CBO MEMORANDUM

CLIMATE CHANGE AND THE
FEDERAL BUDGET

August 1998

CONGRESSIONAL BUDGET OFFICE
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WASHINGTON, D.C. 20515

NOTE

Numbers may not add up to totals because of rounding. All years are fiscal years unless noted otherwise.

PREFACE

This Congressional Budget Office (CBO) memorandum was prepared at the request of the Senate Committee on the Budget to document current U.S. efforts in the area of global climate change and to review current federal spending programs and tax policies that relate to climate change. The memorandum also describes proposals contained in the President's 1999 budget for funding for those programs and several new tax policies. It should be helpful to policymakers as they consider options to respond to international proposals for reducing the threat of climate change. In accordance with CBO's mandate to provide objective and impartial analysis, the memorandum contains no recommendations.

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CHAPTER I
CLIMATE CHANGE: THE POLICY CHALLENGE AND CURRENT PROGRAMS

For over a decade, scientists and policymakers worldwide have debated how human activity affects the global climate and whether anything can or should be done about it. Some people believe that climate change poses a great risk to future generations and call for immediate action that could impose high costs on the economy and society at large. Other people believe that it is not a serious problem and can be dealt with if and when it occurs. Still others believe that the warmer temperatures that coincide with climate change might benefit the economy. Opinions about climate change reflect the uncertainties that surround it: about the science of the phenomenon itself; about the implications for people, economies, and ecosystems; and about the best policy for dealing with it. Further research can help inform policymakers but, as with other highly charged issues, decisions will have to be made before all the facts are in.

Since the mid-1980s, the United States has funded scientific research and monitoring efforts and participated in international negotiations and agreements, all centered around the global climate issue. In 1993, the government developed a set of voluntary programs to cut emissions of carbon dioxide and other greenhouse gases that scientists believe to be at the core of the problem.

But stronger measures would be needed to cut emissions significantly. In December 1997, representatives from the United States and other industrialized countries agreed to the Kyoto Protocol—a treaty with binding targets and timetables for reducing emissions of carbon dioxide and other greenhouse gases.[1] The reductions that the participants agreed to are a modest first step toward a goal of eventually stabilizing atmospheric concentrations of those gases, but some analysts believe that even those preliminary measures will be excessively costly to the U.S. economy.

The Kyoto Protocol requires ratification by the Senate. The Administration is postponing presentation of the Kyoto Protocol to the Senate to get "meaningful participation" from developing countries in the effort to limit emissions—something lacking in the treaty. Climate change is a global problem, and the United States and other industrialized countries will not succeed without global cooperation. Talks with developing countries are ongoing.

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1. Kyoto Protocol to the United Nations Framework Convention on Climate Change, FCCC/CP/1997/L.7/Add.1, Conference of Parties, Third Session, Kyoto, December 1-10, 1997 (available at http://www.unfccc.de/fccc/docs/cop3/07a01.pdf).

Even if some level of global cooperation is achieved and the treaty is presented to the Senate, the debate on climate change will have just begun. Policymakers face questions for which there are no certain answers: Should current sacrifices be made for uncertain future benefits? Who should pay for reductions in emissions? and What actions could lessen adjustment costs? If the treaty is ratified, future Congresses will have to consider authorizations and appropriations for particular programs to meet the treaty's targets and timetables.

This memorandum reviews current and proposed federal spending programs and tax policies that relate to climate change, their effects on the federal budget, and the Administration's proposals for funding them. Included in that inventory are activities that directly address climate change and those that are associated with climate change through their effects on emissions of carbon dioxide.

Federal regulatory activities could also affect climate change but are not included in this memorandum. The private sector bears most of the cost of regulation, so those figures do not show up in the federal budget; even the expenses of federal agencies to administer and enforce regulations are often offset by collections from the regulated industry and, hence, have little or no net budgetary impact. Although some regulations may affect energy use and emissions of carbon dioxide, none directly address climate change. That could change as policies evolve.

Sooner or later, policymakers will face major decisions on climate policy—particularly whether to limit carbon emissions and how to go about it. Those policy decisions will inevitably affect the budget. Sharply limiting emissions would have large near-term effects on the economy with ensuing consequences for federal revenues and outlays. The choice of a policy instrument could also have a large budgetary effect. Taxes to curtail use of fossil fuels, for example, could generate substantial revenues. The budgetary effects of tradable emissions allowances—a policy option in the Kyoto treaty—would depend on whether permits were distributed or auctioned. Ultimately, policy decisions that may be influenced by budgetary effects will be dominated by the larger question of the effects of policy actions, or of taking no actions, on the U.S. and world economies.

"DIRECT" AND "ASSOCIATED" SPENDING PROGRAMS AND TAX POLICIES

Programs and tax policies reported in this memorandum are divided into two categories, based on whether they are directly related to climate change or just associated with it. The first category includes spending programs and tax policies that are specifically designated by the Administration as climate change programs. The second category comprises programs that may affect climate change even though that may not be their primary purpose. Some of those programs may be intended to cut the use of fossil fuels—a goal shared with activities that are identified as climate

change programs. Others—particularly certain tax policies—may lead to an increase in the use of fossil fuels and thus contribute to carbon emissions, although, again, that is not their purpose.

The direct category comprises spending programs in the U.S. Global Change Research Program (USGCRP), the Climate Change Technology Initiative, and several international programs related to climate change. Budget authority for those programs in 1998 totals $2.9 billion (see Table 1). The USGCRP, which consists mainly of programs to discern the science and consequences of global change, was funded at about $1.9 billion in 1998—roughly 65 percent of funding for programs directly related to climate change. The President requested a substantial increase in 1999, to $3.4 billion, for all climate change programs, mostly for research and development in energy technology.

The Climate Change Technology Initiative also contains proposed changes in tax law. Those changes include several tax credits to encourage the development and adoption of new energy-efficient technologies in transportation, industry, buildings, and electricity. Estimated revenue losses associated with those tax proposals are $478 million in 1999, rising to nearly $1.3 billion by 2003. Those policy proposals and tax policies are discussed in more detail in Chapter 2.

The second category of programs are those associated with climate change primarily through their effects on the use of fossil fuels. Table 1 shows spending for a number of such programs, mostly in the areas of transportation, energy conservation, and nuclear energy research and development. Budget authority totals nearly $1.8 billion in 1998, and the request for 1999 is roughly the same. Those programs are discussed in more detail in Chapter 3.

Various taxes and tax preferences also influence the use of fossil fuels and, consequently, emissions of carbon dioxide. Tax preferences that may discourage the use of fossil fuel include credits, exclusions, and exemptions to encourage energy conservation, the development of alternative fuel supplies or energy-producing technologies, or both. Excise taxes on fossil fuels and activities related to transportation and travel exert a direct effect on energy use by applying upward pressure on prices, which, in turn, reduces demand. The estimated effects on revenues of tax preferences and excise taxes is quite large. But since the effects on climate change are largely incidental to the purposes of the programs and vary greatly by program, the total is not particularly meaningful.

TABLE 1. FEDERAL PROGRAMS DIRECTLY RELATED TO GLOBAL CLIMATE CHANGE OR ASSOCIATED WITH CLIMATE CHANGE (In millions of dollars of budget authority)

	1997	1998	Requested 1999	Change 1998-1999
Spending Programs and Tax Policies Directly Related to Climate Change				
U.S. Global Change Research Program[a]	1,818	1,867	1,864	-3
Climate Change Technology Initiative	744	820	1,292	471
International Programs	206	213	287	74
Total	2,768	2,901	3,442	542
Revenue Effects of CCTI Tax Incentives[b]	n.a.	n.a.	-478	
Spending Programs Associated with Climate Change				
Partnership for a New Generation of Vehicles (Non-CCTI)[c]	99	82	78	-4
Congestion Mitigation and Air Quality Improvement Program	807	1,257	1,260	3
Advanced Transportation Technologies Consortium (Non-CCTI)[c]	16	16	10	-7
Other Transportation Programs	14	14	5	-9
Energy Conservation Assistance Grant Programs	150	155	191	36
Civilian Nuclear Energy R&D				
Fission (Non-CCTI)[c]	41	7	34	27
Fusion	230	230	228	-1
Total	1,357	1,762	1,806	45
All Programs and Tax Policies				
Total	4,125	4,663	5,248	587

SOURCE: Congressional Budget Office based on information from the Office of Management and Budget; *Budget of the United States Government, Fiscal Year 1999*: U.S. House of Representatives, *Making Appropriations for Energy and Water Development for the Fiscal Year Ending September 30, 1998*, conference report to accompany H.R. 2203, Report 105-271 (September 26, 1997); Department of Energy, *Fiscal Year 1999 Budget Request to Congress: Control Table by Appropriation* (January 30, 1998); Department of Energy, *Fiscal Year 1999 Congressional Budget Request: Science, Technology and Energy for the Future* (February 1998); Department of Housing and Urban Development; Department of the Treasury; Global Environment Facility Secretariat's Office; Department of State; Environmental Protection Agency; and the Agency for International Development.

