Annual Report to Congress on Federal Government Energy Management and Conservation Programs Fiscal Year 2001

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U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Federal Energy Management Program
Washington, DC 20585

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Federal Communications Commission	FCC
Federal Emergency Management Agency	FEMA
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General Services Administration	GSA
International Broadcasting Bureau	IBB
National Aeronautics and Space Administration	NASA
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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 Information Agency	USIA
United States Postal Service	USPS

INTERNET WEB SITES CITED IN THIS REPORT

Federal Energy Management Program	www.eren.doe.gov/femp
Energy Efficiency and Renewable Energy Clearinghouse	www.eren.doe.gov
National Energy Information Center	www.eia.doe.gov
Alternative Fuels Data Center	www.afdc.nrel.gov
Clean Cities Program	www.ccities.doe.gov

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EXECUTIVE SUMMARY

This report on Federal Energy Management for Fiscal Year (FY) 2001 provides information on energy consumption in Federal buildings, operations, and vehicles and equipment, and documents activities conducted by Federal agencies to meet the statutory requirements of Title V, Part 3, of the National Energy Conservation Policy Act (NECPA), as amended, 42 U.S.C. §§ 8251-8259, 8262, 8262b-k, and Title VIII of NECPA, 42 U.S.C. § 8287-8287c. Implementation activities undertaken during FY 2001 by the Federal agencies under the Energy Policy Act of 1992 (EPACT) and Executive Order 13123 are also discussed in this report.

Based on reports submitted to the Department of Energy (DOE) by 29 Federal agencies, the total primary energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.4 quadrillion British Thermal Units (quads) during FY 2001.[1] These 1.4 quads consumed by the Government in buildings and operations to provide essential services to its citizens, including the defense of the Nation, represent approximately 1.4 percent of the total 96.19 quads[2] used in the United States. In total, the Federal Government is the single largest energy consumer in the Nation, although its pattern of consumption is widely dispersed geographically.

The Federal Government consumed 1.0 quads during FY 2001 when measured in terms of energy actually delivered to the point of use (site-delivered energy consumption, not accounting for estimates of energy input at the power or steam plant). 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 2001 was 30.9 percent less than the Federal Government consumed in the FY 1985 base year. This reduction of 449.0 trillion Btu, which reflects both a drop in Government activity and the success of energy management efforts, could satisfy the energy needs of the State of Wyoming for more than one year.[3] The total cost of the 1.0 quads was $9.6 billion in FY 2001.[4] This is $890.5 million less than the $10.5 billion reported in FY 1985, an 8.5 percent[5] decrease in nominal costs. In constant

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[1]Primary energy consumption considers all energy resources used to generate and transport electricity and steam. Tables 1-A, 5-A, and 8-B show primary energy consumption for comparison with site-delivered consumption shown in Tables 1-B, 5-B, and 8-A respectively. Conversion factors of 10,346 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam are used to calculate gross energy consumption.

[2]DOE/EIA-0035(2002/12), *Monthly Energy Review*, December 2002.

[3]Based on site-delivered energy consumption estimates for 1999 in the residential, commercial, industrial, and transportation sectors (421.8 trillion Btu). Source: DOE/EIA-0214(99), *State Energy Data Report, 1999,* Table 9; May 2001.

[4]Unless otherwise noted, all costs cited in this report are in constant 2001 dollars, calculated using Gross Domestic Product implicit price deflators. See DOE/EIA-0384(01), *Annual Energy Review 2001*, Table E1; November 2002). 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.

[5]Calculation of percent changes in this report do not account for rounding of numbers in text.

2001 dollars, this equates to a decrease of 38.3 percent from $15.6 billion in FY 1985 to $9.6 billion in FY 2001. The reductions in energy costs from 1985 are attributable primarily to reduced energy prices and reduced Government activity, although they also reflect the effects of agency energy management efforts. Many other variables also contribute to fluctuations in annual energy consumption and costs, including changes in building square footage, building stock, weather, tempo of operations, fuel mix, and vehicle, naval, and aircraft fleet composition.

The Federal Government's energy bill for FY 2001 increased 26.0 percent compared to the previous year. The significant increase from FY 2000 is attributable mainly to increases in prices paid by the Government for every fuel type. Overall, the unit cost of all fuel types used increased 25.0 percent, from $7.69 per million Btu to $9.62 per million Btu.

Federal agencies report energy consumption under four categories: 1) standard buildings; 2) industrial, laboratory and other energy intensive facilities; 3) exempt facilities; and 4) vehicles and equipment.

Standard Buildings

In FY 2001, the Federal Government used 327.5 trillion Btu at its 3.0 billion square feet of standard buildings space. This consumption represents a 21.8 percent decrease compared to FY 1985 and a 1.0 percent increase relative to FY 2000. This significant drop from the 1985 base year reflects the success of Federal energy management efforts in reducing fossil fuel use in Federal facilities. The cost of energy for buildings and facilities in FY 2001 was $3.9 billion, an increase of approximately $488.6 million from FY 2000 expenditures, and a decrease of 25.9 percent from the FY 1985 expenditure of $5.3 billion.[6] The cost increases compared to FY 2000 are attributable largely to increased energy prices.

Industrial, Laboratory and Other Energy Intensive Facilities

Under section 543(a)(2) of NECPA, 42 U.S.C. § 8253, buildings that house energy-intensive activities may be excluded from NECPA's performance goal for buildings. Most energy used in these facilities is process energy used for purposes other than the normal building heating, ventilation, and air-conditioning (HVAC) operations and electrical use. Process energy is consumed in industrial operations, laboratories, certain R&D activities, and in electronic-intensive facilities.

Section 203 of Executive Order 13123 sets a goal for these facilities that requires each agency to reduce energy consumption per square foot, per unit of production, or per other unit as applicable, by 20 percent by 2005 and 25 percent by 2010, relative to 1990.

In FY 2001, the Federal Government used 60.7 trillion Btu of energy in energy intensive operations, approximately 6.1 percent of the total 1.0 quads consumed. Total energy consumption in this category decreased 9.9 percent relative to FY 1990 and decreased 3.2 percent relative to FY 2000. These changes resulted from both changes in activity levels and energy management efforts.

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[6]Cost and consumption figures for FY 1985 may be different from those published in last year's Annual Report since Federal agencies update their files and provide revisions to their data.

The Federal Government spent $618.3 million on energy intensive operations energy in FY 2001, $68.5 million more than the FY 2000 expenditure of $549.8 million, in constant dollars.

Exempt Facilities

Sec. 704 of the Executive Order 13123 defines "Exempt facility" as "a facility. . .for which an agency uses DOE-established criteria to determine that compliance with the Energy Policy Act of 1992 or [Executive Order 13123] is not practical." Eight agencies, the Departments of Defense (DOD), Energy, Health and Human Services, State, and Transportation, the National Aeronautics and Space Administration (NASA), the General Services Administration (GSA), and the Tennessee Valley Authority have chosen to exempt facilities from Executive Order requirements. In addition, the U.S. Postal Service has reported electricity consumption used in mail processing automation under this exempt category without reporting associated facility square footage. Energy used in exempt facilities accounts for approximately 2.1 percent of the total 1.0 quads used by the Federal Government. Electricity constitutes 73.8 percent of the energy used in exempt facilities, 9.7 percent is accounted for by natural gas, and 11.2 percent by fuel oil. Small amounts of purchased steam, liquefied petroleum gas (LPG)/propane, and "other" energy account for the remaining 5.3 percent.

The energy used in exempt facilities in FY 2001 accounted for approximately 4.5 percent of the total Federal energy bill. The Federal Government spent approximately $435.3 million for this category's energy during the fiscal year.

Vehicles and Equipment

The vehicles and equipment category 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 2001, the Federal Government used approximately 586.8 trillion Btu of energy in vehicles and equipment, 58.6 percent of the total 1.0 quads consumed. Total energy consumption in vehicles and equipment decreased 37.3 percent relative to FY 1985 and was 1.1 percent greater than the FY 2000 consumption of 579.1 trillion Btu. Most of the increase from FY 2000 is attributable to increased use of jet fuel by the DOD. DOD consumed 535.2 trillion Btu or 91.4 percent of all vehicles and equipment energy used by the Federal Government.

The Federal Government spent $4.6 billion on vehicles and equipment energy in FY 2001, $1.4 billion more than the FY 2000 expenditure, a 41.7 percent increase in constant dollars. The significant increase in this end-use sector is attributable to a 39.8 percent increase in fuel prices. For all fuels the cost per million Btu rose from $5.66 in FY 2000 to $7.92 in FY 2001. The unit costs of the two most-used fuels, jet fuel and diesel/distillate fuel oil, increased 39.4 percent and 57.2 percent respectively. Gasoline prices paid by the Government increased 20.2 percent.

Investments in Energy Efficiency

During FY 2001, Federal agencies had three primary options for financing energy efficiency, water conservation, and renewable energy projects in buildings and facilities: direct appropriated funding, energy savings performance contracts (ESPCs), and utility energy service contracts (UESCs). Known funding from the three sources totaled approximately $668 million in FY

2001. Direct appropriations accounted for approximately $131 million. ESPC contracts awarded in FY 2001 resulted in approximately $298 million in estimated contractor investment ($121 million from DOE Super ESPC delivery orders and $177 million from other agency ESPCs), and approximately $239 million in private sector investment came from UESCs. While these three categories of funding are not entirely comparable, they do indicate that ESPCs and UESCs have become the dominant source of support for energy efficiency investments throughout the Federal Government. Energy efficiency investment from ESPCs and UESCs increased from $478.5 million in FY 2000 to $536.4 million in FY 2001. In FY 1999, investment from these sources totaled only $395.3 million. In FY 2001, direct funding identified by agencies for energy conservation retrofits and capital equipment increased 6.1 percent to $131.3 million from $123.7 million dollars in FY 2000.

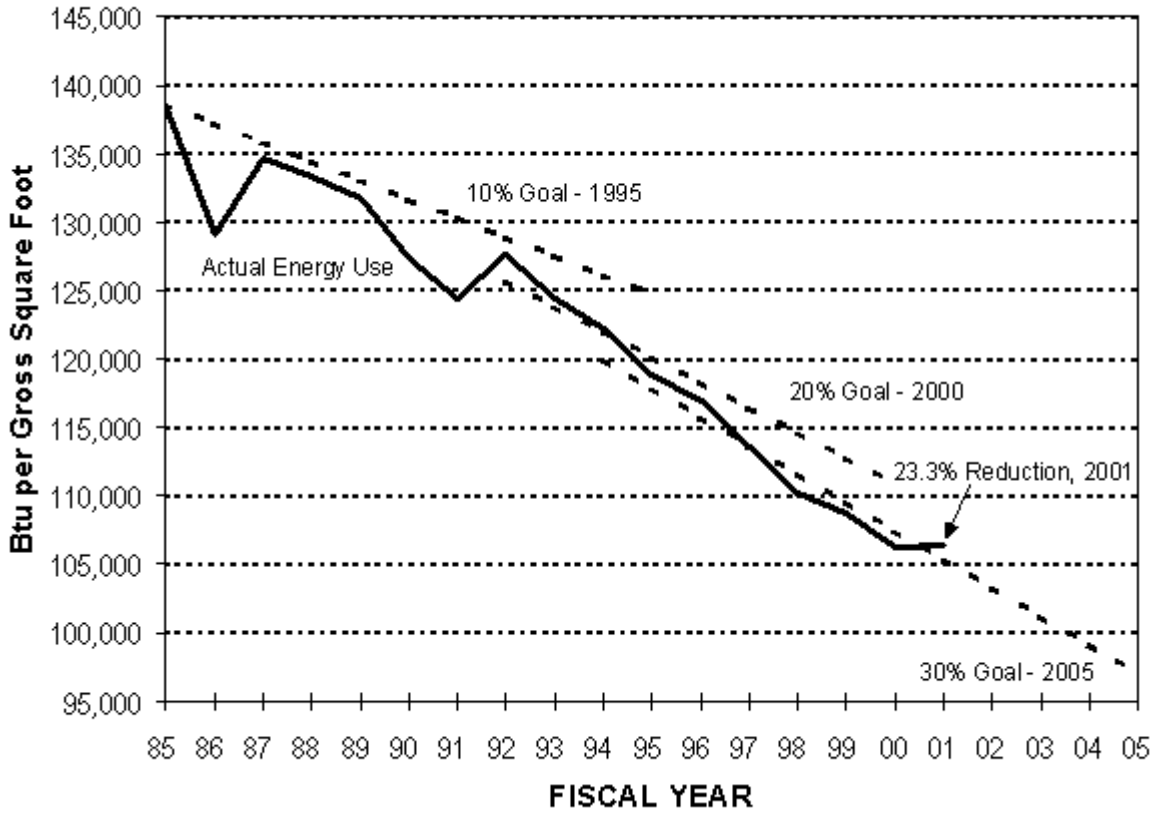
Since 1985, the Government has invested approximately $4.4 billion in energy efficiency improvements, $2.7 billion of which was funded with direct appropriations and $1.7 billion of which came from alternative financing mechanisms ($1.0 billion from ESPCs and $0.7 billion from UESCs).

Agency Progress in Meeting Energy Reduction Goals

NECPA, as amended by EPACT, requires agencies to take the steps necessary to reduce energy consumption in Federal buildings by 10 percent by 1995 compared to 1985 consumption levels, based on Btu per gross square foot, and requires a 20 percent reduction by 2000 compared to 1985 consumption levels. The 10 percent goal was met by the Government in FY 1995 with a 12.7 percent reduction from FY 1985. Executive Order 12902 added a goal of reducing energy consumption by 30 percent by the year 2005 relative to 1985 consumption levels. Executive Order 13123, which superceded Executive Order 12902, adds an additional goal of a 35 percent reduction by 2010, compared to FY 1985. Agencies provided FY 2001 data to DOE that indicated a decrease in energy consumption per gross square foot of 23.3 percent relative to FY 1985. The Government's performance for each year since FY 1985 is illustrated in Figure ES-1. This reduction has resulted from significant decreases in the consumption of fuel oil, natural gas, and coal. The use of non-electric fuels in Federal buildings has declined 35.3 percent since 1985, while the consumption of electricity has increased by 10.0 percent. The installation and increased use of electricity-driven electronic equipment contributed to increases in electricity use through the years. Electricity now represents about 66.8 percent of the total energy costs of Federal buildings and accounts for 43.8 percent of total site-delivered energy consumption in buildings. This is compared to 30.9 percent of the total site-delivered energy consumption in buildings in FY 1985. Agency efforts undertaken in FY 2001 to increase energy efficiency in buildings included:

- improvement of operations and maintenance procedures;
- implementation of no-cost, low-cost efficiency measures;
- energy-efficient building retrofits and capital improvements;
- energy awareness activities and employee training programs; and
- procurement of energy-efficient goods and products.

FIGURE ES-1
Decrease in Btu per Gross Square Foot
in Federal Standard Buildings from FY 1985

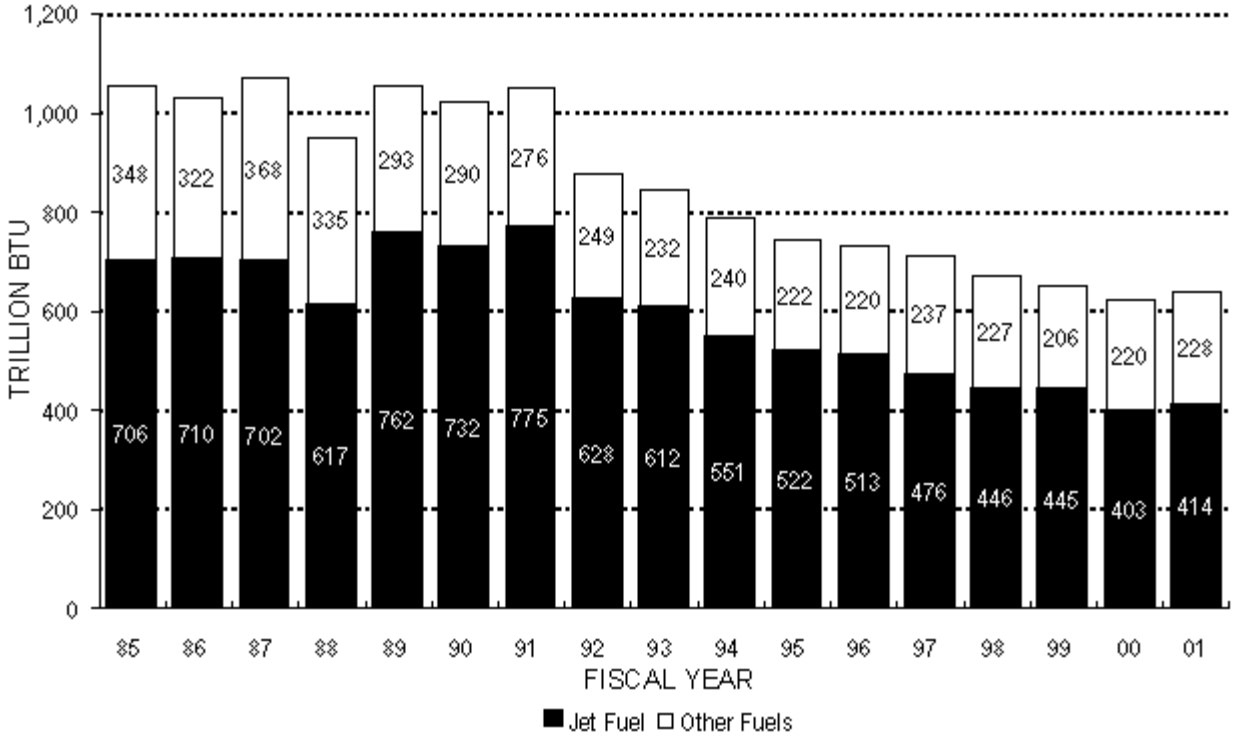


Reducing Petroleum-Based Fuel Consumption

Effective management of energy resources is of strategic importance to the Federal Government as well as the Nation. In FY 2001, petroleum-based fuels accounted for 0.64 quads of the total 1.0 quads of energy consumed by the Federal Government, with 0.58 quads used by the DOD, primarily for jet fuel and distillate/diesel for vehicles and equipment. The Federal Government consumed 39.1 percent less petroleum-based fuel in FY 2001 than in FY 1985. Figure ES-2 illustrates the trend in the Federal Government's use of petroleum fuels.

Section 205 of Executive Order 13123 directs agencies to minimize the use of petroleum-based fuels in buildings and facilities. Federal agencies have made significant progress in reducing their dependence on petroleum-based fuels in their buildings and facilities. For example, Federal agencies report that in FY 2001, 44.5 trillion Btu of petroleum-based fuels were used for standard buildings energy, a 54.3 percent decrease from FY 1985, but a 31.2 percent increase from FY 2000. The 9.9 trillion Btu increase in fuel oil consumption in standard buildings seems to be, in part, displacing a 4.4 trillion Btu drop in the consumption of coal in this end-use sector. Natural gas consumption moved down slightly since the previous year, a decrease of only 0.2 percent. This represents 13.6 percent of total buildings and facilities energy consumption.

FIGURE ES-2
Federal Consumption of Petroleum-Based Fuels
FY 1985 through FY 2001



Renewable Energy

Section 204 of Executive Order 13123 restates the goal of the Million Solar Roofs Initiative, which is 2,000 solar roof installations in the Federal Government by 2000, and 20,000 installations by 2010. In the period from June 1997 to April 2000 the Federal Government installed 1,745 solar energy systems. This total included 1,682 solar hot water systems, 58 photovoltaic power systems and 5 transpired solar thermal collectors. The U.S. Navy installed an additional 1000 solar hot water systems by the end of FY 2000. This brought total installations to just over 2,700 systems by the end of 2000, accomplishing the Federal goal. In FY 2001 the total increased to 3,151 systems, including 3,041 solar water heaters, 105 photovoltaic systems, and 5 transpired collectors. The next step is to continue this progress to meet the long-run solar system goal of 20,000 by 2010.

Federal Energy Management Highlights

Progress is being made in increasing Federal energy efficiency, although there remain opportunities for greater efficiency and cost reduction. Several of the most important findings of this report are listed below:

- The overall real cost of energy consumption in the Federal Government measured in constant 2001 dollars has fallen from $15.6 billion in FY 1985 to $9.6 billion in FY 2001. While most of this drop is attributable to declining energy prices and reduced Defense-related activity, energy management efforts made a significant contribution.[7]

- Total site-delivered energy consumption in FY 2001 decreased 30.9 percent from FY 1985; again, a reflection of both reduced Defense-related activity and successful energy management efforts.[7]

- Energy consumption in Federal Government buildings in FY 2001 decreased 21.8 percent from FY 1985.[7]

- On a Btu-per-gross-square-foot basis, there has been a 23.3 percent reduction in buildings site-delivered energy—a good indicator of the success of energy management efforts.

- Six agencies, the Departments of Commerce, Defense, Energy, Justice, Transportation, and the Tennessee Valley Authority have surpassed a 20 percent reduction in buildings energy use per gross square foot from the 1985 base year.

- Energy consumption in FY 2001 was used for the following purposes:

End Use	*Percentage*	*Cost*
Standard Buildings	32.7 percent	$3.9 billion
Energy Intensive Facilities	6.1 percent	$0.6 billion
Exempt Facilities	2.7 percent	$0.4 billion
Vehicles & Equipment	58.5 percent	$4.6 billion

[7]Many other variables also contribute to fluctuations in annual energy consumption and costs, including changes in building square footage, building stock, weather, tempo of operations, fuel mix, and vehicle, naval, and aircraft fleet composition.

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I. OVERVIEW OF FEDERAL ENERGY MANAGEMENT ACTIVITIES

A. Overview of Federal Energy Management Policy and Legislative Mandates

This report on Federal Energy Management for Fiscal Year (FY) 2001 provides information on energy consumption in Federal buildings and operations and documents activities conducted by Federal agencies to meet the statutory requirements of Title V, Part 3, of the National Energy Conservation Policy Act (NECPA), as amended, 42 U.S.C. §§ 8251-8259, 8262, 8262b-k and Title VIII of NECPA, 42 U.S.C. § 8287-8287c. Implementation activities undertaken during FY 2001 by Federal agencies under the Energy Policy Act of 1992 (EPACT) and Executive Order 13123, Greening the Government through Efficient Energy Management, are also discussed in this report. In compliance with section 381(c) of the Energy Policy and Conservation Act (EPCA), as amended, 42 U.S.C. § 6361c, this report also describes the energy conservation and management activities of the Federal Government under the authorization of section 381 of EPCA, 42 U.S.C. § 6361.

Requirements of NECPA and EPACT

NECPA provides major policy guidance to Federal agencies to improve energy management in their facilities and operations. Amendments to NECPA made by the Federal Energy Management Improvement Act of 1988, 42 U.S.C. § 8253 (a)(1), 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 basis. It also directed the Department of Energy (DOE) to establish life-cycle costing methods and coordinate Federal conservation activities through the Interagency Energy Management Task Force. Section 152 of Subtitle F of EPACT, Federal Agency Energy Management, further amends NECPA and contains provisions regarding energy management requirements, 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.

Requirements of Executive Order 13123

On June 3, 1999, the President signed Executive Order 13123, Greening the Government Through Efficient Energy Management, superseding Executive Order 12902. This new Executive Order addressed greenhouse gas emissions from Federal facilities, and makes energy-efficiency targets more stringent.

The key requirements of the legislation and Executive Order authorities are outlined in the exhibit below along with current findings.

KEY REQUIREMENTS OF LEGISLATIVE AND EXECUTIVE ORDER AUTHORITIES

Statute/Directive	Requirement	FY 2001 Findings	Annual Report Discussion
Section 543, NECPA, 42 U.S.C., § 8253(a)(1) Executive Order 13123	20 percent reduction (Btu/GSF) in Federal buildings by 2000 from 1985. 30 percent reduction (Btu/GSF) by 2005 from 1985. 35 percent reduction by 2010 from 1985.	Federal agencies reported a 23.3 percent decrease in energy consumption in buildings in FY 2001, compared to FY 1985.	Section II (B), page 64
Section 544, NECPA, 42 U.S.C., § 8254	DOE to establish life-cycle cost methods to determine cost-effectiveness of proposed energy efficiency projects.	The 2001 edition of the energy price indices and discount factors for life-cycle cost analysis was published and distributed to Federal energy managers.	Section I (D), page 46
Section 545, NECPA, 42 U.S.C., § 8255	Transmit to Congress the amount of appropriations requested in each agency budget for electric and energy costs incurred in operating and maintaining facilities and for compliance with applicable statutes and directives.	Approximately $131.3 million was appropriated and spent on energy efficiency projects in Federal facilities.	Section I (D), page 36
Section 546, NECPA, 42 U.S.C., § 8256(a)	Establishment of a program of incentives within Federal agencies to expedite Energy Savings Performance Contracts.	In FY 2001, 60 ESPC contracts and delivery orders were awarded under DOE Super ESPCs and other agency contracts.	Section I (D), page 40
Section 546, NECPA, 42 U.S.C., § 8256(b)	DOE to establish a Federal Energy Efficiency Fund to provide grants to agencies.	There were no appropriations for the Fund in FY 2001; FY 1995 funds were allocated and progress of the few remaining projects is being monitored.	Section I (D), page 40
Section 157, EPACT, 42 U.S.C., § 8262(c)	Federal agencies to establish and maintain programs to train energy managers and to increase the number of trained energy managers within each agency.	DOE's FEMP conducted 62 training workshops and symposia for more than 5,407 attendees in the efficient use and conservation of energy, water, and renewable energy in Federal facilities.	Section I (D), page 23; Section VI, Agency Reports, page 83

Statute/Directive	Requirement	FY 2001 Findings	Annual Report Discussion
Executive Order 13123	20 percent reduction for Federal industrial/laboratory facilities by 2005 from 1990. 25 percent reduction by 2010 from 1990.	Findings are specific to individual agencies.	Section III (B), page 69
Executive Order 13123	30 percent reduction in greenhouse gas emissions attributed to Federal facilities by 2010 from 1990.	Carbon emissions from energy used in non-exempt Federal facilities declined 19.4 percent in FY 2001 compared to FY 1990.	Section I(B), page 20
Executive Order 13123	Expand use of renewable energy by implementing renewable energy projects and by purchasing electricity from renewable sources. The Federal Government will strive to install 20,000 solar roofs by 2010.	Findings are specific to individual agencies. During FY 2001, 3,151 solar technology systems were identified on Federal Government facilities.	Section I(G), page 54 Section VI, Agency Reports, page 83
Executive Order 13123	Minimize petroleum use within Federal facilities through use of non-petroleum energy sources and eliminating unnecessary fuel use.	The consumption of petroleum-based fuels in standard buildings during FY 2001 decreased 54.3 percent compared to FY 1985 and increased 31.2 percent from FY 2000.	Section II(A), page 62
Executive Order 13123	Reduce total energy use and greenhouse gas emissions, as measured at the source. Agencies shall undertake projects to reduce source energy, even if site energy use increases.	Primary energy consumed in standard buildings in FY 2001 decreased 9.0 percent from FY 1985 and increased 0.1 percent from FY 2000. Measured in terms of source energy, Federal buildings show a reduction of 10.3 percent in Btu/GSF during FY 2001 compared to FY 1985.	Section II(A), page 57, 59, and 67
Executive Order 13123	Reduce water consumption and associated energy use.	Findings are specific to individual agencies.	Section I(F), page 53 Section VI, Agency Reports, page 83

B. Overall Federal Energy Consumption, Costs, and Carbon Emissions

As shown in Table 1-A, the total primary energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.4 quadrillion British Thermal Units (quads) or 1,395,337.8 billion Btu during FY 2001. Primary energy consumption considers all resources used to generate and transport electricity and steam. (The source conversion factors of 10,346 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam are used to calculate primary energy consumption. See Appendix B for conversion factors used to calculate site-delivered energy consumption.) Federal agencies reported a 22.6 percent decrease in total primary energy consumption compared to FY 1985, and a 0.2 percent decrease from FY 2000. These reductions resulted from a combination of reduced Federal activity and successful energy management efforts. The 1.4 quads used in FY 2001 represent approximately 1.4 percent of the total 96.19 quads[8] used in the United States, and reflect Government energy consumption in buildings and operations to provide essential services to its citizens, including the defense of the Nation. In total, the Federal Government is the single largest energy consumer in the Nation, although its pattern of consumption is widely dispersed.

Based on reports submitted to DOE by 29 Federal agencies, the Federal Government consumed 1.0 quads during FY 2001 when measured in terms of energy actually delivered to the point of use. As shown in Table 1-B, Federal agencies reported a 30.9 percent decrease in total site-delivered energy consumption compared to FY 1985, and a 0.8 percent increase from FY 2000.

The cost of this energy was $9.6 billion and represented approximately 0.5 percent of the total Federal expenditures of $1.864 trillion[9] for all purposes in FY 2001. The Federal energy bill for FY 2001 increased 26.0 percent from the previous year, increasing $2.0 billion in constant dollars compared to FY 2000.[10]

The significant increase from FY 2000 is attributable mainly to increases in prices paid by the Government for every fuel type. Overall, the unit cost of all fuel types used increased 25.0 percent, from $7.69 per million Btu to $9.62 per million Btu. Contributing to the overall increase in unit costs were increases in the prices paid by the Government for:

- Natural Gas (61.7 percent increase)
- Diesel Fuel (57.2 percent increase)
- Jet Fuel (39.4 percent increase)
- Gasoline (20.2 percent increase)
- Electricity (6.6 percent increase).

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[8] DOE/EIA-0035(2002/12), *Monthly Energy Review*, December 2002.

[9] *Analytical Perspectives, Budget of the United States Government, Fiscal Year 2003*

[10] Appendix C indicates the annual cost of energy used in Federal standard buildings, energy intensive operations, exempt buildings, and vehicles and equipment for FY 1985 through FY 2001.

TABLE 1-A
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^{15}])

CIVILIAN AGENCY	**FY 1985**	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	**FY 2000**	**FY 2001**	%Change 85-01	%Change 00-01
USPS	**47,439.3**	54,767.8	56,017.0	57,697.8	61,629.9	63,646.5	65,828.1	67,412.9	71,636.0	71,861.1	72,898.5	**81,165.0**	**78,523.6**	65.5	-3.3
VA	**40,266.0**	41,421.0	42,232.9	42,374.9	43,203.9	43,487.6	43,909.9	45,441.5	46,267.8	46,877.0	47,069.4	**46,450.8**	**48,526.2**	20.5	4.5
DOE	**90,572.9**	82,422.3	79,294.4	82,516.7	79,097.4	78,369.1	81,439.1	71,975.8	79,148.2	64,459.3	64,848.5	**64,669.3**	**65,030.8**	-28.2	0.6
GSA	**43,052.8**	34,789.6	33,524.8	32,994.1	33,742.8	33,253.4	32,839.0	33,660.0	33,822.4	33,583.7	34,448.6	**38,236.1**	**38,955.4**	-9.5	1.9
DOJ	**10,595.9**	10,790.3	13,230.3	12,139.6	13,964.4	15,825.8	16,133.4	19,539.4	19,077.5	23,560.3	23,451.8	**28,723.5**	**28,603.1**	169.9	-0.4
NASA	**21,696.2**	25,972.0	26,859.6	27,112.7	26,848.9	27,453.1	26,641.6	24,632.7	26,048.4	25,322.0	24,680.7	**23,611.5**	**21,798.8**	0.5	-7.7
DOI	**10,933.6**	10,337.7	10,368.8	10,089.3	11,167.8	11,507.0	9,810.3	7,038.3	9,608.7	9,542.0	10,611.1	**11,297.0**	**13,610.9**	24.5	20.5
DOT	**27,287.3**	26,939.8	27,491.0	28,618.9	31,616.7	28,321.4	27,139.9	30,288.1	28,756.0	29,597.6	38,440.5	**37,489.9**	**29,890.5**	9.5	-20.3
ST[1]	**6,224.6**	6,358.0	6,347.8	747.0	987.0	1,058.2	1,109.8	1,583.7	7,387.6	7,370.9	7,068.8	**7,601.9**	**6,573.1**	5.6	-13.5
USDA	**11,576.9**	13,833.8	13,830.4	13,287.1	13,650.6	13,766.7	13,425.1	13,574.8	11,755.2	12,432.5	12,197.1	**11,739.3**	**11,364.3**	-1.8	-3.2
DOL	**3,688.0**	3,842.5	3,923.8	3,944.2	4,050.7	4,119.3	3,992.2	4,094.5	4,123.2	4,168.6	3,337.1	**4,357.0**	**4,608.9**	25.0	5.8
TVA	**7,432.2**	6,894.8	6,845.0	6,367.7	5,866.3	6,685.6	6,737.9	6,464.1	6,282.8	6,074.4	6,737.4	**7,119.6**	**7,200.7**	-3.1	1.1
TRSY	**3,715.2**	6,627.1	7,851.0	8,589.2	8,271.4	8,210.2	7,469.3	6,946.5	8,918.0	8,496.8	8,729.3	**9,225.3**	**9,224.7**	148.3	0.0
DOC	**3,804.6**	6,110.9	4,261.0	4,083.2	4,287.4	5,007.0	5,173.4	4,930.3	4,866.3	4,558.3	4,777.1	**3,726.8**	**4,964.1**	30.5	33.2
HHS	**9,692.6**	12,262.4	11,073.7	11,995.7	12,806.5	13,016.8	11,110.8	11,722.2	13,699.4	13,680.5	13,233.0	**14,706.0**	**15,331.2**	58.2	4.3
HUD	**315.2**	384.2	407.0	378.7	346.0	324.0	310.6	326.8	318.0	303.2	310.2	**324.6**	**332.8**	5.6	2.5
EPA	**1,621.0**	1,483.3	1,635.6	1,662.7	1,845.1	1,922.8	2,108.8	2,070.5	2,113.8	2,108.0	2,341.7	**1,966.1**	**2,269.6**	40.0	15.4
OTHER*	**2,055.9**	5,212.6	4,211.6	4,380.2	4,828.2	5,573.8	7,951.3	10,198.3	10,897.3	8,951.1	8,754.4	**8,548.2**	**8,513.5**	314.1	-0.4
Civilian Agencies Subtotal	**341,970.3**	350,450.3	349,405.7	348,979.5	358,210.8	361,548.6	363,130.5	361,900.3	384,726.5	372,947.2	383,935.0	**400,958.0**	**395,322.1**	15.6	-1.4
DOD	**1,459,945.7**	1,497,346.8	1,519,110.8	1,352,815.6	1,292,793.5	1,213,755.8	1,153,527.4	1,123,168.5	1,092,230.0	1,045,560.2	1,018,045.4	**997,715.6**	**1,000,015.7**	-31.5	0.2
Total	**1,801,916.0**	1,847,797.2	1,868,516.5	1,701,795.1	1,651,004.3	1,575,304.3	1,516,657.9	1,485,068.8	1,476,956.5	1,418,507.4	1,401,980.4	**1,398,673.6**	**1,395,337.8**	-22.6	-0.2
MBOE	**309.3**	317.2	320.8	292.2	283.4	270.4	260.4	254.9	253.6	243.5	240.7	**240.1**	**239.5**		
Petajoules	**1,901.0**	1,949.4	1,971.2	1,795.3	1,741.7	1,661.9	1,600.0	1,566.7	1,558.1	1,496.5	1,479.0	**1,475.5**	**1,472.0**		

DATA AS OF 09/25/02

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

[1]In 1998, the State Department developed a statistical method for estimating the energy consumption in the large number of foreign buildings it owns and leases. This method was subsequently applied to estimate FY 1991 energy consumption and is now used annually to assess progress. The FY 1991 foreign building estimates were combined with domestic building data for the fiscal years 1985 and 1990, since these are base years for performance goals.

Note: This table uses a conversion factor for electricity of 10,346 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

TABLE 1-B

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^{15}])

CIVILIAN AGENCY	**FY 1985**	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	**FY 2000**	**FY 2001**	%Change 85-01	%Change 00-01
USPS	**27,762.5**	30,616.2	30,817.0	31,674.2	33,725.1	34,950.8	36,220.9	36,427.1	40,760.0	39,487.3	39,774.0	**43,284.2**	**43,397.4**	56.3	0.3
DOE	**52,201.6**	43,445.6	42,075.0	44,278.0	43,406.0	42,145.9	47,255.4	35,419.9	43,070.4	31,520.2	31,068.6	**30,492.9**	**31,065.5**	-40.5	1.9
VA	**25,144.7**	24,898.4	25,050.4	25,254.9	25,741.2	25,587.8	25,428.9	26,832.9	27,261.1	27,597.2	27,472.4	**27,043.9**	**27,661.9**	10.0	2.3
DOJ	**8,176.0**	6,961.6	8,018.3	7,544.3	9,081.7	10,263.6	10,193.3	12,127.7	11,999.9	15,805.1	15,366.2	**19,693.0**	**19,681.9**	140.7	-0.1
GSA	**19,256.1**	15,656.6	13,985.0	13,842.0	14,149.4	13,963.0	13,671.8	14,499.2	14,364.3	14,095.0	14,359.9	**17,632.3**	**18,415.8**	-4.4	4.4
DOT	**19,568.0**	18,965.2	18,971.4	17,027.3	19,360.1	19,772.6	18,688.7	19,564.1	19,125.9	18,509.8	22,570.8	**21,215.6**	**17,810.2**	-9.0	-16.1
NASA	**10,855.1**	12,399.0	12,539.5	12,620.2	12,363.2	12,573.9	12,394.7	11,459.7	11,996.1	11,731.4	11,433.4	**11,120.8**	**9,858.5**	-9.2	-11.4
DOI	**7,816.3**	7,391.9	7,094.8	6,992.4	7,482.1	7,892.2	6,378.4	4,326.6	6,612.2	6,427.3	7,456.0	**7,845.9**	**9,504.5**	21.6	21.1
HHS	**5,953.5**	7,119.0	6,222.5	6,794.0	7,215.5	7,519.0	6,129.7	6,628.9	7,852.7	7,400.8	7,131.2	**7,952.5**	**8,541.0**	43.5	7.4
USDA	**8,358.7**	9,573.4	9,599.6	9,100.6	9,332.9	9,412.9	9,045.8	9,056.9	7,370.7	7,917.0	7,828.6	**7,446.7**	**7,373.6**	-11.8	-1.0
TRSY	**2,868.3**	3,576.4	4,177.1	4,628.4	4,912.7	4,558.2	4,132.6	3,764.1	4,597.6	4,816.3	4,899.4	**5,337.0**	**5,355.6**	86.7	0.3
ST[1]	**2,771.7**	2,827.4	2,799.0	273.8	390.2	422.3	437.3	653.3	3,278.0	3,258.4	3,368.6	**3,652.4**	**3,091.1**	11.5	-15.4
TVA	**2,851.9**	2,605.4	2,623.2	2,380.9	2,246.2	2,534.9	2,607.3	2,547.8	2,396.9	2,295.9	2,510.1	**2,921.5**	**2,929.4**	2.7	0.3
DOL	**2,385.2**	2,376.0	2,446.0	2,452.4	2,514.9	2,527.9	2,385.7	2,491.5	2,490.2	2,540.4	2,048.1	**2,480.7**	**2,671.4**	12.0	7.7
DOC	**2,489.1**	4,476.3	2,722.2	2,460.1	2,338.4	2,858.3	2,882.8	2,883.1	2,721.4	2,470.3	2,684.3	**1,907.1**	**2,521.9**	1.3	32.2
EPA	**904.5**	747.0	822.4	839.7	994.8	1,041.3	1,120.5	1,100.0	1,149.3	1,120.4	1,290.8	**1,038.1**	**1,228.3**	35.8	18.3
HUD	**116.9**	140.3	164.9	156.7	147.8	144.2	131.3	140.8	137.6	126.4	129.6	**144.1**	**149.0**	27.4	3.4
OTHER*	**1,156.1**	3,072.0	2,212.2	2,403.8	2,539.2	2,922.8	4,108.4	4,814.5	5,040.5	3,889.4	3,865.9	**3,731.3**	**3,749.5**	224.3	0.5
Civilian Agencies Subtotal	**200,636.3**	196,847.7	192,340.4	190,723.6	197,941.2	201,091.5	203,213.5	194,738.3	212,224.7	201,008.6	205,258.2	**214,940.3**	**215,006.6**	7.2	0.0
DOD	**1,250,613.8**	1,241,655.8	1,269,291.5	1,103,990.1	1,048,772.9	977,040.4	926,022.9	904,456.2	880,007.7	837,115.8	810,663.0	**779,055.2**	**787,216.4**	-37.1	1.0
Total	**1,451,250.2**	1,438,503.5	1,461,631.8	1,294,713.8	1,246,714.1	1,178,132.0	1,129,236.4	1,099,194.5	1,092,232.4	1,038,124.4	1,015,921.2	**993,995.4**	**1,002,223.0**	-30.9	0.8
MBOE	**249.1**	247.0	250.9	222.3	214.0	202.3	193.9	188.7	187.5	178.2	174.4	**170.6**	**172.1**		
Petajoules	**1,531.0**	1,517.6	1,542.0	1,365.9	1,315.2	1,242.9	1,191.3	1,159.6	1,152.3	1,095.2	1,071.8	**1,048.6**	**1,057.3**		

DATA AS OF 09/25/02

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

[1]In 1998, the State Department developed a statistical method for estimating the energy consumption in the large number of foreign buildings it owns and leases. This method was subsequently applied to estimate FY 1991 energy consumption and is now used annually to assess progress. The FY 1991 foreign building estimates were combined with domestic building data for the fiscal years 1985 and 1990, since these are base years for performance goals.

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

Source: Federal Agency Annual Energy Management Data Reports

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.

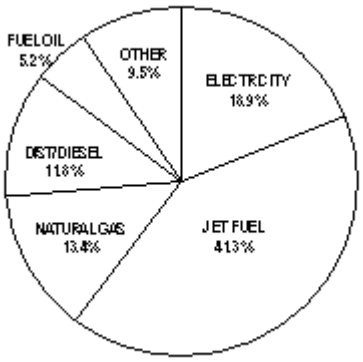
In FY 2001, the Department of Defense (DOD) spent $6.9 billion for energy out of the total Federal energy expenditure of $9.6 billion. Overall, DOD used 37.2 percent less site-delivered energy in FY 2001 than in FY 1985—a reflection of reduced Defense-related activity and successful energy management efforts.

Figures 1 and 2 depict the percentage of total energy used by the Federal Government in FY 2001 and its cost. As illustrated, jet fuel and electricity account for approximately 60.2 percent of the total energy consumption represented in Figure 1 and approximately 69.6 percent of the total energy costs in Figure 2.

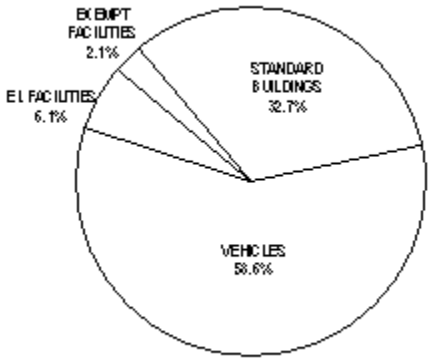
Petroleum-based fuels used by the Federal Government are shown in Table 2. In FY 2001, petroleum-based fuels accounted for 0.64 quads (641,796.9 billion Btu) of the total 1.0 quads consumed by the Federal Government. Of that, approximately 0.58 quads (579,004.3 billion Btu) were used by DOD primarily for jet fuel and distillate/diesel for vehicles and equipment energy. Only 0.04 quads (44,466.9 billion Btu) of petroleum-based fuels were used for Federal standard buildings energy.

FIGURE 1
Federal Energy Consumption, FY 2001

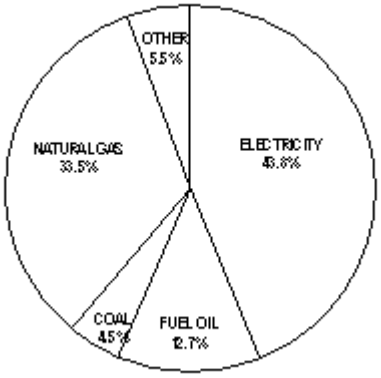
Total by Energy Type: 1.00 quads



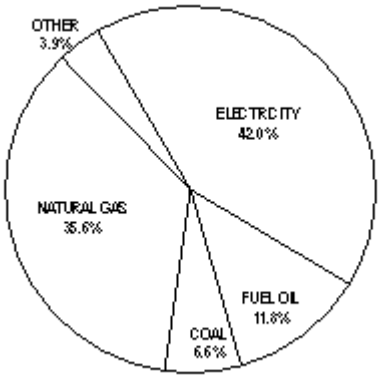
Total by Sector: 1.00 quads



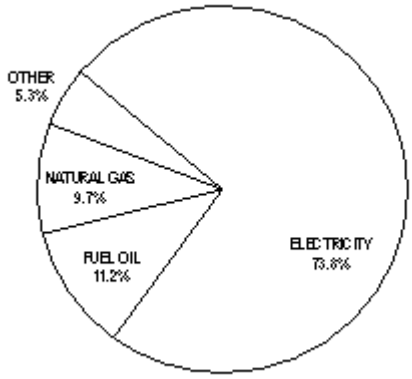
Standard Buildings: 0.33 quads



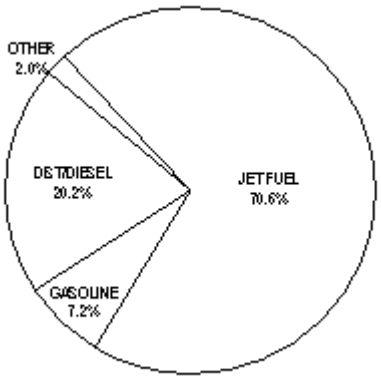
Energy Intensive Facilities: 0.06 quads



Exempt Facilities: 0.03 quads



Vehicles & Equipment: 0.59 quads

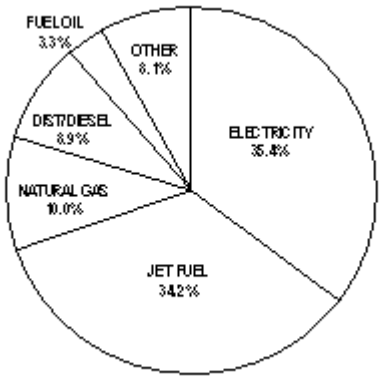


Data as of 09/25/02

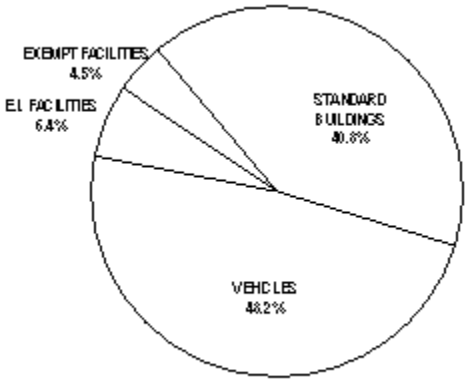
Source: Federal Agency Annual Energy Management Data Reports
Note: Sum of components may not equal 100 percent due to independent rounding.

FIGURE 2
Federal Energy Costs, FY 2001

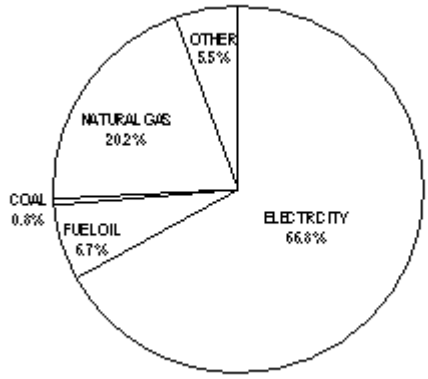
Total by Energy Type: $9.64 Billion



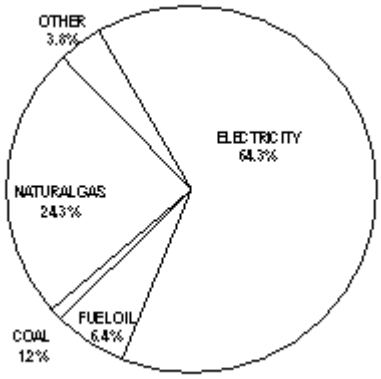
Total by Sector: $9.64 Billion



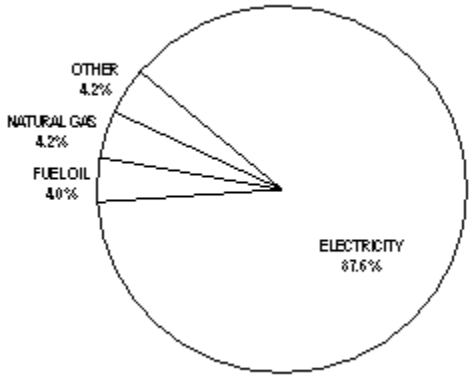
Standard Buildings: $3.94 Billion



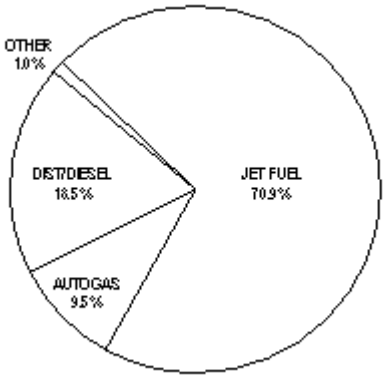
Energy Intensive Facilities: $0.62 Billion



Exempt Facilities: $0.44 Billion



Vehicles & Equipment: $4.60 Billion



Data as of 09/25/02

Source: Federal Agency Annual Energy Management Data Reports
Note: Sum of components may not equal 100 percent due to independent rounding.

