

**Annual Report to Congress  
on Federal Government  
Energy Management and  
Conservation Programs  
Fiscal Year 2006**

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## EXECUTIVE SUMMARY

This report on Federal energy management for fiscal year (FY) 2006 provides information on energy consumption in Federal buildings, operations, and vehicles and documents activities conducted by Federal agencies to meet the requirements of:

- Title V, Part 3, of the National Energy Conservation Policy Act (NECPA), as amended (42 U.S.C. §§ 8251-8259, 8262b-k);
- Title VIII of NECPA (42 U.S.C. § 8287-8287c);
- The Energy Policy Act of 2005 (EPACT 2005) (42 U.S.C. § 8262c); and
- Executive Order 13123, “Efficient Energy Management” (superseded by Executive Order 13423 of January 24, 2007, “Strengthening Federal Environmental, Energy, and Transportation Management” (72 FR 3919)).

The energy management requirements of Executive Order 13423 will be addressed in the report for FY 2007. This report presents information for FY 2006 and was drafted prior to the enactment of the 2007 Energy Independence and Security Act (EISA). These requirements will be considered in the FY 2008 report.

## OVERVIEW OF CONSUMPTION AND COSTS

- Based on reports submitted to the Department of Energy (DOE) by 25 Federal agencies, the total primary energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was approximately 1.5 quadrillion British thermal units (Btu) or “quads” during FY 2006.
  - These 1.5 quads, consumed by the Government in buildings and operations to provide essential services to its citizens, including the defense of the Nation, represent approximately 1.5 percent of the total 99.61 quads used in the United States.
  - In total, the Federal Government is the single largest energy consumer in the Nation, although its consumption is widely dispersed geographically.
  - The total primary energy consumption in FY 2006 was 18.2 percent less than in FY 1985, 4.8 percent less than in FY 2003, and 5.8 percent less than in FY 2005.
- When measured in terms of energy delivered to the point of use or site-delivered energy consumption, the Government consumed almost 1.1 quads (1,059,521.5 billion Btu) during FY 2006.
  - The total site-delivered energy consumption in FY 2006 was 26.9 percent less than in FY 1985, 5.9 percent less than in FY 2003, and 7.8 percent less than in FY 2005.
- The total cost of the 1.1 quads was \$17.7 billion in FY 2006 and represented approximately 0.7 percent of the total Federal expenditures of \$2.655 trillion for all purposes in FY 2006.
  - In constant 2006 dollars, this equates to an increase of 65.4 percent from \$10.7 billion in FY 2003 to \$17.7 billion in FY 2006 (Table A-9).
  - During that same period, the unit cost of all fuel types used increased 75.7 percent, from \$9.52 per million Btu in FY 2003 to \$16.73 per million Btu in FY 2006.
  - Compared to FY 2005, the combined unit costs of all fuels increased 28.5 percent in FY 2006. Contributing to the overall increase in unit costs were increases from the prior year in the prices paid by the Government for:
    - Jet fuel (33.1 percent increase),
    - Navy special fuel oil (48.0 percent increase),
    - Diesel fuel (26.1 percent increase)
    - Gasoline (28.1 percent increase),
    - Electricity (8.6 percent increase)
    - Fuel oil (42.3 percent increase), and

- Natural gas (23.0 percent increase)
- Federal agencies now report energy consumption under three end-use sectors:
  - EPACT 2005 goal-subject buildings;
  - EPACT 2005 goal-excluded buildings; and
  - vehicles and equipment.
- Total Federal energy consumption and costs are summarized below by end-use sector:

Energy Use	Trillion Btu	Percentage
Goal Buildings	352.9	33.3%
Excluded Buildings	37.9	3.6%
Vehicles & Equipment	668.7	63.1%
Total	1,059.5	100.0%

Energy Cost	\$Billion	Percentage
Goal Buildings	\$5.8	32.8%
Excluded Buildings	\$0.7	3.9%
Vehicles & Equipment	\$11.2	63.4%
Total	\$17.7	100.0%

## **GOVERNMENT ENERGY MANAGEMENT PERFORMANCE IN FY 2006**

### **Energy Performance Requirement for Federal Buildings**

- Taking into account renewable energy purchases and improvements in the efficiency of certain energy generating facilities, the Federal Government decreased energy use per gross square foot by 6.4 percent in fiscal year 2006 relative to fiscal year 2003 for buildings subject to the EPACT 2005 amendments goal. Based strictly on total site energy use per gross square foot (excluding renewable energy purchases and improved generating efficiency), the Government cut its energy intensity by 3 percent.
- Using either accounting method, the Government surpassed the EPACT 2005 amendments goal of a 2 percent reduction.

### **Greenhouse Gas (GHG) Reduction**

- Compared to FY 2003, estimated emissions of carbon dioxide, methane, and nitrous oxide from energy use in Federal buildings subject to the EPACT 2005 amendments goal decreased 7.4 percent, from 46.3 million metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>E) to 42.8 MTCO<sub>2</sub>E in FY 2006.
  - Twenty-one agencies showed reductions in GHG emissions during the period in this estimation.

### **Use of Renewable Energy**

- The Federal renewable energy goals in EPACT 2005 begin in FY 2007. (42 U.S.C. 15852(a)) Therefore, this report tracks performance for FY 2006 under the existing reporting structure that was used under Executive Order 13123, “Efficient Energy Management”. (64 FR 30851; June 8, 1999.)
  - The goal under Executive Order 13123 was for the equivalent of 2.5 percent of electricity consumption in Federal facilities to come from new renewable energy sources by 2005.

- Non-electric renewable energy use was also eligible to be counted toward progress in meeting the goal.
- Federal agencies reported purchasing or producing 12,891.5 billion Btu of new renewable energy in FY 2006, equivalent to 6.9 percent of the Federal Government's electricity use.

### **Petroleum Reduction in Buildings**

- Federal agencies have made significant progress in reducing their dependence on fuel oil and LPG/propane in their buildings.
  - Federal agencies reduced petroleum-based fuels by 72.6 percent in FY 2006 compared to FY 1985, from 118.8 trillion Btu to 32.6 trillion Btu.
  - Compared to FY 2003, use of these fuels fell by 24.3 percent.

### **INVESTMENTS IN ENERGY EFFICIENCY**

- During FY 2006, Federal agencies had three primary options for financing energy efficiency, water conservation, and renewable energy projects in buildings:
  - Direct appropriated funding,
  - Energy savings performance contracts (ESPCs), and
  - Utility energy service contracts (UESCs).
- Known funding from the three sources totaled approximately \$665.9 million in FY 2006.
  - Direct appropriations accounted for approximately \$281.1 million.
  - ESPC contract awards by agencies resulted in approximately \$314.5 million in estimated project investment in FY 2006
    - \$164.4 million from DOE Super ESPC delivery orders and \$150.1 million from other agency ESPCs, and
  - Approximately \$70.4 million in project investment came from UESCs.
- Since 2003, the Government has invested approximately \$2.2 billion in energy efficiency, \$921.4 million of which was direct agency expenditures, \$902.4 million was from ESPCs and \$338.9 million was from UESCs.



# I. OVERVIEW OF FEDERAL ENERGY CONSUMPTION AND COSTS

This report on Federal energy management for fiscal year (FY) 2006 provides information on energy consumption in Federal buildings, operations, and vehicles and documents activities conducted by Federal agencies to meet the statutory requirements of:

- Title V, Part 3, of NECPA, as amended by the Energy Policy Act of 2005 (42 U.S.C. §§ 8251-8259, 8262, 8262b-k);
- Title VIII of NECPA, as amended by the Energy Policy Act of 2005 (42 U.S.C. § 8287-8287c).

This report adopts the reporting structure of the Energy Policy Act of 2005 (EPACT 2005; Pub. L. No. 109-58) with regard to new performance goals and baseline year of 2003 rather than that of Executive Order 13123, “Efficient Energy Management” (64 FR 30851; June 8, 1999) which was superseded by Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, (72 FR 3919; January 24, 2007). The energy management requirements of Executive Order 13423 will be addressed more comprehensively in the report for FY 2007.

Based on reports submitted to the Department of Energy (DOE) by 25 Federal agencies, the total primary energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was approximately 1.5 quadrillion British thermal units (Btu) or “quads” during FY 2006 (see Table A-1 in Appendix A, Energy Consumption and Cost Detail Tables).<sup>1</sup> These 1.5 quads, consumed by the Government in buildings and operations to provide essential services to its citizens, including

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<sup>1</sup>Primary energy consumption considers all energy resources used to generate and transport electricity and steam. Tables 7, 8, and A-1 show primary energy consumption while the rest of the tables in the report reflect site-delivered consumption. See Appendix B for information on energy conversion factors.

the defense of the Nation, represent approximately 1.5 percent of the total 99.61 quads<sup>2</sup> used in the United States. In total, the Federal Government is the single largest energy consumer in the Nation, although its consumption is widely dispersed geographically. The total primary energy consumption in FY 2006 was 18.2 percent less than in FY 1985, 4.8 percent less than in FY 2003, and 5.8 percent less than in FY 2005.

When measured in terms of energy delivered to the point of use or site-delivered energy consumption, the Federal Government consumed almost 1.1 quads (1,059,521.5 billion Btu) during FY 2006 (Table A-2). Unless otherwise noted, this report uses the site-measured conversion factors to convert common units for electricity and steam to British thermal units (Btu). The total site-delivered energy consumption in FY 2006 was 26.9 percent less than in FY 1985, 5.9 percent less than in FY 2003, and 7.8 percent less than in FY 2005.

The total cost of the 1.1 quads was \$17.7 billion in FY 2006 and represented approximately 0.7 percent of the total Federal expenditures of \$2.655 trillion<sup>3</sup> for all purposes in FY 2006.<sup>4</sup> In constant 2006 dollars, this equates to an increase of 65.4 percent from \$10.7 billion in FY 2003 to \$17.7 billion in FY 2006 (Table A-9).

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<sup>2</sup>DOE/EIA, *Monthly Energy Review Jun 2007*, Table 1.1. [www.eia.doe.gov/emeu/mer/pdf/pages/sec1\\_3.pdf](http://www.eia.doe.gov/emeu/mer/pdf/pages/sec1_3.pdf)

<sup>3</sup>*Analytical Perspectives, Budget of the United States Government, Fiscal Year 2008*

<sup>4</sup>Unless otherwise noted, all costs cited in this report are in constant 2006 dollars, calculated using Gross Domestic Product implicit price deflators. See Bureau of Economic Analysis web site, [www.bea.gov/bea/dn/gdplev.xls](http://www.bea.gov/bea/dn/gdplev.xls). Costs noted as nominal dollars reflect the price paid at the time of the transaction and have not been adjusted to remove the effect of changes in the spending power of the dollar.

During that same period, the unit cost of all fuel types used increased 75.7 percent, from \$9.52 per million Btu in FY 2003 to \$16.73 per million Btu in FY 2006.

Compared to FY 2005, the combined unit costs of all fuels increased 28.5 percent in FY 2006. Contributing to the overall increase in unit costs were increases from the prior year in the prices paid by the Government for:

- Jet fuel (33.1 percent increase),
- Navy special fuel oil (48.0 percent increase),
- Diesel fuel (26.1 percent increase)
- Gasoline (28.1 percent increase),
- Electricity (8.6 percent increase)
- Fuel oil (42.3 percent increase), and
- Natural gas (23.0 percent increase).

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 2006, the Department of Defense (DOD) spent almost \$13.8 billion for energy out of the total Federal energy expenditure of \$17.7 billion, or 77.8 percent. Overall, DOD used 7.8 percent

less site-delivered energy in FY 2006 than in FY 2005.

Figures 1 and 2 depict the percentage of total energy used by the Federal Government in FY 2006 and its cost. As illustrated, jet fuel and electricity account for approximately 59.4 percent of the total energy consumption represented in Figure 1 and approximately 69.1 percent of the total energy costs in Figure 2.

Federal agencies now report energy consumption under three end-use sectors: 1) EPACT 2005 goal-subject buildings<sup>5</sup>; 2) EPACT 2005 goal-excluded buildings; and 3) vehicles and equipment.

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

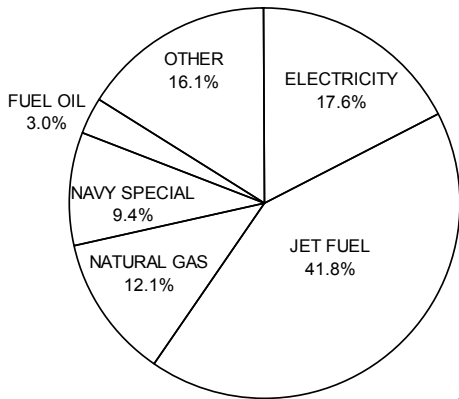
Energy Use	Trillion Btu	Percentage
Goal Buildings	352.9	33.3%
Excluded Buildings	37.9	3.6%
Vehicles & Equipment	668.7	63.1%
Total	1,059.5	100.0%

Energy Cost	\$Billion	Percentage
Goal Buildings	\$5.8	32.8%
Excluded Buildings	\$0.7	3.9%
Vehicles & Equipment	\$11.2	63.4%
Total	\$17.7	100.0%

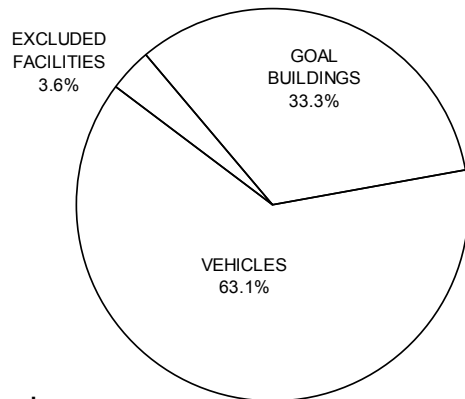
<sup>5</sup> Section 102 of EPACT 2005 re-established the statutory energy reduction goals for Federal buildings. The new goal uses a base year of FY 2003 and requires reductions of 2 percent per year in energy use per square foot, leading to a 20 percent reduction in the fiscal year 2015.

**Figure 1**  
**Federal Energy Consumption by Fuel Type and End-Use Sector, FY 2006**

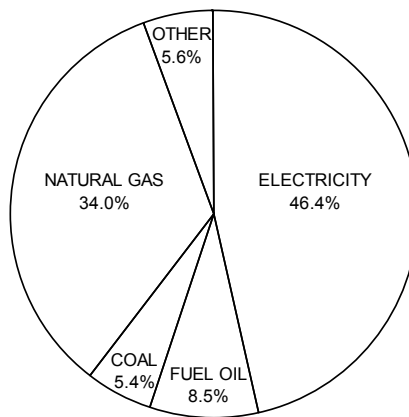
**Total by Energy Type: 1.06 quads**



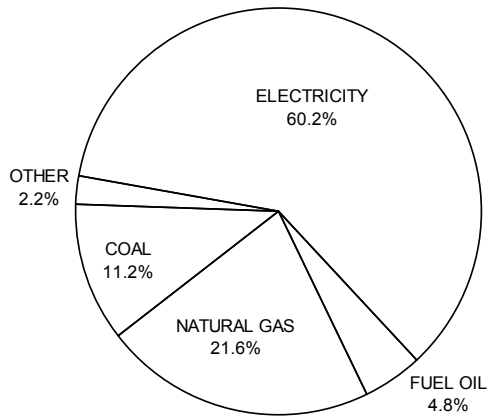
**Total by End-Use Sector: 1.06 quads**



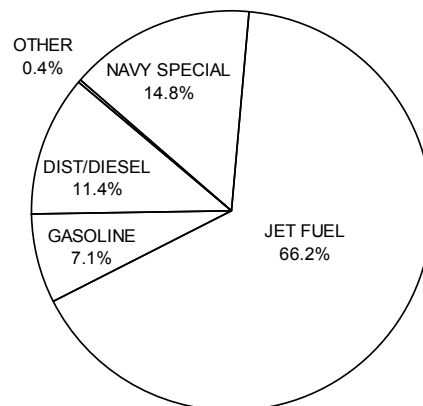
**Goal Buildings: 0.35 quads**



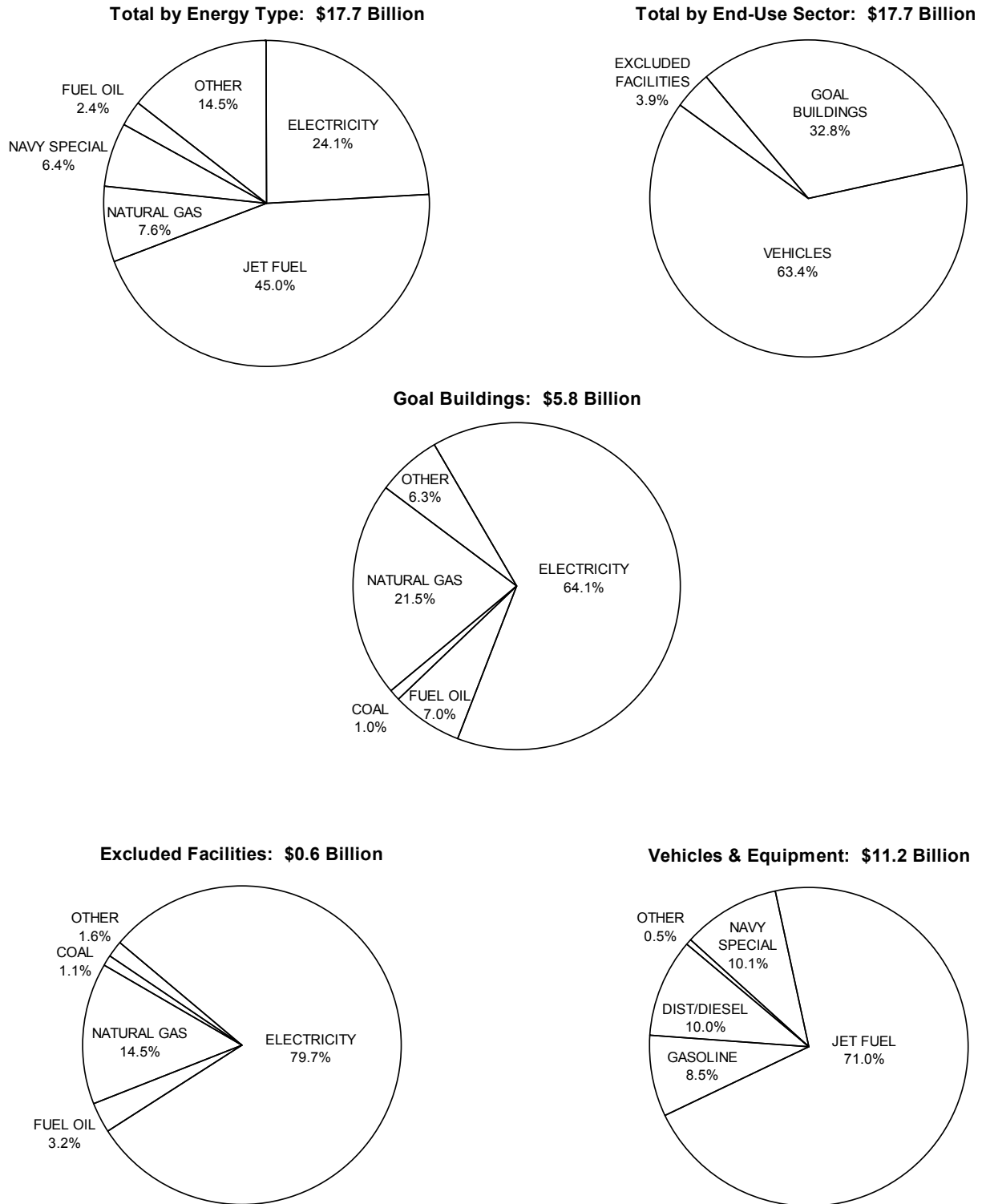
**Excluded Facilities: 0.04 quads**



**Vehicles & Equipment: 0.67 quads**



**Figure 2**  
**Federal Energy Costs by Fuel Type and End-Use Sector, FY 2006**



## A. EPACT 2005 Goal Buildings

EPACT 2005 Goal Buildings are Federal buildings which are subject to EPACT energy performance requirements. They comprise 3.0 out of 3.2 billion square feet of total Federal space (94.9 percent) and account for 352.9 of 390.8 trillion Btu (90.3 percent) of energy use. Formerly, Federal agencies reported energy consumption separately for standard buildings and for industrial, laboratory, and other energy intensive facilities. Under EPACT 2005 amendments to section 543 of NECPA, these two end-use sectors are now combined for the purpose of goal performance measurement and are referred to in this report as “goal buildings.” (42 U.S.C. 8253(a)(1)) Below is an overview of energy consumption and costs in goal buildings. See Section II for the discussion on goal performance.

In FY 2006, the Federal Government used 352.9 trillion Btu to provide energy to 3.0 billion square feet of building space subject to the EPACT 2005 amendments goal (Table A-3). This consumption represents a 28.7 percent decrease compared to FY 1985, a 6.1 percent decrease relative to FY 2003, and a 5.8 percent decrease from FY 2005. The significant drop from FY 1985 reflects the success of Federal energy management efforts in reducing fossil fuel use in Federal buildings as well as reduced defense-related facility energy use (41.5 percent less than FY 1985). The cost of energy for goal buildings in FY 2006 was \$5.8 billion, an increase of approximately \$461.9 million from FY 2005 expenditures, and an increase of 22.7 percent from the FY 2003 expenditure of \$4.7 billion (Table A-4).<sup>6</sup> Of the \$5.8 billion spent for energy used in the goal buildings, \$3.25 billion was spent by DOD with the remaining \$2.56 billion spent by the civilian agencies.

The 352.9 trillion Btu used in goal buildings comprised approximately 33.2 percent of the total 1.1 quads used by the Federal Government. Electricity constitutes 46.4 percent of the energy

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<sup>6</sup>Cost and consumption figures for prior years may be different from those published in last year’s annual report since Federal agencies update their files and provide revisions to their data.

used in goal buildings; 34.0 percent is accounted for by natural gas, 8.5 percent by fuel oil, and 5.4 percent by coal. Small amounts of purchased steam, liquefied petroleum gas (LPG)/ propane, and “other” energy account for the remaining 5.6 percent.

## B. Excluded Buildings

As required by the EPACT 2005 amendments to section 543 of NECPA (42 U.S.C. 8253(c)(3)), the Department of Energy’s Federal Energy Management Program (FEMP) finalized and promulgated on January 27, 2006 the *Guidelines Establishing Criteria for Excluding Buildings from the Energy Performance Requirements of Section 543 of the National Energy Conservation Policy Act as Amended by the Energy Policy Act of 2005*. These guidelines were developed through an interagency working group process under the auspices of the Federal Interagency Energy Management Task Force which subsequently concurred with the final product. The *Guidelines* are available at: [http://www1.eere.energy.gov/femp/pdfs/exclusion\\_criteria.pdf](http://www1.eere.energy.gov/femp/pdfs/exclusion_criteria.pdf). Excluded buildings comprise 174.1 million square feet out of 3.2 billion square feet of total Federal space (5.1 percent) and account for 37.9 of 390.8 trillion Btu (9.7 percent) of energy use.

Twelve agencies have chosen to exclude buildings from energy performance requirements: DOD, DOE, the Departments of Commerce, Health and Human Services, Homeland Security, Transportation, and the Treasury, the National Aeronautics and Space Administration (NASA), the General Services Administration (GSA), the International Broadcast Bureau, the U.S. Postal Service, and the Tennessee Valley Authority have chosen to exclude buildings from energy management requirements. These buildings are listed at [www.eere.energy.gov/femp/pdfs/excludedfac06.pdf](http://www.eere.energy.gov/femp/pdfs/excludedfac06.pdf).

In general, excluded buildings are comprised of structures and processes that are not qualified as Federal buildings, buildings under construction or renovation, and certain types of leased space. For example:

- Structures such as outside parking garages which consume essentially only lighting

energy, yet are classed as buildings,

- Federal ships that consume “Cold Iron Energy,” (energy used to supply power and heat to ships docked in port) and airplanes or other vehicles that are supplied with utility-provided energy,
- Buildings entering or leaving the inventory during the year, buildings down-scaled operationally to prepare for decontamination, decommissioning and disposal, and buildings undergoing major renovation and/or major asbestos removal,
- Leased space where the Government may pay for some energy but not all or the space comprises only part of a building, and
- Separately-metered energy-intensive loads that are driven by mission and operational requirements, not necessarily buildings, and not influenced by conventional building energy conservation measures.

If none of the circumstances above apply, then NECPA requires each agency seeking to exclude buildings to demonstrate that for the building being excluded:

- Energy reduction requirements are impracticable,
- All Federally-required energy management reports have been completed and submitted,
- Agency has achieved compliance with all energy efficiency requirements, and
- All practicable, life cycle cost-effective projects have been implemented at the excluded building(s)

(42 U.S.C. 8253(c)(1)(A)(i)-(iv))

Agency-specific details pertaining to their excluded buildings are described in Section III of this report.

Energy used in excluded buildings totaled 37.9 trillion Btu in FY 2006 (Table A-5), approximately 3.6 percent of the total 1.1 quads used by the Federal Government. Electricity constitutes 60.2 percent of the energy used in excluded buildings, 21.6 percent is accounted for by natural gas and 4.8 percent by fuel oil. Small amounts of purchased steam, liquefied petroleum gas (LPG)/propane, and “other” energy account for the remaining 2.2 percent.

The energy used in excluded buildings in FY 2006 accounted for 3.9 percent of the total Federal energy bill. The Federal Government spent approximately \$684.0 million for this category’s energy during the fiscal year (Table A-6).

### **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 2006, the Federal Government used approximately 668.7 trillion Btu of energy in vehicles and equipment, 63.1 percent of the total 1.1 quads consumed (Table A-7). Total energy consumption in vehicles and equipment decreased 28.4 percent relative to FY 1985 and 11.0 percent from the FY 2005 consumption of 751.2 trillion Btu. DOD consumed 620.4 trillion Btu or 92.8 percent of all vehicles and equipment energy used by the Federal Government.

The Federal Government spent \$11.2 billion on vehicles and equipment energy in FY 2006 (Table A-8), almost \$2.1 billion more than the FY 2005 expenditure, a 22.5 percent increase in constant dollars. For all fuels, the cost per million Btu increased from \$12.21 in FY 2005 to \$16.79 in FY 2006 (Table A-9). The unit cost of the most-used fuel, jet fuel, increased 33.1 percent from the previous year. Gasoline prices paid by the Government increased 28.1 percent from the previous year.

Consumption of alternative fuels and progress toward the EPACT 2005 and Executive Order goals for Federal fleet vehicles is addressed in the report, *Federal Fleet Compliance with EPACT and E.O. 13149, Fiscal Year 2006*, available at [http://www1.eere.energy.gov/vehiclesandfuels/epact/pdfs/2006\\_fed\\_fleet\\_report.pdf](http://www1.eere.energy.gov/vehiclesandfuels/epact/pdfs/2006_fed_fleet_report.pdf). In FY 2006, Federal agencies reported using 1,554.4 billion Btu of alternative fuels at a cost of \$30.2 million. Alternative fuels comprise 0.2 percent of the Government’s energy consumption in vehicles and equipment and 0.3 percent of the costs.

## II. FEDERAL GOVERNMENT ENERGY MANAGEMENT PERFORMANCE IN FY 2006

### **A. Overview of Federal Energy Management Policy and Legislative Mandates**

The National Energy Conservation Policy Act (NECPA), as amended by EPACT 2005 requires Federal agencies to improve energy management in their facilities and operations. (42 U.S.C. 8253(a)) Amendments to NECPA made by the Federal Energy Management Improvement Act of 1988 (Pub. L. No. 100-615), required each agency to achieve a 10 percent reduction in energy consumption in its Federal buildings by FY 1995, when measured against a FY 1985 baseline on a Btu-per-gross-square-foot (Btu/GSF) basis. It also directed DOE to establish life-cycle costing methods and coordinate Federal conservation activities through the Interagency Energy Management Task Force. Section 543 of NECPA contained provisions requiring a reduction in Btu/GSF of 20 percent by 2000, life-cycle cost methods and procedures, budget treatment for energy conservation measures, incentives for Federal facility energy managers, reporting requirements, new technology demonstrations, and agency surveys of energy-saving potential.

**Section 102 of EPACT 2005 amended NECPA to re-establish the statutory energy reduction goals for Federal buildings.** (42 U.S.C. 8253(a)) Since FY 2000, the Government has been measuring its progress in this area against Executive Order goals that were an extension of the Energy Policy Act of 1992 (Pub. L. No. 102-486) goals using a 1985 base year for comparison. **The new goal uses a base year of FY 2003 and requires reductions of 2 percent per year in energy use per square foot, leading to a 20 percent reduction in the fiscal year 2015.** The new requirement includes industrial, laboratory, and other energy intensive facilities in the goal. Since the EPACT 2005 amendments make no distinction between standard buildings and energy intensive facilities in measuring performance toward its annual goals and uses 2003 as its

baseline year, burdensome data management activities would have been required of agencies to continue reporting against the old Executive Order 13123 goals. Therefore, this report for FY 2006 uses the EPACT 2005 amendments reporting scheme while looking ahead to the requirements of the new Executive Order 13423.

To further assist agencies in adjusting to the new goals, FEMP provided guidance for establishing the baseline for the goals under the EPACT 2005 amendments and clarified how the differing reporting requirements of EPACT 2005 and Executive Order 13123 (still in effect) would be addressed. FEMP assisted Federal agencies in assessing their FY 2003 energy data to lay the foundation of their EPACT baseline, providing each agency with its FY 2003 energy consumption, costs, and square footage data formatted in ways that allowed agencies to assess their baseline data according to default and new building inventory categories. Agencies submitted baseline assessments with their FY 2006 reporting packages.

**Section 102 of EPACT 2005 also amended NECPA to update the criteria for exclusion of buildings from the energy efficiency goals requirement** based on findings by the head of the agency relating to implementation of all life-cycle cost-effective projects, energy intensiveness, and national security functions. (42 U.S.C. 8253(c)(3)) Section 543(c)(3) of NECPA states that the Secretary of Energy shall issue guidelines that establish criteria for exclusions from the energy performance requirement for a fiscal year, any Federal building or collection of Federal buildings, within the statutory framework provided by the law. (42 U.S.C. 8253(c)(3))

On January 27, 2006, DOE issued the *Guidelines Establishing Criteria for Excluding Buildings from the Energy Performance Requirements of Section 543 of the National Energy Conservation Policy Act as Amended by the Energy Policy Act of 2005*. These guidelines were developed through an

interagency working group process under the auspices of the Federal Interagency Energy Management Task Force. See [www.eere.energy.gov/femp/pdfs/exclusion\\_criteria.pdf](http://www.eere.energy.gov/femp/pdfs/exclusion_criteria.pdf).

As an incentive, **section 102 amends section 546 of NECPA to include authority for Federal agencies to retain any funds appropriated to that agency for energy, water, or wastewater treatment expenditures that are not made because of savings through actions taken to comply with the Act.** (42 U.S.C. 8256(e)) Subject to other applicable law, the funds can only be used for energy efficiency, water conservation, or unconventional and renewable energy resources projects.