NOTE: CCTI = Climate Change Technology Initiative; R&D = research and development; n.a. = not available.

a. Totals are augmented in 1997 by $1 million and in 1998 by $1.6 million—funding for the Department of Energy's research on carbon sequestration. Comparable funding for CCTI is $743 million in 1997 and $819 million in 1998.

b. Estimates of revenue losses that would result from enactment of CCTI tax incentives.

c. Funding for activities in this program that are not included in CCTI in the President's 1999 budget.

CURRENT PROGRAMS AND TAX POLICIES AND THE EMISSION OF GREENHOUSE GASES

The federal government is now spending nearly $5 billion annually on programs that are either directly related to climate change or associated with climate change through their effects on the use of fossil fuels. In addition, taxes and tax policies that affect the prices, production, or use of fossil fuels can also affect carbon emissions. The directly related programs are helping U.S. researchers and policymakers learn more about climate change, conduct applied technology research and development to improve energy efficiency, promote international actions, and, to a modest extent, cut emissions of greenhouse gases.

Other programs and tax policies that affect the use of fossil fuels may also indirectly affect emissions of carbon dioxide. A Congressional Budget Office (CBO) study prepared in 1990 looked specifically at carbon dioxide emissions and concluded that whether programs and tax policies then in place had a net positive or negative effect on total emissions was unclear. The studies predicted that, whatever the direction of the effect, it would probably be small.[2] That conclusion still holds. More programs are now designated as climate change programs than in the past. Since most of the funds are spent to learn more about the phenomenon and to improve energy efficiency in the future, the short-term effect is minimal.

2. Congressional Budget Office, *Energy Use and Emissions of Carbon Dioxide: Federal Spending and Credit Programs and Tax Policies* (December 1990).

CHAPTER II
CURRENT AND PROPOSED SPENDING PROGRAMS AND TAX POLICIES DIRECTLY LINKED TO CLIMATE CHANGE

Current U.S. policy toward climate change focuses on three areas: scientific research and monitoring to better understand climate change, its implications, and what to do about it; applied technology research and development to reduce energy use or to make future limits on carbon emissions less costly to the economy; and activities to promote international agreements and actions.

Two other categories of climate change activities receive less attention now but could dominate federal action in the future. First are efforts to reduce the emissions of greenhouse gases. Several voluntary federal programs to cut emissions exist, but they fall short of meeting any significant reduction goals such as those in the Kyoto Protocol. Second are activities to adapt to the effects of climate change. Adapting to change, instead of trying to prevent it, requires little current action.

SPENDING PROGRAMS DIRECTLY LINKED TO CLIMATE CHANGE

The U.S. Global Change Research Program, the Climate Change Technology Initiative (CCTI), and a group of international activities are the major federal efforts directly linked to climate change. The USGCRP has been in place since 1989. The CCTI, a new umbrella designation, includes programs formerly in the Climate Change Action Plan and the research and development programs of the Department of Energy (DOE).

The U.S. Global Change Research Program

The U.S. Global Change Research Program is a comprehensive effort to understand the science and consequences of a full range of natural and human-induced changes in the Earth's environment. The four main areas of study are seasonal to interannual climate variability; climatic changes over time; changes in ozone, ultraviolet radiation, and atmospheric chemistry; and changes in land cover and ecosystems. Ten executive departments or agencies conduct or fund that research. Funding for 1998 is almost $1.9 billion, and the request for 1999 is nearly the same (see Table 2).[1]

1. Several Department of Defense (DoD) research activities, totaling $6.5 million in 1998 (the request for 1999 is $6.7 million), also support the programs, but funding for DoD programs is not included in the official totals of the USGCRP.

TABLE 2. FUNDING FOR THE U.S. GLOBAL CHANGE RESEARCH PROGRAM
(In millions of dollars of budget authority)

	1997	1998	Requested 1999	Change, 1998-1999
National Aeronautics and Space Administration	1,369	1,417	1,372	-45
National Science Foundation	166	167	187	20
Department of Energy	109	108	113	5
Department of Commerce	62	62	71	9
Department of Agriculture	57	58	59	1
Department of the Interior	29	29	29	0
Environmental Protection Agency	14	15	21	6
Smithsonian	7	7	7	0
Department of Health and Human Services	4	4	5	1
Tennessee Valley Authority	1	a	a	n.a.
Total	1,818	1,867	1,864	-3

SOURCE: Congressional Budget Office based on information from the Office of Management and Budget; *Budget of the United States Government, Fiscal Year 1999* (February 1998); and National Science and Technology Council, Committee on Environment and Natural Resources, Subcommittee on Global Change Research, *Our Changing Planet, The FY 1999 U.S. Global Change Research Program* (March 1998).

NOTE: n.a. = not applicable.

a. No funding in that year.

About 40 percent of USGCRP funds go to research scientists studying a broad range of questions. The USGCRP publishes an annual report on research objectives and projects, including information on budgetary resources allocated to projects within agencies or departments.[2]

The remaining 60 percent of funding supports development of a space-based observation system—a series of satellites and data systems to monitor the Earth's natural systems. The National Aeronautics and Space Administration controls that activity, which accounts for about 80 percent of NASA's funding within the USGCRP—the remainder being scientific research. Most of those hardware development funds are for the Earth Observing System (EOS) program. The first satellite in that program, the EOS AM-1, is scheduled for launch this year to gather various data on land surface, atmosphere, and oceans.

2. National Science and Technology Council, Committee on Environment and Natural Resources, Subcommittee on Global Change Research, *Our Changing Planet, The FY 1999 U.S. Global Change Research Program* (March 1998).

The Climate Change Technology Initiative

The Climate Change Technology Initiative is a group of programs that would receive increased funding for research, development, and deployment of technologies to improve energy efficiency and reduce carbon emissions. The 1999 budget request totals $1,292 million, an increase of $471 million over the 1998 level (see Table 3). About $100 million of the $471 million would be for new activities. The remainder represents increased funding for existing programs, with some of those being major expansions. The increase over five years from current levels would total $2.7 billion. The CCTI also includes tax incentives, described below.

The CCTI is led by the Department of Energy and the Environmental Protection Agency (EPA). Those two agencies would receive 98 percent of the requested funding for 1999. The remaining 2 percent would fund activities at the Department of Housing and Urban Development, the Department of Commerce's National Institute of Standards and Technology (NIST), and the Department of Agriculture.

Most CCTI programs also serve other policy goals—for example, enhancing energy security, promoting energy efficiency, and improving air quality. The CCTI consists of the following activities within the Department of Energy:

- Energy efficiency and conservation activities, including research and development programs, the Federal Energy Management Program, DOE's contribution to the Partnership for a New Generation of Vehicles (a multiagency program to promote high-efficiency vehicles), municipal energy management, and DOE's contribution to the Advanced Transportation Technologies Consortium, which promotes research on electric and hybrid vehicles. The 1999 request is $617 million, exceeding 1998 funding by $161 million.

- Solar and renewable energy R&D. The 1999 request is $372 million, an increase of $100 million over 1998 levels.

- New activities within the fossil energy research and development program. The President requested $10 million to investigate the sequestration of carbon and $20 million for a new effort to improve the efficiency of the combustion of coal.