TABLE 2
FEDERAL PETROLEUM USAGE IN FY 2001
(in Thousands of Gallons, Billions of Btu,
and Petajoules [Joule x 10^{15}])

	Unit Total (KGal)	BBTU* DOD	BBTU* Civilian	BBTU* Total	Petajoules* Total
Standard Buildings					
Fuel Oil	300,390.6	33,351.0	8,313.2	41,664.2	43.95
LPG/Propane	29,347.8	1,488.8	1,313.9	2,802.7	2.96
Energy Intensive Operations					
Fuel Oil	51,692.7	4,381.9	2,787.9	7,169.8	7.56
LPG/Propane	2,475.9	75.7	160.7	236.4	0.25
Exempt Buildings					
Fuel Oil	22,007.0	2,538.5	513.8	3,052.4	3.22
LPG/Propane	270.6	0.0	25.8	25.8	0.03
Vehicles & Equipment					
Motor Gas	340,137.4	13,592.1	28,925.0	42,517.2	44.85
Dist-Diesel & Petrol.	854,908.5	106,822.6	11,753.2	118,575.8	125.12
Aviation Gas	1,967.8	5.4	240.6	246.0	0.26
Jet Fuel	3,185,607.1	407,713.8	6,415.1	414,128.9	436.89
Navy Special	47,000.0	6,518.9	0.0	6,518.9	6.88
LPG/Propane	569.3	27.8	26.6	54.4	0.06
Other	4,804.4	2,487.9	2,316.5	4,804.4	5.07
Total		579,004.3	62,792.5	641,796.9	677.10

DATA AS OF 09/25/02

*Uses a conversion factor of:

95,500 Btu/gallon for LPG/propane
138,700 Btu/gallon for fuel oil, distillate-diesel & petroleum, and navy special
125,000 Btu/gallon for motor gasoline and aviation gasoline
130,000 Btu/gallon for jet fuel
947.9 Billion Btu/Petajoule

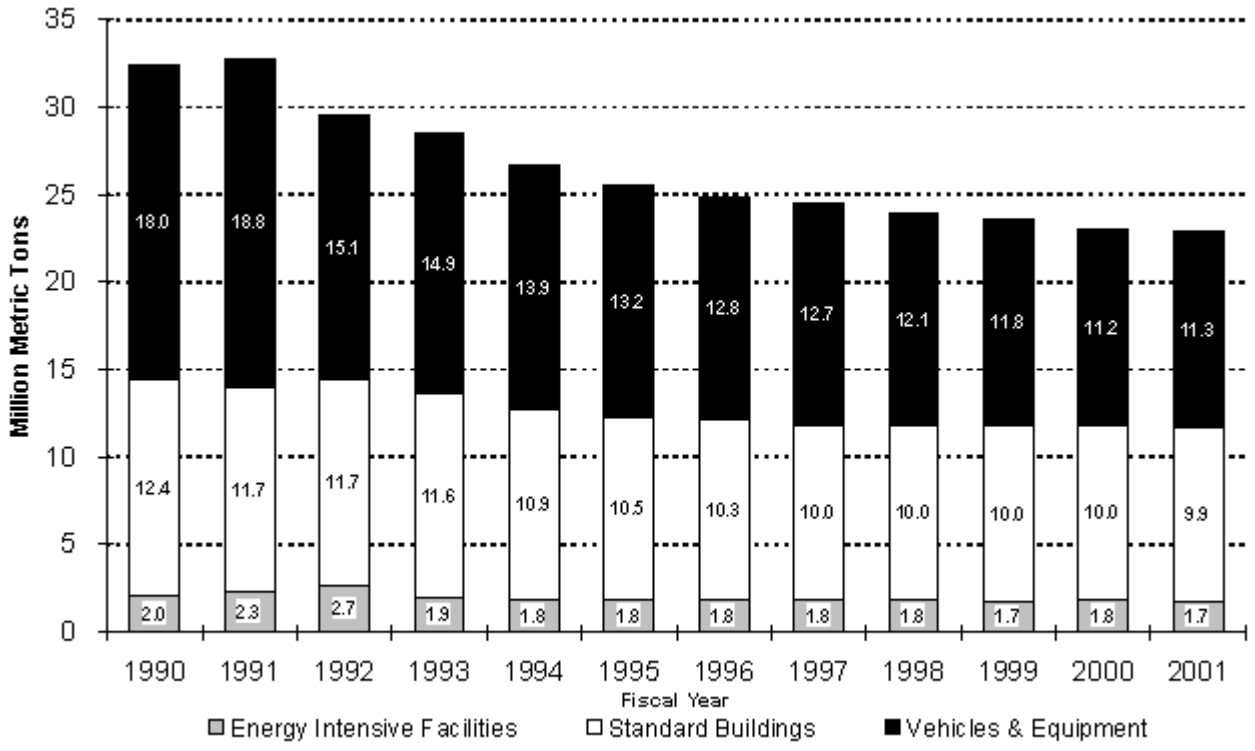
Note: FY 2001 contains estimated data for the following agencies: CIA, IBB, EEOC, FCC, and OPM. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

Carbon emissions from Federal Government energy consumption have decreased significantly since FY 1990. As shown in Figure 3, the Federal Government has reduced carbon emissions across the three non-exempt end-use sectors by 29.2 percent from 32.4 million metric tons of carbon equivalent (MMTCE) in FY 1990 to 23.0 MMTCE in FY 2001.[11] The largest contribution to this reduction is from the vehicles and equipment sector, which has seen a decrease in carbon emissions of 37.1 percent. This is a result of a reduction of almost 6.2 MMTCE emissions from jet fuel, as well as smaller reductions from diesel, aviation gasoline, navy special, and LPG/propane.

Carbon emissions have decreased by 20.2 percent in the standard buildings sector since 1990. Contributing to this reduction was a 8.7 percent reduction in gross square footage since FY 1990 and an 8.9 percent decrease in primary energy intensity (223,321 Btu/GSF in FY 1990, 203,427 Btu/GSF in FY 2001). Carbon emissions from energy intensive activities in industrial, laboratory, and other buildings decreased 14.3 percent (0.3 million metric tons) since FY 1990.

FIGURE 3
Carbon Emissions from Federal Energy Consumption by End-Use Sectors
FY 1990 through FY 2001
(Million Metric Tons of Carbon Equivalent [MMTCE])



[11]Carbon emissions were calculated by multiplying energy consumption for each fuel type by an associated carbon coefficient shown in Appendix B.

Section 201 of Executive Order 13123 establishes a greenhouse gas reduction goal for Federal Government facilities. This goal applies to standard buildings subject to the energy efficiency goals of Section 202 and industrial, laboratory, and other energy-intensive facilities subject to the goals of Section 203. The requirement states:

> "Through life-cycle cost-effective energy measures, each agency shall reduce its greenhouse gas emissions attributed to facility energy use by 30 percent by 2010 compared to such emissions levels in 1990. In order to encourage optimal investment in energy improvements, agencies can count greenhouse gas reductions from improvements in nonfacility energy use toward this goal to the extent that these reductions are approved by the Office of Management and Budget (OMB)."

As shown in Table 3, when the carbon emissions from non-exempt facilities are combined, the Government shows a reduction of 19.4 percent from 14.4 MMTCE in FY 1990 to 11.6 MMTCE in FY 2001.

Carbon emission calculations were adjusted in FY 2001 for nine agencies to reflect purchases of renewable energy. These agencies, and their corresponding credit for renewable energy purchases are shown below:

Agency	MTCE
DOD	85,676
GSA	870
EPA	464
SSA	463
DOE	421
USDA	192
DOJ	143
TVA	74
DOI	1
TOTAL	88,305

TABLE 3
CARBON EMISSIONS FROM FEDERAL AGENCY FACILITY ENERGY USE
(In Metric Tons of Carbon Equivalent [MTCE])

CIVILIAN AGENCY	**FY 1990**	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	**FY 2000**	**FY 2001**	%CHANGE 90-01	%CHANGE 00-01
USPS	**687,516**	704,295	729,898	786,519	764,341	781,885	805,984	724,512	772,307	784,284	**893,086**	**849,231**	23.5	-4.9
VA	**665,288**	676,624	676,063	688,980	674,610	678,289	702,452	701,307	709,187	712,775	**712,680**	**758,450**	14.0	6.4
DOE	**864,642**	822,281	843,751	846,797	830,647	814,381	790,342	741,801	730,498	707,258	**673,157**	**692,804**	-19.9	2.9
GSA	**576,465**	547,107	538,150	548,957	510,255	500,452	523,980	522,925	531,401	547,685	**587,494**	**605,314**	5.0	3.0
DOJ	**151,026**	192,962	150,733	190,656	200,586	211,621	258,891	257,427	266,555	276,209	**315,577**	**319,104**	111.3	1.1
NASA	**274,477**	273,866	275,835	270,365	265,443	265,107	257,195	263,382	272,021	267,758	**261,613**	**258,454**	-5.8	-1.2
HHS	**218,216**	194,929	213,473	222,189	212,968	183,414	197,046	217,171	217,720	214,647	**228,784**	**239,014**	9.5	4.5
USDA	**140,752**	137,793	131,456	138,104	130,495	129,733	133,786	127,553	135,547	128,569	**128,611**	**131,542**	-6.5	2.3
DOT	**105,548**	97,026	121,017	121,993	111,813	111,480	124,499	128,331	119,651	123,740	**121,125**	**123,816**	17.3	2.2
ST	**123,002**	123,473	14,909	2,292	3,873	4,188	13,075	121,155	125,402	119,607	**123,500**	**112,022**	-8.9	-9.3
DOI	**124,663**	127,882	113,716	138,001	128,478	119,447	96,585	109,071	112,139	112,460	**123,058**	**145,883**	17.0	18.5
TRSY	**78,782**	91,364	98,735	88,342	87,311	82,611	81,572	105,194	94,436	97,038	**101,072**	**99,432**	26.2	-1.6
DOC	**46,893**	46,471	49,502	52,605	60,615	67,454	68,680	58,832	59,906	62,301	**57,017**	**69,990**	49.3	22.8
DOL	**65,669**	64,182	64,748	66,957	64,930	62,918	64,636	65,211	66,983	51,838	**69,856**	**74,293**	13.1	6.4
EPA	**25,722**	28,371	28,882	30,197	29,870	32,525	32,132	31,698	32,765	35,925	**30,008**	**35,130**	36.6	17.1
TVA	**19,112**	19,171	19,125	19,698	30,970	34,277	33,205	31,254	30,969	30,676	**29,112**	**29,475**	54.2	1.2
NARA	**3,491**	3,495	3,733	10,170	17,572	20,791	17,054	18,131	18,029	18,219	**17,378**	**18,172**	420.6	4.6
USIA/IBB	**32,969**	22,302	21,848	21,202	19,846	20,894	22,378	26,267	24,571	22,420	**22,420**	**9,430**	-71.4	-57.9
FEMA	**7,623**	7,245	7,358	6,698	6,107	6,107	6,106	6,107	6,368	6,609	**6,571**	**6,706**	-12.0	2.1
HUD	**6,347**	6,072	5,629	5,229	4,677	4,415	4,768	4,540	4,544	4,680	**4,680**	**5,007**	-21.1	7.0
OPM	**3,221**	3,377	3,461	3,727	3,491	3,491	3,490	3,491	3,654	4,357	**3,206**	**3,206**	-0.5	0.0
NRC	**1,861**	2,891	2,559	2,607	2,575	3,408	3,648	3,791	3,934	4,007	**3,801**	**3,723**	100.0	-2.1
RRB	**1,368**	1,438	1,582	1,532	1,493	1,460	1,420	1,448	1,276	1,203	**1,136**	**1,072**	-21.6	-5.7
FTC	**997**	986	976	960	903	903	903	903	943	968	**1,246**	**1,012**	1.4	-18.8
FCC	**586**	619	483	501	521	521	426	426	441	442	**426**	**426**	-27.3	0.0
Other*	**20,089**	11,012	10,614	10,902	10,089	37,245	72,535	75,500	63,802	65,069	**65,672**	**63,888**	218.0	-2.7
Civilian Agencies Subtotal	**4,246,324**	4,207,233	4,128,236	4,276,181	4,174,480	4,179,016	4,316,789	4,347,428	4,405,049	4,400,743	**4,582,287**	**4,656,597**	9.7	1.6
DOD	**10,184,471**	9,788,747	10,286,884	9,312,036	8,555,023	8,091,409	7,788,012	7,481,295	7,418,175	7,394,256	**7,192,174**	**6,980,447**	-31.5	-2.9
Total	**14,430,796**	13,995,980	14,415,120	13,588,217	12,729,503	12,270,425	12,104,800	11,828,724	11,823,224	11,794,999	**11,774,460**	**11,637,044**	-19.4	-1.2

*Other includes, for certain years, CFTC, CIA, NSF, PCC, and SSA. DATA AS OF 09/25/02

Note: 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.

C. Energy Management Infrastructure and Tools

1. Federal Coordination

Federal Interagency Energy Policy Committee (656 Committee)
The Federal Interagency Energy Policy Committee (656 Committee) was established in accordance with Section 656 of the Department of Energy Organization Act (P.L. 95-91) to strengthen Government programs that emphasize productivity through the efficient use of energy, and concurrently, to encourage interagency cooperation in energy conservation. The 656 Committee did not meet in FY 2001. However, a meeting convened by the Office of Management and Budget brought together the Executive Order 13123 Senior Energy Officials in September 2001. For most agencies, the Senior Energy Official is also their 656 Committee member.

Federal Interagency Energy Management Task Force
The Federal Interagency Energy Management Task Force (Task Force) was established in accordance with the Federal Energy Management Improvement Act of 1988 to stimulate increased energy efficiency in the Federal sector. The Task Force serves as technical advisor to the 656 Committee by coordinating the activities of the Federal Government in promoting energy conservation and the efficient use of energy.

The Director of the Department of Energy's Federal Energy Management Program (FEMP) serves as the Executive Director of the Task Force. The Task Force, composed of the chief energy managers of the agencies represented on the 656 Committee, addresses energy issues affecting Federal facilities and operations and provides the 656 Committee with in-depth analysis and recommendations concerning current and pending legislation, technical issues, and implementation of coordinated Federal activities.

The Task Force assesses the progress of agencies toward achieving energy savings, and collects and disseminates information on effective survey techniques, technologies that promote conservation and efficient use of energy, and innovative programs and contracting methods. To accomplish its mission, the Task Force establishes working groups to resolve specific technical or programmatic issues, to develop new initiatives for Federal implementation, and to address legislative requirements and topics presented by the 656 Committee, the Executive Director, or member agencies.

In FY 2001, meetings of the Task Force were held on October 4, 2000; November 16, 2000; March 1, 2001; May 16, 2001; and August 1, 2001. Issues highlighted in the these meetings included the following:

- FEMP's Design Assistance (DA)/Distributed Energy Resources (DER) project funding opportunities.
- The Federal Commercial Building Energy Standard (FEDCOM).
- FEMP's Industrial Facilities Program.

- Provisions of the renewable energy goals of Executive Order 13123 and incentives for implementing renewable energy projects in Federal facilities.

- Federal peak load reduction activities and other measures developed as a result of the West Coast energy crisis of 2000.

- The National Energy Policy Initiative.

- The Federal Energy and Water Management Awards and the Presidential Awards for Federal Energy Management Success.

- The Presidential Directive on Energy Conservation at Federal Facilities.

- Assessment of Load and Energy Reduction Technique (ALERT) Teams activities and assistance.

- Executive Order 13221 on Energy Efficient Standby Power Devices.

- Guidance for completing annual reports, complying with Executive Order 13123, and training opportunities in Federal energy management.

Senior Energy Officials
Section 304 of Executive Order 13123, states that "Each agency shall designate a senior official, at the Assistant Secretary level or above, to be responsible for meeting the goals and requirements of this order, including preparing the annual report to the President. Designated officials shall participate in the Interagency Energy Policy Committee. . . [and] shall communicate its activities to all designated officials to assure proper coordination and achievement of the goals and requirements of this order."

A meeting of the Senior Energy Officials was convened and chaired by OMB on September 7, 2001. A representative from the Vice President's Office discussed the Administration's commitment to the National Energy Policy and leadership role on energy conservation. The Administration's full support of Executive Order 13123 was emphasized. Assistant Secretary for Energy Efficiency and Renewable Energy, David K. Garman, provided an overview of the transportation and energy Executive Orders and Executive Order 13221 on Energy Efficient Standby Power Devices. He also discussed the agency energy scorecards and the *Annual Report to Congress on Federal Government Energy Management.*

2. Training

Many agencies have their own internal training and recognition programs. These are discussed individually in Section VI of this report. Overall, Federal agencies reported spending $2.1 million to train 5,803 Federal personnel in energy efficiency, renewable energy, and water conservation subjects, including energy efficient product procurement and alterative financing techniques for energy and water projects.

During FY 2001, FEMP conducted 62 training workshops and symposia for more than 5,407 attendees in the efficient use and conservation of energy, water, and renewable energy in Federal facilities.

FEMP supplemented its classroom workshops with "distance learning" training, via satellite. The Energy Management Teleworkshop, a six-module survey of FEMP courses, attracted 3,324 viewers. It included modules for life-cycle costing; buying energy efficient products; water resource management; operations and maintenance management; and, financing.

Eight workshops on energy savings performance contracting were conducted in FY 2001 for 159 participants. In each workshop, facility managers, contract specialists, and building engineers were instructed on the statutory provisions for this innovative contracting/financial method, and how to identify suitable projects. Energy savings performance contracts (ESPCs) allow energy-efficient improvements to be installed by private contractors with no up-front capital costs.

FEMP's Utility Project Financing/Utility Restructuring workshop was presented 5 times for 182 students. FEMP's Electric Utility Deregulation Workshop was presented 3 times for 84 attendees.

The Designing Low Energy Buildings course was presented twice for 91 participants. The two-day course included analyses and case studies of building design using passive solar heating, natural ventilation and cooling, and day lighting, as well as glazing and overhangs.

The FEMP Lights course was conducted twice for a total of 44 participants. The objective was to provide guidance on energy-efficient lighting consistent with other facility lighting considerations, quality and cost, and whole building analysis. Topics included: basic lighting concepts; a comprehensive process for Federal relighting project development and implementation; and the use of professional lighting design services.

Two Facility Energy Decision Screening (FEDS) workshops were held during FY 2001 for 62 attendees. This is a training course for Federal facility managers on whole-site analysis of energy conservation, technical, and financial opportunities utilizing the FEDS project screening software and the project implementation software.

The Operations and Maintenance Management classroom course was presented once for 35 students.

FEMP, in conjunction with the National Institute of Standards and Technology (NIST), conducted 2 workshops on life-cycle costing and building retrofit simulation for 47 students.

The Implementing Renewable Energy Projects course was presented twice for 78 students.

FEMP continued to offer its Water Resource Management course with one workshop for 48 attendees in FY 2001. The course is designed to assist Federal site managers and agencies in meeting the water conservation requirements of EPACT and Executive Order 13123.

During FY 2001, FEMP participated in the organization and presentation of 31 panel discussions on Federal energy efficiency, water conservation, and renewable energy topics at national energy management conferences around the country, attracting 1,262 attendees.

"Energy 2001," the energy efficiency workshop and exposition sponsored by FEMP, DOD, and the General Services Administration (GSA) was held August 21-23, 2001, in Kansas City, Missouri. The conference provided participants with opportunities to explore such topics as strategies for energy projects, selling energy projects, and alternative financing. The conference also had panel discussions, an exhibit hall showcasing energy technologies, and chances for relationship building, with over 1,100 attendees and over 70 companies exhibiting during the event.

FEMP continued to offer its Training Course Locator System to assist Federal agencies in training energy managers and in meeting the requirements of the EPACT and energy-related Executive Orders. The Locator system connects those seeking particular training courses with the sponsoring organizations for those courses. Locator is a Web-based application which is readily available through the Internet. During FY 2001, 347 unique visitors to Locator viewed 18,538 pages from the Locator Web site.

3. Awards and Recognition

Federal Energy and Water Management Awards
Outstanding accomplishments in energy efficiency and water conservation in the Federal sector were recognized with the presentation of the 2001 Federal Energy and Water Management Awards on October 17, 2001, in Washington, D.C. The Awards Program is sponsored by the 656 Committee and the Department of Energy. Awards were selected from outstanding Federal energy managers and contributors who:

- Implemented proven energy efficiency, energy and water conservation techniques;
- Developed and implemented energy-related training programs and employee energy awareness programs;
- Succeeded in receiving utility incentives, or awarding ESPC and other Federal-approved performance-based energy and water contracts;
- Made successful efforts to fulfill compliance with energy and water reduction mandates;
- Improved energy efficiency or reduction in energy costs for Federal mobile equipment including aircrafts, ships, and vehicles;
- Provided leadership in purchasing or supplying energy-efficient, renewable energy, or water-conserving products to one or more Federal agencies; and
- Demonstrated cost-beneficial landscape practices which utilize techniques that seek to minimize the adverse effects of landscaping.

Recipients of the 2001 awards were selected from 129 nominees submitted by 21 Federal agencies. Award recipients totaled 43, representing 12 different Federal agencies. Distribution of awards among the Federal agencies for accomplishments in the previous fiscal year is indicated in the following exhibit.

2001 Federal Energy and Water Management Awards, by Group and Type

Agency	Individual	Small Group	Organization	Total	Energy Efficiency	Alternative Financing	Renewable Energy	Mobility	Water Mgmt.	Innovative Tech.	Program Imp.	Exceptional Service	Directors Award
Army		1	5	**6**	3	1			1		1		
DOE			1	**1**	1								
DOI		2	1	**3**	1		1			1			
DOT	1			**1**								1	
GSA		5	2	**7**		2	2			1	2		
HHS		1		**1**		1							
Inter-agency			1	**1**							1		
Navy		1	12	**13**	2	2	1	2	2	3	1		
State		2		**2**		1					1		
USAF	3	1		**4**	1						2	1	
USMC	2	1		**3**				1				1	1
USPS	1			**1**		1							
TOTAL	**7**	**14**	**22**	**43**	**8**	**8**	**4**	**3**	**3**	**5**	**8**	**3**	**1**

Each category contained a wide variety of projects. Examples from each award category follow.

Energy Efficiency Award:
U.S. Army Europe 6th Area Support Group, Department of the Army. The U.S. Army Europe's 6th Area Support Group (ASG) continued its successful energy program through implementation of numerous energy and water management projects, energy audits, and an active energy awareness program that has reduced energy intensity by 8 percent from the previous year. The energy reductions translate to cost avoidance and savings of more than $1 million. During FY 2000, the 6th ASG invested and implemented $450,000 in energy conservation projects. A major effort included retrofitting more than 80,000 exit signs throughout 80 buildings, installing approximately 400 motion sensors in 40 buildings to turn off lights during unoccupied hours, and using photo cells to control outside lighting. Total annual energy savings for the 6th ASG is more than 96 billion Btu.

Alternative Financing Award:
Cathe Grosshandler, United States Postal Service. Cathe Grosshandler used innovative and creative alternative financing strategies to implement a demonstration project that saved the United States Postal Service (USPS) Anchorage General Mail Facility (GMF) more than $1 million. During the initial investigation, the USPS GMF was discovered to have a backup generator with a diesel underground storage tank that would not meet the 1998 EPA underground storage tank regulations. While looking into tank replacement options, Ms. Grosshandler discovered that a recent facility expansion had created load problems, inspiring her to implement five 200-kilowatt fuel cells that provide "green" power to the 300,000 square foot facility and is able to prevent the interruption of mail processing operations caused by power grid outages.

Renewable Energy Award:
Metcalfe Solar Working Group, General Services Administration, Environmental Protection Agency, Department of Energy. The GSA, Environmental Protection Agency (EPA), and DOE formed a multi-agency team to implement a 10 kilowatt solar photovoltaic system for the Ralph H. Metcalfe Building, EPA Region 5 Headquarters in Chicago, Illinois. The team developed and

implemented a photovoltaic (PV) solar cell system that demonstrates a non-polluting, renewable energy approach for generating supplemental electricity for building operations. The photovoltaic system, which consists of 84 panels, will reduce carbon dioxide emissions by more than 20,000 pounds per year, equal to the emissions produced from driving an average passenger car 25,117 miles-or once around the world. In addition, an interactive kiosk system that displays the actual energy production of the PV panels is located in the Metcalfe Building lobby. Funded by DOE, this kiosk will be expanded to educate the general public about the benefits of the PV system and will also include segments on other types of renewable energy. This Federal partnership is on the forefront of sustainable building design. The electricity generated from renewable energy offsets more than 61 million Btu yearly.

Mobility Energy Management Award:
USS Essex, Department of the Navy. Innovative thinking and creative strategies have characterized the USS ESSEX's energy awareness and conservation plans. Energy training and awareness extends to all Marines on the ship and is integrated into every level of planning and operations by the Energy Conservation Board. Non-traditional anchoring plans and maintenance strategies have generated large energy savings. While at anchor in auxiliary steaming status, fuel savings of 23 percent are achieved. The USS ESSEX also switched to a single boiler plant mode of operation, which is now 24 percent more efficient than operating two boilers throughout the majority of its speed range. These efforts have resulted in savings of 225,000 gallons of fuel and more than $135,000 during FY 2000. These energy savings were attained despite the high operational tempo of a ship such as ESSEX, laying to rest the belief that energy conservation and real-world military taskings are mutually exclusive.

Water Management Award:
NAVSEA Crane, Surface Warfare Center Division, Department of the Navy. The NAVSEA Crane, Surface Warfare Center Division utilized innovative thinking in developing the Indiana Water Conservation Project. Previously, Crane's 175-mile water distribution system was antiquated and springing leaks that sent water bills soaring. This forced the Base to rethink its water operations, from production and distribution to end use. One innovative idea that arose from this creative process and that has proven effective was to use scuba divers to clean water towers instead of draining the towers. This change alone saved 1.8 million gallons of water. Crane modernized the water production plant, improving its efficiency and effectiveness. This effort is saving 20 million gallons of water per year. The water consumption crisis in Crane's distribution system drove Crane to seek ways to improve the system through monitoring and analysis. As a result, Crane removed 26 miles of obsolete leaking piping in the water distribution system. In addition, they repaired the leaky swimming pool, saving 1.6 million gallons of water. By reexamining all operations, they were able to devise improvements that are saving $90,000 a year and approximately 88 million gallons of water, representing a 30 percent reduction for the Division.

Innovative Technology Award:
The John Heinz National Wildlife Refuge at Tinicum, U.S. Fish and Wildlife Service, Department of the Interior. The new Cusano Environmental Education Center at the John Heinz National Wildlife Refuge in Tinicum, Pennsylvania, is a model for the conservation and efficient use of energy and water. The Center incorporates geothermal heating and cooling, energy-efficient

lighting, a well-insulated building envelope, and natural daylighting to reduce building energy consumption. Other sustainable design strategies include use of green building materials with significant recycled content. The geothermal heating and cooling system alone is estimated to save approximately 25 percent of the energy compared to a conventional system. In addition, the Center has implemented an innovative on-site "marsh machine," an organic wastewater treatment plant. Estimated savings for the project include $3,850 for the geothermal heat pump alone and more than 119 million Btu for FY 2000.

Program Implementation Award:
You Have the Power Campaign, Interagency. Recognizing that personal behavior is critically important to reducing energy consumption, the *You Have the Power* Energy Awareness Campaign was launched by FEMP in 1997 to assist Federal energy managers in spreading the word about energy-efficient practices and products, as well as facilitate partnerships with energy-related organizations in the private sector. The campaign instills energy efficiency as a basic value among Federal agencies, private sector companies that work with them, and the general public that use Federal facilities. The campaign's theme is designed to give every Federal worker authority to take positive action to implement Federal energy reduction goals. Twenty Federal agencies participate in the *You Have the Power* Campaign. Along with hosting interagency planning meetings, working with agency coordinators on a one-on-one basis, and utilizing a wide array of outreach materials and events, the campaign recognizes Energy Champions who have developed and advocated innovative practices at their agencies that save energy and money, and improve the efficiency of the Federal Government. During FY 2000, the campaign recognized 71 new Federal Energy Champions, bringing the total number of Energy Champions to 296 since the inception of the campaign.

Exceptional Service Award:
Gene McCann, Mike Monroney Aeronautical Center Academy, Federal Aviation Administration, Department of Transportation. Gene McCann is the energy coordinator of the Academy organization at Mike Monroney Aeronautical Center's (MMAC) largest single energy-consuming entity. As energy coordinator, Mr. McCann undertook an energetic campaign to instill new attitudes about and commitment to energy conservation in a complex organization. The Academy's mission requires providing diverse training classes and operating major energy-consuming equipment beyond normal office hours. Conserving energy would require that MMAC's systems be operated differently. The Academy's energy consumption was not being reduced nearly enough to comply with Federal mandates of MMAC's reduction goals. Mr. McCann has been successful in incorporating energy efficiency in all new and renovation construction projects. Directly due to Mr. McCann's perseverance and imaginative campaigning, the Academy has become one of the most energy conscious and efficient organizations within MMAC. His accomplishments include establishing an energy conservation team, developing an Academy energy conservation plan, and exceeding quarterly goals by 7 percent, remarkably through one of the coldest winters on record. As a result of Mr. McCann's efforts, MMAC saved more than $134,000 and 13 billion Btu during FY 2000.

Director's Award
James Trocke, U.S. Marine Corps Air Station, Iwakuni, Japan, United States Marine Corps. Chief James Trocke is receiving the 2001 Director's award for his role in three projects

undertaken during FY 2000. As Air Station Energy Manager, Chief Trocke orchestrated Energy Awareness Week 2000, full of fun and innovative events which encouraged all Air Station residents to focus on energy conservation and usage. On a regular basis, Chief Trocke ensures that the Air Station is using its limited and expensive resources to their fullest. Renegotiation of the Base's electrical billing rates, implementation of an aggressive underground pipeline water leak detection plan, and a comprehensive energy conservation awareness program are just a few outstanding achievements Chief Trocke spearheaded during FY 2000. To combat the long term effects of incurring new electrical consumption peak levels, the Marine Corps Air Station Iwakuni, Japan, and Chief Trocke implemented a comprehensive action plan called "Green Out" during FY 2000. Recognizing the costly nature of setting new electrical consumption peaks, the command implemented a comprehensive, power shaving plan to reduce electrical loads during critical time periods. Aggressive on-Base media coverage and Base-wide flash e-mail messages on all station personal computers ensured that all electrical power users participated in reducing office, household, and workplace usage where feasible. As a result of the entire Air Station's cooperation in this program, new electrical peak charges were avoided. This Base-wide effort, along with Mr. Trocke's personal achievements have saved the Iwakuni Air Station more than 50 billion Btu and more than $1.5 million.

Presidential Awards for Leadership in Federal Energy Management
On October 18, 2001, the White House honored four Federal agency energy management teams and almost 50 Federal employee participants of these teams for their support, leadership, and efforts in promoting and improving Federal energy management, and thereby saving millions of dollars in energy costs.

The Presidential Awards for Leadership in Federal Energy Management were presented for the second time as required by Executive Order 13123, *Greening the Government through Efficient Energy Management*. Winners included representatives from the National Aeronautics and Space Administration (NASA); United States Postal Service; DOD, United States Marine Corps; and DOD, Department of the Navy. Award recipients were recommended to the President by the Office of Management and Budget and FEMP.

Award winners were as follows:

- NASA
  "Federal Energy Management Success"

- USPS – Southeast Area
  "Stamp Out Energy Waste"

- DOD, United States Marine Corps
  U.S. Marine Corps Air Station – Iwakuni, Japan
  "Energy Conservation Program 2000"

- DOD, Department of the Navy – Southwest Region
  "Demand-Side Management"

4. Federal Energy Saver Showcase Facilities

To promote wise energy and water use throughout the Federal government, agencies are showcasing cost-effective energy efficiency, water-conserving, and renewable energy technologies in their facilities.

To highlight these successful energy efficiency projects, Executive Order 13123 requires that agencies designate "exemplary new and existing facilities with significant public access and exposure as showcase facilities to highlight energy or water efficiency and renewable energy improvements." The showcase program functions as a management strategy by assisting agencies in implementing the goals of EO 13123. When facilities are designated as showcases, agencies can receive assistance from the Federal Energy Management Program and have the advantage of partnering with other agencies, energy services companies, utilities, and national laboratories.

Since 1995, FEMP has recognized more than 98 sites across the country as Federal Energy Saver Showcases. Each showcase site prominently displays a plaque notifying visitors that the Government building they are entering uses energy and water, as well as taxpayer dollars, wisely. A call for nominations has been distributed to urge agencies to identify and designate their best projects, or potential projects, so that others may benefit by example.

FEMP recognized 18 outstanding Federal facilities as Federal Energy Saver Showcases for 2001. These facilities are expected to save annually 50 million kilowatt-hours of energy, or about $2 million in energy costs. The agencies and Showcase facilities are as follows:

Department of Agriculture, Animal and Plant Health Inspection Service

- Wildlife Services, National Wildlife Research Center, Animal Research Building, Fort Collins, Colorado

Department of Commerce, National Oceanic and Atmospheric Administration

- Guam Weather Forecast Office, Barrigada, Guam

DOD, Navy

- MCPON Plackett Manor, Great Lakes Naval Training Center, Great Lakes, Illinois

DOE

- Fermi National Accelerator Laboratory, Batavia, Illinois

Department of Health and Human Services (HHS)

- Albuquerque Public Health Service Indian Hospital, Albuquerque, New Mexico
- Program Support Center, Parklawn Building, Rockville, Maryland

Department of the Interior, Fish and Wildlife Service

- Cusano Environmental Education Center, John Heinz National Wildlife Refuge at Tinicum, Philadelphia, Pennsylvania

Department of State

- Florida Regional Center, Oakland Park Facility, Ft. Lauderdale, Florida

Department of the Treasury

- Bureau of Engraving and Printing, Main Building, Washington, D.C.

Department of Veterans Affairs

- Salt Lake City Health Care System, Salt Lake City, Utah

GSA

- Ralph H. Metcalfe Federal Building, Chicago, Illinois
- Richard B. Russell Federal Building, Atlanta, Georgia
- Leo W. O'Brien Federal Building, Albany, New York

NASA

- Dryden Flight Research Center, Aircraft Support Facility, Building 1623, Edwards, California

USPS

- Anchorage Processing & Distribution Center/Air Mail Facility, Anchorage, Alaska
- Center Ossipee Post Office, Center Ossipee, New Hampshire
- Center Sandwich Post Office, Center Sandwich, New Hampshire
- Gilsum Post Office, Gilsum, New Hampshire

5. Energy Awareness

The Federal Government, as the largest single employer in the United States, has the responsibility to set an example for the nation by conducting energy awareness programs. Most agencies have ridesharing, carpooling, and/or public transportation programs in effect. Many agencies also participate in recycling programs. The following exhibit shows the employee awareness activities at the various Federal agencies.

Agency	Award Programs	Recycling	Ridesharing	Transit Subsidies	Information Dissemination
USDA	✓	✓	✓		✓
DOC	✓	✓	✓		
DOD	✓	✓	✓	✓	✓
DOE	✓	✓	✓	✓	✓
HHS	✓	✓	✓	✓	✓
HUD		✓	✓	✓	
DOI	✓	✓	✓	✓	✓
DOJ	✓	✓	✓	✓	✓
DOL	✓	✓	✓	✓	✓
ST	✓	✓	✓		
DOT	✓	✓	✓	✓	✓
TRSY	✓	✓	✓	✓	✓
VA	✓	✓			
EPA	✓	✓	✓	✓	✓
GSA	✓	✓	✓		
NASA	✓	✓	✓	✓	✓
NARA		✓		✓	✓
NRC		✓	✓	✓	✓
RRB	✓	✓		✓	
SSA	✓	✓	✓	✓	✓
TVA		✓	✓		✓
USPS	✓	✓	✓		✓

6. Public Education Programs

NECPA, 42 U.S.C. § 8258(b), requires the Secretary of Energy to include in this and subsequent annual reports information on public education programs carried out by Federal agencies and previously reported under the authority of section 381 of the Energy Policy and Conservation Act (EPCA), 42 U.S.C. § 6361(b). EPCA requires the Secretary of Energy to establish and carry out public education programs to encourage energy conservation and energy efficiency and to promote vanpooling and carpooling arrangements. The Department of Transportation (DOT) has promoted ride sharing activities, while DOE has been responsible for other energy conservation education programs.

Through its Federal Highway Administration, DOT obligates Federal aid funds to assist State and local agencies in implementing programs designed to encourage the use of car pools, van pools, and buses by commuters. DOT efforts have included van pool acquisition programs, fringe and corridor parking facilities, ride-matching projects, preferential treatments for high occupancy vehicles, and transit service improvement. Since 1974, more than $900 million in Federal aid highway funds have been spent on such projects in an effort to establish self-sufficient programs across the Nation.

The DOT's Technology Sharing Program (TSP) makes high quality reports in a user-friendly format available to the non-scientist or technical person to understand and act on transportation problems of state and local governments. This low-cost program disseminates technical reports on a variety of topics to this user community, thus saving them the time and cost of researching the information on an individual basis, or not having the information at all. The TSP products consist of reports, manuals, and summary documents which can be ordered at the following Internet site: http://www.tsp.dot.gov.

In some cases the product is the final output of a research effort funded by one of the DOT Administrations, which is then printed and disseminated by the TSP. In other cases, the TSP sponsors the development of a new, consolidated package for dissemination. A third type of materials is originated by innovative state or local jurisdictions for their own use, and then with their permission is reprinted by the TSP for national distribution. These "Technology Sharing Reprints" are among the most popular products issued since they reflect the needs and concerns of the user community as actually dealt with by one of their peers. Subjects include commuter issues and travel demand, traffic congestion, land-use development, and risk assessment.

The DOE's public education programs encompass a wide variety of services, objectives, and audiences, covering all major areas of conservation and renewable energy. DOE has organized its technology transfer programs to meet the specific information requirements of various audiences.

Three services are managed through subcontracts at the National Renewable Energy Laboratory (NREL): DOE's Energy Efficiency and Renewable Energy Clearinghouse (EREC), DOE's Energy Efficiency and Renewable Energy Network (EREN), and the FEMP Help Desk.

EREC provides basic, technical, and financial information on various energy efficiency and renewable energy technologies and programs. The audience served by EREC includes the general public, business and industry, educational community, media, utility companies, and state and local governments. Information is provided in the form of fact sheets, DOE and National Laboratory books and brochures, bibliographies, and on-line computer-generated technology synopses. Some requests are handled completely over the phone and the caller receives no publications. EREC's telephone number is 800-DOE-EREC (800-363-3732) and its Web site is at www.eren.doe.gov/consumerinfo. In FY 2001, EREC staff responded to 62,946 inquiries and disseminated 301,680 publications.

EREN is the official Web site of the DOE's Office of Energy Efficiency and Renewable Energy (EERE). The audience served by EREN includes business and industry, the general public, the

educational community, the media, and state and local governments. EREN's Web address is www.eren.doe.gov. The site is a comprehensive resource for energy information, providing links to more than 600 energy-related Web sites, allowing keyword searches, and offering a full range of information on topics such as building energy efficiency, wind power, and alternative fuels. In addition, EERE provides its organizational chart, major initiatives, and budget. The site also features current press releases, consumer information, and lists of discussion groups on various energy-related topics. There are even forms to submit energy-related questions and to subscribe to the EREN Network News e-mail newsletter.

The FEMP Help Desk provides Federal energy managers with specialized information on effective energy management practices, technical assistance on implementing Federal sector energy projects, financing information, energy modeling software, publications, and energy management training programs. The Help Desk responds to requests for information via a toll-free telephone service, electronic mail, and through the Internet. The telephone number is 800-DOE-3732. The Web site is www.eren.doe.gov/femp.

The 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. It also makes available the publications produced by the DOE Energy Information Administration. NEIC provides information to Federal employees and the public at www.eia.doe.gov. Electronic inquiries may be sent to infoctr@eia.doe.gov. In FY 2001, NEIC staff responded to 30,500 inquiries and distributed approximately 12,000 publications. EIA is transitioning from providing paper reports to providing electronic copies of reports in the .pdf format on the EIA web site.

The Office of Scientific and Technical Information (OSTI), as part of the DOE's Office of Science, provides coordination and direction for the management of scientific and technical information resulting from the DOE's multi-billion dollar research and development activities. As a cross-cutting Headquarters office, OSTI accomplishes its mission through the Scientific and Technical Information Program (STIP). STIP operates in partnership with program offices, operations offices, and contractors to develop and implement information management "best business practices" to ensure that DOE maximizes the return on its $6 billion annual R&D investment.

OSTI collects, processes, and disseminates DOE-originated research information and selected worldwide research literature on subjects of interest. OSTI also provides scientific and technical information services to, or on behalf of, DOE elements in support of DOE mandates, missions, and objectives. OSTI serves the public directly or indirectly through agreements with the National Technical Information Service, Government Printing Office, depository libraries, and commercial vendors. EnergyFiles is a publicly available, web-based gateway to an array of energy information. Included among the EnergyFiles family is the DOE Information Bridge, an electronic full-text collection of 88,074 documents available to the DOE research community.

OSTI manages a comprehensive collection of approximately one million scientific and technical information documents, representing 50 years of energy-related activities. The organization also maintains the Energy Science and Technology Database (EDB), which has more than 4 million

summaries of DOE and worldwide information. EDB is made available to the public on-line and on CD-ROM through commercial vendors. The majority of its users are industry, Federal and State officials, contractors, libraries, research institutions, and the public. In FY 2001, OSTI added 120,000 research summaries to the database and provided 11,701 full-text documents for public availability to the National Technical Information Service and the Government Printing Office Depository Library Program.

FY 2001 initiatives included a strategic effort to process and disseminate information in an increasingly decentralized environment. As a continuing step towards a "National Library of Energy Science and Technology," the effort will significantly improve DOE and public access to bibliographic and full-text information without major additional investment. In addition to the core program activities, OSTI's other services include developing Internet-based applications for DOE offices, providing information management advice and consultation to the DOE community, managing and disseminating DOE and Nuclear Regulatory Commission scientific and technical software, and representing the United States in multilateral and bilateral international information exchange agreements.

The DOE public information mechanisms include several direct service programs designed to provide technical assistance to specific target groups. Some of these include:

- The State Energy Program is a formula grant program, which provides a flexible, supportive framework to enable the States to address their own energy priorities, as well as focus on national initiatives and strengthens their capabilities to deliver energy services. This customer-driven program seeks to increase the extent to which Federal, State, and local governments work with other public and private sector entities to achieve widespread adoption of available energy efficiency and renewable energy technologies, and to demonstrate the use of emerging technologies which benefit the entire economy.

- The Special Projects component of the State Energy Program offers States the opportunity to apply for competitively selected grants covering a wide range of activities that may expand upon a State's formula grant activities or offer an opportunity to take new initiatives. These projects are designed to utilize the State's skills in forming and sustaining partnerships with local governments, industry, utilities, and private organizations. Many of these projects involve the dissemination of information about, and/or the demonstration of the viability of a variety of energy efficiency and renewable energy applications.

- The Industrial Assessment Center (IAC) Program provides no-cost energy, waste, and productivity assessments to help small and mid-sized manufacturers identify measures to maximize energy-efficiency, reduce waste, and improve productivity. The assessments are conducted by local teams of engineering faculty and students from 26 participating universities across the country. This program not only improves manufacturing efficiency, but at the same time provides valuable, hands-on technical training and experience for engineering students throughout the U.S. Additional information can be obtained by visiting the program Web site at www.oit.doe.gov.

D. Financing Mechanisms for Energy Efficiency Improvements in Federal Facilities

During FY 2001, Federal agencies had three primary options for financing energy efficiency, water conservation, and renewable energy projects in buildings and facilities: direct appropriated funding, ESPCs, and UESCs. The latter two options utilize non-Government sources of funding and can be used to supplement Government funding. Each of these three sources can be combined with another.

To the extent that agencies have been able to provide complete reporting, funding from the three sources totaled approximately $668 million in FY 2001. Direct appropriations accounted for approximately $131 million. ESPC contracts awarded in FY 2001 resulted in approximately $298 million in estimated contractor investment ($121 million from DOE Super ESPC delivery orders and $177 million from other agency ESPCs), and approximately $239 million in private sector investment came from utility energy service contracts. While these three categories of funding are not entirely comparable, they do indicate that ESPCs and UESCs have become the dominant source of support for efficiency investments throughout the Federal Government. Energy efficiency investment from ESPCs and UESCs increased from $478.5 million in FY 2000 to $536.4 million in FY 2001. In FY 1999, investment from these sources totaled only $395.3 million.

Since 1985, the Government has invested approximately $4.4 billion in energy efficiency, $2.7 billion of which was from direct appropriations and $1.7 billion from alternative financing mechanisms ($1.0 billion from ESPCs and $0.7 billion from UESCs).

1. Direct Appropriations

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. Table 4-A presents agency funding (in nominal dollars) reported from FY 1985 through FY 2001 for energy conservation retrofits and capital equipment. Table 4-B presents the same information in constant 2001 dollars. In constant dollars, funding for energy conservation declined from $383.6 million in FY 1985 to a low of $68.6 million in FY 1989. Reports from Federal agencies indicated that $131.3 million was spent on retrofit expenditures in FY 2001, compared with $123.7 million in FY 2000. 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. Figure 4 illustrates agency spending trends for the five largest energy-consuming agencies and the remaining group of Federal agencies.

DOD funded $57.1 million in expenditures for energy efficiency projects in FY 2001, $11.7 million more than the previous year (Table 4-B).

Table 4-A
Agency Direct Appropriations for Energy Conservation Retrofits and Capital Equipment, FY 1985 through FY 2001 (Thousands of Nominal Dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
DOD	**136,100**	**120,000**	**5,550**	**5,280**	**1,500**	**1,020**	**10,000**	**49,669**	**14,444**	**109,000**	**189,600**	**112,487**	**118,970**	**191,446**	**91,243**	**44,442**	**57,113**
CIA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,600
VA	**13,000**	**11,500**	**9,500**	**9,860**	**5,500**	**11,200**	**9,970**	**10,000**	**12,100**	**9,050**	**11,960**	**3,700**	**7,400**	**13,000**	**10,500**	**0**	**15,000**
HHS	0	0	0	427	427	427	427	0	1,813	1,915	1,271	2,676	2,879	2,200	4,793	8,440	8,640
NASA	11,800	12,100	1,700	1,400	4,499	2,943	7,556	7,086	25,072	24,658	20,666	30,266	15,919	13,813	18,509	11,731	6,045
GSA	**6,700**	**6,100**	**2,900**	**9,400**	**4,868**	**11,125**	**30,123**	**37,000**	**30,000**	**37,000**	**7,242**	**7,400**	**20,000**	**0**	**25,000**	**17,000**	**5,000**
TRSY	0	0	2,977	2,393	2,823	1,134	836	0	1,344	4,826	2,810	170	2,990	1,400	1,495	2,152	4,670
DOT	13,650	15,000	12,104	12,700	2,908	0	460	143	593	5,970	3,793	2,585	3,176	3,000	9,005	2,664	4,321
DOI	3,198	5,535	0	0	4,338	0	1,272	9,800	4,859	1,662	779	891	0	160	1,730	23,999	3,220
USDA	2,500	0	0	500	500	1,547	1,752	7,300	7,045	7,277	2,894	5,983	3,891	1,765	994	1,954	2,100
DOE	**14,800**	**14,500**	**16,500**	**18,900**	**19,400**	**19,500**	**20,400**	**20,650**	**20,950**	**24,850**	**30,200**	**0**	**0**	**0**	**0**	**0**	**1,984**
EPA	0	0	0	0	0	0	0	0	500	0	1,720	1,600	1,600	0	0	0	1,963
SSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,000	1,000
DOJ	0	0	0	195	484	6,100	26,400	0	0	1,284	994	1,559	2,091	1,500	1,615	1,170	489
TVA	0	0	0	0	0	0	0	0	475	844	4,277	522	1,158	1,466	1,022	284	300
STATE	0	0	0	0	0	0	0	0	0	67	0	0	1,902	51	1,238	0	260
DOC	0	0	0	0	0	0	0	872	0	51	0	0	0	330	0	257	257
NRC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	226
HUD	0	0	0	0	0	0	0	0	43	30	43	0	2,418	0	0	0	55
RRB	0	0	0	0	0	0	0	0	16	13	33	0	38	23	0	0	35
NARA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
DOL	238	31	106	142	584	17	35	16	0	0	0	366	0	0	40	0	0
PCC	1,274	73	1,174	600	378	361	807	249	500	608	14	23	3	104	0	0	0
USPS	**55,300**	**9,300**	**5,100**	**3,800**	**4,000**	**4,000**	**4,000**	**2,293**	**1,116**	**1,123**	**10,050**	**9,000**	**16,000**	**31,000**	**38,000**	**6,000**	**0**
Total	258,560	194,139	57,611	65,597	52,209	59,374	114,038	145,078	120,870	230,228	288,346	179,228	200,435	261,258	205,184	121,093	131,286

Notes: **Bold** indicates top five primary energy users in buildings and facilities (DOD, DOE, VA, USPS, GSA). In past years, DOE also included funds for energy surveys. Does not include energy savings performance contracts and utility demand side management incentives.

