

Federal Climate Change Expenditures
Report to Congress

June 2010

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FISCAL YEAR 2011 REPORT TO CONGRESS ON FEDERAL CLIMATE CHANGE EXPENDITURES

1. INTRODUCTION

“So we have a choice to make. We can remain one of the world's leading importers of foreign oil, or we can make the investments that would allow us to become the world's leading exporter of renewable energy. We can let climate change continue to go unchecked, or we can help stop it. We can let the jobs of tomorrow be created abroad, or we can create those jobs right here in America and lay the foundation for lasting prosperity.”

-President Barack Obama, March 19, 2009

The following is an accounting of Federal funding for climate change programs and activities, both domestic and international, included in the President's fiscal year 2011 Budget. This report is provided in response to Title IV, Section 426 of Public Law 111-88, the Department of the Interior, Environment, and Related Agencies Appropriations Act of 2010.

1.1 BACKGROUND

The U.S. Government's portfolio of climate change programs and cross-cutting initiatives focuses on reducing the fundamental scientific uncertainties associated with climate change; advancing the development and introduction of energy-efficient, renewable, and other low- or non-emitting technologies; improving standards for measuring and registering emissions reductions and supporting adaptation and resilience to climate change impacts. Many elements of the Administration's climate change portfolio are designed to provide incentives for greenhouse gas emissions reductions throughout the United States and help developing nations or regions to do the same or adapt to the effects of climate change.

In February 2009, President Obama announced his intent to work with Congress in seeking new legislation on energy and climate change that would establish a mandatory economy-wide cap on emissions, with emission reductions beginning in 2012 and becoming more stringent annually thereafter, leading to greenhouse gas (GHG) reductions of approximately 83 percent below 2005 levels by 2050. In June 2009, the U.S. House of Representatives took a significant step toward realizing this goal by passing the American Clean Energy and Security Act. The legislation includes major new investments in clean energy technologies that will be needed to achieve a prosperous transformation to a low-carbon economy, help the United States adapt to the effects of climate change, and establish the United States as a leader in creating the skilled green jobs that will help drive economic growth in coming decades.

In December 2009, at the Fifteenth Conference of the Parties of the UNFCCC, as part of a Copenhagen Accord involving robust GHG mitigation contributions by developed and key developing countries, the Obama administration proposed a U.S. GHG emissions reduction target in the range of 17 percent below 2005 levels by 2020 and approximately 83 percent below 2005 levels by 2050, ultimately aligned with final U.S. legislation. In January 2010, the United States inscribed its near-term proposal—to reduce emissions in the range of 17 percent from 2005 levels by 2020—in the Copenhagen Accord, formally associating itself with the Accord.

The budget information presented in this report reflects the Administration’s commitment to meeting the aims of the UNFCCC while preserving a strong American economy. The President’s 2011 Budget proposes over \$18 billion for climate change activities. This amount is 14% percent higher than the 2010 enacted level for climate change programs, activities, and related tax policies.

The President’s Budget includes continuing support for many successful climate-related programs and initiatives as well as funding for Administration priorities that will help achieve the Administration’s climate goals.

1.2 REPORT OUTLINE

The President’s 2011 Budget supports a wide range of climate change-related research, development, and deployment programs, voluntary partnerships, and international aid efforts. This report presents the expenditures associated with this portfolio of activities in five main categories – science, technology, international assistance, tax provisions, and adaptation efforts associated with wildlife adaptation – as described below:

- **Climate Change Science.** This category encompasses the U.S. Global Change Research Program (USGCRP), previously referred to as the U.S. Climate Change Science Program (CCSP), including funding for the Climate Change Research Initiative (CCRI).
- **Climate Change Technology.** This category comprises the U.S. Climate Change Technology Program (CCTP). The CCTP incorporates a variety of technology research, development, and deployment activities – including voluntary partnerships and grant programs – that reduce greenhouse gas emissions.
- **International Assistance.** This category describes elements of a “whole of government” approach to mobilize a wide range of resources and make use of a wide range of bilateral and multilateral assistance tools. The core budget includes resources for a coordinated set of programs designed to ensure an effective balance among the three pillars of the global climate effort-Adaptation, Clean Energy, and Sustainable Landscapes.
- **Energy Tax Provisions.** This category includes tax incentives for investments in certain energy technologies, and energy grants that can be used in lieu of certain tax credits. These incentives promote deployment of energy efficient or alternative energy technologies, which may help reduce greenhouse gas emissions.

- **Wildlife Adaptation Funding.** The Administration recognizes that there are numerous capabilities across the Federal Government to respond to the impacts of climate change on various critical sectors, institutions and agency mission responsibilities. While the Administration is working to develop criteria to systematically account for a broader suite of adaptation programs, this interim category, described further in section 6, summarizes certain activities at the Department of the Interior designed to promote wildlife adaptation.

The following sections provide further detail in each of these five areas.

Table 1

Summary of Federal Climate Change Expenditures

FY 2011 Budget

(Tax expenditures and budget authority, obligations, and outlays in millions of dollars)¹

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligations ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligations ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010- 2011
US Global Change Research Program (USGCRP)³	641	2,023	2,333	2,131	2,122	2,168	2,163	2,561	439
Climate Change Technology Program (CCTP)	25,499	5,386	15,195	4,225	5,504	15,794	13,337	5,690	186
International Assistance⁴	0	373	376	294	1,080	1,016	785	1,494	414
Energy Tax Provisions That May Reduce Greenhouse Gases^{5,6}	N/A	1,870	1,870	1,870	4,140	4,140	4,140	3,950	-190
Energy Grants in Lieu of Tax Provisions^{7,8}	N/A	1,050	1,050	1,050	3,090	3,090	3,090	4,460	1,370
Wildlife Adaptation Funding	0	0	0	0	65	47	38	87	22
Total^{1,9}	26,140	10,676	20,798	9,547	15,961	26,228	23,529	18,198	2,237

¹Budget Authority provided in millions of dollars. Discrepancies resulted from rounding and improved estimates.

²Obligation and outlay estimates are preliminary estimates and are subject to change, in some cases obligation and outlay estimates are based on historical obligation and outlay rates. Estimates include American Reinvestment and Recovery Act (ARRA) funding, leading to large obligations in FY 2009 and FY 2010, and large outlays in FY 2010 relative to budget authority for the same year.

³USGCRP was previously referred to as the Climate Change Science Program (CCSP), including funding for the Climate Change Research Initiative (CCRI).

⁴International Assistance includes activities by core agencies (i.e. Department of State, Department of the Treasury, US Agency for International Development) as well as complementary agencies (e.g. Department of Energy), but does not include Department of State, Department of Treasury, or US Agency for International Development climate assistance co-benefits nor development finance and export credit agencies.

⁵Tax incentives related to climate change included in this report are currently projected at about \$15.0 billion over five years (2011-2015).

⁶Tax expenditures are estimates of the revenue losses due to a tax preference. While not exactly equivalent to budget authority, obligations or outlays, tax expenditure estimates have been included in all columns for completeness.

⁷Firms can take an energy grant in lieu of certain tax credits. The grants are considered outlays and are direct substitutes for the energy tax provisions. Estimates have been included in all columns for completeness.

⁸Energy grants in lieu of tax credits included in this report are currently projected at \$11.3 billion over five years (2011-2015)

⁹The International Assistance total contains funds that are also counted in the USGCRP and CCTP totals. Table total line excludes this double-count.

