



U.S. DEPARTMENT OF
ENERGY

Annual Report on Federal Government Energy Management and Conservation Programs Fiscal Year 2010

Report to Congress
March 2014

United States Department of Energy
Washington, DC 20585

Message from the Assistant Secretary

We are enclosing the *Annual Report to Congress on Federal Government Energy Management and Conservation Programs, Fiscal Year (FY) 2010*.

This report on Federal energy management for FY 2010 provides information on energy consumption in Federal buildings, operations, and vehicles and documents activities conducted by Federal agencies to meet:

- The energy management and energy consumption requirements of section 543 of the National Energy Conservation Policy Act (NECPA) (Pub. L. No. 95-619), as amended (42 U.S.C. § 8253);
- The energy savings performance contract authority of section 801 of NECPA (Pub. L. No. 95-619), as amended (42 U.S.C. §§ 8287-8287d);
- The renewable energy purchase goal of section 203 of the Energy Policy Act of 2005 (EPACT 2005) (Pub. L. No. 109-58, codified at 42 U.S.C. § 15852);
- The Federal building performance standard requirements under Section 109 of EPACT 2005 (Pub. L. No. 109-58, codified at 42 U.S.C. § 6834(a));
- The requirements on the procurement and identification of energy efficient products under section 161 of the Energy Policy Act of 1992 (EPACT 1992) (Pub. L. No. 102-486, codified at 42 U.S.C. § 8262g);
- Sections 431, 432, and 434 of the Energy Independence and Security Act of 2007 (EISA) (Pub. L. No. 110-140 (42 U.S.C. § 8253) and section 527 of EISA (42 U.S.C. § 17143);
- Executive Order 13423, “Strengthening Federal Environmental, Energy, and Transportation Management” (72 Fed. Reg. 3,919 (Jan. 26, 2007)); and
- Executive Order 13514, “Federal Leadership in Environmental, Energy, and Economic Performance” (74 Fed. Reg. 52,117 (Oct. 5, 2009)).

The following are highlights from the report:

- In FY 2010, the Federal Government consumed 1.1 quadrillion British Thermal Units (Btu) of site-delivered energy in buildings, vehicles (including ships and aircraft), and operations; 2.2 percent less than in FY 2003, and 1.1 percent more than in FY 2009.
- Total cost of the 1.1 quads was \$20.0 billion in FY 2010 and represented 0.5 percent of the total Federal expenditures of \$3.721 trillion for all purposes in FY 2010. In constant 2010 dollars, this equates to an increase of 11.3 percent from \$18.0 billion in FY 2009 to \$20.0 billion in FY 2010.
- Compared to FY 2009, the combined unit costs of all fuels increased 10.1 percent in FY 2010. Transportation fuel prices, which fell in FY 2009, were a significant reason for the

overall increase in energy costs in FY 2010 compared to the prior year. The most significant changes in per unit costs (as-spent dollars per million Btu) include:

- Jet fuel - 16.9 percent increase,
 - Gasoline - 26.0 percent increase,
 - Diesel - 21.2 percent increase,
 - Fuel oil - 11.8 percent increase, and
 - Natural gas - 0.7 percent increase
- The Federal Government collectively did not meet the NECPA statutory requirement that Federal agencies reduce their FY 2010 energy consumption by 15 percent as compared with FY 2003. Including the credit for renewable energy purchases and improvements in the efficiency of certain energy generating facilities included under Department of Energy guidance, the Federal Government decreased energy use per gross square foot by 14.6 percent in FY 2010 relative to FY 2003 for buildings subject to the NECPA energy reduction requirement, as amended by section 431 of EISA. Based strictly on total site energy use per gross square foot (excluding the credits for renewable energy purchases and primary energy savings from improved generating efficiency), the Federal Government cut its energy intensity by 10.4 percent.
 - The Federal Government did collectively surpass the FY 2010 renewable energy goal of a minimum of five percent of electricity use set in section 203 of EACT 2005. Federal agencies reported purchasing or producing 2,999.2 gigawatthours (GWh) of renewable electric energy in FY 2010, equivalent to 5.2 percent of the Federal Government's electricity use of 57,194.7 GWh in FY 2010.
 - During FY 2010, Federal agencies invested \$4,170.9 million in energy efficiency, water conservation, and renewable energy projects in buildings and facilities. This funding came from three primary sources:
 - Direct appropriated funding – \$3,543.7 million
 - Energy savings performance contracts (ESPCs) – \$562.8 million
 - Utility energy service contracts (UESCs) – \$64.4 million
 - This \$4,170.9 million investment was significantly higher than the \$1,681 million investment reported in FY 2009.

This report is being provided to the following Members of Congress:

- **The Honorable Joseph R. Biden, Jr.**
President of the Senate
- **The Honorable John Boehner**
Speaker of the House of Representatives
- **The Honorable Barbara Mikulski**
Chairwoman, Senate Committee on Appropriations

- **The Honorable Richard C. Shelby**
Ranking Member, Senate Committee on Appropriations
- **The Honorable Mary Landrieu**
Chairman, Senate Committee on Energy and Natural Resources
- **The Honorable Lisa Murkowski**
Ranking Member, Senate Committee on Energy and Natural Resources
- **The Honorable Harold Rogers**
Chairman, House Committee on Appropriations
- **The Honorable Nita M. Lowey**
Ranking Member, House Committee on Appropriations
- **The Honorable Fred Upton**
Chairman, House Committee on Energy and Commerce
- **The Honorable Henry A. Waxman**
Ranking Member, House Committee on Energy and Commerce
- **The Honorable Dianne Feinstein**
Chairman, Senate Subcommittee on Energy and Water Development
- **The Honorable Lamar Alexander**
Ranking Member, Senate Subcommittee on Energy and Water Development
- **The Honorable Mike Simpson**
Chairman, House Subcommittee on Energy and Water Development
- **The Honorable Marcy Kaptur**
Ranking Member, House Subcommittee on Energy and Water Development

If you need additional information concerning the report, please contact me or Brad Crowell, Acting Assistant Secretary for Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

Dr. David Danielson
Assistant Secretary
Energy Efficiency and Renewable Energy

List of Acronyms

Agency Acronyms

Broadcasting Board of Governors/ International Broadcasting Bureau	BBG/IBB
Commodity Futures Trading Commission	CFTC
Central Intelligence Agency	CIA
Department of Agriculture	USDA
Department of Commerce	DOC
Department of Defense	DOD
Department of Energy	DOE
Department of Health and Human Services	HHS
Department of Homeland Security	DHS
Department of Housing and Urban Development	HUD
Department of the Interior	DOI
Department of Justice	DOJ
Department of Labor	DOL
Department of State	ST
Department of Transportation	DOT
Department of the Treasury	TRSY
Department of Veterans Affairs	VA
Environmental Protection Agency	EPA
Equal Employment Opportunity Commission	EEOC
Federal Communications Commission	FCC
Federal Emergency Management Agency	FEMA
Federal Energy Regulatory Commission	FERC
Federal Trade Commission	FTC
General Services Administration	GSA
International Broadcasting Bureau	IBB
National Aeronautics and Space Administration	NASA
National Archives and Records Administration	NARA
National Science Foundation	NSF
Nuclear Regulatory Commission	NRC
Office of Personnel Management	OPM
Panama Canal Commission	PCC
Pension Benefit Guaranty Corporation	PBGC
Railroad Retirement Board	RRB
Security and Exchange Commission	SEC
Social Security Administration	SSA
Tennessee Valley Authority	TVA
United States Postal Service	USPS

Other Acronyms

Building Life-Cycle Cost	BLCC
British Thermal Unit(s)	Btu
British Thermal Units(s) per Gross Square Foot	Btu/GSF
Energy Independence and Security Act of 2007	EISA
Energy Information Administration	EIA
Office of Energy Efficiency and Renewable Energy	EERE
Energy Management Control Systems	EMCS
Energy Policy Act of 1992	EPACT 1992
Energy Policy Act of 2005	EPACT 2005
Energy Service Company	ESCO
Energy Savings Performance Contract	ESPC
Environmental Attribute Codes	ENACs
Federal Automotive Statistical Tool	FAST
Federal Energy Management Program	FEMP
Fiscal Year	FY
Greenhouse Gas	GHG
Gross Square Foot	GSF
Indefinite-Delivery, Indefinite Quantity Contract	IDIQ
Life-Cycle Cost	LCC
Liquefied Petroleum Gas	LPG
Megawatthours	MWH
Military Construction	MILCON
Million Barrels of Oil Equivalent	MBOE
Million British Thermal Units	MMBtu
National Energy Conservation Policy Act	NECPA
National Institute of Standards and Technology	NIST
Quadrillion British Thermal Units	Quad
Research and Development	R&D
Utility Energy Service Contract	UESC