- Other research and development. New programs include $10 million to investigate ways to increase the useful life of existing nuclear plants and $27 million in the basic science account for research, principally on carbon sequestration. The research on carbon sequestration in the basic science program and the fossil fuel R&D

TABLE 3. FUNDING FOR PROGRAMS IN THE CLIMATE CHANGE TECHNOLOGY INITIATIVE (In millions of dollars of budget authority)

	1997	1998	Requested 1999	Change, 1998-1999
Department of Energy				
Energy conservation R&D				
Energy efficiency and conservation	273	307	403	
Federal Energy Management Program	20	20	34	
Partnership for a New Generation of Vehicles	120	128	164	
Municipal energy management	2	2	7	
Advanced Transportation Technologies Consortium	a	a	10	
Subtotal	414	457	617	161
Solar and renewable energy R&D[b]	244	272	372	100
Fossil energy R&D				
Sequestration of carbon[c]	1	2	10	
Advanced combustion of coal	a	a	20	
Subtotal	1	2	30	28
Other energy R&D				
Extending life of nuclear plants	a	a	10	
Tracking CO_2 emissions	a	a	3	
Basic science/technology (Sequestration of carbon)	a	a	27	
Subtotal	a	a	40	40
Total	658	730	1,059	329
Environmental Protection Agency[d]				
Former Programs of the Climate Change Action Plan (excluding PNGV)	71	73	115	
Partnership for a New Generation of Vehicles	15	17	35	
Other	a	a	55	
Subtotal	86	90	205	115
Department of Housing and Urban Development (PATH)[e]	a	a	10	10
Department of Commerce (NIST)	a	a	7	7
Department of Agriculture[e]	a	a	10	10
Total	744	820	1,292	471

TABLE 3. CONTINUED

SOURCE: Congressional Budget Office based on information from the Office of Management and Budget; *Budget of the United States Government, Fiscal Year 1999;* U.S. House of Representatives, *Making Appropriations for Energy and Water Development for the Fiscal Year Ending September 30, 1998*, conference report to accompany H.R. 2203, Report 105-271 (September 26, 1997); Department of Energy, *Fiscal Year 1999 Budget Request to Congress: Control Table by Appropriation* (January 30, 1998); Department of Energy, *Fiscal Year 1999 Congressional Budget Request: Science, Technology and Energy for the Future* (February 1998); Department of Housing and Urban Development; Department of the Treasury; Global Environment Facility Secretariat's Office; Department of State; Environmental Protection Agency; and the Agency for International Development.

NOTE: R&D = research and development; PNGV = Partnership for a New Generation of Vehicles; PATH = Partnership for Advancing Technologies in Housing; NIST = National Institute of Standards and Technology.

a. No funding in that year.

b. Net of prior-year balances, including balance carryovers for Renewable Energy Research Program (research in photovoltaics, biomass/biofuels, wind, hydrogen, and solar photoconversion) in 1998 and 1999.

c. Climate Change Technology Initiative (CCTI) totals in the table are augmented in 1997 by $1 million and in 1998 by $1.6 million—funding for the Department of Energy's carbon sequestration research. Comparable funding for CCTI is $743 million in 1997 and $819 million in 1998.

d. Figures for the Environmental Protection Agency in 1997 and 1998 equal agency funding for Climate Change Action Plan (CCAP) programs.

e. Some funding related to climate change activities for Department of Housing and Urban Development (HUD) and Department of Agriculture (USDA) were not included in order to be consistent with the President's budget request. HUD used about $1 million in "seed" funds for the Partnership for Advancing Technologies in Housing program in 1998; those funds were taken from HUD's general R&D fund and used as start-up funds for the program. Funding for Climate Change Action Plan (CCAP) programs at USDA was $8 million in 1997 and 1998. CBO was unable to determine what happened to the USDA CCAP programs.

programs is the only example of newly proposed research that would not also serve other energy policy goals.

CCTI activities within the Environmental Protection Agency would include the bulk of programs that were formerly part of the Climate Change Action Plan (CCAP). Many of the CCAP programs administered by EPA would be expanded under the proposal, including the Energy Star Programs for buildings, appliance labeling, and homes. The 1999 request for the former CCAP activities other than the Partnership for a New Generation of Vehicles (PNGV) is about $115 million, up from $73 million in 1998. The PNGV, formerly part of CCAP, is now part of the Climate Change Technology Initiative. EPA's contribution to PNGV would roughly double, from $17 million to $35 million, in the 1999 request.

The Partnership for a New Generation of Vehicles, launched in 1993, is a cooperative effort between the federal government and industry to foster breakthrough technology in personal vehicles. In addition to DOE and EPA, the Department of Commerce, the National Science Foundation, and the Department of Transportation receive funding for PNGV activities. One goal of the program is to

develop a production prototype vehicle capable of 80 miles per gallon by 2004. Funding was about $234 million in 1997 and $227 million in 1998. The President's request for PNGV funding for all agencies, whether included in CCTI or not, is $50 million above 1998 levels.

The CCTI program in the Department of Housing and Urban Development is the Partnership for Advancing Technologies in Housing (PATH). The purpose of PATH is to develop, demonstrate, and help to commercialize safe, energy-efficient housing technologies. The PATH program received about $1 million in seed money from a HUD R&D account in 1998. The program would be funded at $10 million in 1999 under the President's proposal.

CCTI programs at the Department of Agriculture (USDA) would fund research on biomass and carbon sequestration. CCTI would allot $10 million to USDA to support research on the conversion of wood, crop wastes, and energy crops to fuels and electricity and on enhancing the carbon-sequestering capabilities of agricultural species.

The CCTI also includes funding for new research at the National Institute of Standards and Technology in the Department of Commerce. Research efforts at NIST would work to improve measurements of greenhouse gases and would support biotechnology work on plant metabolism and carbon sequestration. The proposed level of funding for NIST programs in 1999 is $7 million.

International Activities That Target Climate Change

The United States contributes to various international efforts to assess the problem of climate change and to reduce emissions of carbon dioxide and other greenhouse gases. Contributions to the Intergovernmental Panel on Climate Change, the Global Environment Facility, the Montreal Protocol, and bilateral assistance programs totaled more than $200 million in 1998 (see Table 4).

Intergovernmental Panel on Climate Change and the Climate Change Secretariat. The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme (UNEP) to assess the available scientific, technical, and socioeconomic information in the field of climate change. The IPCC released its Second Assessment Report in 1995 and periodically produces technical papers and develops methodologies (for example, inventories of greenhouse gases) for use by the parties to the Climate Change Convention. The Climate Change Secretariat was organized under the U.N. Framework Convention on Climate Change to handle coordination and administrative responsibilities under the Convention. The United States contributed $5 million to the IPCC and the Climate Change Secretariat in 1998. The 1999 request is $8 million.

TABLE 4. FUNDING FOR INTERNATIONAL PROGRAMS DIRECTLY RELATED TO GLOBAL CHANGE (In millions of dollars of budget authority)

	1997	1998	Requested 1999	Change, 1998-1999
Department of State				
Intergovernmental Panel on Climate Change and the Climate Change Secretariat[a]	3	5	8	3
Bilateral Assistance Grant Program (AID)	150	150	150	0
Department of the Treasury				
Global Environment Facility[b]	13	18	73	55
Montreal Protocol				
Department of State	28	28	34	
Environmental Protection Agency	12	12	21	
Total	40	40	55	15
All Programs				
Total	206	213	287	74

SOURCE: Congressional Budget Office based on information from the Office of Management and Budget; *Budget of the United States Government, Fiscal Year 1999*; Department of the Treasury; Global Environment Facility Secretariat's Office; Department of State; Environmental Protection Agency; and the Agency for International Development.

NOTE: AID = Agency for International Development.

a. Funding data are voluntary contributions to the Climate Stabilization Fund.

b. Funding for the "climate" share of the Global Environment Facility was calculated as 38 percent of the total budget authority (net of funding for payments in arrears).

Bilateral Assistance. Bilateral assistance is primarily conducted through the U.S. Agency for International Development (AID). AID has made the mitigation of climate change one of two global environmental priorities. The agency supports grants focusing on this issue to nine key countries—India, Indonesia, the Philippines, Mexico, Brazil, Russia, Ukraine, Kazakstan, and Poland—and supports a broader portfolio of energy efficiency, renewable energy, and forestry activities related to climate change. Obligations for grants related to climate change were $150 million in 1998, the same as the request for 1999.

Global Environment Facility. The Global Environment Facility (GEF) is an international financial institution established in 1991 to provide developing countries with grants and low-interest loans for projects in four areas: global climate change, international waters, biological diversity, and depletion of the ozone layer. The GEF is run jointly by the United Nations Development Programme (UNDP), UNEP, and the World Bank. Budget authority for climate change activities was about $18 million in 1998 (38 percent of all funds appropriated for the GEF). The total request for funds for the GEF in 1999 is $300 million—38 percent of which is $114 million. The 1999 budget identifies about $41 million (of the $114 million) as "payments in arrears," leaving $73 million that may be available for new obligation.

Montreal Protocol. The Montreal Protocol is an international environmental agreement with the objective of eliminating the use of substances that deplete the ozone layer in the stratosphere and are believed to contribute to climate change: chlorofluorocarbons, halons, and hydrochlorofluorocarbons. The agreement is implemented by the World Bank, UNDP, UNEP, and the United Nations Industrial Development Organization. The U.S. contribution, which is jointly paid by the Department of State and the Environmental Protection Agency, totaled $40 million in 1998. CBO includes spending for the Montreal Protocol in this memorandum because of the close link between ozone-depleting gases and greenhouse gases.