2. CLIMATE CHANGE SCIENCE

The U.S. Global Change Research Program (USGCRP) was mandated by Congress in the Global Change Research Act of 1990 (P.L. 101-606) to improve understanding of uncertainties in climate science, including the cumulative effects of human activities and natural processes on the environment, develop science-based resources to support policymaking and resource management, and communicate findings broadly among scientific and stakeholder communities. Thirteen departments and agencies participate in the USGCRP. The Office of Science and Technology Policy (OSTP) and the Office of Management and Budget (OMB) work closely with the USGCRP to establish research priorities and funding plans to ensure the program is aligned with the Administration's priorities and reflects agency planning. The program is currently developing a new strategic plan.

The 2011 Budget proposes \$2.6 billion for the USGCRP to support the goals set forth in the program's current strategic plan. These activities can be grouped under the following areas: improve our knowledge of Earth's past and present climate variability and change; improve our understanding of natural and human forces of climate change; improve our capability to model and predict future conditions and impacts; assess the Nation's vulnerability to current and anticipated impacts of climate change; and improve the Nation's ability to respond to climate change by providing climate information and decision support tools that are useful to policymakers and the general public. Reports and general information about the USGCRP are available on the program's website, www.globalchange.gov.

2.1 SELECTED AGENCY HIGHLIGHTS OF THE USGCRP IN THE 2011 BUDGET

- The Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) is a leading sponsor of oceanic and atmospheric research and is one of the key sponsors of climate science capabilities in the Federal government. The 2011 Budget allocates \$437 million for the Department of Commerce's USGCRP efforts, predominantly from NOAA, an increase of \$77 million or 21 percent over the 2010 level.
- The National Aeronautics and Space Administration (NASA) budget includes a bold new investment in climate science. NASA's Earth Science program conducts first-of-a-kind demonstration flights of sensors in air and space in an effort to foster scientific understanding of the global integrated Earth system and to improve the ability to forecast global and regional climate change and natural disasters. The President has directed NASA to accelerate the development of new satellites that the National Research Council recommended as Earth Science priorities, in addition to flying several research satellites currently in development, conducting an airborne campaign to monitor changes in polar ice sheets, and pursuing enhancements to climate models. NASA will also develop and fly a replacement of the Orbiting Carbon Observatory (OCO), a mission designed to identify global carbon sources and sinks that was lost when its launch vehicle failed in 2009.
- The National Science Foundation (NSF) is the primary source of support for academic research for most nonbiomedical disciplines, funding basic research across the entire spectrum of the

sciences and engineering. NSF USGCRP support totals \$370 million in the 2011 Budget, an increase of 16 percent over the 2010 level.

- The 2011 Budget provides \$81 million for USGCRP programs in the Department of the Interior, an increase of \$18 million or 29 percent over the 2010 funding level. Interior's lead science agency, the U.S. Geological Survey (USGS), funds several programs to monitor and analyze the impacts of climate change on natural resources, including the Global Change Effects Network and Climate Science Centers, and to develop biological and geological carbon sequestration assessments.

Table 2

U.S. Global Change Research Program

Details by Agency/Account

(Budget authority, obligations, and outlays in millions of dollars)¹

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
Department of Agriculture									
Agricultural Research Service	0	20	20	20	20	24	20	22	2
National Institute of Food and Agriculture	0	5	5	4	56	56	50	106	50
Economic Research Service	0	0	0	0	1	1	1	1	0
Forest Service – Forest and Rangeland Research	0	22	22	22	32	32	32	28	-4
Subtotal – USDA³	0	47	47	46	109	113	103	157	48
Department of Commerce									
National Oceanic and Atmospheric Administration – Operations, Research, and Facilities	0	274	274	227	309	309	256	315	6
National Oceanic and Atmospheric Administration – Procurement, Acquisition, and Construction	218	101	234	194	49	134	111	120	71
National Institute of Standards and Technology (NIST)	0	2	2	2	2	2	2	2	0
Subtotal – DOC³	218	377	510	423	360	445	369	437	77
Department of Energy									
Science – Biological & Environmental Research	65	168	233	168	165	165	235	191	26
Department of Health and Human Services									
National Institutes of Health	0	5	5	5	4	4	4	4	0
Department of the Interior									
U.S. Geological Survey – Surveys, Investigations, and Research	0	45	37	43	63	20	61	81	18

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation	FY 2009 Outlays	FY 2010 Enacted Budget Authority	FY 2010 Obligation	FY 2010 Outlays	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
Department of Transportation									
Federal Highway Administration – Federal-Aid Highways ⁴	0	0	0	0	0	0	0	0	0
Federal Aviation Administration – Research, Engineering, and Development	0	2	2	1	3	3	1	3	0
Federal Transit Administration - Research and University Research Centers ⁵	0	0	0	0	0	0	0	0	0
Subtotal – DOT³	0	2	2	1	3	3	1	3	0
Environmental Protection Agency									
Science and Technology	0	18	17	17	21	21	21	22	1
National Aeronautics and Space Administration									
Science	237	1,086	1,086	1,071	1,071	1,071	1,075	1,285	214
National Science Foundation									
Research and Related Activities	121	269	390	351	319	319	287	370	51
Smithsonian Institution									
Salaries and Expenses	0	6	6	6	7	7	7	11	4
U.S. Agency for International Development									
<i>Development Assistance- non-add⁶</i>	0	17	17	17	36	36	36	43	7
Total³	641	2,023	2,333	2,131	2,122	2,168	2,163	2,561	439

¹All data supersede numbers released with the 2011 President's Budget. Budget authority provided in millions of dollars. Discrepancies may result from rounding and improved estimates.

²All obligation and outlay data are preliminary estimates and are subject to change, in some cases obligation and outlay estimates are based on historical obligation and outlay rates.

³Agency subtotals and table total may not add due to rounding.

⁴The FY 2009 and FY 2011 funding for Federal Highway Administration – Federal-Aid Highways was less than \$500,000.

⁵Federal Transit Administration - Research and University Research Centers is FTA's support for DOT's Center for Climate Change. The 2009 through 2011 funding amounts for this program are less than \$500,000.

⁶USAID funding supports USGCRP and the Climate Change International Assistance effort. In the past, some USAID funding was counted under both categories. USAID spending is now only reported under International Assistance and does not add to the USGCRP total.

3. CLIMATE CHANGE TECHNOLOGY

The U.S. Climate Change Technology Program (CCTP) activities help to reduce, avoid, or sequester greenhouse gas emissions. The CCTP comprises research, development, and deployment efforts, including a variety of voluntary partnership and grant activities. The activities have the effect of stimulating the development and use of certain energy technologies, including renewable, low-carbon fossil, and nuclear technologies as well as energy efficient technologies, products, and process improvements.

The 2011 Budget proposes approximately \$5.7 billion for the CCTP. Table 3 provides a breakdown by agency of CCTP funding.

Descriptions of some select activities are included below.