Executive Summary

This report on Federal energy management for fiscal year (FY) 2010 provides information on energy consumption in Federal buildings, operations, and vehicles and documents activities conducted by Federal agencies under:

- The energy management and energy consumption requirements of section 543 of the National Energy Conservation Policy Act (NECPA) (Pub. L. No. 95-619), as amended (42 U.S.C. § 8253);
- The energy savings performance contract authority of section 801 of NECPA (Pub. L. No. 95-619), as amended (42 U.S.C. §§ 8287-8287d);
- The renewable energy purchase goal of section 203 of the Energy Policy Act of 2005 (EPACT 2005) (Pub. L. No. 109-58, codified at 42 U.S.C. § 15852);
- The Federal building performance standard requirements under Section 109 of EPACT 2005 (Pub. L. No. 109-58, codified at 42 U.S.C. § 6834(a));
- The requirements on the procurement and identification of energy efficient products under section 161 of the Energy Policy Act of 1992 (EPACT 1992) (Pub. L. No. 102-486, codified at 42 U.S.C. § 8262g);
- Sections 431, 432, and 434 of the Energy Independence and Security Act of 2007 (EISA) (Pub. L. No. 110-140 (42 U.S.C. § 8253) and section 527 of EISA (42 U.S.C. § 17143);
- Executive Order 13423, “Strengthening Federal Environmental, Energy, and Transportation Management” (72 Fed. Reg. 3,919 (Jan. 26, 2007)); and
- Executive Order 13514, “Federal Leadership in Environmental, Energy, and Economic Performance” (74 Fed. Reg. 52,117 (Oct. 5, 2009)).

The following page contains a summary of Federal Government-wide progress toward the key statutory and Executive Order goals.

Goal/Requirement	FY 2010 Federal Performance
<p>E.O. 13423/EISA: Reduce energy intensity (Btu/GSF) by 15 percent compared to 2003; 30 percent reduction required in FY 2015.</p>	<p>Government decreased energy intensity by 14.6 percent in FY 2010 relative to FY 2003 (10.4 percent without additional credits).</p>
<p>EPACT 2005/E.O. 13423: Use renewable electric energy equivalent to a least five percent of total electricity use; at least half of which must come from sources developed after January 1, 1999.</p>	<p>Government purchased or produced renewable energy in FY 2010 equivalent to 5.2 percent of total electricity use.</p>
<p>E.O. 13423/13514: Reduce water consumption intensity (Gal/GSF) by six percent relative to 2007 baseline; 16 percent by the end of FY 2015; 26 percent by FY 2020.</p>	<p>Government reduced water consumption intensity by 10.4 percent in FY 2010 relative to FY 2007.</p>
<p>E.O. 13514: Reduce Government-wide scope 1 and 2 greenhouse gas emissions from targeted sources by 28 percent in FY 2020 compared to FY 2008</p>	<p>Government reduced scope 1 and 2 GHG emissions by 6.4 percent in FY 2010 relative to FY 2008.</p>



ANNUAL REPORT ON FEDERAL GOVERNMENT ENERGY MANAGEMENT AND CONSERVATION PROGRAMS FISCAL YEAR 2010

Table of Contents

I.	Overview of Federal Energy Consumption	1
A.	GOAL BUILDINGS	6
B.	EXCLUDED BUILDINGS	6
C.	VEHICLES AND EQUIPMENT	7
II.	Federal Government Performance in FY 2010	8
A.	FACILITY ENERGY INTENSITY REDUCTION REQUIREMENT	8
B.	RENEWABLE ENERGY GOAL	10
C.	WATER INTENSITY REDUCTION GOAL	12
D.	GREENHOUSE GAS REDUCTION	13
III.	Other Energy Management Activities.....	16
A.	FACILITY EFFICIENCY INVESTMENT	16
B.	MANAGEMENT OF ENERGY AND WATER EFFICIENCY IN BUILDINGS.....	17
C.	METERING	18
D.	FEDERAL BUILDING PERFORMANCE STANDARDS	18
E.	ENERGY EFFICIENT PROCUREMENT	19

I. Overview of Federal Energy Consumption

This report on Federal energy management for fiscal year (FY) 2010 provides information on energy consumption in Federal buildings, operations, and vehicles and documents activities conducted by Federal agencies to meet the statutory requirements under:

- The energy management and energy consumption requirements of section 543 of the National Energy Conservation Policy Act (NECPA) (Pub. L. No. 95-619), as amended (42 U.S.C. § 8253);
- The energy savings performance contract authority of section 801 of NECPA (Pub. L. No. 95-619), as amended (42 U.S.C. §§ 8287-8287d);
- The renewable energy purchase goal of section 203 of the Energy Policy Act of 2005 (EPACT 2005) (Pub. L. No. 109-58, codified at 42 U.S.C. § 15852);
- The Federal building performance standard requirements under Section 109 of EPACT 2005 (Pub. L. No. 109-58, codified at 42 U.S.C. § 6834(a));
- The requirements on the procurement and identification of energy efficient products under section 161 of the Energy Policy Act of 1992 (EPACT 1992) (Pub. L. No. 102-486, codified at 42 U.S.C. § 8262g);
- Sections 431, 432, and 434 of the Energy Independence and Security Act of 2007 (EISA) (Pub. L. No. 110-140 (42 U.S.C. § 8253) and section 527 of EISA (42 U.S.C. § 17143);
- Executive Order 13423, "Strengthening Federal Environmental, Energy, and Transportation Management" (72 Fed. Reg. 3,919 (Jan. 26, 2007)); and
- Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance" (74 Fed. Reg. 52,117 (Oct. 5, 2009)).

This report summarizes the findings contained in data tables with agency specific details located on-line at: <http://www1.eere.energy.gov/femp/docs/FY10AnnualRpt.xls>. Agency-specific performance is also detailed on their annual Office of Management and Budget (OMB) Sustainability and Energy Scorecards and in their Strategic Sustainability Performance Plans located at <http://sustainability.performance.gov>. Also described in these resources are agency activities undertaken under Title V of EISA.

During FY 2010 reports were submitted by the 25 Federal agencies assessed on OMB Sustainability/Energy Scorecards, as well as by a number a smaller agencies, many of which had previously not reported. These reports show that total primary or source energy consumption of the U.S. Government, including energy consumed to produce, process, and transport energy,

was 1.6 quadrillion British thermal units (Btu) or “quads” during FY 2010.¹ These 1.6 quads represent approximately 1.6 percent of the 97.3 quads² used in the United States. The total primary energy consumption in FY 2010 was 14.6 percent less than in FY 1985, 2.3 percent less than in FY 2003, and 1.3 percent more than in FY 2009.³

Site-delivered energy consumption by the Government was about 1.1 quads during FY 2010. Unless otherwise noted, this report uses the site-measured conversion factors to convert common units for electricity and steam to Btu. Site-delivered energy consumption in FY 2010 was 23.3 percent less than in FY 1985, 2.2 percent less than in FY 2003, and 1.1 percent more than in FY 2009.

Total cost of the 1.1 quads was \$20.0 billion in FY 2010 and represented 0.5 percent of the total Federal expenditures of \$3.721 trillion⁴ for all purposes in FY 2010.⁵ In constant 2010 dollars, this equates to an increase of 11.3 percent from \$18.0 billion in FY 2009 to \$20.0 billion in FY 2010.

Compared to FY 2009, the combined unit costs of all fuels increased 10.1 percent in FY 2010. Transportation fuel prices, which fell in FY 2009, were a significant reason for the overall increase in energy costs in FY 2010 compared to the prior year. The most significant changes in per unit costs (as-spent dollars per million Btu) include:

- Jet fuel – 16.9 percent increase,
- Gasoline – 26.0 percent increase,
- Diesel – 21.2 percent increase,
- Fuel oil – 11.8 percent increase, and
- Natural gas – 0.7 percent increase

¹Primary or source energy consumption considers all energy resources used to generate and transport electricity and steam. For this report, DOE uses a source conversion factor for electricity of 11,850 Btu/kWh and site-delivered factor of 3,412 Btu/kWh.

²DOE/EIA, *Monthly Energy Review November 2011*, Table 1.1.
<http://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf>

³ Reporting changes for FY 2008 and FY 2010 to accommodate the White House Council on Environmental Quality’s (CEQ’s) new greenhouse gas accounting guidance under Executive Order 13515 are not reflected in FY 2009 totals; see <http://www.whitehouse.gov/administration/eop/ceq/sustainability/fed-ghg>.

⁴*Updated Summary Tables, Budget of the United States Government, Fiscal Year 2011*
<http://www.gpoaccess.gov/usbudget/fy11/pdf/summary.pdf>

⁵Unless otherwise noted, all costs cited in this report are in constant 2010 dollars, calculated using Gross Domestic Product implicit price deflators. See Bureau of Economic Analysis web site, <http://www.bea.gov/national/xls/gdplev.xls>. Costs noted as nominal dollars have not been adjusted to remove the effect of changes in the spending power of the dollar.