Source: Federal Agency Annual Energy Management Data Reports

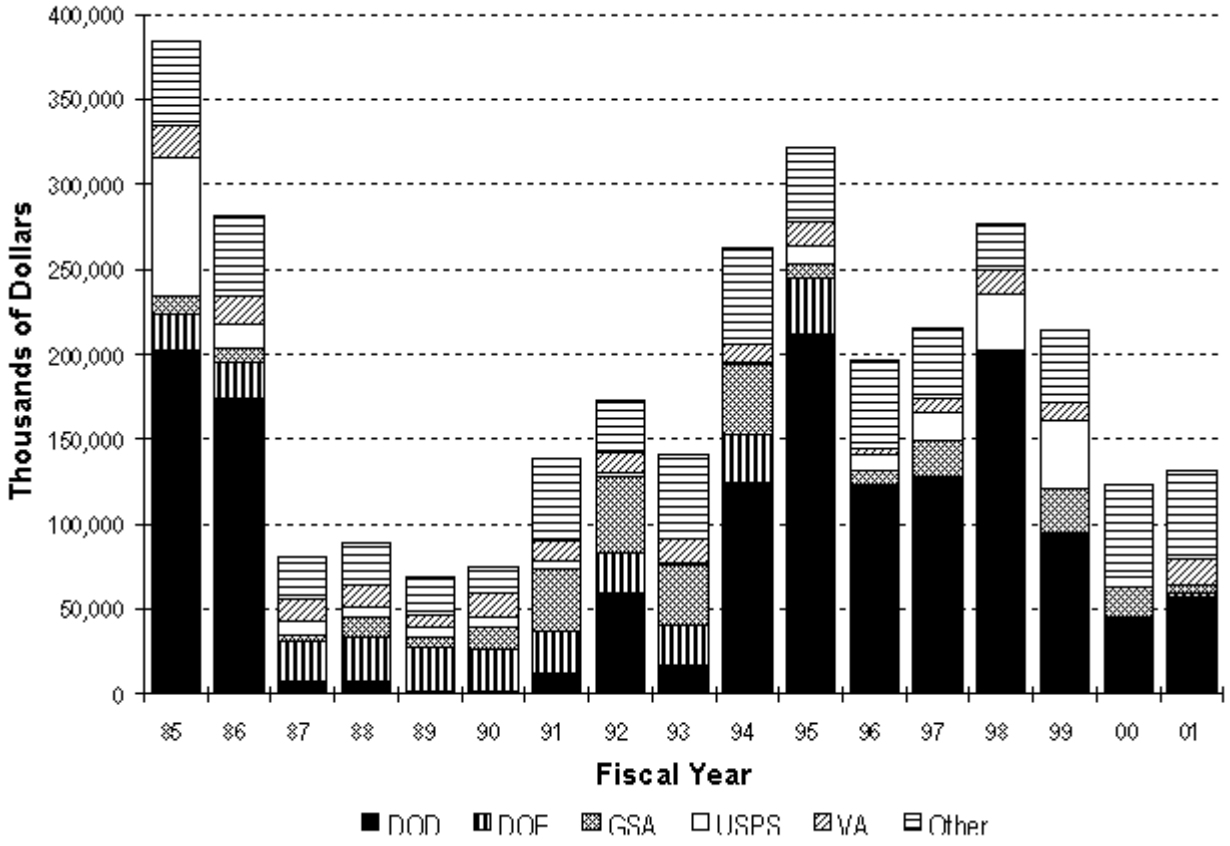
Table 4-B
Agency Direct Appropriations for Energy Conservation Retrofits and Capital Equipment, FY 1985 through FY 2001 (Thousands of Constant 2001 Dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
DOD	**201,929**	**174,165**	**7,828**	**7,203**	**1,971**	**1,290**	**12,195**	**59,130**	**16,795**	**124,146**	**211,371**	**123,071**	**127,650**	**202,803**	**95,343**	**45,395**	**57,113**
CIA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,600
VA	**19,288**	**16,691**	**13,399**	**13,452**	**7,227**	**14,159**	**12,159**	**11,905**	**14,070**	**10,308**	**13,333**	**4,048**	**7,940**	**13,771**	**10,972**	**0**	**15,000**
HHS	0	0	0	583	561	540	521	0	2,108	2,181	1,417	2,928	3,089	2,331	5,008	8,621	8,640
NASA	17,507	17,562	2,398	1,910	5,912	3,721	9,215	8,436	29,153	28,084	23,039	33,114	17,080	14,632	19,341	11,983	6,045
GSA	**9,941**	**8,853**	**4,090**	**12,824**	**6,397**	**14,064**	**36,735**	**44,048**	**34,884**	**42,141**	**8,074**	**8,096**	**21,459**	**0**	**26,123**	**17,365**	**5,000**
TRSY	0	0	4,199	3,265	3,710	1,434	1,020	0	1,563	5,497	3,133	186	3,208	1,483	1,562	2,198	4,670
DOT	20,252	21,771	17,072	17,326	3,821	0	561	170	689	6,800	4,229	2,828	3,408	3,178	9,410	2,721	4,321
DOI	4,745	8,033	0	0	5,700	0	1,551	11,667	5,650	1,893	868	975	0	169	1,808	24,514	3,220
USDA	3,709	0	0	682	657	1,956	2,137	8,690	8,192	8,288	3,226	6,546	4,175	1,870	1,039	1,996	2,100
DOE	**21,958**	**21,045**	**23,272**	**25,784**	**25,493**	**24,652**	**24,878**	**24,583**	**24,360**	**28,303**	**33,668**	**0**	**0**	**0**	**0**	**0**	**1,984**
EPA	0	0	0	0	0	0	0	0	581	0	1,918	1,751	1,717	0	0	0	1,963
SSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,021	1,000
DOJ	0	0	0	266	636	7,712	32,195	0	0	1,462	1,108	1,706	2,244	1,589	1,688	1,195	489
TVA	0	0	0	0	0	0	0	0	552	961	4,768	571	1,242	1,553	1,068	290	300
STATE	0	0	0	0	0	0	0	0	0	76	0	0	2,041	54	1,294	0	260
DOC	0	0	0	0	0	0	0	1,038	0	58	0	0	0	350	0	263	257
NRC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	226
HUD	0	0	0	0	0	0	0	0	50	34	48	0	2,594	0	0	0	55
RRB	0	0	0	0	0	0	0	0	19	15	37	0	41	24	0	0	35
NARA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
DOL	353	45	150	194	767	21	43	19	0	0	0	400	0	0	42	0	0
PCC	1,890	106	1,656	819	497	456	984	296	581	692	16	25	3	110	0	0	0
USPS	**82,047**	**13,498**	**7,193**	**5,184**	**5,256**	**5,057**	**4,878**	**2,730**	**1,298**	**1,279**	**11,204**	**9,847**	**17,167**	**32,839**	**39,707**	**6,129**	**0**
Total	383,620	281,769	81,257	89,491	68,606	75,062	139,071	172,712	140,547	262,219	321,456	196,092	215,059	276,756	214,403	123,691	131,286

Notes: **Bold** indicates top five primary energy users in buildings and facilities (DOD, DOE, VA, USPS, GSA). In past years, DOE also included funds for energy surveys. Does not include energy savings performance contracts and utility demand side management incentives.

Source: Federal Agency Annual Energy Management Data Reports

FIGURE 4
Direct Appropriations for Energy Conservation Retrofit
(In Constant 2001 Dollars)



Source: Federal Agency Annual Energy Management Data Reports

2. Federal Energy Efficiency Fund

The Federal Energy Efficiency Fund was established by section 152 of EPACT, which amended section 546 of NECPA, to provide grants to agencies to assist them in meeting the mandated energy efficiency and water conservation requirements. The limited spending authority available in FY 1994 and FY 1995 was applied to those proposals which were most competitive, considering the five following factors:

- The cost-effectiveness of the project (saving-to-investment ratio).
- The net dollar cost savings to the Federal Government.
- The amount of energy savings to the Federal Government.
- The amount of funding committed by the agency requesting financial assistance.
- The amount of funding leveraged from non-Federal sources.

No spending authority has been provided beyond FY 1995. A total of 114 proposals were received during FY 1994 and FY 1995 and Fund grants were provided for 37 projects. Of these, 35 projects provide energy savings of 5.8 trillion Btu and two projects result in water conservation in the amount of 738 million cubic feet, with an estimated energy and water cost savings of $54 million (before payback of the initial investment) over the useful lives of the projects. The total Fund investment to realize these savings was $7.9 million, which leveraged $3.6 million in Federal-agency funding and $0.9 million in non-Federal funding. The projects encompass 14 states and the District of Columbia, with one project located in the Caribbean.

3. Energy Savings Performance Contracting

Section 155 of EPACT amended Title VIII of NECPA, relating to energy savings contracts, providing agencies the authority to enter into ESPCs and describes the methodology of contract implementation. The ESPC program was created to provide agencies with a quick and cost-effective way to increase the energy efficiency of Federal buildings. Under an ESPC, a private sector energy service company (ESCO) will assume the capital costs of installing energy conservation equipment and renewable energy systems. The ESCO guarantees the agency a fixed amount of energy cost savings throughout the life of the contract and is paid from those energy cost savings. Agencies retain the remainder of the energy cost savings.

On April 10, 1995, DOE published in the *Federal Register* (10 CFR Part 436) a final rule that sets forth the regulations for energy savings performance contracting. An application process for a Qualified List of ESCOs was also released with the ESPC regulations. Only firms on the Qualified List may receive an ESPC contract award. Firms that wish to be on the Qualified List must submit an application to DOE and possess the required experience and expertise. The List is continually updated.

On November 2, 1998, the Energy Conservation Reauthorization Act was signed by President Clinton to become Public Law 105-388. The law made several significant changes to EPACT and NECPA. Section 4 of Public Law 105-388 amends NECPA section 801 to extend the authority of Federal agencies to enter into ESPCs through September 30, 2003. Section 4 also

amends the definition of "Federal agency" in NECPA Section 804 to include each authority of the U.S. Government, whether or not it is within or subject to review by another agency.

Section 403(a) of Executive Order 13123 states that "Agencies shall maximize their use of available alternative financing contracting mechanisms, including Energy Savings Performance Contracts." This section goes on to state that "Energy Savings Performance Contracts. . .provide significant opportunities for making Federal facilities more energy efficient at no net cost to taxpayers."

During FY 2001, 60 ESPC contracts or delivery orders were awarded at 11 agencies. These include delivery orders awarded through the DOE/FEMP Super ESPC programs as well as projects awarded by the DOD and other agencies. Total contractor investment from these projects was approximately $297.9 million, providing the Government with an opportunity to save more than 1.5 trillion Btu each year. These ESPCs include 30 by the DOD, 11 by the Department of Veterans Affairs, eight by the GSA, two by the DOE, Department of the Interior, and HHS, and one each by the Departments of State, Transportation, and the Treasury, as well as NASA and the National Gallery of Art.

Energy Savings Performance Contracts and Delivery Orders Awarded by Federal Agencies in FY 2001

			Allocation of Project Cost Savings (Thousand $)			
Agency	Number of Delivery Orders/ Contracts	Project Investment Value	Guaranteed Total Cost Savings	Less Payment to Contractor	Net Savings to Government	Annual Energy Savings (MMBtu)
Defense	30	$228,232	$504,557	$307,002	$197,556	943,664
Energy	2	$3,528	$8,373	$8,318	$55	22,585
GSA	8	$12,426	$30,258	$29,526	$732	118,690
HHS	2	$2,649	$7,321	$7,394	-$73	29,672
Interior	2	$8,097	$15,999	$15,958	$41	57,132
National Gallery of Art	1	$2,696	$4,845	$4,821	$24	22,796
State	1	$5,552	$12,848	$12,848	$0	30,750
Transportation	1	$4,017	$15,137	$15,130	$7	10,841
Veterans Affairs	11	$26,304	$63,589	$56,824	$6,765	288,030
Treasury	1	$3,100	$5,580	$5,580	$0	20,000
NASA	1	$425	$454	$454	$0	2,873
Total	60	$297,897	$668,959	$463,854	$205,105	1,547,033

Through a decentralized approach, DOD awarded the largest number of contracts/delivery orders with 30 ESPC projects in FY 2001. 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, EMCS systems 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 decide 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 for, the DOD will be able to obtain full cost savings.

In FY 2001, DOD received Congressional funding of $4 million to facilitate implementation of ESPC contracts.

Awarding ESPCs on a one-by-one basis has often proven to be complex and time consuming. To make it easier to use ESPCs, DOE/FEMP developed Regional and Technology-Specific Super ESPCs. Both Regional and Technology-Specific Super ESPCs share the same general contract terminology and provisions with conventional ESPCs and they present several significant advantages to Federal agencies.

Super ESPCs are unlike conventional ESPCs in two fundamental ways. First, a Super ESPC blankets a large geographic territory; a conventional ESPC is used for a specific site. Second, Super ESPCs substantially reduce the lead time to contract with an ESCO for energy services. Super ESPCs are broad area indefinite delivery, indefinite quantity (IDIQ) contracts that allow agencies to negotiate site-specific delivery orders with an ESCO without having to start the contracting process from scratch. Demand on agency resources to develop and award contracts, as well as lead times, are greatly reduced, and energy savings are realized more quickly.

Technology-Specific Super ESPCs emphasize a particular advanced energy-efficiency or renewable energy technology to advance these proven, yet still emerging, technologies in the Federal marketplace. They blanket the entire nation and carry the same agency resource and time saving benefits as Regional Super ESPCs. ESCOs chosen for these awards have unique capabilities and experience in providing energy savings through installation of the technology, thereby greatly reducing the risks of misapplying emerging technologies. Technology-Specific Super ESPCs can also be comprehensive projects employing multiple energy conservation measures, as long as the named technology is the focus of the project.

As shown in the exhibit on the next two pages, 31 Super ESPC delivery orders were awarded during FY 2001. Total contractor investment totaled $120.4 million, providing annual savings of almost 775 billion Btu to the Government. These delivery orders include nine by the DOD, seven by the GSA, six by the Department of Veteran's Affairs, two each by the Department of the Interior, HHS, and DOE, and one by the DOT, Department of State and the National Gallery of Art.

Delivery Orders Awarded in FY 2001 with DOE Super ESPC Program Support

Agency/Site/Location	Project Description	Investment Value	Energy Savings (MMBtu/yr.)
DOD, Navy Region Southwest, CA	Lighting Upgrades	$2,087,098	8,316
DOD, Aberdeen Proving Grounds, Aberdeen, MD	GHP Systems	$4,964,428	35,969 (est.)
DOD, Ft. Jackson, SC	Chiller Plant Upgrades, GHP Retrofit, Lighting Upgrade, Demand Lighting System	$19,020,674	82,865
DOD, MCAS, Miramar, CA	Central Chiller Plant with TES, HID Lighting Retrofit and Controls	$3,476,565	9,758
DOD, Naval Air Station, Fallon, NV	Lighting	$2,089,374	8,023
DOD, Navy Region Southwest #2, San Diego, CA	Microturbines with Heat Recovery and Reduced Temp., Xeriscaping/Water Conservation, Compressed Air System Improvements, HVAC Upgrades, PV System	$13,660,026	24,373
DOD, U.S. Naval Submarine Base #2, Bangor, WA	Boiler Improvements, Chiller Improvements, AHU Modifications, Chilled Water Supply and Pumping Modifications, Lighting Modifications, Hot Tub Cover	$4,878,828	52,443
DOD, Marine Corps Air Station, Beaufort, SC	GHP, BAS/Controls, Lighting, Building Envelope Mods, Plug Loads, Motors/Drives, Rate/Fuel Switching, Water Conservation, HVAC	$11,164,338	14,152
DOD, MCSA Richards-Gebaur Memorial Airport, Kansas City, MO	Chillers, EMCS, Lighting Upgrades, Occupancy Controls, Variable Flow and VFDs, Water Conservation	$1,190,661	13,335
DOE, Idaho Engineering Lab, Idaho Falls, ID	Lighting Retrofits, Electrical Distribution	$779,000	2,664
DOE, Y12 (ORNL), Oak Ridge, TN	Chiller, Controls, HVAC, Lighting and Daylighting	$2,749,477	19,921 (est.)
DOI, Southwest Indian Polytechnic Institute, Albuquerque, NM	Lighting, EMCS, Windows, Chiller	$3,924,290	25,580
DOI/BIA, Haskell Indian Nations University and Riverside Indian School, Lawrence, KS and Anadarko, OK	EMCS, HVAC, VFD HVAC Retrofit, Bldg. Envelope/ Windows, Water, Lighting	$4,173,115	31,552
DOT, US Merchant Marine Academy, Upton, NY	Chiller Plant Upgrades, Lighting Improvements, Water Fixture Upgrade	$4,016,891	10,841
GSA, 11 sites, SC, TN	Boilers, Chillers, HVAC, Lighting, Building Envelope Mods., Piping, Electric Motors	$1,444,607	16,528 (est.)
GSA, Memphis Customer Service Center and 8 bldgs in 4 states, Memphis, TN	Lighting, Airside VFDs, Chillers, Cooling Tower	$1,922,589	10,873
GSA, John McCormack Post Office and Courthouse, Boston, MA	Chiller, Expand DDC Controls, Rate Reduction on Steam Rate, Modification of Condensate Tempering System	$984,674	1,281
GSA, Edith Green/Wendal Wyatt Federal Building, Portland, OR	EMCS and Refrigeration Improvements	$516,821	7,552

Agency/Site/Location	Project Description	Investment Value	Energy Savings (MMBtu/yr.)
GSA, Federal Building, Des Moines, IA	Boiler, Steam Traps, High Efficiency Motors and VFDs, Vending Machine Control, Water Conservation Measures, Tariffs	$1,361,854	6,482
GSA, Denver Federal Center #2, Lakewood, CO	Boiler Staging, Chilled Water Flow Upgrades, Metering, AHU Controls, Chilled Water Plant Controls, Lighting, Lighting Controls, DHW System Scheduling, Solar DHW System	$2,176,016	37,572
GSA, Federal Courthouse, Gulfport, MS	Improved Glazing, Lighting, Lower ChW Coil Static Pressure, VFDs on AHUs, Water Pumps and Cooling Tower Fans, Chiller Efficiency, Occupancy Ventilation, Cooling Tower Water Meter, HW System, Single Electrical Service Meter, CHW System	$1,603,580	15,329
HHS, Centers for Disease Control, Chamblee and Lawrenceville campuses, Atlanta, GA	Lighting, BAS, EMCS, HVAC, Chilled Hot Water and Steam Distribution, Rebate	$578,218	9,528
HHS, Indian Health Services, Aberdeen, SD	EMCS, Lighting	$2,070,508	20,144
National Gallery of Art, Washington, DC	EMCS, Lighting, and Chilled/Hot/Steam Piping and Distribution Systems	$2,696,406	22,796
State, Seoul, Korea	GSHP, BAS, Lighting, Building Envelope, Plug Loads, Motors and Drives, Central Utilities, Rebates, Water, HVAC	$5,551,616	30,750
VA, Southern Arizona VA Health Care System, Tucson, AZ	Replace Steam Traps, Upgrade EMCS, Bldg. 30 HVAC Repair, Energy Efficient Motors, Lighting	$2,525,551	76,001
VA, VA Medical Center, Providence, RI	Steam Turbine System, Boiler Stack Heat Recovery, AC Window Units and Controls, Transformers, VFDs Repair and Controls, Steam Traps	$1,132,267	15,538
VA, VA Medical Center, Denver, CO	Lighting, Chiller and Cooling Tower, Plate-Frame Heat Exchanger, New DDC EMS, Close Steam System	$2,317,938	26,722
VA, South Texas Veteran Health Care System, San Antonio, Kerrville and Corpus Christi, TX	Steam Plants, VAV Conversion, Lighting, HVAC Improvements, Steam Trap Replacement, Chilled Water Pump VFD, Foot Pedal Valve, Solar Domestic/Heating HW, Linen System VFD, Medical Waste Management	$6,978,025	17,948
VA, VA Medical Center, Des Moines, IA	HVAC, Lighting, Tariffs	$595,050	9,966
VA, VA Medical Centers, Newington and West Haven, CT, and Northhampton, MA	Expand DDC Control System, HVAC, Lighting, Steam System, Chilled Water Optimization, Hot Water Pump Control, Energy Efficient Motors, Water and Sewer Conservation Systems	$7,818,171	110,094

4. Utility Energy Service Contracts

Section 403(a) of Executive Order 13123 provides that Federal agencies maximize their use of available alternative financing contracting mechanisms, including utility energy service contracts (UESCs), when life-cycle cost-effective, to meet the energy reduction goals of the order. Agencies are encouraged to partner with the private sector to implement facility and energy improvements, streamline contracts, and maximize purchasing power. UESCs provide significant opportunities for making Federal facilities more energy efficient at no net cost to taxpayers.

UESCs enable agencies to implement energy and water efficiency projects without obtaining direct appropriations. The net cost to the participating Federal agency remains minimal, as the projects pay for themselves from a share of the energy cost savings. Utility services range from rebates on energy-efficient equipment to energy audits, feasibility studies, design, finance, and delivery of complete turn-key projects, with contract terms generally limited to 10 years. Projects typically begin with an energy audit and feasibility study, and proceed to engineering, design, and installation phases.

FEMP helps Federal agencies and their utility companies work together to save energy and dollars at Federal facilities. FEMP supports agencies and their utilities by promoting Federal/utility partnerships through the Federal Utility Partnership Working Group and supplying alternative financing information. FEMP provides comprehensive assistance and services to agencies with the support of partners, including DOE offices, DOE national laboratories, and private sector contractors. Six DOE Regional Offices serve as the initial customer contact points and customer advocates. FEMP also sponsors utility-related training, helps remove regulatory barriers, and provides information on utility restructuring and its effects on Federal agencies to help agencies to take advantage of the partnerships.

In FY 2001, a total of 65 UESCs were implemented by all Federal agencies. Private sector investment in the projects totaled approximately $230.4 million. The estimated annual energy savings from the 65 projects is 1.3 trillion Btu.

Projects were undertaken by agencies to accomplish a wide variety of energy efficiency improvements. Of the 65 UESCs awarded in FY 2001, 44 were implemented by the DOD. 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 the UESC financing tool include: new thermal storage systems, chillers, boilers, lights, motors, EMCS systems and water reducing devices.

GSA awarded six utility financed projects in FY 2001 with a total value of $55.3 million and expected annual energy cost savings of 28.7 billion Btu. Five contracts were used to implement energy projects at GSA facilities in Region 2, with the sixth contract awarded for an project at the Smithsonian Institute, in Washington, D.C. Combined with those already in progress, GSA has 13 UESC projects in place.

5. Life-Cycle Costing (LCC)

Section 544 of NECPA, as amended in 1988, requires DOE to establish practical and effective methods for estimating and comparing the life-cycle costs for Federal buildings using the sum of all capital and operating costs for energy systems of new buildings involved over the expected life of such systems or during a period of 25 years, whichever is shorter, and using average fuel costs and a discount rate determined by the Secretary of Energy. In addition, section 544 requires that procedures be developed in applying and implementing the methods that are established. EPACT further amends NECPA to require, after January 1, 1994, agencies which lease buildings to fully consider the efficiency of all potential building space at the time of renewing or entering into a new lease.

FEMP publishes updated fuel price projections for life-cycle cost analyses prior to the beginning of each fiscal year. The FY 2001 update of the *Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis, Annual Supplement to Handbook 135* was published and distributed to Federal energy managers in April 2000.

A Building Life-Cycle Cost (BLCC) computer program has been developed and supported by NIST under FEMP sponsorship. The programs are a valuable economic tool to assist Federal energy managers with performing LCC analyses. The latest update of the BLCC computer program was released April 1, 2002. NIST's annual update of the BLCC program version BLCC 5.1-02 includes the DOE/FEMP discount rates and energy price projections from the Energy Information Administration for 2002. Two modules for evaluating Military Construction (MILCON) projects have also been added to BLCC5.1-02. BLCC5.1-02 now contains the following four modules for analyzing energy and water conservation and renewable energy projects:

- Analyses for Federal agency-funded projects;
- Analyses for Federal agency projects financed through energy savings performance contracts or utility energy savings contracts;
- MILCON analyses for DOD-funded projects; and
- MILCON analyses for projects under DOD's Energy Conservation Investment Program.

Executive Order 13123 required DOE to provide "guidance to clarify how agencies determine the life-cycle cost for investments required by the order, including how to compare different energy and fuel options and assess the current tools" (section 502(d)); and "assist agencies in ensuring that all project cost estimates, bids, and agency budget requests for design, construction and renovation of facilities are based on life-cycle costs" (section 503(a)). Such guidance was developed and was delivered to agency heads by the Secretary of Energy on July 31, 2000.

E. ENERGY STAR® and Energy Efficient Product Procurement

Executive Order 13123 directs Federal agencies to purchase ENERGY STAR®- labeled products, or, for those product types not covered by the EPA/DOE ENERGY STAR® labeling program, products "in the upper 25 percent of energy efficiency as designated by FEMP" (section 403(b)). In July 2001, President Bush issued a new Executive Order (13221) directing agencies to buy products that use "no more than one watt in their standby power consuming mode" wherever available and cost-effective, or otherwise to select products with the lowest available standby power. In consultation with GSA, DLA and their Federal customers; the ENERGY STAR® program; and industry, FEMP has developed purchasing criteria for an initial group of low-standby power devices.

Recent changes in the Federal Acquisition Regulations (FAR) (48 CFR 23.203) require all federal agencies to comply with the Executive Order by purchasing ENERGY STAR® or other energy-efficient products designated by FEMP, whenever "life-cycle cost-effective and available." These same requirements also apply to all agency contracts for services that include provision of energy-using products, such as ". . .contracts for design, construction, renovation, or maintenance of a public building."

The ENERGY STAR® labeling program is a joint effort between EPA and DOE to help manufacturers identify and market efficient products with the easily recognizable ENERGY STAR® logo. Since this is a nationwide labeling program covering multiple products, it makes it very simple for customers to identify truly efficient models among those offered - for instance, in a retail showroom or among various models listed in a product catalog. In FY 2001, the program included a wide variety of office equipment and home heating and cooling products, as well as many consumer audio and video products (e.g., TVs, VCRs, and DVD players), appliances, and residential windows. Some commercial equipment was also covered, such as unitary (rooftop) air conditioners, reach-in refrigerators, exit signs, low-voltage distribution transformers, and roofing products.

To assist Federal agencies in meeting the requirements of the Executive Order and FAR directives, FEMP publishes a series of Product Energy Efficiency Recommendations, which set forth the efficiency levels that meet the ENERGY STAR® and "upper 25 percent" requirements of the Executive Order, as well as the new requirements for low-standby products. The Recommendations also provide cost-effectiveness examples, tips on important product selection parameters such as sizing and fuel choice, and information about buying efficient products from the Federal supply agencies: the Defense Logistics Agency (DLA) and the GSA. The Recommendations, which now cover 44 products, are available on FEMP's Web site at www.eren.doe.gov/femp/procurement, as well as in print, through a loose-leaf binder called "Buying Energy Efficient Products." The binder is available free of charge from FEMP's clearinghouse (800-363-3732); subscribers receive new and updated material as it is printed twice per year.

To be most effective, FEMP's product energy efficiency recommendations need to be incorporated into other purchasing guidance, such as agency-specific policies, construction specifications, and services contracts. In addition, FEMP has partnered with DLA and GSA to

incorporate energy efficient purchasing in training workshops and promotional material designed for Federal procurement officials. These training workshops help agencies comply with the FAR and Executive Orders, as well as educate Federal buyers on the ENERGY STAR® labeling program and FEMP's Recommendations.

During FY 2001, FEMP worked with GSA's Federal Supply Service to identify energy-efficient equipment in supply catalogs and product offerings listed in GSA's on-line shopping network, Advantage. DLA's customers rely heavily on the information in the Federal Logistics Information System (FLIS) database to procure products and equipment. The FLIS catalogs millions of items by "national stock numbers" (NSNs), which can be accessed by vendor name or code. DLA has established a database field within the FLIS that highlights positive environmental attributes, including energy efficiency and low standby power using the FEMP efficiency criteria.

By the end of FY 2001, FEMP's biggest success with energy-efficient purchasing was the incorporation of FEMP-recommended product efficiency levels into agency guide specifications for construction and major renovation. When an agency writes a FEMP recommendation into a "guide spec" for a given product, it helps assure that virtually all the buildings constructed by that agency will use energy-efficient HVAC, lighting, and other equipment that complies with the requirements of the Executive Order; this affects millions of dollars worth of products and construction projects. Following the early lead of the Army Corps of Engineers and the Naval Facilities Engineering Command (NAVFAC), the Tri-Service Committee on Unified Facilities Guide Specifications is adopting FEMP's recommended efficiency levels for electric chillers, rooftop unitary air conditioners, fluorescent and HID lighting, motors, exit signs, distribution transformers, and roofing products.

Finally, FEMP partnered with DLA and the DOE Buildings Program in FY 2001 to promote large-scale federal purchases of new unitary air conditioners that are significantly more energy-efficient than traditional models. The intent, in keeping with Section 127(c)(3) of the Energy Policy Act of 1992, is not only to save tax dollars, but also to use federal buying power to help establish an initial market demand that reduces the risk to manufacturers of developing and marketing a more efficient and cost-effective line of products. To achieve this objective, the participating agencies have organized a competitive procurement for "packaged" air conditioners often found on rooftops of low-rise federal and commercial buildings. In contrast to common practice, which typically involves purchase decisions based on lowest first-cost rather than lowest life-cycle cost, the RFP issued in January 2002 focused on life-cycle cost, including electricity consumption under typical weather conditions. The resulting proposals have been evaluated, and basic ordering agreements are being negotiated that will allow both federal and commercial organizations to buy high-performance rooftop AC units from winning bidders at competitive prices.

F. Integrated Whole Building Efficiency

1. Federal Building Energy Performance Standards

Section 305 of EPCA, as amended by EPAct, (42 U.S.C. § 6834) mandates that new Federal buildings must contain energy saving and renewable energy specifications that meet or exceed the energy saving and renewable energy specifications of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)/ Illuminating Engineering Society of North America (IESNA) Standard 90.1-1989 and the Council of American Building Officials Model Energy Codes (CABO) 1992.

A final rule on 10 CFR 434, *Energy Code for New Federal Commercial and Multi-Family High Rise Residential Buildings,* was published in the *Federal Register* on October 6, 2000, and became effective on October 8, 2001. The *Energy Code* revised the prior interim Federal standards to conform generally with the codified version of ASHRAE Standard 90.1-1989 and incorporated changes in the areas of lighting, mechanical ventilation, motors, building envelope, and fenestration rating test procedures, and test procedures for heating and cooling equipment. Additionally, the new lighting provisions are more stringent than those in Standard 90.1-1989 and reflect new information concerning energy requirements needed to achieve adequate lighting levels. DOE is also initiating another update of the Federal commercial building standards using ASHRAE 90.1-1999 as the model. DOE expected to solicit public comments on this new proposed rule in a *Federal Register* notice in 2002.

A separate proposed rule for new Federal residential buildings was issued by DOE in the *Federal Register* in May 1997. DOE has determined that the 1997 proposed rule does not contain sufficient cost effective, energy efficient requirements for new Federal residential buildings. Therefore, DOE will propose a new rule containing updated energy efficient measures.

2. ENERGY STAR® Buildings

Section 403(c) of Executive Order 13123 calls upon agencies to strive to meet the ENERGY STAR® building criteria for energy performance and indoor environmental quality in their eligible facilities to the maximum extent practicable by the end of 2002. Agencies have the option of using ESPCs, UESCs, or other means to conduct evaluations and make improvements to their buildings in order to meet the criteria. Buildings that rank in the top 25 percent in energy efficiency relative to comparable commercial and Federal buildings qualify to receive the ENERGY STAR® building label.

The ENERGY STAR® Building program was developed by EPA with DOE as a co-sponsor to promote energy efficiency through the use of online software that benchmarks and ranks buildings by type in terms of energy efficiency. In FY 2001, office buildings and K-12 school buildings were able to be evaluated by EPA's benchmarking tool. Other building types will be included in the program in future years, including laboratories, warehouses, and healthcare facilities. ENERGY STAR® Building certification and labeling is based upon measured building data and a comparison with archetypes in various regions of the country. Many agencies are using the five-stage ENERGY STAR® implementation strategy, which consists of lighting

upgrades, building tune-up, other load reductions, fan system upgrades, and heating and cooling systems upgrades.

The ENERGY STAR® Building program is currently being implemented and utilized by many different agencies. To spotlight a few examples:

- TVA's Edney building received the ENERGY STAR® Building label during FY 2001. The building incorporates an energy efficient water source heat pump system, energy management system, energy efficient lighting with occupancy sensors, and other energy and environmentally friendly systems. This brings the percentage of TVA buildings meeting the ENERGY STAR® criteria to approximately 11 percent of TVA's overall corporate square footage.
- By the end of 2001, GSA had earned the ENERGY STAR® Building label for 85 of its owned facilities and one leased facility. This represents approximately 16 percent of the eligible square footage, and 13 percent of facilities.
- The Department of the Navy and EPA signed a Memorandum of Understanding, certifying that Navy family housing construction criteria meets or exceeds ENERGY STAR® Homes requirements. All homes built to the criteria will be certified ENERGY STAR® Homes.
- DOI is planning to partner with EPA to include a designation for visitor centers in the program.

3. Sustainable Building Design

As required by section 403(d) of Executive Order 13123, DOD and GSA, in consultation with DOE and EPA, have developed sustainable design principles. Agencies are required to apply such principles to the development, design, and construction of new facilities. Agencies shall optimize life-cycle costs, pollution, and other environmental and energy costs associated with the construction, life-cycle operation, and decommissioning of the facility. Agencies have the option of using ESPCs or UESCs to aid in the construction of sustainably-designed buildings.

Nineteen agencies are either developing or have implemented the Whole Building Design Guide (WBDG) and the U.S. Green Building Council's Leadership in Energy and Environment Design (LEED) programs into their facilities design standards and master planning process, and are applying integrated design approaches to the life-cycle of buildings and infrastructures. The WBDG and LEED are Internet resources which provide a wide range of building-related design guidance, criteria, and technology for the integration of sustainable building design. The WBDG is an up-to-date, knowledge-based tool, creatively linked to information across disciplines and traditional professional boundaries. It is intended to encourage the "whole building approach" to design and construction, and is used by Federal, military, and private sector architects, engineers, and project managers. The approach directs members of the planning, design, and construction team to look at the project materials, systems, and assemblies from many different perspectives. The design is evaluated for cost, quality of life, flexibility, efficiency, overall environmental impact, productivity, creativity, and the benefit to the facility's occupants.

Examples of sustainable design measures incorporated into facilities include the installation of high performance windows, direct-digital control systems, high efficiency electric lighting,

energy efficient HVAC equipment, and increased insulation in roofs, walls and foundations. Many agencies are also incorporating low-cost projects such as replacing high volume water fixtures, installing solar lighting, upgrading lighting with motion detectors and occupancy sensors, installing or replacing insulation, replacing mechanical ventilation systems with natural ventilation, and installing water conserving toilets. In support of this effort, several agencies have also conducted training on implementing the sustainable design principles.

The Department of the Navy co-sponsored both the development of the WBDG as well as a commissioning guide that incorporates LEED criteria. Navy family housing criteria includes sustainable planning and development standards. The Naval Facilities Engineering Command (NAVFAC) led the adoption of the ASHRAE/IESNA Standard 90.1 as the Tri-Service energy criteria for new construction and developed standard contract clauses to ensure sustainable design is used in new construction and major renovations. Many DOD renovation projects have incorporated sustainable design principles, including the Naval Sea Command at the Washington Navy Yard, housing at Hickam Air Force Base, Hawaii, and the Pentagon renovation program.

Several EPA facilities are applying green building principles, including the installation of one of the two largest photovoltaic roofs on top of its National Computer Center in Research Triangle Park, North Carolina. The 100-kilowatt, integrated roof power system will convert sunlight into energy and provide it to the building and supplement the main power utility. The new consolidated facility in Research Triangle Park incorporates low volatile organic compound paints, sealants, and adhesives to improve indoor air quality; direct digital controls and high efficiency boilers and chillers to ensure peak energy performance; and recycled carpet and other recycled building materials to conserve virgin materials and divert waste from landfills. Fume hoods are serviced by a centralized air flow system and customized sashes that save energy by avoiding the loss of heated or cooled air and by reducing the need for numerous energy-consuming fans. Outside the building, EPA minimized ground clearing to preserve forests, streams, and wetlands, and a plant rescue saved thousands of native plants. Additionally, the campus will be designated and maintained as a Corporate Wildlife Habitat.

In 2001, NASA continued development of an integrated sustainable design policy that will combine the traditional sustainability concepts of the WBDG with building commissioning. Detailed implementation procedures and guidelines are being developed along with a companion in-house training course. Despite lack of an approved agency-wide policy, NASA continued work on several facility project designs that incorporate sustainable design features. For example, the Operations Support Building II at Kennedy Space Center is designed to exceed energy efficiency requirements, and will use at least 47 percent less energy than the offices it will replace. The project will incorporate an automatic irrigation system, 100 percent native plants with low water requirements, high efficiency lighting with occupancy sensors and daylight-compensating dimmer controls, variable air volume HVAC systems with variable frequency drives on air handlers and chilled water pumps, and advanced filtration to maintain adequate indoor air quality.

4. Highly Efficient Systems

Under section 403(g) of Executive Order 13123, agencies are directed to implement district energy systems and other highly efficient systems in new construction or retrofit projects. Agencies are to consider combined cooling, heat, and power when upgrading and assessing facility power needs and survey local natural resources to optimize use of available biomass, bioenergy, geothermal, or other naturally occurring energy sources.

Highly efficient systems are being installed and used by nearly every reporting agency. In many cases, agencies are entering into ESPCs with energy service companies to install cogeneration, geothermal, and biomass systems. For example, in FY 2001, EPA used the ESPC process to further its installation of combined cooling, heating, and power systems and locally available renewable energy sources. In addition to a geothermal heat pump being installed in Ada, Oklahoma, as part of the ESPC upgrade, a natural gas fuel cell was installed in the Ann Arbor, Michigan, lab to provide both base load power and emergency backup power for the facility. The fuel cell generates 200 kilowatts of power and provides heating water for the reheat water loop serving the air handling units. By integrating the heating and cooling plant, EPA will recover significant amounts of energy that would have otherwise been wasted in cooling towers or radiators.

USPS facilities are seeking to improve their energy efficiency with new technologies. For example, a Lincoln, Nebraska, facility uses geothermal energy to run its HVAC systems. Energy savings from the hookup are monitored and compared to a conventionally-powered USPS facility nearby. Also, USPS has a Memorandum of Understanding with the Geothermal Heat Consortium to obtain design assistance when a new or replacement facility is considering geothermal as an energy source.

5. Water Conservation

Under Section 207 of Executive Order 13123, agencies are required to reduce water consumption and associated energy use in their facilities to reach the goals set under section 503(f) of the order.

The water conservation goals require 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 (BMP), as defined in DOE guidance documents. The goals include the following schedule for program implementation in agencies' facilities: 5 percent of facilities by 2002, 15 percent of facilities by 2004, 30 percent of facilities by 2006, 50 percent of facilities by 2008, and 80 percent of facilities by 2010.

FY 2000 water consumption data are used by agencies as baseline usage to measure progress in water conservation efforts. Agencies use actual data where available or develop estimates where actual data are not available. Water usage was reported to DOE in the FY 2001 annual energy reports. Water conservation measures implemented and water saved on an annual basis also was reported.

In FY 2001, all reporting agencies combined consumed more than 245.8 billion gallons of water at a cost of $448 million. This was a decrease versus the FY 2000 water consumption level of 256.4 billion gallons and an increase in cost, reported at $432 million last year.

Conservation efforts undertaken by agencies in 2001 included the installation or implementation of the following:

- Wastewater irrigation systems,
- Water pressure pumps to control water consumption,
- Performing leak detection on distribution systems,
- Installation of low-flow fixtures and motion senored water faucets,
- Installation of water meters at individual facilities,
- Development of a computer model to improve water conservation of a sanitary sewer system,
- Comprehensive smoke testing to identify leakage, assist in design, and improve "once through" water systems,
- Implementation of xeriscaping techniques, and
- Installation of efficient water towers, which reduce the water volume needed to run cooling systems.

Water conservation measures not only reduce water use and cost, but also reduce energy consumption (for pumping) and sewage treatment costs. Additionally, water conservation helps to reduce the quantities of wastewater treatment chemicals (most notably chlorine) being released into the environment, and reduces the risk of drawing down aquifers or saltwater intrusion into aquifers.

G. Renewable Energy

Section 503 of Executive Order 13123 directed the Secretary of Energy in collaboration with the heads of other agencies to develop a goal for increased renewable energy use in the Federal Government. The Renewable Energy Working Group of the Interagency Energy Management Task Force worked with agency and industry representatives to develop an appropriate renewable energy goal and guidance on how to measure progress toward the goal. In July 2000, the Secretary approved a goal that the equivalent of 2.5 percent of electricity consumption from Federal facilities should come from *new* renewable energy sources by 2005. Based on FY 2001 Federal electricity consumption the goal for new renewable energy use in the Federal Government is currently 1,384 gigawatthours (GWh) by 2005. This is a decrease from 1,423 GWh in FY 2000, due to decreased Federal electricity consumption. New renewable energy only includes energy from projects or purchases of renewable energy contracted or built after 1990. 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.

Federal agencies purchased or produced 362 GWh of new renewable energy in FY 2001, 26 percent of the goal. Renewable energy sources include: Purchases of renewable energy or renewable energy credits (127 GWh), biomass projects (92.5 GWh) ground source heat pumps (88.8 GWh), photovoltaics (22.2 GWh), wind energy (14.1 GWh), biomass transportation fuels (10.4 GWh) and solar thermal applications (6.5 GWh).

FY 2001 consumption of new renewable energy was more than double the amount of new renewable energy the Federal government used in FY 2000, the first year the goal was in place. The major growth since FY 2001 came from: purchases of renewable energy or renewable energy credits (113.5 GWh), ground-source heat pumps (16.9 GWh), photovoltaics (11.3 GWh), wind (2.5 GWh), and solar thermal applications (1.8 GWh). Looking forward to FY 2002, agencies reported several significant projects and purchases in progress involving landfill gas and increased renewable energy purchases that should continue progress toward the goal.

The renewable energy goal encourages agencies to acquire new renewable energy, but it is important to note that agencies continue to support and use renewable energy sources developed in the 1970s and 1980s as well. Large-scale geothermal is an important source of energy for Federal facilities at China Lake, California and Keflavik, Iceland. Waste to energy systems have provided heat and power to facilities in Virginia for over 20 years. Photovoltaic systems have played an integral role in powering navigation aids and remote equipment in many agencies since the mid 1980s. The energy from these older projects far exceed the amount of new renewable energy added since 1990. These older systems provide a solid base of experience that help the credibility of new projects using similar technologies.

In order to better track Federal renewable energy use, FEMP, with technical support from NREL, integrated information from the Million Solar Roofs Initiative solar system project registry, Sandia National Laboratory's assessment of solar systems at U.S. Department of the Interior and U.S. Department of Agriculture Forest Service facilities and other disparate data sources into a single database and Web-enabled project registry. In FY 2001, the Internet site for this system was in its testing phase. The database contains information on renewable energy usage at more

than 25,000 sites, including information on green power purchases, on-site power generation, and thermal applications. FEMP and NREL are continuing to enter system data into the registry to more accurately reflect a baseline for Federal renewable energy use.

Million Solar Roofs

Section 204 of Executive Order 13123 restated a goal of 2,000 solar roof installations in Federal Government facilities by 2000, and 20,000 installations by 2010. The goal was first articulated in the 1997 announcement of the Million Solar Roofs Initiative. In the period from June 1997 to April 2000 the Federal government installed 1,745 solar energy systems. This total included 1,682 solar hot water systems, 58 photovoltaic power systems and 5 transpired solar thermal collectors. The U.S. Navy installed an additional 1,000 solar hot water systems by the end of FY 2000. This brought total installations to just over 2,700 systems by the end of 2000, accomplishing the Federal goal. In FY 2001 the total increased to 3,151 systems, including 3,041 solar water heaters, 105 PV systems, and 5 transpired collectors.

II. ENERGY MANAGEMENT IN STANDARD BUILDINGS

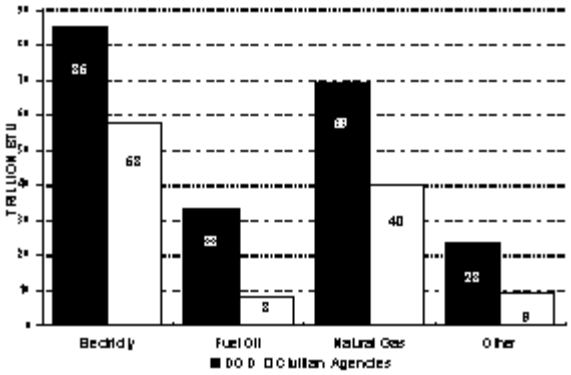
A. Energy Consumption and Costs for Standard Buildings

The Federal Government provides energy to approximately 500,000 buildings and facilities comprising approximately 3.4 billion square feet of floor area. Of this, approximately 3.1 billion square feet was reported as standard building space in FY 2001. The remaining space is reported as energy intensive facilities or exempt facilities and is discussed in Sections III and IV respectively. The energy is used in standard buildings provides lighting, heating, ventilation, air conditioning, and other standard building services, and is used for certain process operations that are not reported separately.[12] Federal buildings include both Federally-owned and leased buildings. However, in many instances the lessor pays the energy bill, and consumption and cost data may not be available to the Government. Accordingly, Federal agencies report data for leased space to the maximum extent practicable.[13]

Table 5-A shows the total primary energy consumed in Federal buildings and facilities, including energy resources used to generate, process, and transport electricity and steam.[14] Primary energy consumed in buildings and facilities in FY 2001 decreased 9.0 percent from FY 1985 and increased 0.1 percent from FY 2000.

Table 5-B shows that agencies have decreased site-delivered energy consumption in buildings by 21.8 percent, from 419.0 trillion Btu in FY 1985 to 327.5 trillion Btu in FY 2001. A comparison to FY 2000 shows an increase of 1.0 percent in total buildings energy consumption.

FIGURE 5
Defense and Civilian Energy Consumption in Standard Buildings by Fuel Type, FY 2001



Of the 29 agencies represented on the tables for FY 2001, 11, including DOD, consume approximately 98 percent of the reported buildings energy use. Energy used in buildings accounts for 32.7 percent of the total 1.0 quads used by the Federal Government. The mix of Federal buildings energy use for Defense and civilian agencies is depicted in Figure 5. Electricity

[12]Process energy is that energy used in buildings for operations other than standard building services. In cases where separate reporting was not possible, due to the lack of meters or estimation techniques, process energy was reported as though it was part of the energy used for standard building services.

[13]GSA is the primary leasing agent for the Federal Government, although most of the other agencies do have some leasing authority. In some cases, GSA will delegate operations and maintenance responsibility to individual agencies for leased space, requiring the agency to be responsible for paying the utility bills and reporting energy consumption.

[14]Conversion factors of 10,346 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam are used to calculate primary energy consumption. See Appendix B for conversion factors for site-delivered energy consumption.

TABLE 5-A
FEDERAL PRIMARY ENERGY CONSUMPTION IN STANDARD BUILDINGS
(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10^{15}])

CIVILIAN AGENCY	**FY 1985**	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	**FY 2000**	**FY 2001**	%Change 85-01	%Change 00-01
USPS	**35,915.2**	42,631.6	43,820.8	45,472.7	49,064.6	50,297.9	51,256.8	53,195.9	48,869.8	50,939.9	52,058.2	**58,913.2**	**55,566.5**	54.7	-5.7
VA	**39,673.2**	40,902.8	41,915.5	41,740.0	42,540.0	43,113.2	43,556.3	44,780.8	45,068.6	45,496.7	45,731.8	**45,527.5**	**47,612.6**	20.0	4.6
DOE	**46,652.7**	45,662.6	44,183.6	44,809.1	45,369.1	43,214.8	41,567.5	41,134.1	38,639.0	37,935.6	36,845.4	**35,269.0**	**35,623.1**	-23.6	1.0
GSA	**36,001.5**	28,471.0	31,461.5	31,129.0	31,050.0	30,558.4	29,845.2	31,186.6	31,339.2	31,278.2	31,527.5	**28,241.8**	**28,277.8**	-21.5	0.1
DOJ	**8,531.9**	8,692.4	11,106.3	8,464.4	11,128.5	10,588.5	10,996.1	13,343.0	13,678.7	14,132.4	14,696.6	**16,987.3**	**17,354.0**	103.4	2.2
NASA	**7,999.3**	9,640.0	9,765.1	9,612.9	9,707.5	9,646.7	10,182.8	10,386.6	10,251.3	10,266.1	9,957.4	**9,787.0**	**10,050.6**	25.6	2.7
DOI	**7,879.7**	6,985.2	7,160.1	6,270.2	7,660.0	7,537.0	7,028.1	5,690.7	6,665.0	6,862.1	6,949.6	**7,457.8**	**8,798.6**	11.7	18.0
DOT	**8,012.0**	6,601.8	6,104.4	7,677.4	7,954.1	7,736.2	7,617.9	8,652.6	8,942.8	8,121.7	8,076.2	**7,903.5**	**7,975.1**	-0.5	0.9
ST[1]	**6,209.8**	6,323.1	6,347.8	747.0	119.9	212.2	230.4	706.0	6,531.3	6,532.6	6,173.0	**6,388.4**	**5,789.3**	-6.8	-9.4
USDA	**3,770.7**	4,674.2	5,109.3	4,855.2	4,985.2	4,785.1	4,657.8	4,831.6	4,293.5	4,538.2	4,045.5	**4,416.3**	**4,401.6**	16.7	-0.3
DOL	**3,455.8**	3,603.6	3,521.9	3,555.5	3,681.6	3,749.7	3,635.3	3,756.8	3,786.9	3,818.4	2,986.9	**3,988.1**	**4,250.0**	23.0	6.6
TVA	**1,180.5**	1,260.5	1,270.9	1,269.4	1,308.1	1,988.7	2,202.4	2,133.7	2,007.6	1,981.0	1,959.6	**1,861.4**	**1,887.9**	59.9	1.4
TRSY	**1,560.2**	672.0	3,933.6	4,350.4	3,843.4	3,936.9	3,399.3	3,287.8	4,363.8	4,126.0	4,172.5	**1,297.3**	**1,345.0**	-13.8	3.7
DOC	**1,092.9**	855.4	2,945.7	1,340.6	1,499.9	1,851.9	1,231.1	1,190.5	1,175.6	1,090.5	1,125.3	**1,094.0**	**1,221.3**	11.8	11.6
HHS	**603.9**	653.9	578.6	546.9	550.1	495.9	525.2	520.0	508.9	477.9	465.7	**518.2**	**526.3**	-12.8	1.6
HUD	**315.2**	384.2	374.3	345.2	314.4	293.4	285.2	301.4	289.7	279.9	286.8	**286.8**	**299.4**	-5.0	4.4
OTHER*	**966.9**	1,522.5	1,112.0	1,083.1	1,075.7	1,063.0	2,904.9	4,678.3	4,924.0	4,597.6	4,834.2	**4,716.0**	**4,743.9**	390.7	0.6
Civilian Agencies Subtotal	**209,821.1**	209,536.8	220,711.7	213,269.1	221,852.1	221,069.5	221,122.3	229,776.3	231,335.8	232,474.8	231,892.3	**234,653.5**	**235,723.1**	12.3	0.5
DOD	**475,614.7**	541,109.0	487,672.6	489,972.8	486,658.5	466,182.5	441,755.4	420,185.3	405,417.0	397,287.8	395,675.6	**388,867.4**	**388,282.8**	-18.4	-0.2
Total	**685,435.8**	750,645.8	708,384.2	703,241.9	708,510.6	687,252.1	662,877.7	649,961.6	636,752.9	629,762.6	627,567.9	**623,520.9**	**624,005.9**	-9.0	0.1
MBOE	**117.7**	128.9	121.6	120.7	121.6	118.0	113.8	111.6	109.3	108.1	107.7	**107.0**	**107.1**		
Petajoules	**723.1**	791.9	747.3	741.9	747.5	725.0	699.3	685.7	671.8	664.4	662.1	**657.8**	**658.3**		

DATA AS OF 09/25/02

*Other includes for certain years the CFTC, CIA, EEOC, FEMA, FTC, NARA, NSF, NRC, OPM, RRB, SSA, USIA/IBB, and FERC.

Note: This table uses a conversion factor for electricity of 10,346 Btu per kilowatt hour and 1,390 Btu per pound of steam. Contains estimated data for the following agencies: FEMA (1997, 1998), FCC (1997, 1998, 1999), FTC (1997, 1998, 1999), and OPM. (1997, 1998, 1999, 2000). Sum of components may not equal total due to independent rounding.

[1]In 1998, the State Department developed a statistical method for estimating the energy consumption in the large number of foreign buildings it owns and leases. This method was subsequently applied to estimate FY 1991 energy consumption and is now used annually to assess progress. The FY 1991 foreign building estimates were combined with domestic building data for the fiscal years 1985 and 1990, since these are base years for performance goals.