3.1 SELECTED AGENCY HIGHLIGHTS OF THE CCTP IN THE 2011 BUDGET

- **Increased Investment in DOE Climate Change Technology R&D.** The budget proposes \$4.9 billion for climate change technology R&D programs at the Department of Energy, 11 percent more than the 2010 enacted level. The Department's funding supports a wide range of important R&D on key technologies such as solar, wind, nuclear and carbon capture and storage. Highlights include:
 - \$300 million for the Advanced Research Projects Agency – Energy (ARPA-E). ARPA-E was initiated with Recovery Act funding to pursue advances in energy technology.
 - \$2.355 billion for Energy Efficiency and Renewable Energy programs, an increase of \$113 million over the FY 2010 enacted level. This includes increases for solar (\$302 million; +\$77 million or 34 percent), wind (\$123 million, +\$43 million or 53 percent), and geothermal energy research and development (\$55 million; +\$11 million or 25 percent) as well as for efforts focused on improving energy efficiency of buildings (\$231 million; +\$31 million or 15 percent), the development of advanced technology vehicles such as plug-in electric vehicles (\$325 million; +\$14 million or 4 percent), and reducing the energy intensity of industrial processes and manufacturing (\$100 million; +\$4 million or 4 percent).
 - Establishment of new National Laboratory Carbon Capture and Storage Modeling Partnerships. The Budget provides \$20 million to advance modeling and simulation of carbon capture component technologies and geologic sequestration risk management, monitoring, verification, and accounting.

Table 3

Climate Change Technology Program

Details by Agency/Account

(Budget authority, obligations, and outlays in millions of dollars)¹

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
Department of Agriculture									
Natural Resources Conservation Service – Carbon Cycle	0	9	7	7	7	7	7	7	0
National Agricultural Statistics Service	0	0	0	0	0	0	0	1	1
Agricultural Research Service – Bioenergy Research	0	5	5	5	5	5	5	4	-1
Cooperative State Research, Education and Extension Service - Biofuels/Biomass Research, Formula Funds, National Research Initiative (National Institute of Food and Agriculture)	0	5	5	5	5	5	5	5	0
Forest Service – Biofuels/Biomass, Forest and Rangeland Research	0	1	1	1	5	5	5	5	0
Rural Business Service – Value Added Producer Grants (Cooperative Development Grants)	0	6	2	2	4	2	2	4	0
Rural Business Service – Rural Energy for America Program	0	5	5	0	39	39	24	39	0
Rural Business Service – Biorefinery Assistance Program	0	0	0	0	0	0	0	17	17
2008 Farm Bill, Mandatory Funding									
Rural Business Service – Rural Energy for America	0	55	55	19	60	0	0	70	10
National Institute of Food and Agriculture – Biomass Research and Development	0	20	20	13	28	28	20	28	0
Rural Business Service – Repowering Assistance Program	0	35	0	0	0	35	9	0	0
Rural Business Service – Biorefinery Assistance Program	0	75	0	0	245	75	4	0	-245
Rural Business Service - Bioenergy Program for Advanced Biofuels	0	55	0	0	55	30	8	85	30
Subtotal - mandatory funding	0	240	75	32	388	168	41	183	-205
Subtotal - discretionary funding	0	31	25	20	65	63	48	82	17
Subtotal – USDA³	0	271	100	52	453	231	89	265	-188

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
Department of Commerce									
National Institute of Standards and Technology (NIST) – Scientific and Technological Research and Services	4	7	7	7	15	15	15	15	0
NIST – Industrial Technical Services, Technology Innovation Program	0	6	6	6	1	1	1	1	0
International Trade Administration – Operations and Administration	0	2	2	2	2	2	2	2	0
Subtotal – Commerce³	4	15	15	15	18	18	18	18	0
Department of Defense									
Research, Development, Test and Evaluation, Army	44	98	137	124	93	98	154	28	-65
Research, Development, Test and Evaluation, Navy	18	54	69	47	13	18	29	11	-2
Research, Development, Test and Evaluation, Air Force	35	108	132	105	120	122	108	104	-16
Research, Development, Test and Evaluation, Defense Wide ⁴	42	0	37	20	0	4	17	0	0
Subtotal – DOD³	139	261	376	296	226	243	308	143	-83
Department of Energy									
Energy Efficiency and Renewable Energy	16,800	2,179	11,922	1,666	2,242	4,762	10,056	2,355	113
Electricity Delivery and Energy Reliability	4,340	113	164	101	109	4362	595	143	34
Nuclear Energy ⁵	0	787	750	677	747	745	671	793	46
Fossil Energy R&D – Efficiency and Sequestration ⁶	3,400	762	598	316	560	3,810	453	545	-15
Science – Fusion, Sequestration, and Hydrogen ⁷	283	700	966	818	723	740	775	738	15
Energy Transformation Acceleration Fund - Advance Research Projects Agency- Energy (ARPA-E) ⁸	0	0	0	0	9	1	1	300	291
Energy Transformation Acceleration Fund - (ARPA-E) Recovery Act ⁹	400	0	3	1	0	397	54	0	0
Departmental Administration – Climate Change Technology Program Direction ¹⁰	0	2	2	1	9	1	0	9	0
Subtotal – DOE³	25,223	4,543	14,405	3,580	4,399	14,818	12,605	4,883	484

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation	FY 2009 Outlays	FY 2010 Enacted Budget Authority	FY 2010 Obligation	FY 2010 Outlays	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
Department of Transportation									
National Highway Traffic Safety Administration ¹¹	0	0	0	0	1	0	0	0	-1
Research and Innovative Technology Administration – Research and Development	0	1	1	0	1	1	0	1	0
Federal Highway Administration – Federal Aid Highways	0	19	19	12	19	19	13	19	0
Federal Aviation Administration - RED	0	3	1	1	11	11	6	5	-6
Federal Transit Administration - Research and University Research Centers and Formula and Bus Grants ¹²	100	19	19	15	94	169	20	53	-41
Subtotal – DOT³	100	43	41	28	125	200	39	77	-48
Environmental Protection Agency									
Environmental Programs and Management	0	94	97	97	113	113	113	123	10
Science and Technology	0	17	16	16	20	20	20	17	-3
Subtotal – EPA³	0	111	113	113	133	133	133	140	7
National Aeronautics and Space Administration									
Science, Aeronautics, and Exploration	31	119	119	118	124	124	122	137	13
National Science Foundation									
Research and Related Activities	2	24	26	23	26	26	23	27	1
Total³	25,499	5,386	15,195	4,225	5,504	15,794	13,337	5,690	186

¹All data supersede numbers released with the 2011 President's Budget. Budget authority provided in millions of dollars. Discrepancies may result from rounding and improved estimates.

²Obligation and outlay data are preliminary estimates and are subject to change, in some cases obligation and outlay estimates are based on historical obligation and outlay rates. Estimates include American Reinvestment and Recovery Act (ARRA) funding, leading to large obligations in FY 2009 and FY 2010, and large outlays in FY 2010 relative to budget authority for the same year.

³Agency subtotals and table total may not add due to rounding.

⁴The American Recovery and Reinvestment Act (ARRA) provided funding to the Department of Defense for improvements in energy generation and efficiency, transmission, regulation and storage. Funding shown in 2009 includes funding that was allocated to agencies in DoD (in addition to funds provided to the military services, which is shown in other lines).

⁵Funding levels for all years shown do not include the MOX facility. The decrease in 2010 is due to the close-out of the Nuclear Power 2010 program and the termination of the Nuclear Hydrogen Initiative.

⁶The 2010 funding is for conduct of R&D only. The reductions from 2009 reflect the fact that carbon capture and storage demonstration projects are funded through ARRA.

⁷The 2009 funding includes \$6 million for ARPA-E activities appropriated in the DOE Science Account.

⁸The 2010 funding reflects the transfer of funds originally appropriated in the science account in 2009.

⁹Funding for ARPA-E through ARRA is shown on a separate line because it has a unique account in the President's Budget Appendix.

¹⁰The increase from 2009 to 2010 reflects additional funding for program assessment, modeling, and analysis.