The request for 1999 is $55 million—$34 million for the Department of State and $21 million for the Environmental Protection Agency.

TAX PROPOSALS DIRECTLY LINKED TO CLIMATE CHANGE

As part of its Climate Change Technology Initiative, the Administration has proposed several tax preferences designed to encourage the development of new technologies that offer superior energy efficiency and to induce purchases of higher-cost, energy-efficient equipment. Improving energy efficiency would reduce emissions of carbon dioxide, the cost of complying with any future limits on emissions, or both.

The Administration sought to tailor the incentives to technologies that either are currently available or will be when the credits go into effect and to equipment that can be precisely defined for purposes of the Internal Revenue Service. According to estimates of the Joint Committee on Taxation (JCT), the tax incentives would result in revenue losses of $3.8 billion through 2003 and $9.8 billion through 2008 (see Table 5).[3]

3. Joint Committee on Taxation, "Estimated Budget Effects of the Revenue Provisions Contained in the President's Fiscal Year 1999 Budget Proposal," February 24, 1998.

TABLE 5. ESTIMATES OF REVENUE LOSSES FROM PROPOSALS FOR ENERGY AND ENVIRONMENTAL TAX INCENTIVES IN THE ADMINISTRATION'S 1999 BUDGET (In millions of dollars)

Proposal	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	1998-2003	1998-2008
Tax Credits													
Fuel-Efficient Vehicles	0	0	a	-89	-299	-544	-904	-1,011	-1,004	-994	-979	-931	-5,823
Energy-Efficient Building Equipment	0	-125	-225	-285	-340	-410	-155	-20	-5	1[b]	1[b]	-1,385	-1,563
CHP Equipment	18[c]	-326	-285	-90	-116	-115	-39	2[b]	3[b]	4[b]	4[b]	-913	-938
Wind and Biomass	0	-2	-7	-21	-43	-71	-109	-128	-131	-134	-137	-144	-784
Energy-Efficient Homes	0	-5	-25	-40	-55	-75	-35	0	0	0	0	-200	-235
Circuit Breaker Equipment	0	-5	-10	-15	-10	-5	-2	2[b]	1[b]	1[b]	1[b]	-45	-42
Rooftop Solar Equipment	0	-2	-6	-9	-12	-16	-18	-26	-12	d	d	-43	-100
PFC and HFC Recycling Equipment	0	-5	-10	-10	-5	-3	1[b]	1[b]	1[b]	1[b]	d	-33	-29
Other Tax Incentives													
Parking and Transit Benefits	0	-8	-16	-25	-31	-35	-36	-39	-43	-42	-44	-114	-318
All Tax Incentives													
Total	18	-478	-584	-584	-911	-1,274	-1,297	-1,219	-1,190	-1,163	-1,154	-3,808	-9,832

SOURCE: Congressional Budget Office based on the Joint Committee on Taxation's estimates of the revenue effects of the Climate Change Technology Initiative in the President's 1999 budget.

NOTE: CHP = combined heat and power; PFC = perfluorocompound; HFC = hydrofluorocarbon.

a. Revenue loss of less than $500,000.

b. Positive revenue estimates reflect projected lower deductions for depreciation.

c. The positive revenue estimate reflects a projected slowdown in investment pending enactment of the credit, which in turn would result in lower deductions for depreciation.

d. Revenue gain of less than $500,000.

Tax Credits

Most of the proposals for tax preferences are for new or expanded tax credits.

Tax Credits for Highly Fuel-Efficient Vehicles. Under current law, a 10 percent credit is available for the purchase of new electric vehicles for use by the taxpayer and not for resale. In addition, a deduction is available for qualified clean-fuel vehicles. The proposed tax credits are intended to reduce carbon dioxide emissions by encouraging the manufacture and purchase of fuel-efficient vehicles. The proposal is for two temporary tax credits: a $4,000 credit for each vehicle that has three times the base fuel economy for its class, and a $3,000 tax credit for each vehicle that has twice the base fuel economy for its class. The $4,000 credit would be available in calendar years 2003 through 2006 and would subsequently be reduced by $1,000 a year, phasing out completely in 2010. The $3,000 credit would be available for calendar years 2000 through 2003 and would phase out in 2006, also at the rate of $1,000 a year. The credits would be available for cars, sport utility vehicles, minivans, light trucks as well as hybrid, electric, and other light vehicles. Taxpayers who claimed the new credits would not be able to claim the credit that is currently available for electric vehicles or the deduction for clean-fuel vehicles.

The JCT estimates that enacting the proposal would reduce revenues by $931 million from 1998 through 2003 and by $5,823 million from 1998 through 2008.

Tax Credit for Energy-Efficient Building Equipment. The proposal would provide a credit for the purchase of certain types of energy-efficient building equipment: fuel cells, electric heat pumps and advanced natural gas water heaters, advanced natural gas and residential-size electric heat pumps, and advanced central air conditioners. The credit, which would be nonrefundable, would be equal to 20 percent of the purchase price, subject to a cap. For businesses, it would be subject to the limits on the general business credit, and it would reduce the basis of the equipment. The credit would be in effect from January 1, 2000, to December 31, 2004, for fuel cells, and from January 1, 1999, to December 31, 2003, for other types of equipment. To be eligible for the credit, the equipment would have to meet specified criteria.

The JCT estimates that the proposal would result in revenue losses of $1,385 million between 1998 and 2003 and $1,563 million between 1998 and 2008.

Investment Tax Credit for Combined Heat and Power Systems. Combined heat and power (CHP) systems are used to produce electricity and process heat or mechanical power from a single primary energy source. The systems use thermal energy that is otherwise wasted in the process of producing electricity conventionally—which, in turn, results in less consumption of fossil fuels, reduced carbon emissions, and lower costs. The proposal is for a 10 percent investment tax credit for CHP systems with electrical capacity of more than 50 kilowatts. Investments in the systems with cost-recovery periods of less than 15 years would be eligible for the credit only if a 15-

year recovery period and the 150 percent declining-balance method were used to calculate depreciation deductions.

The systems would be required to produce at least 20 percent of their useful energy in the form of both thermal energy and electric or mechanical power. To qualify for the credit, CHP systems would have to meet specified energy-efficiency and percentage-of-energy tests, as certified by qualified engineers, pursuant to regulations issued by the Secretary of the Treasury. The credit would be subject to the limits on general business credits and would be available for equipment placed in service during calendar years 1999 through 2003.

The JCT estimates that the proposal would result in revenue losses of $913 million through 2003.

Wind and Biomass Tax Credit. A tax credit of 1.5 cents per kilowatt hour (indexed for inflation after 1992) is currently available for electricity produced from wind or biomass. It now applies only to facilities placed in service before June 1, 1999, for wind and before July 1, 1999, for biomass. The proposal would extend the credit for both types of facilities placed in service by July 1, 2004. Unlike the other proposed tax credits, the wind and biomass credit is based on production rather than investment. The electricity must be sold to an unrelated third party, and the credit is limited to the first 10 years of production.

The JCT estimates the potential revenue losses of the proposal at $144 million through 2003 and $784 million through 2008.

Tax Credit for Purchase of New Energy-Efficient Homes. The proposal would provide a tax credit of 1 percent of the purchase price up to $2,000 to buyers of new homes that use at least 50 percent less energy for heating, cooling, and hot water than the Model Energy Code standard for single-family homes. The credit would be available for calendar years 1999 through 2003. Homes purchased in 2004 and 2005 would be eligible for a maximum credit of $1,000.

The JCT estimates that the proposal would result in revenue losses of $200 million between 1998 and 2003 and an additional $35 million in 2004.

Tax Credit for Replacement of Circuit Breaker Equipment. The proposal would provide a 10 percent tax credit to replace circuit breakers installed before 1986 that use sulfur hexafluoride (SF_6), a potent greenhouse gas. The replaced circuit breakers must be destroyed to prevent further use. The credit applies to property placed in service in calendar years 1999 through 2003 and is subject to the limits of the general business credit. Also, the amount of credit claimed reduces the depreciable basis of qualified property for which the credit is taken.

The JCT estimates that the proposal would result in revenue losses of $45 million between 1998 and 2003.

Tax Credit for Rooftop Solar Equipment. The proposed tax credit would be available for two types of solar equipment—photovoltaic heating systems and water heating systems located on or adjacent to buildings. The credit would be equal to 15 percent of the total investment in either system up to a maximum credit of $2,000 for rooftop photovoltaic heating systems and $1,000 for solar water heating systems. It would be nonrefundable and would not be available for systems to heat swimming pools. For businesses, the credit would reduce the depreciable basis of the property by the amount claimed and would be subject to the limits of the general business credit. It would apply to equipment placed in service during calendar years 1999 through 2003 for solar water heating systems and through 2005 for rooftop photovoltaic systems.