In addition to prices and Federal energy management activities, many other variables contribute to changes in annual energy use and costs, including changes in square footage, building stock, weather, tempo of operations, fuel mix, and vehicle, naval, and aircraft fleet composition.

In FY 2010, the Department of Defense (DOD) spent about \$15.4 billion for energy use, 77.1 percent of the total Federal energy expenditure of \$20.0 billion. DOD used 1.1 percent more site-delivered energy in FY 2010 than in FY 2009.

Figures 1 and 2 depict the Federal Government’s FY 2010 energy consumption and costs. As illustrated, jet fuel and electricity account for approximately 65.6 percent of the total energy consumption by energy type and approximately 70.7 percent of total energy costs by energy type.

Federal agencies now report energy consumption under three end-use sectors:

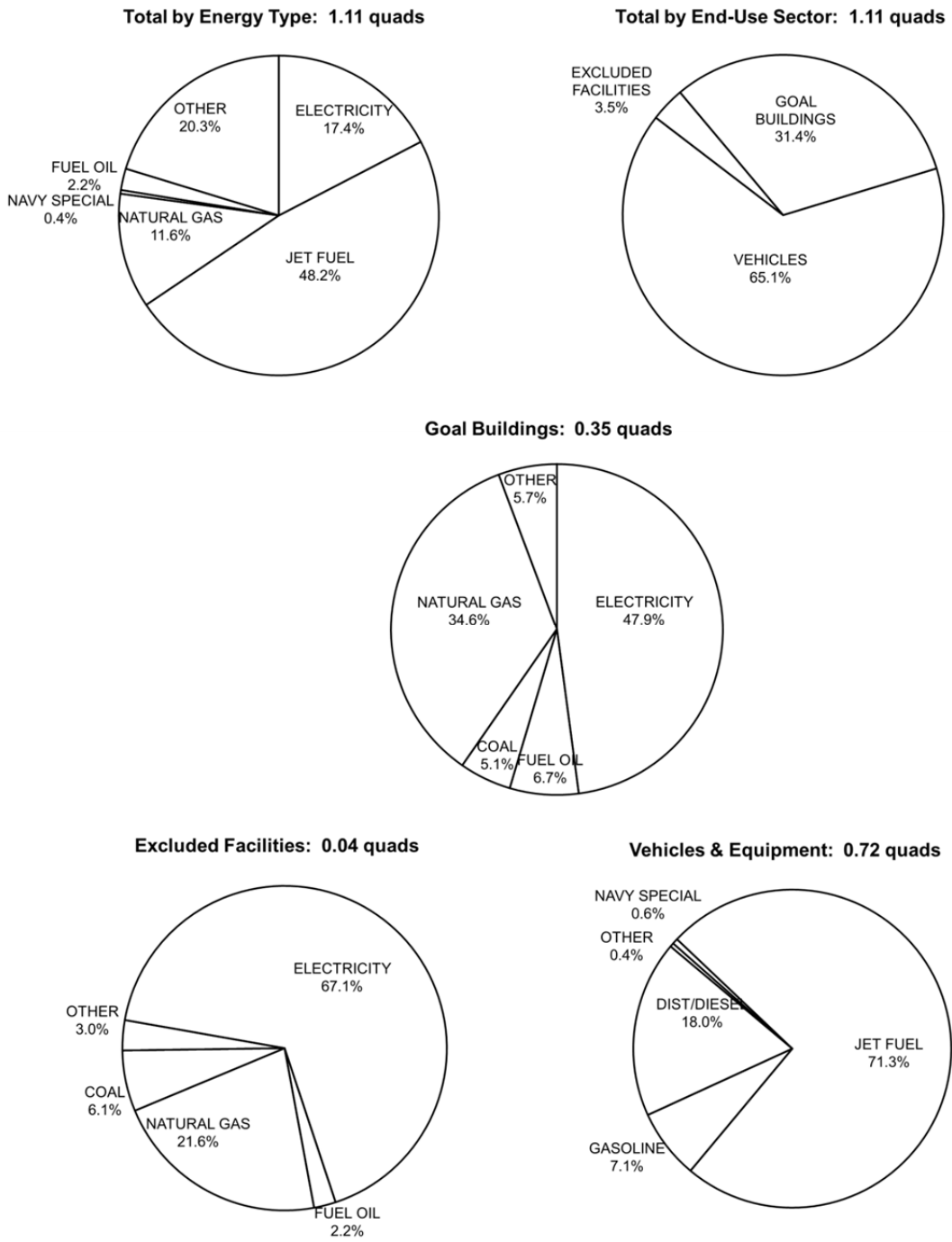
1. Buildings subject to the energy reduction requirements of NECPA, as amended by (“goal buildings”);
2. Buildings excluded from the energy reduction requirements of NECPA, as amended (“goal-excluded buildings”); and
3. Vehicles and equipment.

Total Federal energy consumption and costs are summarized below by end-use sector:

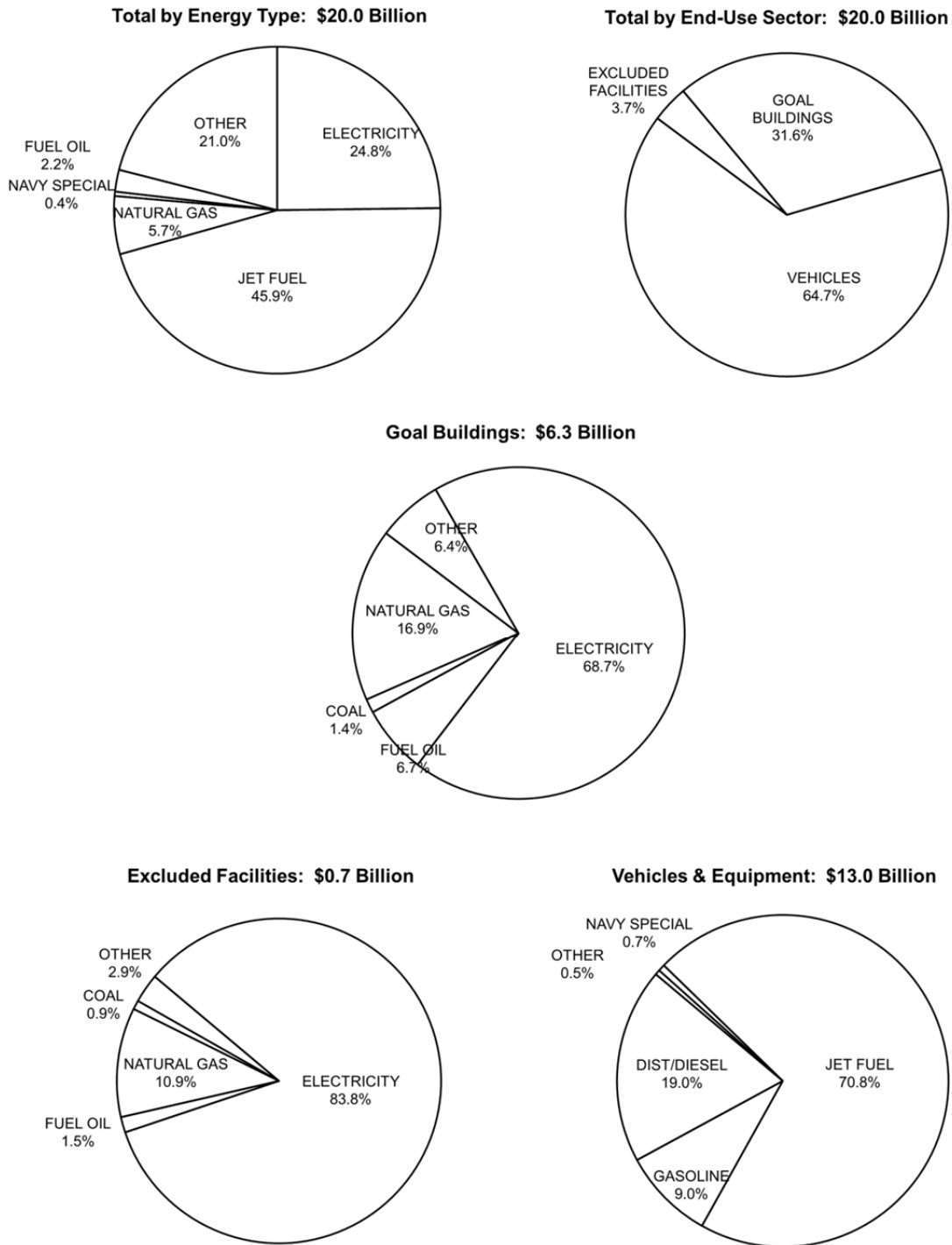
Energy Use	Trillion Btu	Percentage
Goal Buildings	349.1	31.4%
Excluded Buildings	38.7	3.5%
Vehicles & Equipment	724.2	65.1%
<i>Total</i>	<i>1,112.0</i>	<i>100.0%</i>

Energy Cost	\$Billion	Percentage
Goal Buildings	\$6.3	31.6%
Excluded Buildings	\$0.7	3.7%
Vehicles & Equipment	\$13.0	64.7%
<i>Total</i>	<i>\$20.0</i>	<i>100.0%</i>

Figure 1
Federal Energy Consumption by Fuel Type and End-Use Sector, FY 2010



**Figure 2
Federal Energy Costs by Fuel Type and End-Use Sector, FY 2010**



A. GOAL BUILDINGS

Goal buildings are those buildings not designated by an agency as excluded from the energy intensity performance requirement (42 U.S.C. 8253(a)(1) and (2)).