¹¹The budget contains no policy recommendations for surface transportation programs subject to reauthorization, including for NHTSA and FTA programs. Instead, the budget displays baseline funding levels for all surface transportation programs.

¹²Section 3045 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU) establishes a National Fuel Cell Bus Technology Development Program (NFCBP). The NFCBP's goal is to facilitate the development of commercially viable fuel cell bus technologies and related infrastructure to reduce fossil fuel dependence and emissions from bus transportation. The American Recovery and Reinvestment Act, 2009, provided \$100,000,000 for discretionary grants for capital investment that will assist in reducing energy consumption and greenhouse gas emissions. FTA's Transit Investments in Greenhouse Gas and Energy Reduction (TIGGER) program funds projects that demonstrate energy savings and/or GHG reductions.

4. INTERNATIONAL ASSISTANCE

The Administration has taken a whole-of-government approach to pursue four broad international climate change financing objectives within its international assistance programs: demonstrate continued U.S. leadership in forging a global solution to the climate challenge; help developing countries focus their climate investments strategically over the coming years; create robust means of measuring, monitoring, and verifying domestic emissions in developing countries; and reduce vulnerability to climate change. Coordinating and integrating activities from across the U.S. government promotes complementarities that enhance the value of U.S. climate-related financing and increase the likelihood of successfully realizing these four objectives.

Although the Administration's efforts to address climate change are diverse, its bilateral and multilateral international climate change financing is focused on three policy pillars: adaptation, clean energy, and sustainable landscapes. These three policy pillars invest in significant emissions reduction strategies as well as activities that help communities adapt to a changing climate. Key results and indicators to measure progress have been identified for activities in these policy pillars and can be mapped to the Administration's four broad objectives. These activities will strengthen our relationships with other nations, help mitigate the security risk that climate change poses as a threat multiplier in the developing world, support our efforts for a comprehensive, multilateral approach to climate change that involves meaningful actions by all major economies, and create economic opportunities for manufacturers of clean energy technologies.

In its FY 2011 Budget, the Administration is seeking \$1,384 million for core international efforts to combat global climate change, which represents a 38 percent increase over the FY 2010 level. These efforts, conducted by the U.S. Agency for International Development, the U.S. Department of State, and the U.S. Department of the Treasury, will help the most vulnerable countries respond to the growing impacts of climate change, and help forge a global solution to the climate crisis.

The core activities are complemented by an estimated \$110 million that is being sought for programs conducted by a range of additional U.S. agencies that address climate change internationally.

In addition to the funding summarized in table 4, USAID, State, and Treasury will be implementing other programs, such as food security programs or biodiversity programs, in ways that will make a significant contribution to the fight against climate change. Programs focused primarily on non-climate change goals may promote "climate-proofed" development or use adjusted techniques to significantly reduce emissions while promoting other development goals and thereby deliver climate change mitigation and adaptation co-benefits. As of April 2010, the Administration estimated the FY 2011 budget authority for these programs to be \$386 million.¹ Furthermore, the Administration is enhancing U.S. efforts to address global climate change and promote clean energy technologies in important ways beyond those programs with direct appropriations. Through direct loans, loan guarantees, insurance, and working capital guarantees, U.S. development finance and export credit agencies are increasingly mobilizing investments in clean energy technologies around the world.

¹ Summary of the "whole of government" U.S. International Climate Change Financing is available at <http://www.state.gov/documents/organization/140689.pdf>

Based on initial estimates as of April 2010, the value of these financial products is estimated at \$873 million for FY 2011.² These U.S. Government financial products will help American firms, financial institutions, and investors, with their foreign partners, address climate change in developing countries, offering global benefits.

Together, these activities will substantially contribute to the international community's renewed efforts to address climate change, including through the implementation of the Copenhagen Accord, and make clear the Administration's commitment to international leadership in the necessary transition to a low emission economy.

4.1 U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)

USAID is the lead contributor to bilateral assistance, with a focus on capacity building, civil society building, governance programming and creating the legal and regulatory environments needed to address climate change. USAID will leverage its significant technical expertise to provide leadership in development and implementation of low-carbon strategies, creating policy frameworks for market-based approaches to emission reduction and energy sector reform, promoting sustainable management of agriculture lands and forests, and mainstreaming adaptation into development activities in countries most at risk. USAID has long-standing relationships with host country governments that will enable it to work together to develop shared priorities and implementation plans. USAID's engagement and expertise in agriculture, biodiversity, health, and other critical climate sensitive sectors provide an opportunity to implement innovative cross-sectoral climate change programs. Finally, USAID bilateral programs can work in key political and governance areas that multilateral agencies cannot.

4.2 DEPARTMENT OF STATE

State takes the lead on diplomatic efforts and deploys financial resources in support of key multilateral and bilateral priorities. State's comparative advantage is promoting effective international solutions, advanced technology strategies, and innovative market approaches through international processes and U.S.-led diplomatic partnerships and initiatives.

4.3 DEPARTMENT OF THE TREASURY

The Treasury Department is the primary vehicle by which the U.S. Government provides contributions through multilateral delivery channels, including the Climate Investment Funds and the Global Environment Facility. Multilateral assistance promotes institutional structures governed jointly by developed and developing countries, which are needed for a coordinated, global response to climate change. Multilateral institutions complement bilateral assistance by leveraging contributions from other donors, making capital investments in infrastructure, providing a range of tailored financial products, and working across a larger number of countries.

² Estimates of development finance and export credit agencies' international climate investments are based on an initial review of planned projects, and in some cases the final review of activities, after their implementation, may change the accounting of timing and scale of financing.

The 2011 Budget requests \$400 million for the Clean Technology Fund (CTF), which aims to close the price gap in developing countries between dirtier conventional technologies and commercially available cleaner alternatives in the power sector, the transportation sector, and in energy efficiency. The CTF focus is on transforming energy use on a sector scale in the larger emitter developing countries.

In addition, the Budget requests \$235 million for the Strategic Climate Fund in three programs: \$90 million for the Pilot Program for Climate Resilience, \$95 million for the Forest Investment Program and \$50 million for The Program for Scaling-up Renewable Energy in Low Income Countries (SREP). The Pilot Program for Climate Resilience will help finance comprehensive efforts to improve the technical capacity of countries to plan for and finance climate adaptation efforts. The Forest Investment Program will support activities informed by national plans to reduce deforestation and will focus on transitioning a small number of developing countries to participate in carbon financing for forest preservation. SREP aims to demonstrate how to put the poorest countries on a pathway that uses renewable energy to expand energy access, and stimulate economic growth.

4.4 COMPLEMENTARY AGENCIES

In addition to the core international assistance activities, a number of additional agencies provide technical and in some cases direct support for international efforts to address climate change. Two international agencies, the Millennium Challenge Corporation (MCC) and the U.S. Trade and Development Agency (USTDA), work directly with international partners on projects that may have climate change benefits.

MCC works with its foreign government partners on programs that reduce poverty through sustainable economic growth. In undertaking its poverty reduction programs, MCC seeks to integrate climate change considerations, such as adaptation and reduced emissions, where relevant. For example, MCC clean energy capital investments may support both development and emissions reductions. MCC agriculture and agricultural infrastructure programs, such as irrigation, may integrate more sustainable use of water resources at risk to become scarcer in a changing climate.

USTDA has a number of programs that couple support for U.S. exports and a focus on emissions reductions abroad. USTDA provides technical assistance to developing countries on clean energy technologies that U.S. firms provide, organizes visits for foreign entities seeking business opportunities with U.S. firms in the renewable energy sector, and funds studies on future clean energy infrastructure investments.