Under current law, a 10 percent energy investment tax credit for businesses is available for equipment that uses solar energy to generate electricity, to heat or cool or provide hot water for use in a structure, or to provide solar-process heat. The equivalent credit for residential solar systems expired in 1985. Under the proposals, businesses would have to choose between the present and the proposed tax credits.

The JCT estimates that enacting the proposal would reduce revenues by $43 million through 2003 and $100 million through 2008.

Tax Credit for Perfluorocompound and Hydrofluorocarbon Recycling Equipment. Perfluorocompounds (PFCs) and certain hydrofluorocarbons (HFCs) are extremely potent greenhouse gases because of their stability in the atmosphere and their capacity to absorb radiation. Under current law, manufacturers who install equipment to recover or recycle PFC and HFC gases used in producing semiconductors may depreciate the cost of that equipment over six years. The proposal would make available a 10 percent tax credit for installing PFC and HFC recovery or recycling equipment. The credit would be subject to the limits of the general business tax credit and would reduce the depreciable basis of the equipment by the amount claimed. To qualify, the equipment must recover at least 99 percent of the PFCs and HFCs used and must be placed in service between January 1, 1999, and December 31, 2003.

The JCT estimates that enacting the proposal would reduce revenues by about $33 million between 1998 and 2003.

Parking and Transit Benefits

The Administration has also proposed an increase in benefits to encourage the use of mass transit and van pools. Current law provides for the exclusion of parking benefits from gross income, regardless of whether the benefits are in addition to or

in lieu of other employee compensation. However, for transit and van-pool benefits, the exclusion applies only if those benefits are in addition to other compensation. The current limits on the income exclusion (in 1993 dollars) are $155 per month for parking and $60 for transit passes and van-pool benefits. The proposal calls for eliminating the relative tax advantage of parking benefits. It would treat parking, transit passes, and van-pool benefits in the same way, subject to the same limits that currently apply to parking.

The JCT estimates that the proposal would reduce revenues by $114 million through 2003 and $318 million through 2008.

CHAPTER III
OTHER FEDERAL SPENDING PROGRAMS AND TAX POLICIES ASSOCIATED WITH CLIMATE CHANGE

Other federal programs and tax policies affect energy use and emissions of carbon dioxide—some positively, some negatively. Energy use is so important to the economy, and the government affects economic activity in so many ways, that a very broad range of government programs could be included. Deciding where to draw the line is difficult. The programs and tax policies included in this chapter represent one way to inventory a set of programs and tax policies associated with energy use and climate change.

Programs closely associated with climate change include activities in transportation, energy conservation, and nuclear energy research and development that could affect emissions of carbon dioxide (or lower the costs of using less carbon). Those programs have multiple objectives—as do many that are directly related to climate change. Isolating the portions of the programs that should be charged to climate change is impossible. Nevertheless, since those programs are linked to activities related to climate change, they may be part of future changes to the policy mix.

FEDERAL SPENDING PROGRAMS THAT AFFECT ENERGY USE

The federal government currently funds several programs that have the purpose or effect of conserving energy or reducing emissions of greenhouse gases but that are not identified as being directly linked to climate change (see Table 6). The 1999 budget requests for most of those programs are near 1998 levels, with the exception of the Department of Energy's Weatherization Assistance Program, which would increase from $125 million to $154 million, and civilian nuclear R&D, which would rise from $7 million to $34 million. Programs and activities included are:

- The non-CCTI activities of the Partnership for a New Generation of Vehicles administered by the Department of Commerce's NIST, the National Science Foundation, and the Department of Transportation (DOT). The 1999 request totals $78 million, which is a slight decrease from 1998 levels.

- The Congestion Mitigation and Air Quality Improvement Program, which would remain at about the same level as in 1998—$1.3 billion.

TABLE 6. FUNDING FOR FEDERAL PROGRAMS ASSOCIATED WITH CLIMATE CHANGE
(In millions of dollars of budget authority)

	1997	1998	Requested 1999	Change, 1998-1999
Partnership for a New Generation of Vehicles (Non-CCTI)				
Department of Commerce	41	25	22	
National Science Foundation	54	53	52	
Department of Transportation	4	4	4	
Subtotal	99	82	78	-4
Congestion Mitigation and Air Quality Improvement Program (CMAQ)[a]				
Department of Transportation, Federal Highway Administration				
Transit	362	563	565	
Traffic flow	265	412	413	
Surface transportation program devoted to CMAQ	57	88	88	
Shared ride	36	55	55	
Demand management	31	48	48	
Bicycle/pedestrian	22	34	34	
Other	36	57	57	
Subtotal	807	1,257	1,260	3
Advanced Transportation Technologies Consortium (Non-CCTI)[b]				
Department of Defense	15	15	c	
Department of Transportation				
Federal Transit Administration	2	2	c	
Research and Special Programs Administration	c	c	10	
Subtotal	16	17	10	-7
Other Transportation Programs				
Department of Transportation, Federal Transit Administration				
Advanced Technology Transit Bus	7	10	1	
Fuel Cell Bus	8	4	4	
Subtotal	14	14	5	-9

TABLE 6. CONTINUED

	1997	1998	Requested 1999	Change, 1998-1999
Energy Conservation Assistance Grant Programs				
DOE, Office of State and Community Programs				
Weatherization Assistance	121	125	154	
State Energy Conservation	29	30	37	
Subtotal	150	155	191	36
Civilian Nuclear Energy Research and Development				
Fission (Non-CCTI)	41	7	34	
Fusion	230	230	230	
Subtotal	271	237	262	26
All Programs				
Total	1,357	1,762	1,806	45

SOURCE: Congressional Budget Office based on information from the Office of Management and Budget; *Budget of the United States Government, Fiscal Year 1999*; House Committee on Appropriations, *Department of Defense Appropriations Bill, 1998*, report to accompany H.R. 2266, Report 105-206, (July 25, 1997); Department of Energy, *Fiscal Year 1999 Congressional Budget Request: Science, Technology and Energy for the Future* (February 1998); Department of Energy, *Fiscal Year 1999 Budget Request to Congress: Control Table by Appropriation* (January 30, 1998); Department of Transportation, Federal Highway Administration and Federal Transit Administration; U.S. House of Representatives, *Making Appropriations for Department of Transportation and Related Agencies for Fiscal Year Ending September 30, 1997*, conference report to accompany H.R. 3675, Report 104-785 (September 16, 1996); U.S. House of Representatives, *Making Appropriations for Department of Transportation and Related Agencies for Fiscal Year Ending September 30, 1998*, conference report to accompany H.R. 2169, Report 105-313 (October 7, 1997); and the Northeast Alternative Vehicle Consortium.

NOTE: CCTI = Climate Change Technology Initiative; CMAQ = Congestion Mitigation and Air Quality Improvement Program; DOE = Department of Energy.

a. Figures for CMAQ categories were calculated using the percentage share held by each category from 1992 to 1996 as follows: transit, 44.8 percent; traffic flow, 32.8 percent; surface transportation program devoted to CMAQ, 7.0 percent; shared ride, 4.4 percent; demand management, 3.8 percent; bicycle/pedestrian, 2.7 percent; and other, 4.5 percent. On May 22, 1998, the House and Senate passed the Transportation Equity Act for the 21st Century. The act would authorize funds to be appropriated out of the Highway Trust Fund for the CMAQ program at a funding level of $1.35 billion in 1999.

b. Requested funding for the Advanced Transportation Technologies Consortium for 1999 is $20 million—$10 million for the Department of Energy and $10 million for the Department of Transportation—which is about $3.5 million greater than funding in 1998.

c. No funding in that year.

- The Advanced Transportation Technologies Consortium, which would receive $10 million in funding from the Department of Transportation in addition to the $10 million in funding from DOE under CCTI.

- The Advanced Technology Transit Bus and Fuel Cell Bus Programs at the Federal Transit Administration, which support the development and market penetration of low-emission, light-weight, low-cost buses. Funding for those programs totaled $14 million in 1998; the total funding request for 1999 is only $5 million because the transit bus program ends next year.

- Conservation grants administered by the Department of Energy. Those grants would be funded at $191 million in 1999—an increase of $36 million compared with 1998. The additional funding would expand programs that administer block grants to states to fund energy-efficiency programs and weatherization of low-income housing.

- Civilian nuclear energy R&D (that was not included in the CCTI). Those activities are University Nuclear Science and Reactor Support (at $10 million, an increase of $3 million from 1998), a new $24 million Nuclear Energy Research Initiative, and research on magnetic fusion, funding for which has been stable for several years and comes in at $228 million.