In FY 2010, the Federal Government used 349.1 trillion Btu to provide energy to 3.1 billion square feet of building space subject to the energy consumption reduction requirements of NECPA (42 U.S.C. 8253(a)(1)). This consumption represents a 29.5 percent decrease compared to FY 1985, a 9.3 percent decrease relative to FY 2003, and a 0.6 percent decrease from FY 2009. The significant drop from FY 1985 levels reflects the success of Federal energy management efforts in reducing fossil fuel use in Federal buildings as well as a 41.5 percent reduction in defense-related facility energy use from FY 1985. The energy cost for goal buildings in FY 2010 was \$6.3 billion, a decrease of approximately \$148.7 million from FY 2009 expenditures, and an increase of 35.2 percent from FY 2003 expenditures of \$4.7 billion.⁶ Of the \$6.3 billion energy costs for goal buildings, \$3.6 billion was spent by DOD with the remaining \$2.8 billion spent by the civilian agencies.

The 349.1 trillion Btu used in goal buildings comprised approximately 31.4 percent of the total 1.1 quads used by the Federal Government. Electricity constitutes 47.9 percent of the energy used in goal buildings; 34.6 percent is accounted for by natural gas, 6.7 percent by fuel oil, and 5.1 percent by coal. Small amounts of purchased steam, liquefied petroleum gas (LPG)/propane, and “other” energy account for the remaining 5.7 percent.

Primary energy consumption considers all resources used to generate and transport electricity and steam in addition to the energy delivered to the site of use. The Federal Agency management Program (FEMP) uses National-level source conversion factors of 11,850 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam to estimate primary energy consumption. See Appendix B for background on the conversion factors for calculating both primary and site-delivered energy consumption.

Total primary energy use in Federal buildings subject to the NECPA energy reduction requirement decreased 13.2 percent in FY 2010 compared to FY 1985, from 883.1 trillion Btu to 766.8 trillion Btu. Compared to FY 2003 consumption of 820.6 trillion Btu, FY 2010 primary energy use decreased 6.6 percent, and was essentially flat compared to the previous year.

B. EXCLUDED BUILDINGS

Excluded buildings are those facilities designated by agencies that are not subject to the energy intensity performance requirement in accordance with the Department of Energy’s (DOE) *Guidelines Establishing Criteria for Excluding Buildings from the Energy Performance Requirements of Section 543 of the National Energy Conservation Policy Act* (42 U.S.C. 8253(c)(3)).

⁶Cost and consumption figures for prior years may be different from those published in last year’s annual report due to conversion to current year dollars and Federal agency updates and data revisions.

These *Guidelines* are available at:

http://www1.eere.energy.gov/femp/pdfs/exclusion_criteria.pdf.

Fifteen agencies have chosen to exclude certain buildings from energy intensity reduction requirements:

- Broadcasting Board of Governors
- Department of Homeland Security
- Department of Commerce
- Department of Defense
- Department of Energy
- Department of Transportation
- Health and Human Services
- General Services Administration
- National Aeronautics and Space Administration
- National Science Foundation
- Pension Benefit Guaranty Corp.
- Securities and Exchange Commission
- Department of State
- Tennessee Valley Authority
- U.S. Postal Service

Energy used in excluded buildings totaled 38.7 trillion Btu in FY 2010, approximately 3.5 percent of the total 1.1 quads used by the Federal Government. Electricity constitutes 67.1 percent of the energy used in excluded buildings, 21.6 percent is accounted for by natural gas, 6.1 percent by coal, and 2.2 percent by fuel oil. Small amounts of purchased steam, liquefied petroleum gas (LPG)/propane, and energy reported as “other” account for the remaining 3.0 percent. The energy used in excluded buildings in FY 2010 accounted for 3.7 percent of the total Federal energy bill. The Federal Government spent approximately \$742.1 million for this category’s energy during the fiscal year.

C. VEHICLES AND EQUIPMENT

Vehicles and equipment energy includes aircraft and naval fuels, automotive gasoline, diesel fuel consumed by Federally-owned and leased vehicles and privately-owned vehicles used for official business, and the energy used in Federal construction.

In FY 2010, the Federal Government used approximately 724.2 trillion Btu of energy in vehicles and equipment, 65.1 percent of the total 1.1 quads consumed. Total energy consumption in vehicles and equipment decreased 22.5 percent relative to FY 1985 and increased 1.8 percent from the FY 2009 consumption of 711.0 trillion Btu. DOD consumed 668.8 trillion Btu, or 92.4 percent, of all vehicles and equipment energy used by the Federal Government.

The Federal Government spent \$13.0 billion on vehicles and equipment energy in FY 2010, about \$2.5 billion more than the FY 2009 expenditure, a 20.3 percent increase in constant dollars. For all fuels, the cost per million Btu increased from \$15.15 in FY 2009 to \$17.90 in FY 2010. The real unit cost of the most-used fuel, jet fuel, increased 16.9 percent from the previous year. Gasoline prices paid by the Government increased 26.0 percent from the previous year.

In FY 2010, Federal agencies reported using 1,315.2 billion Btu of alternative fuels in their fleets at a cost of \$31.6 million. Alternative fuels comprise 0.2 percent of the Government’s vehicle and equipment energy consumption and costs.

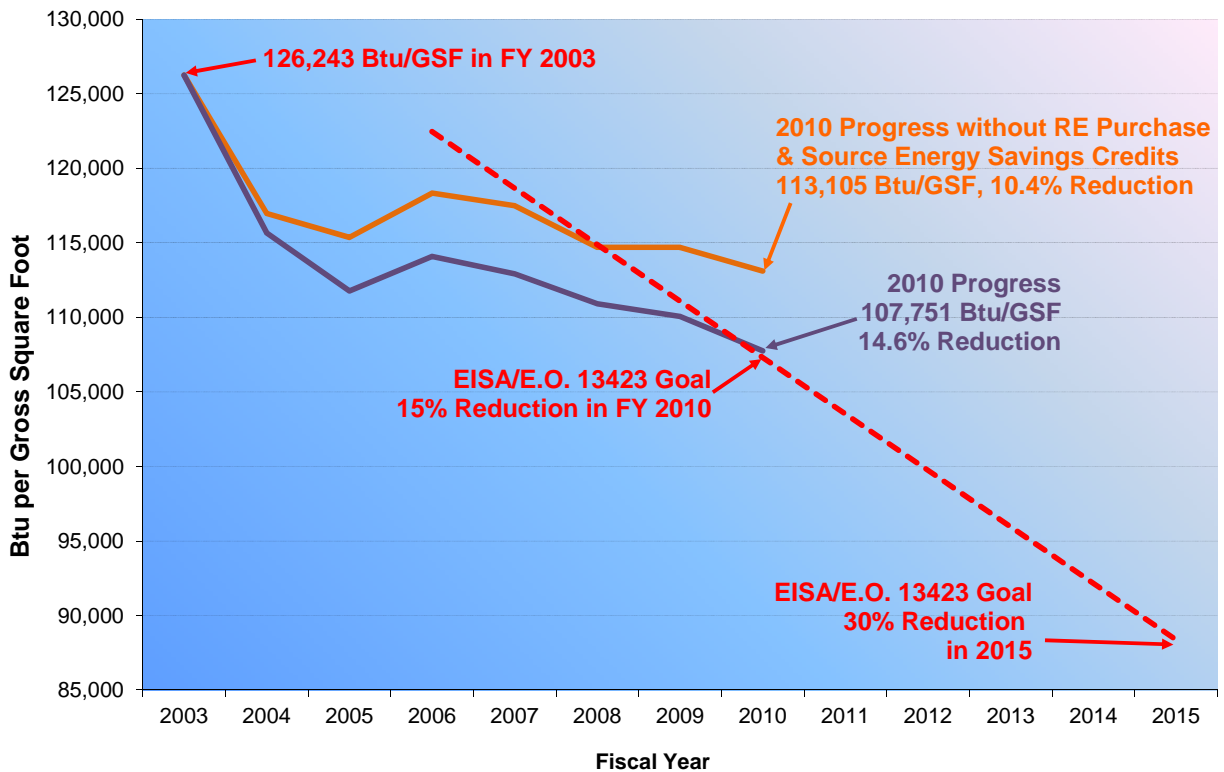
II. Federal Government Performance in FY 2010

A. FACILITY ENERGY INTENSITY REDUCTION REQUIREMENT

The National Energy Conservation Policy Act (NECPA), as amended, requires Federal agencies to improve energy management in their facilities and operations. (42 U.S.C. 8253.) The requirement was most recently amended by section 431 of the Energy Independence and Security Act of 2007 (EISA) which requires each Federal agency to achieve targeted reductions of three percent per year in energy use per square foot, leading to a 30 percent reduction by FY 2015 compared to the FY 2003 base year.