A number of domestic agencies with significant technical expertise complement the core international assistance activities on climate change through a variety of functions. The Department of Energy and the Environmental Protection Agency provide technical assistance on clean energy investments and environmental regulations undertaken by foreign governments; the National Oceanic and Atmospheric Administration, National Aeronautics and Space Administration, and the National Science Foundation provide research and science assistance to the core international assistance agencies that directly supports climate change efforts; and the Forest Service works with USAID on a number of forestry programs that reduce emissions through carbon sequestration.

Table 4

International Climate Change Assistance

Details by Agency/Account

(Budget authority, obligations, and outlays in millions of dollars) ¹

	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
Core Agencies³								
Department of State⁴								
Diplomatic and Consular Affairs ⁵	2	2	2	2	2	2	0	-2
Economic Support Fund	24	29	23	158	88	80	110	-48
International Organizations and Programs	29	29	29	39	39	39	39	0
Subtotal – State⁶	55	60	54	199	129	121	149	-50
Department of the Treasury								
Debt Restructuring – Tropical Forestry Conservation	20	20	40	20	39	39	20	0
Global Environment Facility ⁷	26	26	26	26	26	26	89	63
Clean Technology Fund	0	0	0	300	300	300	400	100
Strategic Climate Fund ⁸	0	0	0	75	75	75	235	160
Subtotal – Treasury⁶	46	46	66	421	440	440	744	323
U.S. Agency for International Development⁴								
Assistance for Europe, Eurasia, and Central Asia ⁹	15	15	1	26	26	10	26	0
Development Assistance	113	113	94	313	313	122	446	133
Economic Support Fund	94	94	25	44	44	40	19	-25
International Disaster Assistance	0	0	0	0	0	0	0	0
Subtotal – USAID⁶	222	221	120	383	383	172	491	108
Subtotal- Core Agencies⁶	323	327	240	1,003	952	733	1,384	381
Complementary Agencies¹⁰								
US Department of Energy¹¹								
Energy Efficiency and Renewable Energy	0	0	0	8	0	0	8	0
Fossil Energy R&D – Efficiency and Sequestration	0	0	0	3	0	0	3	0
Science	0	0	0	3	0	0	3	0
Subtotal- DOE⁶	0	0	0	13	0	0	13	0

	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
Environmental Protection Agency								
Environmental Programs and Management ¹²	20	20	20	21	21	21	21	0
Department of Commerce								
National Oceanic and Atmospheric Administration- Operations, Research, and Facilities ¹³	9	9	5	9	9	7	9	0
International Trade Administration- Operations and Administration ¹⁴	2	2	2	2	2	2	2	0
Subtotal – Commerce⁶	11	11	7	11	11	9	11	0
National Science Foundation								
Research and Related Activities ¹⁵	3	3	3	6	6	5	9	3
Department of Agriculture								
Forest Service-Forest and Rangeland Research ¹⁶	4	4	4	5	5	5	4	-1
National Aeronautics and Space Administration								
Science ¹⁷	2	2	2	2	2	2	6	4
Millennium Challenge Corporation								
Millennium Challenge Corporation ¹⁸	0	0	11	2	2	5	25	23
US Trade and Development Agency								
Trade and Development Agency ¹⁹	10	9	7	17	17	5	21	4
Subtotal- Complementary Agencies⁶	50	49	54	77	64	52	110	33
Total⁶	373	376	294	1,080	1,016	785	1,494	414

¹All data supersede numbers released with the 2011 President's Budget. Budget authority provided in millions of dollars. Discrepancies may result from rounding and improved estimates.

²All obligation and outlay data are preliminary estimates and are subject to change. In some cases obligation and outlay estimates are based on historical obligation and outlay rates.

³ Core agencies for the purposes of the Federal Climate Change Expenditure Report are made of the primary climate assistance activities of the Department of State, Department of the Treasury, and US Agency for International Development (USAID). The Federal Climate Change Expenditures Report contained only these core agencies in previous years.

⁴ USAID and Department of State's Global Climate Change figures for 2010 and 2011 are considered estimates and may change as bureaus and missions update operational budgets and outlays are finalized.

⁵ Diplomatic and Consular Affairs continues to support international climate change activities, but because it is not a foreign assistance account, it has been excluded from the international assistance crosscut, beginning in FY 2011.

⁶ Agency subtotals and table total may not add due to rounding.

⁷ A portion of GEF funds is allocated to programs related to climate change and shown here. The increase in FY11 is due to a new focus towards sustainable landscapes/forestry activities during the fifth GEF replenishment.

⁸ The increase to the Strategic Climate Fund in FY11 reflects the budget request to increase Treasury contributions to Pilot Programs for Climate Resilience (\$90m) and the Forest Investment Program, as well as a first-time contribution to Scaling-up Renewable Energy in Low Income Countries (SREP).

⁹ In the 2009 Omnibus appropriation, Congress combined Assistance for Eastern Europe and the Baltic States with Assistance for the Independent States of the Former Soviet Union, making a new account called Assistance for Europe, Eurasia, and Central Asia.

¹⁰ Estimates of complementary agencies' international climate investments are based on an initial review of funding, and may not include all relevant programs and agencies. In some cases the final review of activities, after their implementation, may change the accounting of timing and scale of financing. Additionally, development finance and export credit agencies (i.e. the Overseas Private Investment Corporation and the Export-Import Bank of the United States) make significant contributions to the deployment of clean energy technologies that are not included in this report.

¹¹ DOE funding represents the China and India Clean Energy Research Centers which are funded through the three accounts shown. FY10 funding reflects a reprogramming request, it was not included in the 2010 President's Budget proposal nor in 2010 appropriated funding.

¹² EPA activities include Methane to Markets, International Capacity Building, and contribution to the Multilateral Fund to support the Montreal Protocol on Substances that Deplete the Ozone Layer.

¹³ NOAA activities include funding for the International Research Institute for Climate and Society (IRI).

¹⁴ ITA funding represents activities under the Asia Pacific Partnership to promote the development and deployment of cleaner and more efficient energy technologies.

¹⁵ NSF activities include the Regional Institutes for Global Change through the Directorate for Geosciences as well as Basic Research to Enable Agriculture Development (BREAD) through the Directorate for Biological Science.

¹⁶ Forest Service activities include assistance to developing countries to establish and maintain sustainable landscape management.

¹⁷ NASA activities include funding for the SERVIR initiative which consists of two web-based regional monitoring networks to provide environmental (land, sea, atmosphere, biota) information and projections to decision makers in Central America/Caribbean and East Africa.

¹⁸ Millennium Challenge Corporation does not project future expenditures/outlays at the activity level. Its estimated outlay for FY10 is based on actual expenditures through Q1 and an initial estimate of expected expenditures through the remainder of the year. Estimated FY10 obligations of \$2 million are anticipated but subject to change. The estimated portion of MCC's total FY11 budget authority that would be used to support projects with ancillary climate benefits (estimated at \$25 million) is based on an average of current, anticipated, and past climate-related activities that MCC is funding or expects to fund to date.

¹⁹USTDA provides funding for various forms of investment analysis and technical assistance to promote investment opportunities for U.S. companies in developing countries. USTDA has expanded its clean energy project portfolio dramatically over the last few years.