Source: Federal Agency Annual Energy Management Data Reports

TABLE 5-B
FEDERAL SITE-DELIVERED ENERGY CONSUMPTION IN STANDARD BUILDINGS
(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10^{15}])

CIVILIAN AGENCY	**FY 1985**	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	**FY 2000**	**FY 2001**	%Change 85-01	%Change 00-01
VA	**24,552.0**	24,380.1	24,733.0	24,620.0	25,077.2	25,213.4	25,075.4	26,172.3	26,062.0	26,216.9	26,134.8	**26,120.6**	**26,748.3**	8.9	2.4
USPS	**16,238.3**	18,480.0	18,620.8	19,449.2	21,159.8	21,602.2	21,649.7	22,210.0	22,006.4	22,683.9	23,127.0	**25,238.3**	**24,974.3**	53.8	-1.0
DOE	**29,593.7**	26,612.0	25,455.1	26,155.5	26,905.1	25,474.3	24,236.7	21,970.2	20,350.5	19,835.6	18,992.1	**17,805.1**	**18,356.4**	-38.0	3.1
GSA	**15,897.7**	11,174.5	13,116.3	13,061.4	13,075.2	12,832.9	12,366.7	13,439.4	13,353.7	13,123.7	13,083.9	**11,728.0**	**12,024.9**	-24.4	2.5
DOJ	**6,112.0**	4,863.8	5,894.3	3,869.2	6,245.8	6,143.9	6,303.9	7,490.6	8,003.7	7,783.0	8,047.1	**9,374.6**	**9,798.9**	60.3	4.5
DOI	**4,762.4**	4,039.4	3,886.2	3,173.4	3,974.3	3,922.1	3,596.3	2,979.1	3,668.5	3,747.4	3,794.6	**4,006.6**	**4,692.2**	-1.5	17.1
NASA	**3,760.1**	4,381.0	4,341.1	4,288.0	4,232.9	4,158.3	4,381.2	4,436.1	4,350.7	4,404.8	4,303.3	**4,263.7**	**4,418.3**	17.5	3.6
DOT	**4,614.5**	3,750.4	3,297.6	3,918.0	3,886.6	3,903.0	3,669.1	4,058.0	3,959.6	3,779.5	3,828.1	**3,716.4**	**3,913.8**	-15.2	5.3
ST[1]	**2,756.9**	2,792.5	2,799.0	273.8	45.3	82.9	92.9	289.2	2,894.1	2,893.3	3,012.2	**2,892.7**	**2,663.6**	-3.4	-7.9
DOL	**2,153.0**	2,137.1	2,044.1	2,063.7	2,145.8	2,158.3	2,028.8	2,153.9	2,153.9	2,190.2	1,697.9	**2,111.8**	**2,312.5**	7.4	9.5
USDA	**1,953.6**	2,204.9	2,342.4	2,151.6	2,234.8	2,164.5	2,083.1	2,261.3	1,996.0	2,111.1	1,901.8	**2,052.5**	**2,070.8**	6.0	0.9
TVA	**402.4**	427.8	426.6	425.6	439.8	664.0	748.5	728.4	665.6	658.4	650.8	**617.7**	**626.2**	55.6	1.4
TRSY	**713.4**	396.0	1,494.7	1,749.1	1,568.0	1,624.7	1,418.3	1,484.9	1,904.4	1,741.2	1,815.0	**530.0**	**573.0**	-19.7	8.1
DOC	**540.3**	399.4	1,406.9	531.0	571.9	752.9	494.9	490.1	457.2	429.9	449.4	**437.0**	**471.4**	-12.8	7.9
HHS	**253.0**	273.1	224.5	215.8	214.1	172.1	201.7	204.7	200.1	188.8	184.8	**212.3**	**219.6**	-13.2	3.5
HUD	**116.9**	140.3	132.2	123.1	116.2	113.5	105.9	115.4	109.3	103.1	106.3	**106.3**	**115.6**	-1.2	8.7
OTHER*	**406.8**	660.0	468.9	472.0	471.4	449.4	1,235.8	1,929.8	2,035.7	1,911.5	1,982.6	**1,946.3**	**1,967.3**	383.6	1.1
Civilian Agencies Subtotal	**114,827.1**	107,112.2	110,683.8	106,540.2	112,364.2	111,432.3	109,688.6	112,413.3	114,171.3	113,802.3	113,111.7	**113,160.0**	**115,947.1**	1.0	2.5
DOD	**304,190.0**	321,101.6	286,885.7	295,719.8	279,726.5	262,661.5	247,166.9	235,994.1	227,070.0	220,567.6	217,958.2	**210,965.0**	**211,528.2**	-30.5	0.3
Total	**419,017.1**	428,213.8	397,569.5	402,259.9	392,090.7	374,093.9	356,855.5	348,407.4	341,241.3	334,369.9	331,069.9	**324,125.0**	**327,475.3**	-21.8	1.0
MBOE	**71.9**	73.5	68.3	69.1	67.3	64.2	61.3	59.8	58.6	57.4	56.8	**55.6**	**56.2**		
Petajoules	**442.0**	451.7	419.4	424.4	413.6	394.7	376.5	367.6	360.0	352.7	349.3	**341.9**	**345.5**		

DATA AS OF 09/25/02

*Other includes for certain years the CFTC, CIA, EEOC, FEMA, FTC, NARA, NSF, NRC, OPM, RRB, SSA, USIA/IBB, and FERC.

Note: This table uses a conversion factor for electricity of 3,412 Btu per kilowatt hour. Contains estimated data for the following agencies: FEMA (1997, 1998), FCC (1997, 1998, 1999), FTC (1997, 1998, 1999), and OPM. (1997, 1998, 1999, 2000). Sum of components may not equal total due to independent rounding.

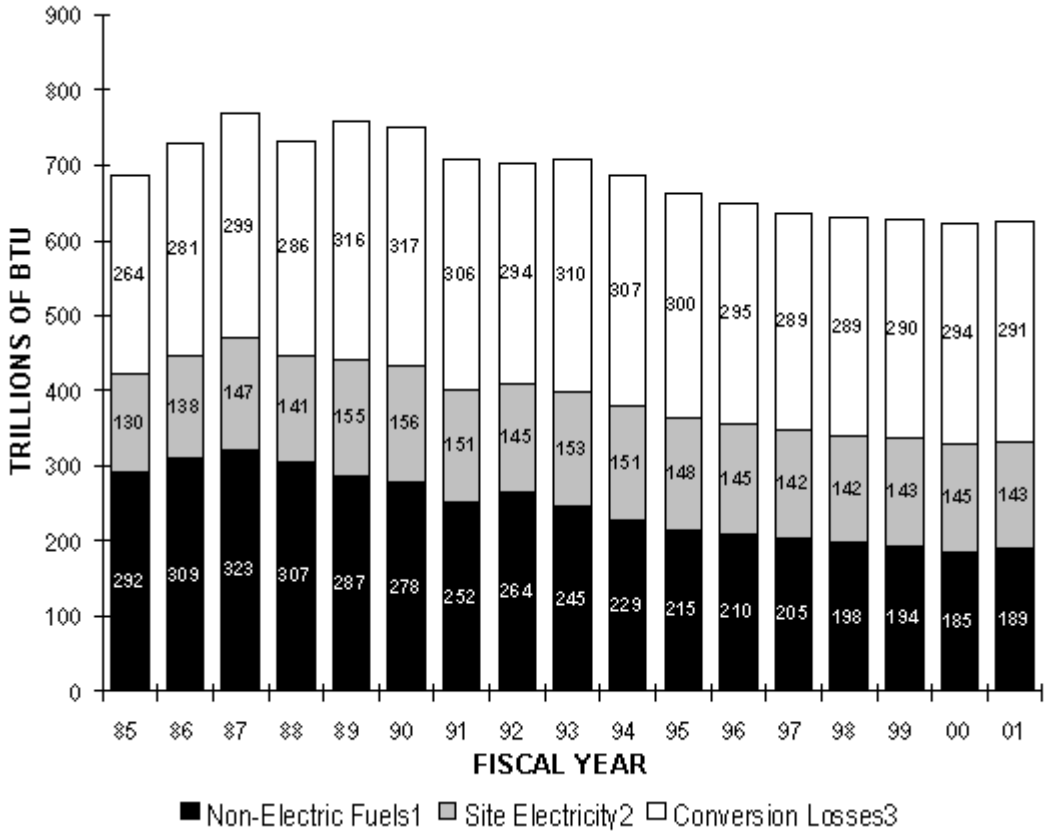
[1]In 1998, the State Department developed a statistical method for estimating the energy consumption in the large number of foreign buildings it owns and leases. This method was subsequently applied to estimate FY 1991 energy consumption and is now used annually to assess progress. The FY 1991 foreign building estimates were combined with domestic building data for the fiscal years 1985 and 1990, since these are base years for performance goals.

Source: Federal Agency Annual Energy Management Data Reports

constitutes 43.8 percent (143.4 trillion Btu) of Federal buildings energy use; 33.5 percent is accounted for by natural gas (109.6 trillion Btu), and 12.7 percent by fuel oil (41.7 trillion Btu). Coal, purchased steam, liquefied petroleum gas (LPG)/propane, and energy reported as "other" (comprised mainly of chilled water), account for the remaining 10.0 percent.

Figure 6 illustrates the proportion of energy consumption in buildings and facilities that is attributable to electricity for FY 1985 through FY 2001. The figure also breaks out the amount of Btu lost through the generation and transmission processes and amount of Btu delivered to the site. In FY 2001, electricity consumption, including energy used at the source of generation,

FIGURE 6
Consumption of Electricity and Other Fuels in Standard Buildings, FY 1985 through FY 2001



[1]Includes Fuel Oil, Natural Gas, LPG/Propane, Coal, Purchased Steam, and Other. Uses a conversion factor for steam of 1,390 Btu per pound (source conversion).

[2]Uses a conversion factor of 3,412 Btu per kilowatt hour. Amount of energy which reaches the site of use when generation and transmission losses are subtracted.

[3]Amount of energy lost through generation and transmission processes. When added to amount of energy reaching the point of use, the total equals amount of Btu consumed at the source. The source conversion factor is 10,346 Btu per kilowatt hour.

Source: Federal Agency Annual Energy Management Data Reports

accounted for approximately 69.7 percent (434,787.3 billion Btu) of the total primary Btu used in buildings and facilities (624,005.9 billion Btu; see Table 5-A). Of this amount, 33.0 percent or 143.4 trillion Btu reached the site of use. The remaining 67.0 percent, 291.4 trillion Btu, was lost during the generation and transmission processes. Significant decreases in consumption relative to FY 2000 were seen in coal (22.8 percent) and purchased steam (10.0 percent). Slight decreases were seen in electricity (0.8 percent), natural gas (0.2 percent), and fuels reported under the category of "other" (0.4 percent). Major increases relative to the previous year were seen in the consumption of fuel oil (31.3 percent) and LPG/propane (28.8 percent).

The mix of fuels consumed by Government buildings has changed notably from FY 1985 through FY 2001. The actual consumption of electricity in FY 2001 increased 10.6 percent since FY 1985. The proportion of energy consumed in Federal buildings and facilities that was electricity increased from 30.9 percent in FY 1985 to 43.8 percent in FY 2001. Over the same period, fuel oil use decreased from 22.5 percent of the total in FY 1985 to 12.7 percent in FY 2001. The portion of the Federal buildings fuel mix comprised by natural gas has increased from 30.6 percent in FY 1985 to 33.5 percent in FY 2001. The use of coal as a fuel source, which accounted for 12.5 percent of the total energy consumed in FY 1985, has declined to 4.5 percent of the total in FY 2001. Contributing to this has been the practice of agencies, such as DOD and DOE, to purchase steam rather than generating their own in coal-fired plants.

As shown in Table 6 the consumption of petroleum-based fuels in buildings during FY 2001 decreased 54.3 percent compared to FY 1985, although it increased 31.6 percent from FY 2000. Efforts by agencies to utilize natural gas as a cost-effective substitute for petroleum-based fuels in buildings, as well as conservation of fuel oil and LPG/propane in buildings contributed to the reductions from FY 1985. The increases in consumption of fuel oil and LPG/propane from the previous year may be a reaction to the 60.2 percent increase in the price of natural gas during the same period. Although fuel oil prices also increased (by 27.1 percent), the unit cost of natural gas to the Federal Government in FY 2001 ($7.26 per million Btu) rose for the first time above the unit cost of fuel oil ($6.31 per million Btu). Still, petroleum fuel consumption in buildings during FY 2001 represented only 13.6 percent of all energy consumed in Federal buildings. Of this amount, 93.7 percent is attributed to fuel oil and the remaining 6.3 percent to LPG/propane.

TABLE 6
PETROLEUM-BASED FUEL* CONSUMPTION IN STANDARD BUILDINGS
(In Billions of Btu)

CIVILIAN AGENCY	**FY 1985**	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	**FY 2000**	**FY 2001**	%Change 85-01	%Change 00-01
DOD	**84,366.6**	69,030.1	59,451.5	65,654.1	55,585.9	50,285.7	42,939.0	42,861.7	35,214.4	32,354.5	30,506.7	**27,982.5**	**34,839.8**	-58.7	24.5
VA	**2,176.7**	2,219.3	1,404.9	1,506.0	1,533.9	1,827.4	1,292.9	2,098.2	1,186.3	954.6	954.8	**1,045.4**	**3,040.5**	39.7	190.8
DOE	**1,455.4**	1,768.1	1,818.4	1,891.6	1,804.4	1,772.1	1,825.8	1,390.3	1,257.7	576.8	637.8	**675.7**	**1,289.8**	-11.4	90.9
DOT	**2,380.4**	1,524.1	1,308.4	1,426.0	854.0	1,001.6	912.2	709.9	670.9	817.2	824.3	**815.0**	**928.2**	-61.0	13.9
USPS	**1,673.2**	1,502.2	1,219.4	1,195.8	988.8	983.7	813.9	595.2	819.0	1,139.4	821.7	**857.9**	**1,425.5**	-14.8	66.2
DOI	**1,591.6**	1,273.9	1,141.1	919.1	1,181.9	1,560.6	1,574.3	1,177.7	799.6	964.7	835.1	**996.7**	**1,324.0**	-16.8	32.8
ST	**817.8**	817.8	817.8	0.0	0.0	0.0	0.0	21.8	706.0	706.0	1,098.0	**774.2**	**767.2**	-6.2	-0.9
DOL	**437.8**	331.2	258.3	263.6	276.1	277.5	210.8	220.6	254.2	226.1	188.9	**193.2**	**210.0**	-52.0	8.7
GSA	**944.2**	668.1	443.1	418.2	359.4	379.8	199.0	242.3	143.0	54.8	68.4	**68.2**	**125.1**	-86.8	83.5
DOJ	**381.7**	371.6	503.7	383.8	250.8	234.8	182.8	234.3	134.9	103.1	115.0	**129.5**	**147.4**	-61.4	13.8
NASA	**328.1**	495.6	428.4	449.0	318.4	291.8	166.8	132.2	83.6	100.0	88.4	**77.7**	**82.6**	-74.8	6.3
CIA	**0.0**	0.0	0.0	0.0	0.0	0.0	49.6	87.9	84.6	60.2	53.6	**57.0**	**57.0**	N/A	0.0
USDA	**414.2**	260.0	291.3	242.9	255.6	236.3	244.1	242.5	272.2	270.6	114.1	**122.8**	**143.4**	-65.4	16.8
DOC	**130.3**	22.5	13.1	9.8	23.8	52.4	10.8	33.4	9.3	8.7	6.1	**5.3**	**32.4**	-75.1	512.1
FEMA	**56.7**	72.3	59.1	66.9	67.6	49.1	49.1	49.1	49.1	49.1	30.6	**32.2**	**32.6**	-42.5	1.2
TRSY	**22.5**	138.4	127.7	84.2	190.5	160.8	116.6	116.2	57.0	44.8	60.3	**64.3**	**15.0**	-33.2	-76.7
SSA	**0.0**	0.0	0.0	0.0	0.0	0.0	0.0	8.2	11.8	8.9	3.5	**3.4**	**4.7**	N/A	39.9
TVA	**4.2**	3.2	0.1	1.3	2.7	3.5	3.9	4.1	0.0	3.0	2.9	**1.9**	**1.5**	-65.1	-21.9
FCC	**1.7**	1.9	1.0	1.3	1.3	1.3	1.3	1.7	1.7	1.7	1.7	**0.2**	**0.2**	-91.2	N/A
HHS	**34.5**	39.3	29.8	34.5	31.3	0.0	0.0	2.9	1.9	1.9	1.9	**0.0**	**0.0**	-100.0	N/A
EEOC	**0.0**	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**	N/A	N/A
NSF	**19.4**	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**	-100.0	N/A
USIA/IBB	**0.0**	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**	N/A	N/A
TOTAL	**97,237.1**	80,551.1	69,316.9	74,548.4	63,726.4	59,118.4	50,592.8	50,230.1	41,757.4	38,446.3	36,413.6	**33,903.1**	**44,466.9**	-54.3	31.2

DATA AS OF 09/26/02

*Petroleum-based fuels include fuel oil and LPG/propane.

Note: Contains estimated data for the following agencies: FEMA (1997, 1998), FCC (1997, 1998, 1999), FTC (1997, 1998, 1999), and OPM. (1997, 1998, 1999, 2000).

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

[1]In 1998, the State Department developed a statistical method for estimating the energy consumption in the large number of foreign buildings it owns and leases. This method was subsequently applied to estimate FY 1991 energy consumption and is now used annually to assess progress. The FY 1991 foreign building estimates were combined with domestic building data for the fiscal years 1985 and 1990, since these are base years for performance goals.

Source: Federal Agency Annual Energy Management Data Reports

The energy used in standard buildings in FY 2001 accounted for approximately 41.1 percent of the total Federal energy bill. Tables 7-A and 7-B show that the Federal Government spent approximately $3,936.1 million for buildings energy during the fiscal year, a 14.2 percent increase ($488.6 million) from FY 2000 expenditures.

The significant increase from FY 2000 is attributable mainly to increases in prices paid by the Government for most fuel types consumed in standard buildings. Overall, the unit cost of all fuel types used increased 13.0 percent, from $10.34 per million Btu to $12.02 per million Btu. Contributing to the overall increase in unit costs were increases in the prices paid by the Government for:

- Natural Gas (60.2 percent increase)
- Fuel Oil (27.1 percent increase)
- Electricity (4.0 percent increase)
- LPG/propane, purchased steam, and "other" combined (12.2 percent increase).
- Coal prices paid by the Government decreased only slightly, 0.6 percent, from FY 2000.

In constant 2001 dollars, Federal energy costs for buildings and facilities decreased 25.9 percent from $5,312.4 million in FY 1985 to $3,936.1 million in FY 2001. The combined cost for buildings energy in constant dollars in FY 2001 was $12.02 per million Btu, down 5.2 percent from $12.68 per million Btu in FY 1985.

TABLE 7-A
DEFENSE AND CIVILIAN FEDERAL COSTS FOR STANDARD BUILDINGS ENERGY IN FY 2001
(In Millions of Dollars)

	ELECTRICITY	FUEL OIL	NATURAL GAS	LPG/ PROPANE	COAL	PURCHASED STEAM	OTHER	TOTAL
DEFENSE	1,492.887	204.630	504.579	16.094	26.759	104.801	11.881	2,361.630
CIVILIAN	1,137.807	58.328	291.815	13.985	3.988	63.519	5.054	1,574.496
TOTAL	2,630.693	262.958	796.394	30.079	30.747	168.320	16.934	3,936.125

AVERAGE COST PER UNIT, BASED ON REPORTS FROM AGENCIES

ELECTRICITY	=	62.60	/ MWH
FUEL OIL	=	0.88	/ GALLON
NATURAL GAS	=	7.49	/ THOUSAND CUBIC FEET
LPG/PROPANE	=	1.02	/ GALLON
COAL	=	51.12	/ SHORT TON
PURCHASED STEAM	=	12.79	/ MILLION BTU
OTHER	=	8.31	/ MILLION BTU

DATA AS OF 09/25/02

Note: Contains estimated data for the following agencies: NSF and OPM.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports.

TABLE 7-B
CONSUMPTION AND COSTS OF FEDERAL BUILDINGS ENERGY BY FUEL TYPE IN FY 2001, FY 2000, AND FY 1985
(Constant 2001 Dollars)

ENERGY TYPE	BILLIONS OF BTU	COST PER MMBTU	COST (IN MILLIONS OF DOLLARS)
FY 2001			
ELECTRICITY	143,388.2	18.3467	2,630.693
FUEL OIL	41,664.2	6.3114	262.958
NATURAL GAS	109,639.9	7.2637	796.394
LPG/PROPANE	2,802.7	10.7320	30.079
COAL	14,784.6	2.0797	30.747
PURCHASED STEAM	13,157.8	12.7924	168.320
OTHER	2,038.0	8.3094	16.934
TOTAL	327,475.3		3,936.125
AVERAGE COST PER MMBTU = $12.020			
FY 2000			
ELECTRICITY	144,516.3	17.6494	2,550.626
FUEL OIL	31,726.3	4.9662	157.560
NATURAL GAS	109,881.7	4.5347	498.280
LPG/PROPANE	2,176.8	8.3192	18.109
COAL	19,151.8	2.0926	40.077
PURCHASED STEAM	14,626.3	11.8962	173.997
OTHER	2,045.8	4.3423	8.884
TOTAL	324,125.0		3,447.533
AVERAGE COST PER MMBTU = $10.636			
FY 1985			
ELECTRICITY	129,660.2	24.8924	3,227.548
FUEL OIL	94,069.9	8.8530	832.796
NATURAL GAS	128,024.8	6.8526	877.306
LPG/PROPANE	3,167.3	10.2706	32.530
COAL	52,397.2	3.4450	180.510
PURCHASED STEAM	7,482.7	17.5528	131.342
OTHER	4,215.1	7.2128	30.403
TOTAL	419,017.1		5,312.435
AVERAGE COST PER MMBTU = $12.678			

DATA AS OF 09/25/02

Note: FY 2001 contains estimated data for: FCC, CIA, and OPM.
FY 2000 contains estimated data for: NSF and OPM.

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

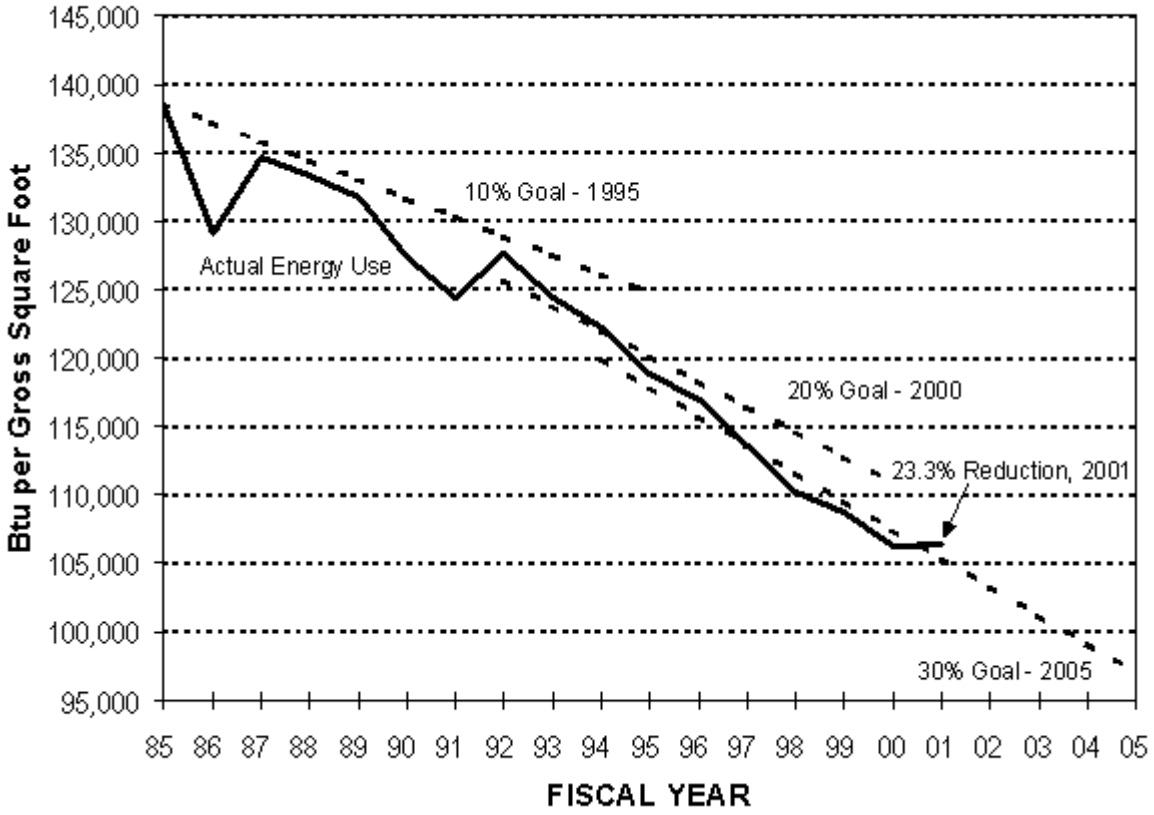
Electricity costs of $2,630.7 million represent approximately 66.8 percent of total expenditures of $3,936.1 million for buildings energy in FY 2001. Natural gas costs account for approximately 20.2 percent of the total, expenditures for fuel oil account for 6.7 percent, with the remaining 6.3 percent attributable to expenditures for LPG/propane, coal, purchased steam, and "other."

In FY 2001, the cost of all energy used in Federal buildings was $1.28 per gross square foot. Of the $1.28 spent per square foot Government-wide, $0.86 was spent for electricity, $0.26 was spent for natural gas, $0.09 was spent for fuel oil, and the remaining $0.07 was spent for purchased steam, coal, LPG/propane, and other fuels.

B. Progress Toward the Mandated Goals for Buildings and Facilities

Both the magnitude of energy consumption and the potential for energy savings have prompted legislative and executive branch initiatives to achieve energy conservation in the Federal buildings sector.[15] Federal Government progress toward the 10, 20, and 30 percent energy reduction goals of NECPA and Executive Order 13123 is illustrated in Figure 7.

FIGURE 7
Progress Toward the Energy Reduction Goals for Federal Standard Buildings, FY 2001



[15]The legislative authorities for Federal agencies are detailed in Appendix A.

(Executive Order 13123 also establishes a 35 percent reduction goal for 2010.) Overall, the Federal Government reduced its site-delivered energy consumption in buildings and facilities by 23.3 percent in FY 2001 compared to FY 1985 when measured in terms of British Thermal Units consumed per gross square foot (Btu/GSF) of floor area.

Table 8-A shows the FY 2001 performance of the individual agencies in site-delivered Btu/GSF compared to FY 1985. Site-delivered Btu reflects the amount of energy delivered to the point of use and is used to measure agency performance toward the mandated goals.

Table 8-B shows the performance of the agencies measured in terms of primary Btu/GSF. Primary Btu represents the average amount of energy required at the source of generation (primary energy) rather than the actual Btu delivered to the site. Primary Btu includes energy resources used to generate, process, and transport electricity and steam. Measured in terms of source energy, the Federal Government shows a reduction of 10.3 percent in FY 2001 compared to FY 1985. This large difference from the site-delivered Btu/GSF reduction of 23.3 percent reflects the significant declines in direct use of fossil fuels and the offsetting increases in the share of the fuel mix contributed by electricity.

Contributing to the overall reduction of 23.3 percent in site-delivered Btu/GSF were the percentage reductions greater than 20 percent made by the following six agencies: the Departments of Commerce, Defense, Energy, Justice, Transportation, and the Tennessee Valley Authority. The progress of each agency toward the goal for standard buildings is illustrated in Figure 8.

The agencies used a variety of strategies to reduce their energy consumption. Operations and maintenance (O&M) procedures continued to be emphasized as a major component in the effort to achieve the energy reduction goals. Improvements in energy efficiency were achieved through improved energy systems operations and both preventive maintenance and improved maintenance. O&M funding, used for the replacement of boilers, HVAC equipment, windows, and lighting systems, continued to benefit energy conservation.

In FY 2001, the implementation of many no-cost and low-cost energy conservation measures was continued, such as reducing lighting levels, lowering hot water temperatures, turning off unused equipment, and installing energy-efficient windows, insulation, weather stripping, and set-back thermometers.

Numerous energy-efficient building retrofits and energy conservation projects were undertaken to supplement the no-cost, low-cost measures. These initiatives can be categorized by lighting system replacement, HVAC equipment modernization, building envelope improvements, and other miscellaneous projects, such as installation of energy management control systems. Energy savings performance contracts were often pursued as supplemental sources of funding, as well as utility energy service contracting initiatives. Other activities include energy awareness programs featuring energy awareness seminars, publication of materials promoting energy efficiency, the procurement of energy-efficient goods and products, increased maintenance training, and increased engineering assistance.

TABLE 8-A
FEDERAL STANDARD BUILDINGS SITE-DELIVERED ENERGY USE PER GROSS SQUARE FOOT, FY 1985 AND FY 2001

	FISCAL YEAR 1985			FISCAL YEAR 2001			
	GSF (Thousands)	BTU (Billions)	**BTU/GSF**	GSF (Thousands)	BTU (Billions)	**BTU/GSF**	%CHANGE 1985-2001
VA	123,650.0	24,552.0	**198,560**	154,795.0	26,748.3	**172,798**	-13.0
USPS	189,400.0	16,238.3	**85,736**	348,758.4	24,974.3	**71,609**	-16.5
DOE[1]	62,762.4	29,593.7	**471,519**	68,900.6	18,356.4	**266,284 †**	-43.5
GSA	189,976.9	15,897.7	**83,682**	175,249.6	12,024.9	**68,461 †**	-18.2
DOJ	20,768.8	6,112.0	**294,289**	54,994.5	9,798.9	**178,105 †**	-39.5
DOI	54,154.4	4,762.4	**87,940**	53,860.0	4,692.2	**87,118 †**	-0.9
NASA	14,623.4	3,760.1	**257,130**	20,831.3	4,418.3	**212,100**	-17.5
DOT	32,291.1	4,614.5	**142,904**	36,539.6	3,913.8	**107,111**	-25.0
ST	44,674.4	2,756.9	**61,711**	43,549.7	2,663.6	**61,162**	-0.9
DOL	18,268.3	2,153.0	**117,852**	22,019.7	2,312.5	**105,022**	-10.9
USDA	24,061.0	1,953.6	**81,195**	31,250.4	2,070.8	**66,136 †**	-18.5
TVA	4,886.6	402.4	**82,357**	10,521.1	626.2	**59,363 †**	-27.9
TRSY	7,182.6	713.4	**99,317**	6,486.5	573.0	**88,335**	-11.1
DOC	4,522.6	540.3	**119,476**	5,960.2	471.4	**79,095**	-33.8
HHS	2,649.8	253.0	**95,491**	2,700.1	219.6	**81,342**	-14.8
HUD	1,432.0	116.9	**81,668**	1,432.0	115.6	**80,700**	-1.2
OTHER*	3,172.0	406.8	**128,249**	15,714.2	1,967.3	**124,766 †**	-2.7
CIVILIAN AGENCIES							
TOTAL	798,476.3	114,827.1	**143,808**	1,053,562.9	115,947.1	**110,002 †**	-23.5
DOD	2,224,527.3	304,190.0	**136,744**	2,013,906.6	211,528.2	**104,407 †**	-23.6
TOTAL	3,023,003.6	419,017.1	**138,610**	3,067,469.5	327,475.3	**106,329 †**	-23.3

DATA AS OF 09/26/02

*Other includes the Federal Communications Commission, Federal Trade Commission, Federal Emergency Management Agency, National Archives and Records Administration, National Science Foundation, Nuclear Regulatory Commission, Office of Personnel Management, Panama Canal Commission, Railroad Retirement Board, Social Security Administration, the U.S. Information Agency, and the Federal Energy Regulatory Commission.

†Indicates where reductions were made to Btu/GSF to reflect purchases of renewable energy. When calculating Btu/GSF, the following amounts were subtracted from agency energy use shown above for FY 2001: DOD, 1,262.7 BBtu; DOE, 9.3 BBtu; DOI, 0.02 BBtu; DOJ, 4.0 BBtu; GSA, 27.2 BBtu; TVA, 1.6 BBtu; USDA, 4.0 BBtu; and SSA, 6.7 BBtu. SSA is included under the Other category because it lacks FY 1985 baseline data.

[1]DOE's high rate of energy intensity is the result of unmetered process energy reported under this building category.

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 8-B
FEDERAL STANDARD BUILDINGS PRIMARY ENERGY USE PER GROSS SQUARE FOOT, FY 1985 AND FY 2001

	FISCAL YEAR 1985			FISCAL YEAR 2001			
	GSF (Thousands)	BTU (Billions)	**BTU/GSF**	GSF (Thousands)	BTU (Billions)	**BTU/GSF**	%CHANGE 1985-2001
USPS	189,400.0	35,915.2	**189,626**	348,758.4	55,566.5	**159,327**	-16.0
VA	123,650.0	39,673.2	**320,851**	154,795.0	47,612.6	**307,585**	-4.1
DOE[1]	62,762.4	46,652.7	**743,322**	68,900.6	35,623.1	**517,021**	-30.4
GSA	189,976.9	36,001.5	**189,504**	175,249.6	28,277.8	**161,357**	-14.9
DOJ	20,768.8	8,531.9	**410,805**	54,994.5	17,354.0	**315,559**	-23.2
NASA	14,623.4	7,999.3	**547,022**	20,831.3	10,050.6	**482,478**	-11.8
DOI	54,154.4	7,879.7	**145,504**	53,860.0	8,798.6	**163,360**	12.3
DOT	32,291.1	8,012.0	**248,118**	36,539.6	7,975.1	**218,259**	-12.0
ST	44,674.4	6,209.8	**139,002**	43,549.7	5,789.3	**132,936**	-4.4
USDA	24,061.0	3,770.7	**156,714**	31,250.4	4,401.6	**140,849**	-10.1
DOL	18,268.3	3,455.8	**189,167**	22,019.7	4,250.0	**193,010**	2.0
TVA	4,886.6	1,180.5	**241,575**	10,521.1	1,887.9	**179,443**	-25.7
TRSY	7,182.6	1,560.2	**217,217**	6,486.5	1,345.0	**207,358**	-4.5
DOC	4,522.6	1,092.9	**241,648**	5,960.2	1,221.3	**204,914**	-15.2
HHS	2,649.8	603.9	**227,888**	2,700.1	526.3	**194,930**	-14.5
HUD	1,432.0	315.2	**220,090**	1,432.0	299.4	**209,066**	-5.0
OTHER*	3,172.0	966.9	**304,811**	15,714.2	4,743.9	**301,888**	-1.0
CIVILIAN AGENCIES							
TOTAL	798,476.3	209,821.1	**262,777**	1,053,562.9	235,723.1	**223,739**	-14.9
DOD	2,224,527.3	475,614.7	**213,805**	2,013,906.6	388,282.8	**192,801**	-9.8
TOTAL	3,023,003.6	685,435.8	**226,740**	3,067,469.5	624,005.9	**203,427**	-10.3

DATA AS OF 09/26/02

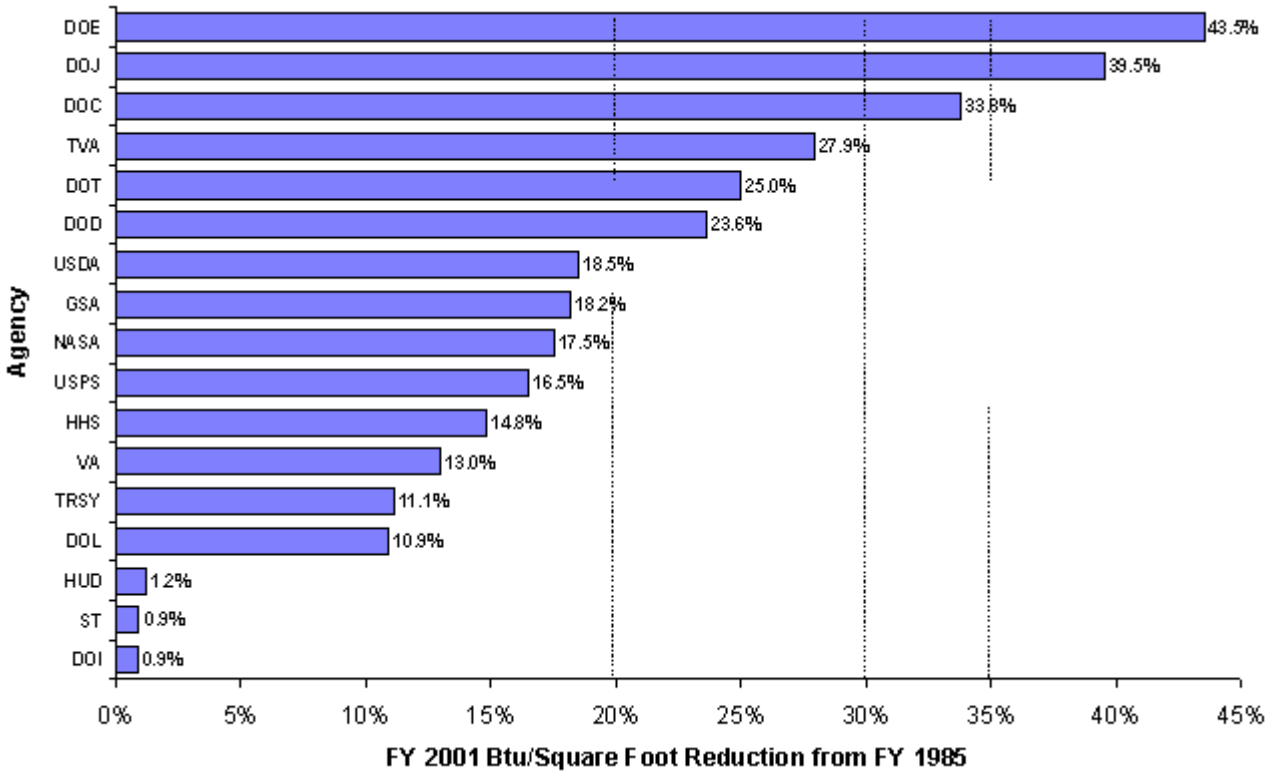
*Other includes the Federal Communications Commission, Federal Trade Commission, Federal Emergency Management Agency, National Archives and Records Administration, National Science Foundation, Nuclear Regulatory Commission, Office of Personnel Management, Panama Canal Commission, Railroad Retirement Board, Social Security Administration, the U.S. Information Agency, and the Federal Energy Regulatory Commission.

[1]DOE's high rate of energy intensity is the result of unmetered process energy reported under this building category.

Note: This table uses a conversion factor for electricity of 10,346 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

FIGURE 8
Progress of Individual Agencies Toward the Federal Reduction Goal for Standard Buildings
FY 2001 Compared to FY 1985



A number of agencies began submitting energy data to DOE starting in FY 1989 in compliance with NECPA as amended by the Federal Energy Management Improvement Act of 1988 (Pub. L. 100-615). Among these agencies are the Department of State, the Office of Personnel Management, and the Federal Energy Regulatory Commission. These three agencies submitted historical energy data back to FY 1985. For FY 1990 and forward, Federal Energy Regulatory Commission energy consumption is reported as part of DOE and is therefore grouped under the category of "Other" for the years prior to FY 1990. Other agencies grouped under the category of "Other" in the tables had no buildings data to report for FY 1985. These agencies include the Federal Trade Commission, the National Archives and Records Administration, the Nuclear Regulatory Commission, the Railroad Retirement Board, Social Security Administration, and the U.S. Information Agency. The National Science Foundation, Federal Communication Commission, Federal Emergency Management Agency, and Office of Personnel Management also are grouped under this category due to lack of reporting in more recent years.

In FY 2001, GSA continued to delegate building management authority to agencies that occupy buildings owned and operated by GSA. As a result, several agencies reported increased gross square footage and energy consumption relative to FY 1985, while GSA reported decreases in these categories during the same period. The GSA delegation accounts for the significant inter-year changes in energy consumption reported by various individual agencies.

III. INDUSTRIAL, LABORATORY, AND OTHER ENERGY INTENSIVE FACILITIES

A. Energy Consumption and Costs for Energy Intensive Facilities

NECPA, as amended, 42 U.S.C. § 8253, allows agencies to exclude from the buildings goal, facilities which house energy intensive activities. The energy consumed in these facilities is reported under the category of "industrial, laboratory, and other energy intensive facilities."

The designation of these facilities is at the discretion of each agency. Currently, 14 agencies are excluding specific facilities from the NECPA goal and reporting them as energy intensive facilities under Executive Order 13123: the Departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Justice, and the Treasury, EPA, Federal Communications Commission, GSA, NASA, the National Archives and Records Administration, the Social Security Administration, and the U.S. Information Agency (now known as the International Broadcasting Bureau). Lists of the energy intensive facilities that have been identified by the agencies are included in Appendix D.

Table 9 shows that energy consumed in industrial, laboratory, and other energy intensive facilities have decreased 9.9 percent compared to FY 1990 and 2.9 percent from FY 2000. During FY 2001, the DOD consumed 28.6 trillion Btu of this category's energy, 47.2 percent of all energy used by the Federal Government in energy intensive facilities.

Some of the fluctuations in energy consumption in energy intensive facilities resulted from agencies changing data collection and reporting procedures. The Social Security Administration began reporting its energy separately from the Department of Health and Human Services in FY 1996 and has elected to designate check processing facilities as energy intensive. The Department of Justice commenced reporting energy consumption in its energy intensive facilities during FY 1994, but has not backed out the consumption for these facilities from the standard buildings category for previous years. NASA began reporting energy under this category in FY 1989 and has revised its prior year data to reflect the removal of its energy intensive facilities from the standard building category. GSA began reporting energy in energy intensive facilities in FY 1990 and has backed out this energy consumption from its FY 1985 standard buildings data. The Departments of Agriculture and Commerce both began reporting energy intensive facilities separately from standard buildings in FY 1992. USDA revised all of its prior year buildings data back to FY 1985 to reflect the exclusion of the Agricultural Research Service. The Commerce Department revised its standard buildings data for FY 1985, FY 1990, and FY 1992 forward to reflect the removal of its energy intensive facilities. EPA has removed all of its facilities (laboratories) from the standard buildings category and classified them as energy intensive facilities from FY 1985 forward.

TABLE 9

FEDERAL SITE-DELIVERED ENERGY CONSUMPTION IN ENERGY-INTENSIVE FACILITIES

(In Billions of Btu, with Conversions to Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10^{15}])

CIVILIAN AGENCY	**FY 1990**	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	**FY 2000**	**FY 2001**	%CHANGE 90-01	%CHANGE 00-01
HHS	**6,845.9**	5,998.0	6,578.2	6,824.1	7,170.6	5,822.6	6,405.6	7,217.7	6,764.3	6,498.6	**7,138.8**	**7,597.8**	11.0	6.4
GSA[1]	**4,354.0**	746.2	677.6	994.6	1,060.2	1,213.8	961.0	890.7	849.2	1,150.8	**5,093.8**	**5,799.4**	33.2	13.9
DOE	**5,322.6**	4,984.2	5,512.6	5,305.2	5,046.0	5,111.2	5,439.5	5,298.0	5,338.7	4,988.0	**4,948.6**	**5,090.0**	-4.4	2.9
NASA	**4,142.9**	3,910.8	4,012.9	3,816.2	4,070.7	3,900.6	3,535.9	3,835.6	3,897.9	3,794.5	**3,585.5**	**3,413.9**	-17.6	-4.8
USDA	**2,416.2**	2,133.3	1,966.3	2,166.9	2,119.3	2,141.0	2,140.8	2,221.6	2,416.5	2,589.0	**2,368.5**	**2,826.7**	17.0	19.3
TRSY	**1,707.2**	1,026.8	814.1	923.7	771.8	941.0	928.3	1,131.8	996.5	964.2	**2,303.7**	**2,204.8**	29.1	-4.3
DOC	**976.6**	0.0	976.6	770.8	1,110.2	1,627.4	1,823.0	1,335.2	1,332.0	1,400.4	**1,315.8**	**1,454.6**	49.0	10.6
USIA/IBB	**1,406.9**	850.6	828.5	796.8	861.1	878.2	936.2	1,092.2	1,020.4	951.4	**951.4**	**951.4**	-32.4	0.0
EPA	**747.0**	822.4	839.7	894.1	943.3	1,020.9	1,023.5	1,012.1	1,022.7	1,170.2	**940.3**	**1,118.3**	49.7	18.9
DOJ	**0.0**	0.0	0.0	0.0	668.4	707.8	944.1	846.9	850.7	862.8	**862.2**	**845.1**	N/A	-2.0
NARA	**81.9**	82.2	88.8	274.7	610.7	792.2	562.9	572.7	591.8	582.1	**544.6**	**573.9**	601.2	5.4
SSA	**0.0**	0.0	0.0	0.0	0.0	0.0	215.5	204.7	211.4	199.1	**237.5**	**201.9**	N/A	-15.0
FCC	**0.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**6.3**	**6.3**	N/A	0.0
CIVILIAN AGENCIES TOTAL	**28,191.8**	20,751.4	22,489.2	22,964.6	24,633.5	24,365.9	25,135.0	25,880.1	25,292.0	25,151.3	**30,296.8**	**32,084.1**	13.8	5.9
DOD	**39,209.1**	56,372.1	67,913.1	41,159.3	39,781.4	37,962.6	37,260.1	35,702.3	36,588.4	32,919.0	**32,280.9**	**28,649.8**	-26.9	-11.2
ALL AGENCIES TOTAL	**67,400.9**	77,123.6	90,402.3	64,124.0	64,414.9	62,328.5	62,395.1	61,582.4	61,880.5	58,070.3	**62,577.7**	**60,733.9**	-9.9	-2.9
MBOE	**11.6**	13.2	15.5	11.0	11.1	10.7	10.7	10.6	10.6	10.0	**10.7**	**10.4**		
Petajoules	**71.1**	81.4	95.4	67.6	68.0	65.8	65.8	65.0	65.3	61.3	**66.0**	**63.9**		

DATA AS OF 09/26/02

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.

[1] GSA's large increase in energy reported under this category beginning in FY 2000 is a result of the agency reclassifying buildings from the standard buildings inventory for FY 1990 and FY 2000 forward without adjusting data for the intervening years.

Source: Federal Agency Annual Energy Management Data Reports

Energy used in energy intensive facilities accounts for approximately 6.1 percent of the total 1.0 quads used by the Federal Government. Electricity constitutes 42.0 percent of the energy used in energy intensive facilities, 35.6 percent is accounted for by natural gas, 6.6 percent by coal, and 11.8 percent by fuel oil. Small amounts of purchased steam, liquefied petroleum gas (LPG)/propane, and "other" energy account for the remaining 3.9 percent.

The energy used in energy intensive operations in FY 2001 accounted for approximately 6.4 percent of the total Federal energy bill. Table 10 shows that the Federal Government spent approximately $618.3 million for this category's energy during the fiscal year. The combined cost of energy intensive facility energy in FY 2001 was $10.18 per million Btu, up 15.8 percent from the combined cost of $8.79 reported in FY 2000 (see Appendix C).

TABLE 10
DEFENSE AND CIVILIAN FEDERAL COSTS FOR ENERGY INTENSIVE FACILITIES ENERGY IN FY 2001
(In Millions of Dollars)

	ELECTRICITY	FUEL OIL	NATURAL GAS	LPG/ PROPANE	COAL	PURCHASED STEAM	OTHER	TOTAL
DEFENSE	171.404	20.074	55.028	0.726	7.244	5.991	0.133	260.600
CIVILIAN	226.381	19.684	94.925	1.468	0.115	14.018	1.062	357.652
TOTAL	397.785	39.758	149.953	2.193	7.359	20.009	1.194	618.252

AVERAGE COST PER UNIT, BASED ON REPORTS FROM AGENCIES

ELECTRICITY	=	53.19	/ MWH
FUEL OIL	=	0.77	/ GALLON
NATURAL GAS	=	7.14	/ THOUSAND CUBIC FEET
LPG/PROPANE	=	0.89	/ GALLON
COAL	=	44.95	/ SHORT TON
PURCHASED STEAM	=	9.78	/ MILLION BTU
OTHER	=	13.45	/ MILLION BTU

DATA AS OF 09/26/02

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

Source: Annual energy cost data submitted to DOE by Federal agencies.

B. Statutory Background and Progress Toward Goals for Energy Intensive Facilities

Under section 543(a)(2) of NECPA, as amended by EPACT, 42 U.S.C. § 8253, buildings that house energy-intensive activities may be excluded from NECPA's performance goal for buildings. These buildings are listed in Appendix D. Most energy used in excluded buildings is process energy. Process energy is consumed in industrial operations, laboratories, certain R&D activities, and in electronic-intensive facilities.

Executive Order 12902 expanded the scope of Federal energy management activities beyond the NECPA mandates by establishing goals for industrial operations. It required industrial facilities to increase in energy efficiency by at least 20 percent by 2005 as compared to 1990. Section 203 of Executive Order 13123 further expands this goal by requiring each agency to reduce energy consumption per square foot, per unit of production, or per other unit as applicable by 20 percent by 2005 and 25 percent by 2010 relative to 1990. This goal covers laboratory and other energy-intensive facilities in addition to industrial facilities. Measures undertaken to achieve this goal must be life-cycle cost-effective, and agencies are also directed to implement all cost-effective water conservation projects.

During 1999, the Energy Intensive Facilities Working Group worked to produce a guidance document entitled *Guidelines: Executive Order 13123, Section 203 Performance Goals for Industrial, Laboratory, Research, and Other Energy-Intensive Facilities*. The document was reviewed and approved by the Interagency Energy Management Task Force and issued in January 2000. The guidelines fulfill two requirements under the Executive Order. These are that the Secretary of Energy shall:

- Issue guidelines to assist agencies in measuring energy per square foot, per unit of production, or other applicable unit in industrial, laboratory, research, and other energy-intensive facilities (Section 502(a)); and

- Develop guidance to assist agencies in calculating appropriate energy baselines for previously exempt facilities and facilities occupied after 1990 in order to measure progress toward goals (Section 502(c)).

The guidance presents three options for measuring performance. These are: a rate-based measure of annual energy consumed per number of production units; a rate-based measure of annual energy consumed per number of other applicable units (for example, number of experiments, labor hours, customers served); and Btu per gross square foot. The guidance provides advise on which measurement option is appropriate, depending on agency-specific factors. The guidance also advises agencies on the proper manner of calculating appropriate energy baselines for previously exempt buildings and facilities. The Executive Order contains strict criteria for exemption that will mean agencies having to re-examine previously exempt buildings and possibly reassign them to one of the goal categories.

More detail on each agency's approach to tracking and achieving progress toward the energy intensive facility goals are contained in the individual agency's narratives in Section VI.

DOD reports facilities that perform production or industrial functions under the energy intensive facilities category. Because the relationship between energy consumption and production varies widely between processes, DOD has decided to use energy usage per gross square foot as the performance measure for the industrial and laboratory facility category. Additionally, to simplify data collection, and the associated metering and reporting costs, DOD considers an entire base an industrial facility if 60 percent or more of the base-wide energy use is for industrial purposes. DOD established a FY 1990 baseline of 213,349 Btu/GSF for the energy intensive facilities

category. During FY 2001, DOD achieved a 20.3 percent reduction in Btu/GSF consumption relative to the FY 1990 base year.

In FY 2001, DOE reported that its laboratory and industrial facilities saw a reduction in Btu per gross square foot of 18.8 percent compared to FY 1990. These facilities comprised 17.7 million square feet in FY 2001 and consumed almost 5.1 trillion Btu.

Almost 87 percent of the HHS's square footage is energy intensive facilities including laboratories, hospitals, animal centers, health clinics, and other related support space. The performance measure used for the HHS energy intensive facilities is Btu/GSF. In FY 2001, the energy consumption of HHS energy intensive facilities declined 12.8 percent compared to FY 1990.