Federal agencies reported that buildings subject to the NECPA energy reduction goals collectively decreased energy use per gross square foot (Btu/GSF) by 14.6 percent in FY 2010 relative to FY 2003. This falls short of the 15 percent reduction requirement for FY 2010.

Figure 3
Overall Government Progress Toward Facility Energy Efficiency Goals, FY 2003 – FY 2010

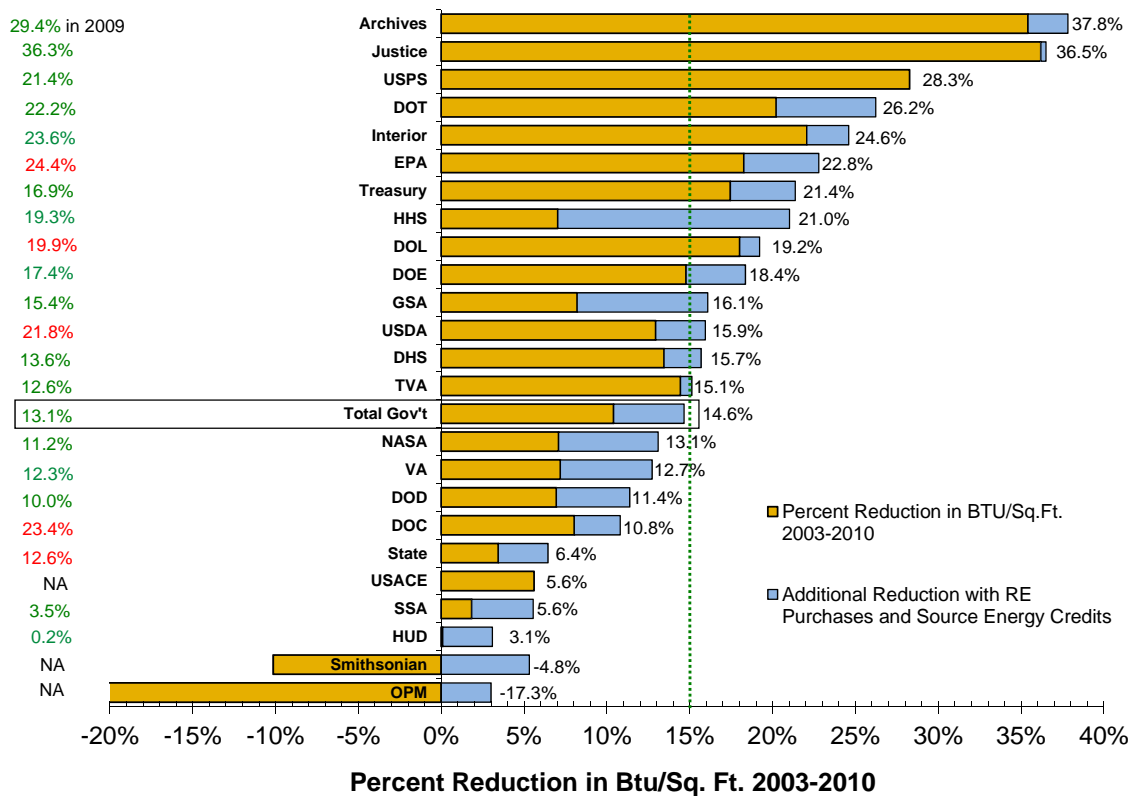


The 14.6 percent reduction in energy intensity includes the subtraction of 16.5 trillion Btu for renewable energy purchases and for projects that reduce source energy use (as opposed to site-delivered energy). When measured strictly on the basis of reduced energy intensity without these allowable adjustments, the reduction in terms of Btu/GSF was only 10.4 percent.⁷

Individual agency performance in FY 2010, compared to FY 2003, is illustrated below in Figure 4. Fourteen out of 24 OMB Scorecard-assessed agencies reported that they reduced energy use per gross square foot in goal buildings by more than 15 percent from FY 2003.

Large improvements are often seen in those agencies that either add additional low energy intensive space or take advantage of renewable energy credits and primary energy project reduction credits. Even without the credits, many agencies have achieved remarkable success in reducing energy intensity. Eight agencies achieved the 15 percent reduction goal without additional credits. Six agencies (Department of Homeland Security, Department of Energy, Department of Health and Human Services, General Services Administration, Tennessee Valley Authority, and Department of Agriculture) pushed past the goal through use of credits.

Figure 4
Individual Agency Progress in Facility Energy Efficiency Goals, FY 2010



⁷ Overall energy intensity for prior years may be different than reported in previous Annual Reports due to revisions and minor corrections to prior year data later provided by agencies.

Per DOE's *Renewable Energy Requirement Guidance for EPACT 2005 and Executive Order 13423* (See www1.eere.energy.gov/femp/pdfs/epact05_fedrenewenergyguid.pdf), contributions to the energy reduction requirement by Renewable Energy Certificate (RECs) purchases are being phased out. DOE guidance phases out long-term renewable purchases and RECS a bit more slowly than regular renewables and RECS in order to continue to promote the development of renewable generation. The limits on applicability of RECs and purchased renewables on the energy intensity goal are 6.0 percent and 3.0 percent for long-term and regular respectively for FY 2010 and 3.6 percent and 1.8 percent for FY 2011 before dropping to zero in 2012.

B. RENEWABLE ENERGY GOAL

Under section 203 of EPACT 2005, the Secretary of Energy must seek to ensure that, to the extent economically feasible and technically practicable, of the total amount of *electric* energy the Federal Government consumes, the following amounts must come from renewable energy as defined in section 203 of the Act:

- Not less than three percent in FYs 2007 through 2009.
- Not less than five percent in FYs 2010 through 2012.
- Not less than 7.5 percent in FY 2013 and each FY thereafter. (42 U.S.C. 15852(a))

In calculating the amount of renewable energy used by a Federal agency for the purpose of the goal, an amount of renewable energy is doubled if it is produced on-site and used at a Federal facility, produced on Federal lands and used at a Federal facility, or produced on Indian land and used at a Federal facility. (42 U.S.C. 15852(c)).

Section 203(b) of EPACT 2005 defines the term "renewable energy" to mean electric energy generated from solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project. (42 U.S.C. 15852(b)).

Executive Order 13423 adds the following requirements to these EPACT 2005 goals:

- At least half of the statutorily required renewable energy consumed by each agency in a fiscal year must come from new renewable sources, and
- To the extent feasible, each agency should implement renewable energy generation projects on agency property for agency use.

In terms of total use of Federal goal-eligible renewable energy, DOD consumed 40.3 percent of all renewable energy utilized by Federal agencies, followed by DOE with 15.5 percent, GSA with 11.9 percent, VA with 7.5 percent, and EPA with 5.3 percent. Federal agencies reported purchasing or producing 2,999.2 gigawatthours of renewable electric energy in FY 2010, equivalent to 5.2 percent of the Federal Government's FY 2010 electricity use.