5. ENERGY TAX PROVISIONS THAT MAY REDUCE GREENHOUSE GASES

This report includes existing energy tax provisions and energy grants in lieu of tax provisions which may reduce greenhouse gases. Summary descriptions of the provisions are provided below and the associated revenue effects are shown in Table 5. A tax expenditure is an exception to baseline provisions of the tax structure that usually results in a reduction in the amount of tax owed. In addition to categories of tax expenditures described in previous Federal climate change expenditures reports, this report contains estimated payments from the Department of the Treasury authorized by Section 1603 of the American Recovery and Reinvestment Act.

All tax expenditure estimates presented here are based upon current tax law enacted as of December 31, 2009. Expired or repealed provisions are not listed if their revenue effects result only from taxpayer activity occurring before fiscal year 2009. The estimates reflect 2010 Budget Midsession Review economic assumptions. Legislation enacted in 2010 is not reflected in these estimates. Tax expenditure information can also be found in *Analytical Perspectives, Budget of the United States Government*, Fiscal Year 2011, Chapter 16.

New technology credit - Energy production Credit – The Tax Code provides a credit for certain electricity produced from wind energy, biomass, geothermal energy, solar energy, small irrigation power, municipal solid waste, or qualified hydropower and sold to an unrelated party.

Energy investment credit. — The Tax Code provides credits for investments in solar and geothermal energy property, qualified fuel cell power plants, geothermal heat pumps, small wind property and combined heat and power property. Owners of renewable power facilities that qualify for the energy production credit may instead elect to take an energy investment credit.

Credit and deduction for clean-fuel burning vehicles – The Tax Code allows a number of credits for certain types of vehicles and property. These are available for alternative motor vehicles (including fuel cell, advanced lean burn technology, hybrid, and alternative fuel motor vehicles), alternative fuel vehicle refueling property, and plug-ins (including plug-in electric vehicles, plug-in electric drive motor vehicles, and plug-in conversion kits).

Exclusion of utility conservation subsidies – In certain circumstances, public utilities offer rate subsidies to non-business customers who invest in energy conservation measures.

Credit for holding clean renewable energy bonds – The Tax Code provides for the issuance of Clean Renewable Energy Bonds which entitles the bond holder to a Federal income tax credit in lieu of interest. The limit on the volume issued in 2009 is \$2.4 billion.

Allowance of deduction for certain energy efficient commercial building property – The Tax Code allows a deduction, per square foot, for certain energy efficient commercial buildings.

Credit for construction of new energy efficient homes – The Tax Code allows contractors a tax credit of \$2,000 for the construction of a qualified new energy-efficient home that has an annual level of heating and cooling energy consumption at least 50 percent below the annual consumption of a comparable dwelling unit. The credit equals \$1,000 in the case of a new manufactured home that meets a 30 percent standard.

Credit for energy efficiency improvements to existing homes – The Tax Code provides an investment tax credit for expenditures made on insulation, exterior windows, and doors that improve the energy efficiency of homes and meet certain standards. The Tax Code also provides a credit for purchases of advanced main air circulating fans, natural gas, propane, or oil furnaces or hot water boilers, and other qualified energy efficient property.

Credit for energy efficient appliances – The Tax Code provides tax credits for the manufacture of efficient dishwashers, clothes washers, and refrigerators. The size of the credit depends on the efficiency of the appliance.

Credit for residential purchases/installations of solar and fuel cells — The Tax Code provides a credit for the purchase of a qualified photovoltaic property and solar water heating property, as well as for fuel cell power plants, geothermal heat pumps and small wind property.

Credit for qualified energy conservation bonds — The Tax Code provides for the issuance of energy conservation bonds which entitle the bond holder to a Federal income tax credit in lieu of interest. The limit on the volume issued in 2009 is \$3.2 billion.

Energy grants in lieu of new technology credit or energy investment credit — Section 1603 of the American Recovery and Reinvestment Tax Act of 2009 (Section 1603) authorizes the United States Department of the Treasury (Treasury) to make payments to persons who place in service specified energy property in 2009 and 2010 or whose construction commenced in 2009 and 2010. Firms can take an energy grant in lieu of the energy production credit or the energy investment credit.

Table 5**Energy Tax Provisions That May Reduce Greenhouse Gases**

(Revenue effect in millions of dollars)

	2009	2010	2011	2012	2013	2014	2015	2011-2015
New technology credit (without coal) ¹	360	780	1,020	1,240	1,530	1,530	1,500	6,820
Energy Investment Credit ²	270	530	600	680	420	370	450	2,520
Tax credit and deduction for clean-fuel burning vehicles	130	240	260	130	170	230	390	1,180
Exclusion of utility conservation subsidies	140	140	130	120	120	120	120	610
Credit for holding clean renewable energy bonds	70	80	100	120	140	140	140	640
Allowance of deduction for certain energy efficient commercial building property	60	80	90	90	130	80	10	400
Credit for construction of new energy efficient homes	30	20	20	20	0	0	0	40
Credit for energy efficiency improvements to existing homes	570	1,950	1,460	0	0	0	0	1,460
Credit for energy efficient appliances	130	130	50	0	0	0	0	50
Credit for residential purchases/ installations of solar and fuel cells	110	180	180	180	190	190	190	930
Qualified energy conservation bonds	0	10	40	80	110	120	120	470
Tax Provisions- subtotal	1,870	4,140	3,950	2,660	2,810	2,780	2,920	15,120
Energy Grants in lieu of new technology credit or energy investment credit ³	1,050	3,090	4,460	4,240	2,360	230	30	11,320
TOTAL (Tax provisions + grants)	2,920	7,230	8,410	6,900	5,170	3,010	2,950	26,440

¹Estimates of revenue loss from coal provisions have been removed from the tax expenditure estimate in the budget. In previous years, the Energy Investment Credit was contained within the New Technology Credit.

²In previous years, the Energy Investment Credit was contained within the New Technology Credit. The Energy Investment Credit also includes the business installation of fuel cells, which was an independent entry in tables from previous years. Estimates of revenue loss from the micro-turbine provision have been removed from the tax expenditure estimate in the budget.

³Firms can take an energy grant in lieu of the energy production credit or the energy investment credit for facilities placed in service in 2009 and 2010 or whose construction commenced in 2009 and 2010. The grants are considered outlays and are direct substitutes for the energy tax provisions.

6. WILDLIFE ADAPTATION FUNDING

Climate change is a complex, interdisciplinary issue with the potential to affect nearly every sector and level of governmental operations. When President Obama signed the [Executive Order on Federal Leadership in Environmental, Energy, and Economic Performance](#), on October 5, 2009, he called on the Interagency Climate Change Adaptation Task Force to develop, within one year, Federal recommendations for adapting to climate change impacts both domestically and internationally. The effort to develop recommendations is ongoing, and will inform the criteria by which climate change adaptation expenditures are estimated. While the Administration is working to develop criteria to systematically account for a broader suite of adaptation programs, this interim category summarizes certain activities at the Department of the Interior designed to promote wildlife adaptation. The 2011 Climate Change Expenditures Report includes one particular climate change adaptation activity at the Department of the Interior.

The President's Budget for FY2010 included an increase of \$130 million for the Department of the Interior to fund a number of near-term activities to help fish and wildlife adapt to the impacts of climate change including planning for such changes. The FY 2011 President's Budget continues this funding including developing protocols for addressing the impacts of climate change on wildlife in land management plans and related activities.

The Department of the Interior's climate change adaptation activity is an effort to gain effective and broad collaboration to determine the causes, formulate solutions, and implement changes to reduce or reverse climate impacts to lands, waters, natural and cultural resources.