**Section 103 “Energy Use Measurement and Accountability” amends section 543 of NECPA to direct 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. 8256(e)) The direction is specific to the measurement of electricity in that advanced meters or metering devices that provide data at least daily and measure the consumption of electricity at least hourly will be used to the maximum extent practicable. The law directs the Secretary of Energy – in consultation with the Department of Defense, the General Services Administration, and all private sector utility, metering stakeholders, as well as national laboratories and universities – develop guidelines for implementation. The Congressional direction includes specific issues to be considered in developing the guidelines including: the relative costs and benefits of the proposed metering, the amount of funds and personnel resources necessary to implement the direction, protocol to prioritize metering applications, and guidelines for excluding individual buildings. (42 U.S.C. 8253(e)(2)(A) and (B)) Within six months of receipt of the guidance, agencies will 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. (42 U.S.C. 8253(e)(3))

**Section 104 “Procurement of Energy Efficient Products”** amends Part 3 of title V of NECPA to require that each agency “... incorporate into the specifications for *all* procurements involving energy consuming products and systems, including guides specifications, project specifications, and construction, renovation, and services contracts that include provision of energy consuming products and systems, and into the factors for the evaluation of offers received for the procurement, criteria for energy efficiency that are consistent with ... Energy Star products and for rating FEMP designated products.” (42 U.S.C. 8259(b)(3))

**Section 105 “Energy Savings Performance Contracts” extends the authority of NECPA for Federal agencies to energy into the performance contracts for energy and water conservation to 2016.** (42 U.S.C. 8287(c))

To assure that all new Federal buildings incorporate the best energy efficiency techniques available, **Section 109 “Federal Building Performance Standards” amends section 305(a) of the Energy Conservation and Production Act to direct the Secretary of Energy, within one year, to issue a rule that establishes Federal building energy efficiency performance standards based on updated industry standards.** (42 U.S.C. 6834(a)) The standards will require that, if life-cycle cost-effective, all new Federal buildings will be designed to achieve energy consumption levels thirty percent below those of the current version of the applicable ASHRAE standard or the International Energy Conservation Code (IECC). (42 U.S.C. 6834(a)(3)(A)(i)(I)) The requirement further states that sustainable design principles will be applied to the siting, design, and construction of all new and replacement buildings. (42 U.S.C. 6834(a)(3)(A)(i)(II)) The section also requires DOE to perform a review within one year of any change to the ASHRAE standard or IECC to see if the Federal guidance should be updated. (42 U.S.C. 6834(a)(3)(B)) As an oversight provision, the section also directs each agency to include in its annual budget request and report under the National Energy Conservation Policy Act identification of all new buildings and whether they meet or exceed the developed standards. (42 U.S.C. 6834(a)(3)(C))



**Section 203 of EPACT 2005 requires** the Secretary of Energy to 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 are renewable energy as defined in section 203 of the Act:**

- **Not less than 3 percent in fiscal years 2007 through 2009.**
- **Not less than 5 percent in fiscal years 2010 through 2012.**
- **Not less than 7.5 percent in fiscal year 2013 and each fiscal year thereafter.**

(42 U.S.C. 15852 (a))

Section 203 also provides a bonus to Federal agencies by allowing them to double count renewable energy 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 states that the term “renewable energy” means 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)(2))

The Federal renewable energy goals in EPACT 2005 begin in fiscal year 2007 and DOE’s guidance for implementing the goals was still being finalized in December of 2007. Therefore, this report tracks performance for FY 2006 under the existing reporting structure that was used under Executive Order 13123.

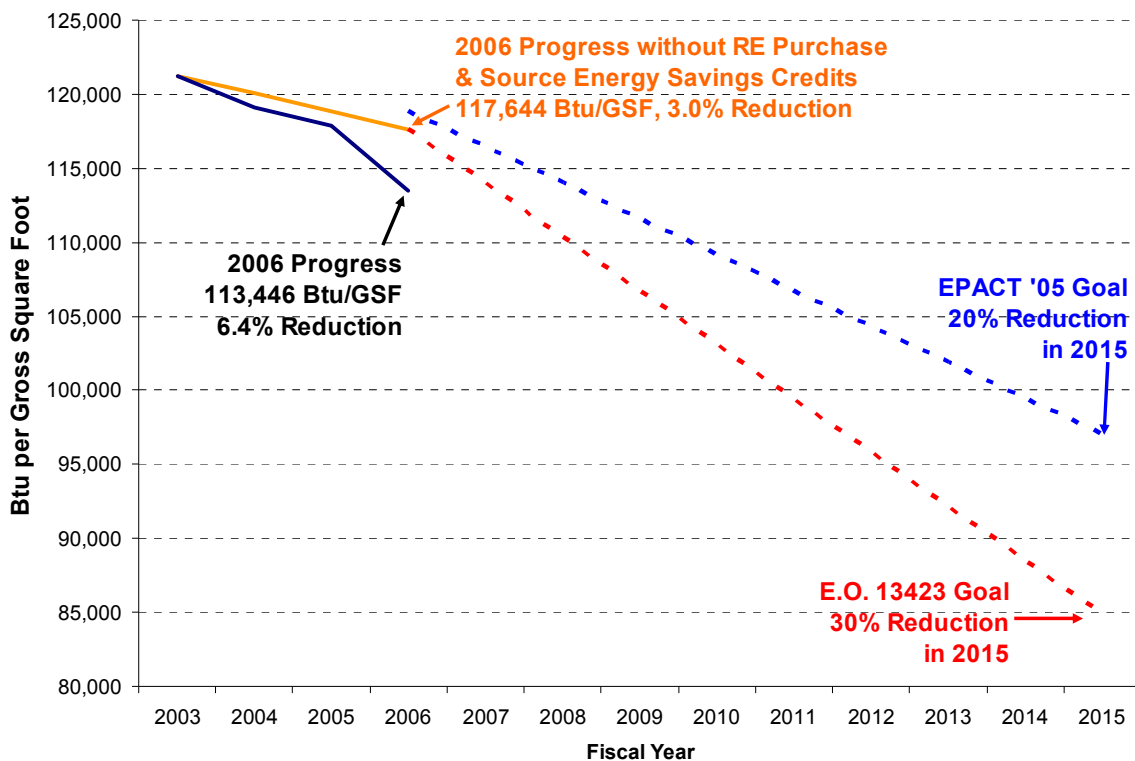
## B. Energy Performance Requirement for Federal Buildings

According to data provided by the agencies, the Federal Government decreased energy use per gross square foot by 6.4 percent in FY 2006 relative to FY 2003 for buildings subject to the goal. This surpassed the EPACT 2005 amendments goal of a 2 percent reduction. The Federal Government has also met the goal of subsequently-issued Executive Order 13423 with a 3 percent reduction strictly on the basis of reduced energy intensity. Subtracting 12.6 trillion Btu for renewable energy purchases and for projects that reduce primary energy use (as opposed to site-delivered energy), the reduction is more than

doubled to 6.4 percent below the FY 2003 baseline. The Federal Government's performance for each year since FY 2003 is illustrated in Figure 3.

EPACT 2005 is silent on whether purchases of renewable energy can be used to achieve energy reduction goals. Under the old Executive Order 13123, agencies were permitted to credit renewable energy purchases toward their performance under the energy reduction goals. These credits were continued for FY 2006, pending the release of DOE guidance on EPACT 2005's renewable energy goal which will phase out the credits over time. For FY 2006, these credits amounted to 12.6 trillion Btu that were subtracted from agencies' consumption before Btu/GSF was calculated.

**Figure 3**  
**Overall Government Progress toward Facility Energy Efficiency Goals,**  
**FY 2003 through FY 2006**



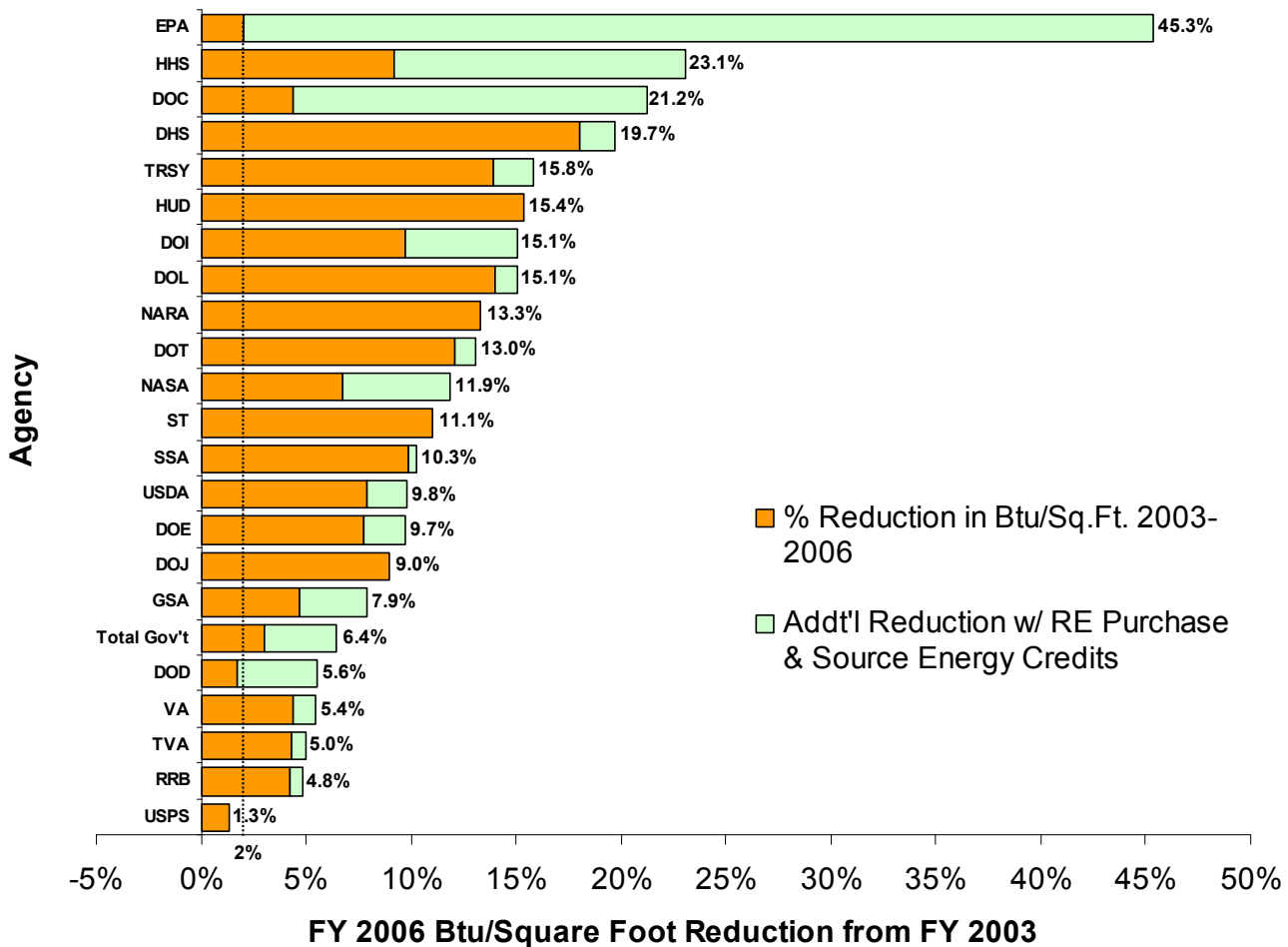
Similarly, Section 502(e) of Executive Order 13123 provided credit to agencies that implement cost-effective projects that save primary energy, but not necessarily site-delivered energy. In FY 2006, these credits amounted to almost 3.8 trillion Btu. This credit is necessary so that cost-effective projects which generate electricity on site (and increase site energy use while reducing source energy use) do not penalize agency performance toward the goal. This practice is expected to continue under the goals of Executive Order 13423 through supplemental guidance to be released by DOE under authority of the Executive Order's implementing instructions.

The additional credits toward energy intensity reduction as applied to each agency are documented in the notes of Table 2.

Individual agency performance in FY 2006, compared to FY 2003, is illustrated below in Figure 4 and documented in Table 2. Twenty-one out of 22 agencies reporting their performance toward the goal have reduced energy use per gross square foot in goal buildings by more than 2 percent from 2003.

At the agency level, the largest overall reductions are seen in those agencies taking advantage of renewable energy credits, and to a lesser degree, primary energy project reduction credits. Even without the credits, many agencies have achieved remarkable success in reduction in energy intensity. Eighteen agencies achieved the 2 percent goal without additional credits. Only two agencies, EPA and DOD pushed past the goal through use of credits.

**Figure 4**  
**Individual Agency Reductions in Btu per Square Foot of Goal Building Space**  
**in FY 2006 Compared to FY 2003**



**TABLE 1  
FEDERAL GOAL BUILDINGS SITE-DELIVERED ENERGY USE PER GROSS  
SQUARE FOOT (BTU/GSF), FY 2003 AND FY 2006**

Agency	FISCAL YEAR 2003			FISCAL YEAR 2006			%CHANGE 2003-2006
	GSF (Thou.)	Billion Btu	BTU/GSF	GSF (Thou.)	Billion Btu	BTU/GSF	
VA	141,326.3	29,278.0	<b>207,166</b>	142,271.4	27,873.0	<b>195,914</b>	-5.4
USPS	353,090.5	23,968.6	<b>67,882</b>	331,812.9	22,230.5	<b>66,997</b>	-1.3
DOE	98,386.6	25,712.3	<b>261,340</b>	89,269.5	21,059.4	<b>235,908</b>	-9.7
DOJ	56,771.1	16,410.0	<b>289,056</b>	67,603.7	17,783.4	<b>263,054</b>	-9.0
GSA	184,330.4	14,091.8	<b>76,449</b>	179,368.6	12,630.1	<b>70,414</b>	-7.9
HHS	27,742.0	9,566.6	<b>344,842</b>	28,444.1	7,542.0	<b>265,150</b>	-23.1
NASA	31,726.7	6,850.5	<b>215,922</b>	31,523.8	5,998.1	<b>190,273</b>	-11.9
DOI	57,857.6	5,095.2	<b>88,064</b>	63,334.0	4,735.8	<b>74,775</b>	-15.1
USDA	60,566.0	5,376.8	<b>88,776</b>	52,908.0	4,238.5	<b>80,111</b>	-9.8
DHS	40,141.3	4,747.6	<b>118,271</b>	42,210.4	4,007.2	<b>94,935</b>	-19.7
DOL	21,612.3	2,566.9	<b>118,769</b>	20,335.8	2,051.1	<b>100,861</b>	-15.1
TRSY	12,487.6	2,288.2	<b>183,237</b>	12,592.5	1,942.0	<b>154,216</b>	-15.8
DOC	10,045.0	1,968.5	<b>195,966</b>	10,536.2	1,626.0	<b>154,329</b>	-21.2
EPA	3,643.4	1,264.4	<b>347,036</b>	3,682.6	698.4	<b>189,659</b>	-45.3
SSA	9,262.0	1,151.3	<b>124,300</b>	9,262.0	1,032.8	<b>111,508</b>	-10.3
DOT	7,114.6	721.6	<b>101,423</b>	7,216.9	636.5	<b>88,190</b>	-13.0
NARA	2,804.6	508.1	<b>181,166</b>	4,062.0	637.7	<b>156,992</b>	-13.3
TVA	9,796.2	641.9	<b>65,530</b>	9,471.3	589.8	<b>62,273</b>	-5.0
ST	3,866.5	494.5	<b>127,885</b>	4,516.2	513.7	<b>113,746</b>	-11.1
HUD	1,432.0	112.9	<b>78,817</b>	1,432.0	95.5	<b>66,690</b>	-15.4
RRB	346.9	36.0	<b>103,877</b>	346.9	34.3	<b>98,876</b>	-4.8
OTHER	2,202.1	193.5	<b>87,871</b>	149.7	9.8	<b>65,304</b>	-25.7
Civilian Agencies							
Subtotal	1,136,551.7	153,045.2	<b>134,657</b>	1,112,350.5	137,965.5	<b>124,031</b>	-7.9
DOD	1,963,169.3	222,838.5	<b>113,510</b>	1,887,636.9	202,369.8	<b>107,208</b>	-5.6
TOTAL	3,099,721.0	375,883.7	<b>121,264</b>	2,999,987.4	340,335.3	<b>113,446</b>	-6.4

Data as of 26 Sept 2007

\*Other includes the FCC, FTC, NRC, and OPM.

*Italics* indicate that reductions were made to FY 2006 energy use and Btu/GSF to reflect purchases of renewable energy. When calculating Btu/GSF, the following amounts were subtracted from agency energy use for FY 2006: VA, 309.8 BBtu (1.1% of energy use); DOE, 466.0 BBtu (2.2%); DOJ, 6.8 BBtu (0.0%); GSA, 442.1 BBtu (3.4%); HHS, 57.2 BBtu (15.4%); NASA, 349.5 BBtu (5.5%); DOI, 298.5 BBtu (5.9%); USDA, 88.4 BBtu (2.0%); DHS, 85.2 BBtu (2.1%); DOL, 26.5 BBtu (1.3%); TRSY, 44.9 BBtu (2.3%); DOC, 348.1 BBtu (17.6%); EPA, 554.1 BBtu (44.2%); SSA, 4.6 BBtu (0.4%); DOT, 7.1 BBtu (1.1%); TVA, 4.0 BBtu (0.7%); RRB, 0.2 BBtu (0.6%); and DOD, 5,743.2 BBtu (3.9%). The follow agencies also received credits for projects that save primary energy: GSA, 2.3 BBtu; HHS, 1,310.8 BBtu; and DOD 2,445.7 BBtu.

Note: This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour.  
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

### **C. Changes in Estimated Greenhouse Gas Emissions from Reduced Energy Use in EPACT Goal Buildings**

Although Federal agencies formerly had a greenhouse gas (GHG) reduction goal under Executive Order 13123, FY 2006 was not one of the milestone years. Under Executive Order 13423, GHG is defined and GHG reduction is in the context of a reduction in energy intensity. However, Executive Order 13423 does not contain a specific quantitative goal for GHG reduction.<sup>7</sup> DOE will continue to estimate GHG emissions based on agency-reported energy consumption.

Not all of the gases mentioned in the Executive Order 13423 definition of GHG<sup>8</sup> can be estimated solely on the energy data provided by the agencies, but DOE's Federal Energy Management Program (FEMP) has developed a method for estimating emissions of carbon dioxide, methane, and nitrous oxide from agency energy use (See Appendix B). Carbon dioxide is overwhelmingly the largest component of GHG emissions from energy use. Even considering the higher global warming potential (GWP) of methane and nitrous oxide, they still make up less than a half of a percent of the GWP of carbon dioxide emissions for any facility fuel.

Since agencies do not report electricity use disaggregated by region, FEMP uses a nationally-derived factor for estimating GHG emissions from electricity use. Purchases of all forms of renewable energy used in buildings are factored out of GHG emission estimates. In future year reporting, agencies will have the option of estimating GHG emissions from their energy use independently based on disaggregated or more detailed data provided that 1) estimates are provided to FEMP

for inclusion in Federal Government totals, and 2) agencies provide a detailed description of their estimation methodology.

In another change from prior GHG reporting, emissions will now be reported in metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>E) rather than metric tons of carbon equivalent which does not consider the full molecular weight of the gases. Estimated GHG emissions from buildings excluded from the energy intensity reduction goals of section 102 of the EPACT 2005 amendments are not be included in the totals.

Table 2 presents estimated GHG emissions from agency energy usage in absolute terms of MTCO<sub>2</sub>E. Compared to FY 2003, GHG emissions for Federal buildings subject to the section 102 of EPACT 2005 goal decreased 7.4 percent, from 46.3 million MTCO<sub>2</sub>E to 42.8 MTCO<sub>2</sub>E in FY 2006. Twenty-one agencies showed reductions in GHG emissions during the period in this estimation.

Table 3 estimates GHG emission intensity by agency in terms of MTCO<sub>2</sub>E per million gross square foot of their EPACT 2005 amendments goal building space. The largest percentage decreases are seen at the agencies with large purchases of renewable energy. The National Archives and Records Administration, which showed an increase in GHG emissions of 33.1 percent in absolute terms, shows an 8.1 percent decrease in terms of MTCO<sub>2</sub>E per million gross square foot. This metric takes into consideration the 44.8 percent increase in NARA's square footage between FY 2003 and FY 2006.

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<sup>7</sup> Section 2(a) of E.O. 13423 states that "the head of each agency shall. . .improve energy efficiency and reduce greenhouse gas emissions of the agency, through reduction of energy intensity by 3 percent annually through the end of fiscal year 2015, or 30 percent by the end of fiscal year 2015, relative to the baseline of the agency's energy use in fiscal year 2003;"

<sup>8</sup> Under E.O. 13423, "greenhouse gases" means carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride;

**TABLE 2**  
**ESTIMATED EMISSIONS OF CARBON DIOXIDE, METHANE AND NITROUS**  
**OXIDE FROM GOAL BUILDING ENERGY USE, BY AGENCY**  
**(In Metric Tons of Carbon Dioxide Equivalent (MTCO<sub>2</sub>E))**

	FY 2003	FY 2004	FY 2005	FY 2006	% Change 03 - 06
DOD	26,397,645	27,278,995	26,182,954	25,217,938	-4.5%
USPS	3,361,119	3,533,165	3,583,392	3,225,957	-4.0%
VA	3,134,313	3,115,507	3,047,425	2,983,318	-4.8%
DOE	3,674,342	3,297,052	3,095,791	2,926,123	-20.4%
GSA	2,122,071	2,295,325	1,930,909	1,944,964	-8.3%
DOJ	1,913,580	1,400,484	1,522,671	1,876,760	-1.9%
HHS	1,144,047	951,970	1,053,913	911,548	-20.3%
NASA	967,689	981,762	1,017,325	851,715	-12.0%
DOI	642,512	619,012	579,554	554,278	-13.7%
DHS	623,942	606,176	584,825	538,734	-13.7%
USDA	682,035	537,925	575,381	506,744	-25.7%
TRSY	351,927	338,672	332,160	300,065	-14.7%
DOL	286,761	283,597	273,578	238,505	-16.8%
DOC	254,330	269,571	209,455	191,120	-24.9%
SSA	165,625	154,732	159,919	150,878	-8.9%
TVA	123,394	121,864	118,038	113,883	-7.7%
DOT	109,374	105,782	104,050	100,295	-8.3%
ST	82,204	54,661	58,175	88,492	7.7%
NARA	62,664	72,466	86,400	83,416	33.1%
HUD	19,936	19,376	18,784	17,298	-13.2%
EPA	94,678	28,142	18,381	7,480	-92.1%
RRB	4,002	3,975	3,988	3,991	-0.3%
Other	34,553	16,125	17,656	1,645	-95.2%
<b>Total</b>	<b>46,252,744</b>	<b>46,086,333</b>	<b>44,574,726</b>	<b>42,835,146</b>	<b>-7.4%</b>

Data as of 26 Sept 2007

\*Other includes the FCC, FTC, NRC, and OPM.  
Sum of components may not equal total due to independent rounding.

Source: Calculated from energy consumption data from Federal Agency Annual Energy Management Data Reports, see Appendix B.

**TABLE 3**  
**ESTIMATED EMISSIONS OF CARBON DIOXIDE, METHANE AND NITROUS**  
**OXIDE FROM GOAL BUILDING ENERGY USE, BY AGENCY**  
**((Metric Tons of Carbon Dioxide Equivalent per Million Gross Square Foot**  
**(MTCO<sub>2</sub>E/Million GSF))**

	FY 2003	FY 2004	FY 2005	FY 2006	% Change 03 - 06
EPA	25,986.2	7,635.4	4,958.7	2,031.3	-92.2%
DOC	25,319.0	25,485.3	19,847.2	18,139.4	-28.4%
HHS	41,238.8	35,286.3	38,657.0	32,047.0	-22.3%
DOI	11,105.1	9,974.0	9,272.8	8,751.7	-21.2%
DHS	15,543.6	14,489.7	13,804.5	12,763.1	-17.9%
DOJ	33,706.9	23,071.3	23,952.9	27,761.2	-17.6%
TRSY	28,182.1	26,790.5	26,370.3	23,828.9	-15.4%
USDA	11,261.0	9,970.0	9,619.8	9,577.8	-14.9%
HUD	13,922.1	13,530.5	13,117.0	12,079.5	-13.2%
DOE	37,346.0	34,990.4	33,822.1	32,778.5	-12.2%
DOL	13,268.4	12,700.5	12,049.0	11,728.3	-11.6%
NASA	30,500.8	28,597.0	29,478.5	27,018.2	-11.4%
DOT	15,373.2	14,674.6	14,447.0	13,897.2	-9.6%
SSA	17,882.2	16,706.7	17,266.7	16,290.0	-8.9%
NARA	22,343.3	19,132.4	21,896.2	20,535.6	-8.1%
ST	21,260.5	20,012.0	18,275.7	19,594.4	-7.8%
GSA	11,512.3	11,710.3	9,899.5	10,843.4	-5.8%
VA	22,177.8	20,395.1	18,957.9	20,969.2	-5.4%
TVA	12,596.1	12,667.6	12,121.5	12,024.0	-4.5%
DOD	13,446.4	13,031.3	12,396.7	13,359.5	-0.6%
RRB	11,537.6	11,458.3	11,496.8	11,505.0	-0.3%
USPS	9,519.1	10,092.3	9,940.5	9,722.2	2.1%
Other	15,690.9	20,852.4	19,129.2	10,987.3	-30.0%
Total	14,921.6	14,177.4	13,525.9	14,278.4	-4.3%

Data as of 26 Sept 2007

\*Other includes the FCC, FTC, NRC, and OPM.

Sum of components may not equal total due to independent rounding.

Source: Calculated from energy consumption data from Federal Agency Annual Energy Management Data Reports, see Appendix B.

## D. Renewable Energy Use

The Federal renewable energy goals in EPACT 2005 begin in FY 2007 (42 U.S.C. 15852(a)(1)) and DOE's guidance for implementing the goals was still being finalized in December of 2007. Therefore, this report tracks performance for FY 2006 under the existing reporting structure that was used under Executive Order 13123. The goal under Executive Order 13123 called for the equivalent of 2.5 percent of electricity consumption in Federal buildings should come from new renewable energy sources by 2005. Although the goal is based on Federal electricity consumption,

non-electric renewable energy use is also eligible to be counted toward progress in meeting the goal. FY 2006, being an interim year in terms of renewable energy goals, adopts the FY 2005 goal as the performance metric for FY 2006.

As shown in Table 4, Federal agencies reported purchasing or producing 12,891.5 billion Btu of new renewable energy in FY 2006, equivalent to 6.9 percent of the Federal Government's electricity use.

**TABLE 4  
FEDERAL AGENCY USE OF RENEWABLE ENERGY AS A PERCENTAGE OF  
FACILITY ELECTRICITY USE, FY 2006**

Agency	Self-Generated Renewable Energy					Purchased Renewable Energy	Total Renewable Energy	Total Facility Electricity Use	Renewable Energy vs. Electricity Use
	Electricity	Biomass Natural Gas	Thermal Energy	Other	Total Self-Generated Renewable Energy				
	MWH	Million Btu	Million Btu	Million Btu	Billion Btu	Billion Btu	Billion Btu	Billion Btu	Percentage
EPA	115.8	0.0	8,262.4	0.0	8.7	554.1	562.7	458.7	122.68%
DOC	57.0	0.0	0.0	0.0	0.2	348.1	348.3	1,065.3	32.69%
DOI	4,060.2	0.0	17,728.0	326.6	31.9	298.5	330.4	2,265.3	14.59%
DOD	321,108.1	25,378.2	2,616,364.9	150,711.7	3,888.1	5,743.2	9,631.3	101,652.1	9.47%
NASA	205.4	0.0	196.0	0.0	0.9	370.2	371.1	5,407.9	6.86%
USDA	1,546.6	0.0	200.0	0.0	5.5	88.4	93.9	1,979.0	4.74%
GSA	543.7	0.0	1,430.0	0.0	3.3	442.1	445.4	9,895.0	4.50%
DHS	229.0	0.0	1,666.8	0.0	2.4	85.2	87.6	2,325.3	3.77%
TRSY	0.0	0.0	0.0	0.0	0.0	44.9	44.9	1,323.7	3.39%
VA	0.0	0.0	2,127.0	0.0	2.1	309.8	312.0	10,381.7	3.00%
DOL	2.6	0.0	0.0	0.0	0.0	26.5	26.5	897.1	2.96%
DOE	116.2	0.0	112.6	14,671.6	15.2	471.0	486.2	16,722.8	2.91%
TVA	3,630.0	0.0	0.0	37,030.4	49.4	4.0	53.4	1,894.9	2.82%
HHS	0.5	0.0	0.0	0.0	0.0	57.2	57.2	2,920.9	1.96%
RRB	0.0	0.0	0.0	0.0	0.0	0.2	0.2	15.6	1.00%
DOT	408.6	0.0	15,750.0	0.0	17.1	7.1	24.3	2,689.4	0.90%
SSA	109.0	0.124	0.1	0.0	0.4	4.6	5.0	684.0	0.73%
DOJ	115.5	0.0	9.0	0.0	0.4	6.8	7.2	6,128.1	0.12%
USPS	1,168.9	0.0	0.0	0.0	4.0	0.0	4.0	16,779.9	0.02%
STATE	0.0	0.0	0.0	0.2	0.0	0.0	0.0	384.2	0.00%
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	870.340	0.00%
<b>TOTAL</b>	<b>333,417.1</b>	<b>25,378.3</b>	<b>2,663,846.8</b>	<b>202,740.5</b>	<b>4,029.6</b>	<b>8,861.9</b>	<b>12,891.5</b>	<b>186,741.2</b>	<b>6.90%</b>

\*Other includes the FCC, FTC, NRC, and OPM.

<sup>1</sup>EPA's renewable energy use is 122.68% of its electricity use due to its purchases and generation of non-electric renewable energy.



Figure 5 illustrates that the consumption of renewable energy in FY 2006 is essentially unchanged from the previous year. However, this percentage can be expected to drop significantly in future year's reporting under EPACT 2005 and Executive Order 13423's narrower definitions of renewable energy and changes to the goal metric resulting from DOE's pending guidance. Among the expected changes:

- EPACT 2005's language limiting the renewable energy goal to electricity only,
- Executive Order 13423's provision that at least half of the statutorily required renewable energy consumed by the agency in a fiscal year must come from new renewable sources developed after January 1, 1999.
- Limits on use of short-term renewable energy certificates (RECs) from DOE's pending guidance.

Offsetting these limits is EPACT 2005's provision for double credit for renewable energy produced and used on-site or on Native American lands.

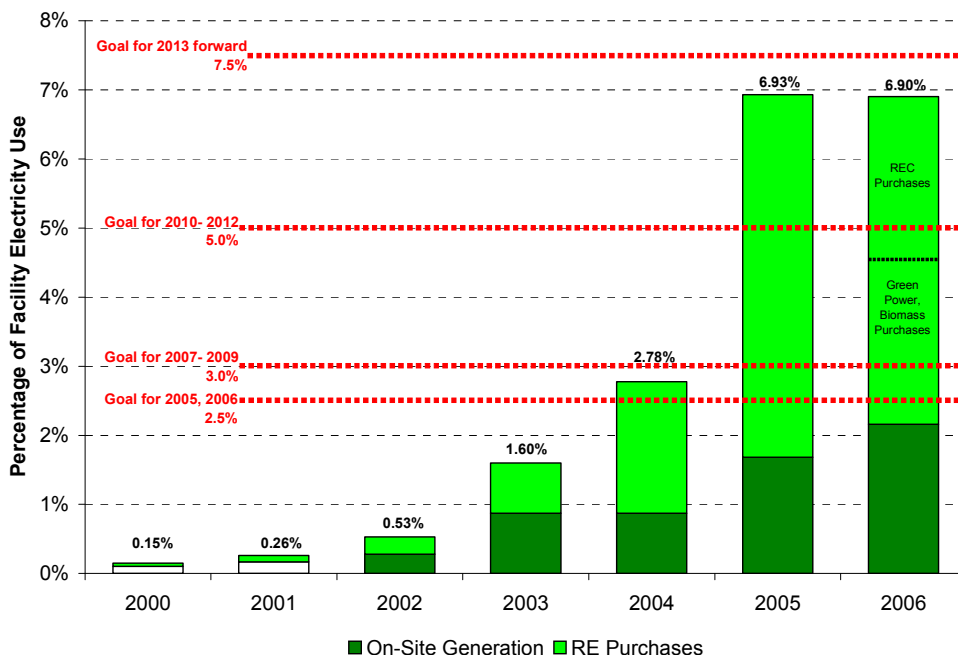
Purchases of renewable energy, including green power, renewable electricity credits, and landfill gas comprised 68.7 percent of Federal Government renewable energy use in FY 2006.

Half of Federal agency purchases of renewable energy in FY 2006 were in the form of RECs. RECs represent the environmental attributes of renewable generation sold separately from the actual electricity delivered to the grid.

Self-generated energy, including electricity, solar thermal applications, and geothermal heat pump installations, comprised 31.3 percent of renewable energy use. On-site electricity generation from photovoltaics, wind, and other renewable sources constitutes 8.8 percent the Government's renewable energy total (including purchases).

In FY 2006, 13 agencies obtained the equivalent of more than 2.5 percent of total electricity consumption from renewable sources. These agencies are EPA, (122.7 percent), DOC, (32.7 percent), Interior, (14.6 percent), DOD, (9.5 percent), NASA, (6.9 percent), USDA, (4.7 percent), GSA, (4.5 percent), DHS, (3.8 percent), Treasury, (3.4 percent), VA, (3.0 percent), Labor, (3.0 percent), Energy, (2.9 percent), and TVA, (2.8 percent). HHS used renewable energy equivalent to 2.0 percent of its electricity use and the Railroad Retirement Board (RRB) used 1.0 percent. Four agencies reported renewable energy use amounting to less than 1 percent of electricity use.