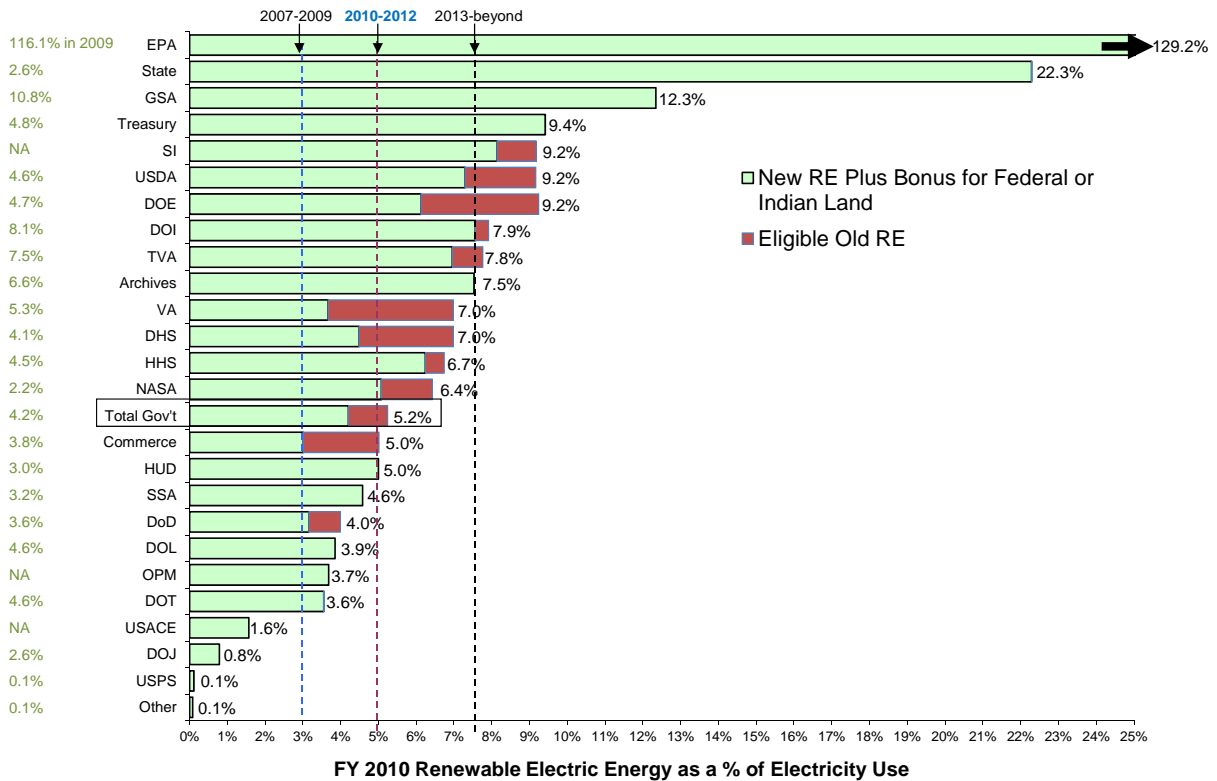
Figure 5 ranks each agency’s performance under the renewable energy goal in terms eligible renewable energy use as a percentage of their electricity use.

In FY 2010, 16 agencies obtained the equivalent of more than 5.0 percent of total electricity consumption from renewable sources. In total, Federal agencies reported purchasing or producing 2,999.2 Gigawatthours of renewable electric energy in FY 2010, equivalent to 5.2 percent of the Federal Government’s FY 2010 electricity use.

EPA’s remarkable renewable energy use of 129.2 percent of its electricity use was achieved through purchases of renewable electricity for space that it leases but for which is neither responsible for payment or reporting of energy costs and consumption nor for electricity used to generate chilled water delivered to its facilities.

More information on the progress of the Federal Government in meeting the renewable energy goals of EPACT 2005 and Executive Order 13423 will be available in the report required under Section 203 of EPACT 2005 (42 U.S.C. 15852(d)). This report is prepared every two years.

Figure 5
Individual Agency Renewable Energy Goal Performance, FY 2010

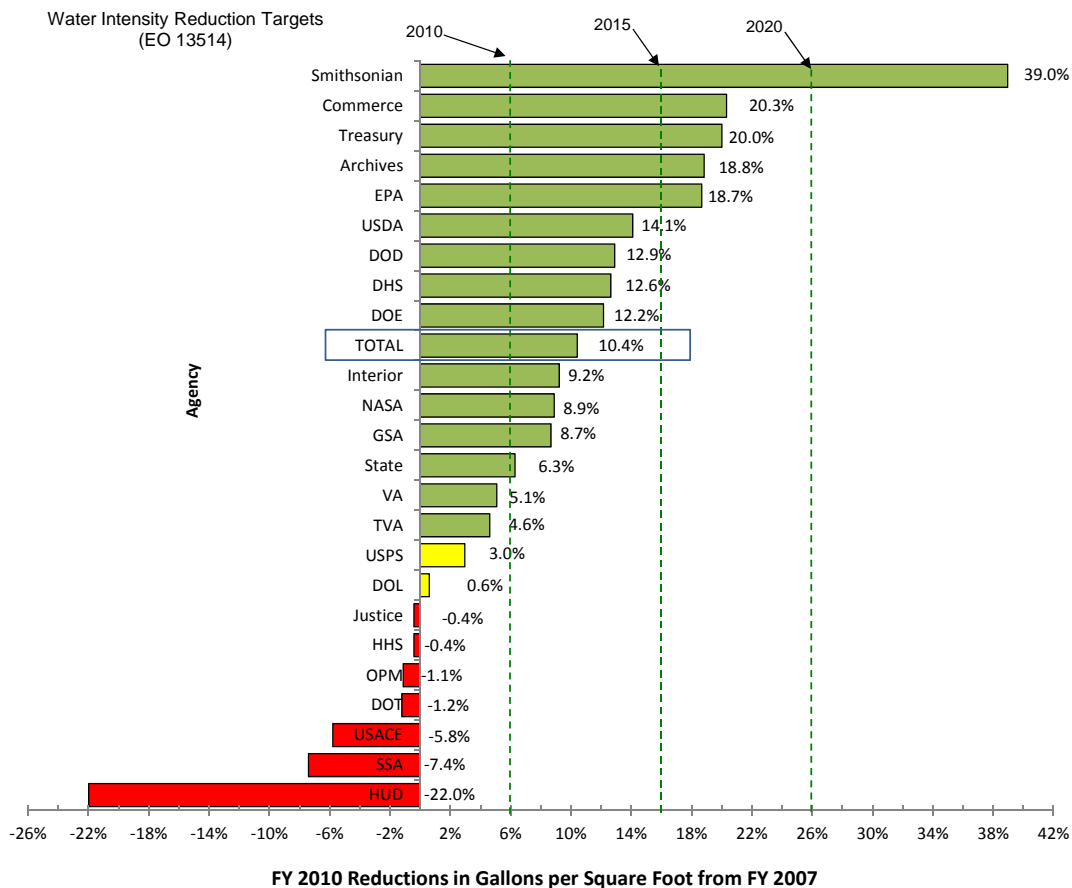


C. WATER INTENSITY REDUCTION GOAL

Section 2(c) of Executive Order 13423 establishes a water use reduction goal for agencies beginning in FY 2008. Agencies are required to reduce water consumption intensity from the FY 2007 baseline by two percent annually through the end of FY 2015, using life-cycle cost-effective measures, for a cumulative reduction of 16 percent by the end of FY 2015. Executive Order 13514 extended this goal for potable water intensity to 26 percent by FY 2020.

As reported by the agencies, the Federal Government as a whole used 150.5 billion gallons of water in FY 2010 at a cost of \$544.5 million, for an average price of \$3.62 per 1,000 gallons. Agency progress toward meeting the water intensity reduction goal for FY 2010 is illustrated below in Figure 6. Overall, the Federal Government’s water intensity in FY 2010 was 47.8 gallons per gross square foot, a reduction of 10.4 percent from the 53.3 gallons per gross square foot reported in FY 2007.

Figure 6
Individual Agency Water Intensity Reduction Goal Performance, FY 2010



The Department of Defense represents the largest Federal water consumer. DOD facilities covered almost two billion square feet and utilized 101.8 billion gallons of water in FY 2010, representing 67.6 percent of the Federal Government's water consumption for the fiscal year. The Department of Veterans Affairs was the second largest Federal water consumer, consuming 6.1 percent of the total Federal water consumption in FY 2010 using a total of 9.1 billion gallons.

The Department of Justice reported the highest water use intensity, 134.5 gallons per gross square foot. This is due to its large percentage of facility space dedicated to custodial housing. NASA and the DOE reported the second and third highest water use intensity, with 67.5 and 61.9 gallons per gross square foot respectively. DOD also has a higher than average intensity with a reported 52.1 gallons per gross square footage. Agencies such as the General Services Administration and Social Security Administration, which are chiefly comprised of office space, have water intensity rates lower than 16 gallons per gross square foot.

As required by Executive Order 13514, agencies began reporting Industrial, Landscaping and Agricultural (ILA) water use for the first time in 2010. Agencies reported using 257.2 billion gallons of the non-potable ILA water with the Veterans Administration and Tennessee Valley Authority combined using 93.1 percent of the total.

D. GREENHOUSE GAS REDUCTION

Executive Order 13514 required Federal agencies to set individual targets for reduction of combined Scope 1 and 2 GHG emissions in FY 2020 compared to FY 2008. When all agency targets are combined, the overall target for the entire Federal Government is a 28 percent reduction in FY 2020 compared to FY 2008. GHG emissions from certain types of activities are not subject to the reduction targets, including emissions from generation of electric power sold to others and from fuels used in excluded vehicles and equipment (tactical, combat support, law enforcement, emergency response, and spaceflight operations). The White House Council on Environmental Quality's (CEQ's) *Federal Greenhouse Gas Accounting and Reporting Guidance* under Executive Order 13515 is located here:

<http://www.whitehouse.gov/administration/eop/ceq/sustainability/fed-ghg>.

