energy consumption and therefore reduce greenhouse gas emissions. H.R. 142 (Nussle) would establish tax credits for the purchase of certain energy-efficient appliances.

Transportation-Related Proposals

CAFE. Because transportation plays such a large role in U.S. dependence on oil as well as in greenhouse gas emissions, there has been continuing congressional interest in Corporate Average Fuel Economy (CAFE) standards. H.R. 705 (Gilchrest) would require an increase in light truck standards to 26.1 miles per gallon by 2011. H.R. 1103 (Nancy Johnson) would require the Environmental Protection Agency to update its CAFE test procedures to better reflect real-world conditions.[62]

Conclusion

Energy policy continues to be a key issue in the 109th Congress, as it was in 107th and 108th Congresses. High energy prices, international instability, and, to a lesser extent, concerns over greenhouse gas emissions have motivated greater interest

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[61] Proponents of renewable energy argue that repeal would reduce the role of renewables, while advocates of repeal argue that renewables no longer need economic intervention. For a more detailed discussion of PURPA, see CRS Report RL32728, *Electric Utility Regulatory Reform: Issues for the 109th Congress*.

[62] Currently, CAFE test procedures over-estimate actual in-use fuel economy. If in-use fuel economy were equal to CAFE ratings, fuel consumption would be significantly lower.

in developing comprehensive energy legislation. In addition to comprehensive bills, stand-alone bills have been introduced to directly address energy supply and demand issues.

With respect to proposed legislation to reduce greenhouse gas emissions, a common thread is their focus on energy supply and demand. This linkage is reflected in the current debate on these proposals. The CAFE standard, appliance efficiency, renewable portfolio standard, and other proposals would have a direct effect on fuel demand and choice, if enacted. Likewise, proposals directly focused on CO_2 emissions, including multi-pollutant bills, are being debated with respect to their impact on energy policy (particularly with respect to effects on natural gas and coal demand).

Given that energy consumption is the dominant source of carbon dioxide emissions in this country, and a substantial source of overall greenhouse gas emissions, any reduction in energy consumption will likely lead to lower emissions. As indicated below, energy-related activities are responsible for about 85% of the country's greenhouse gas emissions, and 96% of its carbon dioxide emissions. Any effective climate change policy directed at reducing greenhouse gas emission has to deal directly with energy consumption and, thus, be integrated with energy policy. Further, because at the present time energy supply and demand issues are seen as more pressing than climate change, the political climate favors action on general energy legislation, as opposed to legislation specifically targeting climate change.

Table 2. 2000 Energy-Related Greenhouse Gas Emissions

(million metric tons of CO_2 equivalent)

Greenhouse Gas	Energy-Related 2000 Emissions	Total U.S. 2000 Emissions	Energy as Percent of Total
Carbon Dioxide*	5,629	5,840	96%
Methane	211	615	34%
Nitrous Oxide	73	425	17%
HFC, PFC, SF6	14	121	12%
Totals	5,927	7,001	85%

Source: Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2000*, April 2002.
Note: Because carbon dioxide is by far the largest volume greenhouse gas, energy-related emissions are responsible for the majority of total greenhouse gas emissions.
*Biomass not included.

The last major energy bill to be enacted by Congress was the 1992 Energy Policy Act (EPACT). As noted in this report, climate change was an integral part of the debate on EPACT, occurring as it did during the signing and ratifying of the

UNFCCC.[63] Indeed, EPACT became the implementing legislation for the UNFCCC, and, as discussed in this report, those programs are responsible for much of the reduced growth in greenhouse gases achieved since 1992. Most federal policies and regulations that have resulted in greenhouse gas reductions were, in fact, promulgated as energy policy initiatives.

Climate change — as a specific issue — has yet to achieve an equivalent place in the current energy policy debate. The dissociation of energy policy and climate change policy could derive from a number of perceptions and actions: that the George W. Bush Administration has rejected the Kyoto Protocol; that the failure of the United States to achieve voluntarily its goals under UNFCCC seems to imply great potential costs of any emissions control programs; that climate change is not an immediate concern; that current efforts to reduce emissions are sufficient; or that no further initiatives are justified given present uncertainties about costs, risks, and benefits. However, if perceptions of the urgency of the climate change problem were to increase, either due to further research and understanding of the issue and its risks, or from an empirical event such as an abrupt change in climate, the need to reintegrate the energy-climate change policy debate might have to be considered.

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[63] For more on the relationship between UNFCCC and EPACT, see Larry Parker and John Blodgett, *Global Climate Change Policy: Cost, Competitiveness, and Comprehensiveness*, CRS Report RL30024.