**Figure 5**  
**Renewable Energy Use as a Percentage of Facility Electricity Use, FY 2000 to FY 2006**



## E. Petroleum Reduction

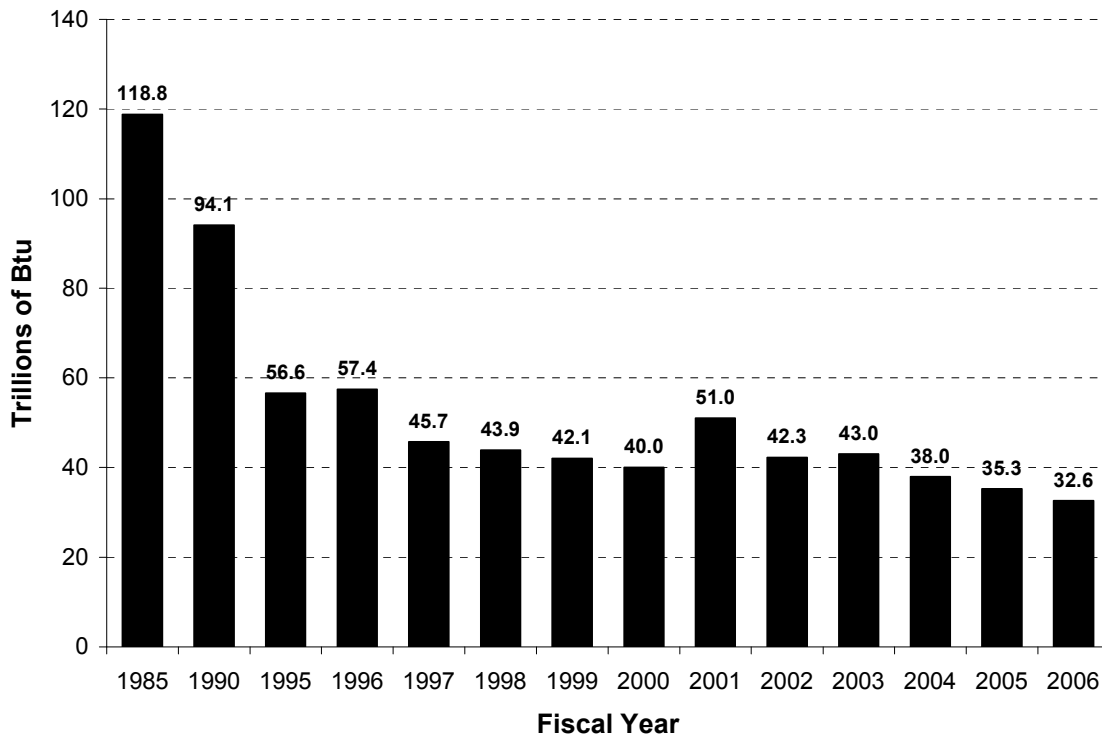
The strategic nature of petroleum-based fuel reduction has long been recognized by statutory and Executive Branch authorities.

In FY 2006, petroleum-based fuels accounted for 703,137.9 billion Btu (0.70 quads) of the total 1.1 quads consumed by the Federal Government (Table 5). Of that, approximately 647,230.0 billion Btu (0.65 quads) were used by DOD primarily for jet fuel, navy special fuel oil, and distillate/diesel for vehicles and equipment energy. Only 0.03 quads (32,583.8 billion Btu) of petroleum-based fuels were used for Federal non-excluded building energy.

Section 205 of Executive Order 13123 had a requirement for agencies to reduce the use of petroleum within their buildings.

Federal agencies have made significant progress in reducing their dependence on fuel oil and LPG/propane in their buildings. Table 6 shows that Federal agencies reduced petroleum-based fuels by 72.6 percent in FY 2006 compared to FY 1985, from 118.8 trillion Btu to 32.6 trillion Btu. Compared to FY 2003, use of these fuels fell by 24.3 percent. Figure 6 illustrates this consumption for the previous 10 years and for FY 1985 and FY 1990.

**Figure 6**  
**Petroleum-Based Fuel Consumption in Federal EPACT 2005 Goal Buildings;**  
**1985, 1990, and 1995 through 2006**



**TABLE 5**  
**FEDERAL PETROLEUM USAGE IN FY 2006**  
**(in Thousands of Gallons, Billions of Btu, and Petajoules [Joule x 1015])**

	Unit Total (K Gal)	BBTU* DOD	BBTU* Civilian	BBTU* Total	Petajoules* Total
<b>EPACT Goal Buildings</b>					
Fuel Oil	216,456.7	24,254.6	5,768.0	30,022.5	31.7
LPG/Propane	26,819.8	1,292.0	1,269.3	2,561.3	2.7
<b>Excluded Facilities</b>					
Fuel Oil	13,156.0	1,310.0	514.7	1,824.7	1.9
LPG/Propane	412.7	19.0	20.4	39.4	0.0
<b>Vehicles &amp; Equipment</b>					
Motor Gas	382,230.8	17,336.2	30,442.6	47,778.8	50.4
Dist-Diesel & Petrol.	551,182.5	68,019.5	8,429.5	76,449.0	80.7
Aviation Gas	4,851.3	80.3	526.2	606.4	0.6
Jet Fuel	3,404,724.3	436,275.5	6,338.6	442,614.2	466.9
Navy Special Fuel Oil	714,702.8	97,715.3	1,413.9	99,129.3	104.6
LPG/Propane	611.1	2.6	55.7	58.4	0.1
Other	2,053.8	924.9	1,129.0	2,053.8	2.2
<b>Total</b>		<b>647,230.0</b>	<b>55,907.9</b>	<b>703,137.9</b>	<b>741.8</b>

\*Uses a conversion factor of:

95,500 BTUs/gallon for lpg/propane

138,700 BTUs/gallon for fuel oil, distillate-diesel & petroleum, and navy special

125,000 BTUs/gallon for motor gasoline and aviation gasoline

130,000 BTUs/gallon for jet fuel

947.9 Billion BTUs/Petajoule

1,055 Petajoule/quad

Data as of 26 Sept 2007

Note: Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

**TABLE 6**  
**PETROLEUM-BASED FUEL\* CONSUMPTION IN GOAL BUILDINGS**  
**(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 1015])**

AGENCY	FY 1985. . .	FY 1990. . .	FY 1995. . .	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	% CHANGE 85-06	% CHANGE 03-06
DOD	101,385.4	77,517.0	46,340.5	32,748.8	39,297.4	33,794.7	33,160.3	29,756.0	27,393.5	25,546.6	-74.8	-23.0
DOI	1,591.6	1,273.9	1,574.3	996.7	1,324.0	1,382.5	1,249.1	1,574.8	1,292.9	1,307.9	-17.8	4.7
DHS	0.0	0.0	0.0	0.0	0.0	0.0	1,400.3	1,223.1	1,279.3	1,187.4	NA	-15.2
DOE	1,773.3	1,965.8	2,093.2	1,063.9	1,706.0	1,207.3	1,498.9	1,409.4	1,322.0	1,178.6	-33.5	-21.4
VA	2,176.7	2,219.3	1,292.9	1,045.4	3,040.5	1,206.2	1,659.6	1,114.7	911.5	931.2	-57.2	-43.9
USPS	1,673.2	1,502.2	813.9	857.9	1,425.5	719.9	948.5	673.7	738.4	755.4	-54.9	-20.4
HHS	2,096.5	2,282.0	1,152.5	751.4	897.0	636.6	892.8	477.4	612.9	501.9	-76.1	-43.8
USDA	900.6	732.7	426.7	226.0	327.6	422.4	1,011.2	586.2	809.6	397.6	-55.9	-60.7
DOL	437.8	331.2	210.8	193.2	210.0	405.0	362.4	337.4	181.8	172.2	-60.7	-52.5
DOJ	381.7	371.6	286.2	240.5	261.5	289.0	188.8	161.1	284.3	171.3	-55.1	-9.3
NASA	652.6	896.4	360.9	206.1	265.2	229.0	220.8	308.6	219.6	170.5	-73.9	-22.8
GSA	3,120.0	2,040.4	250.3	121.1	466.7	99.7	129.3	103.0	50.1	101.9	-96.7	-21.2
TRSY	22.5	291.4	117.1	120.7	102.1	80.1	61.5	60.4	55.0	52.8	134.7	-14.1
DOC	157.2	77.6	354.8	77.7	56.6	33.7	122.7	42.8	69.2	42.6	-72.9	-65.3
EPA	16.7	5.9	43.4	33.7	113.3	17.7	73.8	95.4	26.2	32.8	96.4	-55.6
SSA	0.0	0.0	0.0	40.2	37.7	50.9	44.0	40.6	31.5	30.4	NA	-30.9
DOT	2,380.4	1,524.1	912.2	815.0	928.2	1,014.2	3.8	3.4	2.3	1.5	-99.9	-60.5
TVA	4.2	3.2	3.9	1.9	1.5	1.5	1.5	1.9	1.5	0.7	-83.3	-53.3
NARA	0.0	0.0	7.1	7.4	82.2	0.0	0.0	0.0	0.0	0.0	NA	NA
BBG/IBB	0.0	1,055.2	375.6	472.7	472.7	660.1	0.0	0.0	0.0	0.0	NA	NA
Other	21.1	13.3	1.3	0.6	0.6	0.6	0.6	0.0	0.4	0.3	-98.6	-50.0
<b>TOTAL</b>	<b>118,791.5</b>	<b>94,103.3</b>	<b>56,617.5</b>	<b>40,020.9</b>	<b>51,016.3</b>	<b>42,251.0</b>	<b>43,029.7</b>	<b>37,970.1</b>	<b>35,281.7</b>	<b>32,583.8</b>	<b>-72.6</b>	<b>-24.3</b>

Data as of 26 Sept 2007

\*Petroleum-based fuels comprise fuel oil and LPG/propane.  
Other includes, for certain years, FCC, FEMA, FTC, NRC, OPM.

Note: Ellipses after fiscal year (1985. . .) indicate where intervening years' data are left off the table, but available upon request from FEMP.  
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

## **F. Primary Energy Use**

Section 206 of Executive Order 13123 directed the Federal Government to strive to reduce primary energy use as measured at the source of generation. 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 source conversion factors of 11,850 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam are used to estimate primary energy consumption. See Appendix B for conversion factors for calculating both primary and site-delivered energy consumption.

Table 7 shows that primary energy use in Federal EPACT 2005 goal buildings declined 13.5 percent in FY 2006 compared to FY 1985, from 882.9 trillion Btu to 763.9 trillion Btu. Compared to FY 2003 consumption of 801.7 trillion Btu, FY 2006 primary energy use declined 4.7 percent. Primary energy used in Federal buildings during FY 2006 decreased 5.0 percent from the previous year.

Table 8 shows Federal agency progress toward the EPACT 2005 amendments building goals in terms of primary energy use per gross square foot. Measured in terms of primary energy, the Federal Government shows a reduction of 5.5 percent in FY 2006 compared to FY 2003. The difference from the site-delivered Btu/GSF reduction of 6.4 percent (as shown previously in Table 1) reflects declines in direct use of fossil fuels and the offsetting increases in the share of the fuel mix contributed by electricity.

Without purchases of renewable energy in FY 2006, estimated primary energy intensity is 1.5 percent below the FY 2003 Btu/GSF baseline.

## **G. Water Conservation**

Under Section 207 of Executive Order 13123, agencies were required to reduce water consumption and associated energy use in their buildings to reach the goals set under Section 503(f) of the Executive Order. These goals have been superseded by the new goal of Executive Order 13423, which under Section 2 (c), requires agencies “beginning in FY 2008, reduce water consumption intensity, relative to the baseline of the agency’s water consumption in fiscal year 2007, through life-cycle cost-effective measures by 2 percent annually through the end of fiscal year 2015 or 16 percent by the end of fiscal year 2015.”

The water conservation goals under the former Executive Order required agencies to implement life-cycle cost-effective water efficiency programs that include developing a comprehensive water management plan and at least four separate Water Efficiency Improvement Best Management Practices (BMPs), as defined in DOE guidance documents. The goal for FY 2006 called for program implementation in a least 30 percent of an agency’s buildings.

In FY 2006, eight agencies reported that at least 30 percent of their buildings have implemented comprehensive water management plans and four BMPs. These agencies are NRC, RRB, SSA, Treasury, EPA, HHS, DOD, and the State Department.

Four agencies reported having implemented plans and BMPs in at least 20 percent of their buildings. These agencies are NASA, Energy, VA, and GSA. Of the remaining agencies, seven reported implementing water management plans and BMPs in at least some of their buildings, and six did not report on progress.

During FY 2006, all reporting agencies combined consumed 165.4 billion gallons of water at a cost of \$388.1 million. This was a decrease of 5.3 percent from the previous year. Agencies use actual data where available or develop estimates where actual data are not available.

**TABLE 7  
PRIMARY ENERGY USE IN EPACT 2005 GOAL BUILDINGS**

**(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 1015])**

CIVILIAN AGENCY	FY 1985. . .	FY 1990. . .	FY 1995. . .	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	% Change 85-06	% Change 03-06	% Change 05-06
USPS	40,143.9	47,824.8	57,606.8	66,217.4	62,202.1	62,145.5	60,810.9	63,678.4	64,656.4	58,483.6	45.7	-3.8	-9.5
VA	42,864.1	44,400.3	47,474.3	49,633.7	52,031.5	52,217.8	54,990.9	54,694.9	55,320.2	54,275.7	26.6	-1.3	-1.9
DOE	66,407.8	67,974.2	62,984.0	56,356.8	52,584.0	56,996.4	62,772.5	56,585.1	54,576.6	51,070.4	-23.1	-18.6	-6.4
GSA	45,589.4	39,162.3	36,535.0	40,614.0	41,558.5	40,737.5	36,963.7	41,404.9	41,301.6	35,132.5	-22.9	-5.0	-14.9
DOJ	9,048.5	9,512.4	14,011.8	20,975.6	21,300.2	21,209.2	33,924.4	24,556.5	26,693.2	33,270.5	267.7	-1.9	24.6
HHS	10,128.2	13,188.5	12,084.2	14,633.6	15,334.3	15,696.3	19,087.6	16,672.1	18,139.0	16,207.2	60.0	-15.1	-10.6
NASA	17,379.0	20,954.2	21,138.1	19,625.0	19,363.4	19,018.2	17,483.5	17,741.2	18,840.6	16,031.6	-7.8	-8.3	-14.9
DOI	8,542.8	7,616.8	7,770.1	8,202.1	9,685.2	9,690.9	11,166.6	11,428.7	10,675.2	10,681.3	25.0	-4.3	0.1
DHS	0.0	0.0	0.0	0.0	0.0	0.0	10,750.2	10,479.6	10,327.5	9,597.1	NA	-10.7	-7.1
USDA	7,947.0	9,668.0	9,502.6	9,339.8	9,620.4	9,078.5	11,998.6	9,548.6	10,099.3	9,287.5	16.9	-22.6	-8.0
TRSY	1,723.3	5,542.3	6,009.7	7,148.0	6,972.5	7,032.5	6,021.9	5,882.8	5,826.6	5,335.9	209.6	-11.4	-8.4
DOC	3,075.3	3,283.3	4,906.6	3,963.2	4,893.2	4,400.1	4,511.8	4,804.5	4,759.8	4,602.6	49.7	2.0	-3.3
DOL	3,734.1	3,916.2	3,979.2	4,392.2	4,666.0	4,813.7	5,068.9	4,997.8	4,855.8	4,314.6	15.5	-14.9	-11.1
SSA	0.0	0.0	0.0	3,070.2	3,001.2	2,889.9	2,993.2	2,785.5	2,904.3	2,739.5	NA	-8.5	-5.7
EPA	1,644.1	1,643.0	2,165.1	1,959.9	2,297.0	2,089.6	2,339.6	2,467.7	2,475.8	2,398.0	45.9	2.5	-3.1
TVA	1,779.6	1,830.1	2,797.8	2,426.6	2,427.2	2,210.2	2,220.6	2,188.3	2,127.7	2,053.5	15.4	-7.5	-3.5
DOT	8,746.5	7,217.0	8,472.5	8,810.5	8,849.0	9,326.2	1,979.3	1,969.9	1,881.9	1,817.5	-79.2	-8.2	-3.4
ST	702.6	833.6	260.3	389.6	324.4	738.6	1,355.7	975.1	1,040.4	1,498.4	NA	10.5	44.0
NARA	0.0	215.9	1,546.3	1,293.8	1,323.6	1,249.0	1,150.2	1,296.0	1,549.0	1,472.7	NA	28.0	-4.9
HUD	356.2	435.0	322.3	324.2	336.7	327.8	324.8	312.8	305.9	290.1	NA	-10.7	-5.2
RRB	0.0	103.7	99.0	79.1	74.6	75.6	73.1	72.5	72.9	72.9	NA	-0.3	0.0
OTHER*	1,668.4	4,539.1	6,011.0	4,965.9	4,905.1	7,115.4	602.4	287.8	316.3	29.4	-98.2	-95.1	-90.7
Civilian Agencies Subtotal	271,480.5	328,418.3	305,676.8	324,421.1	323,749.9	329,059.0	348,590.4	334,830.6	338,745.8	320,662.6	18.1	-8.0	-5.3
DOD	611,431.9	663,669.2	556,998.4	492,646.7	482,168.3	480,472.1	453,270.0	471,709.4	465,121.1	443,264.5	-27.5	-2.2	-4.7
Total	882,912.4	992,087.5	862,675.2	817,067.8	805,918.2	809,531.1	801,860.5	806,540.0	803,866.9	763,927.1	-13.5	-4.7	-5.0
MBOE	151.6	170.3	148.1	140.3	138.4	139.0	137.7	138.5	138.0	131.1			
Petajoule	931.4	1046.6	910.1	862	850.2	854	845.9	850.9	848.1	805.9			

Other includes, for certain years, FCC, FEMA, FTC, NRC, and OPM.

Data as of 26 Sept 2007

Notes: Renewable energy purchases have not been subtracted primary energy consumption in this table, making it comparable with Table A-3 which presents site-delivered energy use.

This table uses a conversion factor for electricity of 11,850 Btu per kilowatt hour and 1,390 Btu per pound of steam.

Ellipses after fiscal year (1985. . .) indicate where intervening years' data are left off the table, but available upon request from FEMP.

Sum of components may not equal total due to independent rounding. Source: Federal Agency Annual Energy Management Data Reports

**TABLE 8  
FEDERAL GOAL BUILDINGS PRIMARY ENERGY USE  
PER GROSS SQUARE FOOT (BTU/GSF), FY 2003 AND FY 2006**

	FISCAL YEAR 2003			FISCAL YEAR 2006			%CHANGE 2003-2006
	GSF (Thou.)	Billion Btu	BTU/GSF	GSF (Thou.)	Billion Btu	BTU/GSF	
USPS	353,090.5	60,810.9	<b>172,225</b>	331,812.9	58,483.6	<b>176,255</b>	2.3
VA	141,326.3	54,990.9	<b>389,106</b>	142,271.4	53,199.6	<b>373,931</b>	-3.9
DOE	98,386.6	62,772.5	<b>638,019</b>	89,269.5	49,452.0	<b>553,963</b>	-13.2
GSA	184,330.4	36,963.7	<b>200,530</b>	179,368.6	33,597.0	<b>187,307</b>	-6.6
DOJ	56,771.1	33,924.4	<b>597,564</b>	67,603.7	33,246.9	<b>491,790</b>	-17.7
HHS	27,742.0	19,087.6	<b>688,039</b>	28,444.1	16,008.5	<b>562,805</b>	-18.2
NASA	31,726.7	17,483.5	<b>551,066</b>	31,523.8	14,817.6	<b>470,045</b>	-14.7
DOI	57,857.6	11,166.6	<b>193,002</b>	63,334.0	9,644.5	<b>152,280</b>	-21.1
DHS	40,141.3	10,750.2	<b>267,809</b>	42,210.4	9,301.3	<b>220,356</b>	-17.7
USDA	60,566.0	11,998.6	<b>198,108</b>	52,908.0	8,980.5	<b>169,737</b>	-14.3
TRSY	12,487.6	6,021.9	<b>482,232</b>	12,592.5	5,179.9	<b>411,344</b>	-14.7
DOC	10,045.0	4,511.8	<b>449,159</b>	10,536.2	3,393.8	<b>322,105</b>	-28.3
DOL	21,612.3	5,068.9	<b>234,538</b>	20,335.8	4,222.5	<b>207,639</b>	-11.5
SSA	9,262.0	2,993.2	<b>323,174</b>	9,262.0	2,723.5	<b>294,047</b>	-9.0
EPA	3,643.4	2,339.6	<b>642,157</b>	3,682.6	473.7	<b>128,637</b>	-80.0
TVA	9,796.2	2,220.6	<b>226,680</b>	9,471.3	2,039.6	<b>215,349</b>	-5.0
DOT	7,114.6	1,979.3	<b>278,197</b>	7,216.9	1,792.7	<b>248,403</b>	-10.7
ST	3,866.5	1,355.7	<b>350,629</b>	4,516.2	1,498.4	<b>331,783</b>	-5.4
NARA	2,804.6	1,150.2	<b>410,118</b>	4,062.0	1,472.7	<b>362,555</b>	-11.6
HUD	1,432.0	324.8	<b>226,783</b>	1,432.0	290.1	<b>202,584</b>	-10.7
RRB	346.9	73.1	<b>210,862</b>	346.9	72.2	<b>208,145</b>	-1.3
OTHER*	2,202.1	602.4	<b>273,538</b>	149.7	29.4	<b>196,393</b>	-28.2
Civilian Agencies							
Subtotal	1,136,551.7	348,590.4	<b>306,709</b>	1,112,350.5	309,920.0	<b>278,617</b>	-9.2
DOD	1,963,169.30	453,270.00	<b>230,887</b>	1,887,636.9	423,318.1	<b>224,258</b>	-2.9
TOTAL	3,099,721.00	801,860.50	<b>258,688</b>	2,999,987.4	733,238.1	<b>244,414</b>	-5.5

Data as of 26 Sept 2007

\*Other includes the FCC, FTC, NRC, and OPM.

Italics indicates that reductions were made to FY 2006 energy use and Btu/GSF to reflect purchases of renewable energy. When calculating Btu/GSF, the following amounts were subtracted from agency energy use for FY 2006: VA, 1,076.1 BBtu; DOE, 1,618.4 BBtu; GSA, 1,535.5 BBtu; DOJ, 23.6 BBtu; HHS, 198.7 BBtu; NASA, 1,214.0 BBtu; DOI, 1,036.8 BBtu; DHS, 295.8 BBtu; USDA, 307.0 BBtu; TRSY, 156.0 BBtu; DOC, 1,208.8 BBtu; DOL, 92.1 BBtu; SSA, 16.0 BBtu; EPA, 1,924.3 BBtu; TVA, 13.9 BBtu; DOT, 24.8 BBtu; and DOD, 19,946.4 BBtu.

Note: This table uses a conversion factor for electricity of 11,850 Btu per kilowatt hour and 1,390 Btu per pound of steam.  
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

## **H. Investments in Energy Efficiency**

During FY 2006, Federal agencies had three primary options for financing energy efficiency, water conservation, and renewable energy projects in buildings: direct appropriated funding, energy savings performance contracts (ESPCs), and utility energy service contracts (UESCs). Known funding from the three sources totaled approximately \$665.9 million in FY 2006. Direct appropriations accounted for approximately \$281.1 million. ESPC contract awards by agencies resulted in approximately \$314.5 million in estimated project investment in FY 2006 (\$164.4 million from DOE Super ESPC delivery orders and \$150.1 million from other agency ESPCs), and approximately \$70.4 million in project investment came from UESCs.

Since 2003, the Government has invested approximately \$2.2 billion in energy efficiency, \$921.4 million of which was direct agency expenditures, \$902.4 million was from ESPCs and \$338.9 million was from UESCs.

### **1. Direct Appropriations**

Section 545 of NECPA requires each agency, in support of the President's annual budget request to Congress, to specifically set forth and identify funds requested for energy conservation measures. (42 U.S.C. 8255) Table 9-A presents agency funding (in nominal dollars) reported from FY 1985 through FY 2006 for energy conservation retrofits and capital equipment. Table 9-B presents the same information in constant 2006 dollars. Reports from Federal agencies indicated that \$281.1 million was spent on energy efficiency projects in FY 2006, compared with \$300.2 million in FY 2005, a 6.4 percent decrease in constant dollars. In some cases, the data provided by the agencies include funding from operation and maintenance accounts that was specifically identified as contributing to energy efficiency.

The U.S. Postal Service reported \$34.9 million in investment after five consecutive years with no reported funding. NASA reported an increase of 21.6 percent from the previous year to \$13.8 million. The Interior Department increased its funding by a third to \$10.5 million.

DOD funded \$158.8 million for energy efficiency projects in FY 2006, a decrease of 18.7 percent from the previous year. GSA spent \$28.0 million compared to \$36.4 million in FY 2005. VA reported funding \$8.4 million in FY 2006 down from \$19.3 million in FY 2005.

### **2. Energy Savings Performance Contracts**

During FY 2006, 44 ESPC contracts or delivery orders were awarded at nine agencies. These include delivery orders awarded through the DOE/FEMP Super ESPC programs as well as projects awarded by the DOD and the U.S. Postal Service. Project investment from these projects totaled approximately \$314.5 million, providing the Federal Government with an opportunity to save more than 1.9 trillion Btu each year. Details of these contract awards are provided by agency in Table 10.

Through a decentralized approach, DOD awarded the largest number of contracts/delivery orders with 19 ESPC projects in FY 2006. These contracts include many infrastructure upgrades and new equipment to help DOD installations reduce energy and water consumption. Examples include new thermal storage systems, chillers, boilers, lights, motors, energy management control systems (EMCS), and water reducing devices. Normally, cost savings are used to first pay the contractor, and then are used to offset other base operating support expenses. In some cases, however, installations decided to seek a shorter contract term and defer all Government cost savings until contract completion. In these cases, the savings generated by ESPCs help to reduce the energy consumption, but do not reduce the total cost of operation until the contracts expire. After contract expiration and the retrofits are paid in full, DOD will retain any future cost savings.

During FY 2006, 22 delivery orders were awarded under DOE/FEMP Super ESPCs. Super ESPCs are broad area indefinite delivery, indefinite quantity (IDIQ) contracts that allow agencies to negotiate site-specific performance-based delivery orders with an energy service company (ESCO) under the umbrella contracts. Project investment totaled \$164.4 million, providing annual savings of almost 1.6 trillion Btu to the Government.



**TABLE 9-A**  
**AGENCY DIRECT EXPENDITURES FOR ENERGY EFFICIENCY PROJECTS, FY 1985 THROUGH FY 2006**  
**(THOUSANDS OF NOMINAL (AS-SPENT) DOLLARS)**

AGENCY	FY 1985...	FY 1990...	FY 1995...	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	% CHANGE 05-06
DOD	\$136,100	\$1,020	\$189,600	\$44,442	\$57,113	\$60,600	\$103,490	\$121,400	\$188,961	\$158,792	-16.0
USPS	\$55,300	\$4,000	\$10,050	\$6,000	\$0	\$0	\$0	\$0	\$0	\$34,908	NA
GSA	\$6,700	\$11,125	\$7,242	\$17,000	\$5,000	\$4,500	\$4,800	\$5,000	\$35,213	\$28,000	-20.5
NASA	\$11,800	\$2,943	\$20,666	\$11,731	\$6,045	\$9,389	\$8,501	\$11,118	\$10,950	\$13,753	25.6
DOI	\$3,198	\$0	\$779	\$23,999	\$3,220	\$22,800	\$26,134	\$5,740	\$7,592	\$10,463	37.8
VA	\$13,000	\$11,200	\$11,960	\$0	\$15,000	\$898	\$686	\$2,000	\$18,700	\$8,426	-54.9
DOC	\$0	\$0	\$0	\$257	\$257	\$1,883	\$621	\$3,537	\$3,405	\$4,960	45.7
DOE	\$14,800	\$19,500	\$30,200	\$0	\$2,000	\$1,400	\$1,500	\$1,963	\$1,951	\$4,366	123.8
TRSY	\$0	\$1,134	\$2,810	\$2,152	\$4,670	\$8,678	\$7,854	\$8,662	\$2,379	\$3,667	54.1
EPA	\$0	\$0	\$1,720	\$0	\$1,963	\$1,684	\$2,439	\$3,458	\$3,790	\$2,950	-22.2
DHS	\$0	\$0	\$0	\$0	\$0	\$0	\$1,700	\$1,740	\$2,714	\$2,810	3.5
DOT	\$13,650	\$0	\$3,793	\$2,664	\$4,321	\$2,085	\$1,243	\$978	\$2,318	\$2,289	-1.3
HHS	\$0	\$427	\$1,271	\$8,440	\$8,640	\$1,771	\$3,700	\$2,934	\$7,363	\$2,095	-71.6
USDA	\$2,500	\$1,547	\$2,894	\$1,954	\$2,100	\$3,818	\$2,000	\$2,958	\$2,655	\$1,000	-62.3
DOJ	\$0	\$6,100	\$994	\$1,170	\$489	\$968	\$223	\$1,300	\$651	\$788	21.0
NARA	\$0	\$0	\$0	\$0	\$9	\$68	\$140	\$100	\$295	\$584	98.0
DOL	\$238	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$448	\$500	11.6
SSA	\$0	\$0	\$0	\$1,000	\$1,000	\$500	\$175	\$500	\$885	\$370	-58.2
TVA	\$0	\$0	\$4,277	\$284	\$300	\$365	\$400	\$336	\$278	\$276	-0.7
STATE	\$0	\$0	\$0	\$0	\$260	\$4	\$847	\$70	\$0	\$36	NA
HUD	\$0	\$0	\$43	\$0	\$55	\$22	\$68	\$8	\$0	\$26	NA
RRB	\$0	\$0	\$33	\$0	\$35	\$10	\$15	\$15	\$15	\$15	0.0
CIA	\$0	\$0	\$0	\$0	\$18,600	\$0	\$2,770	\$0	\$0	\$0	NA
NRC	\$0	\$0	\$0	\$0	\$226	\$0	\$0	\$0	\$0	\$0	NA
PCC	\$1,274	\$361	\$14	\$0	\$0	\$0	\$0	\$0	\$0	\$0	NA
<b>Total</b>	<b>\$258,560</b>	<b>\$59,374</b>	<b>\$288,346</b>	<b>\$121,093</b>	<b>\$131,302</b>	<b>\$121,442</b>	<b>\$169,306</b>	<b>\$173,815</b>	<b>\$290,563</b>	<b>\$281,073</b>	<b>-3.3</b>

Data as of 26 Sept 2007

Notes: Does not include energy savings performance contracts, utility energy service contracts, and utility demand side management incentives. Ellipses after fiscal year (1985. . .) indicate where intervening years' data are left off the table, but available upon request from FEMP. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

**TABLE 9-B**  
**AGENCY DIRECT EXPENDITURES FOR ENERGY EFFICIENCY PROJECTS, FY 1985 THROUGH FY 2006**  
**(THOUSANDS OF CONSTANT 2006 DOLLARS)**

AGENCY	FY 1985...	FY 1990...	FY 1995...	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	% CHANGE 05-06
DOD	\$256,792	\$1,637	\$269,318	\$51,677	\$65,950	\$68,864	\$114,734	\$129,424	\$195,207	\$158,792	-18.7
USPS	\$104,340	\$6,421	\$14,276	\$6,977	\$0	\$0	\$0	\$0	\$0	\$34,908	NA
GSA	\$12,642	\$17,857	\$10,287	\$19,767	\$5,774	\$5,114	\$5,322	\$5,330	\$36,377	\$28,000	-23.0
NASA	\$22,264	\$4,724	\$29,355	\$13,641	\$6,980	\$10,669	\$9,425	\$11,852	\$11,312	\$13,753	21.6
DOI	\$6,034	\$0	\$1,107	\$27,906	\$3,718	\$25,909	\$28,974	\$6,120	\$7,843	\$10,463	33.4
VA	\$24,528	\$17,978	\$16,989	\$0	\$17,321	\$1,020	\$761	\$2,132	\$19,318	\$8,426	-56.4
DOC	\$0	\$0	\$0	\$299	\$297	\$2,140	\$688	\$3,771	\$3,518	\$4,960	41.0
DOE	\$27,925	\$31,300	\$42,898	\$0	\$2,309	\$1,591	\$1,663	\$2,093	\$2,015	\$4,366	116.6
TRSY	\$0	\$1,820	\$3,991	\$2,502	\$5,393	\$9,861	\$8,707	\$9,234	\$2,458	\$3,667	49.2
EPA	\$0	\$0	\$2,443	\$0	\$2,267	\$1,914	\$2,704	\$3,686	\$3,915	\$2,950	-24.7
DHS	\$0	\$0	\$0	\$0	\$0	\$0	\$1,885	\$1,855	\$2,804	\$2,810	0.2
DOT	\$25,755	\$0	\$5,388	\$3,098	\$4,990	\$2,369	\$1,377	\$1,043	\$2,395	\$2,289	-4.4
HHS	\$0	\$685	\$1,805	\$9,814	\$9,977	\$2,012	\$4,102	\$3,128	\$7,606	\$2,095	-72.5
USDA	\$4,717	\$2,483	\$4,111	\$2,272	\$2,425	\$4,339	\$2,217	\$3,153	\$2,743	\$1,000	-63.5
DOJ	\$0	\$9,791	\$1,412	\$1,360	\$565	\$1,099	\$247	\$1,386	\$673	\$788	17.2
NARA	\$0	\$0	\$0	\$0	\$10	\$77	\$155	\$107	\$305	\$584	91.6
DOL	\$449	\$27	\$0	\$0	\$0	\$0	\$0	\$0	\$463	\$500	8.0
SSA	\$0	\$0	\$0	\$1,163	\$1,155	\$568	\$194	\$533	\$914	\$370	-59.5
TVA	\$0	\$0	\$6,075	\$331	\$346	\$415	\$443	\$358	\$287	\$276	-3.9
STATE	\$0	\$0	\$0	\$0	\$300	\$4	\$939	\$75	\$0	\$36	NA
HUD	\$0	\$0	\$61	\$0	\$63	\$25	\$75	\$8	\$0	\$26	NA
RRB	\$0	\$0	\$47	\$0	\$40	\$11	\$17	\$16	\$15	\$15	-3.2
CIA	\$0	\$0	\$0	\$0	\$21,478	\$0	\$3,071	\$0	\$0	\$0	NA
NRC	\$0	\$0	\$0	\$0	\$261	\$0	\$0	\$0	\$0	\$0	NA
PCC	\$2,404	\$579	\$20	\$0	\$0	\$0	\$0	\$0	\$0	\$0	NA
Total	\$487,849	\$95,303	\$409,582	\$140,806	\$151,619	\$138,002	\$187,701	\$185,304	\$300,168	\$281,073	-6.4

Data as of 26 Sept 2007

Notes: Does not include energy savings performance contracts, utility energy service contracts, and utility demand side management incentives. Ellipses after fiscal year (1985. . .) indicate where intervening years' data are left off the table, but available upon request from FEMP. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports.