Scope 1 GHG emissions are direct emissions and include the following sources:

- **On-Site Fuel Combustion:** Emissions from stationary combustion of fuels for heat or the generation of electricity, steam, or hot water from sources purchased and controlled by the agency (natural gas, fuel oil, propane, coal, etc.). Includes emissions from use of boilers, furnaces, turbines, and emergency generators.
- **Non-Highway Mobility and Equipment:** Emissions from fuels used in aircraft, ships, construction equipment, fork-lifts, etc., including jet fuel, diesel, gasoline, aviation gas, propane, etc.

- **Passenger Fleet Vehicles:** Emissions from fuels used in over-the-road vehicles, including gasoline, diesel, compressed natural gas, propane, and alternative fuels.
- **Fugitive Emissions & Incinerators:** Emissions that are not physically controlled, but result from the intentional or unintentional releases of GHGs.
- **Industrial Process Emissions**

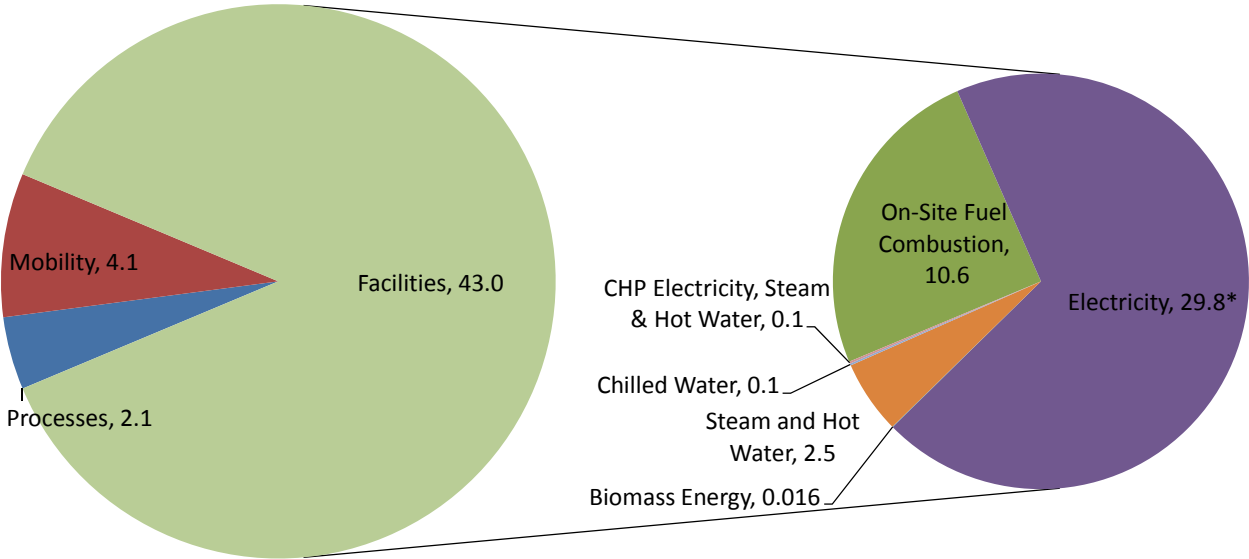
Scope 2 emissions are indirect emissions and include:

- **Purchased Electricity:** Emissions from electricity consumption as determined using the baseload subregional factors of the Emissions & Generation Resource Integrated Database (eGRID). Does not include transmission and distribution losses which are considered Scope 3.
- **Purchased Steam and Hot Water:** Emissions from fuel combustion (usually natural gas, fuel oil, or coal) required to generate and transport steam and/or hot water purchased by an agency.
- **Purchased Chilled Water:** Emissions from electricity use or fuel combustion required to generate and transport chilled water purchased by an agency.
- **Purchased Biomass and CHP Energy:**
 - For purchased biomass (electricity, fuel or landfill gas), emissions of methane and nitrous oxide resulting from the combustion of the source biomass. The biogenic CO₂ is accounted for separately.
 - For purchased electricity, steam, or hot water from a combined heat and power (CHP facility), the emissions from fuel combustion (usually natural gas, fuel oil, or coal) required to generate and transport electricity, steam and/or hot water purchased by an agency.

Overall, the Federal Government reduced combined Scope 1 and 2 GHG emissions by 6.4 percent, from 52.5 million metric tons of carbon dioxide equivalent (MMTCO₂e) to 49.1 MMTCO₂e. Approximately 1.7 MMTCO₂e of the 3.3 MMTCO₂e in GHG reductions came in the form of purchases of renewable energy or the attributes of renewable energy in the form of RECs.

Figure 7 illustrates the sources of the 49.1 MMTCO₂e of Scope 1 and 2 GHG emissions subject to the E.O. 13514 reduction targets. Emissions from facility energy use comprise almost 88 percent of the targeted Scope 1 and 2 GHG emissions with emissions from electricity use alone 69 percent of the total. Scope 1 on-site fuel combustion (natural gas, fuel oil, coal, LPG/propane, etc.) comprises approximately 22 percent of targeted emissions. Biomass energy emissions under the target comprise methane and nitrous oxide only. Carbon dioxide from biomass combustion is considered biogenic (not included under the target).

Figure 7
FY 2010 Federal Government Scopes 1 & 2 GHG Emissions Covered by Reduction Target
(49.1 MMTCO₂e)



*Includes reductions from purchases of renewable energy attributes

III. Other Energy Management Activities

A. FACILITY EFFICIENCY INVESTMENT

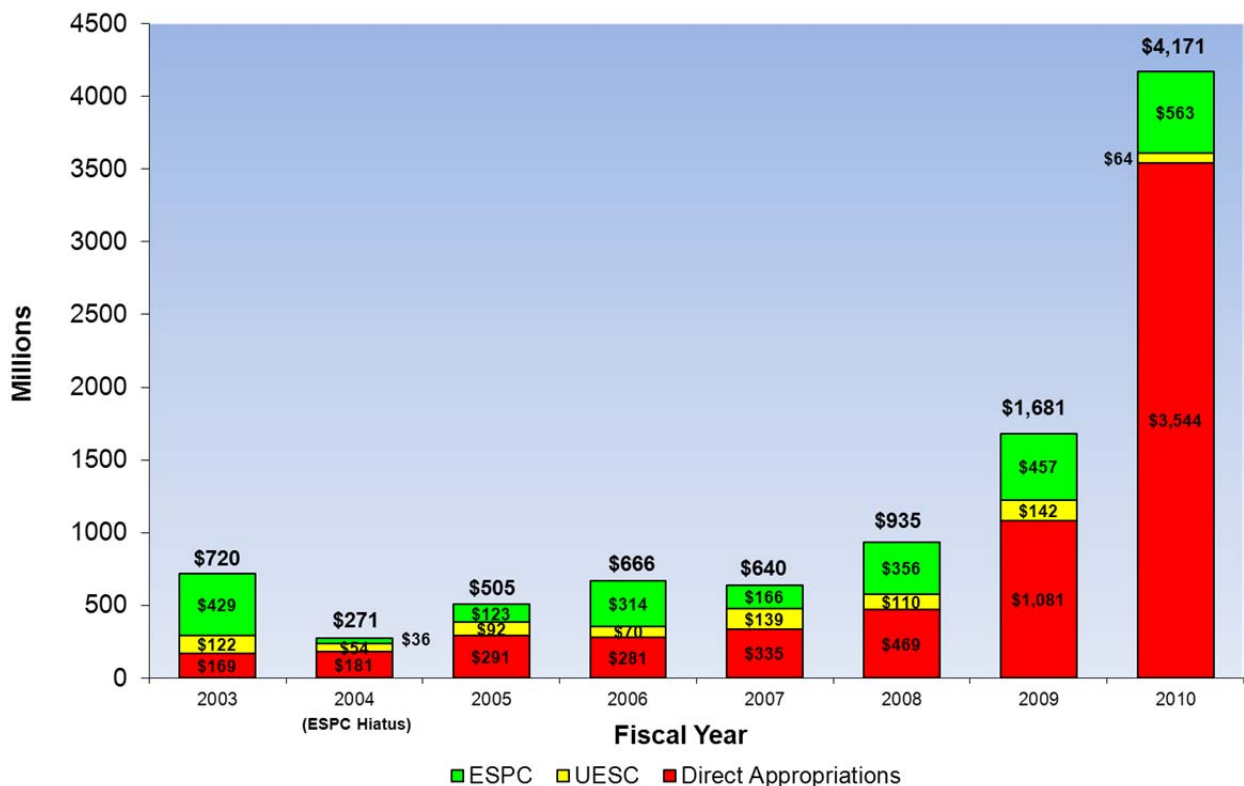
During FY 2010, Federal agencies had three primary options for financing energy efficiency, water conservation, and renewable energy projects in buildings: 1) direct appropriated funding, 2) energy savings performance contracts (ESPCs), and 3) utility energy service contracts (UESCs).