At USDA, Agricultural Research Service (ARS) and Animal Plant and Health Inspection Service (APHIS) facilities energy performance is measured based on Air-Quality-Adjusted Btu/GSF, which removes the impact of present day requirements for increased laboratory ventilation air for safety and health reasons. Since 1990, ARS and APHIS have undertaken an extensive conversion program of systematically modifying space-conditioning systems in its laboratory facilities to use far less re-circulating air, and more fresh air from outside the building, in order to protect researchers from the health and safety risks of hazardous chemicals and airborne pathogens. These requirements have become more stringent and require greater energy use than the standards that were in place in 1990, the base year of the goal. Removing the effect of the modernization-related increase results in an increase of 10.9 percent from the baseline consumption in FY 1990 based on Air-Quality Adjusted Btu/GSF. Without the adjustment, the increase would have been 12.9 percent.

The Justice Department's energy intensive facilities are comprised of large data centers, FBI labs, the FBI headquarters facility, and the training facility in Quantico, Virginia. These facilities operate 24 hours per day, 365 days per year and are not typical office buildings. DOJ has not developed a baseline for FY 1990 or designated a performance indicator for these facilities. On a Btu/GSF basis, Justice decreased the energy intensity of its energy intensive facilities by 3.8 percent from 188,180 Btu/GSF in FY 2000 to 180,979 Btu/GSF in FY 2001.

Treasury reports energy consumption for 8.6 million square feet of industrial space. Approximately 5.7 million square feet of space for the Internal Revenue Service (IRS) was managed directly by Treasury under the GSA Buildings Delegation Program. The reclassification of the IRS Service Centers to this category was completed in FY 2001. The remaining 3.2 million square feet of space belongs to the Bureau of Engraving and Printing, the U.S. Mint, and the U.S. Secret Service. As of FY 2001, Treasury's industrial facilities have achieved a 6.1 percent reduction in consumption over their FY 1990 baseline on a Btu/GSF basis. Treasury reports that the lack of a common unit of production continues to require the use of the Btu/GSF as their reporting unit and does not appropriately reflect the improvement some bureaus have made.

Since 1985, the EPA has measured and reported laboratory energy and water consumption using its standard facility 1985 baseline and reduction requirements. Beginning in FY 2000, EPA

stopped reporting its laboratory energy consumption under the standard facility designation and is now using the more appropriate energy intensive facility designation. EPA reduced energy consumption in its laboratories from 399,992 Btu per gross square foot per year in 1985 to 354,437 Btu per gross square foot per year in 2001—a reduction of 11.4 percent. The 12 facilities that existed in 1990 reduced energy consumption from 357,414 Btu per gross square foot per year in 1990 to 348,235 Btu per gross square foot per year in 2001—a reduction of 2.6 percent. Energy use at all 19 EPA laboratory complexes decreased by almost 1 percent from 357,414 Btu per gross square foot per year in 1990 to 354,437 Btu per gross square foot per year in 2001. EPA's energy intensity for FY 2001 was adjusted to reflect purchases of 12.5 billion Btu of renewable electricity.

GSA's energy usage in its energy intensive facilities during FY 2001 was 297,098 Btu/GSF compared to 432,313 Btu/GSF in FY 1990. This represents a decrease of 31.3 percent compared with the 1990 base year. In 2001, GSA invested $82,700 of energy program appropriations in its industrial and laboratory facilities.

NASA has elected to use Btu/GSF as the agency-wide aggregate performance measure for energy intensive facilities. Other performance measures are utilized for individual industrial facilities, space flight tracking stations, and clean rooms. The average energy intensity for NASA's energy intensive buildings was 244,642 Btu/GSF by the end of FY 2001, as compared to the FY 1990 baseline value of 323,972 Btu/GSF. This represents a decrease of 24.5 percent.

The Department of Commerce's energy intensive facilities are operated by three of its agencies: the NIST, the National Oceanic and Atmospheric Administration (NOAA), and the Bureau of the Census. NIST installations are comprised of general purpose and special laboratories that require constant environmental space control and base electrical loads for scientific equipment and computer systems. NOAA Weather Service facilities operate 24 hours a day and consist of radar towers, computers, special gauges, meters and other sophisticated equipment. Marine Fisheries and Laboratories conduct marine biology research and utilize refrigerators, freezers, incubators, coolers, seawater pumps, and compressors that operate 24 hours a day. The Bureau of Census Charlotte Computer Center is a leased facility and is used solely as a computer center. The building is operated 24 hours a day. During FY 2001, Commerce energy intensive facilities decreased energy intensity 22.1 percent from FY 1990, from 315,975 Btu/GSF to 246,253 Btu/GSF.

The International Broadcasting Bureau designates domestic and overseas Voice of America Relay Stations as energy-intensive facilities.

NARA designates all 12 of its facilities as energy intensive because of stringent records storage requirements which demand that documents and records be maintained in a controlled environment 24 hours per day, 365 days per year.

The Social Security Administration, which began reporting energy consumption this year as an independent agency, has designated its National Computer Center as an energy intensive facility. The Center contains SSA's main database and operates 24 hours per day and 365 days per year.

IV. EXEMPT FACILITIES

A. Energy Consumption and Costs for Exempt Facilities

Sec. 704 of Executive Order 13123 defines "Exempt facility" as "a facility. . .for which an agency uses DOE-established criteria to determine that compliance with the Energy Policy Act of 1992 or [the Order] is not practical." Section 502(b) of Executive Order 13123 requires the Secretary of Energy, in collaboration with other agency heads, to "establish criteria for determining which facilities are exempt from the Order. In addition, DOE must provide guidance for agencies to report proposed exemptions." This guidance was issued in December 1999. The following facilities may be exempted from Section 201, Greenhouse Gas Reduction Goal, Section 202, Energy Efficiency Improvement Goals for standard buildings and facilities, and the goals of Section 203, Industrial and Laboratory Facilities of Executive Order 13123:

- Structures such as outside parking garages which consume essentially only lighting energy, yet are classed as buildings.

- Buildings where energy usage is skewed significantly due to reasons such as: 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.

- 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 and facilities in which it is technically infeasible to implement energy efficiency measures or where conventional performance measures are rendered meaningless by an overwhelming proportion of process-dedicated energy. For these exemptions, a finding of impracticability must be approved by DOE as outlined in Section 543(c) of the National Energy Conservation Policy Act, as amended by the Energy Policy Act of 1992. For buildings where exemptions are granted, agencies should undertake energy audits and are strongly encouraged to implement all life-cycle cost-effective measures per the recommendation of the audit.

Eight agencies, the Departments of Defense, Energy, Health and Human Services, State, and Transportation, NASA, GSA, and the Tennessee Valley Authority have chosen to exempt facilities from Executive Order requirements. These facilities are listed in Appendix E. In addition, the U.S. Postal Service has reported electricity consumption used in mail processing automation under the exempt category without reporting associated facility square footage. Table 11 presents an accounting of energy use and costs in exempt facilities for FY 2001 and shows what percentage of each agency's facility energy use, costs, and space is considered exempt.

TABLE 11
ENERGY CONSUMPTION, COSTS, AND GROSS SQUARE FOOTAGE OF FEDERAL EXEMPT FACILITIES, FY 2001

	Energy Consumption		Energy Costs		Facility Gross Square Feet	
Agency	(BBtu)	% of Agency's Total Facility Use	($ Million)	% of Agency's Total Facility Costs	(Thou. Sq. Ft.)	% of Agency's Total Facility Space
DOD	9,870.0	3.9%	$175.026	6.3%	0.0	N/A
DOE	5,904.7	20.1%	$78.379	27.2%	12,632.3	12.7%
DOT	5,157.1	56.9%	$73.830	54.3%	16,274.9	30.8%
USPS	2,231.0	8.2%	$50.989	10.7%	0.0	N/A
NASA	1.647.2	17.4%	$20.437	16.5%	4,991.1	12.5%
TVA	1,480.9	70.3%	$19.531	70.3%	22,440.5	68.1%
GSA	478.7	2.6%	$9.953	3.3%	11,438.0	5.5%
ST	390.4	12.8%	$7.021	13.7%	3,360.9	7.2%
HHS	8.3	0.1%	$0.143	0.2%	882.8	3.3%
Total	27,168.2		$435.311		72,020.5	

DATA AS OF 09/26/02

TABLE 12
CONSUMPTION AND COSTS OF FEDERAL EXEMPT FACILITY ENERGY BY FUEL TYPE IN FY 2001

ENERGY TYPE	BILLIONS OF BTU	COST PER MMBTU	COST (IN MILLIONS OF DOLLARS)
ELECTRICITY	20,040.7	19.0372	381.519
FUEL OIL	3,052.4	5.6428	17.224
NATURAL GAS	2,648.7	6.9029	18.284
LPG/PROPANE	25.8	10.4565	0.270
COAL	27.9	6.1715	0.172
PURCHASED STEAM	753.2	14.2222	10.712
OTHER	619.5	11.5085	7.130
TOTAL	27,168.2		435.311

AVERAGE COST PER MBTU = $16.023

DATA AS OF 09/26/02

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 12 illustrates total exempt energy consumption and costs by fuel type for FY 2001. Energy used in exempt facilities accounts for approximately 2.7 percent of the total 1.0 quads used by the Federal Government. Electricity constitutes 73.8 percent of the energy used in exempt facilities, 9.7 percent is accounted for by natural gas, and 11.2 percent by fuel oil. Small amounts of purchased steam, liquefied petroleum gas (LPG)/propane, and "other" energy account for the remaining 5.3 percent.

The energy used in exempt facilities in FY 2001 accounted for approximately 4.5 percent of the total Federal energy bill. The Federal Government spent approximately $435.5 million for this category's energy during the fiscal year. The combined cost of exempt facility energy in FY 2001 was $16.02 per million Btu.

Under DOD, the Navy is the only Military Service to list facilities classified as exempt. The Navy exempts mission-critical, concentrated energy use transmitters, simulators, cold iron support to ships, and some privately-owned facilities. These are non-production-oriented facilities with little or no square footage, making conventional performance measures meaningless. (DOD did not report any square footage for this category.) The mission criticality of these end users is such that energy efficiency measures are evaluated on a case-by-case basis.

Most of the facilities exempted by the DOE have been scaled back operationally to prepare for decontamination and decommissioning. These facilities have traditionally housed energy intensive operations that will in many cases dominate the energy consumption being reported at the site and the site consumption will vary in direct relationship to the processes undertaken at these facilities. Traditional energy conservation measures will not significantly effect the energy consumption that will be reported for these facilities, and it would be impossible to meet the goals with these facilities included in other than the exempt category.

Within the DOT, the Federal Aviation Administration excludes all buildings involved in implementing the National Airspace System Plan. A sampling survey was conducted of typical facilities that indicated an overwhelming proportion of process dedicated energy for National Airspace System electronic and plant support systems. These buildings house energy-intensive electronic equipment with the associated HVAC requirements to maintain an environment for reliable equipment operation. The Federal Highway Administration exempts a research facility that is a mixture of indoor and outdoor laboratories for testing of various highway systems with heavy process energy use. The St. Lawrence Seaway Development Corporation exempts energy used to maintain two river locks. The Maritime Administration exempts cold iron energy for the National Reserve Fleet.

The Tennessee Valley Authority exempts its power plants and associated station service energy use.

GSA exempts those buildings and facilities where energy usage is skewed significantly due to reasons such as: buildings entering or leaving the inventory during the year; buildings down-scaled operationally to prepare for disposal; buildings undergoing major renovation and/or major asbestos removal; or buildings functions like that of outside parking garages which consume essentially only lighting energy, yet are classed as buildings.

The State Department includes in this category the Harry S. Truman Headquarters Building and Building C of the Charleston Regional Center (which is being razed for reconstruction).

NASA exempts 5.0 million square feet of its mission-variable (MV) facilities or 12.5 percent of its total facility space. These facilities are highly specialized and energy intensive, having been constructed for specific space flight and research programs. Examples are wind tunnels driven

by multi-thousand horsepower electric motors, space simulation chambers, and space communication facilities. Energy consumption in these facilities varies directly with the level and intensity of program activities. NASA provided justifications for each MV facility exemption to explain why it is either technically infeasible to implement energy efficiency measures or to apply conventional performance measures due to the overwhelming proportion of process-dedicated energy consumed in these facilities.

The only exempted facilities at HHS are outdoor multilevel parking garages on the National Institutes of Health Bethesda Campus that consume lighting energy only. These facilities are not metered separately. Therefore, the energy consumption of these structures has been estimated based on the number of lighting fixtures and the time of use.

The Postal Service energy consumption reported under this category reflects process energy consumed by mail processing equipment. This consumption has been factored out of energy consumption of Postal Service standard buildings in order to provide a better measure of their energy efficiency status.

V. ENERGY MANAGEMENT IN VEHICLES AND EQUIPMENT

A. Energy Consumption and Costs for Vehicles and Equipment

Vehicle and equipment energy consists of energy used by equipment ranging in size and function from aircraft carriers to forklifts. It includes aircraft and naval fuels, automotive fuels consumed by Federally-owned and leased vehicles and privately-owned vehicles used for official business, and the energy used in Federal construction.

Table 13 shows that in FY 2001, the Federal Government used approximately 586.8 trillion Btu of energy for vehicles and equipment, a decrease of 37.2 percent relative to FY 1985. DOD's vehicle and equipment energy consumption decreased 39.7 percent from FY 1985, while the civilian agencies increased consumption by 14.0 percent. Overall, vehicle and equipment consumption increased 1.3 percent from FY 2000.

Jet fuel consumption accounted for 70.6 percent of all vehicle and equipment energy in FY 2001. In FY 2001 compared to the previous year, jet fuel consumption increased 2.7 percent from 403.1 trillion Btu to 414.1 trillion Btu.

Agencies have taken many tangible steps to keep the use of vehicle fuels to a minimum. For example, USPS continues to modernize its fleet, adding diesel delivery vans and long-life vehicles to its inventory, both of which are more fuel efficient than the older vehicles they replaced. DOD continues to increase the use of flight simulators, as well as the use of new propulsion technologies and strategies in order to lessen the growth of vehicle and equipment fuel consumption.

Figure 9 depicts the vehicles and equipment fuel mix within DOD and civilian agencies. Jet fuel accounted for 414.1 trillion Btu or 70.6 percent of the total energy usage in the category, with 20.2 percent attributed to diesel and distillate fuel, 7.2 percent to auto gasoline, and 2.0 percent to aviation gasoline, navy special, LPG/propane and other fuels, combined.

As shown in Tables 14-A and 14-B, the Federal Government spent $4,646.8 million on vehicles and equipment energy in FY 2001, 41.7 percent more than the FY 2000 expenditure of $3,280.1 million constant dollars. In FY 2001, the combined price for all types of vehicles and equipment energy was $7.92 per million Btu, up 39.8 percent from FY 2000. The average real cost of gasoline to the Federal Government increased from $1.08 per gallon in FY 2000 to $1.30 in FY 2001. The unit cost for diesel/distillate fuel rose 57.2 percent while the unit cost for jet fuel rose 39.4 percent.

When compared to FY 1985 using constant 2001 dollars, energy costs for vehicles and equipment decreased 48.3 percent from $8,996.3 million to $4,646.8 million in FY 2001. During that same period, the Government's combined cost per million Btu for vehicles and equipment energy fell 17.8 percent from $9.63 to $7.92 in constant dollars.

Vehicle and equipment fuel costs in FY 2001 represent 48.2 percent of the Government's total energy costs of $9.6 billion.

TABLE 13

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^{15}])

CIVILIAN AGENCY	**FY 1985**	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	**FY 2000**	**FY 2001**	%Change 85-01	%Change 00-01
USPS	**11,524.2**	12,136.2	12,196.2	12,225.0	12,565.3	13,348.6	14,571.2	14,217.1	16,779.2	14,777.2	14,583.7	**15,976.3**	**16,192.1**	40.5	1.4
DOJ	**2,064.0**	2,097.9	2,124.0	3,675.1	2,835.9	3,451.3	3,181.6	3,693.0	3,149.3	7,171.4	6,456.3	**9,456.3**	**9,037.9**	337.9	-4.4
DOT	**11,957.0**	12,150.8	12,350.7	8,702.6	10,769.7	12,917.0	12,193.7	12,222.9	12,347.9	10,145.0	10,870.5	**11,122.9**	**8,739.3**	-26.9	-21.4
DOI	**3,053.9**	3,352.5	3,208.6	3,819.1	3,507.8	3,970.0	2,782.2	1,347.5	2,943.7	2,679.9	3,661.4	**3,839.3**	**4,812.3**	57.6	25.3
TRSY	**2,155.0**	1,473.2	1,655.7	2,065.2	2,420.9	2,161.8	1,773.4	1,350.9	1,561.4	2,078.6	2,120.2	**2,503.3**	**2,577.8**	19.6	3.0
USDA	**4,319.6**	4,952.3	5,123.8	4,982.7	4,931.2	5,129.1	4,821.7	4,654.8	3,153.0	3,389.4	3,337.9	**3,025.7**	**2,476.2**	-42.7	-18.2
DOE	**2,882.0**	2,520.4	2,559.7	2,078.1	2,241.3	2,085.9	1,841.9	1,561.0	1,971.0	1,955.6	1,444.6	**1,803.4**	**1,714.4**	-40.5	-4.9
VA	**592.8**	518.3	317.4	634.9	663.9	374.4	353.6	660.7	1,199.1	1,380.3	1,337.6	**923.4**	**913.6**	54.1	-1.1
TVA	**578.5**	476.6	534.7	408.8	452.4	480.3	541.7	583.8	479.5	429.1	423.3	**850.1**	**822.3**	42.1	-3.3
HHS	**373.3**	0.0	0.0	0.0	177.3	176.3	105.5	18.6	435.0	447.7	447.7	**593.2**	**715.2**	91.6	20.6
DOC	**1,010.2**	3,100.3	1,315.2	952.5	995.7	995.2	760.6	570.1	929.1	708.4	834.5	**154.3**	**595.8**	-41.0	286.2
NASA	**1,972.7**	1,736.7	1,864.0	1,875.4	1,798.0	1,734.3	1,750.9	1,539.3	1,622.1	1,428.3	1,412.8	**1,490.1**	**379.1**	-80.8	-74.6
DOL	**232.2**	239.0	401.9	388.7	369.1	369.6	356.9	337.7	336.2	350.2	350.2	**368.9**	**358.9**	54.6	-2.7
GSA	**144.1**	128.1	122.6	102.9	79.6	69.9	91.3	98.8	119.9	122.2	125.2	**127.0**	**112.7**	-21.8	-11.3
EPA	**132.3**	0.0	0.0	0.0	100.7	98.0	99.6	76.5	137.2	97.7	120.6	**97.9**	**110.0**	-16.8	12.4
ST	**14.8**	34.9	0.0	0.0	7.5	0.0	0.0	0.0	44.7	40.9	40.9	**486.4**	**37.1**	151.0	-92.4
HUD	**0.0**	0.0	32.7	33.6	31.6	30.7	25.4	25.4	28.3	23.3	23.3	**37.8**	**33.4**	N/A	-11.6
OTHER*	**582.1**	732.4	613.5	820.6	798.8	800.3	992.9	951.4	914.0	154.2	150.6	**45.3**	**48.8**	-91.6	7.6
Civilian Agencies Total	**43,588.5**	45,649.7	44,420.7	42,765.2	44,746.7	48,193.0	46,244.1	43,909.5	48,150.6	47,379.4	47,741.4	**52,901.5**	**49,677.1**	14.0	-6.1
DOD	**890,679.9**	881,345.1	926,033.6	740,357.2	727,887.1	674,597.5	640,893.4	631,202.0	617,235.4	579,959.8	559,785.8	**526,234.1**	**537,168.4**	-39.7	2.1
TOTAL	**934,268.4**	926,994.8	970,454.3	783,122.4	772,633.8	722,790.5	687,137.4	675,111.5	665,386.0	627,339.2	607,527.2	**579,135.6**	**586,845.6**	-37.2	1.3
MBOE	**160.4**	159.1	166.6	134.4	132.6	124.1	118.0	115.9	114.2	107.7	104.3	**99.4**	**100.7**		
Petajoules	**985.6**	977.9	1,023.8	826.2	815.1	762.5	724.9	712.2	702.0	661.8	640.9	**611.0**	**619.1**		

DATA AS OF 09/26/02

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

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

Source: Federal Agency Annual Energy Management Data Reports

FIGURE 9
Defense and Civilian Consumption in
Vehicles and Equipment by Fuel Type, FY 2001

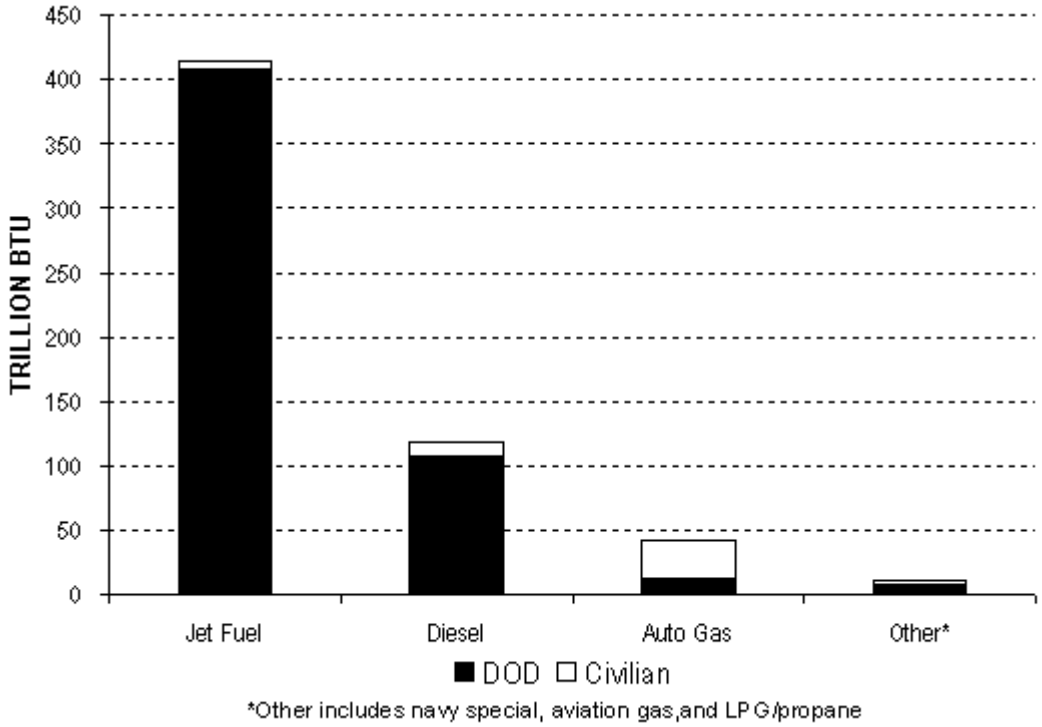


TABLE 14-A
DEFENSE AND CIVILIAN FEDERAL COSTS FOR VEHICLE AND EQUIPMENT ENERGY IN FY 2001 (In Millions of Dollars)

	AUTO GAS	DIST. DIESEL	LPG/ PROPANE	AVIATION GAS	JET FUEL	NAVY SPECIAL	OTHER	TOTAL
DEFENSE	117.252	756.856	0.229	0.224	3,218.850	30.576	1.732	4,125.719
CIVILIAN	324.341	104.928	0.306	3.325	77.038	0.000	11.148	521.085
TOTAL	441.593	861.784	0.535	3.549	3,295.887	30.576	12.880	4,646.804

AVERAGE COST PER UNIT, BASED ON REPORTS FROM AGENCIES

GASOLINE	=	1.30	/ GALLON
DIST/DIESEL	=	1.01	/ GALLON
LPG/PROPANE	=	0.94	/ GALLON
AVIATION GAS	=	1.80	/ GALLON
JET FUEL	=	1.03	/ GALLON
NAVY SPECIAL	=	0.65	/ GALLON
OTHER	=	11.40	/ MILLION BTU

DATA AS OF 09/26/02

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

Source: Federal Agency Annual Energy Management Data Reports

TABLE 14-B
CONSUMPTION AND COSTS OF VEHICLE AND EQUIPMENT ENERGY BY FUEL TYPE IN FY 2001, FY 2000, AND FY 1985
(Constant 2001 Dollars)

ENERGY TYPE	BILLIONS OF BTU	COST PER MMBTU	COST (IN MILLIONS OF DOLLARS)
FY 2001			
AUTO GASOLINE	42,517.2	10.3862	441.593
DIST/DIESEL	118,575.8	7.2678	861.784
LPG/PROPANE	54.4	9.8412	0.535
AVIATION GASOLINE	246.0	14.4279	3.549
JET FUEL	414,128.9	7.9586	3,295.887
NAVY SPECIAL	6,518.9	4.6904	30.576
OTHER	4,804.4	2.6809	12.880
TOTAL	586,845.6		4,646.804
AVERAGE COST PER MMBTU = $ 7.918			
FY 2000			
AUTO GASOLINE	43,946.6	8.6410	379.744
DIST/DIESEL	123,645.8	4.6247	571.825
LPG/PROPANE	39.5	12.2057	0.482
AVIATION GASOLINE	192.0	17.0455	3.273
JET FUEL	403,051.3	5.7108	2,301.755
NAVY SPECIAL	6,426.8	2.7989	17.988
OTHER	1,833.6	2.7592	5.059
TOTAL	579,135.6		3,280.127
AVERAGE COST PER MMBTU = $5.664			
FY 1985			
AUTO GASOLINE	50,420.1	11.2125	565.335
DIST/DIESEL	169,215.0	8.9514	1,514.720
LPG/PROPANE	149.2	10.4017	1.552
AVIATION GASOLINE	1,882.3	16.5693	31.188
JET FUEL	705,675.5	9.6731	6,826.052
NAVY SPECIAL	6,687.7	8.3015	55.518
OTHER	238.6	8.0029	1.909
TOTAL	934,268.4		8,996.276
AVERAGE COST PER MMBTU = $9.629			

DATA AS OF 10/26/02

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

Source: Federal Agency Annual Energy Management Data Reports

VI. FEDERAL AGENCY ENERGY MANAGEMENT ACTIVITIES

A. DEPARTMENT OF AGRICULTURE (USDA)

Management and Administration

In the U.S. Department of Agriculture (USDA), the Assistant Secretary for Administration has the authority to implement Federal energy management policy related to the internal operations of USDA, and to exercise full USDA-wide contracting and procurement authority. As the Senior Energy Official, the Assistant Secretary for Administration is principally responsible for planning and implementing energy conservation programs within USDA, and responsible for coordination with DOE with respect to energy matters.

USDA has an Energy Support Technical Team, comprised of USDA energy policy officials and land-holding agency energy coordinators, engineers, facilities managers, and procurement personnel. The three USDA agencies represented on the team - the Agricultural Research Service (ARS), Forest Service (FS), and the Office of Operations (OO) - are responsible for 89 percent of USDA's direct facilities energy consumption. Each of the USDA agencies has also been directed to form an internal energy team.

Management Tools

Awards

USDA participates in DOE's Federal Energy and Water Management Awards program. FS and ARS include recognition for energy and water management accomplishments within their existing internal agency award programs. In the FS in FY 2001, implementation of energy saving ideas was rewarded with time off and cash awards.

During FY 2001, one USDA employee was recognized as an energy champion under DOE's "You Have the Power" energy awareness campaign. Deputy Area Director John Van de Vaarst of the Beltsville Agricultural Research Center (BARC) who, by increasing the efficiency of boiler plant operation, scheduling smart energy purchases, alternating between natural gas and fuel oil, and negotiating a favorable long-term contract for natural gas, was recognized for helping USDA save as much as $1 million annually in fuel costs.

USDA's Office of Procurement and Property Management (OPPM) also recognized a National Finance Center systems analyst for developing an online energy cost reporting system.

Performance Evaluations

An energy management element has been incorporated into position descriptions and performance evaluation standards of USDA employees responsible for the successful implementation of the agency's energy management and conservation program.

At BARC, each critical position employee is evaluated based on the energy conservation measures achieved within the employee's unit.

Training

OPPM established a USDA Energy and Environment website that provides information on Executive Order 13123, DOE and the Federal Energy Managment Program, ENERGY STAR® products, energy efficient lighting, Whole Building Design, and other useful tools for efficient energy management. OPPM's Energy and Environment staff distributed "You Have the Power" materials to more than 20 contacts or locations three times during FY 2001.

Energy and Environment staff members attended Energy 2001, and other employees also participated in various workshops and training. FS engineering personnel nationwide also participate in energy conservation seminars and training.

In FY 2001, ARS continued to provide relevant energy management training and materials to its employees. ARS employees are encouraged to attend energy management training opportunities through FEMP, private or public educational institutions, Federal agencies, or professional associations.

Showcase Facilities

OO completed Phase II of the South Building Modernization Plan at the USDA Headquarters building in Washington, DC, which will result in a Federal Energy Saver Showcase facility of approximately 2 million feet when all eight phases are completed.

In FY 2001, ARS designated a facility in Maricopa, Arizona, as an energy showcase. The Animal and Plant Health Inspection Service (APHIS) designated the National Plant Germplasm and Quarantine Center in Beltsville, Maryland, as a Showcase facility. The APHIS Animal Research Building National Wildlife Research Center, Ft. Collins, Colorado, was also designated a 2001 Showcase building.

Energy Efficiency Performance

Standard Buildings
In FY 2001, USDA reported a 18.5 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot. USDA received credit for purchases of 4.0 billion Btu of renewable electricity. This lowered the energy intensity of its standard buildings from 66,265 Btu/GSF to 66,136 Btu/GSF. USDA attributes some of the increase in energy intensity from the previous year to a more complete accounting of energy costs in FY 2001 versus FY 2000, due to the implementation of a new energy cost reporting system by its National Finance Center.

Industrial and Laboratory Facilities
For purposes of Executive Order 13123 reporting, the entire ARS building inventory and all APHIS facilities are treated as energy intensive.

An ongoing issue in making progress toward this goal is the requirement to modernize USDA facilities to meet current health standards for increased laboratory ventilation air for safety and health requirements. USDA is continuing to review and refine a reasonable formula metric to use to accommodate for this difference in requirements in the accounting of energy consumption. For FY 2001, USDA is reporting a 10.9 percent increase in air-quality-adjusted Btu per square foot, compared to the FY 1990 base year.

Greenhouse Gas Reduction Goal
USDA reported carbon emissions of 131,542 metric tons of carbon equivalent (MTCE), a decrease of 6.5 percent from data reported for the FY 1990 baseline year. USDA was credited 191.6 MTCE for purchases of renewable electricity made during the year.

Renewable Energy

Self-Generated Renewable Energy
Where possible and cost effective, the FS installs photovoltaic-powered equipment at remote sites, incorporates passive solar technology into new facility design and construction, and identifies energy use from renewable energy self-generation and renewable energy thermal projects. Recent examples include:

- Coronado National Forest: Photovoltaic units provide electricity for the fans, lights, and effluent pumps at composting toilets in recreation areas.

- Gila National Forest: Photovoltaic units provide 11 kilowatts of energy. Most units provide power for communications in remote locations such as fire lookout towers, while others are used in recreation areas to power fans and heaters in composting toilets.

At the APHIS Animal Research Building, National Wildlife Research Center, 27 percent of electricity was wind-generated during FY 2001.

Purchased Renewable Energy
During FY 2001, the Southern Plains Area of ARS reported a renewable electricity purchase of 1,180 megawatthours. The ARS location at Kimberly, Idaho, reported hydroelectric power usage of 650 megawatthours. Iowa State University (ISU) provides electricity, steam, and chilled water for the National Soil Tilth Laboratory (NSTL) in Ames, Iowa. ISU generates much of its own power using a combination of renewable resources and coal in energy production.

Beltsville Agricultural Research Center (BARC), in an innovative experiment, purchased biodiesel and used a biodiesel blend to heat 12 buildings during the 2000-2001 winter season. BARC also purchased biodiesel for use by its vehicular fleet and mail and passenger vans operated by the Headquarters Office of Operations. In FY 2001, BARC purchased approximately 100,000 gallons of biodiesel for a total cost of about $123,000.

Petroleum
Since 1985, USDA has substantially reduced its use of petroleum-based fuels in its facilities. In FY 2001, USDA used 279,600 gallons of fuel oil, compared to 886,500 gallons in FY 1985.

Water Conservation
In FY 2001, USDA used an estimated 951.1 million gallons of water in its standard buildings and energy intensive buildings combined.

ARS water consumption was 345.8 million gallons, at a cost of $1.4 million.

Implementation Strategies

Life-Cycle Cost Analysis
ARS uses life-cycle cost (LCC) analysis to evaluate energy conservation opportunities. ARS policies require economic analysis to determine the best method of implementing facility modernization.

In FY 2001, OO focused its resources on modernization of Wing 3 of the Headquarters South Building and the design of an energy and water efficient Wing 4. Capital budgeting decisions concerning energy efficiency features were made using LCC analysis.

Facility Energy Audits
In FY 2001, an energy audit was conducted at the Manhattan, Kansas, ARS facilities. The findings will determine if the site can benefit from an energy savings performance contract or utility energy service contract project.

An energy audit was also conducted at BARC in FY 2001, in anticipation of an ESPC expected in FY 2002. FS also reported conducting energy audits at various sites during FY 2001.

Financing Mechanisms
APHIS has a utility energy service contract (UESC) for the Hawaii Sterile Fruit Fly facility in Waimanalo, Hawaii, for implementation of energy efficiency projects. The UESC was established through a GSA Basic Ordering Agreement with the Hawaii Electric Company. The project includes facility renovation, including air handlers, wastewater system, and roof replacement. A $1.1 million contract was awarded for projects related to energy and water conservation, automation, repairs, and renovations. Preliminary costs for the 10-year project are $20 million, with estimated annual savings of about $2 million.

The FS Corvallis Laboratory has been retrofitted under a Super ESPC delivery order, and energy reduction measures continue to be implemented in the Lab. In FY 2001, modifications reduced steam use by 40 percent as compared to FY 2000.

ENERGY STAR® and Other Energy-Efficient Products
USDA agencies acquire computers and other products that meet the ENERGY STAR® requirements. Purchases of equipment through operations and maintenance contracts are monitored to ensure that they meet ENERGY STAR® requirements.

ARS procurement staff have been trained in procurement of energy efficient products, obtaining product information of energy efficient products, using energy efficiency as a selection criteria, and encouraging purchase of energy efficient products. Information on procuring energy efficient products has been widely distributed to staff and posted online.

The OO and FS also reported activities in support of energy efficient purchasing and developing product specifications in FY 2001.

Sustainable Building Design
Considerations of sustainable design principles are given to the siting, design, and construction of new ARS facilities. These principles have also been incorporated into USDA's facility design standards.

The new FS building in Missoula included construction of a groundwater source heat pump HVAC system and clerestory windows, eliminating the need for artificial lighting for most offices on sunny days because of the abundant natural light. All lighting fixtures are efficient fluorescent with electronic ballasts. Lighting costs are expected to be reduced by between 25 and 50 percent as a result of these features.

The FS is incorporating sustainable design and energy conservation principles into national standard designs and specifications for air tanker bases and fire facilities.

Energy Efficiency in Lease Provisions
USDA agencies have leasing authority and are continuing the process of addressing energy efficiency clauses in lease provisions as appropriate.

Energy and water efficiency considerations are used as evaluation factors when soliciting for new lease space for ARS and FS. In the Pacific Southwest region, energy conservation criteria have been incorporated into all facility designs and lease specifications.

Industrial Facility Efficiency Improvements
ARS spent more than $2.0 million for energy conservation and efficiency improvement projects during FY 2001. Examples of measures taken include replacing luminaries, retrofitting boiler and control systems, updating HVAC systems, installing programmable thermostats, replacing deficient steam traps, installing digital temperature control systems, installing occupancy sensors, and replacing windows and exterior caulking.

In FY 2001, the Pacific Northwest Station completed a lab lighting retrofit for the La Grande Lab. All fluorescent lighting has been converted to new T2 fixtures and energy reductions of approximately 30 percent are anticipated. A new heating control system and boilers will also be installed. Laboratory heating costs will be significantly reduced, and overall energy usage is expected to decrease about 40 percent.

Highly Efficient Systems
A highly efficient cogeneration system, completed under an ESPC at the National Animal Disease Center (NADC), is fired by natural gas and generates 1.1 megawatts of electrical capacity and 8,000 pounds per hour of steam. The electricity is used for base loads and the steam for water heating, building heating, and wastewater heat sterilization. A diesel-driven electrical

generator provides full interruptibility for the Center and electrical capacity to operate a standby electrical chiller, without creating a peak demand load, while service is completed on the base-load natural gas engine-driven chiller.

The Rio Grande National Forest installed three new boilers in dwellings in Colorado. The new units are rated at 135,000 Btu input and 114,000 Btu output for an 84 percent efficiency.

Other USDA sites also reported installing or improving various energy systems during the year.

Off-Grid Generation
ARS continues to consider off-grid electricity opportunities that provide energy and environmental benefits. The cogeneration and standby generation systems completed at the NADC in FY 2001 allow electrical power generation as needed.

Off-grid generation is provided to NSTL by ISU. Small solar cell systems are used on several field instrumentation operations. Solar electric systems are also located at both the Coronado and Tonto National Forests.

Electrical Load Reduction Measures
In FY 2001, USDA agencies nationwide implemented electrical load reduction measures in response to the President's directive and the California energy crisis.

ARS implemented the following electrical load reduction measures in FY 2001:

- A facility at the Biosciences Research Laboratory in Fargo, North Dakota, has a standby/emergency generator that can support the entire laboratory complex. During high electrical usage, and in cooperation with the local utility, the generator is operated for peak shaving.

- In power emergencies, the National Agricultural Library (NAL) will reduce some of the power requirement by using a 500 KVA emergency generator to power certain items such as the elevators and water cooler. NAL plans to add other items to the emergency generator system to reduce the power requirement during power emergencies.

- An El Reno, Oklahoma, facility modifies run time on current energy management systems, and will install digital timekeepers on outlying HVAC equipment to reduce electrical load.

Examples of load reduction activity in the FS include:

- The Pacific Northwest region worked closely with the Bonneville Power Administration (BPA) in FY 2001 to accomplish 14 projects, paid mostly by BPA through their load reduction program. BPA paid an estimated $400,000 for the projects. As a result, FS expects annual power bill reductions of between $85,000 and $90,000.

- The Pacific Southwest Station reduced its thermostats and turned off computers and unnecessary lights, reducing overall energy use by more than 20 percent.

In addition, APHIS installed an energy monitoring and control system at the National Germplasm Quarantine Center in Beltsville, Maryland. This will allow the center to monitor energy consumption and peak electrical demand, and shed loads and operate systems during off-peak times. The center will be able to coordinate peak load reduction efforts with the local utility on high demand days. The system is expected to be on line in FY 2002.

Water Conservation
ARS continued to improve efforts to conserve water and energy in its operations. Activities include:

- A trickle irrigation system, designed to reduce water usage, was installed in a greenhouse in Ames, Iowa.

- At an Athens, Georgia, facility, deduct water meters were installed on cooling towers with an expected reduction of at least $100,000 in annual water costs.

In addition, an APHIS facility in Fort Collins, Colorado, installed water pressure pumps to control water consumption, with estimated savings of 455,000 gallons of water per year.

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B. DEPARTMENT OF COMMERCE

Management and Administration

The Senior Official for the Department of Commerce (Commerce) Energy Team is the Chief Financial Officer and Assistant Secretary for Administration. The Senior Official participates in Interagency Energy Policy Committee meetings and ensures all actions under Commerce's Strategic Implementation Plan (SIP) for Energy Management are accomplished to meet the Federal goals.

The Commerce energy team consists of representatives from the Office of Real Estate Policy and Major Programs; Environmental Compliance and Safety Division, National Oceanic and Atmospheric Administration (NOAA); Plant Division, National Institute of Standards and Technology (NIST); Facilities Engineering Unit, NIST; Facilities Engineering Group, NIST; and Acquisition Management.

Management Tools

Awards

Commerce has an awards program in place to recognize employees for achievements in energy management.

Performance Evaluations

Commerce performance evaluations for relevant employees include components for measuring energy management.

Training

In FY 2001, Commerce provided energy management training to relevant employees.

Energy Efficiency Performance

Standard Buildings

In FY 2001, Commerce reported a 33.8 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot.

Industrial and Laboratory Facilities

NIST plans to implement the Gaithersburg Campus Site-Wide Energy Conservation Master Plan measures that can reduce the Gaithersburg laboratory consumption by 20 percent relative to FY 1990.

To document consumption of energy and to provide baseline information for building improvements, NIST installed electrical meters on most Gaithersburg, Maryland, building feeders and will log individual building electrical power consumption in FY 2002. Chilled water consumption has been monitored in campus buildings using two portable external pipe installed flow meters. A separate building chilled water differential temperature study was completed to identify chilled water low return water temperature problems, to improve the central chilled water plant efficiency and reduce CHW pumping power.

NIST proposes to spend up to $200,000 and $500,000 for energy conservation projects for Boulder, Colorado, and Gaithersburg, respectively, from FY 2002 Safety, Capacity, Maintenance and Major Repairs (SCMMR) funding. Increased funding will be requested in future SCMMR plans through FY 2010 to help meet energy efficiency improvement goals. Design guidelines in contracts to architecture/engineering firms provide energy consumption budgets and reference Executive Order 13123 goals.

Greenhouse Gas Reduction Goal

Commerce reported carbon emissions of 69,990 metric tons of carbon equivalent (MTCE) in FY 2001, a 49.3 percent increase compared to the FY 1990 base year.

Renewable Energy

Self-Generated Renewable Energy

NIST completed a new 28-kilowatt photovoltaic system on the Gaithersburg campus Administration Building roof. Solar film installation on four Gaithersburg campus laboratories is also complete, with projected annual savings of approximately $11,000 in cooling load reduction.

In FY 2001, NOAA planned and designed two photovoltaic projects for the Mauna Loa laboratory, Hawaii, and the National Weather Station (NWS) in Miramar, California.

Purchased Renewable Energy

NIST Boulder, Colorado, labs are purchasing wind generated energy. The Engineering, Maintenance, Safety, and Support Division, Boulder, contracted the purchase of $22,000 of wind-generated electricity from a wind turbine facility in northeastern Colorado. The purchase will provide between 2.5 and 3.0 percent of the Boulder NIST-owned facilities' annual electricity. The Boulder campus completed a DOE/FEMP energy survey in FY 2001, which resulted in recommendations for the installation of lighting dimmers, energy efficient ballasts and occupancy sensor light switches.

Implementation Strategies
Commerce published its Strategic Implementation Plan, a comprehensive plan which outlines strategies to achieve greater energy and water efficiency. The plan was developed with the participation of the energy team and with technical support by FEMP and the National Renewable Energy Laboratory (NREL).

With a grant from FEMP, NOAA hired an energy manger to develop a comprehensive energy program. NOAA's energy program objectives are to reduce operating costs, improve energy efficiency and the working environment by replacing obsolete equipment, demonstrating sustainable design concepts that reflect NOAA's mission, and complying with energy reduction mandates. NOAA has implemented several energy projects, including competitive procurement, rate negotiation, utility energy services contracts (UESCs), renewable projects, energy audits, energy accounting, and other energy projects. Also, NOAA has established a separate budget line item to advocate and execute the energy program plan.

Facility Energy Audits
NOAA has conducted energy audits at over 2 million square feet of facilities, representing 40 percent of total facility space. Over $1 million in energy savings opportunities were identified as a result of these audits. NOAA is actively pursuing both in-house appropriated funds and third-party financing to implement the energy saving opportunities.

Financing Mechanisms
An energy savings performance contract (ESPC) with a private sector investment of approximately $3 million has been initiated for the NIST Gaithersburg campus. An interagency agreement between NIST and DOE to use the Super ESPC program has also been prepared. The energy conservation measures will include retrofit of high-efficiency motors, lighting and HVAC controls retrofit of office air supply systems.

NOAA has awarded UESC projects and continues to pursue other projects at different locations. NOAA awarded a $120,000 contract to San Diego Gas and Electric, which conducted utility sponsored energy audits at the Atlantic Oceanographic and Meteorological Laboratory (AOML) fishery building in Miami, and at the Stellwagen Bank National Marine Sanctuary in Massachusetts. NOAA is working with local utilities to implement UESCs for follow-on energy retrofit projects identified in these audit reports.

AOML has identified a project to retrofit outdated lighting and HVAC systems. Under the terms of the UESC, NOAA would provide a buy-down payment of $150,000 to implement this project. The remaining funds would be provided from utility incentives and future energy savings. NOAA has programmed $150,000 of appropriated funds for FY 2003. NOAA worked with local governments and other Federal agencies to obtain energy grants and rebates in implementing renewable energy projects.

ENERGY STAR® and Other Energy-Efficient Products
Commerce incorporates energy efficiency criteria into relevant purchases.

Sustainable Building Design
In FY 2001, Commerce applied sustainable design principles to all of its new buildings construction/design projects.

Electrical Load Reduction Measures
NOAA has renegotiated the electric rate schedule at the Silver Spring Metro Complex (SSMC). NOAA currently has 10 accounts with the local utilty, with an annual electricity cost of $2.7 million. Consolidating the accounts under a single rate schedule would save between $200,000 and $250,000 annually. Also, NOAA is installing real-time meters to better manage electricity demand. Expected savings will range from 2 percent to 3 percent of the total electricity cost. Once real-time meters are installed, NOAA will develop a demand management program based on the actual consumption information.

NOAA is participating with the General Services Administration (GSA) to purchase the electricity for SSMC facility through a competitive bid in a deregulated market. Aggregating NOAA's electricity loads with other federal agency purchases will result in saving of between $25,000 and $30,000 per year.

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C. DEPARTMENT OF DEFENSE (DOD)

Management and Administration

The Principal Deputy Under Secretary of Defense (Acquisition, Technology and Logistics) is the DOD Senior Agency Official responsible for meeting the goals of Executive Order 13123.

The DOD Installations Policy Board (IPB), chaired by the Deputy Under Secretary of Defense (Installations & Environment) has been designated as the DOD Agency Energy Team. The membership of the IPB contains the cross-section of DOD senior leadership necessary to make decisions needed to remove obstacles hindering compliance with energy reduction mandates.

The facilities energy program is decentralized, with Defense component headquarters providing guidance and funding, and installations managing site-specific energy and water conservation programs. Energy project funding comes from a combination of government and alternative financing initiatives. Military installations are responsible for maintaining awareness, developing and implementing projects, and ensuring that new construction meets sustainable design criteria.

Management Tools

Awards

Energy conservation awards are presented to individuals, organizations, and installations in recognition of their energy-savings efforts. In addition to recognition, these awards provide the motivation for continued energy-reduction achievements. In October 2001, the Department of the Navy held its annual Secretary of the Navy awards ceremony in Washington, DC In August 2001, Active Army, U.S. Army Reserve, and Army National Guard commands were presented with Secretary of the Army's Energy and Water Management Awards for FY 2000 accomplishments in energy management. Air Force major commands have annual energy award programs that distribute funds to their base winners. The Services also participate in the Department of Energy Federal Energy and Water Management Awards Program. For FY 2001, DOD received 26 awards. The White House recognized the Department of the Navy with two Presidential Energy Awards for Federal Energy Management, and the General Services Administration (GSA) Achievement Award for Real Property Innovation was presented to the Army's Sustainable Design and Development policy initiative. Additionally, the Defense Commissary Agency (DeCA), the National Imagery and Mapping Agency (NIMA), Washington Headquarters Service (WHS), and the National Security Agency (NSA) incorporate spot awards and incentive awards to recognize exceptional performance and participation in the energy management program.

Performance Evaluations

Energy and water management provisions are included in performance plans of the DOD Energy Chain of Command, including major command, base and site energy managers. To ensure the inclusion of management provisions, action items are established in the Navy shore energy plan, while the Army conducts scheduled assistance visits to installations.

Training

Awareness and training programs are a critical part of DOD's efforts to achieve and sustain energy-efficient operations at the installation level. In FY 2001, a total of 2,676 personnel were trained through either commercially available or in-house-generated technical courses, seminars, conferences, software, videos, and certifications. In FY 2001, many components sponsored in-house courses, workshops and seminars. Certified Energy Managers (CEM) training was provided by Association Energy Engineers (AEE) instructors. The Services held installation energy management conferences and DOD personnel attended the Energy 2001 Workshop in Kansas City, Missouri. DOD was a co-sponsor of Energy 2001, with WHS being an active participant in the planning committees for both Energy 2001 and Energy 2002.

DOD has an active program to identify and procure energy-efficient products, specifically through the Defense Logistics Agency (DLA). DLA and GSA product catalogs are widely used, as well as the Construction Criteria Base.

Showcase Facilities

DOD continues to be a leader in DOE-designated showcase facilities demonstrating new and innovative energy saving technologies. Continuing showcase facilities include the United States Naval Academy, Annapolis, MD, the Naval Base Ventura County, Port Hueneme, California, and Hill Air Force Base (AFB), Utah.

Energy Efficiency Performance

Standard Buildings

In FY 2001, DOD reported a 23.6 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot.

DOD received credit for purchases of 1,262.7 billion Btu of renewable energy. This lowered the energy intensity of its standard buildings from 105,034 Btu/GSF to 104,407 Btu/GSF. DOD's sustained progress toward the energy reduction goals was impeded by severe weather and substantial escalation in natural gas prices resulting in use of less efficient alternative fuels.

Industrial and Laboratory Facilities
DOD's energy consumption in energy intensive facilities was 169,945 Btu per gross square foot in FY 2001, a 20.3 percent reduction as compared to the 1990 baseline of 213,349 Btu per gross square foot. While this was an increase of 4.9 percent as compared to the FY 2000 energy consumption of 162,005 Btu per square foot, DOD has already surpassed the FY 2005 goal set by Executive Order 13123 and has achieved 81 percent of the FY 2010 goal. Severe weather, substantial escalation in natural gas prices, and the closing of two industrial bases in FY 2001 attributed to the lost ground on reducing consumption in this category.

Exempt Facilities
The Navy is the only component in DOD to list facilities classified as exempt. Navy exempts mission critical, concentrated energy use transmitters, simulators, cold iron support to ships, and some private party facilities. These are non-production-oriented facilities with little or no square footage, making conventional performance measures meaningless. The mission criticality of these end users is such that energy efficiency measures are evaluated on a case-by-case basis.

Tactical Vehicle and Equipment Fuel Use
Total tactical vehicle fuel usage was 525.0 trillion Btu in FY 2001, increasing 1.7 percent from FY 2000. The increase usage is attributed to mission surges increasing jet fuel consumption, despite reductions in automobile gasoline and diesel-distillate through improved fuel efficiency of equipment and energy conserving operating procedures.

The Army issued an alternative-fuel vehicles (AFV) policy and developed a power and energy strategy. The strategy establishes goals and policy for tactical vehicles, establishes policy framework, provides a means to measure improvement, and recommends activities to better synchronize investment, acquisition, sustainment, and disposal based upon energy implications. The Air Force's strategy relies on expanding use of biodiesel fuel and flex-fuel capable vehicles. In FY 2001, Scott Air Force Base, Illinois, began testing biodiesel as their primary vehicle diesel fuel option with promising results. Additionally, the Air Force is currently working with GSA and the Defense Energy Support Center (DESC) to make B20 the primary diesel fuel used in their operated vehicles at bases worldwide when it is available.