**TABLE 10**  
**ENERGY SAVINGS PERFORMANCE CONTRACTS, DELIVERY ORDERS, AND**  
**CONTRACT MODIFICATIONS AWARDED BY FEDERAL AGENCIES IN FY 2006**

Agency	Number of Delivery Orders/ Modifications/ Contracts	Project Investment (Thou. \$)	Total Guaranteed Cost Savings (Thou. \$)	Payment to Contractor (Thou. \$)	Net Savings to Government (Thou. \$)	Annual Energy Savings (MMBtu)
DOD	19	\$232,278	\$588,856	\$586,494	\$2,362	1,325,806
USPS	17	\$18,135	\$22,205	\$22,205	\$0	96,074
DOE	2	\$28,427	\$69,467	\$69,163	\$304	283,132
Archives	1	\$5,180	\$7,824	\$7,367	\$457	58,924
GSA	1	\$2,290	\$4,415	\$4,409	\$6	10,579
HHS	1	\$3,682	\$5,973	\$5,698	\$275	24,058
Interior	1	\$1,552	\$3,696	\$3,541	\$156	10,241
Justice	1	\$20,983	\$43,519	\$43,405	\$114	80,412
SSA	1	\$1,960	\$3,300	\$3,300	\$0	13,671
<b>Total</b>	<b>44</b>	<b>\$314,486</b>	<b>\$749,255</b>	<b>\$745,583</b>	<b>\$3,672</b>	<b>1,902,897</b>

**3. Utility Energy Service Contracts**

In FY 2006, Federal agencies awarded 25 UESCs as shown in Table 11. Financed investment in the projects totaled approximately \$61.8 million. The estimated annual energy savings from the 25 projects is 446.6 billion Btu. Of the 25 UESCs awarded in FY 2006, 17 were implemented by the DOD.

Projects were undertaken by agencies to accomplish a wide variety of energy efficiency improvements. Contracts were put in place to perform infrastructure upgrades and purchase new equipment to help installations reduce energy and water consumption. Examples of equipment purchased with UESCs include: HVAC and steam system upgrades, chillers, boilers, lights, motors, EMCS systems and water reducing devices.

**TABLE 11**  
**UTILITY ENERGY SERVICE CONTRACTS AND DELIVERY ORDERS AWARDED**  
**BY FEDERAL AGENCIES IN FY 2006**

Agency	Number of Delivery Orders/ Contracts	Total Capital Cost (Thou. \$)	Financed Investment (Thou. \$)	Appropriations (Thou. \$)	Annual Energy Savings (MMBtu)
Defense	17	\$68,384.7	\$60,211.1	\$8,173.6	424,245.6
DOE	5	\$527.2	\$90.2	\$437.0	5,949.0
HHS	2	\$741.4	\$741.4	\$0.0	1,817.0
Commerce	1	\$733.9	\$733.9	\$0.0	14,539.0
<b>Total</b>	<b>25</b>	<b>\$70,387</b>	<b>\$61,777</b>	<b>\$8,611</b>	<b>446,551</b>

### III. INTERAGENCY EXCHANGE OF INFORMATION

#### A. Federal Coordination

##### *Federal Interagency Energy Policy Committee*

The members of the Federal Interagency Energy Policy Committee met on February 25, 2005 during a meeting of Federal Senior Energy and Environmental Officials to review Federal agency progress in implementing energy, transportation, and environmental Executive Orders. Executive Order progress reports on government-wide implementation were presented for energy, transportation, and environmental requirements. Representatives from DOD, Interior, and NASA also gave presentations highlighting their accomplishments toward the requirements, and recent progress within agencies was also discussed. For most agencies, the Senior Energy Official is also their Federal Interagency Energy Policy Committee member.

##### *Federal Interagency Energy Management Task Force*

In FY 2006, meetings of the Federal Interagency Energy Management Task Force were held on October 2, 2005; February 8, 2006; May 17, 2006; July 19, 2006; and September 20, 2006. The memoranda of record from these meetings are posted at <http://www1.eere.energy.gov/femp/about/fiemtf.html>. Issues highlighted in these meetings included the following:

- Agency energy management programs, budgets, challenges, opportunities, and activities to meet reduction and renewable energy goals for FY 2006.
- Distribution and discussion of issues relating to FY 2006 energy reporting requirements.
- Guidance for completing annual reports and scorecards.
- Discussion of the pending new Executive Order.

- Discussion of the White House Summit on Federal Sustainable Buildings.
- The importance of the work and growth of the energy savings performance program.
- The progress of the Energy Savings Expert Team Initiative, formed in response to hurricane Katrina and natural gas distribution and price fluctuations in 2005.
- EPACT 2005 and its provisions affecting federal energy management, including discussion of metering provisions, exclusion provisions, new renewable energy provisions, energy efficiency procurement, new energy management goals, and the new Federal building standard.
- Federal Energy and Water Management Awards and the Presidential Awards for Leadership in Federal Energy Management event status and successes.
- FEMP's technical assistance programs, workshops, and conferences related to Federal energy management.

#### B. Training

Many agencies have their own internal training and recognition programs. Overall, Federal agencies reported spending \$2.4 million to train 4,876 Federal personnel in energy efficiency, renewable energy, and water conservation subjects. During FY 2006, FEMP conducted training workshops and symposia for approximately 3,000 attendees in the efficient use and conservation of energy, water, and renewable energy in Federal buildings. FEMP workshops conducted during FY 2006 included the following:

- Advanced ESPC/Financing,
- Advanced Facility Energy Decision System (FEDS),
- BestPractices Steam Systems Tool Suite Webcast,

- Building Design Strategies Course,
- CHP for Federal Facilities Workshop,
- Design Strategies for Low-Energy, Sustainable, Secure Buildings,
- Energy 2006 Conference,
- Energy Management Telecourse: 1; Utility Energy Services Contracting,
- Energy Management Telecourse: 2; Energy Efficient Procurement; Life-Cycle Costing,
- Energy Management Telecourse: 3; Water Resource Management; Operations and Maintenance,
- Energy Star Workshop (Energy Conference 2006),
- Evolving Energy Markets,
- FEMP Lights Lighting and Health Workshop,
- FEMP Lights On Line Course,
- Implementing Renewable Energy Projects,
- Introduction to Distributed Energy,
- Introduction to ESPC,
- Labs 21 Advanced Course – Laboratory Ventilation Design,
- Labs 21 High Performance, Low Energy Laboratory Design,
- Operations and Maintenance Management,
- Project Facilitator Meeting,
- Super ESPC Regional Webcast,
- Utility Energy Services Contracting (UESC), and
- Water Resource Management

“Energy 2006” the energy efficiency workshop and exposition sponsored by FEMP, and co-sponsored by the Department of Veterans Affairs and GSA, was held August 6-9, 2006 in Chicago, Illinois. The conference provided participants with opportunities to explore such topics as increasing renewable energy use, conserving water, and the use of alternative financing. The conference had panel discussions and an exhibit hall featuring advanced energy efficiency products and services. More than 1,400 were in attendance and more than 90 companies exhibited at the event.

### **C. Awards and Recognition**

Outstanding accomplishments in energy efficiency and water conservation in the Federal sector were recognized with the presentation of the 2006 Federal Energy and Water Management Awards on October 5, 2006 in Washington, D.C. Awards were selected from outstanding Federal energy managers who have demonstrated:

- leadership and exemplary efforts in energy and water management;
- use of renewable and distributed energy resources;
- practices that improve energy security;
- increased efficiency of mobile equipment; and
- any other area that may merit recognition.

Recipients of the 2006 awards were selected from 77 nominees submitted by 15 Federal agencies. There were 17 awardees representing 11 different Federal agencies. Distribution of awards among the Federal agencies for accomplishments in the previous fiscal year is indicated in Table 12.

The Presidential Awards for Leadership in Federal Energy Management recognize highly successful efforts, leadership, and support in promoting and improving Federal energy management. These awards were held in 2006 at the Eisenhower Executive Office Building in Washington, DC. Five organizations, three from DOD, one from SSA, and one from USPS received this prestigious award. These organizations included 49 federal employees and contractors and were responsible for efforts that resulted in estimated annual savings of more than \$12 million and 417 billion Btu.

**TABLE 12**  
**2006 FEDERAL ENERGY AND WATER MANAGEMENT AWARDS**  
**BY GROUP AND TYPE**

Agency	Individual	Small Group	Organization	Total	Energy Efficiency	Renewable Energy	Water Conservation	Energy Security	Exceptional Service
Army		1		1		1			
DOI	1			1			1		
DOJ		1		1		1			
GSA		2		2	2				
HHS		1		1	1				
Navy	1	3		4	2	1			1
SSA	1			1		1			
USAF		3		3	2	1			
USMC			1	1		1			
USPS	1			1					1
VA		1		1				1	
<b>TOTAL</b>	4	12	1	17	7	6	1	1	2

#### **D. Public Education Programs**

The DOE's Office of Energy Efficiency and Renewable Energy (EERE) Information Center provides basic, technical, and financial information on various energy efficiency and renewable energy technologies and programs. The EERE Information Center telephone number is 877-337-3463. The EERE Information Center has two operations—the Message Center and the Mail Center. The Message Center is the location where the calls are answered, and emails and letters are received. The Mail Center ships the products requested from the orders received from the Message Center.

EERE has a website ([www.eere.energy.gov](http://www.eere.energy.gov)) and offers free subscriptions to the *EERE Network News* e-mail newsletter. In the past 11 years, the number of visitors to the EERE website has increased from 12,000 in FY 1996 to 540,000 in FY 2006. *EERE Network News* showed steady subscribers growth throughout the year. Since last year, the number of subscribers has increased by 2,600. The national attention to energy efficiency and renewable energy issues contributed to this impressive growth. In FY 2006, the site's subscriber base grew 29 percent—the largest increase in one year.

The Energy Information Administration's National Energy Information Center (NEIC) responds to public and private sector questions on energy production, consumption, prices, resource availability, and projections of supply and demand. NEIC provides information to Federal employees and the public at [www.eia.doe.gov](http://www.eia.doe.gov). Electronic inquiries may be sent to [infoctr@eia.doe.gov](mailto:infoctr@eia.doe.gov). During FY 2006, NEIC staff responded to 31,974 inquiries. The EIA web site recorded 22.2 million user sessions during FY 2006. (EIA Web site usage is projected to exceed 26 million unique user sessions in FY 2007.)

The Office of Scientific and Technical Information (OSTI), as part of the Office of Science, provides leadership and coordination for the DOE-wide Scientific and Technical Information Program (STIP). In this capacity, OSTI assures access by DOE, the scientific research community, academia, U.S. industry, and the public to DOE research results in support of the DOE mission. Key collections developed and maintained by OSTI on behalf of DOE include Energy Citations Database (ECD), the DOE Information Bridge, the E-print Network, Research and Development (R&D) Project Summaries, and EnergyFiles. In FY 2006, there were approximately 44 million

transactions by individuals accessing OSTI resources—doubling access in the past two years. The DOE public information mechanisms include several direct service programs designed to provide technical assistance to specific target groups. Two of these programs are the State Energy Program (SEP) and the Industrial Assessment Center Activity.

SEP provides funding to states to carry out their own energy efficiency and renewable energy programs. SEP funding enables state energy offices to design and implement programs according to the needs of their economies, the potential of their natural resources, and the participation of local industries. States use grants to address their energy priorities and program funding to adopt emerging renewable energy and energy efficiency technologies. Funding from SEP goes to state energy offices in all states and U.S. territories. SEP projects are managed by state energy offices, not by DOE directly. There are three sources of funding for DOE's SEP: DOE grants, SEP Special Projects, and Petroleum Violation Escrow (PVE) Funds.

The SEP provides grants based on a yearly appropriation by Congress and a formula that takes into account population and energy consumption in each state. The second source of funding is from technology programs in DOE's Office of Energy Efficiency and Renewable Energy for deployment projects in the states. EERE awards this funding annually to state energy offices through a competitive solicitation for SEP Special Projects. Since the competition for these funds is keen, many states join forces with private sector partners and contribute their own funds toward these projects. State energy offices can use PVE funds for SEP projects if they appear in the SEP plan that the states file yearly with DOE. These funds proceed from court settlements for overcharges by oil companies in the 1970s and 1980s. The last distribution of PVE funds was in the late 1980s, and a final distribution of funding from these escrow accounts was made in 2005.

The SEP plays a role when the state energy office is involved in the project, the State Energy Program provides funding, or the state uses petroleum violation escrow funds for part of the project and it is in the states SEP plan. The results from the State Energy Program reflect the work of state energy offices. The outcome is an innovative deployment of new energy efficiency and renewable energy technologies across the geographic panorama of the United States and its territories. Additional information is on their website: [www.eere.energy.gov/state\\_energy\\_program](http://www.eere.energy.gov/state_energy_program).

The Industrial Assessment Centers (IACs), sponsored by EERE's Industrial Technologies Program, provide no-cost energy, waste, and productivity assessments to help eligible small and mid-sized manufacturers identify measures to maximize energy-efficiency, reduce waste, and improve productivity. Additionally, the IACs serve as a training ground for the next-generation of energy savvy engineers. The assessments are conducted by local teams of engineering faculty and students from 26 participating universities across the country. Additional information is on the website: [www.eere.energy.gov/industry/bestpractices/iacs.html](http://www.eere.energy.gov/industry/bestpractices/iacs.html).

## IV. FEDERAL AGENCY ENERGY MANAGEMENT ACTIVITIES

### A. Department of Agriculture

#### Reduction Goal Performance

In FY 2006, USDA reported using 80,111 Btu per gross square foot in its goal subject buildings, a 9.8 percent decrease in energy intensity from 88,776 Btu/GSF used in FY 2003. USDA received credit for purchases of 88.4 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 81,782 Btu/GSF to 80,111 Btu/GSF. Without the credit for renewable energy purchases, USDA's reduction from FY 2003 is 7.9 percent.

#### Petroleum Use in Buildings

Since FY 2003, USDA has reduced petroleum-based fuel use in its goal subject buildings by 60.7 percent, from 1,011.2 billion Btu to 397.6 billion Btu in FY 2006. The large decrease in petroleum from FY 2003 to FY 2006 are partially a result of the actions undertaken by the department and its agencies in response to the President's Memorandum (dated September 26, 2005) on Energy and Fuel Conservation.

#### Renewable Energy Use

In FY 2006, USDA reported using 93.9 billion Btu of renewable energy, equivalent to 4.7 percent of its facility electricity use. Of the total renewable energy used, 5.5 billion Btu was self-generated and 88.4 billion Btu was purchased. In FY 2006, USDA issued a Departmental Regulation on Facilities Energy that required agencies to comply with the renewable energy requirements of EPACT 2005. USDA agencies strived to select products, materials, and systems that maximize the use of renewable energy. Appropriate consideration was given to incorporating solar and other renewable technologies when life-cycle cost-effective.

#### *Self Generated Renewable Energy*

Within USDA, the U.S. Forest Service (FS) continued to install photovoltaic systems at remote sites, and used passive solar design strategies, to the greatest extent possible, in new facility design and construction. Since 1990, FS has installed over 500 photovoltaic units mainly at remote sites

formerly served by fossil-fueled generators. Below are just two examples of the many USDA self-generated renewable energy projects:

- In the Rocky Mountain Region of the Forest Service, eight 90-watt photovoltaic panels and one 75-watt photovoltaic panel were installed at Trappers Lake to provide power for a remote water distribution system that serves 60 campsites. The campground is open from mid-June through the end of September. The panels provide power to operate a 400-watt well pump and a 19-watt chlorinator pump. Estimated annual energy generated is 155 kilowatt-hours per year.
- The Beltsville Agricultural Research Center (BARC), which is part of Agricultural Research Service (ARS), has installed approximately 74 generators operated by B-20 (Biodiesel fuel) in its facilities.

#### *Purchased Renewable Energy*

In FY 2006, USDA's Office of Procurement and Property Management purchased 25,300 megawatt-hours of Renewable Energy Certificates (RECs) for the Department at-large. The purchase, which was facilitated by the Defense Energy Support Center, includes RECs generated from biomass and wind power.

The Forest Service, through an Inter-Agency Agreement between its Rocky Mountain Regional Office and the Western Area Power Administration and the Rocky Mountain Regional Office, purchased 550 megawatt-hours of renewable energy of which 50 percent is biomass. It is estimated that this power is approximately 5 percent of the Region's electrical power consumption.

An ARS location in Athens, Georgia purchased 20 percent biodiesel for running generators and the dual fuel boilers for steam production. Also, the Gainesville, Florida location purchased 60 megawatt-hours of "Green" Energy from Gainesville Regional Utilities.



### **Investment in Energy Efficiency**

In FY 2006, USDA invested \$1.0 million in energy efficiency and renewable energy projects, 1.3 percent of its total facility energy costs. During FY 2006 USDA did not finance any projects with energy savings performance contracts or utility energy savings contracts.

### **Water Consumption**

In FY 2006, USDA reported using 2,108.5 million gallons of water at a cost of \$7.9 million. USDA agencies made progress in implementing the water conservation goals of Executive Order 13123. Overall, 27 USDA facilities implemented or continued to implement Water Management Plans (WMPs); while 20 facilities implemented WMPs and had at least four water conservation Best Management Practices during FY 2006. The Agricultural Research Service reported implementation of a wide variety of new and ongoing water conserving methods and practices. For instance, in the North Atlantic Area, low flush toilets were installed within buildings and work sites. Additionally, within the Forest Service, the Regions reported implementing many water conservation measures during FY 2006. For example, the Rocky Mountain Region installed water meters as part of new construction projects. In the Forest Service's Intermountain Region, numerous well, water and septic systems were repaired or upgraded to eliminate leaks.

### **Training**

In FY 2006, USDA reported training 165 energy managers at a cost of \$23,100. USDA personnel participated in training opportunities throughout FY 2006 from a variety of sources, including energy management-related sessions offered by FEMP and other educational organizations. Specifically, USDA's Facilities Energy Program Manager received a Business Energy Professional certification from the Association of Energy Engineers. Additionally, staff from USDA's Energy and Environment Division (E&ED), along with agency representatives participated in FEMP's Energy 2006 Conference in Chicago, Illinois. Furthermore, E&ED disseminated hundreds of copies of various energy awareness and educational materials to agency facility and energy managers, and directed them to the Division's Facilities Energy website. Within the Agricultural Research Service, relevant energy management training and materials was also provided to the workforce. FS conducted and participated in various training and education programs, including a Sustainable Operations Summit. The summit included presentations and discussions on reducing energy and water consumption, as well as developing sustainable leadership.

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## **B. Department of Commerce**

### **Reduction Goal Performance**

In FY 2006, DOC reported using 154,329 Btu per gross square foot in its goal subject buildings, a 21.2 percent decrease in energy intensity from 195,966 Btu/GSF used in FY 2003. DOC received credit for purchases of 348.1 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 187,364 Btu/GSF to 154,329 Btu/GSF. Without the credit for renewable energy purchases, DOC's reduction from FY 2003 is 4.4 percent.

### **Excluded Buildings**

In FY 2006, DOC reported using 20.5 billion Btu in its excluded buildings, 1.0 percent of the agency's total facility use. DOC's excluded buildings occupy approximately 26,000 square feet, 0.2 percent of the agency's total facility space. These facilities, categorized as Assumed Excluded Structures, are primarily radar and radio transmitter facilities. In addition, the National Institute of Science and Technology's (NIST's) Advanced Measurement Laboratory complex was excluded from the baseline because it was still under construction during FY 2003.

### **Petroleum Use in Buildings**

Since FY 2003, DOC has reduced petroleum-based fuel use in its goal subject buildings by 65.3 percent, from 122.7 billion Btu to 42.6 billion Btu in FY 2006. Although the Department has been very successful in reducing the use of petroleum-based fuels, most Department facilities only use petroleum-based fuels, such as diesel, for their emergency generators and some facilities use oil as a back-up fuel for their natural gas fired boilers. While DOC cannot control the use of oil in central plants, the agency can continue to reduce consumption in other applications. The National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service (NWS) has begun installing fuel cells instead of diesel generators at some of its sites and plans to continue using state-of-the-art technologies wherever feasible.

### **Renewable Energy Use**

In FY 2006, DOC reported using 348.3 billion Btu

of renewable energy, equivalent to 32.7 percent of its facility electricity use. Of the total renewable energy used, 0.2 billion Btu was self-generated and 348.1 billion Btu was purchased.

#### *Self Generated Renewable Energy*

Small-scale projects that self-generate energy using renewable sources or renewable energy thermal projects are used to supplement commercial power. NOAA continues to operate a 10-kilowatt photovoltaic unit in American Samoa and a 10-kilowatt photovoltaic system in San Diego, CA. NIST continues to operate its 35-kilowatt photovoltaic array of the roof of the Administration Building at its Gaithersburg, Maryland, facility. NIST's Boulder, Colorado campus also has solar-powered lighting for its Building 2 parking lot. In 2006, NOAA's and NIST's systems produced a total of 20.2 megawatthours and 36.7 megawatthours of electricity, respectively.

#### *Purchased Renewable Energy*

NIST and NOAA continue to purchase wind-generated renewable power to supply a portion of the electrical needs at their Boulder, Colorado facilities. In FY 2006, NIST and NOAA consumed 882 megawatthours and 1,129 megawatthours of purchased renewable energy, respectively.

In addition, the Department purchased 100,000 megawatthours of renewable energy certificates to ensure the Department met the energy reduction and renewable energy purchasing goals for FY 2006.

### **Investment in Energy Efficiency**

In FY 2006, DOC invested \$5.7 million in energy efficiency and renewable energy projects, 11.9 percent of its total facility energy costs. Of this total, almost \$5 million was funded directly by the agency and \$733,900 was a result of utility energy service contracts. DOC did not finance any projects with energy savings performance contracts during FY 2006.

In FY 2006, DOC awarded one UESC for \$733,900 in energy efficiency improvements, expected to save 14.5 billion Btu annually. NOAA has been investigating ESPCs and UESCs where available. The Office of the Secretary completed a

UESC lighting project for the Hoover Building, which DOC operates and maintains for GSA.

### **Water Consumption**

In FY 2006, DOC reported using 33.9 million gallons of water at a cost of \$1.7 million. To date, the Department has completed three Water Management Plans (WMPs). These plans have been developed with the assistance of DOE's National Energy Renewable Laboratory. DOC has four additional facilities that require WMPs, three of which are currently under development. In addition, operating units are incorporating FEMP Best Management Practices (BMP) for efficient use of water. These practices include raising water conservation awareness, installing low-flow devices and sensors, planting indigenous plants, and recycling water. For example, during 2007, NIST will install low-flow aerators on all sinks and showers at its Boulder, Colorado facility. To date they have implemented three BMPs; with this additional BMP completed they will have met Federal requirements for successful water management program at the facility.

### **Training**

In FY 2006, DOC reported training 25 energy managers at a cost of \$32,000. The Agency Energy Team promotes energy-related training opportunities for facility energy management personnel. Annually, employees attend the Federal government-sponsored energy training workshop. Operating units make energy awareness a key part of their energy programs, using materials provided through the FEMP You Have the Power program as well as with supplemental materials. Annually, the Department implements energy conservation awareness campaigns in conjunction with Energy Awareness Month and Earth Day. The campaigns included displays, informational materials and posters in the Herbert C. Hoover Building (Hoover Building). Other DOC sites around the country conduct similar campaigns.

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## C. Department of Defense

### Reduction Goal Performance

In FY 2006, DOD reported using 107,208 Btu per gross square foot in its goal subject buildings, a 5.6 percent decrease in energy intensity from 113,510 Btu/GSF used in FY 2003. DOD received credits for purchases of 5,743.2 billion Btu of renewable energy in FY 2006 and for project source energy savings of 2,445.7 billion Btu, reducing the performance measure of these buildings from 111,546 Btu/GSF to 107,208 Btu/GSF. Without these credits, DOD's reduction from FY 2003 is 1.7 percent.

DOD's rate of energy intensity exceeds the 98,201 Btu/GSF reported in 2005. This is attributable to the change in facility category accounting from 2005 to 2006 and was also influenced by increased troop mobilization and training, activities supporting the Global War on Terrorism, and response to natural disasters.

### Excluded Buildings

In FY 2006 the DOD reported using 12.8 trillion Btu in its excluded buildings, 5.7 percent of the agency's total facility use. DOD's excluded buildings occupy 69.5 million square feet, 3.5 percent of the agency's total facility space. The Department of the Navy excludes mission critical, concentrated energy use transmitters, simulators, cold iron support to ships, and some private party facilities as authorized by the DOE criteria guidelines. The Air Force has identified several excluded buildings. Numerous Military Family Housing (MFH) facilities are being privatized with the utility systems belonging to the housing contractor and the contractor paying for the costs of the utilities therefore excluded from the energy goals. Several communication/test lab facilities are also being excluded due to energy intensive loads driven by mission and operational requirements and not influenced by conventional building energy conservation measures.

### Petroleum Use in Buildings

Since FY 2003, DOD has reduced petroleum-based fuel use in its goal subject buildings by 23.0 percent, from 33.2 trillion Btu to 25.5 trillion Btu in FY 2006.

### Renewable Energy Use

In FY 2006, DOD reported using 9,631.3 billion Btu of renewable energy, equivalent to 9.5 percent of its facility electricity use. Of the total renewable energy used, 3,888.1 billion Btu was self-generated and 5,743.2 billion Btu was purchased.

#### *Self Generated Renewable Energy*

DOD has integrated photovoltaic power systems, solar water heating systems, and transpired solar collectors (solar walls) into its facilities. Active solar heating applications have included maintenance facility solar walls, swimming pool heating, and hot water heating. A few examples of DOD's on-site generation projects using renewable energy are described below.

As technologies have become more cost-effective, the Army has used self-generating technologies using solar, wind, geothermal, and biomass, and continues to make significant progress in promoting the use of these and other renewable technologies at its installations. The Army has generated an estimated 674 billion Btu of electrical power from renewable resources during FY 2006, including the following:

- Fort Stewart, GA generated high-pressure steam using wood chips at the central energy plant, using approximately 167 billion Btu (39,901 short tons) of wood chips.
- Fort Huachuca, AZ generated 487 million Btu of energy from photovoltaic, solar and wind generation in FY 2006.
- Rock Island Arsenal, IL generated approximately 70.3 billion Btu of electricity from its hydroelectric plant in FY 2006.
- Red River Army Depot, TX used 49.0 billion Btu of renewable energy through burning wood scrap.
- Geothermal conversion of barracks at Fort Knox, KY resulted in savings of 16.8 billion Btu savings per year while the geothermal test wells at Hawthorne Army Depot, CA, will facilitate development of future geothermal facility systems.

The Navy generated 308,431 megawatthours of renewable electricity and 1.8 trillion Btu of

renewable thermal energy in FY 2006. The Navy is also increasing generation of renewable energy, operating the largest wind/ diesel hybrid plant in the world and the two largest Federal photovoltaic systems in the United States.

Examples of self-generating renewable energy projects at the Air Force include:

- Luke AFB, AZ installed a 375 kW PV system.
- Nellis AFB, NV awarded a contract on July 31, 2006 to build the world's largest PV array in the world. The array will be a minimum of 15 MW and provide approximately one third of the base's power needs.
- Dyess AFB, TX awarded an ESPC contract to construct a 5.5 megawatt waste-to-energy plant.
- Hill AFB, UT generated about 7,100 megawatt-hours of electricity from landfill gas.

#### *Purchased Renewable Energy*

DOD continued to purchase energy from renewable sources. In FY 2006, DOD purchased 1,213,782 megawatt-hours and 1.6 trillion Btu of renewable energy.

During FY 2006, the Army purchased 1.2 trillion Btu of renewable thermal energy and purchased 130 megawatt-hours of electricity from renewable sources.

The Navy purchased 133,657 megawatt-hours of renewable electricity and 364.0 billion Btu of renewable thermal energy at the Norfolk Naval Shipyard, Portsmouth, VA. The installation purchases electricity and steam from a privatized waste-to-energy plant.

#### **Investment in Energy Efficiency**

In FY 2006, DOD invested \$459.5 million in energy efficiency and renewable energy projects, 13.1 percent of its total facility energy costs. Of this total, \$158.8 million was funded directly by the agency, \$232.3 million was financed through energy savings performance contracting, and \$68.4 million was a result of utility energy service contracts.

In FY 2006, DOD awarded 19 ESPCs for \$232.3 million in energy efficiency improvements,

expected to save 1.3 trillion Btu annually. In FY 2006, the Army awarded two ESPC contracts, one at Fort Stewart, GA and another at Fort Hood, TX, with first year investments totaling \$17.9 million and combined estimated annual savings of 110.5 billion Btu. The Navy awarded five ESPCs in FY 2006. The Air Force awarded 11 new ESPCs in FY 2006. These task orders include energy infrastructure upgrades and new equipment to help the installations reduce energy and water consumption and produce renewable energy. Examples include new waste to steam generation, chillers, boilers, lights, motors, EMCS systems and water reducing devices. Additionally, Washington Headquarters Service established an ESPC partnership with Honeywell in FY 2006. The Pentagon will facilitate energy audits with its ESPC partner to identify energy saving strategies.

DOD awarded 17 UESCs in FY 2006 expected to save 424.2 billion annually. In FY 2006, the Army awarded nine UESCs, (seven at Fort Knox, one at Fort Campbell and one at Fort Rucker) with utility company investment of approximately \$29.6 million. Most of the anticipated \$42.6 million in cost savings will be returned to the utility company to pay for the efficiency measures. Additionally, the Air Force awarded three new UESC task orders in FY 2006 and the Navy awarded five.

#### **Water Consumption**

In FY 2006, DOD reported using 114.1 billion gallons of water at a cost of \$217.6 million. In 2006, DOD had established Water Management Plans and implemented at least four Best Management Practices in 324 of the existing agency inventory of 769 facilities. DOD is striving to increase water conservation awareness and reduce water use—particularly where tight water supplies may potentially impact mission accomplishment and personnel morale. The Air Force, for example, consumed 36.0 billion gallons of water in FY 2006. This is a reduction of 5.6 percent from last year's consumption. Naval Base Coronado, CA, illustrates just one example of many water conservation practices implemented by DOD. Naval Base Coronado purchased 300 1.75 gallon-per-minute (GPM) showerheads using energy award funds. In partnership with Combined Bachelor Housing (CBH), enlisted CBH personnel

installed 100 showerheads at no cost in FY 2006; another 146 are slated for early FY 2007 installation. Each showerhead installed will save 0.75 GPM; 100 installed in FY 2006 will result in annual water/wastewater cost savings of \$85,800.