Known funding from the three sources totaled approximately \$4,170.9 million in FY 2010.

- Direct appropriations accounted for approximately \$3,543.7 million.
- ESPC contract awards by agencies resulted in approximately \$562.8 million in estimated project investment in FY 2010, and
- Approximately \$64.4 million in project investment came from UESCs.

As Figure 8 illustrates, since 2003 the Government has invested approximately \$9.6 billion in energy efficiency, \$6.4 billion of which was direct agency expenditures, \$2.4 billion was from ESPCs and \$794 million was from UESCs.

Figure 8
Investment in Energy Efficiency and Renewable Energy, FY 2003 to FY 2010
(Millions of As-Spent Dollars)



B. MANAGEMENT OF ENERGY AND WATER EFFICIENCY IN BUILDINGS

Section 432 of EISA amended section 543 of the NECPA by adding a new subsection, *Use of Energy and Water Efficiency Measures in Federal Buildings* (42 U.S.C. 8253(f)) The new subsection outlines a framework for facility energy and water project management and benchmarking, including the following requirements for Federal agencies:

- Designate “covered facilities” and assign “facility energy managers” for ensuring compliance of “covered facilities” subject to the requirements;
- Conduct “comprehensive energy and water evaluations;”
- Implement identified efficiency measures;
- Follow-up on implemented efficiency measures;
- Report data into the Federal Agency Management Program’s (FEMP) web-based tracking system for covered facilities’ energy use, evaluations, projects, follow-up, and analysis;
- Benchmark metered buildings that are, or are part of, covered facilities; and
- Disclose agency progress in evaluating covered facilities, project implementation, follow-up status, and benchmarked building performance monitoring status.

Information on FEMP’s EISA Compliance Tracking System (CTS) along with the most recent Government-wide findings can be found here:

http://www1.eere.energy.gov/femp/regulations/facility_cts.html.

In FY 2010, the energy used in EISA covered facilities comprised 323 trillion Btu or 84 percent of all Government facility energy use. EISA requires agencies "cover" at a minimum, Federal facilities that constitute at least 75 percent of facility energy use at each agency under the requirement.

As of August 2011, Federal agencies have performed comprehensive evaluations of half of the Federal Government facilities covered by the requirements, with 2,618 of 5,196 covered facilities evaluated (50.4 percent) or 1.35 billion square feet of 2.78 billion square feet (48.6 percent). The facility evaluations conducted by the agencies identified \$7 billion in potential investment in facility energy/water efficiency and conservation measures (ECMs).

Approximately 55,800 potential ECMs were identified by agencies in audits conducted since 2006. Potential annual cost savings from the identified ECMs is approximately \$764 million per year (less than 10 year simple payback period for \$7 billion in investment).

C. METERING

Section 103 of EPACT 2005 “Energy Use Measurement and Accountability” amended NECPA to require that all Federal buildings be metered for the purposes of efficient energy use and reduction in the cost of electricity used in such buildings by October 1, 2012 (42 U.S.C. 8253(e)). The Act specified that the agencies use advanced meters or metering devices that provide data at least daily and measure the consumption of electricity at least hourly to the maximum extent practicable. The law directed the Secretary of Energy to develop guidelines for implementation (42 U.S.C. 8253(e)(2)). The “Guidance for Electric Metering in Federal Buildings” was published on February 3, 2006 and can be found at http://www1.eere.energy.gov/femp/pdfs/adv_metering.pdf.

Agencies were required to submit to DOE an implementation plan identifying personnel responsible for achieving the requirements, and any determination by the agency that advanced meters or metering systems are not practicable in their specific situation.

Section 434(b) of EISA amended NECPA to stipulate that agencies must also meter natural gas and steam usage by October 1, 2016.

For FY 2010, agencies were required to report progress on both buildings with standard meters and buildings with advanced meters. Based on reports submitted to DOE, 11 agencies reported that all appropriate buildings were metered for electricity use with at least standard electricity meters. The 11 agencies meeting the 100 percent target include the Department of State; Department of Housing and Urban Development; the Department of the Treasury; Environmental Protection Agency; General Services Administration, National Archives and Records Administration; Nuclear Regulatory Commission; Office of Personnel Management; Railroad Retirement Board; Social Security Administration; and the United States Postal Service. Four agencies — the Department of Housing and Urban Development, National Archives and Records Administration, Railroad Retirement Board, and the Department of State — reported that they have already have advanced metering in 100 percent of their buildings.

Overall, agencies identified 85,843 buildings for which separate electricity meters are appropriate. Of these buildings, 78,121 had standard electricity meters installed and 16,414 had advanced meters installed. Accounting for instances of agencies reporting both the advanced and standard meters in a single building as well as reporting meters in buildings not considered appropriate, overall compliance with the electric metering goal was 94.2 percent.

D. FEDERAL BUILDING PERFORMANCE STANDARDS

Section 109 of EPACT 2005, “Federal Building Performance Standards,” amended the Energy Conservation and Production Act and directed the Secretary of Energy, to issue a rule that establishes Federal building energy efficiency performance standards (42 U.S.C. 6834(a)). The

standards require that, if life-cycle cost-effective, all new Federal buildings must be designed to achieve energy consumption levels 30 percent below those of the current version of the applicable ASHRAE standard or the International Energy Conservation Code (42 U.S.C. 6834(a)(3)(A)(i)(I)).

Six agencies did not achieve full compliance with the mandate, but only three of these were below 95 percent compliance. Overall, agencies reported over 97.5 percent of buildings designed since 2007 are 30 percent more efficient than relevant code. Agencies also have an opportunity to revisit designs to bring them into compliance. Some agencies are also assessing performance of designs underway to determine compliance and will report these findings in future reports.

E. ENERGY EFFICIENT PROCUREMENT

Section 161 of EPACT 1992 requires the Department of Energy to report to Congress on the procurement and identification of energy efficient products (42 U.S.C. 8262g(d)). It also requires GSA, DOD, and DLA, in consultation with DOE, to identify and designate energy efficient products that offer significant potential life-cycle savings. Combined, ENERGY STAR and FEMP cover over 70 product categories. For these categories, either ENERGY STAR or FEMP sets minimum energy efficiency levels. Both GSA's GSA Advantage! and DOD's DLA EMALL have begun to label products that meet these requirements in their procurement systems. ENERGY STAR and FEMP have committed to work with GSA and DLA to improve the quality of this identification and ensure its accuracy.

DLA uses Environmental Attribute Codes (ENACs) to identify products that contain environmental attributes, including energy efficient products meeting either ENERGY STAR qualifications or FEMP-designated efficiency requirements. In a 2008 review of its data, DLA found that it provided compliant products (eligible for ENACs) in 4 of the 21 energy consuming product categories examined. For those four categories, compliant products represented 3 to 25 percent of total products available. Since its 2005 data review, DLA has increased the number of products with ENACs to include over 600 National Stock Numbers. In conducting this review DLA found that it was difficult to determine whether a product met FEMP efficiency requirements, due to either the information available in DLA's system, or to the way in which the efficiency requirement was written.

In 2008 and 2010, FEMP, through a third-party contract, reviewed a sample of contract solicitations to estimate compliance with this requirement. In 2010, FEMP's review of 102 contract solicitations for energy-consuming products found that 46 percent complied with the requirement. For purposes of this review, compliance was defined as containing any reference: specifying that products must be ENERGY STAR-qualified and/or meeting FEMP-designated efficiency requirements; specifying that all products provided must comply with Section 104 of EPACT 2005; outlining energy-efficient performance specifications that met ENERGY STAR or

FEMP efficiency requirements; requesting an ENERGY STAR-qualified product; or referring to either FAR clause 23.203-23.206 and/or 52.225-15.

To support increased compliance, FEMP now sets efficiency requirements using industry-recognized testing standards, the results of which are often provided in manufacturer or vendor product specification summaries. In FY 2012, FEMP will also provide technical assistance and training to DLA Product Specialists to increase the ease with which they can comply with FEMP-designated efficiency requirements. GSA encourages the purchase of energy efficient products by including them in the “Environmental Aisle” of GSA Advantage! ENERGY STAR regularly reviews product labels in the GSA Advantage! system to ensure accurate labeling of ENERGY STAR qualified products. FEMP and GSA are now working together to accurately label products that meet ENERGY STAR and low standby power requirements.