Greenhouse Gas Reduction Goal
DOD reported carbon emissions of 6,980,447 metric tons of carbon equivalent (MTCE) in FY 2001, a 31.5 percent decrease from data reported for the FY 1990 baseline year. DOD was credited 85,676.1 MTCE for purchases of 238,472 megawatthours of renewable electricity and 1.2 trillion Btu of renewable thermal energy.

Renewable Energy
DOD plans to install renewable energy technologies and purchase electricity from renewable sources when life-cycle cost effective. Since DOD policy is to privatize utility systems whenever economical, power generation systems will generally be contractor-owned or located at remote, grid independent sites.

Self-Generated Renewable Energy
DOD has integrated photovoltaic power systems, solar water heating systems, and transpired solar collectors into its facilities. Self-generated power is often coupled with ground-source heat pumps, solar water heating systems and photovoltaic arrays to generate electricity at isolated locations, such as range targets, airfield landing strip lighting and remote water pumping stations. Active solar heating applications have included maintenance facility solar walls, swimming pool heating, and hot water heating. The Army is developing portable photovoltaic technology to serve as the primary power source of a battalion-size Tactical Operations Center.

In FY 2001, the Army funded the installation of 10 kilowatt wind turbines at Fort Huachuca, Arizona, and at the Headquarters, Arizona National Guard. Projects installed include solar domestic hot water heaters for barracks, heads and mess halls at Hale Moku Pearl Harbor, Hawaii; Hokulani Pearl Harbor, Hawaii; Pearl City, Hawaii; and Marine Corps Logistics Base, 29 Palms, California. Geothermal heat pumps were installed at Marine Corps Air Station, Beaufort, South Carolina; Navy Technical Training Center, Corry Station, Florida; and Naval Air Station, Pensacola, Florida. Solar photovoltaics were installed at the Royal Air Force (RAF) Station in Mildenhall, United Kingdom, to power remote oil interceptor alarm indicators; Altus Air Force Base, Oklahoma to power remote radio equipment and windsock illumination; and

Hickam Air Force Base, Hawaii, to power exterior lights.

Photovoltaic technology was utilized on the Boat House's solar roof at Ford Island, Hawaii, and for the outdoor warning system at Goodfellow AFB, Texas. The Pentagon Heating and Refrigeration Plant Complex operates a 30-kilowatt photovoltaic array.

Purchased Renewable Energy

The Armed Services have made significant progress in the purchase of renewable energy generated from solar, wind, geothermal, and biomass sources when cost-effective. For example, in FY 2001, the Army purchased 65,367 megawatthours of electrical power generated from renewable sources and the Navy purchased 155,381 megawatthours of renewable electricity and 1.3 trillion Btu of renewable thermal energy. Portsmouth Naval Shipyard, Virginia, purchases electricity and steam from a privatized waste to energy plant, while Naval Air Station, Keflavik, Iceland, purchases hot water from geothermal wells, and electricity from hydroelectric plants. The Air Force purchased a total of 17,724 megawatthours of renewable energy, with Hanscom AFB, Massachusetts, and Edwards AFB, California, purchasing 2,400 megawatthours and 12,100 megawatthours, respectively.

Million Solar Roofs

DOD is committed to the Million Solar Roofs initiative and continues to emphasize the use of solar and other renewable energy sources where it is cost-effective. Passive solar designs, such as building orientation and window placement and sizing, are already being implemented in a variety of building types and new facility construction. DOD anticipates more growth in the implementation of renewable energy and active solar technologies due to the availability of DOE's technology-specific Energy Savings Performance Contracts. The Army has approximately 3,100 "solar roofs" in use at its installations, and has requested assistance from DOE's Sandia National Laboratory to bring existing inoperable photovoltaic systems back to operational status.

Petroleum

Petroleum-based fuel use in facilities has decreased 59 percent from the FY 1985 baseline. Combined facility consumption was 101.4 trillion Btu in FY 1985 and 41.8 trillion Btu in FY 2001. Reductions were accomplished primarily through fuel switching to natural gas, tune-ups, steam trap replacements and improved controls in boiler plants. A significant factor in this reduction was the DESC Natural Gas Competitive Procurement Program. The objective of this program is to obtain cost-effective supply of natural gas for DOD installations while maintaining supply reliability, thereby assisting the components to minimize their reliance on petroleum products. In FY 2001, DESC competitively procured 48.5 trillion Btu of natural gas for the 180 DOD installations that participated in the program (approximately 62 percent of the DOD total annual natural gas consumption) and achieved over $13.9 million in cost avoidance. Fuel oil use in facilities increased 6.6 trillion Btu compared to FY 2000, while natural gas consumption decreased 1.9 trillion Btu. The net increase of 4.7 trillion Btu in the combined fuel oil and natural gas consumption was a result of a colder and longer winter heating season.

Water Conservation

In FY 2001, DOD consumed 206.8 billion gallons of potable water and spent $330.9 million on water and water-related services. The Services are striving to increase water conservation awareness and reduce water use—particularly where tight water supplies may potentially impact mission accomplishment and personnel morale. Although DOD water use has decreased steadily, the costs associated with its use have not come down proportionately, due to an increase in the unit cost of water in many regions. Greater treatment and testing requirements imposed on water suppliers by the Safe Drinking Water Act and amendments have increased the cost of providing potable drinking water. Additionally, some installations that purchase their water are increasingly likely to be on rate schedules designed to encourage conservation, such as increasing block rates or summer peak-demand charges. The Marine Corps audited two installations for water projects. Since 1997, these audits have identified and fixed over 486 million gallons in water leaks, and projects totaling $15 million were identified.

Implementation Strategies

Life-Cycle Cost Analysis

DOD facilities use life-cycle cost (LCC) analysis when making decisions about investments in products, services, construction, and other projects to lower costs and to reduce energy and water consumption. DOD considers the life-cycle costs of combining projects, and encourages bundling of energy efficiency projects with renewable energy projects, where appropriate. Projects are generally prioritized for capital funding and execution based upon the greatest life-cycle savings to investment ratio. The use of passive solar design and active solar technologies are recommended where cost-effective over the life of the project. Sustainable development projects use LCC methodology and follow

the Whole Building Design Guide. For example, the Air Force used life-cycle analysis for a $4.5 million wind generation project on Ascension Island and a $10.9 million decentralized heat plant at Mt. Home AFB, Idaho. In FY 2001, DeCA revised its Design Criteria Handbook emphasizing use of life cycle cost requirements in design of commissaries and NSA established an energy team to develop a detailed energy implementation plan using life cycle cost analysis for investment decisions regarding products, services, and construction.

Facility Energy Audits

Comprehensive audits were conducted on 180.8 million square feet, or 14 percent of facility square footage, in FY 2001. Since 1992, comprehensive audits were completed on a total of 939.6 million square feet, or 69.9 percent of facility square footage. Auditing 10 percent of facilities annually has been cost prohibitive and many DOD components have been unable to fully fund the audit program. To make up for part of this shortfall, components obtain audits as part of alternatively financed energy savings projects whenever feasible.

Financing Mechanisms

Partnerships with the private sector through Utility Energy Service Contracts (UESC) and ESPCs are a crucial tool for financing energy efficiency measures that allow installations to improve their infrastructure and pay for the energy efficiency measures through the savings generated by the project over time. In FY 2001, DOD awarded 44 UESC and 30 ESPC task orders/contracts producing a total life-cycle savings of $729 million with a total contractor share of $431 million. These contracts include many infrastructure upgrades and new equipment to help the installations reduce energy and water consumption. Examples include new thermal storage systems, chillers, boilers, lights, motors, EMCS systems and water reducing devices. Savings generated over time are returned to the contractor to pay for the improvement measures. In some cases installations decide to seek a shorter contract term and defer all Government cost savings until contract completion. In these cases, the savings generated by UESCs and ESPCs help to reduce the energy consumption, but do not reduce the total costs of operation until the contracts expire. After contract expiration and the retrofits are paid for, DOD will be able to obtain full cost savings.

DOE, Naval Facilities Engineering Command (NAVFAC), Huntsville Engineering and Support Center, and DESC all provide alternative financing contracting vehicles to installations and major commands. A few commands and installations use their own internally developed ESPC contracts.

Congress appropriated $15 million of the requested $33.5 million in FY 2001 and $27 million of the requested $35 million in FY 2002. Additionally, DOD received a Congressional addition of $4 million to facilitate implementation of ESPC contracts in FY 2001.

ENERGY STAR® and Other Energy-Efficient Products

When life-cycle cost-effective, DOD components select ENERGY STAR® and other energy-efficient products when acquiring energy-consuming products. Guidance generated by DOE, GSA and DLA for energy-efficient products are being incorporated into the sustainable design and development of new and renovated facilities. The components invest in energy efficient technologies, such as high-efficiency lighting and ballasts, energy efficient motors, and the use of packaged heating and cooling equipment with energy efficiency ratios that meet or exceed Federal criteria for retrofitting existing buildings. Information technology hardware, computers and copying equipment are acquired under the ENERGY STAR® program using GSA Schedules and either Government-wide or Service contracts.

Army procurement regulations were updated and are in compliance with the President's directive to procure only energy-consuming products which are in the upper 25 percent of energy efficiency as designated by the Federal Energy and Management Program. Navy energy managers utilized the DLA lighting software and Washington State Energy Office MotorMaster database to assist in purchasing energy efficient equipment. One example of promoting energy-efficient products is NAVFAC's specifications for transformer efficiencies that exceed industry standards.

ENERGY STAR® Buildings

DOD currently does not have any ENERGY STAR® certified buildings, because DOD buildings generally are not separately metered and temporary metering schemes are cost prohibitive. A memorandum of understanding (MOU) signed in June 1997 between DOD, DOE, and EPA allows military installations to self-certify buildings as ENERGY STAR® equivalents if comprehensive audits were conducted and all projects with a 10-year or better payback were implemented. In February 2001, Navy and EPA signed an MOU certifying that Navy family housing construction criteria meets or exceeds ENERGY STAR® Homes requirements. All homes built to the criteria will be certified Energy Star Homes. In FY 2001, a team was formed in an effort to facilitate the incorporation of the ENERGY

STAR® Action Plan into the Pentagon Renovation Program.

Sustainable Building Design
The concepts of sustainable development as applied to DOD installations have been incorporated into the master planning process of each of the Services. The Navy co-sponsored the development of the Whole Building Design Guide and a commissioning guide, in cooperation with the Passive Solar Industries Council. Navy family housing criteria includes sustainable planning and development standards and an interim sustainable rating worksheet based on industry and local programs.

Naval Sea System Command at the Washington Navy Yard was completely renovated using sustainable principles and highlights the use of sustainable design within the Navy. The project converted high bay naval gun factories and additions into one million square feet of administrative space while retaining the historical aspects of the facility. Additionally, every effort has been made to incorporate sustainable design initiatives in all phases of the Pentagon Renovation Program. These initiatives include environmentally preferred products and equipment choices for the building envelope, electrical, and mechanical systems.

Energy Efficiency in Lease Provisions
DOD emphasizes energy and water conservation in leased facilities and each Service has issued guidance directing that all leased spaces comply with the energy and water efficiency requirements. Build-to-lease solicitations for DOD facilities will contain criteria encouraging sustainable design and development, energy efficiency, and verification of building performance. DeCA incorporated the use of current commercial energy efficient design standards with set back thermostats and new low flow plumbing fixtures for their headquarters leased through GSA.

Industrial Facility Efficiency Improvements
Several major initiatives for industrial facility efficiency improvements are under way including the decentralization of the central heat plant at Grand Forks AFB, North Dakota, with energy savings of 82.5 billion Btu per year. The Army utilized the Process Energy and Pollution Reduction software developed by the Army Construction Engineering Research Laboratories to evaluate their energy reduction potential in industrial facilities. DeCA, with a large inventory of commissary stores, installs dual-path air conditioning to control humidity as an alternative to natural gas or propane fired desiccant dehumidification systems. DeCA also uses and plans to increase the use of heat-pipe technology for dehumidification and heat reclaim. Domestic hot water heat reclaim systems are standard in most large commissary store systems. Remote diagnostic monitoring of Refrigeration Monitoring and Control Systems is used at approximately 175 individual commissaries to assure that refrigeration and lighting systems are being operated and maintained at their design specification. Lighting controls were monitored and discrepancies were forwarded to DeCA's maintenance contractors on a daily basis for correction. This surveillance resulted in improved contractor maintenance and improved equipment operation and less energy consumed.

Highly Efficient Systems
DOD components are encouraged to combine cooling, heating, and power systems in new construction and/or retrofit projects when cost effective. The Army is currently in the fourth year of a five-year, $300 million central boiler plant modernization program. The goals of this program are to update the aging central boiler plant infrastructures that are currently found on many Army installations. These projects have resulted in upgraded or new boilers, new distribution systems, improved high efficiency pumps and motors, and updated system controls in all of these plants. Base Support Battalions (BSB) were used to execute several of these retrofit projects. The Navy used an ESPC to install a 7.5 megawatt gas turbine with 30,000 lb/hr heat recovery steam generators at Marine Air Ground Task Force Training Command, 29 Palms, CA, with a projected savings over the life of the project of $40 million.

Off-Grid Generation
DOD is pursuing off-grid generation where it is life-cycle cost-effective. The Army's Fort Hood is using two new innovative energy reduction technologies: solar parking lot lighting and an active daylighting system. Each of the 174 units of active daylighting installed produces the equivalent of approximately 600 to 800 watts of fluorescent light—virtually eliminating all daytime electric lighting—equating to more than 1.4 billion Btu of renewable energy. The solar parking lot lighting system uses just two panels to produce 800 kilowatthours per year. These two projects combined to produce a total of approximately 2.5 billion Btu, and saved the installation $106,200 in FY 2001. Navy Region Southwest contracted for a parking garage-mounted 750 kilowatt photovoltaic system that will be one of the largest grid connected systems in the United States. The Air Force installed two solar panel roofs that supply domestic hot water at RAF Mildenhall, UK. The Wilford Hall Medical Center (WHMC) Total Energy Plant at Lackland AFB, Texas, runs natural gas

turbines to generate 8 megawatts of electrical power with the waste heat captured for absorption chillers, domestic hot water heating, and facility heating.

Electrical Load Reduction Measures

DOD installations in the West responded to the President's Memorandum of May 3, 2001 and reduced summer peak demand. In May 2001, DOD announced a plan to reduce the electricity demand from the California commercial electricity grid by a combination of energy conservation, peak demand reduction investments and power generation. The goals of this California Electrical Demand Reduction Program were to reduce DOD's peak electricity demand 10 percent by the summer of 2001 and 15 percent by the summer of 2002 from a summer 2000 baseline. The Department received $45.7 million in the FY 2001 Supplemental Appropriation Act which consisted of $28.7 million to execute 89 investment projects estimated to save 70 megawatts and $17 million to conduct energy and sustainability audits, an energy generation siting study, and a geothermal test wells at China Lake.

DOD Services meet the conservation challenge by instituting an aggressive energy awareness campaign and monitoring program, installing vending machine misers, adjusting energy management control system set points, and hiring regional efficiency managers. California commissaries turned off 50 percent of sales area lighting during load reduction warning periods. Peak demand reduction investments for the program included installation of automating controls, demand meters, compact fluorescent lighting, solar reflective window film, and thermal energy storage systems. Additional investments included using skylighting in hangars and upgrading/repairing energy intensive equipment. Back-up generators were used for peak load shedding operations. DOD Services procured additional generators and invested in Distributed Energy Resources (DER) such as microturbines, fuel cells, and solar photovoltaic systems. As a result of this program, DOD reduced its peak demand from August 2000 to August 2001 by an average of 9.4 percent.

Water Conservation

DOD components have concentrated on water conservation methods such as early leak detection and repair, installation of low-flow water-efficient fixtures in housing and administration buildings, and public awareness programs. Water conservation methods in the Army are concentrated on water-saving technologies for toilets, urinals, showerheads, and faucets in housing barracks and other administration buildings. Fort Carson, Colorado, maintains a comprehensive water conservation program consisting of sound environment management, special projects, outreach, and education to protect and conserve water resources. Water-saving projects at Fort Carson include centralizing the vehicle wash facility, using wastewater to irrigate the 180-acre golf course, installing composting toilets that are almost waterless, and practicing beneficial landscaping. These projects reduced water use by 17 percent and saved more than $1.8 million in water and wastewater treatment costs. Most notable about the work at Fort Carson was that this reduction in water use took place while troop strength increased and a sizable increase in water use for irrigation took place.

The Navy performed leak detection on distribution systems, reviewed water management operating procedures, and corrected system maps. F.E. Warren AFB, Wyoming, installed water timers on hose bibs in military family housing saving 85 million gallons per year at a savings of $190,000.

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D. DEPARTMENT OF ENERGY (DOE)

Management and Administration

The Assistant Secretary for Energy Efficiency and Renewable Energy is the Department of Energy's (DOE) Senior Agency Official. The Director of the Federal Energy Management Program (FEMP) is responsible for implementing the policies, programs, and new initiatives of the Assistant Secretary at DOE facilities and for accomplishing the requirements of law and applicable Executive Orders.

The agency energy team at headquarters is the Energy Management Steering Committee (EMSC), which is comprised of senior level representatives from each of the major DOE programs responsible for implementation of DOE's mission at the sites. The EMSC reviews proposed implementation policy and plans to ensure compatibility with mission requirements and to facilitate implementation within their programs and at the sites.

DOE also has a team of energy management professionals from headquarters, DOE Field Offices, and sites called the Energy Efficiency Working Group (EEWG) which is sponsored by FEMP. The group promotes excellence in energy management through the exchange of management and technical information.

Management Tools

Awards

DOE's Departmental Energy Management Awards were established in FY 1979. Each year, these awards are presented to DOE personnel in recognition of their outstanding contributions toward energy and dollar savings at DOE facilities and field organizations. During FY 2001, 11 organizations and individuals were presented with awards.

Many DOE organizations have employee incentive programs to reward exceptional performance in implementing Executive Order 13123.

Performance Evaluations

One method of ensuring that Executive Order 13123 is implemented correctly is relating energy activities to employee performance evaluations and position descriptions. Many DOE sites incorporate energy management provisions into evaluations and position descriptions.

Training

Technical training and energy awareness activities continue to be a large component of DOE site programs, and many DOE organizations have training programs in place, or take advantage of training and education opportunities as they arise.

Showcase Facilities

Many DOE facilities do not qualify as Showcase facilities because visitation is restricted because of national security or safety reasons. In FY 2001, a facility at Fermilab received the Showcase designation because of the installation of energy saving retrofits.

Energy Efficiency Performance

Standard Buildings

In FY 2001, DOE reported a 43.5 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot. DOE received credit for purchases of 9.3 billion Btu of renewable electricity. This lowered the energy intensity of its standard buildings from 266,418 Btu/GSF to 266,284 Btu/GSF. DOE's reduction in energy consumption is partially due to reduced mission-related activities and overall downsizing of operations and facilities. As manpower is reduced and facilities are closed, efforts are ongoing to consolidate operations and minimize energy use in vacated buildings. This includes review of HVAC systems, lighting, transformers, and other building equipment usage.

Industrial and Laboratory Facilities

DOE's laboratory and industrial facilities saw a reduction in Btu per gross square feet of 11.7 percent since FY 1990. This reduction is mainly attributable to reduced mission-related activities and overall downsizing of operations and facilities.

Exempt Facilities

Most exempt DOE facilities have been scaled back operationally to prepare for decontamination and decommissioning. These facilities have traditionally been energy intensive operations that will in many cases dominate the energy consumption being reported at the site and the site consumption will vary in direct relationship to the energy consumption of these facilities. Traditional energy conservation measures will not significantly effect the energy consumption that will be reported for these facilities, and it would be impossible to meet the goals with these facilities included in other than the exempt category.

Tactical Vehicle and Equipment Fuel Use

Over-the-road vehicles at the Idaho National Engineering and Environmental Laboratory (INEEL)

are switching from gasoline and diesel to compressed natural gas (CNG) and liquefied natural gas (LNG). It is anticipated that off-road equipment will make similar changes once the equipment becomes available. Also, INEEL installed a CNG fueling station in Idaho Falls, in partnership with several local businesses and the Greater Yellowstone-Teton Clean Cities Coalition. This effort resulted in an alternative fuel source for a growing commercial alternative fuel infrastructure and in support of vehicle pool and alternative fuel research for the INEEL. This project was recognized as a "You Have the Power, Energy Project Champion" in FY 2001. The Los Alamos National Laboratory (LANL), Argonne National Laboratory-East (ANL-E), and Argonne National Laboratory-West (ANL-W) also reported use of compressed natural gas, electrical vehicles, or other alternative fuel for automobile gas, in combination with fleet reduction.

Greenhouse Gas Reduction Goal
DOE reported that energy use in its facilities resulted in carbon emissions of 692,804 metric tons of carbon equivalent (MTCE) in FY 2001, a 19.9 percent decrease versus data reported for the FY 1990 baseline year. DOE was credited 421.4 MTCE for purchases of renewable electricity made during the year.

Renewable Energy

Self-Generated Renewable Energy
The National Renewable Energy Laboratory (NREL) generates about 50,000 kilowatthours of electricity from a grid-connected photovoltaic system each year. Panels are located on the Solar Energy Research Facility and the Outdoor Test Facility. In FY 2001, NREL purchased photovoltaic panels with 720 watts of capacity and installed them at the Site Entrance Building to help offset the building's electrical usage.

The Lawrence Livermore National Laboratory (LLNL) Environmental Remediation Department has deployed nine Solar Treatment Units (STUs). The units are photovoltaic-powered, portable, groundwater contamination treatment units. Each unit's photovoltaic array is capable of generating approximately 400 watts of electric power. Total STU photovoltaic-generated power at LLNL is approximately 3.6 kilowatts.

At the National Nuclear Security Administration/Nevada (NNSA/NV), photovoltaic technology continues to be used for environmental air sampling facilities in remote areas. NNSA/NV is working to bring a commercial wind farm generation project to the Nevada Test Site (NTS) which would produce between 200 to 500 megawatts of electrical energy during peak generation periods. The first 85 megawatt phase of this project will be constructed during FY 2002 and should come online the first quarter of FY 2003. The power will be sold offsite to commercial utilities. NNSA/NV will receive 1.3 percent of the energy production of the project.

Purchased Renewable Energy
The Richland Operations Office has negotiated a 10-year contract with Bonneville Power Administration (BPA) to purchase 1 megawatt of green power. As the Pacific Northwest National Laboratory (PNNL) currently uses an average of 30 megawatts of electricity, the new BPA power contract achieves the three percent goal at almost no additional cost. The site already purchases 80 percent hydropower as part of its conventional generation mix.

In FY 2001, Oak Ridge National Laboratory (ORNL) continued to participate in the Tennessee Valley Authority (TVA) "Green Power Switch" program as TVA's first industrial green power participant. The TVA program presently includes three wind turbines atop Buffalo Mountain in the Southeast's first commercial-scale use of wind power to generate electricity. The TVA program also includes several solar collectors with additional sites and a landfill gas-to-energy facility planned. In support of the Green Power Switch program, ORNL receives 675 megawatthours annually at an incremental cost of $18,000.

In FY 2001, NREL purchased 1,981 megawatthours of wind-generated electricity from the local utility company, approximately 10 percent of NREL's total electricity use. Assuming that NREL's funding continues at the current level, NREL has agreed to purchase this amount in FY 2002 and FY 2003.

Million Solar Roofs
INEEL's Records Storage Facility solar wall qualifies for registry with the MSR program. The solar wall technology is used to provide make-up air pre-heating as a passive solar energy efficiency measure.

Petroleum
Since FY 1985, DOE has substantially reduced its use of petroleum-based fuels in its facilities. In FY 2001, DOE reduced consumption of fuel oil in its standard buildings by 9.2 percent from almost 11.1 million gallons in FY 1985 to 10.0 million gallons in FY 2001. The use of LPG/propane was reduced 62.9 percent during the period, a reduction of 771,600 gallons.

Water Conservation

DOE recognizes the potential to save money and natural resources through water conservation. To meet the goals of Executive Order 13123, facilities are using life-cycle cost-effective measures to reduce water consumption and associated energy use. In FY 2001, DOE also encouraged its field offices and sites to include water management plans within their facility management plans.

NNSA/NV and Bechtel Nevada have established a water conservation and efficiency program and plan to be included in the Energy Management Plan for FY 2002 and FY 2003. At the Oak Ridge Institute for Science and Education (ORISE) , low volume fixtures are used in new construction and to replace older fixtures. Water conservation measures are built into retrofit and new construction engineering designs.

At the Savannah River Site (SRS), a number of water conservation activities were completed in FY 2001. Most notable was the preparation and approval of the site Comprehensive Water Management Plan, issued in March 2001. The existing water conservation program at the SRS was further enhanced through the planning and implementation of five Best Management Practices as specified by FEMP guidance documents.

Implementation Strategies

Life-Cycle Cost Analysis

DOE encourages facilities to use life-cycle cost (LCC) analysis when making decisions about their investments in products, services, construction, and other projects to lower the agency's costs and to reduce energy and water consumption. Sites and facilities also implement programs to retire inefficient equipment on an accelerated basis where replacement results in lower life-cycle costs.

ANL-E utilizes LCC analysis in its implementation of energy and water conservation projects. LCC analysis is required for all energy and water conservation projects that are proposed for implementation at ANL-E, including those projects developed by UESC and ESPC contractors. LCC analysis allows the laboratory to determine if the lifetime of the equipment and systems installed by such projects outlive the payback period of the project by at least 25 percent, assuring actual cost savings flow back into the laboratory at the end of the payback period.

Stanford Linear Accelerator Center (SLAC) used LCC analysis in FY 2001 for a new office building construction project and for its central plant chillers replacement project. The new chillers for the central plant will be energy efficient machines, the chilled water plant pumping system will be a variable flow system, and the entire chilled water plant will be automated by means of a direct digital control energy management system.

Facility Energy Audits

DOE sites are working to meet the Executive Order 13123 goal of conducting energy and water audits for approximately 10 percent of their facilities each year. Audits are conducted independently, through ESPCs or UESCs. In FY 2001, over 3 percent of DOE facilities were audited. From FY 1992 to FY 2001, over 88 percent of DOE space received energy audits.

SRS was very successful in facility auditing in FY 2001. While it was projected that approximately 900,000 square feet of SRS building space would be audited, nearly 2.4 million square feet were audited, roughly one third of the total square footage at the site. This resulted from the development of an ESPC task order.

At PNNL-Hanford, 158 facilities were evaluated in FY 2001 for energy and water reductions for an audit rate of 10 percent. At the close of FY 2001, a total of 951 facilities, or 58.7 percent of the 1998 baseline, had been assessed. Facilities identified as no longer required by the new mission are deactivated and placed in a cheap-to-keep mode, excessed, or demolished.

Financing Mechanisms

DOE's Departmental Energy Management Program (DEMP) received $2 million in appropriations for FY 2001. Funds received in FY 2001 were distributed between activities to introduce new energy management practices into DOE sites through Model Program Development, and funding support for energy projects through Energy Retrofit Project Support, that provide known reductions in energy use. In this way, DOE sustains an effective program balance between implementing new initiatives for energy management emphasizing best practices, and achieving known quantifiable energy savings through retrofit projects.

Through an agency-wide competition, six sites received Energy Retrofit Project Support funds and 10 sites received funds for Model Program Development. The retrofit projects will save 9,138 megawatthours of electricity and 2.4 billion Btu of natural gas annually. The Government will save approximately $300,000 per year in avoided utility costs. The combined simple payback period of the investments is less than two years, with a 42 percent return on investments.

Projects chosen under the Model Program Development include such initiatives as sustainable building design, the acquisition of Energy Star® Building Labels, building re-commissioning, and energy reduction efforts in excess facilities. DEMP Model Programs provide a springboard for the introduction of best practices in energy management at DOE sites. DOE believes that many of the model programs will have a return on investment of greater than 25 percent. The actual return on investment will be measured through information gathered from the funded activities once they are implemented. Most of these initiatives will be implemented within one year of receiving funding. Many projects have the potential to provide significant returns for both energy management and mission oriented activities.

Alternative Financing

To date, DOE facilities have awarded and completed five UESC projects with a total private sector investment of almost $40 million. DOE has awarded four site-specific ESPCs to-date and four Super ESPC delivery orders. Two of the ESPC delivery orders were awarded during FY 2001.

A delivery order under the Western Regional Super ESPCs at the INEEL Research Center complex in Idaho Falls, Idaho, was awarded in January 2001. The energy conservation measures for this project include lighting retrofits and electrical distributions for nine facilities. The private sector investment for the ESPC project is approximately $779,000, with savings of $91,828 per year, and a simple payback of 8.5 years.

A delivery order under the Southeast Region Super ESPC contract was awarded in 2001 for the Y-12 National Security Complex in Oak Ridge, Tennessee. This was a contractor-identified project with a project investment of $2.9 million. The project includes chiller plant improvements, energy management system expansions, energy-efficient lighting improvements, skylight installations, and daylighting controls. Repayment will be made from the average $375,379 savings each year over the 17-year term, including annual savings of 6,882 megawatthours of electricity, 335 million Btu of natural gas, and 4.8 billion Btu of coal. Fifteen facilities are included with a total of 404,439 square feet of floor space. Plans are being completed for a second delivery order in the remainder of the property protection area. Once security clearances issues are resolved, a much larger ESPC effort will be initiated that would include the production facilities, which have considerable energy savings potential.

ENERGY STAR® and Other Energy-Efficient Products

ANL-E and ANL-W use the ENERGY STAR®-labeled products and specifications as preferred products for office and construction purchases as an on going procurement policy. Both laboratories have modified the standard Commercial Terms & Conditions document to include ENERGY STAR® requirements in the purchase and warranty provisions. These terms are included in the purchase of all commercial items procured by the laboratory. At ANL-E, energy efficiency criteria are incorporated into all construction specifications and product specifications developed for new construction and renovation projects.

SLAC has an ongoing program to procure products that increase energy efficiency and conservation. This includes the purchase of energy efficient lighting fixtures and ballasts, procurement of energy efficient motors for pumps, HVAC units and fans, and for many other uses on site. The most energy efficient magnets and other equipment, which meet specifications for the accelerator, are purchased on an ongoing basis. SLAC purchases energy efficient microcomputers, peripheral equipment, copy machines, and other ENERGY STAR® compliant products through Blanket Ordering Agreements negotiated by the DOE Integrated Contractor Purchasing Team on a regular basis.

At Pantex, ENERGY STAR® compliance for computer hardware is a procurement procedure clause. The Plant Design Criteria Manual is furnished to all architect/engineering firms and contractors in the design phase of new construction. It contains requirements to do energy efficient designs, perform life cycle costing, incorporate renewable energy projects, and provide energy conservation reports on new facility designs.

ENERGY STAR® Buildings

Many DOE sites have evaluated their office buildings for their possible inclusion in the ENERGY STAR® Buildings program, and three buildings have qualified to date. In FY 2001, the Engineering Research Office Building at INEEL obtained qualification for an ENERGY STAR® building. A building at LBNL also met the EPA's standards for energy performance and thermal comfort and received the Energy Star Building Label in FY 2001.

ENERGY STAR® evaluations for four Hanford buildings were completed in February 2001 by using SAVEnergy audit funding. Although the buildings do not presently qualify for the ENERGY STAR® label for buildings, the evaluations established a baseline for annual energy consumption and demonstrated potential for energy conservation measures to achieve ENERGY STAR® goals.

Sustainable Building Design

Sustainable design is being implemented into INEEL processes and procedures. A sustainable design matrix has been developed which identifies and tracks responsibility for sustainable design. Several procedures are being revised to include sustainable design criteria. A sustainable design checklist is being finalized, which will provide sensible and sustainable design parameters for designers and engineers.

One facility at the INEEL incorporated sustainable design processes into its design and construction. The new Records Storage Facility in Idaho Falls at the INEEL Research Center complex was completed in FY 2001 and uses a computerized/zonal lighting control system. This system takes advantage of infrequent traffic in the storage areas to provide computerized, aisle-by-aisle lighting control. Also included are occupancy sensors in offices and receiving areas.

During FY 2001, NREL began studying the broader requirements of sustainable operations for the laboratory, and began to consider these with respect to the newest building currently in design, the Science and Technology Facility (STF). The STF is the first NREL building to be scored according to the criteria for sustainable buildings established by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) criteria. With a goal of achieving a gold rating for the STF, NREL brought in nationally recognized experts on sustainable laboratory design for a design augmentation charette. A two-story design was developed as an alternative to the original one-story design to minimize site impacts and several other sustainable features were added. The experiences in applying sustainable design principles will be reflected in future revisions to design standards and specifications, design process, and site planning principles.

Sustainable design principles have been implemented, written into procedures, or are planned for a variety of facility types at many other DOE sites.

Energy Efficiency in Lease Provisions

As part of the Facility Revitalization Project at ORNL, several new facilities are being developed and constructed for leasing. Energy efficiency criteria are being incorporated into the project. New buildings are being required to be LEED-certified. Requiring a new building developer to provide a LEED-certified building would help incorporate many energy efficient, pollution prevention, and sustainable aspects into the design.

PNNL negotiated with its leased building owners to incorporate night setbacks on a schedule for traditional unoccupied times and to replace burned out light bulbs with energy efficient lights and fixtures. Bechtel Nevada (BN), contractors for NNSA/NV, have policies requiring energy efficiency in lease provisions.

Industrial Facility Efficiency Improvements

A number of activities have been undertaken at BNL with regard to efficiency in energy intensive facilities this past year. These include:

- Construction of a natural gas vehicle refueling facility;
- Energy management control system (EMCS) optimization in various buildings;
- An electric load curtailment program which saved $372,000 in 2001;
- Analysis of steam system distribution losses to evaluate additional potential saving opportunities;
- A fuel purchasing system, which saved over $592,000 by fuel switching, timing fuel purchases and utilizing storage capabilities to reduce fuel costs.

A complete re-commissioning of the controls system for some of LBNL's most energy-intensive facilities was completed in FY 2001. The re-commissioning included replacement of the control system, improving the sequences of operation for energy efficiency and appropriate functionality, testing of all sensors, actuators, and controlled devices, replacing failed mechanical components, and developing graphical displays of each system to improve diagnostic abilities.

At LLNL, five energy efficiency projects were completed during FY 2001 with a combined investment of about $302,000. These projects addressed retrofits for energy efficiency in building HVAC and wastewater systems. The LLNL Energy Management Program (EMP) also conducted numerous other activities. Expected savings are about 675 million kilowatthours per year of electric power and 3,359 therms per year of natural gas. Energy and operations and maintenance cost savings total about $79,000 per year, generating a combined simple payback period of about 3.8 years. One of the most successful projects involved retrofitting of the lighting systems in Building 482. This project represented a true collaboration between FEMP, EMP and LLNL's Plant Engineering Maintenance Management Division. This project earned a FY 2001 Departmental Energy Efficiency Award.

In FY 2001, ORNL continued with the implementation of a 10-year master plan to convert the central steam plant from coal to natural gas as the primary fuel. This

conversion has allowed the burning of coal and the handling of coal to be eliminated and will save significant energy, maintenance, operation, and environmental-related expenses in future years. As part of this effort, two coal-fired boilers were modified to burn natural gas more efficiently. Additionally, the former coal yard's top surface was stripped off so that it can be leveled and reclaimed, either as a brown field or a green field. Boiler control improvements are being planned for FY 2002.

Highly Efficient Systems
The LLNL Visitor's Center Photovoltaic Demonstration Project will provide shaded parking, reduce Visitor's Center power costs through net-metering, and will promote the technology to LLNL visitors.

Off-Grid Generation
At BNL, installation was started for two microturbine demonstration units. The system will provide off-grid generation and heat recovery. In addition, a $1 million grant from the New York State Energy Research and Development Administration was secured for a 250-kilowatt fuel cell demonstration project.

Electrical Load Reduction Measures
All of DOE's major energy using sites in California participated in the California Energy Commission's Emergency Load Reduction Test to demonstrate their peak load reduction capabilities. This includes the largest DOE energy-using site in California, the Lawrence Livermore National Laboratory.

As of April 3, 2001, the California Public Utilities Commission ordered electricity service providers to include transmission-level customers, such as all the DOE sites in California, to participate in the rotating outage process. All sites have therefore developed electricity usage curtailment plans that address the actions required at each of the three electrical emergency stages. The major sites affected by the rotating outages are LBNL, LLNL, SLAC, and SNL-California, all of which receive power from and are notified of impending electrical emergency alerts from the Western Area Power Administration (WAPA).

LBNL notifies all staff of alerts by e-mail within 10 minutes of receiving notification from WAPA. At the Stage 1 level, staff turn off all non-essential experimental equipment, lights, computer monitors and other office equipment. At the Stage 2 level, staff turn off all non-critical experimental equipment and the same lights and equipment turned off during a Stage 1 alert. At the Stage 3 level, staff turn off all non-critical equipment and all office air conditioning.

DOE's major energy-using sites are required to have emergency conservation plans for 10, 15 and 20 percent reductions from the previous fiscal year in gasoline, other oil-based fuels, natural gas, or electricity, for periods up to 12 months. These plans are designed to achieve the desired level of energy use reductions with the least impact on the site's mission and operating costs.

Water Conservation
ANL-E continues to add metering to individual facilities in order to track the sources of water use. The total unaccounted-for use of domestic water has been reduced from 35 percent to eight percent. This provides for proper billing and a reduction in overall water usage by targeting high use areas for conservation projects.

At Rocky Flats, water conservation practices are centered on using the least amount of treated water for construction purposes. In addition, two smaller cooling towers have replaced the large cooling towers, which were no longer needed and losing significant amounts of water because of the large evaporative surfaces.

At KCP, continuing efforts have been made to eliminate one-pass cooling with potable water. Systems have been converted to cooling from the central chilled water system. Restroom renovations specify low-usage fixtures. Excess capacity in the Reverse Osmosis Deionized Water system has been reconfigured to treat industrial wastewater. The treated water is then used as make-up water to the East Boilerhouse cooling tower. The system is still in the development stage but is expected to replace 11 million gallons of city water usage a year and decrease the industrial waste flow.

In order to better assess the need for water conservation at ORNL, a computer model was developed for the sanitary sewer system. Comprehensive smoke testing was completed on the system to help identify points of in-leakage, assist in evaluating the overall design, and ultimately to aid in identifying water systems that are designed as "once through" systems. Such analyses are used to target future water conservation and water treatment projects.

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E. DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS)

Management and Administration

The Senior Agency Official at the Department of Health and Human Services (HHS) is the Assistant Secretary for Administration and Management.

HHS has established a centralized energy program to coordinate the energy and water conservation efforts throughout the agency, facilitate alternative financing of energy and water projects, promote Federal energy programs, manage an extensive energy awareness campaign, and provide information and assistance to meet the goals of Executive Order 13123.

The six Operating Divisions (OPDIVs) that manage real property within HHS are the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), the Indian Health Service (IHS), the National Institutes of Health (NIH), the Office of the Secretary (OS), and the Program Support Center (PSC).

Management Tools

Awards

The annual HHS Energy and Water Management Awards Program rewards the exceptional performance of HHS energy management personnel in implementing projects, programs, and alternative financing contracts. In FY 2001, six awards were presented to individuals, small groups, and an organization for exceptional performance in energy efficiency, energy management, water conservation, and alternative financing.

Also in FY 2001, NIH received a Small Group Award for the Federal Energy and Water Management Awards for developing an altenative financing contract with PEPCO Services for a 23-megawatt cogeneration power plant. The plant will be constructed at the NIH facility in Bethesda, Maryland, and is one of the largest ever planned for the Federal Government. Expected savings are more than 640 billion Btu and approximately $3.6 million per year. In addition, the plant will reduce greenhouse gas emissions by roughly 100,000 tons per year and other pollutant emissions and particulate matter by close to 600 tons per year. The project cost is approximately $30 million and will be paid through energy savings from the project.

HHS uses the "You Have the Power" campaign posters to recognize individuals and small groups for their outstanding efforts in energy and water efficiency. In FY 2001, one Energy Champion poster and one Energy Project Poster were published for HHS.

CDC, IHS, and OS used internal awards programs in FY 2001 to recognize individuals for their work on energy awareness events and recycling.

Performance Evaluations

Key OPDIV energy management personnel positions contain critical performance elements that address energy and water efficiency, particularly within OS, NIH, CDC, and PSC. Each year, additional positions within the OPDIVs are revised to include performance measurements for energy and water conservation.

Training

In FY 2001, 84 HHS energy personnel received training in energy and water efficiency topics. This training included OPDIV-specific workshops, DOE and FEMP classes, utility or manufacturer-sponsored training, and the HHS Renewable Energy Seminar held in New Mexico with assistance from the National Renewable Energy Laboratory.

IHS Area Offices also sponsor specific courses for personnel. In FY 2001, the Portland Area Office sponsored a three-day HVAC seminar that discussed elements critical to energy efficiency, attended by more than 30 HHS personnel.

Outreach and energy awareness programs are widely used throughout the OPDIVs and by the HHS Energy Program. Events on Earth Day and Energy Awareness Month highlight the ENERGY STAR® program and other energy efficient products and programs.

Showcase Facilities

In FY 2001, the IHS Albuquerque Indian Hospital in New Mexico, and the PSC Parklawn Building in Rockville, Maryland, were designated as Federal Energy Saver Showcase Facilities.

The IHS Albuquerque Indian Hospital installed a ground source heat pump project to replace the original boilers, chillers, and air handling units of the facility. The new system reduces the production of greenhouse gas emissions, saves energy, offers greater flexibility and control, and is very easy to maintain.

The PSC Parklawn Building entered into an alternative financing contract with the local utility company to install energy efficient lighting and water saving plumbing fixtures. The annual savings of the projects is 11 percent of the total annual electricity consumption for the building, and 6.3 million gallons of water, with cost savings of $211,000.

Energy Efficiency Performance

Standard Buildings
In FY 2001, HHS reported a 14.8 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot.

FY 2001 energy consumption in standard facilities was 3 percent higher than in FY 2000. The increase was caused by a large rise in district steam consumption at the Hubert S. Humphrey Building, due to the expanded use of a steam absorption chiller.

Industrial and Laboratory Facilities
Ninety percent of HHS square footage is considered energy intensive, which includes laboratories, hospitals, animal centers, health clinics, and other related support space. HHS reports energy consumption in Btu per gross square foot for its energy intensive facilities.

In FY 2001, the energy consumption of HHS energy intensive facilities was 326,341 Btu per gross square foot, versus 374,400 Btu per gross square foot in FY 1990, a decrease of 13 percent.

New construction on CDC and NIH campuses has offset the energy efficiency reductions realized from implementing energy projects. In addition, much of the construction and renovations are focused on updating laboratories with current ventilation standards. Such projects result in greater energy consumption due to the increased ventilation required, even with energy efficient technologies.

Exempt Facilities
HHS exempts outdoor multilevel parking garages at the NIH Bethesda, Maryland, campus that consume energy for lighting purposes only.

Greenhouse Gas Reduction Goal
Energy consumption in HHS facilties resulted in carbon emissions of 239,014 metric tons of carbon equivalent (MTCE) in FY 2001, a 9.5 percent increase versus data reported for the FY 1990 baseline year.

Renewable Energy

Self-Generated Renewable Energy
IHS has been active in the use of self-generated renewable energy. The IHS Santa Fe and Acoma-Canoncito-Laguna (ACL) hospitals in New Mexico both use solar energy collection systems. The ACL hospital also installed solar powered outdoor lighting. The Santa Fe Indian Hospital was awarded a grant from DOE to refurbish its 20 year-old solar energy system.

In FY 2001, CDC was awarded funding from the DOE/FEMP Distributed Energy Resources Program to install a solar energy project at a small health clinic in Kenya. DOE funding covered half of the cost, and CDC funded the balance.

Petroleum
In FY 2001, HHS facilities used 897.0 billion Btu of petroleum products, a 60 percent reduction versus FY 1990 levels.

Water Conservation
Ths HHS OPDIVs reported using 1.5 billion gallons of water in FY 2001, at a cost of $7.0 million. Data collection for IHS water consumption remains a problem, however. In addition, several facilities reported difficulties monitoring water consumption through the current water utility billing procedures.

Implementation Strategies

Life-Cycle Cost Analysis
All HHS OPDIVs use life-cycle cost (LCC) analysis to prioritize and justify the implementation of energy efficiency projects. FDA has initiated the use of LCC analysis when making investment decisions about new laboratory construction. LCC analysis was used to evaluated HVAC equipment to be installed in FDA's new laboratory to be built in Irvine, California.

NIH guidelines also require the use of LCC analysis for new construction or renovation projects. LCC analysis was used as part of an ESPC at facilities in the IHS Aberdeen Area, and is required for all energy projects submitted for funding in the IHS Anchorage Area.

Most CDC facility designers and program managers have been trained in the use of LCC analysis to accurately analyze new building and retrofit designs.

Facility Energy Audits
In FY 2001, 1.1 million square feet, 4.2 percent of the total square footage of HHS, was audited. To date, 55 percent of HHS square footage has received energy and water efficiency audits.

Financing Mechanisms
In FY 2001, the HHS Energy Program continued efforts to promote and facilitate the use of alternative financing mechanisms for energy and water efficiency projects, and four such contracts were signed during the year.

NIH is using utility energy service contracts (UESCs) to identify, evaluate, and implement economically feasible energy and water conservation measures. NIH

entered into two UESCs in FY 2001, for a total of $1.3 million. The contracts cover upgrades to provide energy efficient ballasts, variable speed controllers, and water conserving plumbing fixtures in two buildings.

The IHS Aberdeen Area and Seattle Engineering Services signed a Super ESPC to implement energy projects at 28 facilities in North Dakota and South Dakota. The 15-year contract is valued at $2 million.

ENERGY STAR® and Other Energy-Efficient Products
The HHS Energy Program communication tools relate the importance of using ENERGY STAR® and other energy efficient products. HHS also makes available resources and guides for purchasing these products. OPDIVs use the GSA Schedule to procure energy efficient products and have revised project specifications and procurement contracts to include energy efficient product purchasing.

Sustainable Building Design
In FY 2001, the HHS Energy Program continued to highlight the concept of sustainable building design and the use of the Whole Building Design Guide (WBDG) through awareness newsletters, training, and direct facility management correspondence.

NIH guidelines require that new building siting, design, and construction conform to the Executive Order 13123 sustainable design and development principles in the WBDG. These principles are applied to the greatest extent possible.

Energy Efficiency in Lease Provisions
Only 7 percent of HHS square footage is leased space. In FY 2001, no lease negotiations were completed. Where appropriate, OPDIVs review lease agreements to give preference to buildings with sustainable and energy efficient designs.

Industrial Facility Efficiency Improvements
With the majority of HHS square footage considered energy intensive, most of the agency's energy projects address systems such as steam systems, boiler operation, fuel switching, and cogeneration.

The NIH Bethesda, Maryland, campus has implemented many projects to improve energy efficiency in its buildings. Projects included the gradual substitution of inefficient chillers with ultra efficient large capacity models, retrofitting oil burning boilers to use natural gas, and replacing the utility distribution system with larger capacity lines to reduce head loss and overall chilled water operating pressures.

The IHS Navajo Area replaced existing HVAC equipment with energy efficient boilers and cooling towers that require less energy at start up. Flat plate heat exchangers were also installed to provide free cooling in winter months. The IHS Albuquerque Area also completed energy efficiency projects at the Zuni Hospital.

CDC completed assessments and made improvements to automated control methodologies, night setback operations, and energy recovery for all laboratories.

Highly Efficient Systems
At the IHS Anchorage Area, a ground water cooling project is currently under design for the Alaska Native Medical Center. Renovations continued in FY 2001 at the IHS Albuquerque Hospital.

In FY 2001, construction continued on the 23-megawatt cogeneration unit for the NIH Bethesda, Maryland, campus. The highly efficient unit, with an efficiency rating of 85 percent, will save more than 640 billion Btu and approximately $3.6 million per year. The plant will also reduce greenhouse gas emissions by roughly 100,000 tons per year. A similar system is under construction at the NIH Clinical Research Center (CRC), involving the use of steam driven electric generating turbines to capture steam energy that would be lost in the normal pressure reducing process.

Off-Grid Generation
Solar powered outdoor lighting was installed at the IHS ACL and Santa Fe Hospitals in New Mexico. The IHS Bemidji area has also proposed installing an off-grid generator at the White Earth Health Center.

The NIH cogeneration unit at the Bethesda, Maryland, campus will also generate off-grid power. A steam driven electrical generating turbine is also under construction at a campus facility to convert steam pressure reduction energy to electricity.

Electrical Load Reduction Measures
Most HHS facilities have established communications with local utility companies regarding peak load periods and demand load reduction programs. OPDIV facility managers have developed facility plans to reduce peak demand on high load days.

Several HHS facilities have systems for alerting employees of expected high demand days. Where available, energy management control systems are used to monitor total facility demand and loads for individual pieces of major equipment. Facility managers are able to determine target levels for demand reduction and

monitor daily use patterns. When electrical demand approaches high levels, or during utility curtailment periods, the control systems automatically power down nonessential equipment.

The OPDIVs also formulated and implemented methods to reduce electrical loads due to lighting, office equipment, and air conditioning. Many of the measures aimed to increase employee participation in energy efficient practices.

Water Conservation
The Energy Program will focus efforts on assisting the OPDIVS in developing and formalizing Water Management Plans that include measures from the Best Management Practices. Most facilities have plans that have not been formalized. In general, HHS facilities minimize the amount of water used to water lawns and landscapes. Many retrofitted and new plumbing fixtures are low-flow models.

CDC evaluates water source cooling units that use once-through potable water for removal or connection to a recirculating system.

The IHS Bemidji Area installed water softener units that use reduced volume regeneration cycles. The IHS Tucson Area facilities has decreased the amount of water used for landscaping through more efficient irrigation.

NIH has also implemented many water saving measures, including elimination of lawn watering, xeriscaping techniques, using low-flow faucets, toilets, and other projects.

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F. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

Management and Administration

The Senior Energy Official for the Department of Housing and Urban Development (HUD) is the General Deputy Assistant Secretary for Administration, who is responsible for meeting the goals and requirements of Executive Order 13123.

HUD's energy team consists of staff members from the agency's divisions for facilities management, building maintenance and energy, budget and administrative services, procurement, and information technology. The members of the energy team provide technical support to expedite and encourage the agency's use of appropriations, energy savings performance contracts (ESPCs), and other alternative financing mechanisms to meet the energy goals of the HUD Headquarters building. HUD field offices are located in GSA-leased buildings and energy conservation measures are included in lease provisions.

Management Tools

Awards

HUD is in the process of developing an awards program to reward exceptional performance in implementing Executive Order 13123. HUD currently uses the "You Have the Power" campaign to recognize employees. In FY 2001, Thomas Hamilton, from the HUD headquarters building, was recognized for his contributions to energy and water management.

Performance Evaluations

HUD will be incorporating provisions of Executive Order 13123 into position descriptions and performance evaluations of members of the energy team and facility/energy managers beginning in FY 2002.

Training

In FY 2001, HUD staff distributed literature to employees describing how they can help to reduce energy use. One staff member from HUD attended training sessions at the Energy 2001 conference.