### **Training**

In FY 2006, DOD reported training 3,200 energy managers at a cost of \$1.6 million. The Army Energy Campaign Plan, for example, emphasizes certification of all of its energy managers at installations. The Army uses commercial energy management training resources such as the Association of Energy Engineers (AEE) to meet the requirements of Executive Order 13123, EPACT 2005 and the *Campaign Plan*. During the week of June 12, 2006, the Office of the Army Chief of Staff for Installation Management (ACSIM) sponsored Certified Energy Manager (CEM) training for Army Energy Managers, which was conducted by AEE and included four days of intense instruction culminating with a four hour examination. Of the 30 Army energy managers participating in the training, 17 passed the examination and are now nationally recognized professionals, who can be dedicated full-time to implement effective Army energy and water management and conservation programs. ACSIM sponsors and funds this CEM training every year.

In FY 2006, 206 Department of Navy personnel received training in areas specified under EPACT. These personnel consist of: energy managers, energy conservation officers, maintenance mechanics, planners, equipment mechanics, facilities supervisors, accountants, administrative officers, project managers, architects, environmental engineers, electrical engineers, division directors, controls mechanics, civil engineers, budget analysts, boiler plant personnel, resident officers in charge of contracting, zone managers, and utility engineers. This brings total Navy personnel receiving training to 2,359 since the program began.

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## **D. Department of Energy**

### **Reduction Goal Performance**

In FY 2006, DOE reported using 235,908 Btu per gross square foot in its goal subject buildings, a 9.7 percent decrease in energy intensity from 261,340 Btu/GSF used in FY 2003. DOE received credit for purchases of 466.0 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 241,128 Btu/GSF to 235,908 Btu/GSF. Without the credit for renewable energy purchases, DOE's reduction from FY 2003 is 7.7 percent.

### **Excluded Buildings**

In FY 2006, DOE reported using 10.0 trillion Btu in its excluded buildings, 31.8 percent of the agency's total facility use. DOE's excluded buildings occupy 20.7 million square feet, 18.8 percent of the agency's total facility space. Most of DOE's buildings that are excluded from the goals of the EPACT 2005 amendments are currently reported under the metered process category and have been scaled back operationally to prepare for decontamination and decommissioning. Many of these facilities were energy intensive process operations where traditional energy conservation measures would not significantly effect the energy consumption that be reported for these facilities.

### **Petroleum Use in Buildings**

Since FY 2003, DOE has reduced petroleum-based fuel use in its goal subject buildings by 21.4 percent, from 15.0 trillion Btu to 11.8 trillion Btu in FY 2006. Due to the introduction of natural gas at Brookhaven National Laboratory's central steam facility and the conversion of boilers to dual-fuel-firing capability, BNL has reduced its use of oil by 26 percent from FY 2005.

### **Renewable Energy Use**

In FY 2006, DOE reported using 440.2 billion Btu of renewable energy, equivalent to 2.9 percent of its facility electricity use. Of the total renewable energy used, 15.2 billion Btu was self-generated and 471.0 billion Btu was purchased.

#### *Self-Generated Renewable Energy*

Examples of DOE's self-generating renewable energy projects in FY 2006 include the following:

- The Idaho National Laboratory Records Storage Facility includes a solar wall that provides heat, resulting in approximately \$1,250 per year in avoided electric energy costs for space conditioning.
- Oak Ridge National Laboratory (ORNL) has several photovoltaic (PV) panels at approximately 10 remote sites. The panels range from 5 to 6 watts in capacity to up to 55 watts where 6 to 8 panels are grouped together. The panels are used to recharge batteries that power remote data-gathering equipment.
- The National Wind Technology Center (NWTC) has approximately 1,600 kilowatts of installed wind turbine capacity used for research purposes. When the turbines are running, the energy produced is used to offset simultaneous NWTC site energy use. The turbines produced over 45,800 kilowatthours in FY 2006. The total self-generated electricity at NREL was 112,300 kilowatthours.
- DOE Headquarters installed 7 kilowatt PV arrays and solar water collectors at the Germantown, Maryland, and Forrestal building child development centers. Headquarters also installed PV arrays at Earth Day Park and on the south side of Forrestal's South Building.

#### *Purchased Renewable Energy*

In signing up to the TVA (Tennessee Valley Authority) Green Power Switch program for 675 megawatthours per year, ORNL became TVA's first industrial green power participant. The TVA program includes 18 wind turbines with the capability to generate a total of 29 megawatts atop Buffalo Mountain in the Southeast's first commercial-scale use of wind power to generate electricity. Also, the TVA program includes several solar collectors, including those at the ORNL PV distributed energy resources showcase project. Additional sites and a landfill gas-to-energy facility are planned in the near future.

In FY 2006, the Oak Ridge Institute for Science and Education (ORISE) purchased 150 blocks (76 kilowatthours) of renewable energy through the TVA Green Power Switch Program. At least 3 percent of the ORISE electricity consumed in FY 2007 will be produced by green power sources.

DOE Headquarters purchased 35,892.8 megawatt-hours of renewable electricity for the Germantown campus and Forrestal building.

During FY 2006, the Strategic Petroleum Reserve purchased 1,596 megawatt-hours of renewable energy certificates.

### **Investment in Energy Efficiency**

In FY 2006, DOE invested \$33.3 million in energy efficiency and renewable energy projects, 8.9 percent of its total facility energy costs. Of this total, \$4.4 million was funded directly by the agency, \$28.4 million was financed through ESPCs, and \$527,200 was a result of UESCs.

In FY 2006, DOE awarded two ESPCs for \$28.4 million in energy efficiency improvements, expected to save 283.1 billion Btu annually. The first, awarded in December 2005 is for \$19.5 million in energy efficiency improvements at the Pantex Plant in Panhandle, Texas. The 19-year contract will be paid for over time with \$55.2 million in guaranteed cost savings. The projects include improvements to lighting systems, chilled water and steam piping systems, HVAC systems, and the installation of an energy management control system.

The second ESPC was awarded in September 2006 is for \$8.9 million in energy efficiency improvements at Argonne National Laboratory in Argonne, Illinois. The 10 year contract will be paid for over time with \$14.2 million in guaranteed cost savings. The projects include improvements to the building envelope; lighting systems; chilled water and steam piping systems; HVAC, chiller, and boiler systems; and installation of efficient motors and drives and an energy management control system.

Five projects were undertaken during FY 2006 at Pacific Northwest National Laboratory under a UESC arrangement with the Bonneville Power Administration. PNNL invested \$437,000 in the projects with BPA providing financing of \$90,000 to realize improvements worth more than \$527,000 and saving almost 6 billion Btu annually.

### **Water Consumption**

In FY 2006, DOE reported using almost 5.5 billion gallons of water at a cost of \$14.7 million. DOE recognizes the potential to save money and natural resources through water conservation. Furthermore, DOE encourages its field offices and sites to include water management plans within their facility management plans. The National Energy Technology Laboratory is just one example and is in the initial stages of developing a formal water management program. Additionally, on-site research activities associated with NETL's mission, where applicable, are annually reviewed for water conservation. NETL's Technology Support Facility, located in Morgantown, West Virginia, is currently under construction. When finished, the facility will use roof-collected rainwater to provide flush water for all urinal and commodes associated with the building.

Additionally, at Lawrence Livermore National Laboratory, all new construction must comply with California Title-24 requirements that specify water saving plumbing fixtures. LLNL has implemented a waterless urinal pilot program that has been implemented with funding assistance from DOE FEMP.

### **Training**

In FY 2006, DOE reported training 110 energy managers at a cost of \$139,100. The following DOE organizations have training programs in place, or take advantage of training and education opportunities as they arise: Hanford, Fermilab, SRS, INL, Naval Petroleum Reserve and Rocky Mountain Oilfield Testing Center (NPR/RMOTC), Princeton Plasma Physics Laboratory (PPPL), BNL, NREL, Savannah River Site, TJNAF, NETL, ORNL and PNNL.

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## **E. Department of Health and Human Services**

### **Reduction Goal Performance**

In FY 2006, HHS reported using 265,150 Btu per gross square foot in its goal subject buildings, a 23.1 percent decrease in energy intensity from 344,842 Btu/GSF used in FY 2003. HHS received credits for purchases of 57.2 billion Btu of renewable energy in FY 2006 and for project source energy savings of 1.3 trillion Btu reducing the performance measure of these buildings from 313,246 Btu/GSF to 265,150 Btu/GSF. Without these credits, the HHS reduction from FY 2003 is 9.2 percent.

The reduced consumption is primarily due to the 23-megawatt cogeneration plant at the National Institutes of Health's Bethesda Campus.

In addition, in FY 2006, the Centers for Disease Control experienced an 18.9 percent decrease in consumption from FY 2005 due to several buildings being only partially occupied during the year because they were under construction or major renovation. A dramatic increase should be expected next year to reflect fully occupied conditions and the construction of new laboratories which have a larger emphasis on safety that demands more ventilation than older laboratories that are being replaced.

### **Excluded Buildings**

In FY 2006 the HHS reported using 32.8 billion Btu in its excluded buildings, 0.4 percent of the Agency's total facility use. The HHS excluded buildings occupy almost 2.0 million square feet, 6.5 percent of the Agency's total facility space. NIH has outdoor multilevel parking garages on the NIH Bethesda Campus that consume lighting energy only. In addition, NIH has three buildings where energy usage is skewed significantly due to the buildings entering or leaving the inventory during the year, buildings are down-scaled operationally to prepare for decontamination, decommissioning and disposal, and the buildings are undergoing major renovation.

These facilities are not metered separately. Therefore, the energy consumption of the parking garages has been estimated based on the number of lighting fixtures and the time of use. Total energy use is estimated at 7.7 billion Btu or 8,685 Btu/GSF. The energy consumption of the essentially empty buildings has been estimated based upon the number of lights still in operation and the minimal use of natural gas for heat.

The PSC Parklawn Building has a large computer data center that is metered separately and has been excluded for the first time this year. Only the computer center's energy and square footage has been excluded; the rest of the Parklawn Building is still subject to the reduction goal. The computer center consumes 6.3 million kilowatthours, or 33 percent of the building's entire electrical load, while only occupying 0.6 percent of the space.

### **Petroleum Use in Buildings**

Since FY 2003, HHS has reduced petroleum-based fuel use in its goal subject buildings by 43.8 percent, from 892.8 billion Btu to 501.9 billion Btu in FY 2006. From FY 2005 to FY 2006, petroleum decreased by 18.1 percent primarily due to a decrease in fuel oil usage at the NIH Bethesda Campus. The decrease is explained by the increased use of the cogeneration unit and a reduction in the number of times that the natural gas was interrupted thereby requiring the use of fuel oil.

### **Renewable Energy Use**

In FY 2006, HHS reported using 57.2 billion Btu of renewable energy, equivalent to almost 2.0 percent of its facility electricity use. The HHS Energy Program promotes and encourages renewable energy practices through seminar topics, newsletters, and direct communication.

#### *Self Generated Renewable Energy*

A solar energy feasibility study was completed at the FDA Muirkirk Campus facility in Beltsville, Maryland. The study identified projects that are estimated to reduce energy costs by more than \$87,000 per year from solar air heating. Specifically, the projects include the installation of 21 solar roofing panels and siding systems or ground mounted solar heating for 17 out buildings

and four emergency generators. The study was forwarded to GSA for review since the majority of work involved a facility which is GSA-owned.

#### *Purchased Renewable Energy*

In FY 2006, many HHS facilities entered into competitive contracts for the procurement of electricity with a green component or purchased renewable energy certificates (RECs). FDA purchased renewable energy from the Defense Energy Support Center. FDA purchased 6,175 megawatt-hours of RECs from a biomass source. This represents 8.2 percent of FDA electricity consumption.

The Indian Health Service Albuquerque Area's major utility provider implemented an alternative wind energy program. The Albuquerque Indian Hospital and Santa Fe Indian Hospital, the area's highest electricity users, have increased their purchase of alternative wind energy to 10 percent of their monthly usage.

#### **Investment in Energy Efficiency**

In FY 2006, HHS invested \$6.5 million in energy efficiency and renewable energy projects, 4.3 percent of its total facility energy costs. Of this total, \$2.1 million was funded directly by the agency, \$3.7 million was financed through energy savings performance contracting, and \$741,400 was a result of utility energy service contracts.

In FY 2006, HHS awarded one ESPC for \$3.7 million in energy efficiency improvements, expected to save 24.1 billion Btu annually for the NIH in Bethesda, MD. This is the second ESPC task order awarded for this site. Also in FY 2006, design and construction continued under the ESPC project at the FDA White Oak Campus.

HHS also awarded two UESCs at NIH facilities in FY 2006 for \$741,400 in energy efficiency improvements, expected to save 1.8 billion Btu annually.

#### **Water Consumption**

In FY 2006, HHS reported using 1.5 billion gallons of water at a cost of \$8.9 million. Several HHS operating divisions refined water management plans in accordance with EO 13123 and 45 percent of HHS facilities have implemented best

practices in water conservation. In FY 2006, the Indian Health Service updated its water management plan and is in the process of finalizing it with each Area. The IHS Tucson Area facilities, along with many other IHS Areas, are replacing outdated toilets, faucets, shower head and other devices with water saving products.

#### **Training**

In FY 2006, HHS reported training 116 energy managers at a cost of \$49,700. The HHS Energy Program sponsored the following energy courses:

- Facility Energy Metering Course in conjunction with DOE FEMP,
- Energy Summit that included sustainability training,
- Employee Energy Conservation Workshops (residential information),
- General Energy Management Training for NIH, CDC, and IHS, and
- Formulation of on-line employee energy efficiency course

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## **F. Department of Homeland Security**

### **Reduction Goal Performance**

In FY 2006, DHS reported using 94,935 Btu per gross square foot in its goal subject buildings, a 19.7 percent decrease in energy intensity from 118,271 Btu/GSF used in FY 2003. DHS received credit for purchases of 85.2 billion Btu of renewable energy in FY 2006, reducing the performance measure of these facilities from 96,952 Btu/GSF to 94,935 Btu/GSF. Without the credit for renewable energy purchases, DHS' reduction from FY 2003 is 18.0 percent. The reduction has been attributable to a variety of efforts including the cumulative effect of long term measures conducted by the U.S. Coast Guard (USCG) through both ESPCs and numerous energy efficiency projects, better energy accounting and tracking, and the hiring of savings-funded Resource Efficiency Managers.

### **Excluded Buildings**

In FY 2006, DHS reported using 103.4 billion Btu in its excluded buildings, 2.5 percent of the agency's total facility use. The DHS excluded buildings occupy 671.5 thousand square feet, 1.6 percent of the agency's total facility space. The United States Secret Service excluded its John J. Rowley Computer Security building due to its energy-intensive computer operations in use 24 hours a day, 7 days a week.

The Customs Border Protection (CBP) has intense lighting and remote video surveillance systems along the border. CBP currently tracks electricity consumption and cost data for those sites and systems that are separately metered. However, some are not separately metered from the facilities. The CBP continues to work on developing a complete inventory of buildings that qualify for exclusion, but has not completed this in time for the current report.

The Transportation Security Administration (TSA) has determined, under the Department of Energy's Criteria for Excluding Buildings from the Energy Performance Requirements, that both TSA Headquarters and the Transportation Security Operations Center (TSOC) should be excluded

energy goals. Headquarters is assumed excluded as "leased space where the Government may pay for some energy but not all." The Headquarters lease designates that the owners of the building will pay an allotted price for energy each month. Whenever TSA exceeds that allotment in energy use, it will pay the excess.

TSOC is excluded as "impracticable" due to its "performance of a national security function" TSOC operates 24 hours a day, 7 days a week under high security. Because of its high security functions, "conventional measures are rendered meaningless by an overwhelming proportion of process-dedicated energy."

### **Petroleum Use in Buildings**

Since FY 2003, DHS has reduced petroleum-based fuel use in its goal subject buildings by 15.2 percent, from 1.4 trillion Btu to 1.2 trillion.

### **Renewable Energy Use**

In FY 2006, DHS reported using 87.6 billion Btu of renewable energy, equivalent to 3.8 percent of its facility electricity use. Of the total renewable energy used, 2.4 billion Btu was self-generated and 85.2 billion Btu was purchased.

#### *Self Generated Renewable Energy*

The Coast Guard continually evaluates renewable energy projects for economic viability. Several ESPC projects are under development containing renewable energy sub-components. In FY 2006, the following self-generating renewable energy projects were in operation:

#### *Solar Water Heating*

- 62 housing units in Honolulu, Hawaii
- 149 homes in Puerto Rico Air Station
- Indoor swimming pool in Alameda, CA
- San Francisco Air Station

#### *Photovoltaics*

- Roof panels in Petaluma, CA
- Mobile PV system for charging battery for emergency generator in Puerto Rico
- Lighted aids to navigation: 4,779 solar panel/battery powered light-bouys; 11,620 solar panel/battery powered lighted-fixed aids to navigation

#### Other

- Bio-diesel project for marine applications at USCG Academy in Connecticut

The Secret Service is reviewing solar opportunities as part of a proposed UESC.

#### *Purchased Renewable Energy*

DHS purchased 24,900 megawatthours of Renewable Energy Certificates for FY 2006 through the Defense Energy Support Center (DESC). This represents almost 3.8 percent of total DHS annual electricity use. In addition, the USCG facilities in New York City are included as part of an electric utility contract awarded in FY 2004 and continuing through FY 2010. Part of the award package included a requirement for the equivalent of 10 percent of the total load (60 megawatthours per year) to be purchased from renewable sources.

#### **Investment in Energy Efficiency**

In FY 2006, DHS invested \$ 2.8 million in energy efficiency and renewable energy projects, 3.3 percent of its total facility energy costs. During FY 2006, DHS did not finance any projects through energy savings performance contracts or utility energy service contracts.

#### **Water Consumption**

In FY 2006, DHS reported using 4.9 billion gallons of water at a cost of \$6.7 million. By far the largest user was the USCG, which during FY 2006 formalized water management plans at four major campuses which comprise 17 percent of the total building footprint of the USCG.

The Plum Island Animal Disease Center (PIADC) has reduced its water consumption by 20 percent from FY 2006, as a result of an aggressive steam system maintenance program, water conservation awareness, and procedural changes with respect to how the animal pens are maintained and washed.

The Federal Law Enforcement Training Center (FLETC) has had 259 water meters installed to accurately measure water usage. This will help in developing basic information against which to benchmark water consumption.

#### **Training**

In FY 2006, DHS reported training 51 energy managers at a cost of \$101,000. Information regarding energy training and education is distributed through DHS energy websites and email. A master energy stakeholder email list provides a mechanism for outreach activities that includes disseminating information from the Federal Energy Management Program and Environmental Protection Agency regarding ENERGY STAR and other energy-related topics.

Additionally, DHS employees participated in the “Energy 2006” workshop and conference and the FY 2006 Department of Homeland Security Administrative Services Forum. Coast Guard representatives chaired the Energy session, and presentations were made by USCG and United States Secret Service, and included DHS participants from around the country.

Energy conservation and outreach and awareness were conducted at both TSA Headquarters and the TSOC facility in October 2006 as part of Energy Awareness Month.

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## **G. Department of Housing and Urban Development**

### **Reduction Goal Performance**

In FY 2006, HUD reported using 66,690 Btu per gross square foot in its Washington, DC, headquarters building, the sole building subject to the EPACT 2005 amendments goal. This is a 15.4 percent decrease in energy intensity from 78,817 Btu/GSF used in FY 2003. HUD did not receive any credits for purchases of renewable energy in FY 2006.

### **Renewable Energy Use**

In FY 2006, HUD did not report any renewable energy use. The HUD Headquarters Building currently has no self-generated renewable energy capacity. However, HUD plans to explore possibilities for these types of energy initiatives in the near future. As the HUD Headquarters Building is under delegation of authority from GSA, all steam and electricity is purchased through GSA. HUD will investigate the possibility of obtaining renewable source energy through GSA.

### **Investment in Energy Efficiency**

In FY 2006, HUD invested \$26,000 in energy efficiency and renewable energy projects, 0.9 percent of its total facility energy costs. During FY 2006, HUD did not finance any projects with energy savings performance contracts or utility energy service contracts.

### **Water Consumption**

In FY 2006, HUD reported using 12.4 million gallons of water at a cost of \$69,000. Water-saving flush valves were installed on many of the restroom plumbing fixtures in the building.

### **Training**

In FY 2006, four HUD employees were trained on the operation of the building's energy management control system. In addition, five contract maintenance personnel received training.

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## **H. Department of the Interior**

### **Reduction Goal Performance**

In FY 2006, DOI reported using 74,775 Btu per gross square foot in its goal subject buildings, a 15.1 percent decrease in energy intensity from 88,063 Btu/GSF used in FY 2003. DOI received credit for purchases of 298.5 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 79,488 Btu/GSF to 74,775 Btu/GSF. Without the credit for renewable energy purchases, DOI's reduction from FY 2003 is 9.7 percent.

Interior's FY 2003 baseline was reviewed and revised to 88,063 Btu/GSF. This revision from previous reporting was the result of more accurate data collections, correction of errors and omissions in reporting energy consumption and building gross square footage. Continuous improvements at Interior bureaus to facilities and asset management systems have provided more accurate, detailed facility data.

### **Petroleum Use in Buildings**

Since FY 2003, DOI has increased petroleum-based fuel use in its goal subject buildings by 4.7 percent, from 1,249.1 billion Btu to 1,307.9 billion Btu in FY 2006.

### **Renewable Energy Use**

In FY 2006, DOI reported using 330.4 billion Btu of renewable energy, equivalent to 14.6 percent of its facility electricity use. Of the total renewable energy used, 31.9 billion Btu was self-generated and 298.5 billion Btu was purchased. In FY 2006, the Bureau of Land Management (BLM) issued instruction memoranda on "Solar Energy Development Policy" and "Biomass Utilization Strategy" establishing policy for solar energy development and biomass utilization projects on public lands administered by BLM.

#### *Self Generated Renewable Energy*

Interior has implemented 867 on-site renewable energy projects since 1990, including standalone and grid-connected photovoltaic systems, solar thermal (hot water) projects, geothermal (ground source) heat pumps, and wind related projects. During FY 2006, Interior bureaus inventoried their

respective on-site renewable components. Initial results identified numerous renewable energy components that were not previously accounted for.

Listed below are some of the numerous renewable energy projects implemented or studied in FY 2006:

The Bureau of Indian Affairs (BIA) completed the construction of Enemy Swim Day School in Waubay, South Dakota which is heated and cooled with a geothermal system. BIA is currently installing photovoltaic systems at Alamo Navajo School in Magdalena, New Mexico and Jemez Day School in Jemez Pueblo, New Mexico that will serve as educational tools for the children as well as contribute towards renewable energy goals. The Circle of Nations-Wahpeton Indian Boarding School in Wahpeton, North Dakota is scheduled to replace the dormitory and administration building in FY 2007 which will incorporate a campus-wide geothermal heating project.

Some of the most notable BLM renewable energy systems that went on line in FY 2006 include:

- a ground-source heat pump system (16 tons total) for Pompey's Pillar Visitor Center, near Billings, Montana, for the building's heating, ventilating, and air conditioning requirements;
- an on-site 20 kilowatt renewable wind turbine in addition to numerous green building approaches, including optimal day-lighting, and exemplary energy performance at the Rawlins Field Office in Wyoming, and
- a 1.5 kilowatt photovoltaic system installed during the rehabilitation of the Cleveland-Lloyd Visitor Center and Quarry Building in Cleveland, Utah, to provide seasonal, off-grid power for lighting, cooling and other loads.

The Bureau of Reclamation (BOR) completed the installation of three 30 gallon solar water heaters at Lake Berryessa Dormitory, California to back up the existing electric water heaters. A 10-kilowatt photovoltaic system was constructed at Glendale, Arizona. Generated electricity is returned to Salt River Project grid.

Most notably, the National Park Service (NPS)

Pacific West Region generates 2.25 percent of its electrical power from renewable energy sources. Pacific West Region's Seattle office is 100 percent green powered, Joshua Tree National Park produces 65 percent of its power with solar and Whitman Mission NHS is producing 100 percent of its power with solar.

### **Investment in Energy Efficiency**

In FY 2006, DOI invested almost \$12 million in energy efficiency and renewable energy projects, 12.6 percent of its total facility energy costs. Of this total, \$10.4 million was funded directly by the agency and \$1.6 million was financed through energy savings performance contracting. DOI did not finance any projects with utility energy service contracts during FY 2006.

In FY 2006, DOI awarded one ESPC for \$1.6 million in energy efficiency improvements, expected to save 10.2 billion Btu annually. BLM began using ESPCs in FY 2006. Previously, ESPCs have not been used by land management agencies because their facilities are relatively small, typically use less than \$100,000 annually of natural gas and electricity, and are scattered in remote areas of the country. To attract Energy Service Companies (ESCOs) and gain the numerous environmental and economic benefits, BLM presented a unique partnership to four DOE ESPC contractors. Upon successful completion of a pilot ESPC at National Interagency Fire Center and the BLM's Boise District Complex, all remaining BLM facilities would be split into two groups to be awarded in two subsequent phases. The pilot and packaging of assets into two contracts interested one of the four ESCOs, Johnson Controls, Inc. (JCI). From the start, BLM, JCI, and the DOE worked together to streamline the planning process associated with the use of an ESPC. The traditional 12 to 14 months from award of the ESPC to installation of energy conservation measures was reduced to six months for the pilot. NIFC and the Boise District received \$1.6 million dollars of engineering and energy conservation measures which include three new high efficiency boilers and control systems, light and ballast retrofits, with guaranteed annual savings of \$117,000. In addition, JCI applied for and BLM received \$100,000 from Idaho Power upon completion of the project implementation in

February 2007. While the pilot was deemed a success, further innovation was needed to cost effectively retrofit small remote facilities like campgrounds and fire stations that use \$1,000 to \$3,000 of energy annually. BLM and JCI partnered creating a new approach to further streamline the ESPC process. During Phase 2, JCI will visit approximately 10 percent of BLM's field facilities (e.g., fire stations, recreation sites, wild horse and burro facilities, air tanker bases, and visitor centers). Based on this sampling JCI will propose energy and water conservation and renewable energy opportunities for all of BLM owned facilities (i.e., those that use greater than \$1,000 of electricity annually) in the six states region.

### **Water Consumption**

In FY 2006, DOI reported using 3.0 billion gallons of water at a cost of \$13.1 million. Interior issued a policy on baselining water usage in March 2000. Bureaus established a baseline of portable water usage at owned buildings and focus conservation efforts on those buildings with the highest use. Interior continues to design and install low-flow or ultra low-flow plumbing fixtures in all new facilities. Public information related to drought and water conservation is available at many facilities. Among many notable Interior water reduction policies includes water audits performed by BLM at the National Interagency Fire Center, Boise Idaho as part of an ESPC. BLM continues its efforts to screen all facilities through study of water meter records for the year.

### **Training**

In FY 2006, DOI reported training 80 energy managers at a cost of \$92,000. During the reporting period, Interior energy managers provided information to personnel on available energy management training and encouraged them to attend as much training as operational requirements and funding permitted. Energy managers involved in building energy efficiency and water conservation have attended workshops offered by:

- DOE's Federal Energy Management Program,
- Environmental Protection Agency,
- Association of Energy Engineers,
- U.S. Green Buildings Council, and
- public utilities.

Topics covered in Interior training included:

- green power purchasing,
- LEED rating system,
- building insulation advances, and
- water conservation.

Interior energy personnel attended on-site training and satellite broadcasts of the FEMP courses on

- ESPC basic and advanced,
- UESC,
- Energy Policy Act of 2005,
- ComCheck-EZ,
- Developing Agency Metering Plans, and
- Implementing Renewable Energy Projects.

Energy managers disseminated relevant information concerning emerging technologies, alternative means of financing, and energy efficient practices; and developed employee outreach programs to educate building occupants about energy and water management programs.

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## ***I. Department of Justice***

### **Reduction Goal Performance**

In FY 2006, DOJ reported using 263,054 Btu per gross square foot in its goal subject buildings, a 9.0 percent decrease in energy intensity from 289,056 Btu/GSF used in FY 2003. DOJ received credit for purchases of 6.8 billion Btu of renewable energy in FY 2006, reducing the performance measure of these facilities from 263,154 Btu/GSF to 263,054 Btu/GSF.

### **Petroleum Use in Buildings**

Since FY 2003, DOJ has reduced petroleum-based fuel use in its goal subject buildings by 9.3 percent, from 188.8 billion Btu to 171.3 billion Btu in FY 2006.

### **Renewable Energy Use**

In FY 2006, DOJ reported using 7.2 billion Btu of renewable energy, equivalent to 0.1 percent of its facility electricity use. Of the total renewable energy used, 0.4 billion Btu was self-generated and 6.8 billion Btu was purchased.

### **Investment in Energy Efficiency**

In FY 2006, DOJ invested \$21.8 million in energy efficiency and renewable energy projects, 82.5 percent of its total facility energy costs. Of this total, \$787,900 was funded directly by the agency and \$21.0 million was financed through an energy savings performance contract. During FY 2006, DOJ did not finance any projects with utility energy service contracts.

A DOE Super ESPC contract was awarded during FY 2006 at the FBI Academy in Quantico, Virginia. Almost \$21.0 million in facility energy improvements will be undertaken and will be financed through \$43.5 million in guaranteed cost savings over the 19 year contract. Annual energy savings of more than 80.4 billion Btu is expected from the following energy efficiency measures:

- chiller improvements,
- building automation systems,
- heating, ventilating and air conditioning,
- lighting improvements,
- chilled water/steam distribution system improvements, and
- water and sewer systems.

### **Water Consumption**

In FY 2006, DOJ reported using 9.0 billion gallons of water at a cost of \$ 27.2 million.

### **Training**

In FY 2006, DOJ reported training 166 energy managers at a cost of \$8,600.

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## **J. Department of Labor**

### **Reduction Goal Performance**

In FY 2006, DOL reported using 100,861 Btu per gross square foot in its goal subject buildings, a 15.0 percent decrease in energy intensity from 118,769 Btu/GSF used in FY 2003. DOL received credit for purchases of 26.5 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 102,165 Btu/GSF to 100,861 Btu/GSF. Without the credit for renewable energy purchases, DOL's reduction from FY 2003 is 14.0 percent.

### **Excluded Buildings**

DOL has not excluded any buildings from the EPACT 2005 amendments goal. All DOL regional offices locations are under lease arrangements with GSA, which reports the energy performance of these buildings.

### **Petroleum Use in Buildings**

Since FY 2003, DOL has reduced petroleum-based fuel use in its goal subject buildings by 52.5 percent, from 362.4 billion Btu to 172.2 billion Btu in FY 2006.

### **Renewable Energy Use**

In FY 2006, DOL reported using 26.5 billion Btu of renewable energy, equivalent to 2.96 percent of its facility electricity use. The total amount of 26.5 billion Btu was purchased.

The Job Corps renewable energy plan relies on purchasing renewable energy certificates to satisfy the renewable energy goals. In FY 2006, the Department of Labor exceeded the EPACT goals by purchasing RECs from wind farms amounting to more than 7,770 megawatthours for the Job Corps program during FY 2006.

### **Investment in Energy Efficiency**

In FY 2006, DOL invested \$500,000 in energy efficiency and renewable energy projects, 1.2 percent of its total facility energy costs. During FY 2006 DOL did not finance any projects with energy savings performance contracts or utility energy service contracts.

### **Water Consumption**

In FY 2006, DOL reported using 1.0 billion gallons of water at a cost of \$4.8 million. Approximately 30 Job Corps Centers have had energy audits that revealed that many have energy efficient water fixtures installed. To increase water conservation, all new construction and renovation projects now use low-flow fixtures 1.6 GPF toilets, 1.0 GPF urinals, 2.5 GPM showerheads and 0.5 GPM faucets aerators. Low flow fixtures have been installed in the facilities where energy audits have been completed.

### **Training**

In FY 2006, DOL reported training 70 energy managers at a cost of \$300. Program flyers and mini-training sessions are utilized to promote energy savings and environmental initiatives and to keep staff up to date with the latest conservation requirements. The Department participates in training information sessions provided by the Environmental Protection Agency, Office of Federal Facilities Enforcement, and the Department of Energy's Federal Management Program (FEMP).

Job Corps includes information that promotes energy conservation awareness among its participants as part of regular student development and vocational skills training. Job Corp's base curriculum now includes (1) the importance of energy conservation, and (2) ways to improve the conservation and energy efficiency of residences and the overall campus. In addition, the Office of Job Corp has developed a web-based training curriculum of courses in partnership with IFMA (International Facility Management Association) covering energy and environmental topics.