A key component of this initiative is the development of a network of Landscape Conservation Cooperatives (LCCs), which will become applied conservation science partnerships that provide scientific and technical support for spatially-explicit conservation goals and for integrated, adaptive management actions at landscape scales. LCCs will engage other Federal agencies, local and State partners, and the public in crafting practical, landscape-level strategies for managing climate change impacts in coordination with the Department's Climate Science Centers. Their focus will include impacts of climate change on wildlife migration patterns, wildfire risk, drought, or invasive species that typically extend beyond the borders of any single national wildlife refuge, BLM unit, or national park, but do not encompass an area as large as an entire region.

With resident staff and through connections with partners, LCCs will develop, test, implement, and monitor conservation strategies that will be responsive to the dynamic landscape changes resulting from climate change. The LCCs will facilitate broad availability of data, modeling, and tools to land managers that will allow them to analyze and model trends in species and habitat changes. LCCs will also support improved management of water resources, historical and cultural resources, and resources that are needed by Indian Tribes and Alaska Natives.

Table 6

Wildlife Adaptation Funding

(Budget authority, obligations, and outlays in millions of dollars) ¹

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
Department of the Interior									
National Park Service - Operation of the National Park Service	0	0	0	0	10	0	0	10	0
Fish and Wildlife Service - Resource Management	0	0	0	0	40	32	32	59	19
Bureau of Land Management - Management of Lands and Resources	0	0	0	0	15	15	6	18	3
Total – Wildlife Adaptation Funding	0	0	0	0	65	47	38	87	22

FOOTNOTES

¹All data supersede numbers released with the 2011 President's Budget. Budget Authority provided in millions of dollars. Discrepancies resulted from rounding and improved estimates. Funding in the table does not include USGS climate change wildlife adaptation research, which is captured within USGCRP totals.

²All obligation and outlay data are preliminary estimates and are subject to change.

APPENDIX

Table 7

ACCOUNTING OF FEDERAL CLIMATE CHANGE EXPENDITURES BY AGENCY

Details by Agency/Account

(Tax expenditures and Budget authority, obligations, and outlays in millions of dollars)

The following is a listing of Federal climate change expenditures by agency and by line item in the President's 2011 Budget Appendix. Budget Appendix line items show account level data and may not reflect sub-account level climate change information. The data in this table may be subsets of an account.

Climate Change Expenditures by Agency¹

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
<u>Department of Agriculture</u>									
<u>Global Change Research Program</u>									
Agricultural Research Service	0	20	20	20	20	24	20	22	2
National Institute of Food and Agriculture	0	5	5	4	56	56	50	106	50
Economic Research Service	0	0	0	0	1	1	1	1	0
Forest Service – Forest and Rangeland Research	0	22	22	22	32	32	32	28	-4
USDA- GCRP Subtotal³	0	47	47	46	109	113	103	157	48
<u>Climate Change Technology Program</u>									
Natural Resources Conservation Service – Carbon Cycle	0	9	7	7	7	7	7	7	0
National Agricultural Statistics Service	0	0	0	0	0	0	0	1	1
Agricultural Research Service – Bioenergy Research	0	5	5	5	5	5	5	4	-1
Cooperative State Research, Education and Extension Service - Biofuels/Biomass Research, Formula Funds, National Research Initiative (National Institute of Food and Agriculture)	0	5	5	5	5	5	5	5	0
Forest Service – Biofuels/Biomass, Forest and Rangeland Research	0	1	1	1	5	5	5	5	0
Rural Business Service – Value Added Producer Grants (Cooperative Development Grants)	0	6	2	2	4	2	2	4	0
Rural Business Service – Rural Energy for America Program	0	5	5	0	39	39	24	39	0

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
Rural Business Service – Biorefinery Assistance Program	0	0	0	0	0	0	0	17	17
2008 Farm Bill, Mandatory Funding									
Rural Business Service – Rural Energy for America	0	55	55	19	60	0	0	70	10
National Institute of Food and Agriculture – Biomass Research and Development	0	20	20	13	28	28	20	28	0
Rural Business Service – Repowering Assistance Program	0	35	0	0	0	35	9	0	0
Rural Business Service – Biorefinery Assistance Program	0	75	0	0	245	75	4	0	-245
Rural Business Service - Bioenergy Program for Advanced Biofuels	0	55	0	0	55	30	8	85	30
Subtotal - mandatory funding	0	240	75	32	388	168	41	183	-205
Subtotal - discretionary funding	0	31	25	20	65	63	48	82	17
USDA- CCTP Subtotal³	0	271	100	52	453	231	89	265	-188
International Assistance									
Forest Service-Forest and Rangeland Research	0	4	4	4	5	5	5	4	-1
Total-USDA³	0	322	151	102	567	349	197	426	-141

Department of Commerce

Global Change Research Program

National Oceanic and Atmospheric Administration – Operations, Research, and Facilities	0	274	274	227	309	309	256	315	6
National Oceanic and Atmospheric Administration – Procurement, Acquisition, and Construction	218	101	234	194	49	134	111	120	71
National Institute of Standards and Technology (NIST)	0	2	2	2	2	2	2	2	0
DOC- GCRP Subtotal³	218	377	510	423	360	445	369	437	77

Climate Change Technology Program

National Institute of Standards and Technology (NIST) – Scientific and Technological Research and Services	4	7	7	7	15	15	15	15	0
NIST – Industrial Technical Services, Technology Innovation Program	0	6	6	6	1	1	1	1	0
International Trade Administration – Operations and Administration	0	2	2	2	2	2	2	2	0
DOC- CCTP Subtotal³	4	15	15	15	18	18	18	18	0

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
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International Assistance

National Oceanic and Atmospheric Administration- Operations, Research, and Facilities¹³ 0 9 9 5 9 9 7 9 0

International Trade Administration- Operations and Administration¹⁴ 0 2 2 2 2 2 2 2 0

DOC- International Assistance Subtotal³ 0 11 11 7 11 11 9 11 0

Total- Department of Commerce 222 392 525 438 378 463 387 455 77

Department of Defense

Climate Change Technology Program

Research, Development, Test and Evaluation, Army 44 98 137 124 93 98 154 28 -65

Research, Development, Test and Evaluation, Navy 18 54 69 47 13 18 29 11 -2

Research, Development, Test and Evaluation, Air Force 35 108 132 105 120 122 108 104 -16

Research, Development, Test and Evaluation, Defense Wide⁵ 42 0 37 20 0 4 17 0 0

Total- Department of Defense 139 261 376 296 226 243 308 143 -83

Department of Energy

Global Change Research Program

Science – Biological & Environmental Research 65 168 233 168 165 165 235 191 26

Climate Change Technology Program

Energy Efficiency and Renewable Energy 16,800 2,179 11,922 1,666 2,242 4,762 10,056 2,355 113

Electricity Delivery and Energy Reliability 4,340 113 164 101 109 4,362 595 143 34

Nuclear Energy⁶ 0 787 750 677 747 745 671 793 46

Fossil Energy R&D – Efficiency and Sequestration⁷ 3,400 762 598 316 560 3,810 453 545 -15

Science – Fusion, Sequestration, and Hydrogen⁸ 283 700 966 818 723 740 775 738 15

Energy Transformation Acceleration Fund - Advance Research Projects Agency- Energy (ARPA-E)⁹ 0 0 0 0 9 1 1 300 291

Energy Transformation Acceleration Fund - (ARPA-E) Recovery Act¹⁰ 400 0 3 1 0 397 54 0 0