TAX PROVISIONS THAT AFFECT ENERGY USE

Several tax preferences in current law directly or indirectly discourage reliance on fossil fuels. In addition, several excise taxes raise the price of fossil fuels and thereby reduce demand for them.

Tax Preferences to Promote Less Use of Fossil Fuels

Of the tax preferences designed to encourage less reliance on fossil fuels, two account for the largest revenue losses: the excise tax exemption for alcohol fuels, and the exclusion from income of interest on state and local bonds for hydroelectricity-generating facilities and solid waste disposal facilities that produce electricity (see Table 7). These and other preferences are described below.

Income Tax Credits and Excise Tax Exemptions for Alcohol Fuels. The tax code provides three income tax credits for alcohol-based motor fuels: the alcohol mixture

TABLE 7. ESTIMATES OF TAX EXPENDITURES FROM PREFERENCES THAT DISCOURAGE RELIANCE ON FOSSIL FUELS (In millions of dollars)

Tax Preference	1996	1997	1998	1999	2000	2001	2002
Tax Credits for Alcohol Fuels	11	11	11	11	11	11	3
Excise Tax Exemption for Alcohol Fuels	511	520	530	539	547	556	564
Exclusion of Energy Conservation Subsidies Provided by Public Utilities	55	40	35	35	35	40	40
Tax Credits for Investments in Solar and Geothermal Energy Facilities	80	80	75	70	70	70	70
Tax Credit for Electricity Production from Wind and Biomass	5	10	20	35	37	38	40
Deductions for Clean-Fuel Vehicles and Refueling Property	16	10	10	12	13	15	4
Tax Credit for Electric Vehicles	1	11	25	34	54	71	77
Exclusion of Interest on State and Local IDBs for Energy Production Facilities	225	225	215	205	215	215	210

SOURCE: Congressional Budget Office based on the Joint Committee on Taxation's estimates of the revenue effects of the Climate Change Technology Initiative in the President's 1999 budget.

NOTES: Tax expenditures are revenues that the federal government forgoes as a result of provisions in the income tax code that give selective relief to particular groups of taxpayers or special incentives for particular types of economic activity.

IDBs = industrial development bonds.

or blender's credit, the pure alcohol credit, and the credit for small ethanol producers. The first two credits are 53 cents per gallon of ethanol and 60 cents per gallon of methanol of at least 190 proof; for mixtures of between 150 proof and 190 proof, the credits are 40 cents per gallon of alcohol and 45 cents per gallon of methanol. The credit for small ethanol producers is 10 cents per gallon of ethanol produced, used, or sold for use as a transportation fuel. That credit is limited to 15 million gallons of annual alcohol production from firms with a production capacity of less than 30 million gallons. The credits, which were extended under the Transportation Equity Act of 1998, are in effect through December 31, 2007.

Blenders have a choice of using the income tax credit or claiming an excise tax exemption of 5.4 cents for mixtures of ethanol and liquid motor fuels. Because the credits are included in income and apply only to a portion of income tax liability, most blenders opt for the excise tax exemption. Consumption of ethanol motor fuel has increased sharply in the past 20 years. That increase is probably a result not so much of the income tax credits but of the exemption of alcohol fuels from excise taxes. The Transportation Equity Act extended the excise tax reduction through 2007.

The extent to which the use of ethanol motor fuels reduces emissions of greenhouse gases has been the subject of recent reports by the General Accounting Office (GAO) and Argonne National Laboratory (ANL), among others. The GAO reports concluded that the effect on emissions is difficult to determine but is likely to be minimal. By contrast, the ANL study concluded that the use of corn-based ethanol significantly reduces both the use of fossil energy and emissions of greenhouse gases.[1]

Exclusion of Energy Conservation Subsidies Provided by Public Utilities. The tax code permits residential customers to exclude from income the subsidies provided by public utilities for the purchase or installation of an energy conservation item. The exclusion, which is permanent, reduces the costs of programs financed by utilities to conserve energy.

Tax Credit for Investments in Solar and Geothermal Energy Facilities. The tax code provides a 10 percent credit for business investment in solar and geothermal energy equipment (electric utilities do not qualify). The credits are permanent.

Tax Credit for Electricity Production from Wind and Biomass. The tax code permits a 1.5-cent credit (in 1992 dollars, adjusted for inflation) per kilowatt hour for electricity produced from wind energy or "closed-loop" biomass. (Closed-loop

1. See General Accounting Office, *Tax Policy: Effects of the Alcohol Fuel Incentives*, Letter Report, GAO/GGD-97-41 (1997), and *Motor Fuels: Issues Related to Reformulated Gasoline, Oxygenated Fuels, and Biofuels*, Letter Report, GAO/RCED-96-121 (1996); Argonne National Laboratory, *Fuel-Cycle Fossil Energy Use and Greenhouse Gas Emissions of Fuel Ethanol Produced from U.S. Midwest Corn* (Oak Ridge, Tenn.: 1997).

biomass generates electricity using matter from plants grown solely for fuel.) The credit was instituted to encourage development of technologies that use renewable energy resources rather than conventional fossil fuels. The electricity must be produced from a qualified facility and must be sold to an unrelated third party. (A qualified facility is one that is placed in service after 1992 and before July 1, 1999, for biomass and after 1993 and before June 1, 1999, for wind. The facility must be owned by the taxpayer who claims the credit.) The credit is available for 10 years after a facility is placed in service. It is phased out as the price of electricity from the renewable resource rises over a 3-cent range, from 8 cents to 11 cents (in 1992 dollars, adjusted for inflation). It is also reduced by other government subsidies, including tax-exempt financing. The Administration is proposing to extend the credit.

Deductions for Clean-Fuel Vehicles and Refueling Property and the Tax Credit for Electric Vehicles. Deductions are available for the portion of the cost attributed to the engine, the fuel delivery system, and the exhaust system of vehicles that burn clean fuel. The vehicle must be new, but deductions can also be taken for retrofitting vehicles propelled by gasoline or diesel fuel. Costs are limited by a vehicle's type and weight. The deductions phase out between 2002 and 2005.

Electric vehicles qualify for a tax credit but not the deduction. The credit is 10 percent of the cost of the vehicle up to $4,000. It, too, phases out between 2002 and 2005. The tax preferences are intended to make clean-fuel and electric vehicles more economically attractive, but costs are still high relative to conventional vehicles.

Exclusion of Interest on State and Local Industrial Development Bonds for Energy Production Facilities. Tax-exempt financing is limited to solid waste disposal facilities that produce electric energy and to the construction of hydroelectric generating facilities at dam sites built before 1979 or at sites without dams that require no impoundment of water. The bonds generally are subject to a state-by-state annual volume cap on private activity bonds; however, bonds issued for governmentally owned solid waste disposal facilities are not subject to the cap. The exclusion is permanent.

Excise Taxes and Fees

Excises and fees that may result in decreased emissions of carbon dioxide chiefly include taxes on coal, motor fuels, equipment, and transactions related to travel and shipping (see Table 8). Those tax receipts primarily finance spending on roads, airports, harbors, and other transportation needs. Financing those transportation programs could increase emissions of carbon dioxide. Building more and better roads, airports, and harbors may provide an incentive for more travel. Taxes on motor fuels are dedicated to several trust funds. The largest share of revenue goes

TABLE 8. ESTIMATES OF RECEIPTS FROM EXCISE TAXES AND FEES THAT MAY REDUCE THE USE OF FOSSIL FUELS (In millions of dollars)

Tax or Fee	1996	1997	1998	1999	2000	2001	2002
Highway Trust Fund[a]							
Trust Fund Taxes	23,456	24,354	25,569	37,873	32,499	33,010	33,548
General Fund Taxes	6,513	6,772	321	489	414	420	426
Total	29,968	31,126	25,890	38,362	32,913	33,430	33,974
Airport and Airway Trust Fund[a]							
Trust Fund Fuel Taxes	688	753	798	836	867	893	918
Other Trust Fund Taxes	1,153	3,822	7,566	9,254	8,446	8,923	9,643
General Fund Taxes	584	612	0	0	0	0	0
Total	2,425	5,187	8,364	10,090	9,313	9,816	10,561
Aquatic Resources Trust Fund							
Taxes on Motorboat Fuels, Motors, and Sportfishing Equipment	315	321	281	376	336	339	345
Inland Waterways Trust Fund							
Fuel Taxes	103	107	110	113	115	117	119
Land and Water Conservation Trust Fund							
Taxes	1	1	1	1	1	1	1
Leaking Underground Storage Tank Trust Fund							
Fuel Taxes	40	0	139	206	176	179	181
Harbor Maintenance Trust Fund							
Cargo Taxes	746	784	826	873	922	972	1,025
Hazardous Substance Superfund							
Petroleum, Chemicals, and Feedstock	211	0	0	0	0	0	0
Black Lung Disability Trust Fund							
Coal Tax	615	632	641	651	661	671	681