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## **K. Department of State**

### **Reduction Goal Performance**

In FY 2006, the State Department reported using 113,746 Btu per gross square foot in its goal subject buildings, an 11.1 percent decrease in energy intensity from 127,885 Btu/GSF used in FY 2003. State reported that it did not receive credit for purchases of renewable energy in FY 2006.

### **Excluded Buildings**

The Department has not identified any excluded buildings under the EPACK 2005 amendments requirements during FY 2006. A portion of the Harry S. Truman (HST) headquarters building had formerly been considered exempt under Executive Order 13123 criteria.

### **Renewable Energy Use**

In FY 2006, the Department of State did not report any quantitative data on renewable energy use. However, they reported the installation of photovoltaic cells for parking lot lighting, perimeter building security lighting and a passive solar trough for hot water heating in its Florida Regional Center (FRC). Additional solar PV is scheduled to be installed at FRC to provide electrical power to the facility.

A small 35.1 kilowatt array is installed on the HST roof. The Department is examining the feasibility of installing a solar evacuation tube array on a portion of the HST roof, to help offset steam usage in the building. If that installation is determined to be life-cycle cost effective, the Department will install an array on the Marshall Wing, with subsequent arrays to be installed as additional quadrants of the building are renovated.

### **Investment in Energy Efficiency**

In FY 2006, State invested \$36,000 in energy efficiency and renewable energy projects, 0.2 percent of its total facility energy costs. State did not finance any projects with energy savings performance contracts or utility energy service contracts.

### **Water Consumption**

In FY 2006, the State Department reported using 28.7 million gallons of water at a cost of \$176,000. The Department has installed water saver wash-basin fixtures that reduce water consumption in most facilities. Facility managers are also working to install landscaping that does not require excessive watering.

### **Training**

In FY 2006, the State Department reported training 10 energy managers at no cost. All purchase/credit card holders are required to successfully complete appropriate procurement training—including “buying green” and ENERGY STAR purchasing requirements—on initial issuance of a credit card and periodically thereafter. The Deputy Assistant Secretary for Operations within the Bureau of Administration (A/OPR) is responsible for the acquisition, design, construction, renovation, and operation of the Department’s domestic real estate portfolio. A/OPR organizations support professional development of their staff through occasional training programs, seminars, and credentialing activities. This past year one individual became a LEED-certified professional, three other OPR staff maintained their Certified Energy Manager credentials, and several facility managers participated in sequential on-line seminars on energy conservation and sustainable buildings topics.

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## **L. Department of Transportation**

### **Reduction Goal Performance**

In FY 2006, DOT reported using 88,190 Btu per gross square foot in its goal subject buildings, a 13.0 percent decrease in energy intensity from 101,423 Btu/GSF used in FY 2003. DOT received credit for purchases of 7.1 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 89,180 Btu/GSF to 88,190 Btu/GSF. Without the credit for renewable energy purchases, DOT's reduction from FY 2003 is 12.1 percent.

### **Excluded Buildings**

In FY 2006 DOT reported using 2,938.1 billion Btu in its excluded buildings, 82.0 percent of the agency's total facility use. DOT's excluded buildings occupy 20.3 million square feet, 73.8 percent of the agency's total facility space. Below is an accounting of those buildings:

- The Federal Highway Administration's Turner-Fairbank Research Facility is a mixture of indoor and outdoor labs used for short and long term testing of various highway systems. A major portion of the facility is dedicated to laboratory space with some heavy process dedicated energy users.
- The Maritime Administration operates three ship storage facilities. Over 250 ships of the National Reserve Fleet are maintained in various states of readiness in support of the Department of Defense. Power is provided to the ships primarily for ventilation and cathodic protection in what is referred to as "Cold Iron Energy."
- The St. Lawrence Seaway Development Corporation operates two locks on the St. Lawrence River. During the winter months these locks are closed and drained of water for maintenance. Portions of the locks are temporarily partitioned and heated during maintenance. Since the locks are not buildings and are not industrial in nature, the energy consumed during maintenance is reported as excluded.
- The energy intensiveness of the process energy required by Federal Aviation Administration (FAA) excluded buildings over-

whelms the HVAC energy requirements and renders normal energy reduction measures as impracticable to meet reduction goals. The buildings and facilities listed on the FAA FY 2006 excluded buildings inventory are National Airspace System (NAS) electronic and plant support systems for air traffic control within the continental U.S.

### **Petroleum Use in Buildings**

Since FY 2003, DOT has reduced petroleum-based fuel use in its goal subject buildings by 60.5 percent, from 3.8 billion Btu to 1.5 billion Btu in FY 2006.

### **Renewable Energy Use**

In FY 2006, DOT reported using 24.3 billion Btu of renewable energy, equivalent to 0.9 percent of its facility electricity use. Of the total renewable energy used, 17.1 billion Btu was self-generated and 7.1 billion Btu was purchased. The Office of Real and Personal Property and Asset Management issued guidance on the use of renewable energy to all of the operating administrations in May 2006. As a result, the use of self-generated renewable energy and purchase of renewable energy certificates increased for FY 2006.

#### *Self Generated Renewable Energy*

FAA generated approximately 399 megawatthours of renewable energy in FY 2006 from a combination of hydrogen powered fuel cells, photovoltaic, and wind power systems. Two new 5-kilowatt fuel cell projects were installed in FY 2006. One fuel cell project was installed in the Eastern Service Area (ESA). The second fuel cell, funded by the DOE, was installed by our Central Service Area (CSA). The Western Service Area (WSA) installed 15 1-kilowatt fuel cells. Photovoltaic projects are underway in the CSA and WSA.

The Maritime Administration is completing the installation of geothermal heat pump systems to provide heating and cool for Jones Hall, Barry Hall, and Palmer Hall at the U.S. Merchant Marine Academy (USMMA). In addition, on the Fulton-Gibbs Hall roof a 10-kilowatt photovoltaic system currently provides electrical power to the electrical grid and the Academy facility.

### *Purchased Renewable Energy*

The FAA's Northwest Mountain Region is purchasing 5 percent of its energy requirements from renewable resources. The Research and Innovative Technology Administration's (RITA) Volpe Center procured 2.5 percent of its electric capacity from renewable sources via credits from a GSA area-wide contract.

### **Investment in Energy Efficiency**

In FY 2006, DOT invested \$2.3 million in energy efficiency and renewable energy projects, 2.1 percent of its total facility energy costs. During FY 2006, DOT did not finance any projects energy service performance contracts or with utility energy service contracts.

### **Water Consumption**

In FY 2006, DOT reported using and estimated 645.3 million gallons of water at an estimated cost of \$3 million. DOT reported that it is extremely difficult to develop accurate water consumption data due to the wide variation in units of measure used by water authorities and the lack of any metering at some locations. Specific water conservation was provided at the U.S. Merchant Marine Academy through the installation of over 900 new water fixtures.

### **Training**

In FY 2006, DOT reported training 20 energy managers at a cost of \$27,700. DOT relies heavily on the broad training opportunities offered by the annual energy conferences sponsored by the DOE, GSA, and DOD. DOT also relies on the "You Have the Power" campaign materials for its outreach and employee awareness efforts.

The FAA Air Traffic Organization's Energy Management Program Office organized two national training workshops in FY 2006 for Center and Regional Energy Managers. The first workshop was held in Chicago, Illinois. It was planned in conjunction with the Winter Meeting of the American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) and the Air-conditioning, Heating, Refrigerating (AHR) Conference and Exposition. Workshop attendees reviewed and evaluated the technologies and discussed their performance capabilities with

on-site manufacturer representatives. In addition to visiting the trade show, the workshop attendees visited the Pawaukee Airport remote transmitter/receiver (RTR). This RTR site is unique because it uses a fuel cell to provide 72 hours of clean, back-up power.

The second workshop, held in Denver, Colorado, in conjunction with Solar 2006, provided education and training on photovoltaic and wind power generators, power optimization controllers, solar heating solutions and design seminars. The workshop also provided a forum for FAA energy team members to discuss ongoing energy projects, organizational changes and future funding for the energy program.

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## **M. Department of the Treasury**

### **Reduction Goal Performance**

In FY 2006, Treasury reported using 154,216 Btu per gross square foot in its goal subject buildings, a 15.8 percent decrease in energy intensity from 183,237 Btu/GSF used in FY 2003. Treasury received credit for purchases of 44.9 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 157,784 Btu/GSF to 154,216 Btu/GSF. Without the credit for renewable energy purchases, Treasury's reduction from FY 2003 is 13.9 percent.

During FY 2006, the majority of Department of the Treasury and its bureaus occupied space was located in General Services Administration (GSA) assigned facilities. Treasury reports energy statistics only for the Treasury owned and GSA delegated space for which it controls the utilities.

### **Excluded Buildings**

The Internal Revenue Service has parking lot lights that are separately metered in Atlanta, Georgia and Covington, Kentucky and the consumption data for which are reported as excluded energy.

In addition, the Atlanta Main and the Atlanta child care electricity and natural gas are reported by GSA Atlanta due to a consolidated purchasing agreement.

### **Petroleum Use in Buildings**

Since FY 2003, Treasury has reduced petroleum-based fuel use in its goal subject buildings by 14.1 percent, from 61.5 billion Btu to 52.8 billion Btu in FY 2006.

### **Renewable Energy Use**

In FY 2006, Treasury reported using 44.9 billion Btu of renewable energy, equivalent to 3.4 percent of its facility electricity use. The entire 44.9 billion Btu was purchased.

#### *Self Generated Renewable Energy*

Treasury has not yet fully implemented any self-generating renewable energy projects.

#### *Purchased Renewable Energy*

It is the Bureau of Engraving and Printing's (BEP) policy to encourage purchase and generation of electricity from renewable energy sources. At the Western Currency Facility (WCF), 5 percent of electrical consumption is renewable energy purchased from an electric utility company. This practice has been in place since FY 2004. At District Currency Facility (DCF) starting from October 2006, 3 percent of electrical consumption will be renewable energy. Also, a feasibility study is being conducted to evaluate the opportunity for installing solar or wind energy at the WCF site.

The IRS made a corporate purchase of 7,000 megawatthours of renewable energy certificates (RECs) from Biomass Corporation in FY 2006. IRS qualified for and joined the Environmental Protection Agency Green Power Partnership in 2005.

In FY 2006, the Mint purchased 1,163.9 megawatthours of renewable energy from an electric utility company.

The Bureau of Public Debt purchased 3,000 megawatthours of RECs from Biomass Corporation generators located in Georgia, South Carolina and Alabama.

### **Investment in Energy Efficiency**

In FY 2006, Treasury invested \$3.7 million in energy efficiency and renewable energy projects, 8.3 percent of its total facility energy costs. During FY 2006 Treasury did not finance any projects with energy savings performance contracts or utility energy service contracts.

### **Water Consumption**

In FY 2006, Treasury reported using 415.2 million gallons of water at a cost of \$1.8 million. Water is used at the Bureau of Printing and Engraving for industrial/process purposes and for potable/domestic water for employees. The Bureau continues to investigate the possibility of recycling water from the spent intaglio water wipe solution that is used for cleaning engraved inked plates used for printing Federal Reserve Notes. This process accounts for the use of as much as 65,000 to 80,000 gallons of water per day.

All 11 IRS sites have developed Water Management Plans. The IRS Headquarters building in Washington DC is not billed for water under a multi-agency agreement between GSA and the District of Columbia. Lastly, the United States Mint established objectives to complete best management practices for water conservation at each of its facilities in FY 2007.

### **Training**

In FY 2006, Treasury reported training 32 energy managers at a cost of \$30,700. In FY 2006, 22 (18 IRS), (2 BEP), (1 Mint) and (1 headquarters) employees attended the Department of Energy sponsored Energy 2006 workshop and conference.

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## **N. Department of Veterans Affairs**

### **Reduction Goal Performance**

In FY 2006, VA reported using 195,914 Btu per gross square foot in its goal subject buildings, a 5.4 percent decrease in energy intensity from 207,166 Btu/GSF used in FY 2003. VA received credit for purchases of 309.8 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 198,092 Btu/GSF to 195,914 Btu/GSF. Without the credit for renewable energy purchases, VA's reduction from FY 2003 is 4.4 percent.

### **Petroleum Use in Buildings**

Since FY 2003, VA has reduced petroleum-based fuel use in its goal subject buildings by 43.9 percent, from 1,659.6 billion Btu to 931.2 billion Btu in FY 2006.

### **Renewable Energy Use**

In FY 2006, VA reported using 312.0 billion Btu of renewable energy, equivalent to 3.0 percent of its facility electricity use. Of the total renewable energy used, 2.1 billion Btu was self-generated and 309.8 billion Btu was purchased. VA included language in energy assessment solicitation documents to cover renewable energy potential.

#### *Self Generated Renewable Energy*

VA conducted a national survey of facilities to gather information about sites currently generating renewable energy, as well as sites interested in generating renewable energy.

#### *Purchased Renewable Energy*

VA purchased over 90 million kilowatthours of renewable energy, mostly in the form of renewable energy certificates (RECs). VA also identified the most favorable green power markets for VA purchases and high-potential locations for renewable generation projects.

### **Investment in Energy Efficiency**

In FY 2006, VA invested \$8.43 million in energy efficiency and renewable energy projects, 2.1 percent of its total facility energy costs. This amount was funded directly by the agency, with no projects financed with energy savings performance contracts or utility energy service contracts.

### **Water Consumption**

In FY 2006, VA reported using 10.9 billion gallons of water at a cost of \$26.7 million. An increasing number of VA facilities are practicing best water management techniques, and the National Cemetery Administration (NCA) is leading the way in innovative practices. However, VA's mission in both the cemetery and health care environments means that reductions achievable in certain applications are limited. Additionally, the opening of new water-consuming facilities will add to total consumption.

### **Training**

In FY 2006, VA reported training 349 energy managers at a cost of \$70,000. VA co-sponsored DOE's annual energy workshop, Energy 2006, in Chicago. VA speakers addressed participants at a number of sessions, and VA conducted a one-and-a-half-day training session immediately following the event for VA employees.

In August, NCA trained all 165 individuals responsible for inputting energy data into its consumption and cost database via training sessions at NCA's annual National Conference.

VA's Office of Acquisition and Materiel Management offered conferences designed to assist VA Administrations and staff offices to meet federal mandates regarding acquisition of energy-efficient products and materials.

Veterans Health Administration added energy management sessions to its annual engineering conference held in August. Sessions addressed EPACT 2005 requirements, VA's Action Plan, and renewable energy.

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## **O. Environmental Protection Agency**

### **Reduction Goal Performance**

In FY 2006, EPA reported using 189,659 Btu per gross square foot in its goal subject buildings, a 45.3 percent decrease in energy intensity from 347,036 Btu/GSF used in FY 2003. EPA received credit for purchases of 554.1 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 340,113 Btu/GSF to 189,659 Btu/GSF. Without the credit for renewable energy purchases, EPA's reduction from FY 2003 is 2.0 percent.

### **Petroleum Use in Buildings**

Since FY 2003, EPA has reduced petroleum-based fuel use in its goal subject buildings by 55.6 percent, from 73.8 billion Btu to 32.8 billion Btu in FY 2006.

### **Renewable Energy Use**

In FY 2006, EPA reported using 562.7 billion Btu of renewable energy, equivalent to 122.7 percent of its facility electricity use. Of the total renewable energy used, 8.7 billion Btu was self-generated and 554.1 billion Btu was purchased.

#### *Purchased Renewable Energy*

On September 1, 2006, EPA became the first federal agency to purchase green power or renewable energy certificates (RECs) equivalent to 100 percent of its annual electricity use at all of its 190 facilities nationwide. EPA reached 100 percent green power by finalizing a green power contract on June 2, 2006, its largest contract to date. This contract calls for 110 million kilowatt-hours annually in RECs from 3 Phases Energy Services supporting wind farms in California, Wyoming, Oklahoma, and South Dakota. This single contract covers the electricity used by multiple EPA facilities not yet purchasing green power. The contract also covers existing contracts that were to expire in the near future. EPA's green power purchases support the development of various renewable energy sources in 19 states.

#### *Self Generated Renewable Energy*

EPA continued to operate numerous renewable energy self-generation technologies in FY 2006,

including solar arrays, PV lighting, solar-water heating systems, a solar wall, solar power awnings, a ground-source heat pump, and lake cooling water. For example, the agency continued to operate a 100-kilowatt PV array installed in April 2002 on the roof of the Nation Computer Center in Research Triangle Park and a 10-kilowatt solar array installed on the roof of its Region 5 in Chicago's Metcalf Federal Building in 2000. EPA's Region 10 laboratory also continued operation of 28 solar panels with a combined 2kW capacity.

### **Investment in Energy Efficiency**

In FY 2006, EPA invested almost \$3.0 million in energy efficiency and renewable energy projects, 13.9 percent of its total facility energy costs. During FY 2006 EPA did not finance any projects with energy savings performance contracts or utility energy service contracts.

### **Water Consumption**

Throughout FY 2006, EPA took steps to significantly reduce its water consumption with the aim of reaching the agency's 15 percent reduction goal by FY 2010 from a FY 2000 baseline. In FY 2006, EPA's laboratories used 218.5 million gallons of water, at a cost of \$1.2 million, or 59.8 gallons per square foot, a 6.7 percent reduction from the FY 2000 baseline (63.6 gallons/square foot).

One notable water conservation project was the completion in May 2006 of a condensate recovery system at the Kansas City Science and Technology Center. This system captures condensation from the facility's four air handling units and reuses the collected water in the facility's cooling towers and low-flow toilets.

During FY 2006, as part of its ongoing commitment to efficient water management, EPA completed water assessments and signed water management plans at five of its laboratories, bringing the agency's total number of signed water management plans to 62 percent of facilities.

### **Training**

In FY 2006, EPA reported training 47 energy managers at a cost of \$29,000. EPA's energy

management team uses continuing education and training programs to support individual and team efforts in energy efficiency.

EPA's Laboratories for the 21st Century (Labs21) is a voluntary partnership program dedicated to improving the environmental performance of U.S. laboratories. In addition to an annual conference, Labs21 introductory and advanced training courses trained nearly 500 people in seven different locations throughout the country in FY 2006.

In other efforts to educate employees on the importance of environmental performance, *Energizing EPA* is an internal newsletter that highlights the Agency's efforts to improve overall sustainability, including energy and water efficiency, at its facilities. The newsletter is produced on a quarterly basis and distributed electronically to all EPA employees to educate them about such issues as energy efficiency, green power, green buildings, alternative energy, recycling programs, water conservation, and low-impact development/stormwater management.

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## **P. General Services Administration**

### **Reduction Goal Performance**

In FY 2006, GSA reported using 70,414 Btu per gross square foot in its goal subject buildings, a 7.9 percent decrease in energy intensity from 76,449 Btu/GSF used in FY 2003. GSA received credits for purchases of 442.1 billion Btu of renewable energy and for project source energy savings of 2.3 billion Btu in FY 2006, reducing the performance measure of these buildings from 72,892 Btu/GSF to 70,414 Btu/GSF. Without these credits, GSA's reduction from FY 2003 is 4.7 percent. The agency achieved this reduction by directly investing in energy and water conservation opportunities with paybacks of 10 years or less.

### **Excluded Buildings**

In FY 2006 the GSA reported using 5,031.0 billion Btu in its excluded buildings, 27.8 percent of the agency's total facility use. GSA's excluded buildings occupy 33,211.2 thousand square feet, 15.6 percent of the Agency's total facility space. Generally this space is excluded from the EPACT 2005 amendments performance goals of the following reasons:

- buildings under renovation,
- buildings entering or leaving the inventory that do not have a full year of data,
- leased space where GSA doesn't pay all utilities,
- lease space that comprises only part of a building,
- building disposal is pending,
- buildings that are partially vacant,
- parking facilities with minimal energy use, and
- border stations where goal performance is impracticable due to energy-intensive, mission-related process loads.

### **Petroleum Use in Buildings**

Since FY 2003, GSA has reduced petroleum-based fuel use in its goal subject buildings by 21.2 percent, from 129.3 billion Btu to 101.9 billion Btu in FY 2006.

### **Renewable Energy Use**

In FY 2006, GSA reported using 445.4 billion Btu

of renewable energy, equivalent to 4.5 percent of its facility electricity use. Of the total renewable energy used, 3.3 billion Btu was self-generated and 442.1 billion Btu was purchased.

#### *Self Generated Renewable Energy*

In FY 2006, GSA received and estimated 3.3 billion Btu in energy use from renewable energy projects. Approximately 543.7 megawatthours were generated from GSA's 12 PV installations, 600 million Btu was from GSA's two solar thermal projects and 830 million Btu came from a completed geothermal project. GSA also has funded the repair of five existing solar thermal projects that are currently inactive to bring them back to operating condition.

In FY 2006, GSA funded two new PV systems. The first is a 40-kilowatt array at the Trenton Courthouse Annex. The second is a 300-kilowatt building-integrated PV array at the National Archives facility in Waltham, MA.

#### *Purchased Renewable Energy*

In FY 2006, GSA purchased a total of 129,575 megawatthours of electricity from renewable sources through competitive power contracts and use of green power programs offered by local distribution companies. The decrease in the level of green power purchases made by GSA was in large part to the lack of renewable guidance from DOE determining whether or not there would continue to be a Btu reduction credit toward the energy reduction goal for these purchases.

### **Investment in Energy Efficiency**

In FY 2006, GSA invested \$30.3 million in energy efficiency and renewable energy projects, 7.5 percent of its total facility energy costs. Of this total, \$28 million was funded directly by the agency and \$2.3 million was financed through energy savings performance contracting. During FY 2006 GSA did not finance any projects with utility energy service contracts.

In FY 2006, GSA awarded one ESPC for \$2.3 million in energy efficiency improvements, expected to save 10.6 billion Btu annually. The ESPC will accomplish energy retrofits at both the Whittaker Courthouse and Dole Courthouse in Kansas City.

## **Water Consumption**

In FY 2006, GSA reported using almost 3.8 billion gallons of water at a cost of \$24.8 million. This represents consumption for GSA's entire owned facility inventory. The cost also includes sewage charges in many sites.

In FY 2006, GSA funded and implemented several water conservation projects. The Denver Federal Center implemented several drip irrigation systems at various building in the Federal Center complex and are anticipated to save up to 60 percent of the water usage. Additionally, plumbing fixtures were updated with aerators. GSA finalized a Water Management Guide in FY 2000, which is posted on the GSA Energy Center of Expertise's website for use by any federal agency ([www.gsa.gov/pbs/centers/energy](http://www.gsa.gov/pbs/centers/energy)). GSA utilizes a proactive approach with water management. Every GSA facility has an O&M plan that incorporates water management. The majority of the scopes of work for energy audits that GSA completes each year, include water conservation as well. Lastly, GSA has a comprehensive maintenance program that already incorporates many of the Best Management Practices for water conservation.

## **Training**

In FY 2006, GSA reported training 110 energy managers at a cost of \$140,000. In 2006, GSA held or co-sponsored five conferences/workshops in partnership with Federal agencies and state governments. Among these conferences was Energy 2006 in Chicago, IL, Aug. 7-9, 2006 with approximately 1,400 attendees. GSA also continues to train its own personnel in all aspects of energy and water management and conservation. GSA also includes project managers responsible for renovation and new construction projects in many of these training activities. GSA currently has on staff 28 trained energy managers. Routine training includes such topics, among others, as

- Industrial Energy Process and Building Analysis,
- ASHRAE 90.1,
- Energy Management Techniques, and
- Building Life Cycle Costing.

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## **Q. National Aeronautics and Space Administration**

### **Reduction Goal Performance**

In FY 2006, NASA reported using 190,273 Btu per gross square foot in its goal subject buildings, an 11.9 percent decrease in energy intensity from 215,922 Btu/GSF used in FY 2003. NASA received credit for purchases of 349.5 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 201,361 Btu/GSF to 190,273 Btu/GSF. Without the credit for renewable energy purchases, NASA's reduction is 6.7 percent.

### **Excluded Buildings**

In FY 2006, NASA reported using 2,865.7 billion Btu in its excluded buildings, 28.6 percent of the agency's total facility use. NASA requested exclusions from energy intensity reduction requirements for almost 7.4 million square feet, 18.1 percent of the Agency's total facility space. Examples of exclusions include abandoned buildings with abnormally low Btu/GSF, and highly specialized energy-intensive facilities constructed for specific space flight and research programs, such as wind tunnels driven by multi-thousand horsepower electric motors, space simulation chambers, and space communication facilities. The facilities range from pre-World War II aeronautical test installations to newer facilities that support the Space Shuttle, International Space Station, and deep space exploration programs.

### **Petroleum Use in Buildings**

Since FY 2003, NASA has reduced petroleum-based fuel use in its goal subject buildings by 22.8 percent, from 220.8 billion Btu to 170.5 billion in FY 2006. In order to further reduce facility petroleum consumption, Marshall Space Flight Center (MSFC) is utilizing Strategic Institutional Investment (SII) funds to convert three fuel oil fired boilers to operate on 80/20 fuel oil/biodiesel blend, which will save approximately 36,000 gallons of fuel oil annually.

### **Renewable Energy Use**

In FY 2006, NASA reported using 371.1 Btu of renewable energy, the equivalent of 6.9 percent of NASA's electricity consumption.

### *Self Generated Renewable Energy*

In FY 2006, NASA's Deputy Administrator dedicated \$1.3 million of SII funding to conduct a renewable energy assessment of the major Space Centers and component facilities and provide design assistance. This effort intends to assess key variables like renewable energy resources, utility rates, rebates, and mission compatibility at each site, determine optimal locations within NASA for deploying or purchasing renewable energy, and generate initial designs of the most promising potential systems.

NASA's FY 2006 renewable energy efforts include the following:

- Jet Propulsion Laboratory (JPL) designed a PV system in conjunction with an FY 2007 roof replacement project.
- Kennedy Space Center (KSC) is utilizing SII funds to enable a new facility construction project to install PV parking lot lighting.
- JPL partnered with a PV system developer to provide system hardware, NASA will fund installation costs from SII funds, and JPL will act as a test site for the technology and provide system data to the developer in exchange for the energy produced.
- Ames Research Center (ARC) designed an expansion for one of its PV arrays and is pursuing project funding.

### *Purchased Renewable Energy*

NASA has focused its efforts on purchasing renewable energy from sources that are cost competitive with conventional energy sources. The following purchases were reported in FY 2006:

- Goddard Space Flight Center (GSFC) purchased 187.7 billion Btu of landfill methane in FY 2006, which avoided \$1.3 million compared to the cost of conventional energy. GSFC converted a third boiler to burn landfill methane, and the supplier modified the system at the landfill.
- Dryden Flight Research Center (DFRC) purchased 11,885 megawatthours of green electricity in FY 2006.
- Johnson Space Center (JSC) purchased 40,000 megawatthours in RECs through a Defense Energy Support Center solicitation. These RECs cover the incremental cost of generating

electricity from municipal solid waste.

- ARC purchased 1,600 megawatthours of RECs through the Western Area Power Administration.

### **Investment in Energy Efficiency**

In FY 2006, NASA invested \$13.8 million in energy efficiency and renewable energy projects, 9.0 percent of its total facility energy costs. During FY 2006 NASA did not finance any projects with energy savings performance contracts or utility energy service contracts.

### **Water Consumption**

In FY 2006, NASA reported using almost 2.0 billion gallons of water at a cost of \$ 4.4 million. This represents a 4.3 percent decrease from the 2.1 billion gallons used in FY 2003. Twenty-seven percent of NASA Centers and component facilities have water management plans in place and have fully implemented at least four of the DOE Best Management Practices for water conservation. While this falls slightly short of the required 30 percent, another 40 percent of facilities met half the requirement (either the site created a plan and has not implemented at least four BMPs, or the site's plan remains incomplete and the site implemented at least four BMPs). Centers implemented the following water conservation activities in FY 2006:

- GSFC completed a project to fund flush valve replacement on toilets and urinals, which will reduce annual water consumption 1.6 million gallons.
- MSFC is continuing its efforts to identify and eliminate all once-through cooling systems, such as 2.6 million gallons per year at Building 4711.
- Langley Research Center (LaRC) designed a project to replace the city water supply with a closed-loop cooling system for cooling research cryogenic pumps. When implemented in FY 2007, the project will avoid 1.2 million gallons per year.

### **Training**

In FY 2006, NASA reported training 70 energy managers at a cost of \$151,000. Previously, NASA headquarters developed and conducted an Energy Efficiency and Water Conservation course to

educate civil servants on the basics of conducting an energy/water program. Instead of repeating the course, in FY 2006 NASA tried an alternative approach—centrally funding registration costs for civil servants to participate in DOE's Energy 2006 Federal workshop, and conducting an all-day Energy Efficiency Panel (EEP) meeting at the workshop location on the day after the workshop. Through this approach, NASA funded and registered at the discounted team rate 16 civil servants, and several Centers separately registered contractor personnel. Feedback from participants supports repeating this approach. In addition to benefiting from the workshop, NASA contributed two speakers to sessions.

NASA conducted a Sustainable Design of Facilities (SDF) course at ARC during FY 2006. The SDF course was developed to give energy and facilities management professionals the knowledge and skills required to successfully implement sustainable designs in new and renovation construction projects. NASA employees attended a variety of other training opportunities to further support NASA's mission. Opportunities included topics such as Association of Energy Engineers comprehensive training for energy managers, American Society of Heating, Refrigeration, and Air conditioning Engineers (ASHRAE) "Sustainability and the Building Environment," lighting, energy monitoring and control systems (EMCS), and metering. Several NASA Centers hosted employee energy awareness activities as part of October Energy Awareness Month and Earth Day observances. MSFC efforts targeted informing building managers about EPA Act 2005 requirements. NASA Headquarters continued broadcasting recurring energy conservation messages to all employees via the Headquarters Information Television closed circuit system.

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## **R. National Archives and Records Administration**

### **Reduction Goal Performance**

In FY 2006, NARA reported using 156,992 Btu per gross square foot in its goal subject buildings, a 13.3 percent decrease in energy intensity from 181,166 Btu/GSF used in FY 2003. NARA did not purchase any renewable energy in FY 2006.

### **Renewable Energy Use**

In FY 2006, NARA did not report using any renewable energy. The organization does not utilize any self-generated energy from renewable sources. NARA does however, purchase electricity through a GSA area-wide contract which mandates that 3 percent of the energy bought under the contract be from renewable sources.

### **Investment in Energy Efficiency**

In FY 2006, NARA invested almost \$6.5 million in energy efficiency and renewable energy projects, 49.2 percent of its total facility energy costs. Of this total, \$584,000 was funded directly by the agency and \$5.9 million was financed through energy savings performance contracting. During FY 2006 NARA did not finance any projects with utility energy service contracts.

In FY 2006, NARA awarded one ESPC for \$5.2 million in energy efficiency improvements, expected to save 58.9 billion Btu annually. The project is at the Archives II in College Park, Maryland and includes the following energy efficiency measures:

- chiller improvements,
- building automation systems,
- heating, ventilating and air conditioning, and
- lighting improvements.

### **Water Consumption**

In FY 2006, NARA reported using 75.6 million gallons of water at a cost of \$532,000. Strong water conservation measures continue at NARA. Archives II has awarded a contract for a cooling tower well that will replace roughly one third of the Archives II consumption with well water. As part of the Archives II ESPC, all plumbing fixtures in the building have been replaced with low flow devices.

### **Training**

In FY 2006, NARA reported training 19 energy managers at a cost of \$24,000. Several members of the agency energy team attended the DOE FEMP Energy 2006 workshop and conference in Chicago, Illinois. All Presidential Library facility managers attended a week long training program at Archives II in August of 2006.

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## **S. Railroad Retirement Board**

### **Reduction Goal Performance**

In FY 2006, RRB reported using 98,876 Btu per gross square foot in its headquarters building, the sole building subject to the EPACT 2005 amendments goal, a 4.8 percent decrease in energy intensity from 103,877 Btu/GSF used in FY 2003. RRB received credit for purchases of 156 million Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 99,452 Btu/GSF to 98,876 Btu/GSF. Without the credit for renewable energy purchases, RRB's reduction from FY 2003 is 4.3 percent.

The headquarters building in Chicago, Illinois is the only building over which the RRB has operational control. The RRB operates and maintains the building under a delegation of authority agreement established April 1, 1986 with GSA. A negligible increase in Btu/GSF levels from FY 2005 to FY 2006 was a significant accomplishment considering that the Chicago area experienced some unusually colder temperatures during the winter months. These variations in temperatures from year-to-year as reflected in heating degree days and cooling degree days are not taken into account in the simple Btu/GSF calculation.