Showcase Facilities

The HUD Headquarters building is a designated Federal Energy Saver Showcase facility, due to replacement of the main building chlorofluorocarbon (CFC) chillers with non-CFC, energy efficient chillers.

Energy Efficiency Performance

Standard Buildings

In FY 2001, HUD reported a 1.2 percent decrease in energy consumption from FY 1985 for its headquarters building when measured in Btu per gross square foot.

Tactical Vehicle and Equipment Fuel Use

During FY 2001, HUD purchased 16 alternative-fuel vehicles (AFVs) and plans to purchase additional AFVs in FY 2002 and FY 2003.

Greenhouse Gas Reduction Goal

Energy consumption in the HUD headquarters building resulted in carbon emissions of 5,007 metric tons of carbon equivalent (MTCE) in FY 2001, a 21.1 percent decrease versus data reported for the FY 1990 baseline year.

Water Conservation

During FY 2001, the HUD Headquarters building used 3 million gallons of water, at a cost of $25,800. In the future, HUD plans to implement water conservation measures identified through the FEMP SAVEnergy Audit Program.

Implementation Strategies

Life-Cycle Cost Analysis

HUD will consider the life-cycle costs of combinations of projects, particularly to encourage bundling of energy efficiency projects with renewable energy projects. HUD replaced three chillers and cooling towers in FY 1998 with high efficiency equipment, resulting in significant power savings. HUD will accelerate equipment replacement where it results in lower life-cycle costs.

Financing Mechanisms

In FY 2001, HUD provided information on the use of ESPCs by medium and large housing authorities through training courses developed by the Illinois State Office of HUD in cooperation with Argonne National Laboratory and Oak Ridge National Laboratory. In addition, HUD's Office of Public and Indian Housing is preparing a notice advising housing authorities on the uses of ESPCs.

ENERGY STAR® and Other Energy-Efficient Products
HUD's Office of Information Technology promotes the use of Energy Star® products. HUD will develop directives to require program offices to specify, buy, and install Energy Star® and other energy efficient products as designated by the Environmental Protection Agency (EPA) and DOE.

ENERGY STAR® Buildings
HUD has developed a program to meet energy requirements called Partnership for Advancing Technology in Housing (PATH). This program will help in lessening the environmental impact and energy usage in America's new and existing housing. The following projects are examples of energy saving building initiatives through the PATH HUD demonstration site:

- In Holyoke, Massachusetts, PATH joined forces with the Holyoke Housing Authority to develop a mixed income community of energy and resource efficient townhouses and flats. The project, known as Churchill Homes, incorporates building systems with high insulation values, high efficiency combination boiler-tankless domestic hot water systems, and controlled ventilation systems.

- NextGen is a PATH demonstration project of factory-built homes with remarkable energy performance. The homes exceed the ENERGY STAR® performance requirements by 20 percent. For the homeowner, this equates to a $180 reduction in annual energy costs. NextGen is also expected to produce 872 fewer pounds of carbon dioxide and 6.5 fewer pounds of sulfur oxide and nitrogen oxide each year, compared to a similar HUD-Code home.

Sustainable Building Design
HUD will consider the implementation of sustainable design principles in the planning, design, construction, and operation and maintenance of HUD publicly-funded programs Department-wide and promote the Whole Building Design Guide (WBDG) for implementing sustainable design in HUD programs.

Industrial Facility Efficiency Improvements
HUD's Building Maintenance and Energy Branch (BMEB) is considering installing a boiler system to offset steam usage and use off-gassing from the boiler to power a generator and offset electricity consumption. The BMEB is also working on passive solar and photovoltaic projects to power penthouse mechanical space lighting systems and rooftop equipment.

Highly Efficient Systems
Provisions in the HUD Five Year Plan for Energy Efficiency calls for the agency to explore opportunities for the use of combined heat and power (CHP) by cities/counties to combine energy, economic development, and environmental decisions.

HUD is working with the DOE Office of Power Technologies on HUD programs that can be used to finance CHP projects. The Buffalo Cogeneration Project will include public housing and several Federal buildings.

Water Conservation
A SAVEnergy audit was performed at HUD Headquarters in FY 2000. HUD plans to implement several of the water conservation measures that were recommended in the audit report.

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G. DEPARTMENT OF THE INTERIOR (DOI)

Management and Administration

The Senior Agency Official for the Department of the Interior (DOI) is the Assistant Secretary for Policy, Management, and Budget.

DOI's energy management team consists of an Executive Energy Committee, comprised of bureau representatives at the Assistant Director for Administration level, and the Departmental Energy Conservation Committee (DECC), comprised of bureau representatives ranging from property managment specialists to engineers. The DECC provides advice and recommendations to DOI officials on energy management initiatives and policies, as well as guidance on bureau energy management operations.

Management Tools

Awards

DOI developed a Departmental awards program specifically for energy management and water conservation and selected its first award recipients in FY 2002. Prior to these awards, DOI recognized energy management achievements primarily under the Department's annual Environmental Award Program.

DOI submitted four nominations for the FY 2001 Federal Energy and Water Efficiency Awards Program, and three projects received awards:

- The Cusano Environmental Education Center at the John Heinz National Wildlife Refuge in Philadelphia, Pennsylvania, was honored as a model for efficient use of energy and water.

- The National Park Service's (NPS) Channel Islands National Park research vessel, Pacific Ranger, was honored for undergoing a greening project that reduces its environmental impact while operating in sensitive marine areas. The vessel reduced diesel fuel consumption by using biodiesel fuel, a "Purafiner" filter system battery storage, and AC inverters instead of generators.

- NPS's Zion National Park Visitor Center, a collaboration between the NPS Denver Service Center and DOE's National Renewable Energy Laboratory, was honored for combining passive heating, cooling, daylighting, energy efficiency, and photovoltaic technology into its design process.

Performance Evaluations

DOI recognizes the energy management program responsibilities of facility managers, energy managers, designers, and others in performance evaluations and position descriptions. Newly-created position descriptions are assessed to ensure that applicable energy management program responsibilities are incorporated.

The Fish and Wildlife Service (FWS) has determined that environmental leadership, including energy management, should be a significant factor in the annual performance evaluation of each program manager and project leader. FWS managers will be evaluated on environmental leadership principles. This approach is also under consideration by other DOI bureaus, and could serve as a model for linking performance evaluation with efforts to achieve greater energy efficiency.

Training

Energy managers have attended workshops offered by FEMP, the General Services Administration, the Environmental Protection Agency, the Association of Energy Engineers, public utilities, and at other energy management meetings.

In FY 2001, DOI energy managers provided information and encouraged personnel to attend energy management training. Energy management topics were also included in DOI-sponsored conferences during the year. DOI's Property Management Conference in FY 2002 offered workshops covering real property, energy management, and renewable energy.

Showcase Facilities

DOI recognized one new showcase in FY 2001, the Cusano Environmental Education Center at the John Heinz National Wildlife Refuge. The building incorporates geothermal heating and cooling, energy efficient lighting, a well-insulated building envelope, and natural daylighting. Other design strategies include the use of green building materials with significant recycled content, and an innovative on-site organic wastewater treatment plant.

The geothermal heating and cooling system uses approximately 25 percent less energy as compared to a conventional system. The estimated yearly savings are $5,000 and more than 119 million Btu for the geothermal heat pump.

Energy Efficiency Performance

Standard Buildings
In FY 2001, DOI reported a 0.9 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot. DOI received credit for purchases of 0.02 billion Btu of renewable electricity. This lowered the energy intensity of its standard buildings from 87,119 Btu/GSF to 87,118 Btu/GSF.

Analysis of DOI's data showed increases in the use of fuel oil, LPG/propane, steam, and electricity between FY 2000 and FY 2001. Consumption of electricity alone increased 20 percent versus FY 2001.

DOI spent $3.2 million in FY 2001 for facility energy improvements.

Greenhouse Gas Reduction Goal
Energy use in DOI facilities resulted in carbon emissions of 145,883 metric tons of carbon equivalent (MTCE) in FY 2001, a 17.0 percent increase versus data reported for the FY 1990 baseline year. DOI was credited 0.9 MTCE for purchases of renewable electricity made during the year.

Renewable Energy
DOI recognizes the cost-saving potential for developing renewable energy resources in its energy management plan and guidance documents. DOI requires its engineers to implement low-risk, passive solar strategies, as appropriate, in the design of new buildings. The Secretary of the Interior sponsored a conference in FY 2001, on expanding the use of renewable energy on public lands.

Self-Generated Renewable Energy
DOI has implemented 24 renewable energy projects, including stand-alone and grid-connected photovoltaic systems, solar themal projects, geothermal heat pumps, and wind energy projects. In FY 2001, DOI continued its work with NREL to develop a registry of renewable energy projects.

In FY 2001, the NPS implemented energy projects primarily through the installation of photovoltaics and net-metering. These included:
- Point Reyes National Seashore - Five photovoltaic systems, a total of 30 kilowatts, were installed, and the installation of two solar thermal projects was started;
- Yosemite National Park - A 47-kilowatt system is in the design stage; and
- Channel Islands National Park - A 16-kilowatt photovoltaic project and a seven-kilowatt wind project was initiated.

The Bureau of Land Management (BLM) and FWS implemented several renewable projects in FY 2001, including:
- Red Cliffs Campground, Utah - A 900-kilowatt photovoltaic system was installed for campground host power;
- Eastern Neck National Wildlife Refuge, Maryland - Two photovoltaic demonstration projects totaling 200 kilowatts for lighting and pumping water were implemented; and
- Madison Wildlife Management District, South Dakota - A geothermal heat pump was installed, replacing an unsafe heating system.

Purchased Renewable Energy
DOI has committed to purchasing a portion of its electric power needs from wind-generated electricity, through the WindSource program, offered by the Public Service Company of Colorado. As electricity deregulation becomes more widespread, DOI will investigate methods for purchasing renewable energy for more of its facilities.

Million Solar Roofs
Fifteen Solar Roofs projects were implemented in FY 2001, and included photovoltaic power and water pumping photovoltaic projects at BLM, NPS, and FWS facilities.

Petroleum
Fuel oil use in FY 2001 was 772.5 billion Btu, 27.9 percent less than the amount used by DOI in FY 1985. LPG/propane use increased by 5.9 percent, from 520.7 billion Btu in FY 1985, to 551.4 billion Btu in FY 2001.

DOI encourages its bureaus to replace its gasoline-fueled vehicles with alternative-fuel vehicles. DOI has procured 80,000 gallons of domestically-produced biodiesel for its motor vehicle fleet in the Washington, DC, metropolitan area. The use of biodiesel is a significant part of DOI's strategy to reduce dependence on foreign petroleum.

Water Conservation
In FY 2001, DOI reported water consumption of 4.2 billion gallons at a cost of $9.9 million.

FWS's Mora National Fish Hatchery and Technology Center, New Mexico, was selected for a FY 2000 Federal Energy and Water Management Award for the implementation of a water reuse system. The system

saves approximately 2.2 billion gallons of water per year, due to a water reuse rate of 95 percent. This initiative remains one of DOI's most outstanding examples of water conservation.

Implementation Strategies

Life-Cycle Cost Analysis
DOI's Departmental Plan identifies goals for the use of life cycle cost (LCC) analysis and identifies the benefits of using life-cycle costing techniques for the purchase of energy efficient products.

As an example, FWS policy requires engineers to design buildings and building systems that result in the lowest life-cycle cost. Policies also require all conservation opportunities to be LCC effective.

DOI has incorporated language into its annual budget formulation guidance and into its five-year deferred maintenance plan that identifies planned energy projects and emphasizes life-cycle costing. Bureaus also retire inefficient equipment on an accelerated basis where replacement results in lower life-cycle costs.

Facility Energy Audits
DOI has been an active participant in the SAVEnergy audit working group, formulating implementation strategies for compliance with the mandated audits. In FY 2001, DOI received funding from the FEMP SAVEnergy program to assess the potential use of renewable energy. Three percent of facility space was audited during the fiscal year, and 64 percent of facility space has been audited since FY 1992.

NPS continued the University-National Park Energy Partnership Program with James Madison University. The project links university students and faculty with NPS personnel to identify and develop sustainable energy use practices. These win-win partnerships provide needed technical assistance to the parks while offering students valuable, real world educational experience. The projects included performing energy surveys, developing an innovative database system to track energy consumption and costs, and identification of Shenandoah National Park's first renewable energy project. The goal to apply the partnership philosophy elsewhere in the NPS system is also moving forward.

Financing Mechanisms
Six energy savings performance contracts (ESPCs) are operating within DOI with a total contractor investment of $12.5 million. One facility initiated an ESPC in FY 2001 - the Bureau Indian Affairs (BIA) Southwest Indian Polytechnic Institute.

DOI has benefitted from the Green Energy Parks Program, a partnership begun in 1999 with DOI, NPS, and DOE, to modernize energy use throughout the National Park System. The partnership has resulted in funding and technical support from DOE and from other public and private partners for energy efficiency and renewable energy projects.

The Green Energy Parks Program provides an opportunity to deploy sustainable energy technologies into National Parks. The program also educates the public in the environmental implications of society's energy use, and enhances the awareness of the benefits of sustainable energy solutions. More than 260 million people visit the NPS's 378 units each year, providing an unparalleled opportunity to educate the public about the importance of green energy.

In FY 2001, the NPS committed $2 million for the Green Energy Parks initiative. Over 60 visitor centers are incorporating low-cost projects such as: replacing high volume water fixtures, purchasing solar power generation, installing solar lighting, and upgrading lighting with motion detectors and occupancy sensors. The program also helps forge new partnerships with other Government agencies and private sector groups, which will greatly accelerate and expand the program.

In California, NPS and the state parks are aggressively seeking partnerships and opportunities to fund energy saving activities and technologies through rebates, special funding for energy conservation projects, and other sources of revenue.

ENERGY STAR® and Other Energy-Efficient Products
DOI participates on various interagency committees and workgroups for increasing Federal agency purchases and use of energy efficient and environmentally preferable products.

DOI has incorporated energy efficiency provisions into all levels of procurement. Under DOI's Acquisition Intern Program, personnel are trained on purchasing energy efficient products and services.

DOI has guidelines requiring employees to buy recycled-content, environmentally preferable, and energy efficient products. The guidelines also provide sources of more information on purchasing these products.

ENERGY STAR® Buildings
Although DOI has no ENERGY STAR® buildings, DOI has requested its bureaus to review facilities for potential designation. DOI is also planning to partner

with the Environmental Protection Agency to include a designation for visitor centers in the program.

Sustainable Building Design
Energy coordinators at DOI are working closely with engineering, architect, and design offices to address energy conservation retrofits and new building design. Energy conservation efficiency standards are included as an integral part of all engineering design and construction project specifications.

Energy Efficiency in Lease Provisions
The Strategic Plan for Greening the Department of the Interior includes provisions that leased building space must incorporate sustainable design, green products and services, recycling, energy management, and water conservation measures.

The Main Interior Building, a leased facility, is preparing for a multi-year modernization project. Energy efficient retrofits planned for the building should allow it to be designated as a Showcase facility.

Highly Efficient Systems
DOI uses the tools developed by DOE and its laboratories, including the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system, to identify the potential use of highly efficient systems.

Off-Grid Generation
DOI implemented several off-grid generation projects in FY 2001, including:

- Mohave Desert National Park - A photovoltaic system was installed in a fire center building; and
- Mount Ranier National Park - A large photovoltaic system was installed, which will eliminate the need for diesel generators and will also be used for educational purposes.

Electrical Load Reduction Measures
DOI facilities have actively sought ways to reduce energy use during periods of peak electricity demand. Bureaus have taken steps to identify short- and long-term electricity load reduction measures, monitor total facility demand, strengthen coordination with local utilities, and enhance communication with employees about the benefits and best practices for increased energy efficiency.

In areas that are vulnerable to energy shortages and rising energy costs, DOI has accelerated energy conservation and renewable energy projects in the parks and other DOI facilities throughout California.

Throughout California, DOI bureaus, partnering with DOE, GSA, state agencies, and industry are investing in renewable energy projects and increasing energy conservation. The three largest energy consuming facilities in California - Golden Gate National Recreation Area, Yosemite National Park, and the U.S. Geological Survey's (USGS) Western Regional Office have implemented a range of measures, from reducing light levels in buildings during daytime hours to aggressive monitoring programs that measure and document energy consumption.

Water Conservation
DOI issued policy in FY 2000 requesting bureaus to develop a water consumption baseline, and identify facilities where water conservation Best Management Practices have been implemented. In FY 2001, meetings were held to discuss water conservation and stress the importance of the initiative.

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H. DEPARTMENT OF JUSTICE (DOJ)

Management and Administration

The Assistant Attorney General for Administration is the Senior Energy Official for the Department of Justice (DOJ). Members of the DOJ Energy Team represent the facilities and administrative, procurement, budget, finance, and personnel sections of the agency.

Management Tools

Awards

DOJ employees are nominated for the Federal Energy and Water Management Awards and are recognized within the agency for outstanding performance. DOJ also plans to implement a combined Energy and Environmental Awards program during FY 2002 to recognize excellence in these areas.

Performance Evaluations

The performance evaluation of the DOJ Energy Program Manager includes performance measures for the successful implementation of Executive Order 13123. DOJ is considering expanding this element to other energy team members and appropriate employees. Performance evaluations for the in-house engineering staff of the Federal Bureau of Investigations (FBI) also include performance measures for energy management.

Training

DOJ conducts meetings with its bureaus to disseminate energy information and provides direction and assistance to the bureaus to meet energy efficiency goals and requirements. Energy conservation remains an important topic at the Facilities Management training courses and at the National Facilities Managers Conference.

Showcase Facilities

Due to the nature of the Bureau of Prisons (BOP) mission and security requirements, it is not feasible to designate prisons as Showcase facilities. The BOP complies with national model codes for construction and mandates the use of life-cycle costing in the selection of energy consuming systems. Security issues also preclude the FBI from obtaining the designation for its facilities. The DOJ strives to designate at least one showcase facility annually. Potential candidates include the Batavia, New York, Federal Detention Facility, built with energy efficient materials and equipment, the Krome Service Processing Center in Florida, and the Border Patrol Station in Remey, Puerto Rico, both currently in the design phase. When built, these two facilities will incorporate energy efficient materials and incorporate the use of solar energy.

Energy Efficiency Performance

Standard Buildings

In FY 2001, DOJ reported a 39.5 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot. DOJ received credit for purchases of 4.0 billion Btu of renewable energy. This lowered the energy intensity of its standard buildings from 178,179 Btu/GSF to 178,105 Btu/GSF.

Increases in energy consumption as compared to FY 2000 are primarily due to the addition of over 10,000 inmates into the Federal prison system during FY 2001, and the addition of six additional Federal prison facilities to the existing inventory, a direct result of the assimilation of the District of Columbia prison population into the Federal prison system.

Industrial and Laboratory Facilities

DOJ's industrial and laboratory facilities are large data centers, FBI labs, the FBI Headquarters facility, and the FBI training facility in Quantico, Virginia. The facilities operate 24 hours per day, 365 days per year. Several energy efficiency projects have been undertaken at these locations to improve HVAC systems, lighting, and electrical distribution. New data centers have been constructed using energy efficient equipment and construction materials. Future plans include the consolidation of two data centers into a new energy efficient complex, relocation of FBI laboratories into a newly constructed energy efficient facility, and involvement in the Laboratories for the 21st Century program.

Greenhouse Gas Reduction Goal

Energy use in DOJ facilities resulted in emissions of 319,104 metric tons of carbon equivalent (MTCE) in FY 2001, a 111.3 percent increase versus data reported for the FY 1990 baseline year. DOJ was credited 142.5 MTCE for purchases of renewable thermal energy made during the year.

Renewable Energy

Self-Generated Renewable Energy

The Federal Correctional Institute (FCI) in Phoenix, Arizona, uses solar energy for water heating. The project was accomplished through an Energy savings performance contract in FY 1999, and plans to expand the contract are underway. The BOP is also working on using the contracting tool for a solar water system at the FCI in La Tuna, Texas, and for a solar water-heating

system and wind generation projects at the FCIs in Englewood, Colorado, and Victorville, California.

Purchased Renewable Energy
BOP has contracted with a local utility company to use the landfill methane gas resource located at the Federal Prison Camp in Allenwood, Pennsylvania. The project is expected to become operational in FY 2002.

Petroleum
The DOJ has several projects underway to reduce the use of petroleum in its facilities. The BOP has a solar hot water system at the FCI in Phoenix, Arizona. The FBI is converting its central heating and cooling plant at Quantico, Virginia, from fuel oil to natural gas, and the INS is implementing a geothermal heat pump project in its U.S. Virgin Islands facility.

The BOP is continuing efforts to reduce the use of petroleum within its facilities by using alternative fuels where applicable. The use of life-cycle cost analysis has also limited the use of petroleum-based fuels where it is not the most cost-effective option.

Water Conservation
The BOP has completed a total of 80 energy and water conservation surveys of its facilities. Many of the water conservation opportunities identified can be implemented as extensions of regular maintenance programs.

Implementation Strategies

Life-Cycle Cost Analysis
The BOP has a policy in place mandating the use of life-cycle cost (LCC) analysis. LCC analyses are conducted on all projects involving replacement of major energy-consuming equipment, new construction, renovation, and expansion.

Facility Energy Audits
The BOP conducted three energy audits in FY 2001, and has audited 80 percent of its facilities to-date. Audits have resulted in requests for funding and the establishment of energy conservation projects. DOJ audits are primarily focused on addressing energy conservation in older facilities.

The FBI uses its in-house engineering staff to conduct energy conservation surveys. Each facility is reviewed for energy saving projects, and those with the best investment-to-payback return are given the highest priority. As a result of an audit by GSA at the J. Edgar Hoover Building (JEH) in Washington, DC, a new energy management system is being designed which includes automated controls and sensors and new chillers.

Financing Mechanisms
The BOP has taken part in rebate programs and utility incentives to complete energy conservation projects. The cost savings from the efforts allow for the funding of additional projects. The BOP is working with DOE and the local utility company on a utility energy savings contract (UESC) at the FCI in Englewood, Colorado, and is reviewing additional sites for other potential UESC projects.

The BOP entered into an ESPC in FY 1996 at the FCI in Phoenix, Arizona. The delivery order provided for the installation of a solar energy system that will supply a large percentage of the hot water for the facility. The BOP is evaluating the potential to replicate this type of project in additional facilities. ESPCs are also being considered for the FCI in La Tuna, Texas, and the FCI in Victorville, California.

ENERGY STAR® and Other Energy-Efficient Products
DOJ procurement officials purchase ENERGY STAR® products whenever available.

ENERGY STAR® Buildings
The INS has plans to designate an ENERGY STAR® building during FY 2002.

Sustainable Building Design
DOJ bureaus incorporate sustainable design principles into new design and construction projects.

Energy Efficiency in Lease Provisions
The GSA model lease provisions are used by DOJ in new leases and renewals.

Water Conservation
DOJ plans to increase its emphasis on implementing Best Management Practices to reduce water consumption at DOJ facilities nationwide.

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I. DEPARTMENT OF LABOR (DOL)

Management and Administration
The Department of Labor (DOL) Senior Energy Official is the Assistant Secretary for Administration and Management.

DOL's energy team includes representatives from the larger DOL agencies, including the Occupational Health and Safety Administration, the Employment Standards Administration, the Employment and Training Administration, Job Corps, the Bureau of Labor Statistics, and the Mine Safety and Health Administration. The energy team is divided into work groups to focus on four areas - Outreach, Awards, and Education; Fleet Management; Facilities Management; and Procurement. The team works toward improving the use of energy management tools at DOL and sharing information on energy management across the agency.

Management Tools

Awards
DOL participates in the Federal Energy and Water Management Awards, and received an award in FY 2001 for exceptional accomplishments in the efficient use of energy in the federal sector. The energy team also created the DOL Energy Award, to be presented at the Secretary of Labor's annual awards ceremony, to individuals or groups who have made a significant contribution to energy conservation at DOL.

Performance Evaluations
Performance measures pertaining to energy conservation efforts will be included in Energy Team members' and DOL management performance evaluations.

Training
Training in energy management is available to all appropriate DOL personnel. Employees attend conferences, symposia, and participate in DOE/FEMP training opportunities.

DOL has several employee education programs in place. Energy Savings posters have been posted throughout the Frances Perkins Building (FPB) in Washington, D.C. An all-employee email was sent out, enlisting employee support in energy conservation and listing energy saving tips for offices. During Energy Awareness Month, energy conservation activities were conducted, with an energy information exhibit in the FPB lobby, banners and posters displayed, and other activities.

Showcase Facilities
In FY 2001, the Potomac Job Corps Center (JCC) in Washington, DC, was identified as a potential Showcase facility. The center is being evaluated for a geothermal heat pump system, which has the potential to save approximately $520,000 during the life of the project, with a nine-year payback period.

Energy Efficiency Performance

Standard Buildings
In FY 2001, DOL reported a 10.9 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot.

Renewable Energy

Self-Generated Renewable Energy
In FY 2001, the Job Corps, using SAVEnergy audits, identified four projects that involve installation of solar water heaters and a geothermal heat pump. The projects are being evaluated for implementation in FY 2002.

Petroleum
Many JCCs have converted from fuel oil heating systems to propane as buildings have been modernized and building square footage increased. Use of propane has increased 126 percent since FY 1985, while use of fuel oil has decreased 60 percent. In FY 2001, DOL used 425,000 gallons of propane and 1.2 million gallons of fuel oil.

Water Conservation
In FY 2001, the JCCs consumed 1.2 million gallons of water, at a cost of $3 million. A baseline for water consumption was established with quarterly water and energy consumption data from the centers. In facilities without metering, consumption is determined based on gross square footage.

Implementation Strategies

Life-Cycle Cost Analysis
Life-cycle cost analysis is required for all JCC construction projects. All design scopes of work are reviewed for compliance with Executive Order 13123.

Facility Energy Audits
Fifteen SAVEnergy audits were conducted in FY 2001, representing 16 percent of JCCs nationwide. Since FY 1992, 45 percent of JCCs have been audited. Facility energy audits are completed using SAVEnergy audits,

GSA Area-Wide Contracts, and through Energy savings performance contracts (ESPCs).

Financing Mechanisms
DOL has used ESPCs for energy retrofit projects at a number of JCCs, now in various stages of implementation.

Job Corps initiated a GSA Area-Wide contract with the Southern Company to finance energy efficiency projects at three JCC facilities, including leased facilities.

ENERGY STAR® and Other Energy-Efficient Products
Energy efficient product procurement has been a DOL priority for a number of years. In 1994, the Secretary of Labor ordered the establishment of a cost-effective procurement preference program. In 1999, DOL partnered with GSA in the Planet GSA initiative to promote environmentally responsible procurement, sustainable design principles, and other energy efficiency measures.

DOL complies with all federal procurement requirements. All new purchases of computers and peripherals are ENERGY STAR® compliant.

The DOL energy team procurement work group is updating a guide on purchasing energy efficient equipment, which will be widely distributed upon its completion.

Sustainable Building Design
DOL has incorporated sustainable building design standards into design scopes of work issued for construction and renovation projects at JCC facilities.

Highly Efficient Systems
DOL mandates that all energy and water conservation products purchased for a construction project be in the upper 25 percent of energy efficiency where cost-effective.

Electrical Load Reduction Measures
DOL has resumed its participation in Pepco's Curtailable Load Program at the FPB. Under this program, participants receive summer monthly bill credits for reducing electricity demand. The program helps to ensure electricity supply, conserves electricity, and helps to keep electricity prices low.

Because JCC buildings are relatively small and are typically used for education, residences, and administrative support, the SAVEnergy audits identified no opportunities for implementing load reduction measures at these facilities.

Water Conservation
Design and construction projects at JCC facilities are required to use low flow fixtures. Provisions for water conservation have been incorporated into DOL design scopes of work.

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J. DEPARTMENT OF STATE

Management and Administration
The Department of State (State) has designated the Assistant Secretary for Administration as the Senior Energy Official, who is responsible for ensuring effective integration of energy and water conservation measures in State activities and initiatives.

The Deputy Assistant Secretary, Office of Operations, the Director of the Office of Overseas Buildings Operations, and a team of specialists in procurement, legal, budget, management, and technical areas assist the Senior Energy Official. They expedite and encourage the use of appropriations, alternative financing mechanisms, and other initiatives to advance compliance with Executive Order 13123.

Management Tools

Awards
State uses several employee incentive programs to reward exceptional performance in implementing Executive Order 13123. Financial awards include the Extra Mile, Franklin Awards, and awards given in conjunction with performance evaluations.

Performance Evaluations
Position descriptions of employees with responsibilities for energy conservation include requirements for implementing strategies designed to meet the goals of this order, i.e., the use of alternative financing, sustainable design, and energy efficient procurement. The performance evaluations of these employees include assessments of their activities in these areas.

Training
State employees are encouraged and receive appropriate training for implementing Executive Order 13123. In the past three years, 37 employees in the Office of Foreign Buildings Operations (FBO) received energy conservation training through a five-day course offered by the Association of Energy Engineers.

Showcase Facilities
State has two Showcase facilities. The first is the National Foreign Affairs Training Center (NFATC), Arlington, Virginia. The facility uses energy efficient lighting, variable speed drives, motion sensors, and daylighting schemes. Future projects include installation of a natural gas pumping station for fleet vehicles and humidification units to improve the efficiency of air conditioning and heating. The second Showcase facility, the Florida Regional Center, Oakland Park, Florida, uses photovoltaic cells to power the parking lot and exterior building lighting. In addition, a solar trough supplies hot water.

In addition, the Berlin Model Energy House (MEH) will demonstrate increased energy performance, reduced operating costs, and reductions in environmental impact associated with energy consumption. The MEH is intended to be occupied by the Facilities Maintenance Manager and be available for inspection to the American Foreign Service Officers and their families.

Energy Efficiency Performance

Standard Buildings
In FY 2001, State reported a 0.9 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot. State attributes some of the increase to an increase in square footage due to acquisition.

Exempt Facilities
State has classified the Harry S Truman (Main State) Building, Beltsville Information Center (BIMC), Blair House, Columbia Plaza, International Chancery Center, and Potomac Lot as exempt facilities. All facilities, except for the Harry S Truman Building, will be classified as standard facilities in FY 2002.

All overseas facilities are also classified as exempt. In FY 2001, 291 energy conservation measures were implemented at 50 posts worldwide, a total investment of $5.1 million for energy measures.

Renewable Energy

Self-Generated Renewable Energy
The photovoltaic array and solar trough at the Florida Regional Center generate approximately 159 million Btu per year for lighting and hot water heating use.

Million Solar Roofs
The Foreign Buildings Office has identified a total of 1,285 solar panels in use at foreign posts. In FY 2001, solar domestic water heaters were installed in several posts throughout India. A pool cover in Quito, Ecuador, and solar water heaters in Port Louis, Mauritius, were also implemented.

Water Conservation
State has installed water saving devices and curtailed exterior watering for plants, grass, and shrubbery in facilities.

In its overseas facilities, recording water consumption has been problematic for State because of lack of available consumption data, use of un-metered well water, and because of the use of significant amounts of unmeasured bottled water and trucked water.

Implementation Strategies

Life-Cycle Cost Analysis
Life-Cycle Cost (LCC) analysis is used by State when evaluating potential energy projects and replacement of equipment worldwide.

Facility Energy Audits
In FY 2001, State performed comprehensive energy management surveys at the Florida Regional Center, Florida, and the BIMC, Maryland, a total of more than 295,000 square feet. The FBO performed energy surveys at the U.S. Embassies in Djibouti, Mozambique, and Hungary, approximately 497,000 square feet.

Financing Mechanisms
State has awarded three energy savings performance contracts (ESPCs). The first ESPC delivery order was for the Electronic Relamping Project at the Main State (Harry S Truman Building) facility, begun in FY 1996. The last task order of the ESPC was completed in November 2001.

The second ESPC, the Beltsville Information Management ESPC, was completed in FY 2000 with the operational activation of the heat exchange project for reclaiming heat from the A/C unit for winter heating.

The third ESPC, at the NFATC, was also completed in FY 2000. The project replaced every lighting fixture in the complex and upgraded HVAC systems by installing variable speed controllers on air handler motors and integrating communication to an energy management control system.

Two ESPCs have also been implemented in overseas posts, including the upgrade of HVAC systems at embassy facilities in Mexico City, Mexico, and a geothermal heat pump project under construction in Seoul, Korea. The geothermal heat pump will supply heating and cooling to 158 residences, for a capital cost of $5.7 million, and with annual savings of more than 696 megawatthours of electricity per year.

ENERGY STAR® and Other Energy-Efficient Products
State has distributed catalogs of ENERGY STAR® and other energy efficient products to purchasing personnel.

ENERGY STAR® Buildings
State pursues design and construction methods that result in energy efficient facilities, including meeting the environmental criteria consistent with the ENERGY STAR® program.

State has undertaken an effort to increase awareness and knowledge of energy efficiency options and benefits withing FBO and the design community. The effort is aimed at developing expertise within FBO and its architects/engineers, through promotion of successful projects.

Sustainable Building Design
State encourages the adoption of sustainable building practices through training staff in the use of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Building Rating System as a framework for sustainability analysis, developing sustainability standards for projects, and providing opportunities for vendors of sustainable products to present their products to State personnel.

In FY 2001, LEED sustainability training was provided for three several overseas posts.

Energy Efficiency in Lease Provisions
State leases are secured through the General Services Administration, which considers energy and water efficiency factors when procuring space.

Electrical Load Reduction Measures
All State facilities have developed plans for 10, 20, and 30 percent electrical load reduction in accordance with the President's May 3, 2001, Memorandum for Energy Conservation at Federal Facilities.

Water Conservation
Water saver wash basin fixtures, automatic urinal flushing devices, and other water-saving devices have been installed in State facilities in the United States and abroad.

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K. DEPARTMENT OF TRANSPORTATION (DOT)

Management and Administration

The U.S. Department of Transportation (DOT) is organized into 11 operating administrations, with 7 that operate facilities and the Transportation Administrative Service Center (TASC), which manages the headquarters building. Each of these operating administrations has active energy and water management programs.

The Assistant Secretary for Administration is the designated Senior Agency Official responsible for implementation of energy and environmental requirements at DOT.

DOT established a technical support team at the headquarters level to assist the operating administrations in implementing the requirements of NECPA and Executive Order 13123. The team consists of the DOT energy manager and procurement policy, budget operations, and general counsel representatives. Each of the operating administrations has also developed similar structures within their organizations.

Management Tools

Awards

Within DOT, incentive awards are used widely to reward conscientious and innovative energy management activities. Each year the Federal Aviation Administration (FAA) awards an Administrator's Environmental Excellence Award. In FY 2001, the National Energy Program Manager received an award for Excellence in Resource Conservation.

At the FAA's Aeronautical Center, letters of appreciation and certificates are given to employees for noteworthy contributions to energy management. In addition, two DOT employees received "You Have the Power" awards in FY 2001, in recognition of their exemplary contributions.

Performance Evaluations

DOT's operating administrations require the addition of energy and environmental responsibilities to management position descriptions as they are updated. FAA's Air Traffic Service is preparing an energy conservation performance goal for inclusion in the Airway Facilities Senior Executives Performance Agreements.

Training

With limited training and travel funds available, DOT relies heavily on training opportunities offered by DOE, the General Services Administration (GSA), and the Department of Defense. FAA's Air Traffic Service developed, hosted, and funded a national training workshop in FY 2001 for all Resource Efficiency Managers, held in conjunction with the Energy 2001 conference.

Energy conservation awareness is continuously promoted by the energy manager at the Aeronautical Center, with the aid of workshop materials from the Association of Energy Engineers, FEMP teleworkshops, and other energy management information from the FEMP website.

Showcase Facilities

The U.S. Coast Guard (USCG) Air Station Cape Cod, Massachusetts, was selected as a showcase facility in FY 2001. In coordination with the Coast Guard Research and Development Center, as well as industry and regional governments, Air Station Cape Cod has developed a fuel cell system designed to provide premium electrical power and heat production. The 250-kilowatt molten carbonate fuel cell will reduce emissions and eliminate the potential of spilled oil, reduce fuel use and maintenance requirements.

Energy Efficiency Performance

Standard Buildings

In FY 2001, DOT reported a 25.0 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot. Increases in fuel oil and natural gas account for increases versus the FY 2000 consumption. In addition, reporting anomalies are also likely to be responsible for the increase, as data collection remains problematic.

Exempt Facilities

DOT exempts FAA mission critical electronic systems for air traffic control within the continental United States. DOT performs energy and water audits and implements cost effective conservation projects in these facilities.

Tactical Vehicle and Equipment Fuel Use

Jet fuel used by the USCG and FAA represents the majority of vehicle and equipment consumption for DOT. Consumption levels are highly dependent on mission requirements and efficiency of the fleet. Significant energy reductions have been made through improved operations such as combining missions and training flights. Future reductions will be made through equipment replacement and modernization.

In FY 2001, the USCG reported a 30 percent reduction in diesel fuel used in cutters, due to strict conservation measures and more accurate reporting techniques. The USCG Research & Development Center (R&D Center) is also developing software that will provide real-time fuel mapping to cutter Engineering Officers, and recommendations on reducing fuel consumption through adjustments to throttle and propeller pitch. As a result of a study by the R&D Center, the USCG switched from two-cycle to four-cycle outboard motors for its small boats, resulting in a reduction of approximately 30 percent in gasoline use.

Greenhouse Gas Reduction Goal
Energy use in DOT facilities resulted in carbon emissions of 123,816 metric tons of carbon equivalent (MTCE) in FY 2001, a 17.3 percent increase versus data reported for the FY 1990 baseline year.

Renewable Energy

Self-Generated Renewable Energy
The FAA generated approximately 800 million Btu of renewable energy in FY 2001 from a combination of solar and wind power generation projects. Self-generated renewable energy increased approximately 12.5 percent from FY 2000.

Approximately 96 percent of the lighted buoys and 91 percent of the lighted fixed aids to navigation maintained by the USCG are powered by a solar panel/battery combination. The USCG has also installed 60 solar hot water systems in family housing units in Honolulu, Hawaii. The St. Lawrence Seaway Development Corporation uses solar power for all its fixed and floating aids to navigation.

Purchased Renewable Energy
DOT policy is to use renewable energy sources whenever economically practical. However, opportunities for the purchase of competitive renewable energy at DOT facilities remain limited.

Million Solar Roofs
FAA has 40 remote solar units and the USCG has 60 solar hot water units in operation.

Petroleum
In FY 2001, DOT used 6.6 million gallons of fuel oil, 68 percent less than in FY 1985, and 145,100 gallons of LPG, 53 percent less than levels reported in FY 1985. Since 1985, many DOT facilities have switched from using petroleum fuels to natural gas for heating due to its better efficiency and lower cost.

Water Conservation
Accurate water consumption data has been difficult to develop for the FAA and USCG. In large part, this is due to the wide variation in units of measure used by water authorities, and the lack of metering at some locations. DOT attempts to develop a baseline consumption figure have been hampered by similar issues.

Implementation Strategies

Life-Cycle Cost Analysis
Life-cycle cost (LCC) analysis is formalized in DOT's Transportation Acquisition Manual (TAM). Each of the operating administrations has requirements for LCC analysis in alteration, construction, and procurement of energy-consuming equipment. Employees also use the National Institute of Standards and Technology's LCC materials and software. FAA's Mike Monroney Aeronautical Center has a complete staff of licensed architects and professional engineers trained to provide design and construction services in accordance with Executive Order 13123 and other mandates.

Facility Energy Audits
Approximately 80 percent of DOT facility square footage had been audited by the end of FY 2001. DOT first audited large facilities, and is now auditing smaller facilities. This method is resulting in a lower percentage of square footage completed each year.

Financing Mechanisms
In FY 2001, the Maritime Administration entered into a Super-Energy Savings Performance Contract (ESPC) at the Merchant Marine Academy. The delivery order includes $4 million in capital improvements that will result in significant energy savings.

The USCG obligated $1.5 million in FY 2001 towards the USCG Facility Energy Efficiency Fund (FEEF) projects. FEEF projects are low-cost, high return-on-investment facility retrofits. The USCG also obligated $1.8 million in Civil Engineering funding and $6 million in Operational Expense funding for energy efficiency improvement projects. The USCG also provides a financial rebate equal to the amount of energy savings to units that have saved energy through their own initiatives.

ENERGY STAR® and Other Energy-Efficient Products
DOT's TAM requires the purchase of products in the top 25 percent of efficiency. Energy efficiency criteria have been incorporated into the FAA In-Service Master Specification for new systems. Other national systems that were reviewed in FY 2001 to include energy

efficiency procurement criteria were the Sustained Power Systems, Stand Alone Towers, and the National Air Space Subsystem Initial Requirements Checklist.

Sustainable Building Design
All new FAA buildings are designed to exceed the requirements for ENERGY STAR® building certification. One such building recently completed is the new Western-Pacific Region's Honolulu Combined Facility in Hawaii.

Energy Efficiency in Lease Provisions
DOT has been working with GSA to incorporate energy efficiency and sustainable design principles into the lease for the new DOT headquarters facility. The FAA's Air Traffic Service Energy Program Office has also been working with the GSA Center for Excellence to ensure that space designed, built, or leased from GSA meet the high efficiency standards of ENERGY STAR® buildings.

Off-Grid Generation
In FY 2001, the FAA installed 3.5 kilowatts of photovoltaic panels and 800 watts of wind turbine power at remote communications facilities in the Western-Pacific Region. One facility uses a photovoltaic and wind turbine hybrid system to primary power, with excess power sold through net metering. The USCG's facility in Rio Vista, California, has begun implementation of a wind turbine generating system that will replace the present electrical energy used for housing and business units.

Electrical Load Reduction Measures
The USCG regional headquarters in Alameda, California, the largest agency facility in the state, has taken an active role in preparing load reduction measures to provide grid relief during Stage 2 and Stage 3 alerts. This involved the development of load reduction procedures for its own location, as well as assisting other California facilities prepare responses. Attention is given to protect the mission execution ability, while providing vital grid relief.

Water Conservation
DOT will be developing a method for collecting water consumption data in FY 2002. The USCG has begun monitoring water consumption. In FY 2002, FAA will undertake an initiative to add water management under the national Energy Management Reporting System, which will enable the agency to monitor savings from water conservation more accurately.

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L. DEPARTMENT OF THE TREASURY (TRSY)

Management and Administration

The Department of the Treasury's Senior Agency Official is the Assistant Secretary for Management and Chief Information Officer. Each of the Treasury bureaus has designated a Senior Bureau Energy Official to direct its energy program. The Senior Energy Official and Bureau Officials provide the policy guidance for meeting the goals of Executive Order 13123.

The members of the departmental-level energy teams include staff from the procurement, legal, budget, management, and technical sections of Treasury. Additionally, several of the bureaus have formed teams. The teams are addressing budgeting for energy projects, designing awards programs, and preparing performance plans.

Management Tools

Awards

Treasury uses its existing performance awards system to recognize employees for energy management achievements, and plans to develop an annual Treasury Energy Management Award in FY 2002. Treasury bureaus will also develop annual awards. The Bureau of Engraving and Printing (BEP) and the U.S. Mint (Mint) use gainsharing programs to award cash to individuals for energy savings.

Performance Evaluations

Treasury energy managers have an energy management element in their performance criteria, and Treasury is examining the implementation of similar performance measures for upper management.

Training

In FY 2001, Treasury trained 20 employees in energy management. Treasury used a Department of Energy contractor to conduct an energy management course aimed at industrial operations. Treasury also took advantage of FEMP course offerings whenever available. Energy training and efficient product links have been added to the Office of Procurement's and the Office of Asset Management's web sites to assist the bureaus with their energy issues. Treasury is an active participant in the DOE's "You Have the Power" energy awareness campaign. The materials from the program support the Department's Earth Day, load reduction, and Energy Awareness Month efforts.

Showcase Facilities

The BEP Washington, DC facility was designated a Showcase building in FY 2001. The facility was recognized for its installation of energy efficient cooling towers and a carbon fluidized bed concentrator/thermal oxidizer emission control system.

Energy Efficiency Performance

Standard Buildings

In FY 2001, Treasury reported a 11.1 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot.

During FY 2000, Treasury occupied approximately 46 million square feet of space, the majority of which was in General Services Administration (GSA) facilities. In FY 2001, Treasury reported consumption for 6.5 million square feet in the standard building category.

Treasury managed approximately 2.0 million square feet of space for the Internal Revenue Service (IRS), the Bureau of the Public Debt (BPD), and the Financial Management Service (FMS) under the GSA Buildings Delegations Program. IRS occupied the majority of delegated space for standard buildings.

Treasury-owned or leased standard buildings consisted of 4.5 million square feet of space in the Main Treasury and Annex buildings, the Federal Law Enforcement Training Center (FLETC), the Office of Thrift Supervision (OTS), the U.S. Customs Service, and the U.S. Secret Service (USSS).

In FY 2001, all of the IRS Service Centers were reclassified from standard buildings to energy intensive facilities, resulting in significant changes to energy consumption levels for the FY 2001 report. Treasury worked with GSA and DOE/FEMP staff to recalculate a new base year for both categories.

Energy efficiency measures taken by Treasury during FY 2001 include:

- The BPD completed installation of automated controls on their HVAC system.
- Renovations to the Main Treasury Building were continued with the installation of energy-efficient windows and lighting.
- FLETC retrofitted several buildings with energy efficient lighting and windows and installed a new energy-efficient chilled water system for six buildings with an interface to the existing system. Energy efficient lighting was retrofitted in 11

townhouses. Additionally, FLETC eliminated lighting in 47 vending machines, saving $3,200 annually.

- GSA installed two 130-ton screw-type chillers for building cooling, new pumps and new cooling towers in FMS's Liberty Loan building.

Industrial and Laboratory Facilities
Treasury reports energy consumption for 8.9 million square feet of industrial space. A total of 5.7 million square feet of space for the IRS was managed directly by Treasury under the GSA Buildings Delegations Program. The remaining 3.2 million square feet of space belongs to the BEP, the Mint, and the USSS. As of FY 2001, Treasury's industrial facilities have achieved a 6.1 percent reduction in consumption over their FY 1990 baseline on a Btu per square foot basis.

The BEP received an industrial audit through DOE's Office of Industrial Technology. The audit identified opportunities for more than 46.0 billion Btu per year savings, annual savings of approximately $725,900. BEP plans to self-fund these projects through its revolving fund, at a total cost of $485,200. BEP also replaced two air compressors resulting in an annual cost savings of $107,000. On a production unit basis, BEP reported a 37.1 percent reduction in consumption compared to the 1990 base year.

All IRS delegated sites have established in-depth Energy Management and Conservation Plans. The IRS Austin Service Center used an energy savings performance contract (ESPC) to replace 35 direct expansion computer room air conditioning units with 23 chilled water units, install an energy efficient 600-ton centrifugal chiller, and replace pneumatic controls with direct digital controls.

The USSS is implementing a lighting upgrade at its Beltsville, Maryland, Computer Center. Additionally, a significant amount of computer equipment is being replaced with fewer, smaller units reducing the electric and cooling loads.

Greenhouse Gas Reduction Goal
Energy use in Treasury facilities resulted in emissions of 99,432 metric tons of carbon equivalent (MTCE) in FY 2001, a 26.2 percent increase versus data reported for the FY 1990 baseline year.

Renewable Energy
Purchased Renewable Energy
The U.S. Mint has agreed to purchase 1,500 megawatthours of wind power for the Denver, Colorado, facility, beginning in FY 2002. The IRS's Andover, Massacusetts, facility, and the Philadelphia Mint facilities are participating in GSA's load aggregation for an area-wide energy contract that requires a percentage of power be supplied from green sources.

Petroleum
The IRS's Andover, Massachusetts, Service Center completed conversion of its low-pressure steam boilers from oil to natural gas. The new burners are 15 percent more efficient.

Water Conservation
BEP is examining recycling water wipe solution for printing presses. Through this measure, there is the potential of an up to 95 percent reduction in water use - up to 100,000 gallons per day. A pilot scale system will be tested in FY 2002. BEP renovated its restrooms and installed water-conserving fixtures. The USSS is installing motion-sensor water faucets in all new buildings and in several older buildings at its training center. A 25 percent reduction in water consumption is expected as a result. The Mint reported implementing water conservation measures that are saving 3 million gallons of water annually.

Implementation Strategies

Life-Cycle Cost Analysis
Treasury's revised energy directive specifically requires the use of life-cycle cost analysis for all energy projects and procurements.

Facility Energy Audits
In FY 2001, Treasury performed energy audits in 12 percent of its space. This brings the total space audited to 90 percent since 1992. In June 2001, San Francisco Mint facilities had an industrial audit conducted under a FEMP initiative.

Financing Mechanisms
In FY 2001, Treasury entered into one ESPC and one Utility Energy Services Contract (UESC). Five alternatively-financed projects have been completed since 1997. The three non-appropriated Treasury bureaus continue to self-fund their projects.

After the Southern Company audited 100 percent of the Glynco, GA, facility, FLETC entered into a UESC with Georgia Power using the GSA Area-Wide Contract. The contract includes lighting upgrades in 30 buildings, installation of programmable thermostats, replacement of inefficient motors, and installation of direct digital controls.

ENERGY STAR® and Other Energy-Efficient Products
Treasury has a policy of purchasing only ENERGY STAR®-compliant computers. Treasury also purchases ENERGY STAR® copiers and fax machines, and follows the product recommendations in DOE's Energy Efficient Products Guide. Links to web sites with information about energy efficient product procurement have been added to the Office of Asset Management and Office of Procurement web sites to assist the bureaus obtain information of energy efficient products.

ENERGY STAR® Buildings
Treasury applied for ENERGY STAR® certification of the Firearms Instructors Building at the USSS Training Center in Beltsville, Maryland. The Financial Management Service (FMS) Liberty Loan Building in Washington, DC, is under evaluation for ENERGY STAR® designation.

Sustainable Building Design
Treasury has mandated use of the Whole Building Design Guide for its new facilities. The new Alcohol, Tobacco, and Firearms Headquarters building is being designed following sustainable design principles.

Energy Efficiency in Lease Provisions
Treasury has provided the model green lease provisions to each of its bureaus. Bureaus are encouraged to follow the provisions when leasing facilities, and ensure that GSA follows them when obtaining space for the bureau.

Industrial Facility Efficiency Improvements
The BEP replaced two air compressors with highly efficient air compressors, and increased the insulation rating through a roof renovation. The IRS Austin Service Center replaced old air conditioning units with new chilled water units, installed a 600-ton centrifugal chiller, and upgraded to direct digital controls.

Electrical Load Reduction Measures
Every Treasury-owned or fully delegated facility developed and implemented an electrical load reduction plan based on DOE's "Plan of Action Energy Conservation at Federal Facilities" and the load reduction measures listed on the FEMP web site. Several bureaus in leased space implemented plans and awareness campaigns. Two California facilities received DOE audits to identify additional measures that could be implemented. Peak demand reduction and conservation awareness materials from the FEMP "You Have the Power" campaign were distributed across Treasury. Copies of the individual bureau plans were submitted to DOE in June of 2001. All Treasury bureau facilities participated in local utility company load reduction programs.