(Continued)

TABLE 8. CONTINUED

Tax or Fee	1996	1997	1998	1999	2000	2001	2002
Abandoned Mine Reclamation Fund							
Coal Fee	256	266	262	260	262	267	274
Taxes Not Dedicated to Trust or Special Funds							
Gas Guzzler Taxes	33	47	37	34	34	34	34
Ozone-Depleting Chemicals Taxes	429	100	65	14	0	0	0

SOURCE: Congressional Budget Office.

a. Projections reflect modifications in the rules governing deposits. Taxes imposed on gasoline, diesel fuel, special motor fuels, and kerosene that would otherwise be deposited with the Treasury after July 31, 1998, and before September 20, 1998, are not required to be deposited until October 5, 1998. The same rule modifications apply to air cargo taxes. In addition, deposits of air passenger taxes normally due after August 14, 1998, and before October 1, 1998, are now due on October 5, 1998.

to transportation, with smaller amounts going to nature conservation and environmental cleanup. The Land and Water Conservation Trust Fund accumulates roughly $1 million per year from oil and gas leases. The only excise taxes not dedicated to trust or special funds and designed solely to discourage consumption of products that are detrimental to the environment (as opposed to paying for cleanup after damage has occurred) are taxes on cars that do not achieve specified fuel economy ratings and on ozone-depleting chemicals. Those taxes raise nominal amounts of revenue compared with the trust fund taxes.

Highway Trust Fund. Several excise taxes finance the Highway Trust Fund, which was established under the Federal-Aid Highway Act of 1956. The primary sources of revenue are a tax of 18.3 cents per gallon levied on gasoline, a tax of 24.3 cents per gallon on diesel fuel, and taxes on gasohol and other special fuels. Other trust fund taxes are levied on sales of tires, inner tubes, trucks, tractors, and trailers. In addition, annual use taxes are levied on trucks weighing more than 55,000 pounds. Of the total taxes on gasoline, 1.5 cents per gallon is dedicated to a special mass transit account, which may be used for capital and related expenditures. The taxes dedicated to the Highway Trust Fund were scheduled to expire on September 30, 1999, with the exception of a motor fuels excise tax of 4.3 cents per gallon. The Transportation Equity Act of 1998 extended them through 2005.

Airport and Airway Trust Fund. Taxes on air passenger tickets, air cargo, noncommercial jet fuel and aviation gasoline, domestic flight segments, and

international departures and arrivals are dedicated to the Airport and Airway Trust Fund. Those taxes were scheduled to expire on September 30, 1997. The Taxpayer Relief Act of 1997 extended them with significant modifications, including new taxes on domestic flight segments and international arrivals. The trust fund, which was established in the Airport and Airway Development and Revenue Acts of 1970, finances a substantial portion of the Federal Aviation Administration's budget. When fully phased in, the domestic air passenger tax will be 7.5 percent of the transportation cost plus $3 per flight segment (indexed for inflation). Air cargo is subject to a 6.25 percent excise tax. Aviation gasoline is subject to a permanent excise tax of 4.3 cents per gallon. (Noncommercial aviation fuels are subject to an excise tax of 15 cents per gallon on aviation gasoline and 17.5 cents per gallon on jet fuel.) Commercial air passengers coming from another country or leaving the United States are subject to a $12 tax per arrival or departure.

Aquatic Resources Trust Fund. Taxes on gasoline, electric outboard motors, sportfishing equipment, and sonar devices for finding fish are dedicated to the Aquatic Resources Trust Fund, which was established under the Deficit Reduction Act of 1984. The trust fund is composed of two accounts: one for fish management and restoration and the other for boating safety. Taxes on diesel fuel for recreational motorboats were repealed by the Taxpayer Relief Act of 1997.

Inland Waterways Trust Fund. Taxes dedicated to the Inland Waterways Trust Fund are levied at the rate of 20 cents a gallon on fuels used by commercial vessels plying specified inland and intracoastal waterways. The expenditures from the trust fund, which was established in 1978 under the Inland Waterways Revenue Act, finance up to half of the construction and rehabilitation expenditures for navigation projects on a designated system of 27 inland and intracoastal waterways.

Leaking Underground Storage Tank Trust Fund. An additional 0.1-cent tax on gasoline, diesel, and other motor fuels; aviation fuels; and fuels used by vessels in inland waterways is dedicated to the Leaking Underground Storage Tank Trust Fund. Expenditures from the trust fund finance the cleanup of underground petroleum tanks that are leaking. The tax, which was initially established under the Superfund Amendments and Reauthorization Act of 1986 and had expired at the end of 1995, was reinstated by the Taxpayer Relief Act of 1997.

Harbor Maintenance Trust Fund. Under the Water Resources Development Act of 1986, a tax on both ship passengers and the value of cargo loaded or unloaded at U.S. harbors, channels, and ports was dedicated to the operation and maintenance costs of the Saint Lawrence Seaway and harbors within the United States. The tax is 0.125 percent and, in the case of passengers, had been levied on transportation charges. The Supreme Court recently held that the harbor maintenance tax was unconstitutional as applied to exports. Subsequently—in June 1998—the U.S. Court of International Trade ruled that the tax on embarking passengers was also unconstitutional.

Black Lung Disability Trust Fund. Taxes of $0.55 a ton on surface-mined coal and $1.10 a ton on underground-mined coal other than lignite are dedicated to the Black Lung Disability Trust Fund, established in 1977 under the Black Lung Benefits Revenue Act. The trust fund finances medical care and rehabilitation for miners with black lung disease and makes disability payments to them and to their surviving spouses and dependents.

Abandoned Mine Reclamation Fund. Fees that are structurally similar to excise taxes are levied on the tonnage of domestically mined coal and dedicated to the Abandoned Mine Land Fund, established in 1977 under the Surface Mining Control and Reclamation Act. The current fee is 35 cents per ton on surface-mined coal and 15 cents per ton on underground-mined coal or, alternatively, 10 percent of the value of the coal at the mine, whichever is less. For surface-mined lignite, the fee is 10 cents a ton, or 2 percent of the value of the coal at the mine. The Energy Policy Act of 1992 extended the authorization of the fees through September 30, 2004.

Gas Guzzler Taxes. Gas guzzler taxes are levied on domestic and imported cars with fuel-economy ratings of less than 22.5 miles per gallon. The tax ranges from $1,000 for cars that get at least 21.5 but less than 22.5 miles per gallon to $7,700 for cars that get less than 12.5 miles per gallon. Revenue from the tax is deposited in the general fund.

Taxes on Ozone-Depleting Chemicals. Taxes imposed on a variety of CFCs and halons as well as carbon tetrachloride and methyl chloroform are calculated as the product of a base tax amount and the specific chemical's "ozone-depleting factor." The base rate was set at $5.35 per pound in 1995 and has increased by $0.45 per pound per year. The amount of revenue collected, however, is small because production and import of most ozone-depleting chemicals are prohibited.

Proposed Increases in Excise Taxes That May Cut the Use of Fossil Fuels and Emissions of Carbon Dioxide

The Administration has proposed reinstating several taxes dedicated to the Oil Spill Liability Trust Fund and the Hazardous Substance Superfund (see Table 9). The taxes dedicated to these two funds expired a few years ago. Reinstatement would lead to price increases for oil and petroleum products and thus could indirectly result in reduced emissions of greenhouse gases. The Administration also proposed reinstating the motor fuel excise taxes dedicated to the Highway Trust Fund; those taxes were recently extended and are currently in effect through 2005.

Oil Spill Excise Tax. The President's budget proposes to reinstate the oil spill excise tax of 5 cents per barrel on domestic crude oil and imported petroleum products. The tax, which expired at the end of calendar year 1994, was dedicated to the Oil Spill

TABLE 9. ESTIMATES OF REVENUES FROM PROPOSALS FOR INCREASES IN EXCISE TAXES RELATED TO ENERGY AND THE ENVIRONMENT IN THE ADMINISTRATION'S 1999 BUDGET (In millions of dollars)

Proposal	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	1998-2003	1998-2008
Oil Spill Excise Tax	64	186	231	235	239	243	248	253	258	264	269	1,197	2,489
Hazardous Substance Excise Taxes	84	667	693	706	718	731	745	760	775	792	809	3,598	7,479
Total	148	853	924	941	957	974	993	1,013	1,033	1,056	1,078	4,795	9,968

SOURCE: Congressional Budget Office based on the Joint Committee on Taxation's estimates of the revenue effects of the Climate Change Technology Initiative in the President's 1999 budget.