### **Excluded Buildings**

There are no excluded buildings. Regional and field locations for the RRB are in GSA leased facilities and are reported under the GSA inventory of properties.

### **Renewable Energy Use**

In FY 2006, RRB reported using 156 million Btu of purchased renewable energy.

### **Investment in Energy Efficiency**

In FY 2006, RRB invested \$15,000 in energy efficiency and renewable energy projects, 2.8 percent of its total facility energy costs. During FY 2006, RRB did not finance any projects through energy savings performance contracts or utility energy service contracts.

### **Water Consumption**

In FY 2006, RRB reported using 530,000 gallons of water at a cost of \$16,600.

### **Training**

In FY 2006, RRB reported training three energy managers at no cost.

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## **T. Social Security Administration**

### **Reduction Goal Performance**

In FY 2006, SSA reported using 111,508 Btu per gross square foot in its goal subject buildings, a 10.3 percent decrease in energy intensity from 120,300 Btu/GSF used in FY 2003. SSA received credit for purchases of 4.6 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 112,006 Btu/GSF to 111,508 Btu/GSF. Without the credit for renewable energy purchases, SSA had a decrease of 9.9 percent from FY 2003.

### **Petroleum Use in Buildings**

Since FY 2003, SSA has reduced petroleum-based fuel use in its goal subject buildings by 30.9 percent, from 44 billion Btu to 30.4 billion Btu in FY 2006.

### **Renewable Energy Use**

In FY 2006, SSA reported using 5.0 billion Btu of renewable energy, equivalent to 0.7 percent of its facility electricity use. Of the total renewable energy used, 0.4 billion Btu was self-generated and 4.6 billion Btu was purchased.

#### *Self Generated Renewable Energy*

SSA has three self-generating renewable energy systems, described below:

- Mid-Atlantic Social Security Center in Philadelphia, Pennsylvania has a solar hot water system that has been on line since 2003. This system saves approximately 10,300 kilowatt-hours of electricity per year. SSA has also installed solar/wind lighting on the parking lot of this facility.
- Harold Washington Social Security Center (HWSSC) in Chicago, IL has a 100-kilowatt photovoltaic solar system which came on-line in July of 2005. In FY 2006, this system generated 90,645 kilowatt-hours of electricity.
- The Frank Hagel Federal Building in Richmond, CA installed a 17-kilowatt photovoltaic system which came on line in April 2006.

#### *Purchased Renewable Energy*

Ten percent of the power for SSA's Joseph P. Addabbo Federal Building in Jamaica, NY is from renewable sources. SSA purchased a total of almost 1.4 megawatthours of renewable power.

### **Investment in Energy Efficiency**

In FY 2006, SSA invested \$2.3 million in energy efficiency and renewable energy projects, 9.6 percent of its total facility energy costs. Of this total, \$370,000 was funded directly by the agency and almost \$2.0 million was financed through a energy savings performance contract. During FY 2006 SSA did not finance any projects with utility energy service contracts.

In FY 2006, SSA awarded one ESPC for almost \$2.0 million in energy efficiency improvements, expected to save 13.7 billion Btu annually. HWSSC in Chicago, IL, awarded a Super ESPC in FY 2006, and the construction phase is underway. This delivery order will implement a variety of energy conservation measures to generate savings, including chilled water improvements, energy management system improvements, building re-commissioning and high-efficiency lighting and lighting controls. To ensure the energy savings are realized, SSA will have continuous building commissioning services for the life of the contract.

### **Water Consumption**

In FY 2006, SSA reported using 116 million gallons of water at a cost of \$617,000. SSA's Headquarters Operation Building is undergoing major restroom renovations, which include water-conserving fixtures and technologies.

### **Training**

In FY 2006, SSA reported training 31 energy managers at a cost of \$11,000. Ten SSA employees attended the Energy 2006 workshop and conference. Other training in FY 2006 included: Advanced training on ESPCs and Super ESPCs, National Facilities Management and Technology Conference, Building Owners and Managers Association conference and various energy company seminars on renewable energy at the local and regional level. SSA staff members are active participants on numerous committees including, DOE's Interagency Energy Manage-

ment Task Force, “You Have the Power” committee, and Leadership in Energy and Environmental Design implementation committee.

SSA educates its employees nationwide on the need for and benefits of energy conservation through an awareness program using e-mail, websites, and newsletters.

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## **U. Tennessee Valley Authority**

### **Reduction Goal Performance**

In FY 2006, TVA reported using 62,273 Btu per gross square foot in its goal subject buildings, a 5.0 percent decrease in energy intensity from 65,530 Btu/GSF used in FY 2003. TVA received credit for purchases of 4.0 billion Btu of renewable energy in FY 2006, reducing the performance measure of these buildings from 62,695 Btu/GSF to 62,273 Btu/GSF. Without the credit for renewable energy purchases, TVA's reduction from FY 2003 is 4.3 percent.

### **Excluded Buildings**

In FY 2006, TVA reported using 1,304.6 billion Btu in its excluded buildings, 68.7 percent of the agency's total facility use. TVA's excluded buildings occupy 19.4 million square feet, 67.2 percent of the agency's total facility space. Energy reduction in these buildings has become increasingly more difficult given the majority of the energy consumption in these buildings is largely attributed to process energy (generation and transmission of electricity). In recognition of this and the fact that only so much can be done to make these buildings more efficient in a cost effective manner, TVA has decided to exclude these buildings.

### **Petroleum Use in Buildings**

Since FY 2003, TVA has reduced petroleum-based fuel use in its goal subject buildings by 53.3 percent, from 1.5 billion Btu to 0.7 billion Btu in FY 2006.

### **Renewable Energy Use**

In FY 2006, TVA reported using 53.4 billion Btu of renewable energy, equivalent to 2.8 percent of its facility electricity use. Of the total renewable energy used, 49.4 billion Btu was self-generated and 4.0 billion Btu was purchased.

#### *Self Generated Renewable Energy*

Through TVA's Green Power Switch (GPS) program, TVA utilizes photovoltaics, wind, and methane as part of its mix to provide renewable energy to its customers. TVA and 12 public power companies launched GPS on Earth Day, April 22, 2000. GPS was the first program of its kind

offered in the Southeast and provided consumers with an economical opportunity to participate in TVA's development of renewable energy resources. The program originally included supply from wind and solar energy sources. The program was expanded in FY 2001 to include electricity generated from methane gas at a waste water treatment plant in Memphis, Tennessee. Under the GPS program, residential customers can purchase green power blocks of 150 kilowatt hours each, at a cost of \$4.00 per block. These blocks represent approximately 12 percent of a typical home's monthly energy use. Commercial and industrial customers can sign up for the 150 kilowatt hour blocks based on the amount of energy they use each month. As of September 30, 2006, there were 95 TVA power distributors participating in the GPS program throughout the Tennessee Valley.

#### *Purchased Renewable Energy*

TVA purchased 1,170 megawatthours of renewable energy for use in its Knoxville Office Complex, Chattanooga Office Complex, and Huntsville office.

### **Investment in Energy Efficiency**

In FY 2006, TVA invested \$276,000 in energy efficiency and renewable energy projects, 0.9 percent of its total facility energy costs. The total amount was funded directly by the agency. In FY 2006 TVA did not finance any projects with energy savings performance contracts or utility energy service contracts.

### **Water Consumption**

In FY 2006, TVA reported using 145.8 million gallons of water with an estimated cost of \$306,000. TVA considers water management plans as part of its operation and maintenance activities. As part of these activities, more than 271 facilities have been covered, representing over 4.3 million square feet. To date, TVA has implemented Best Management Practices in more than 11 percent of its gross square footage.

### **Training**

In FY 2006, TVA reported training 180 energy managers at a cost of \$27,000. The TVA Intranet and employee awareness programs are used as tools to educate employees on how they impact

energy efficiency and use, both at work and at home. During FY 2006, TVA articles included the successful implementation of personnel workstation occupancy sensors, demonstration of a membrane energy recovery system (MERV), fuel efficient and money saving driving tips, and President Bush's directive to reduce energy use and improve fuel-conservation measures. Employees are shown their impact on facility energy use through a facility performance poster campaign. Posters showing monthly energy use and energy saving tips are placed in the lobbies of major energy-using facilities. Energy efficiency and information updates on current federal requirements and regulations are provided to employees, managers, and TVA customers upon request.

Energy management and associated environmental training is provided to managers and employees as needed. TVA also educates staff on energy and environmental related topics through the TVA Employee Technical Training and Organizational Effectiveness (ETT&OE) group.

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## **V. United States Postal Service**

### **Reduction Goal Performance**

In FY 2006, USPS reported using 66,997 Btu per gross square foot in its goal subject buildings, a 1.3 percent decrease in energy intensity from 67,882 Btu/GSF used in FY 2003. USPS did not receive any credit for purchases of renewable energy in FY 2006.

### **Excluded Buildings**

The Postal Service does not have any excluded buildings. Instead, it excludes the separately-metered energy use is essential and critical to the USPS mission. Therefore, this operational energy usage is excluded from the reduction goals.

### **Petroleum Use in Buildings**

Since FY 2003, USPS has reduced petroleum-based fuel use in its goal subject buildings by 20.4 percent, from 948.5 billion Btu to 755.4 billion Btu in FY 2006.

### **Renewable Energy Use**

In FY 2006, USPS reported using 4.0 billion Btu of renewable energy, equivalent to 0.02 percent of its facility electricity use. The total 4.0 billion Btu was self-generated.

#### *Self Generated Renewable Energy*

The USPS has working solar PV systems at Postal facilities in California and Rhode Island. Postal facilities in Oklahoma and Maryland are using geothermal heat pump technology to provide heating and cooling. Vendors participating in the Postal Service's Shared Energy Savings (SES) program are tasked to identify candidate facilities for potential renewable energy projects.

### **Investment in Energy Efficiency**

In FY 2006, USPS invested \$53.0 million in energy efficiency and renewable energy projects, 8.7 percent of its total facility energy costs. Of this total, \$34.9 million was funded directly by the agency and \$18.1 million was financed through the USPS performance contracting vehicle, SES contracts. During FY 2006 USPS did not finance any projects with utility energy service contracts.

In FY 2006, USPS awarded 17 SES contracts for \$18.1 million in energy efficiency improvements, expected to save 96.1 billion Btu annually.

### **Water Consumption**

In FY 2006, USPS reported using 5.4 billion gallons of water at a cost of \$26.4 million. Total water used increased by 7.7 percent from FY 2005 to FY 2006 and expenditures increased by 11.4 percent during that period. In FY 2006, USPS utilized the SES program contractors to identify potential water conservation measures as part of bundled savings. USPS will continue its efforts to provide and support for water conservation efforts.

### **Training**

In FY 2006, USPS reported training 100 energy managers at no cost. Individual training, education planning, and implementation are decentralized to the facility and supervisor/subordinate level. Postal employees are also encouraged to participate in the various educational and training opportunities presented by the Federal Energy Management Program. Energy training is integrated into broader training provided to employees with facility operation and maintenance responsibilities. For example, HVAC systems training covers energy efficiency aspects of such systems. These training programs are conducted at the USPS National Training Center. Furthermore, the Energy Management Program provided training the Area Energy Coordinators for specific needs. These included EPACT 2005 training and an earned value workshop. USPS also provided funding for energy managers and support staff to participate in the FEMP Energy 2006 Conference and the World Energy Conference in Washington DC.

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## **APPENDIX A**

### **ENERGY CONSUMPTION AND COST DETAIL TABLES**

**TABLE A-1**  
**TOTAL PRIMARY ENERGY CONSUMPTION BY FEDERAL AGENCIES**  
**(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10<sup>15</sup>])**

CIVILIAN AGENCY	FY 1985...	FY 1990...	FY 1995...	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	% Change 85-06	% Change 03-06	% Change 05-06
USPS	51,668.1	59,961.0	72,178.0	89,381.4	86,142.5	85,320.9	83,069.4	84,553.5	86,044.2	81,239.3	57.2	-2.2	-5.6
DOE	98,876.9	90,859.5	88,840.8	72,041.6	72,338.7	72,682.0	76,923.3	73,854.2	71,457.5	74,808.5	-24.3	-2.7	4.7
VA	43,456.9	44,918.6	47,827.9	50,557.0	52,945.1	53,074.2	56,164.9	55,729.1	56,612.2	55,386.5	27.5	-1.4	-2.2
GSA	47,235.8	40,780.8	36,626.3	42,409.1	42,969.5	42,297.8	43,220.8	43,057.0	43,535.2	43,254.7	-8.4	0.1	-0.6
DOJ	11,112.5	11,610.3	17,193.4	30,431.8	30,338.1	28,515.1	40,200.8	29,118.2	31,426.8	38,986.9	250.8	-3.0	24.1
NASA	23,771.3	28,741.6	29,434.4	26,087.4	25,210.0	24,726.7	25,276.6	23,302.1	24,063.1	23,729.8	-0.2	-6.1	-1.4
DHS	0.0	0.0	0.0	0.0	0.0	0.0	24,340.6	29,351.8	24,809.3	22,908.1	NA	-5.9	-7.7
HHS	10,501.4	13,188.5	12,189.6	15,255.5	16,078.3	15,903.6	19,660.0	17,033.8	18,732.6	16,636.0	58.4	-15.4	-11.2
DOI	11,596.7	10,969.3	10,552.2	12,041.4	14,497.5	12,999.8	14,317.8	14,206.3	14,018.0	13,784.4	18.9	-3.7	-1.7
USDA	12,266.6	14,620.4	14,324.3	12,365.5	12,096.6	11,622.1	14,375.2	12,056.6	12,821.3	11,758.9	-4.1	-18.2	-8.3
DOT	28,959.2	28,666.3	28,971.2	41,018.6	32,503.7	30,707.3	13,522.3	12,897.4	12,200.4	11,272.2	-61.1	-16.6	-7.6
TVA	8,856.0	8,214.3	7,913.9	8,325.7	8,392.7	7,945.1	7,517.8	7,332.2	7,317.2	7,543.2	-14.8	0.3	3.1
TRSY	3,878.3	7,015.4	7,783.1	9,651.3	9,550.3	9,910.8	7,878.2	6,193.5	8,201.6	5,725.1	47.6	-27.3	-30.2
DOC	4,085.5	6,383.7	5,667.2	4,117.5	5,489.0	4,760.0	4,917.0	4,935.5	5,654.6	5,517.9	35.1	12.2	-2.4
DOL	3,966.3	4,155.2	4,336.2	4,761.1	5,024.8	5,177.0	5,466.3	5,395.0	5,277.2	4,688.0	18.2	-14.2	-11.2
EPA	1,776.4	1,643.0	2,264.7	2,057.7	2,407.0	2,204.4	2,472.7	2,577.8	2,582.4	2,536.0	42.8	2.6	-1.8
ST	717.3	868.5	1,342.3	7,631.9	6,503.0	1,669.3	1,799.9	2,130.9	2,395.6	2,401.7	234.8	33.4	0.3
NARA	0.0	215.9	1,546.3	1,293.8	1,323.6	1,249.0	1,336.4	1,296.0	1,549.0	1,472.7	NA	10.2	-4.9
HUD	356.2	435.0	347.7	362.0	370.1	365.8	356.1	345.5	330.6	323.2	-9.3	-9.2	-2.2
RRB	0.0	103.7	99.0	79.1	74.6	75.6	73.1	72.5	72.9	72.9	NA	-0.3	0.0
OTHER*	2,250.4	5,271.6	7,003.9	8,081.3	7,955.1	10,064.2	6,092.7	5,379.3	5,503.6	4,731.0	110.2	-22.3	-14.0
Civilian Agencies Subtotal	365,331.7	417,307.9	396,442.6	437,950.8	432,210.4	421,270.7	448,982.0	430,818.5	434,605.2	428,777.0	17.4	-4.5	-1.3
DOD	1,502,111.8	1,545,014.4	1,197,891.7	1,042,511.1	1,043,757.4	1,097,163.4	1,155,346.6	1,223,168.6	1,186,700.2	1,098,456.5	-26.9	-4.9	-7.4
Total	1,867,443.5	1,962,322.3	1,594,334.3	1,480,462.0	1,475,967.9	1,518,434.1	1,604,328.6	1,653,987.1	1,621,305.4	1,527,233.4	-18.2	-4.8	-5.8
MBOE	320.6	336.9	273.7	254.2	253.4	260.7	275.4	283.9	278.3	262.2			
Petajoule	1,970.1	2,070.2	1,682.0	1,561.8	1,557.1	1,601.9	1,692.4	1,744.9	1,710.4	1,611.2			

Data as of 26 Sept 2007

\*Other includes, for certain years, CFTC, CIA, EEOC, FEMA, FTC, NSF, NRC, OPM, SSA, BBG/IBB, and FERC.

Notes: This table uses a conversion factor for electricity of 11,850 Btu per kilowatt hour and 1,390 Btu per pound of steam. Agencies are listed in descending order of consumption for the current year. Ellipses after fiscal year (1985. . .) indicate where intervening years' data are left off the table, but available upon request from FEMP. FY 2003 was the first year for reporting by the Department of Homeland Security. Significant declines in energy use were also evident in that year for agencies such as the Departments of Transportation and the Treasury which transferred functions to the new Department. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

**TABLE A-2**  
**TOTAL SITE-DELIVERED ENERGY CONSUMPTION BY FEDERAL AGENCIES**  
**(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10<sup>15</sup>])**

CIVILIAN AGENCY	FY 1985...	FY 1990...	FY 1995...	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	% Change 85-06	% Change 03-06	% Change 05-06
USPS	27,762.5	30,616.2	36,220.9	43,284.2	43,397.4	41,617.4	42,606.2	40,664.4	41,128.4	39,742.0	43.1	-6.7	-3.4
DOE	52,201.6	43,454.6	47,255.4	30,492.9	31,065.5	30,668.3	31,639.8	31,398.5	29,629.0	32,938.9	-36.9	4.1	11.2
VA	25,144.7	24,898.4	25,428.9	27,043.9	27,661.9	27,722.6	30,452.0	29,888.5	29,984.7	29,293.6	16.5	-3.8	-2.3
DOJ	8,176.0	6,961.6	10,193.3	19,693.0	19,681.9	17,692.4	22,686.4	17,544.4	18,752.3	23,506.5	187.5	3.6	25.4
GSA	20,721.1	16,995.5	13,671.8	17,632.3	18,415.8	17,473.9	18,524.2	18,291.6	18,430.3	18,160.1	-12.4	-2.0	-1.5
DHS	0.0	0.0	0.0	0.0	0.0	0.0	18,333.3	23,527.9	18,869.7	17,147.7	NA	-6.5	-9.1
NASA	10,855.1	12,399.0	12,394.7	11,120.8	10,934.5	10,677.0	10,798.7	9,858.1	10,283.0	10,187.3	-6.2	-5.7	-0.9
HHS	5,953.5	7,119.0	6,129.7	7,952.5	8,541.0	7,999.8	10,139.0	8,761.5	9,595.6	9,257.6	55.5	-8.7	-3.5
DOI	7,816.3	7,391.9	6,378.4	7,845.9	9,504.5	8,224.9	8,246.4	8,742.6	8,577.5	8,137.4	4.1	-1.3	-5.1
USDA	8,358.7	9,573.4	9,045.8	7,446.7	7,373.6	7,170.5	7,753.4	6,978.5	7,456.9	6,798.4	-18.7	-12.3	-8.8
DOT	19,568.0	18,965.2	18,688.7	21,215.6	17,810.2	18,256.8	5,617.9	5,159.4	4,952.9	4,616.9	-76.4	-17.8	-6.8
DOC	2,489.1	4,476.3	2,882.8	1,907.1	2,521.9	2,197.3	2,345.1	2,216.8	2,930.7	2,861.6	15.0	22.0	-2.4
TVA	2,975.9	2,717.7	2,687.9	3,006.6	3,005.8	2,824.0	2,838.2	2,717.7	2,676.8	2,857.2	-4.0	0.7	6.7
DOL	2,385.2	2,376.0	2,385.7	2,480.7	2,671.4	2,775.1	2,964.3	2,896.2	2,682.7	2,451.0	2.8	-17.3	-8.6
TRSY	2,868.3	3,643.0	4,132.6	5,337.0	5,355.6	5,506.3	4,144.4	2,585.3	4,569.5	2,374.3	-17.2	-42.7	-48.0
ST	246.9	302.7	437.3	3,379.1	2,700.7	626.6	938.6	1,032.5	1,111.9	1,417.0	473.9	51.0	27.4
EPA	904.5	747.0	1,120.5	1,038.1	1,228.3	1,094.5	1,397.5	1,421.3	1,416.9	1,390.5	53.7	-0.5	-1.9
NARA	0.0	81.9	792.2	544.6	573.9	529.2	578.6	565.5	685.2	637.7	NA	10.2	-6.9
HUD	116.9	140.3	131.3	144.1	149.0	148.0	144.3	142.8	131.3	128.5	9.9	-10.9	-2.1
RRB	0.0	46.5	40.1	36.2	36.0	36.4	36.0	35.4	34.0	34.5	NA	-4.2	1.5
OTHER*	1,156.1	2,943.6	3,276.1	3,150.6	3,117.2	4,041.1	2,403.9	2,093.6	2,109.4	1,874.9	62.2	-22.0	-11.1
Civilian Agencies Subtotal	199,700.5	195,849.7	203,294.2	214,752.0	215,746.1	207,281.9	224,588.2	216,522.4	216,008.8	215,813.6	8.1	-3.9	-0.1
DOD	1,250,613.8	1,241,655.8	926,022.9	779,055.2	787,216.4	837,525.4	901,449.3	960,668.6	933,162.0	843,707.9	-32.5	-6.4	-9.6
Total	1,450,314.3	1,437,505.5	1,129,317.1	993,807.2	1,002,962.5	1,044,807.3	1,126,037.5	1,177,191.0	1,149,170.8	1,059,521.5	-26.9	-5.9	-7.8
MBOE	249.0	246.8	193.9	170.6	172.2	179.4	193.3	202.1	197.3	181.9			
Petajoule	1,530.0	1,516.5	1,191.4	1,048.4	1,058.1	1,102.2	1,187.9	1,241.9	1,212.3	1,117.8			

Data as of 26 Sept 2007

\*Other includes, for certain years, CFTC, CIA, EEOC, FEMA, FTC, NSF, NRC, OPM, SSA, BBG/IBB, and FERC.

Notes: This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour and 1,000 Btu per pound of steam. Agencies are listed in descending order of consumption for the current year. Ellipses after fiscal year (1985. . .) indicate where intervening years' data are left off the table, but available upon request from FEMP. FY 2003 was the first year for reporting by the Department of Homeland Security. Significant declines in energy use were also evident in that year for agencies such as the Departments of Transportation and the Treasury which transferred functions to the new Department. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports



**TABLE A-3**  
**SITE-DELIVERED ENERGY CONSUMPTION IN FEDERAL GOAL BUILDINGS**  
**(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10<sup>15</sup>])**

CIVILIAN AGENCY	FY 1985...	FY 1990...	FY 1995...	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	% Change 85-06	% Change 03-06	% Change 05-06
VA	24,552.0	24,380.1	25,075.4	26,120.6	26,748.3	26,866.2	29,278.0	28,854.2	28,692.6	28,182.8	14.8	-3.7	-1.8
USPS	16,238.3	18,480.0	21,649.7	25,238.3	24,974.3	23,671.1	23,968.6	23,388.2	23,423.7	22,230.5	36.9	-7.3	-5.1
DOJ	6,112.0	4,863.8	7,011.7	10,236.8	10,643.9	10,386.5	16,410.0	12,982.7	14,018.8	17,790.2	191.1	8.4	26.9
DOE	35,595.2	33,118.6	30,679.0	24,013.4	23,446.4	24,263.8	25,712.3	23,614.0	22,635.7	21,525.4	-39.5	-16.3	-4.9
GSA	20,012.4	16,867.4	13,580.5	16,821.8	17,824.4	16,890.2	14,091.8	17,586.9	17,498.8	13,074.5	-34.7	-7.2	-25.3
NASA	7,256.4	8,523.9	8,281.8	7,849.2	7,832.2	7,613.6	6,850.5	7,138.0	7,739.5	6,347.7	-12.5	-7.3	-18.0
DOI	4,762.4	4,039.4	3,596.3	4,006.6	4,692.2	4,916.0	5,095.2	5,965.0	5,234.7	5,034.3	5.7	-1.2	-3.8
DHS	0.0	0.0	0.0	0.0	0.0	0.0	4,747.6	4,680.7	4,407.2	4,092.4	NA	-13.8	-7.1
DOL	2,153.0	2,137.1	2,028.8	2,111.8	2,312.5	2,411.8	2,566.9	2,499.0	2,261.3	2,077.6	-3.5	-19.1	-8.1
USDA	4,039.1	4,621.1	4,224.1	4,421.0	4,897.5	4,626.9	5,376.8	4,470.4	4,734.9	4,326.9	7.1	-19.5	-8.6
TRSY	713.4	2,169.8	2,359.2	2,833.7	2,777.8	2,628.0	2,288.2	2,274.7	2,194.6	1,986.9	178.5	-13.2	-9.5
EPA	772.3	747.0	1,020.9	940.3	1,118.3	979.7	1,264.4	1,311.2	1,310.3	1,252.5	62.2	-0.9	-4.4
DOT	4,614.5	3,750.4	3,669.1	3,716.4	3,913.8	3,971.4	721.6	713.8	676.8	643.6	-86.1	-10.8	-4.9
NARA	0.0	81.9	792.2	544.6	573.9	529.2	508.1	565.5	685.2	637.7	NA	25.5	-6.9
TVA	526.4	540.1	829.1	702.8	702.6	640.1	641.9	634.7	617.0	593.8	12.8	-7.5	-3.8
ST	232.2	267.8	92.9	152.9	123.2	245.5	494.5	323.8	337.5	513.7	121.2	3.9	52.2
DOC	1,478.9	1,376.0	2,122.2	1,752.8	1,926.0	1,837.3	1,968.5	2,085.7	2,035.9	1,974.1	33.5	0.3	-3.0
HHS	5,580.3	7,119.0	6,024.2	7,351.0	7,817.4	7,813.1	9,566.6	8,418.8	9,068.3	8,910.0	59.7	-6.9	-1.7
HUD	116.9	140.3	105.9	106.3	115.6	109.9	112.9	110.2	106.6	95.5	-18.3	-15.4	-10.4
RRB	0.0	46.5	40.1	36.2	36.0	36.4	36.0	35.4	34.0	34.5	NA	-4.2	1.5
OTHER*	574.0	2,211.2	2,283.2	3,105.2	3,068.5	3,982.3	1,344.8	1,092.4	1,136.7	1,047.1	82.4	-22.1	-7.9
Civilian Agencies Subtotal	135,329.7	146,655.5	135,466.3	142,061.7	145,544.9	144,419.1	153,045.1	148,745.3	148,850.0	142,371.9	5.2	-7.0	-4.4
DOD	359,933.9	360,310.7	285,129.5	243,246.0	240,178.0	234,774.5	222,838.5	226,850.8	225,632.8	210,558.7	-41.5	-5.5	-6.7
Total	495,263.6	506,966.2	420,595.8	385,307.7	385,722.9	379,193.7	375,883.6	375,596.1	374,482.8	352,930.6	-28.7	-6.1	-5.8
MBOE	85.0	87.0	72.2	66.1	66.2	65.1	64.5	64.5	64.3	60.6			
Petajoules	522.5	534.8	443.7	406.5	406.9	400.0	396.5	396.2	395.1	372.3			

Data as of 26 Sept 2007

\*Other includes for certain years CIA, FEMA, FTC, NSF, NRC, OPM, SSA, BBG/IBB, and FERC.

Notes: Ellipses after fiscal year (1985. . .) indicate where intervening years' data are left off the table, but available upon request from FEMP. FY 2003 was the first year for reporting by the Department of Homeland Security. Significant declines in energy use were also evident in that year for agencies such as the Departments of Transportation and the Treasury which transferred functions to the new Department. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

**TABLE A-4**  
**CONSUMPTION AND COSTS OF FEDERAL GOAL BUILDINGS ENERGY BY FUEL**  
**TYPE IN FY 2006, FY 2005, AND FY 2003**  
**(Constant 2006 Dollars)**

ENERGY TYPE	BILLION BTU	COST (MILLION \$)	COST/ MILLION BTU	COST PER PHYSICAL UNIT
<b>2006</b>				
ELECTRICITY	163,925.7	\$3,725.634	\$22.73	\$77.55 /MWH
FUEL OIL	30,022.5	\$408.228	\$13.60	\$1.89 /Gallon
NATURAL GAS	120,132.0	\$1,247.919	\$10.39	\$10.71 /Thou. Cubic. Ft.
LPG/PROPANE	2,561.3	\$39.258	\$15.33	\$1.46 /Gallon
COAL	19,214.2	\$61.007	\$3.18	\$78.04 /Short Ton
PURCHASED STEAM	14,364.9	\$289.313	\$20.14	\$20.14 /MMBtu
OTHER	2,710.0	\$40.015	\$14.77	\$14.77 /MMBtu
TOTAL	352,930.6	\$5,811.374		

AVERAGE COST PER MMBTU = \$16.466

<b>2005</b>				
ELECTRICITY	171,092.6	\$3,588.11	\$20.30	\$69.27 /MWH
FUEL OIL	31,986.0	\$306.51	\$9.28	\$1.29 /Gallon
NATURAL GAS	128,866.6	\$1,099.82	\$8.26	\$8.52 /Thou. Cubic. Ft.
LPG/PROPANE	3,295.8	\$40.87	\$12.01	\$1.15 /Gallon
COAL	16,999.8	\$50.56	\$2.88	\$70.76 /Short Ton
PURCHASED STEAM	16,066.4	\$173.40	\$10.45	\$10.45 /MMBtu
OTHER	6,175.6	\$90.20	\$14.14	\$14.14 /MMBtu
TOTAL	374,482.8	\$5,349.481		

AVERAGE COST PER MMBTU = \$14.285

<b>2003</b>				
ELECTRICITY	169,512.1	\$3,310.70	\$17.62	\$60.11 /MWH
FUEL OIL	39,799.5	\$257.75	\$5.84	\$0.81 /Gallon
NATURAL GAS	125,561.1	\$822.63	\$5.91	\$6.09 /Thou. Cubic. Ft.
LPG/PROPANE	3,230.2	\$35.98	\$10.05	\$0.96 /Gallon
COAL	17,317.7	\$46.87	\$2.44	\$60.00 /Short Ton
PURCHASED STEAM	17,352.5	\$219.35	\$11.40	\$11.40 /MMBtu
OTHER	3,110.5	\$43.50	\$12.61	\$12.61 /MMBtu
TOTAL	375,883.6	\$4,736.776		

AVERAGE COST PER MMBTU = \$12.602

Data as of 26 Sept 2007

Note: This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour.  
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

**TABLE A-5  
ENERGY CONSUMPTION, COSTS, AND GROSS SQUARE FOOTAGE OF FEDERAL  
GOAL-EXCLUDED BUILDINGS, FY 2006**

Agency	Energy Consumption		Energy Costs		Facility Gross Square Feet	
	Billion Btu	% of Agency's Total Facility Use	(\$ Million)	% of Agency's Total Facility Costs	(Thou. Sq. Ft.)	% of Agency's Total Facility Space
DOD	12,794.8	5.7%	\$246.604	7.1%	69,462.0	3.5%
DOE	10,024.5	31.8%	\$106.229	28.2%	20,722.5	18.8%
GSA	5,031.0	27.8%	\$92.206	22.9%	33,211.2	15.6%
DOT	2,938.1	82.0%	\$92.671	85.1%	20,293.1	73.8%
NASA	2,865.7	31.1%	\$43.603	28.6%	7,374.7	19.0%
USPS	2,120.6	8.7%	\$64.636	10.6%	0.0	0.0%
TVA	1,304.6	68.7%	\$19.432	65.7%	19,421.7	67.2%
USIA	664.3	100.0%	\$15.163	100.0%	962.5	100.0%
DHS	103.4	2.5%	\$1.862	1.5%	671.5	1.6%
HHS	32.8	0.4%	\$0.996	0.7%	1,984.8	6.5%
DOC	20.5	1.03%	\$0.579	1.21%	26.0	0.2%
TRSY	0.7	0.04%	\$0.012	0.03%	0.0	0.0%
Total	37,901.0	NA	\$683.992	NA	174,130.0	NA