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
Departmental Administration – Climate Change Technology Program Direction ¹¹	0	2	2	1	9	1	0	9	0
DOE- CCTP Subtotal³	25,223	4,543	14,405	3,580	4,399	14,818	12,605	4,883	484
International Assistance									
Energy Efficiency and Renewable Energy	0	0	0	0	8	0	0	8	0
Fossil Energy R&D – Efficiency and Sequestration	0	0	0	0	3	0	0	3	0
Science	0	0	0	0	3	0	0	3	0
DOE- International Assistance Subtotal	0	0	0	0	13	0	0	13	0
<u>Total- DOE</u>	25,288	4,711	14,638	3,748	4,564	14,983	12,840	5,074	510
<u>Department of Health and Human Services</u>									
Global Change Research Program									
National Institutes of Health	0	5	5	5	4	4	4	4	0
<u>Total-HHS³</u>	0	5	5	5	4	4	4	4	0
<u>Department of the Interior</u>									
Global Change Research Program									
U.S. Geological Survey – Surveys, Investigations, and Research	0	45	37	43	63	20	61	81	18
Wildlife Adaptation Funding									
National Park Service - Operation of the National Park Service	0	0	0	0	10	0	0	10	0
Fish and Wildlife Service - Resource Management	0	0	0	0	40	32	32	59	19
Fish and Wildlife Service - State and Tribal Wildlife Grants ²	0	0	0	0	0	0	0	0	0
Bureau of Land Management - Management of Lands and Resources	0	0	0	0	15	15	6	18	3
Bureau of Indian Affairs - Operation of Indian Programs ²	0	0	0	0	0	0	0	0	0
DOI- Wildlife Adaptation Subtotal³	0	0	0	0	65	47	38	87	22
<u>Total-DOI³</u>	0	45	37	43	128	67	99	168	40

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
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Department of State

International Assistance

Diplomatic and Consular Affairs	0	2	2	2	2	2	2	0	-2
Economic Support Fund	0	24	29	23	158	88	80	110	-48
International Organizations and Programs	0	29	29	29	39	39	39	39	0

<u>Total-State</u>³	0	55	60	54	199	129	121	149	-50
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Department of Transportation

Global Change Research Program

Federal Highway Administration – Federal-Aid Highways	0	0	0	0	0	0	0	0	0
Federal Aviation Administration – Research, Engineering, and Development	0	2	2	1	3	3	1	3	0
Federal Transit Administration - Research and University Research Centers	0	0	0	0	0	0	0	0	0
DOT- GCRP Subtotal ³	0	2	2	1	3	3	1	3	0

Climate Change Technology Program

National Highway Traffic Safety Administration	0	0	0	0	1	0	0	0	-1
Research and Innovative Technology Administration – Research and Development	0	1	1	0	1	1	0	1	0
Federal Highway Administration – Federal Aid Highways	0	19	19	12	19	19	13	19	0
Federal Aviation Administration - RED	0	3	1	1	11	11	6	5	-6
Federal Transit Administration - Research and University Research Centers and Formula and Bus Grants	100	19	19	15	94	169	20	53	-41
DOT- CCTP Subtotal ³	100	43	41	28	125	200	39	77	-48

<u>Total-DOT</u>³	100	45	43	29	128	203	40	80	-48
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Department of the Treasury

International Assistance

Debt Restructuring – Tropical Forestry Conservation	0	20	20	40	20	39	39	20	0
Global Environment Facility ⁷	0	26	26	26	26	26	26	89	63
Clean Technology Fund	0	0	0	0	300	300	300	400	100
Strategic Climate Fund ⁸	0	0	0	0	75	75	75	235	160
<u>Total-Treasury</u>³	0	46	46	66	421	440	440	744	323

	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
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Environmental Protection Agency

Global Change Research Program

Science and Technology	0	18	17	17	21	21	21	22	1
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Climate Change Technology Program

Environmental Programs and Management	0	94	97	97	113	113	113	123	10
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Science and Technology	0	17	16	16	20	20	20	17	-3
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EPA-CCTP Subtotal³	0	111	113	113	133	133	133	140	7
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International Assistance

Environmental Programs and Management	0	20	20	20	21	21	21	21	0
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Total-EPA³	0	139	140	140	164	164	164	172	8
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Millennium Challenge Corporation

International Assistance

Millennium Challenge Corporation	0	0	0	11	2	2	5	25	23
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Total-MCC³	0	0	0	11	2	2	5	25	23
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National Aeronautics and Space Administration

Global Change Research Program

Science	237	1086	1086	1071	1071	1071	1075	1285	214
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Climate Change Technology Program

Science, Aeronautics, and Exploration	31	119	119	118	124	124	122	137	13
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International Assistance

Science	0	2	2	2	2	2	2	6	4
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Total-NASA³	268	1205	1205	1189	1195	1195	1197	1422	227
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National Science Foundation

Global Change Research Program

Research and Related Activities	121	269	390	351	319	319	287	370	51
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Climate Change Technology Program

Research and Related Activities	2	24	26	23	26	26	23	27	1
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International Assistance

Research and Related Activities	0	3	3	3	6	6	5	9	3
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Total-NSF³	123	293	416	374	348	348	312	403	55
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	ARRA Enacted Budget Authority	FY 2009 Actual Budget Authority	FY 2009 Obligation ²	FY 2009 Outlays ²	FY 2010 Enacted Budget Authority	FY 2010 Obligation ²	FY 2010 Outlays ²	FY 2011 Proposed Budget Authority	Proposed Change in Budget Authority 2010-2011
<u>Smithsonian Institution</u>									
Global Change Research Program									
Salaries and Expenses	0	6	6	6	7	7	7	11	4
<u>Total- Smithsonian³</u>	0	6	6	6	7	7	7	11	4
<u>US Trade and Development Agency</u>									
International Assistance									
Trade and Development Agency	0	10	9	7	17	17	5	21	4
<u>Total-TDA³</u>	0	10	9	7	17	17	5	21	4
<u>U.S. Agency for International Development</u>									
Global Change Research Program									
Development Assistance	0	17	17	17	36	36	36	43	7
International Assistance									
Assistance for Europe, Eurasia, and Central Asia ⁹	0	15	15	1	26	26	10	26	0
Development Assistance	0	113	113	94	313	313	122	446	133
Economic Support Fund	0	94	94	25	44	44	40	19	-25
International Disaster Assistance	0	0	0	0	0	0	0	0	0
USAID-International Assistance Subtotal³	0	222	221	120	383	383	172	491	108
<u>Total- USAID³</u>	0	222	221	120	383	383	172	491	108
Total All Agencies	26,140	7,756	17,878	6,627	8,731	18,998	16,299	9,788	1,057
Energy Tax Provisions That May Reduce Greenhouse Gases	N/A	1,870	1,870	1,870	4,140	4,140	4,140	3,950	-190
Energy Grants in lieu of new technology credit or energy investment credit	N/A	1,050	1,050	1,050	3,090	3,090	3,090	4,460	1370
Total All Agencies + Tax Provisions	26,140	10,676	20,798	9,547	15,961	26,228	23,529	18,198	2,237

FOOTNOTES

¹All data supersede numbers released with the 2011 President's Budget. Budget authority provided in millions of dollars. Any discrepancies are the result of rounding and improved estimates.

²All obligation and outlay data are preliminary estimates and are subject to change, in some cases obligation and outlay estimates are based on historical obligation and outlay rates.

³Agency subtotals and table total may not add due to rounding and subtraction of double-counts.