Liability Trust Fund to finance the cleanup of oil spills and other costs associated with oil pollution. The tax was not imposed for the calendar quarter if the unobligated balance in the trust fund exceeded $1 billion at the close of the previous quarter. The proposal would reinstate the tax from the date of enactment through September 30, 2008, and would increase the funding limit from $1 billion to $5 billion.

The JCT estimates that the proposal would increase revenues by $1,197 million through 2003 and by $2,489 million through 2008 (see Table 9).

Hazardous Substance Excise Taxes. The President's budget also calls for reinstating three taxes that were dedicated to the Hazardous Substance Superfund and expired at the end of 1995: an excise tax of 9.7 cents per barrel on domestic crude oil and imported petroleum products; an excise tax on listed hazardous chemicals at rates that varied from $0.22 to $4.87 per ton; and an excise tax on imported substances that use any materials in their manufacture or production that are subject to the hazardous chemicals excise tax. The taxes were dedicated to the Superfund for expenditures connected to releases of hazardous substances into the environment, under provisions of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended. The proposal would reinstate the taxes for calendar years 1998 through 2008.

The JCT estimates that the proposal would increase revenues by $3,598 million through 2003 and by $7,479 million through 2008.

Tax Preferences to Increase the Domestic Supply of Fossil Fuels

Several tax preferences in current law were designed to increase domestic production of oil and other fuels and reduce reliance on imports, particularly from the Persian Gulf region or politically unstable areas (see Table 10). To the extent that tax preferences lead to lower fuel prices, their effect may go beyond substituting domestic oil for imported oil to fostering increased consumption of fossil fuels. Tax preferences to encourage energy self-sufficiency may also result in more rapid depletion of national resources. In recent years, however, oil drilling activity has been low because of a drop in oil prices and cutbacks in certain tax benefits; as a result, preferences to encourage domestic production of fossil fuels would currently have little effect on emissions of carbon dioxide.

Expensing of Exploration and Development Costs for Oil, Gas, and Other Fuels. Firms engaged in production of oil, gas, or geothermal energy are permitted to expense (rather than capitalize) certain intangible drilling and development costs (IDCs), which include amounts paid for labor, fuel, repairs to drilling equipment,

TABLE 10. ESTIMATES OF TAX EXPENDITURES FROM PREFERENCES TO INCREASE DOMESTIC PRODUCTION OF FOSSIL FUELS AND REDUCE RELIANCE ON IMPORTS (In millions of dollars)

Tax Preference	1996	1997	1998	1999	2000	2001	2002
Expensing of Exploration and Development Costs							
Oil and gas	304	324	356	405	454	498	541
Other fuels	a	a	a	a	a	a	a
Excess of Percentage over Cost Depletion							
Oil and gas	418	471	489	508	529	550	572
Other fuels	85	143	145	148	151	154	157
Tax Credit for Enhanced Oil Recovery Costs	a	a	a	a	a	a	a
Expensing of Tertiary Injectants	a	a	a	a	a	a	a
Tax Credit for Production of Nonconventional Fuels	1,200	1,250	1,300	1,325	1,350	1,350	1,350

SOURCE: Congressional Budget Office based on estimates of the Joint Committee on Taxation.

NOTE: Tax expenditures are revenues that the federal government forgoes as a result of provisions in the income tax code that give selective relief to particular groups of taxpayers or special incentives for particular types of economic activity.

a. Positive tax expenditure of less than $50 million.

hauling, supplies, and site preparation. For vertically integrated producers, expensing is limited to 70 percent of IDCs. That limit was set in the Tax Reform Act of 1986, which also repealed expensing on foreign properties. Additionally, IDCs are subject to the alternative minimum tax (AMT). The amount subject to the AMT is limited to 70 percent.

Excess of Percentage over Cost Depletion for Oil, Gas, and Other Fuels. Firms that extract oil, gas, or other minerals are permitted a deduction to recover their capital investment in the mineral reserve, which depreciates as the minerals are depleted. Cost depletion allows for the recovery of the actual capital investment over the period that the reserve produces income. Percentage depletion allows for the deduction of a fixed percentage of revenue from sales of the mineral. The percentage depletion method of deduction may and typically does exceed the amount of capital invested. Percentage depletion is allowed only for independent producers and

owners entitled to royalties and only for up to 1,000 barrels of oil or its equivalent in gas per day. At present, about one-fourth of oil and gas production benefits from the subsidy. Percentage depletion for the major integrated oil companies was repealed in 1975.

The percentage depletion rate for oil and gas is 15 percent; a higher rate is permitted for marginal wells. The percentage depletion rate for other fuels ranges from 10 percent to 22 percent.

Tax Credit for Enhanced Oil Recovery Costs. The tax code provides a 15 percent credit for the costs of recovering domestic oil by a qualified "enhanced oil recovery" method. Qualifying methods are those that make possible the extraction of oil that is too viscous to be extracted by conventional methods. The costs of labor, repair of equipment, and injectants as well as the intangible costs of drilling and development, qualify for the credit, which is subject to the limits of the general business credit. The credit phases out over a $6 range for oil prices above $28 per barrel (adjusted for inflation after 1991). Current oil prices are well below the phaseout threshold.

Expensing of Tertiary Injectants. Tertiary recovery projects inject fluids, gases, and other chemicals into oil or gas reservoirs to enhance the recovery process. The tax code permits a deduction for the costs of the chemical injectants used in oil and gas production in the year in which the costs are incurred. Without incentives, tertiary recovery methods are generally uneconomic.

Tax Credit for Production of Nonconventional Fuels. The tax code provides a production tax credit of $3 per barrel (in 1979 dollars) for certain types of liquid and gaseous fuels that are equivalent to oil and are produced from alternative energy sources. The credit is phased out as oil prices rise from $23.50 to $29.50 (in 1979 dollars). Both the credit and the phaseout range are adjusted for inflation. Qualifying fuels include oil produced from shale or tar sands and synthetic fuels produced from coal. The credit is available through 2002 for facilities placed in service before 1993. For gas produced from biomass and synthetic fuels produced from coal or lignite, it is available through 2007 for facilities placed in service by July 1, 1998, pursuant to a binding contract entered into before 1997. The credit is offset by benefits from government grants, tax-exempt financing, and credits for energy, investment, and enhanced oil recovery. Apart from coal-bed methane, production of nonconventional fuels has hardly increased since 1980.[2]

2. The use of coal-bed methane as a source of energy results in emissions of carbon dioxide instead of methane. Carbon dioxide is a less potent greenhouse gas than methane.

OTHER FEDERAL ACTIVITIES

Many other federal activities that appear in the budget may indirectly affect emissions of carbon dioxide and other greenhouse gases by altering the supply of energy or the demand for energy.

The federal government contributes to the supply of energy by:

- Producing power (Tennessee Valley Authority, Bonneville Power Administration, and four other power marketing administrations);
- Providing loans to rural electric cooperatives;
- Contributing to efforts to develop a nuclear waste disposal facility;
- Enriching uranium for use in nuclear power;
- Operating the naval petroleum reserves and protecting the oil shale reserves; and
- Leasing oil, gas, and other minerals onshore and offshore.

Although the government spends money on those supply activities, it also benefits from the substantial receipts they generate in the form of user fees, payments, and royalties.

The Low Income Home Energy Assistance Program (LIHEAP) provides assistance to low-income households in meeting the costs of heating and cooling their homes by making payments to eligible households and energy suppliers. States may target assistance to households with high energy needs and may assist households in reducing their need for energy. Budget authority for LIHEAP was about $1 billion in 1997 and 1998.

Transportation programs, in addition to those specifically cited above, may alter fuel use and carbon emissions. Over time, such programs may affect the total amount of travel (and, therefore, fuel used and emissions produced) as well as the type of travel chosen (substituting the amount of one type of travel for another can affect total emissions). For example, the Federal Transit Administration provides grants to transit operators and conducts transit planning and research activities. Emissions could either increase if spending raises the total demand for travel by boosting ridership or decrease (or stay constant) if rising ridership displaces automobile travel.

Finally, the federal government is itself a major user of energy. Gross energy consumption by the government is about 2 percent of all energy consumed in the

United States, with the government's energy bill totaling roughly $8 billion annually. The Federal Energy Management Program, described previously, aims to cut energy usage. Even if goals are met, however, the government would remain a major energy consumer and would be affected significantly by future policies to reduce carbon emissions.