Data as of 26 Sept 2007

Source: Federal Agency Annual Energy Management Data Reports

**TABLE A-6  
CONSUMPTION AND COSTS OF FEDERAL GOAL-EXCLUDED BUILDINGS  
BY FUEL TYPE FY 2006**

ENERGY TYPE	BILLION BTU	COST (MILLION \$)	COST/ MILLION BTU	COST PER PHYSICAL UNIT
ELECTRICITY	22,815.5	\$544.821	\$23.88	\$81.48 /MWH
FUEL OIL	1,824.7	\$21.826	\$11.96	\$1.66 /Gallon
NATURAL GAS	8,169.1	\$98.850	\$12.10	\$12.48 /Thou. Cubic. Ft.
LPG/PROPANE	39.4	\$0.648	\$16.45	\$1.57 /Gallon
COAL	4,240.1	\$7.225	\$1.70	\$41.89 /Short Ton
PURCHASED STEAM	748.1	\$9.574	\$12.80	\$12.80 /MMBtu
OTHER	64.0	\$1.049	\$16.39	\$16.39 /MMBtu
TOTAL	37,901.0	\$683.992		

AVERAGE COST PER MMBTU = \$18.047

Data as of 26 Sept 2007

This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

**TABLE A-7**  
**FEDERAL ENERGY CONSUMPTION IN VEHICLE AND EQUIPMENT OPERATIONS**  
**(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10<sup>15</sup>])**

CIVILIAN AGENCY	FY 1985...	FY 1990...	FY 1995...	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	% CHANGE 85-06	% CHANGE 05-06
USPS	11,524.2	12,136.2	14,571.2	15,976.3	16,192.1	15,831.8	17,173.5	15,821.0	16,215.4	15,391.0	33.6	-5.1
DHS	0.0	0.0	0.0	0.0	0.0	0.0	13,583.9	18,837.1	14,454.8	12,951.9	NA	-10.4
DOJ	2,064.0	2,097.9	3,181.6	9,456.3	9,037.9	7,305.9	6,276.4	4,561.7	4,733.6	5,716.3	177.0	20.8
DOI	3,053.9	3,352.5	2,782.2	3,839.3	4,812.3	3,308.9	3,151.2	2,777.6	3,342.8	3,103.1	1.6	-7.2
USDA	4,319.6	4,952.3	4,821.7	3,025.7	2,476.2	2,543.5	2,376.6	2,508.0	2,722.0	2,471.4	-42.8	-9.2
DOE	2,882.0	2,520.4	1,841.9	1,803.4	1,714.4	1,587.0	1,417.1	2,736.6	2,015.2	1,389.0	-51.8	-31.1
VA	592.8	518.3	353.6	923.4	913.6	856.4	1,174.0	1,034.2	1,292.0	1,110.8	87.4	-14.0
DOT	11,957.0	12,150.8	12,193.7	11,122.9	8,739.3	10,865.9	1,476.3	1,146.8	1,098.2	1,035.2	-91.3	-5.7
NASA	1,972.7	1,736.7	1,750.9	1,490.1	1,455.1	1,372.2	982.8	1,263.1	1,104.2	974.0	-50.6	-11.8
TVA	578.5	476.6	541.7	850.1	822.3	747.9	942.3	845.3	794.4	958.7	65.7	20.7
ST	14.8	34.9	0.0	486.4	37.1	49.4	444.2	451.7	449.0	903.3	NA	101.2
DOC	1,010.2	3,100.3	760.6	154.3	595.8	360.0	360.0	131.1	894.8	867.1	-14.2	-3.1
TRSY	2,155.0	1,473.2	1,773.4	2,503.3	2,577.8	2,878.3	1,856.3	310.5	2,374.8	386.7	-82.1	-83.7
DOL	232.2	239.0	356.9	368.9	358.9	363.3	397.4	397.2	421.3	373.3	60.8	-11.4
HHS	373.3	0.0	105.5	593.2	715.2	178.5	572.4	335.1	500.5	314.7	-15.7	-37.1
EPA	132.3	0.0	99.6	97.9	110.0	114.8	133.1	110.1	106.6	138.0	4.4	29.5
GSA	144.1	128.1	91.3	127.0	112.7	74.9	80.3	49.2	71.7	54.6	-62.1	-23.8
HUD	0.0	0.0	25.4	37.8	33.4	38.0	31.4	32.6	24.7	33.0	NA	33.7
OTHER*	582.1	732.4	992.9	45.3	48.8	58.8	30.7	57.3	62.0	163.4	-71.9	163.7
Civilian Agencies Subtotal	43,588.5	45,649.7	46,244.1	52,901.5	50,753.0	48,535.5	52,459.7	53,406.1	52,678.1	48,335.5	10.9	-8.2
DOD	890,679.9	881,345.1	640,893.4	526,234.1	537,168.4	593,506.3	662,116.2	723,008.8	698,547.6	620,354.4	-30.4	-11.2
Total	934,268.4	926,994.8	687,137.4	579,135.6	587,921.5	642,041.8	714,575.9	776,414.9	751,225.7	668,689.9	-28.4	-11.0
MBOE	160.4	159.1	118.0	99.4	100.9	110.2	122.7	133.3	129.0	114.8		
Petajoule	985.6	977.9	724.9	611.0	620.2	677.3	753.9	819.1	792.5	705.4		

Data as of 26 Sept 2007

\*Other includes for certain years the CFTC, CIA, FEMA, NSF, NRC, OPM, and BBG/IBB.

Note: Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

**TABLE A-8  
CONSUMPTION AND COSTS OF VEHICLE AND EQUIPMENT ENERGY  
BY FUEL TYPE IN FY 2006**

ENERGY TYPE	BILLION BTU	COST (MILLION \$)	COST/ MILLION BTU	COST PER PHYSICAL UNIT
AUTO GASOLINE	47,778.9	\$953.254	\$19.95	\$2.49 /Gallon
DIST/DIESEL	76,449.0	\$1,120.818	\$14.66	\$2.03 /Gallon
LPG/PROPANE	58.4	\$1.189	\$20.38	\$1.95 /Gallon
AVIATION GASOLINE	606.4	\$12.337	\$20.34	\$2.54 /Gallon
JET FUEL	442,614.2	\$7,972.628	\$18.01	\$2.34 /Gallon
NAVY SPECIAL	99,129.3	\$1,129.068	\$11.39	\$1.58 /Gallon
OTHER	2,053.8	\$39.441	\$19.20	\$19.20 /MMBtu
<b>TOTAL</b>	<b>668,689.9</b>	<b>\$11,228.736</b>		

AVERAGE COST PER MMBTU = \$16.792

Data as of 26 Sept 2007

Note: Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

**TABLE A-9  
FEDERAL ENERGY EXPENDITURES, FY 1985–FY 2006  
(Constant 2006 Dollars)**

Sector/ Fiscal Year	Annual Energy Use (BBtu)	Annual Energy Cost (\$ Million)	Annual Energy Cost (\$/MMBtu)	Change in Energy Costs from 1985 (\$ Million) <sup>1</sup>	Sector/ Fiscal Year	Annual Energy Use (BBtu)	Annual Energy Cost (\$ Million)	Annual Energy Cost (\$/MMBtu)	Change in Energy Costs from 1985 (\$ Million) <sup>1</sup>
<b>Goal-Subject Buildings</b>					<b>Excluded Facilities</b>				
1985	495,263.6	\$7,969.204	\$16.091	\$0.000	1985	20,782.4	\$366.791	\$17.649	\$0.000
1986	464,032.4	\$7,218.947	\$15.557	-\$750.257	1986	17,835.0	\$292.515	\$16.401	-\$74.275
1987	490,272.3	\$7,157.799	\$14.600	-\$811.405	1987	17,145.0	\$276.448	\$16.124	-\$90.343
1988	496,119.2	\$6,953.403	\$14.016	-\$1,015.801	1988	17,295.9	\$266.545	\$15.411	-\$100.246
1989	489,915.9	\$6,335.466	\$12.932	-\$1,633.738	1989	14,766.8	\$254.075	\$17.206	-\$112.715
1990	506,966.2	\$7,188.449	\$14.179	-\$780.754	1990	14,719.0	\$293.732	\$19.956	-\$73.059
1991	473,518.0	\$7,035.854	\$14.859	-\$933.350	1991	17,769.1	\$350.264	\$19.712	-\$16.527
1992	494,091.4	\$6,812.554	\$13.788	-\$1,156.650	1992	17,588.8	\$285.594	\$16.237	-\$81.196
1993	457,456.5	\$6,616.755	\$14.464	-\$1,352.449	1993	16,706.3	\$269.312	\$16.120	-\$97.478
1994	439,868.6	\$6,233.991	\$14.172	-\$1,735.213	1994	15,561.6	\$272.602	\$17.518	-\$94.189
1995	420,595.8	\$5,771.942	\$13.723	-\$2,197.262	1995	21,583.8	\$243.439	\$11.279	-\$123.352
1996	412,191.8	\$5,601.456	\$13.589	-\$2,367.748	1996	21,160.6	\$250.664	\$11.846	-\$116.126
1997	401,729.1	\$5,264.862	\$13.106	-\$2,704.342	1997	24,864.5	\$352.865	\$14.192	-\$13.926
1998	394,158.8	\$4,920.572	\$12.484	-\$3,048.632	1998	16,385.6	\$300.083	\$18.314	-\$66.707
1999	383,326.8	\$4,588.519	\$11.970	-\$3,380.684	1999	20,780.4	\$287.952	\$13.857	-\$78.839
2000	385,307.7	\$4,515.977	\$11.720	-\$3,453.227	2000	29,363.9	\$448.833	\$15.285	\$82.042
2001	385,722.9	\$5,234.491	\$13.571	-\$2,734.713	2001	29,318.2	\$525.450	\$17.922	\$158.660
2002	379,193.7	\$4,857.764	\$12.811	-\$3,111.440	2002	23,571.9	\$462.045	\$19.602	\$95.255
2003	375,883.6	\$4,736.776	\$12.602	-\$3,232.428	2003	35,578.1	\$576.208	\$16.196	\$209.418
2004	375,596.1	\$4,999.060	\$13.310	-\$2,970.144	2004	25,180.1	\$428.974	\$17.036	\$62.184
2005	374,482.8	\$5,349.481	\$14.285	-\$2,619.722	2005	23,462.4	\$437.189	\$18.634	\$70.398
2006	352,930.6	\$5,811.374	\$16.466	-\$2,157.830	2006	37,901.0	\$683.992	\$18.047	\$317.202
<b>Vehicles &amp; Equipment</b>					<b>Total Energy - All Sectors</b>				
1985	934,268.4	\$11,440.547	\$12.245	\$0.000	1985	1,450,314.4	\$19,776.542	\$13.636	\$0.000
1986	924,833.7	\$6,843.539	\$7.400	-\$4,597.008	1986	1,406,701.1	\$14,355.002	\$10.205	-\$5,421.540
1987	958,904.3	\$7,228.697	\$7.538	-\$4,211.851	1987	1,466,321.6	\$14,662.944	\$10.000	-\$5,113.598
1988	846,896.2	\$6,799.323	\$8.029	-\$4,641.224	1988	1,360,311.3	\$14,019.271	\$10.306	-\$5,757.271
1989	959,994.6	\$7,660.923	\$7.980	-\$3,779.624	1989	1,464,677.3	\$14,250.464	\$9.729	-\$5,526.077
1990	926,994.8	\$8,457.189	\$9.123	-\$2,983.358	1990	1,448,680.0	\$15,939.371	\$11.003	-\$3,837.171
1991	970,454.3	\$10,842.444	\$11.173	-\$598.103	1991	1,461,741.4	\$18,228.561	\$12.470	-\$1,547.980
1992	783,122.4	\$6,390.683	\$8.161	-\$5,049.864	1992	1,294,802.6	\$13,488.830	\$10.418	-\$6,287.711
1993	772,633.8	\$6,711.338	\$8.686	-\$4,729.209	1993	1,246,796.6	\$13,597.405	\$10.906	-\$6,179.137
1994	722,790.5	\$4,739.643	\$6.557	-\$6,700.904	1994	1,178,220.7	\$11,246.236	\$9.545	-\$8,530.305
1995	687,137.4	\$4,867.886	\$7.084	-\$6,572.661	1995	1,129,317.0	\$10,883.267	\$9.637	-\$8,893.274
1996	675,111.5	\$4,696.440	\$6.957	-\$6,744.107	1996	1,108,463.9	\$10,548.560	\$9.516	-\$9,227.981
1997	665,386.0	\$5,290.350	\$7.951	-\$6,150.197	1997	1,091,979.6	\$10,908.077	\$9.989	-\$8,868.464
1998	627,339.2	\$5,468.099	\$8.716	-\$5,972.448	1998	1,037,883.6	\$10,688.754	\$10.299	-\$9,087.787
1999	607,527.2	\$4,707.046	\$7.748	-\$6,733.501	1999	1,011,634.4	\$9,583.517	\$9.473	-\$10,193.025
2000	579,135.6	\$3,734.005	\$6.448	-\$7,706.543	2000	993,807.2	\$8,698.814	\$8.753	-\$11,077.728
2001	587,921.5	\$5,365.824	\$9.127	-\$6,074.723	2001	1,002,962.6	\$11,125.766	\$11.093	-\$8,650.776
2002	642,041.8	\$5,710.195	\$8.894	-\$5,730.352	2002	1,044,807.4	\$11,030.005	\$10.557	-\$8,746.537
2003	714,575.9	\$5,405.511	\$7.565	-\$6,035.036	2003	1,126,037.6	\$10,718.495	\$9.519	-\$9,058.046
2004	776,414.9	\$6,573.570	\$8.467	-\$4,866.977	2004	1,177,191.1	\$12,001.604	\$10.195	-\$7,774.937
2005	751,225.7	\$9,168.713	\$12.205	-\$2,271.834	2005	1,149,170.9	\$14,955.383	\$13.014	-\$4,821.158
2006	668,689.9	\$11,228.736	\$16.792	-\$211.811	2006	1,059,521.5	\$17,724.103	\$16.728	-\$2,052.439

<sup>1</sup>Changes in energy costs from 1985 should not be construed as savings resulting from Federal energy management activities. Many variables contribute to fluctuations in annual energy costs, including changes in square footage, building stock, weather, energy efficiency investments, service level, fuel mix, fuel prices, and vehicle, naval, and aircraft fleet composition. This table incorporates revisions to previously published energy consumption and cost data submitted to DOE by Federal agencies.

## **APPENDIX B**

### **DATA COLLECTION AND CARBON CALCULATIONS**

## APPENDIX B

### DATA COLLECTION

#### Buildings and Facilities

The Federal agencies that own or control buildings are required to report the energy consumption in these buildings to FEMP by January 1 after the end of each fiscal year. The General Services Administration (GSA) reports the energy of buildings it owns and operates, including usage by other Federal agency occupants. For agencies which have been delegated authority by GSA to enter into contracts for energy and utility services, the individual agencies are responsible for reporting the energy consumption and square footage figures.

The data shown in this report do not include leased space in buildings where the energy costs are a part of the rent and the Federal agency involved has no control over the building's energy management.

The Federal agencies submit their annual reports expressed in the following units: megawatthours of electricity; thousands of gallons of fuel oil; thousands of cubic feet of natural gas; thousands of gallons of liquefied petroleum gas (LPG) and propane; short tons of coal; billions of Btu of purchased steam; and billions of Btu of "other." DOE reviews this data for accuracy and confers with the submitting agency to clarify any apparent anomalies. The data are then entered into a computer database management program.

The tables shown in this annual report are expressed in billions of Btu derived from the following conversion factors:

Electricity	-	3,412 Btu/kilowatt hour
Fuel Oil	-	138,700 Btu/gallon
Natural Gas	-	1,031 Btu/cubic foot
LPG/Propane	-	95,500 Btu/gallon
Coal	-	24,580,000 Btu/short ton
Purchased Steam	-	1,000 Btu/pound

The above conversion factors for electricity and purchased steam refer to site-delivered energy (or heat content) and do not account for energy consumed in the production and delivery of energy products. Table 6 of this report accounts for primary energy use, which is the sum of the energy directly consumed by end users (site energy) and the source energy consumed in the production and delivery of energy products. Using 2002 data from EIA, a blended heat rate of 10,191 Btu/kWh was calculated for fossil and nuclear steam-electric plants. In addition to conversion losses, transmission and distribution losses (9 percent) and power plant use (5 percent) are also factored into the delivered heat content, resulting in a total source energy input for electricity of 11,850 Btu/kWh. DOE uses this conversion factor to calculate primary energy use for electricity and 1,390 Btu per pound for purchased steam.

In addition, the Federal agencies annually report to FEMP the gross square footage of their buildings and the cost of their buildings' energy.



## **Vehicles and Equipment**

Federal agencies are required to report the energy consumption of their fleet vehicles through DOE's Federal Automotive Statistical Tool (FAST) no later than November 1 after the end of each fiscal year. Energy consumption in other types of equipment not reported through FAST is required to be reported to FEMP by January 1 after the end of each fiscal year.

The fuels used in vehicles and equipment are automotive gasoline, diesel and petroleum distillate fuels, aviation gasoline, jet fuel, navy special, liquefied petroleum gas/propane, and "other." All the fuels in this category with the exception of "other" are reported in thousands of gallons. "Other" is reported in billions of Btu.

The conversion factors for these fuels are:

Gasoline	-	125,000 Btu/gallon
Diesel-Distillate	-	138,700 Btu/gallon
Aviation Gasoline	-	125,000 Btu/gallon
Jet Fuel	-	130,000 Btu/gallon
Navy Special	-	138,700 Btu/gallon
LPG/Propane	-	95,500 Btu/gallon

This report excludes those agencies that have been unable to provide complete fiscal year consumption data prior to the publication date. All agency omissions, as well as any anomalies in the data, are indicated by footnotes on the tables or in the text of the report

## ESTIMATING THE CARBON DIOXIDE-EQUIVALENT EMISSIONS OF CARBON DIOXIDE, METHANE, AND NITROUS OXIDE FROM FEDERAL FACILITY ENERGY USE

Executive Order 13423, “Strengthening Federal Environmental, Energy, and Transportation Management,” defines greenhouse gases as “carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.” While the Order does not contain a quantitative goal for reducing greenhouse gas emissions, the Department of Energy’s Federal Energy Management Program (FEMP) will continue to estimate emissions from energy use in Federal buildings subject to the goals of E.O. 13423.

Formerly, FEMP only reported on the carbon-equivalent emissions of carbon dioxide attributed to facility energy use. In light of E.O. 13423’s new definition, this new methodology was developed for generating estimates of non-carbon dioxide emissions using the energy consumption data that is reported to FEMP. Existing means were identified and adopted that allow the use of currently-reported data to generate, in terms of carbon dioxide-equivalence, emissions estimates for carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O).<sup>9</sup> In another change from previous reporting, these estimates will now be reported in units of metric tons of *carbon dioxide* equivalent (MTCO<sub>2</sub>E) rather than metric tons of *carbon* equivalent (MTCOE)

### Emission Factors

To calculate the carbon dioxide-equivalent emissions of gases, fuel-to-gas specific emission factors from the Energy Information Administration (EIA) are used for all fuels except electricity and purchased steam.<sup>10</sup> These fuel-to-gas specific emission factors are couched in terms of:

- Million metric tons of carbon per quadrillion Btu (for CO<sub>2</sub>)
- Grams per gigajoule (for CH<sub>4</sub>)
- Kilograms per terajoule (for N<sub>2</sub>O)

The Energy Information Administration provides five emission factors for coal; these emission factors differ depending upon the industrial sector in which the coal is consumed. The ‘Commercial’ emission factor for coal is used in this methodology.<sup>11</sup>

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<sup>9</sup> An examination of GHG sources was conducted to identify those sources whose emissions can be directly tied to primary energy or electricity consumption. This examination indicated that there is no rigorous means to estimate hydrofluorocarbon, perfluorocarbon, or sulfur hexafluoride emissions based solely upon the data reported by agencies; these emissions are not related in any meaningful way to primary energy or electricity consumption. Thus, calculations are made only for CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O.

<sup>10</sup> Energy Information Administration. Documentation for Emissions of Greenhouse Gases in the United States 2004. December 2006. DOE/EIA-0638 (2004). Table 2-13 (CH<sub>4</sub>), Table 3-6 (N<sub>2</sub>O), Table 6-1 (CO<sub>2</sub>/C) Available at [http://www.eia.doe.gov/oiaf/1605/ggrpt/documentation/pdf/0638\(2004\).pdf](http://www.eia.doe.gov/oiaf/1605/ggrpt/documentation/pdf/0638(2004).pdf).

<sup>11</sup> Energy Information Administration. Form EIA-6A (March 2005), Coal Distribution Report – Annual. “Residential/Commercial (RC): Housing units; wholesale or retail businesses (except coal wholesale dealers); health institutions (hospitals); social and educational institutions (schools and universities); and Federal, State, and local governments (military installations, prisons, office buildings, etc.). Exclude shipments to Federal power projects, such as TVA; and rural electrification cooperatives, power districts, and State power projects. These are to be included in Electric Generation (EG).” Available at <http://www.eia.doe.gov/cneaf/coal/page/surveys/formeia6.pdf>.

## Global Warming Potentials

The Intergovernmental Panel on Climate Change (IPCC) has developed a methodology that allows for emissions of all greenhouse gases to be expressed in units of carbon dioxide-equivalence. This methodology is based upon the Global Warming Potential of a particular gas. According to the Environmental Protection Agency:

“The concept of a Global Warming Potential (GWP) was developed to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas. The definition of a GWP for a particular greenhouse gas is the ratio of heat trapped by one unit mass of the greenhouse gas to that of one unit mass of CO<sub>2</sub> over a specified time period.”<sup>12</sup>

The carbon dioxide-equivalent calculations utilize IPCC-generated global warming potentials as follows:

- Carbon dioxide has a GWP of 1.
- Methane (CH<sub>4</sub>) has a GWP of 21.
- Nitrous oxide (N<sub>2</sub>O) has a GWP of 310.<sup>13</sup>

## Calculating Fuel Specific CO<sub>2</sub>-Equivalent Emission Coefficients

The calculation of fuel specific carbon dioxide-equivalent emission coefficient can be generically expressed as follows:

$$\text{CO}_2\text{-equivalent emission} = \text{EIA emission factor} \times (\text{unit conversions}) \times \text{GWP}$$

Fuel-specific calculations of carbon dioxide-equivalent emission coefficients are shown below.

## Calculations for Fuel Oil, Natural Gas, LPG/Propane, and Coal Emission Coefficients

The emission coefficients for fuel oil, natural gas, LPG/propane, and coal presented in the table are calculated from emissions coefficients found in the Energy Information Administration’s Documentation for Emissions of Greenhouse Gases in the United States 2004.<sup>14</sup> The calculations are as follows; original EIA coefficient units in the equations are shown in **bold**.

**CO<sub>2</sub> estimates** (in terms of metric tons of CO<sub>2</sub>-equivalent per billion Btu) are calculated as follows from data found in Table 6-1 of EIA’s Documentation. The EIA reports CO<sub>2</sub> emissions in terms of million metric tons of carbon per quadrillion Btu; thus, to convert to metric tons of CO<sub>2</sub>-equivalent per billion Btu, it is necessary to divide by 12/44 to account for the full molecular weight of carbon dioxide (12/44 is the ratio of the atomic mass of a carbon atom to the atomic mass of a carbon dioxide molecule).

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<sup>12</sup> Environmental Protection Agency. “High GWP Gases and Climate Change” webpage. Available at <http://www.epa.gov/highgwp/scientific.html#sf6>

<sup>13</sup> Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2005. Draft for Public Review. Table ES-1.

Available at <http://www.epa.gov/climatechange/emissions/usinventoryreport07.html>

<sup>14</sup> Energy Information Administration. Documentation for Emissions of Greenhouse Gases in the United States 2004. December 2006. DOE/EIA-0638 (2004). Available at [http://www.eia.doe.gov/oiaf/1605/ggrpt/documentation/pdf/0638\(2004\).pdf](http://www.eia.doe.gov/oiaf/1605/ggrpt/documentation/pdf/0638(2004).pdf)

$$\frac{MTCE}{BBtu} = \left( \frac{\text{million\_MT C}}{\text{Quad}} \right) \times \left( \frac{1\_Quad}{1,000,000\_BBtu} \right) \times \left( \frac{MTCE}{.000001\_million\_MTC} \right) \times (1) / \frac{12}{44}$$

**CH<sub>4</sub> estimates** (in terms of metric tons of carbon equivalent per billion Btu) are calculated as follows from data found in Table 2-13 of EIA's Documentation:

$$\frac{MTCE}{BBtu} = \left( \frac{\text{g}_{\text{CH}_4}}{\text{GJ}} \right) \times \left( \frac{1000\_GJ}{TJ} \right) \times \left( \frac{1\_TJ}{947,817,120\_Btu} \right) \times \left( \frac{1,000,000,000\_Btu}{1\_BBtu} \right) \times \left( \frac{1\_MT}{1,000,000g} \right) \times (21)$$

**N<sub>2</sub>O estimates** (in terms of metric tons of carbon equivalent per billion Btu) are calculated as follows from data found in Table 3-6 of EIA's Documentation:

$$\frac{MTCE}{BBtu} = \left( \frac{\text{kg}_{\text{N}_2\text{O}}}{\text{TJ}} \right) \times \left( \frac{1\_TJ}{947,817,120\_Btu} \right) \times \left( \frac{1\_MT}{1,000\_kg} \right) \times \left( \frac{1,000,000,000\_Btu}{1\_BBtu} \right) \times (310)$$

### Calculations for Electricity and Purchased Steam Emission Coefficients

The Energy Information Administration does not publish, in its Documentation, CO<sub>2</sub> emissions coefficients for electricity or purchased steam.

The **CO<sub>2</sub> emission coefficient for electricity** is calculated by dividing CO<sub>2</sub> emissions from electric power plants by the amount of electricity they sell. This accounts for the primary energy inputs for electricity delivered to the customer site. CO<sub>2</sub> emissions and electricity sales data are obtained from the Energy Information Administration's Electric Power Annual.<sup>15</sup>

$$\frac{MTCE}{BBtu} = \left( \frac{\text{MT}_{\text{CO}_2}}{\text{MWh}} \right) \times \left( \frac{1\_MWh}{1000\_kWh} \right) \times \left( \frac{1\_kWh}{3,412\_Btu} \right) \times \left( \frac{1,000,000,000\_Btu}{1\_BBtu} \right)$$

**CH<sub>4</sub> emission coefficient for electricity** is calculated from EIA data as follows:<sup>16</sup>

$$\frac{MTCE}{BBtu} = \left( \frac{\text{lbs}_{\text{CH}_4}}{\text{MWh}} \right) \times \left( \frac{1\_MWh}{1000\_kWh} \right) \times \left( \frac{1\_kWh}{3,412\_Btu} \right) \times \left( \frac{1,000,000,000\_Btu}{1\_BBtu} \right) \times \left( \frac{1\_MT}{2204.6\_lbs} \right) \times (21)$$

**N<sub>2</sub>O emission coefficient for electricity** is calculated from EIA data as follows:<sup>17</sup>

<sup>15</sup> For CO<sub>2</sub> emissions, see the EIA's "Emissions from Energy Consumption for Electricity Production and Useful Thermal Output at Combined-Heat-and-Power Plants" webpage (available at <http://www.eia.doe.gov/cneaf/electricity/epa/epat5p1.html>).

For electricity sales data, see "Direct Use and Retail Sales of Electricity to Ultimate Customers by Sector, by Provider" webpage (available at <http://www.eia.doe.gov/cneaf/electricity/epa/epat7p2.html>).

3,412 Btu/kWh is an EIA standard, as per [www.eia.doe.gov/emeu/aer/txt/stb1306.xls](http://www.eia.doe.gov/emeu/aer/txt/stb1306.xls)

<sup>16</sup> Energy Information Administration. Updated State-level Greenhouse Gas Emission Coefficients for Electricity Generation, 1998-2000. Available at <http://tonto.eia.doe.gov/FTP/ROOT/environment/e-supdoc-u.pdf>

<sup>17</sup> Energy Information Administration. Updated State-level Greenhouse Gas Emission Coefficients for Electricity Generation, 1998-2000. Available at <http://tonto.eia.doe.gov/FTP/ROOT/environment/e-supdoc-u.pdf>

$$\frac{MTCE}{BBtu} = \left( \frac{\text{lbs}_{\text{N}_2\text{O}}}{\text{MWh}} \right) \times \left( \frac{1 \text{ MWh}}{1000 \text{ kWh}} \right) \times \left( \frac{1 \text{ kWh}}{3,412 \text{ Btu}} \right) \times \left( \frac{1,000,000,000 \text{ Btu}}{1 \text{ BBtu}} \right) \times \left( \frac{1 \text{ MT}}{2204.6 \text{ lbs}} \right) \times (310)$$

The electricity emission coefficients are national averages, since agencies do not report their consumption broken out by state. This approach therefore assumes that the Government's electricity consumption is distributed according to national electricity use overall.

Because of mismatches in when generation and emissions data are available from EIA and when FEMP reports are produced, year-old emissions data are used (2006 emissions are calculated using 2005 coefficients). This is unlikely to generate large discrepancies in the emission estimates for agencies. Since 2000, calculated electricity coefficients have varied less than 1 percent year to year.

This methodology assumes that purchased steam is generated from the consumption of coal, and using FEMP's historical conversion factor, that the production-to-delivery chain is 72 percent efficient (that is, in order to deliver 1,000 Btu per pound of steam to an end-user, 1,390 Btu of heat input is necessary at the plant). Thus, to arrive at the emission coefficient for purchased steam, the EIA emission coefficients for CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O for coal are multiplied by 1.39.

### Carbon Dioxide-Equivalent Emission Coefficients

The results of the above calculations are presented in the following table in terms of metric tons of CO<sub>2</sub>-equivalent per billion Btu of site-delivered energy use.

Energy Type	Carbon Dioxide (MTCO <sub>2</sub> E/ Site-Delivered Billion Btu)	Methane (MTCO <sub>2</sub> E/ Site-Delivered Billion Btu)	Nitrous Oxide (MTCO <sub>2</sub> E/ Site-Delivered Billion Btu)	Total GHG (MTCO <sub>2</sub> E/ Site-Delivered Billion Btu)
Electricity, 2003	193.3433	0.0310	0.7912	194.1655
Electricity, 2004	193.7833	0.0310	0.7912	194.6055
Electricity, 2005	193.0867	0.0310	0.7912	193.9089
Electricity, 2006	193.0867	0.0310	0.7912	193.9089
Fuel Oil	73.1500	0.0048	0.1962	73.3510
Natural Gas	53.0567	0.0598	0.0327	53.1492
LPG/Propane	62.2967	0.0053	0.0327	62.3347
Coal	95.4800	0.0007	0.4579	95.9386
Purchased Steam	132.7333	0.0009	0.6365	133.3707

### **Calculating Agency-Level Emissions**

To calculate agency-level CO<sub>2</sub>-equivalent emissions of a particular GHG as a result of consumption of a particular fuel, the fuel-specific emission coefficient shown in the table above is multiplied by the agency's consumption of that fuel in terms of billions of British thermal units (BBtu) delivered to the site. For example:

$$CO_2E \text{ Emissions}_{agency, CH_4} = \text{Site-delivered Energy consumption}_{agency, fuel} \times CO_2E \text{ Emission coefficient}_{CH_4, fuel}$$

Two notes on the calculation of agency-level emissions.

1. Purchases of green power, renewable energy certificates, and renewable thermal energy are netted out of agency totals before calculating emissions.
2. Agencies have the option of estimating GHG emissions from their energy use independently based on disaggregated or more detailed data provided that:
  - a. Estimates are provided to FEMP for inclusion in Federal Government totals, and
  - b. Agencies provide a detailed description of their estimation methodology.

## APPENDIX C

### 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
Railroad Retirement Board	RRB
Social Security Administration	SSA
Tennessee Valley Authority	TVA
United States Postal Service	USPS

## Other Acronyms

Assessment of Load and Energy Reduction Techniques	ALERT
Building Life-Cycle Cost	BLCC
British Thermal Unit(s)	Btu
Energy Citations Database	ECD
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 Efficiency and Renewable Energy Clearinghouse	EREC
Energy Service Company	ESCO
Energy Savings Performance Contract	ESPC
Facility Energy Decision System	FEDS
Federal Automotive Statistical Tool	FAST
Federal Energy Management Program	FEMP
Fiscal Year	FY
Gross Square Foot	GSF
Industrial Assessment Center	IAC
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 Energy Information Center	NEIC
National Institute of Standards and Technology	NIST
Office of Industrial Technologies	OIT
Office of Scientific and Technical Information	OSTI
Quadrillion British Thermal Units	Quad
Research and Development	R&D
State Energy Program	SEP
Utility Energy Service Contract	UESC