Water Conservation
New Treasury Directive mandates address the water goals of Executive Order 13123. The USSS has specified motion sensor faucets for all new construction at its Beltsville, Maryland, Training Center.

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M. DEPARTMENT OF VETERANS AFFAIRS (VA)

Management and Administration
The Under Secretary for Health serves as the Senior Energy Official for the Department of Veterans Affairs (VA). The agency's energy team is composed of representatives from the technical, legal, procurement, and budget sections.

Management Tools

Awards
VA initiated an Employee Incentive Awards Program in 1975, and since that time has recognized individuals and Medical Centers for their energy savings efforts. VA also participates in the Medical Center Director, Veterans Integrated Service Network (VISN) Director and/or Secretary of the VA Energy Conservation Awards, and the DOE/FEMP Federal Energy and Water Management Awards.

Performance Evaluations
VA includes energy conservation achievements in performance evaluations for its energy engineers. The chief of engineering service at the Medical Centers is responsible for overall energy management, and performance evaluations are based on implementation of Executive Order 13123.

Training
VA developed a handbook that consolidated energy conservation methods, concepts, and evaluation procedures used by facility engineers. VA compiled the most effective technology and energy conservation opportunities to transfer the knowledge in a concise, usable format.

VA has conducted many regional workshops and teleconferences. Engineering staff also participate in training offered by the Association of Energy Engineers in cooperation with DOE. In FY 2001, staff also participated in energy savings performance contract (ESPC) training courses.

VA also has an energy awareness program which educates employees on energy conservation measures throughout the year.

Energy Efficiency Performance

Standard Buildings
In FY 2001, VA reported a 13.0 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot. During FY 2001, electrical consumption increased as a result of the installation of information technology equipment and state-of-the-art medical equipment.

Tactical Vehicle and Equipment Fuel Use
In FY 2001, VA reported consumption of 5.0 million gallons of auto gasoline and 1.1 million gallons of diesel fuel for its vehicles and equipment.

Greenhouse Gas Reduction Goal
Energy use in VA facilities resulted in emissions of 758,450 metric tons of carbon equivalent (MTCE) in FY 2001, a 14.0 percent increase versus data reported for the FY 1990 baseline year.

Renewable Energy

Self-Generated Renewable Energy
VA has several solar hot water heating systems operating at medical center facilities.

Petroleum
VA reported fuel oil use in FY 2001 of 21.8 million gallons, an increase of 40 percent versus FY 1985 levels. The LPG/propane use of more than 149,000 gallons was 10 percent lower than in FY 1985.

Water Conservation
VA water consumption in FY 2001 was 8.6 billion gallons, at a cost of more than $18 million. Many VA medical centers are implementing Best Management Practices to reduce water consumption, and all medical centers have been directed to work with their energy services companies to implement water conservation projects in conjunction with ESPC projects.

Implementation Strategies

Life-Cycle Cost Analysis
VA policy is to fund only projects that are cost effective based on life-cycle cost analysis. Medical Centers use the analysis tool when making decisions about products, services, construction, and other projects.

Facility Energy Audits
Most VA facilities received energy audits in the 1980s. As a result, a handbook was prepared that consolidated the energy conservation methods, concepts, and evaluation procedures for facility engineers. Medical centers that undergo major system changes or infrastructure receive new energy audits. During FY 2001, the Medical Centers that have ESPCs in place are also undergoing new energy audits as part of the contracts.

Financing Mechanisms
VA uses ESPCs to implement energy projects and has awarded many delivery orders for energy projects at facilities throughout the country. During FY 2001, VA continued to research and develop cost effective financing methods such as utility rebate programs and ESPCs for implementing energy projects.

By the end of FY 2001, most of the VISNs were in various planning stages for implementation of ESPCs. Most medical centers have used alternative financing tools such as ESPCs for implementing projects.

VA estimates that the total private investment of $138.3 million for financed projects will generate annual operating and utility cost savings of more than $21.7 million to VA during the life of the projects.

ENERGY STAR® and Other Energy-Efficient Products
VA has issued directives requesting that contracting officers, purchasing agents, purchase card holders, and other procurement officials purchase ENERGY STAR® equipment or equipment in the upper 25 percent of energy efficiency, when available. Energy efficient purchasing criteria has also been incorporated into specifications for construction projects.

ENERGY STAR® Buildings
VA currently has no ENERGY STAR® buildings, as there are currently no criteria for certifying medical facilities. However, preliminary evaluations conducted by Oak Ridge National Laboratory have shown that approximately 25 percent of VA Medical Centers may qualify as ENERGY STAR® buildings when the designation is available to medical facilities.

Sustainable Building Design
VA has integrated a "build green" strategy for its facilities in several ways, including:
- Incorporating sustainable design concepts into solicitation requirements for architect/engineering firms on all major VA projects;
- Participating in the U.S. Green Building Council, National Institutes of Building Sciences, and other organizations that promote sustainable design principles; and
- Continuously updating VA master specifications, design manuals, and design guides with sustainable design principles.

Energy Efficiency in Lease Provisions
VA incorporates energy efficiency in its lease bid packages by:
- Encouraging lease offerors to use ESPCs or utility agreements to reach the ENERGY STAR® Benchmark Score of 75;
- Stipulating that all newly constructed facilities achieve ENERGY STAR® status within one year of achieving 95 percent occupancy, and maintain that level of performance; and
- Providing lists of energy service companies qualified for ESPCs, plus additional information from FEMP on energy efficiency, renewables, and water conservation.

Highly-Efficient Systems
The VA Medical Center at Mountain Home, Tennessee, is planning to build, operate, and maintain an on-site energy center. The project will be the first privately-financed and operated energy plant on VA property, and the first using VA's unique Enhanced-Use authority. The energy center will use the most recent cogeneration technologies and provide utilities to the Medical Center and other neighboring facilities. The project will replace existing inefficient systems with high efficiency units, and enable the center to reduce its energy consumption and achieve operational cost savings of over $15 million over the term of the lease with no capital cost to VA. The project will also result in a cost avoidance of over $3 million in Major Construction funding, to be used for renovations at the research and educational facilities located at the center.

Electrical Load Reduction Measures
Most VA Medical Centers have emergency generators that have been used to shave peak electrical load, however, VA does not have a policy that mandates the use of the generators for peak shaving.

Water Conservation
VA has taken steps to promote water efficiency throughout the agency by developing water management plans and implementing Best Management Practices for water conservation. Many of the VA ESPC delivery orders for energy projects also include water conservation components.

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N. ENVIRONMENTAL PROTECTION AGENCY (EPA)

Management and Administration

The Environmental Protection Agency (EPA) has designated the Assistant Administrator for Administration and Resources Management as the agency's Senior Energy Official. The Senior Energy Official is supported by a national energy team and a national energy coordinator, located in the Sustainable Facilities Practices Branch (SFPB).

The SFPB gives full-time attention to sustainable practices, policies, and project implementation, reflecting the importance that EPA places on this issue. Key staff in the SFPB's energy team include the branch chief/team manager, national energy coordinator, an energy audit manager, two mechanical engineers, an architect, and support staff.

Management Tools

Awards

EPA is an active participant in the "You Have the Power" campaign and has recognized 20 employees as energy champions. Criteria for selection is based on an individual's effort and success in striving to conserve energy through building design and operation, real estate transactions, and overall promotion of energy-efficiency awareness.

EPA has an Agency-wide awards program. These awards are not specifically for energy management performance, but are more inclusive, addressing sustainable design and resource conservation.

In FY 2001, 13 individuals in the Facilities Management and Services Division received the highly prestigious James W. Craig Pollution Prevention Leadership Award for their work on energy conserving and sustainable facilities.

Performance Evaluations

Employees who have energy management responsibilities are evaluated annually against criteria based on the Agency's energy management principles.

Training

EPA uses several education and training programs to ensure that employees are aware of the latest technologies to increase energy efficiency.

The "Laboratories for the 21st Century" program, which grew out of a 1997 Federal laboratories conference sponsored by EPA in cooperation with the Lawrence Berkeley National Laboratory and the National Renewable Energy Laboratory, provides information on energy-efficient technology alternatives for laboratory applications and creates a forum for laboratory designers, owners, and operators to obtain up-to-date information and support for implementing energy-efficiency programs.

During 2001, Labs21 sponsored a series of one-day workshops on energy-efficient laboratory design and operations. The Labs21 Team designed the course to provide a comprehensive understanding of the opportunities to optimize energy performance of new and existing laboratories.

In FY 2001, EPA also conducted its annual three-day Buildings and Facilities conference, which all EPA facility managers attend, in Dallas, Texas. Conference attendees include facility managers from EPA-operated laboratories and General Services Administration (GSA)-operated regional offices and headquarters.

The *Energizing EPA* newsletter is distributed to all EPA facility managers and other federal agencies interested in renewable energy and energy and water efficiency activities in EPA facilities.

EPA has created a model of a "green" home and an accompanying time line tracing the 30-year history of environmental improvements since EPA's founding. Every feature in the house, from the construction materials to the furnishings, highlights specific environmental benefits that are explained with more than 100 interpretive signs. Almost one-quarter of the items feature energy-efficiency strategies, including the use of ENERGY STAR®-labeled windows, light fixtures, bulbs, appliances, and computers. EPA estimates that more than 400,000 people have visited the house.

Showcase Facilities

EPA did not designate any showcase facilities in FY 2001. Past designees include facilities in Ann Arbor, Michigan; Ada, Oklahoma; and Fort Meade, Maryland. EPA hopes to designate more laboratories as showcase facilities in the future. EPA currently has a new laboratory under construction in Region 7, Kansas City, Kansas, which was the result of a design competition that included energy efficiency and resource conservation as award criteria. Extensive energy modeling and design modifications were also made after award to improve the facility design further. This lab will be completed in FY 2003.

Energy Reduction Performance

Industrial and Laboratory Facilities
EPA has moved forward to improve energy performance in its laboratories. Pursuant to these initial efforts, EPA reduced energy consumption in its laboratories from 399,992 Btu per gross square foot per year in 1985 to 354,437 Btu per gross square foot per year in 2001—a reduction of 11.4 percent. Energy use at all 19 EPA laboratory complexes decreased by almost 1 percent from 357,414 Btu per gross square foot per year in 1990 to 354,437 Btu per gross square foot per year in 2001. EPA's energy intensity for FY 2001 was adjusted to reflect purchases of 12.5 billion Btu of renewable electricity.

Extremely high natural gas prices necessitated a switch to fuel oil at EPA's second and fourth largest laboratory complexes this past winter. Although fuel oil use resulted in significant cost savings at these labs, oil generally burns less efficiently in boilers engineered primarily for natural gas consumption, so this slowed EPA's progress in reducing energy use.

To further improve its energy performance, EPA is purchasing "green power" to reduce the emissions created from its energy use. By the end of FY 2001, the Agency was using green power for 100 percent of the electricity in two of its facilities, or 2.6 percent of the electricity used in its 19 reporting laboratories, and had agreements in place to purchase 100 percent green power at three additional facilities.

In FY 2001, EPA also proposed a $2.6 million Energy Efficiency funding initiative, to be used primarily for laboratory mechanical system upgrades, for FY 2003. If appropriated, this investment will improve the momentum of EPA's energy conservation progress.

Tactical Vehicle and Equipment Fuel Use
EPA's Compliance Strategic Plan for the Reduction of Petroleum-Based Fuels in Tactical Vehicles and Other Equipment has been developed to meet the provisions of Executive Order 13123 and provides a precise approach for achieving the fuel reduction goal.

EPA is pursuing alternatively-fueled vehicles where possible. EPA's Region 5 Office in Chicago, Illinois, and Region 6 Office in Dallas, Texas, are each leasing a Toyota Prius, a gas/electric hybrid vehicle. The Region 10 Office in Seattle, Washington, uses Compressed Natural Gas (CNG) vehicles in all applications where a sedan will serve and where fueling infrastructure exists. In FY 2001, EPA also has ordered CNG buses for use in the Washington, DC, area to transport employees between Agency buildings. These buses were expected to arrive in January 2002.

Greenhouse Gas Reduction Goal
Energy used in EPA facilities resulted in emissions of 29,673 metric tons of carbon equivalent (MTCE) in FY 2001, a 15.4 percent increase versus data reported for the FY 1990 baseline year. EPA was credited 401.2 MTCE for purchases of renewable electricity made during the year.

Renewable Energy

Self-Generated Renewable Energy
EPA has undertaken a variety of activities across the country to take advantage of self-generating sources of renewable energy:

- *Roof-top Solar Array*: In Research Triangle Park (RTP), North Carolina, EPA is installing a photovoltaic roof, one of the two largest on the East Coast, on top of its National Computer Center. The 100-kilowatt, integrated roof power system will supplement the main power utility. The system incorporates PV cells backed with insulating polystyrene foam, turning solar energy into usable power while increasing the building's thermal insulation. RTP also installed solar street lights in parking lots and along facility roadways.

- *Net Metering:* Since the end of 2000, EPA's wet laboratory in Manchester, Washington, has become the first commercial, solar-powered "net metering" project in the Northwest. Under net metering, excess electricity produced by the lab's 28 new solar panels will flow into the local utility power grid, offsetting the lab's energy costs. The new solar panels generate approximately 2 kilowatts of electricity.

- *Geothermal Heat Pump:* EPA's Ada, Oklahoma, laboratory is installing a geothermal heat pump (GHP) as part of its Energy savings performance contract (ESPC) upgrade, which will eliminate the use of natural gas and significantly lower energy consumption in the laboratory. Energy savings in excess of 50 percent are anticipated from this project, with completion scheduled for early 2002. The GHP also will be used to provide domestic hot water, eliminating the need for a boiler or cooling tower. By eliminating the need for a cooling tower, the geothermal system will reduce the lab's water consumption by more than 80 percent, and save more than 938,000 gallons of cooling tower water over the estimated life of the system.

- *Solar Water Heaters:* EPA initiated a project to install a solar hot water heater in San Francisco in July, 2001. EPA's Edison, New Jersey, lab has three solar energy water heating systems that are now the primary source of hot water in their respective facility areas.

Purchased Renewable Energy

In the summer of 1999, with assistance from GSA and DOE, the EPA laboratory in Richmond, California became the first federal building to receive 100 percent of its electricity from renewable sources. EPA signed a three-year contract with the Sacramento Municipal Utility District (SMUD) to purchase electricity generated from an existing geothermal plant and a new landfill gas plant.

The laboratory uses 1.9 million kilowatthours of electricity annually, enough to power 181 households. To ensure the power for this major purchase was truly from renewable sources, EPA required SMUD to obtain "Green-e" certification. Initially, SMUD provided 40 percent of the energy from landfill gas and 60 percent from geothermal sources, but since fall 1999, 100 percent has come from landfill gas.

Since its first green power purchase, EPA has added electricity from 100 percent renewable sources at four more labs, which brings its total use of green power to 21.8 million kilowatthours per year, or approximately 16 percent of the electricity used by its reporting laboratories. Recent green power procurement efforts at other EPA laboratories include:

- *Golden, Colorado:* The facility is purchasing 100 percent green power. The lab consumes approximately 2 million kilowatthours of electricity annually and purchases 1,685 "blocks" of 100 kilowatthours of wind power from the Xcel WindSource green pricing program. EPA procured the green power through a GSA area-wide contract. Xcel charges a premium for wind power. EPA makes up a portion of the cost of this premium through a reduced cost natural gas supply contract with GSA.

- *Manchester, Washington*: The Manchester lab is required to purchase electricity from Puget Sound Energy, which currently supplies only a small amount of renewable power generated from hydroelectric dams. Based on current market prices, the lab determined that purchasing green power from Puget Sound Energy would cost approximately 2.2 cents more per kilowatt hour, representing an additional $50,000 annually. In FY 2000, EPA procured 100 percent renewable wind power through a 10-year demonstration grant agreement with the Bonneville Environmental Foundation (BEF). BEF, working with the Bonneville Power Administration (BPA), is developing a 700-kilowatt wind turbine. The turbine, expected to be completed by the end of FY 2001, will produce approximately 2.1 million kilowatthours of electricity annually. That is enough energy to power the Manchester lab and to produce additional power to the regional electric grid. The electricity from the wind turbine will be sold into the power grid as "generic" electricity. BEF, an independent nonprofit organization promoting renewable energy, will purchase "green tags" from BPA.

- *Cincinnati, Ohio*: EPA signed a green power contract in FY 2001, for 100 percent of the electricity needs at the three main facilities in Cincinnati, Ohio. The EPA facilities have committed to purchasing more than 15 million kilowatthours of renewable energy annually for three years, with a three-year option to renew. Community Energy will supply 778,000 kilowatthours per year of wind power from a wind farm in Pennsylvania. Com Ed, in partnership with Environmental Resources Trust, will supply the remainder of the renewable energy contract with landfill gas from Illinois.

In FY 2001, the Richmond, California; Golden, Colorado; and Manchester, Washington, facilities purchased 100 percent green power. Combined, these facilities purchased 22.3 kilowatthours of renewable energy, 15.7 percent of EPA's electricity purchases for reporting labs. EPA has already surpassed DOE's voluntary goal of 5 percent green power usage in federal agencies.

Based on these green power purchases, the Agency in 2001 qualified as a Founding Partner in EPA's Green Power Partnership. EPA joins Fortune 500 companies, cities, universities, and other partners in helping to boost the market for green power in order to reduce the environmental and health risks associated with conventional power generation.

Million Solar Roofs

EPA has installed solar panels at its laboratories in Athens, Georgia; Manchester, Washington; and Edison, New Jersey. This represents 21 percent of the facilities the Agency manages. The New England Regional Laboratory in Chelmsford, Massachusetts, completed in September 2001, also includes unique solar sunshade

panels in its design. A solar wall is under construction at EPA's lab in Golden, Colorado. In addition, EPA has funded solar panels in facilities it occupies but does not manage, including its Waterside Mall facility in Washington, DC, and the Region 5 headquarters building in Chicago, Illinois.

Petroleum

In FY 2001, EPA used fuel oil in eight of its laboratories. Two of those facilities also used propane. Combined, these facilities used 812,591 gallons of fuel oil and 6,686 gallons of propane in FY 2001. The fuel number is significantly higher than in past years, because in the two facilities, located in Cincinnati, Ohio, and Fort Meade, Maryland, used a significantly higher percentage of oil in FY 2001, due to the fact that natural gas prices spiked to historically high levels in FY 2001. In FY 1990, for example, the Narragansett, Manchester, and Cincinnati facilities combined used a total of only 41,749 gallons of fuel oil. Using oil instead of natural gas in FY 2001 resulted in significant avoided costs. However, oil is generally burned less efficiently in boilers engineered primarily for natural gas consumption, so although purchasing costs went down significantly, consumption was slightly up, therefore contributing to a rise in EPA's overall Btu per gross square foot figure.

Water Conservation

In FY 2001, EPA used 190 million gallons of water in its 19 reporting laboratories. EPA expects water consumption to decrease in its facilities as ESPC improvements begin to take effect.

Implementation Strategies

Life-Cycle Cost Analysis

EPA is pursuing ESPCs and ESPC-like arrangements to achieve its energy and water reduction goals. If certain projects within an ESPC are not the most cost-effective option, but provide a much higher level of energy efficiency, bundling projects allows the ESPC package of projects to achieve the highest efficiency possible, while still ensuring cost-effectiveness.

While many LCC analysis models examine savings over a five- to 10-year time frame, EPA is investigating project savings over a 15- or 20-year time frame, since laboratories are such long-term investments. In contrast to ESPCs, these projects involve greater project-by-project decision-making and trade-offs when performing a LCC analysis. In Fort Meade, Maryland, for example, the payback period for the solid oxide fuel cell is approximately 25 years. EPA considers the reasonable life of these products and the potential for decreased energy consumption, as well as the cost of product, when making investment decisions about which projects to pursue.

Facility Energy Audits

To help identify opportunities for energy system improvements, EPA's office and laboratory facilities are regularly reviewed for their energy efficiency as part of the safety, health, and environmental management audit process.

EPA also incorporates an audit report process into the overall ESPC project evaluation process for the facilities considering energy savings performance contracts. Since 1995, 63 percent of all EPA-owned facilities have been audited.

Financing Mechanisms

In FY 2001, work continued on an ESPC worth more than $4 million that EPA awarded at its laboratory in Ada, Oklahoma. EPA expects to achieve a greater than 50 percent reduction from current energy consumption levels for each facility undergoing a comprehensive upgrade paid through an ESPC.

In FY 2001, EPA initiated work to amend its leases at its facilities in Las Vegas, Nevada, and Richmond, California. An ESPC-like upgrade is planned for the Richmond facility and will include replacing a single, oversized boiler with two smaller boilers—improving boiler operating efficiency—installing a natural gas co-generator unit to provide electricity and hot water for laboratory operations, and upgrading HVAC control systems. Construction is scheduled to start in the third quarter of FY 2002. Using different financing techniques, the lessor will finance each of the energy-efficiency projects. The Agency will finance these improvements by converting the utility savings into lease payments.

ENERGY STAR® and Other Energy-Efficient Products

EPA actively promotes the purchase of energy-efficient products that carry the ENERGY STAR® label. The Agency reviews and updates its purchasing specifications regularly.

The Environmentally Preferable Purchasing program helps train government purchase card users on buying energy-efficient and sustainable products. The Agency also distributes product guides that explain in greater detail the environmental attributes of available products, such as light bulbs, light fixtures, and air conditioning equipment.

ENERGY STAR® Buildings

EPA approaches facility upgrades from a systemic perspective and incorporates holistic design principles in its construction projects. Currently, the ENERGY STAR® Buildings program does not encompass energy-intensive facilities such as laboratories; therefore, EPA cannot designate its 19 laboratory facilities as ENERGY STAR® buildings. The Agency is working with GSA, however, to achieve the ENERGY STAR® Buildings label in its leased office facilities. Currently, three EPA office buildings, the regional office buildings in New York, Chicago, and Denver, which are either owned or leased by GSA, have been awarded the ENERGY STAR® label. The Region 10 Office in Seattle anticipates award of the building label by June 2002.

Sustainable Building Design

To promote a healthy, efficient, and productive working environment, EPA incorporates sustainable design principles into the siting, design, and construction of new facilities, as well as the renovation and maintenance of existing facilities. The Agency developed a Green Buildings Vision and Policy Statement that serves as a guide for a holistic, systems approach to building design.

Several EPA facilities are applying the green building principles outlined in the policy statement, including the new consolidated facility in Research Triangle Park, North Carolina. The facility incorporates low volatile organic compound (VOC) paints, sealants, and adhesives to improve indoor air quality; direct digital controls and high efficiency boilers and chillers to ensure peak energy performance; and recycled carpet and other recycled building materials to conserve virgin materials and divert waste from landfills. Fume hoods are serviced by a centralized air flow system and customized sashes that save energy by avoiding the loss of heated or cooled air and by reducing the need for numerous energy-consuming fans. Outside the building, EPA minimized ground clearing to preserve forests, streams, and wetlands, and a plant rescue saved thousands of native plants. Additionally, the campus will be designated and maintained as a Corporate Wildlife Habitat.

Energy Efficiency in Lease Provisions

As part of its mission to protect and improve the environment, EPA has recently begun requiring "green riders" as part of its leases for newly constructed leased buildings. The green rider, which includes environmentally preferable criteria such as energy- and water-efficiency measures, is an amendment to the Agency's solicitation for offers (SFO) for constructing or retrofitting EPA facilities. EPA used green riders for its new Region 3, Region 7, and Region 10 office buildings, the new Region 1 laboratory and the Region 7 laboratory currently under construction. As part of the lease for its Region 8 Office in Denver, Colorado, EPA has completed a preliminary green rider.

At the Region 3 office in Philadelphia, the Agency included environmental criteria in its solicitation for remodeled office space in an existing building. The green rider requirements included reusing materials; recycling of construction and demolition debris; and using low environmental impact materials. The Agency also required that the building be located in Philadelphia's central business district to promote the use of public transportation by staff.

Industrial Facility Efficiency Improvements

EPA is continuing to maximize the energy and water efficiency and environmental performance of its facilities through a variety of innovative projects and commonsense initiatives. Efficiency improvement opportunities that are either underway or being considered for EPA facilities include:

- *Ann Arbor, Michigan*: As part of the lab's ESPC renovations, a new energy and HVAC infrastructure was installed. As of April 2001, all new air handling units, a new cooling tower, a 200-kW fuel cell, and a new direct digital control system were in place. The new chilled water plant consists of 900 tons of high-efficiency, double-effect chiller/heaters, do not use CFC or HCFC refrigerants and are equipped with units to recover waste heat from the condensers in the cooling cycle. The chiller/heaters recover up to 25 percent of the input energy from the condenser water stream. A natural gas fuel cell was installed in 2001 to provide both base load power and emergency backup for the facility.

- *Fort Meade, Maryland*: Direct digital controls monitor the status of mechanical systems throughout the building to maintain efficiency. Variable air volume fume hoods for lab spaces minimize heating and cooling costs while maintaining a safe working environment. The facility is designed to maximize natural light and uses energy-efficient electrical lighting when needed. The facility is working with DOE and others to demonstrate the world's first megawatt-class solid oxide fuel cell power generation system and is planning to install a small "pony boiler." Extensive work has been performed throughout FY 2001 to make the operations of the laboratory more

energy efficient through a "re-commissioning" of the lab. Team members have worked to correct system programming errors, appropriately reduce exhaust velocities on exhaust stacks, improve the operation of bypass dampers, and identify other energy saving opportunities.

In addition to the energy-efficiency efforts that EPA has undertaken at each of its major facilities, the Agency is taking an in-depth look at its variable air volume (VAV) labs to understand how they could perform better. In 2001, EPA conducted in-depth assessments of its labs in Houston, Golden, Colorado, and Athens, Georgia (Environmental Services Division) and continued a close examination of its Fort Meade, Maryland, facility. In addition, EPA is paying close attention to better controls in new and existing VAV labs, nationwide reporting of energy results, and moving utility bills to the regions.

Highly Efficient Systems

EPA is using the ESPC process to further its installation of combined cooling, heating, and power systems and locally available renewable energy sources. In addition to a geothermal heat pump being installed in Ada, Oklahoma, as part of the ESPC upgrade, a natural gas fuel cell was installed in the Ann Arbor, Michigan, lab to provide both base load power and emergency backup power for the facility. The fuel cell generates 200 kilowatts of power and provides heating water for the reheat water loop serving the air handling units. By integrating the heating and cooling plant, EPA will recover significant amounts of energy that would have otherwise been wasted in cooling towers or radiators.

Off-Grid Generation

EPA facilities are using renewable energy technologies to supplement or replace a large portion of their energy requirements. In all ESPCs, EPA requires the installation of renewable technologies as part of the overall upgrade. The following facilities incorporate renewable energy technologies:

- *Chicago, Illinois*: A 10-kilowatt solar array on the roof of the Metcalfe Building, completed in FY 2001, helps power EPA's Region 5 Office. EPA is also working with GSA and DOE on the installation of a small fuel cell in the Metcalfe Building.

- *San Francisco, California*: A project to install a solar hot water heater was initiated in July 2001, to provide hot water for the fitness center and the child care center.

Electrical Load Reduction Measures

EPA buildings are working with local utilities to reduce electricity load during power emergencies.

- *Seattle, Washington*. The Region 10 office has contingency plans for power emergencies. In January 2001, building management reduced maximum temperature set point from 72 to 68 degrees and raised the lowest cooling set point from 73 to 75 degrees. Recent energy conservation measures implemented in the building are estimated to produce yearly savings of $140,000. Utility bills have been reduced by 35 percent, including rate increases. Motion sensors were installed in conference rooms and all private spaces. Estimated reduction in consumption in those rooms is 40 to 80 percent. Building management also removed fluorescent tubes, reducing energy consumption by 35 to 40 percent per fixture.

- *San Francisco, California*. The Region 9 office has a policy of turning off unused machines, such as coffee pots, unnecessary elevators, and personal printers. More than half of the computers are programmed to go into "sleep mode" after 30 minutes of non-use, resulting in a savings of 78 watts per monitor. Region 9 initiated a "Green Lights" project in 1995; the resulting average monthly energy savings is 35,000 kilowatthours. The office also recently set it HVAC thermostats to 72 degrees and planned to set them a few degrees higher in the summer months if the power supply was tentative. In the fall and winter, thermostats are set at 68 to 70 degrees.

Water Conservation

EPA will continue to require its facilities to monitor and report water consumption and costs and energy consumption data on a quarterly basis. Since 1994, EPA has required the use of water conserving equipment in all newly leased and built facilities. Assessments of water efficiency opportunities are part of EPA's auditing process and ESPC upgrades and have led to operational and management measures that have reduced water consumption. EPA plans to significantly reduce water consumption at the following facilities:

- *Houston, Texas*: The facility incorporated a cooling tower condensate return system to reduce water consumption and operating costs and enhance environmental conditions. Without this system, large volumes of water would have to be supplied by the local water utility.

- *Manchester, Washington*: Since the lab replaced its 4-inch PVC water lines with 6-inch ductile iron water lines, the bigger, stronger lines reduce the frequency of leaks and the lab's overall water consumption rate. The lab also replaced a 20-year-old water cooling tower with a new, more efficient tower, which reduced the water volume needed to run the cooling system. These upgrades have dropped the facility's average water bill from $596 to $203 per month, and reduced water consumption 66 percent, from 204,000 to 70,000 gallons per month.

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O. GENERAL SERVICES ADMINISTRATION (GSA)

Management and Administration

The Assistant Commissioner for Business Performance is the General Services Administration (GSA) Senior Energy Official, with responsibilities for meeting the goals and requirements of Executive Order 13123.

GSA formed a technical support team to expedite and encourage the agency's use of strategies identified in Executive Order 13123. The agency energy team consists of individuals from the different programs at GSA including management, legal, procurement, and others.

Management Tools

Awards

GSA participates in the annual DOE Federal Energy and Water Management Awards program, and received seven awards in FY 2001. GSA also honors each one of the DOE award recipients internally with a ceremony and monetary award. In addition to the DOE awards, GSA distributed its fifth Annual Environmental Awards in FY 2001.

Performance Evaluations

GSA senior management and regional senior management executives have energy performance measures in their performance evaluations. Regional Energy Coordinators' performance evaluation and position descriptions include responsibilities for implementation of energy efficiency, water conservation, and renewable projects.

Training

Under the Energy Policy Act of 1992, GSA is required to hold five energy management workshops for Federal, state, local and tribal communities. In 2001, GSA held six workshops in partnership with Federal agencies and state governments.

These workshops included:

- "Energy CrossTalk", in Orlando, Florida, with 55 attendees;
- ECOE Workshop, in Boston, Massachusetts, with 35 attendees;
- "Energy 2001" in Kansas City, Kansas, with 1,150 attendees; and
- "Northwest Energy Crisis" in Seattle, Washington, with 75 attendees.

GSA continues to train its personnel in all aspects of energy and water management and conservation. GSA includes project managers responsible for renovation and new construction projects in many of these training activities. GSA currently has 28 trained energy managers on staff. Routine training topics include:

- Industrial Energy Process and Building Analysis;
- American Sociey of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) 90.1;
- Energy Management Techniques; and
- Building Life-Cycle Costing.

Showcase Facilities

In FY 2001, GSA designated three facilities as Showcase facilities. The first is the Leo O'Brien Federal Building in Albany, New York. This project was the first delivery order issued under the DOE Northeast Super-ESPC contract award and supported the award of the contract. It incorporated a variety of energy technologies including enhanced building automation system, electric-to-gas conversion, HVAC improvements, lighting upgrades, building envelope improvements, and enhancements to the chilled water system. In total, the project will save 1,951 megawatthours per year, a 27 percent reduction in energy use.

The second facility is the Metcalfe building in Chicago, Illinois. This facility was the first building certified as an ENERGY STAR® Building in Illinois. Energy upgrades that were implemented included lighting retrofits, variable speed fans, new exit signs, occupancy sensors, lighting controls, installation of VendingMiser, and a 10-kilowatt photovoltaic system on the roof.

The third facility is the Richard B. Russell Federal Building in Atlanta, Georgia. Development of the project followed the ENERGY STAR® Building methodologies and resulted in phenomenal energy savings—30.2 billion Btu annually—enough to power 990 homes for one year. This project has received national recognition, having attained both the DOE Federal Energy Saver Showcase designation and the ENERGY STAR® Building certification.

Energy Efficiency Performance

Standard Buildings

In FY 2001, GSA reported a 18.2 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot. GSA received credit for purchases of 27.2 billion Btu of renewable electricity. This lowered the energy intensity of its standard buildings from 68,616 Btu/GSF to 68,461 Btu/GSF. The agency has reduced its energy consumption by directly investing in energy and water

conservation opportunities with paybacks of 10 years or less. From FY 1990 through FY 2001, GSA invested approximately $312 million in projects. In 2001, GSA invested $4.8 million of Energy Program appropriations in its standard facilities.

GSA's FY 1985 baseline for standard buildings and facilities was modified in FY 2001 because of reclassification of facilities into the energy intensive category.

Industrial and Laboratory Facilities
In FY 2001, GSA's energy usage was 297,098 Btu per gross square foot versus 432,303 Btu per gross square foot in FY 1990, a decrease of 31.3 percent. The agency achieved this reduction by directly investing in energy and water conservation opportunities with paybacks of 10 years or less. GSA invested $82,700 of Energy Program appropriations in its industrial and laboratory facilities in FY 2001.

Exempt Facilities
In FY 2001, GSA excluded buildings include those entering or leaving the inventory in a given year, buildings undergoing renovations, and outside parking garages.

Greenhouse Gas Reduction Goal
Energy use in GSA facilities resulted in emissions of 605,314 metric tons of carbon equivalent (MTCE) in FY 2001, a 5.0 percent increase versus data reported for the FY 1990 baseline year. GSA was credited 870.4 MTCE for purchases of renewable electricity made during the year.

Renewable Energy

Self-Generated Renewable Energy
GSA considers opportunities for solar and other renewable energy in new building designs and retrofit projects. When GSA performs an energy audit of a facility, renewable opportunities are identified and implemented if life-cycle cost effective. In addition, GSA facility standards recommend renewable energy sources be considered in proposed designs.

In FY 2001, GSA completed two solar projects at facilities across the country. In Wenatchee, Washington, GSA installed a 10-kilowatt photovoltaic project at the Federal Building and post office, and in Chicago, Illinois, GSA installed a 10-kilowatt solar array at the Metcalfe Federal Building.

Purchased Renewable Energy
In FY 2001, GSA purchased a total of 7,967 megawatthours of electricity from renewables through competitive power contracts.

The mid-Atlantic Region of GSA signed a 12-month agreement which began in FY 2000 with The Energy Cooperative, a non-profit firm in Philadelphia, Pennsylvania, to purchase green power, estimated at 2,700 megawatthours annually.

The Pacific Rim Region of GSA signed a 15-month contract for electric power with Strategic Energy. The delivery under this contract began in FY 2001. Under this procurement, 12 percent of the GSA contract load is supplied from a renewable mix.

Million Solar Roofs
GSA is a participating agency in the Million Solar Roofs initiative. GSA developed a plan to install 60 solar roof projects under this initiative by 2010. In FY 2001, one new qualifying roof was installed and another installation from FY 2000 became active.

Petroleum
GSA has encouraged the reduction of the use of petroleum-based fuel as far back as the 1973-1974 oil embargo. From FY 1985 to FY 2001, GSA petroleum-based fuel use in buildings decreased by 56.5 percent, from 7.6 million to 3.3 million gallons.

Water Conservation
GSA's owned facility water consumption for FY 2001 was approximately 4.0 billion gallons, at a cost of $16.2 million dollars.

Implementation Strategies

Life-Cycle Cost Analysis
GSA uses life-cycle cost (LCC) analysis as a primary factor in determining which energy projects to fund. GSA conducted two LCC analysis training classes during the year. GSA personnel also attend FEMP LCC analysis training classes.

GSA strives to make LCC analysis a part of the selection process for the majority of its construction projects. In addition to being a criteria for disbursement of dedicated energy conservation funds, other construction projects use the tool for selecting equipment prior to issuance of the construction bid documents, to ensure that the most life-cycle cost effective equipment is installed.

Facility Energy Audits
GSA performs energy and water audits and surveys in accordance with its 10-year audit plan. Some audits are

obtained at no cost from utilities and others are obtained through DOE's SAVEnergy audit program. The energy-saving measures that are identifed are developed into energy conservation project proposals using life-cycle costing methodology. The project submissions are compiled into a database for ranking by Savings-to-Investment Ratio. As funding permits, projects are selected for approval and implementation. Funding for projects has been lower than needed to meet the energy reduction goals.

GSA had planned to invest $50 million per year from FY 1994 through FY 2000 in order to meet the 20 and 30 percent reduction goals. The actual appropriations have averaged $16.8 million over six years. Other programs, such as GSA's annual Repair and Alterations Program, as well as the Chlorofluorocarbon Chiller Replacement Program, also invest in energy efficient facilities and equipment. However, the sum of these investments may not be sufficient for GSA to meet the energy reduction goals.

Funding Mechanisms
During FY 2001, more than $878,000 in rebates was deposited into GSA's Federal Buildings Fund from demand side management programs from energy projects. All of the money was distributed to regional programs to fund energy retrofits or energy audits.

GSA received $5 million in energy funding for FY 2001. GSA distributed the funds to the Regions for energy and water conservation projects. Projects were selected based on savings to investment ratio, payback analysis, as well as projects which assisted GSA in achieving some of the strategic goals. Many were a direct result of energy audits that had been conducted at the various facilities.

GSA identified maximizing the use of alternatively financing contracting mechanisms as a strategy in the FY 2001 Implementation Plan. Specifically, a goal was set to increase the number of financed projects in FY 2001 compared to FY 2000 by 20 percent. This goal was accomplished. In FY 2000, GSA awarded a total of nine alternatively-financed projects, six Energy-Savings Performance Contracts (ESPCs) and three utility-financed projects. In FY 2001, GSA awarded 14 financed projects, eight ESPCs and six utility-financed projects. GSA currently has 15 ESPCs in place, and an additional eight ESPCs are targeted for award in FY 2002. The annual savings anticipated from GSA's ESPCs and utility contracts are 404 billion Btu and $248.9 million.

In 2001, GSA used area-wide utility contracts and basic ordering agreements to obtain utility financing for several energy projects located throughout the country, including a $50 million contract with Washington Gas for energy improvements at the Smithsonian Institute in Washington, DC

In FY 2001, GSA awarded several ESPC delivery orders. Among these:

- In Region 4, GSA awarded three additional Super-ESPCs in FY 2001. One with Sempra Energy Services for the Memphis Service Center for more than $1.9 million, one with Johnson Controls for the Columbia Service Center for more than $2.4 million, and one with Duke Solutions for the Raleigh Customer Service Center for an estimated $2.8 million.

- In Region 7, GSA awarded one ESPC in FY 2001. This project was for a group of facilities in Dallas, Texas, with Custom Energy for $2.4 million. In addition to this contract, this region is currently anticipates four more Super-ESPCs, to be awarded in FY 2002. One is with Siemens for an estimated $2.5 million, one is with Johnson Controls for $531,052 and one is with ERI for an estimated $3.2 million.

- In Region 8, GSA awarded phase 2 of a Super-ESPC with Johnson Controls for almost $2.5 million for energy conservation measures at the Denver Federal Center in Denver, Colorado.

ENERGY STAR® and Other Energy-Efficient Products
GSA supports the procurement of energy efficient products through a number of activities. GSA provides product supply schedules that promote energy efficient and environmentally preferable products and mandates the purchase of ENERGY STAR® computers and office equipment. GSA is a signatory to, and an active participant in the "Procurement Challenge," designed to identify the most energy efficient products and to increase the purchase of these products.

ENERGY STAR® Buildings
GSA has successfully conducted a mass evaluation of all standard facilities using ENERGY STAR® software and forwarded the results to the regions for data correction and certification as identified in its FY 2001 Implementation Plan. As of September 30, 2001, GSA has earned the ENERGY STAR® Building Label for 85 of

its owned facilities and one leased facility. This represents approximately 16 percent of the eligible square footage, and 13 percent of facilities.

Sustainable Building Design
In FY 2000, GSA conducted sustainable design workshops in all 11 regions. The training was attended not only by employees directly involved in energy management, but also project managers, building management specialists, engineers, and others. Project managers and energy coordinators also attend conferences which provide information and assistance for incorporating sustainability into GSA's retrofit and new construction programs.

As identified in its FY 2001 Implementation Plan, GSA has incorporated sustainable design criteria into all guide specifications, facilities standards, and other construction requirements for new construction and renovation efforts. GSA's goal is to have all new design projects starting in FY 2003 meet criteria for LEED Green Building Certification.

Energy Efficiency in Lease Provisions
The GSA 2001 Implementation Plan included incorporating lease provisions that encourage energy and water efficiency and sustainable design. GSA issued an acquisition letter to all leasing activities on energy and environmental business practices and solicitation for offers to implement Executive Order 13123. The business practices describe the different leasing activities and when these provisions should be incorporated such as new leases and lease changes that included construction.

Industrial Facility Efficiency Improvements
In FY 2001, Region 10 entered into a Super ESPC with Johnson Controls at the Green-Wyatt Federal Building in Portland, Oregon, for more than $500,000. The energy conservation measures implemented in this project are projected to save 9.7 billion Btu annually at this energy intensive facility.

Highly Efficient Systems
GSA continues to investigate the feasibility of district energy systems and other highly efficient systems in new construction or retrofit projects, when life-cycle cost effective.

Off-Grid Generation
GSA investigates the potential for off-grid generation technologies whenever an energy audit or study is conducted at facilities. In FY 2000, the Energy Center of Expertise (ECOE) funded a geothermal heat pump project in Missouri. Project completion was expected for FY 2001.

Water Conservation
In FY 2000, GSA finalized a Water Management Guide, which is posted on the ECOE website for use by any Federal agency (www.gsa.gov/pbs/centers/energy). This guide provides comprehensive guidance on how to meet the requirements of Executive Order 13123, from detailed descriptions of water conserving technologies and principles and how to measure water use and develop a water management plan to economic analysis and innovative financing options. The guide references the FEMP Best Management Practices for water conservation, and is referenced on FEMP's Water Management Working Group website.

GSA has a comprehensive maintenance program that incorporates many of the Best Management Practices identified by FEMP into the everyday requirements for maintenance at GSA facilities.

GSA energy audits always include water conservation measures. Likewise, GSA includes water conservation savings when investigating the feasibility of ESPCs and utility-financed projects.

In FY 2001, GSA funded numerous whole building retrofits for a variety of facilities across the nation. The measures typically included detailed energy audits for water conservation as well as energy conservation. Measures that are part of the end project are those which are life cycle cost effective. Therefore, restroom retrofits, cooling tower technologies, condensate reuse, and irrigation measures continue to be implemented in GSA facilities.

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P. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

Management and Administration
The Assistant Administrator for Management Systems is the National Aeronautics and Space Administration (NASA) Senior Energy Official responsible for meeting the goals and requirements of Executive Order 13123.

The Energy Efficiency Panel (EEP) was established to meet the requirement for a NASA energy team. The EEP provides an agency-level forum to guide the planning and implementation of energy efficiency activities, including energy and water conservation, greenhouse gases reduction, and use of renewable energy sources.

Management Tools
In FY 2001, NASA employed the following management initiatives and tools to promote effective energy and water management:

- A comprehensive new NASA directive was issued in FY 2001, which provides Agency-wide procedures and guidelines for meeting the requirements and goals of Executive Order 13123, using alternative financing, and evaluating renewable energy and water conservation opportunities.
- Program Operating Plan guidance was issued to NASA Centers and Component Facilities for including energy efficiency funds in their FY 2003 budget requests.
- The NASA Headquarters Environmental Management Division conducted Energy and Water Management Functional Reviews at Ames Research Center, Dryden Flight Research Center (DFRC), Johnson Space Center (JSC), White Sands Test Facility, and Kennedy Space Center (KSC).

Awards
NASA is developing an Agency Environmental/Energy Awards Program to recognize accomplishments in implementing all of the *Greening the Government* Executive Orders. NASA continues to be an active participant in the DOE Federal Energy and Water Management Awards program. In addition, most NASA Centers and Component Facilities recognize employee contributions to energy and water savings through employee suggestion programs, issuing monetary awards based on savings achieved, and recognizing employee contributions in internal news publications.

NASA submitted five nominations for the 2001 Federal Energy and Water Management Awards. The NASA energy team's work in achieving "Federal Energy Management Success" was selected for the 2001 Presidential Award for Federal Energy Management.

NASA named three new Energy Champions in FY 2001, for a total of 19 NASA Energy Champions since the program was initiated in FY 1998.

The Ames Research Center administered Pollution Prevention awards that include energy conservation. Cash awards were given to winners.

The KSC Environmental Program Branch created two new award programs for Center employees and contractors. The *Catch an Environmentalist Award* is a quick recognition program managed by the Environmental Program Office. The *Environmental & Energy Award* is a biannual competition conducted by Center Awards Office. This award recognizes significant achievements in all areas of environmental and energy management. Award winners receive a certificate with a patch flown on the Space Shuttle. The KSC Joint Base Operations Support Contractor established the Energy Achievement Goals for Life and Environment (EAGLE) award program to recognize employee contributions to energy and water efficiency and environmental improvement. During FY 2001, savings bonds, certificates, and EAGLE pins were awarded for installing a boiler automatic blow down system and a new high efficiency compressed air dryer.

Performance Evaluations
Most NASA Centers and Component Facilities include, or plan to include, the successful implementation of energy management conservation requirements in performance evaluations and positions descriptions for all those involved in energy management activities. This practice extends to many Center Operations Support Services contractors.

Training
NASA completed the following activities to ensure that all appropriate personnel received training for energy and water management requirements:

- An Energy Efficiency and Water Conservation course was developed to give energy and facilities management professionals the knowledge and skills to successfully implement energy efficiency and water conservation projects. The pilot course was held in December, 2000, at NASA's Management Education Center at Wallops Island, Virginia, with 25 participants.

- Ten NASA employees and on-site support contractors attended Energy 2001 in Kansas City, Missouri.

- KSC carried the DOE FEMP and American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) 90.1 broadcasts on the Center's closed circuit TV system.

- The NASA Energy Coordinator received a 2001 Federal Energy Management Award for his participation in the "You Have the Power" energy awareness campaign.

- NASA Headquarters began broadcasting recurring energy conservation messages to all employees via the Headquarters Information Television closed circuit system.

In all, approximately 70 NASA employees and contractors received energy and water management training through NASA and FEMP-sponsored courses, industry conferences, and commercial or academic sources.

Showcase Facilities
NASA designated an Aircraft Maintenance Hangar at the Dryden Flight Research Center (DFRC) as a Showcase facility. The facility is NASA's second showcase facility. The building features a hybrid solar/modular gas-fired boiler heating system, consisting of a 2,500 square-foot transpired solar wall and six modular high-efficiency condensing boilers. In replacing the oversized and inefficient aircraft hangar heating system, NASA simultaneously improved indoor air quality, reduced greenhouse gas emissions, and saved energy. Emissions reductions were so significant that the boilers no longer require expensive air permitting.

Energy Efficiency Performance

Standard Buildings
In FY 2001, NASA reported a 17.5 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot.

Industrial and Laboratory Facilities
The average energy intensity for NASA's energy intensive facilities was 244,640 Btu per gross square foot in FY 2001, as compared to the FY 1990 baseline value of 323,971 Btu per gross square foot, a 24.5 percent decrease.

NASA continued its shared energy savings contract incentive arrangement with Lockheed Martin Michoud Space Systems (LMMSS), the contractor operator of the NASA Michoud Assembly Facility, that manufactures the Space Shuttle External Tank. NASA rewards LMMSS for exceptional performance in managing energy use by sharing 8 to 14 percent of energy savings achieved as an additional award fee. NASA's share of the savings are used to reduce the overall cost of the Space Shuttle External Tank program. In FY 2001, Michoud Assembly Facility used 864.5 billion Btu to produce 6.0 External Tanks, or 144.8 billion Btu per External Tank, compared with 203.5 billion Btu per External Tank in FY 1990. This represents a 28 percent decrease in energy consumption per External Tank produced.

Exempt Facilities
In FY 2001, 12.5 percent of NASA facility square footage was designated as exempt. These facilities are highly specialized and energy intensive, having been constructed for specific space flight and research programs. Examples are 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 new facilities that support the Space Shuttle and International Space Station programs. Energy consumption in these facilities varies directly with the level and intensity of program activities.

NASA adopted an internal goal to improve the energy efficiency of exempt mission-variable facilities, where cost effective and without adversely affecting mission performance, by 10 percent by FY 2005 as compared to FY 1985 levels.

Tactical Vehicle and Equipment Fuel Use
NASA completed the following activities to reduce the use of gasoline and diesel fuels in vehicles:
- The Merritt Island Launch Annex converted a Ford F-800 high lift truck to compressed natural gas;
- Ames Research Center initiated discussions with Pacific Gas and Electric and other local agencies to share costs for construction of a compressed natural gas vehicle fueling station; and
- Glenn Research Center and KSC continued operation of on-site compressed natural gas fueling stations.

Greenhouse Gas Reduction Goal
Energy use in NASA facilities resulted in emissions of 258,454 metric tons of carbon equivalent (MTCE) in FY 2001, a 5.8 percent decrease versus data reported for the FY 1990 baseline year.

Renewable Energy

Self-Generated Renewable Energy

NASA's use of self-generated renewable energy is not directly metered, but the quantity produced is negligible. Projects generating an estimated 10.3 megawatthours of electricity were completed in FY 2001.

Purchased Renewable Energy

NASA has focused its efforts on purchasing renewable energy from sources that are cost-competitive with conventional energy sources. In FY 2001, NASA completed several activities to increase energy purchases from renewable sources

Goddard Space Flight Center continued working with Toro Energy of Maryland to bring a landfill methane supply pipeline to the Center. A 10-year utility supply contract was awarded to Toro Energy in FY 2000. Delivery of landfill methane to the Center's central boiler plant will begin in January 2002.

Johnson Space Center awarded a new natural gas supply contract to Entex that will take effect in FY 2002. Two percent of the natural gas supplied to the Center will come from renewable landfill methane at no additional cost to NASA. The Center is also working with Defense Energy Supply Center (DESC) on a new electricity supply contract for the Center when deregulation begins in Texas. The Center may receive up to 5 percent of the electricity from new renewable sources, primarily wind and hydropower, when the final DESC contract is awarded.

Langley Research Center and Marshall Space Flight Center continued to purchase steam generated from municipal solid waste.

Million Solar Roofs

In FY 2001, NASA completed installation of a 5.5 kilowatt photovoltaic power system on the roof of a Space Sciences Building at Ames Research Center.

Petroleum

NASA has reduced facility petroleum use by 54.5 percent since FY 1985.

Water Conservation

NASA used 2.5 billion gallons of potable water in FY 2001, compared with 2.3 billion gallons in FY 2000, a 6.1 percent increase. This increase is possibly due to incomplete FY 2000 baseline data reported by two NASA Centers. NASA will continue to track water consumption data to determine the actual trend.

Implementation Strategies

Life-Cycle Cost Analysis

To compete successfully, proposed energy conservation projects at NASA must have relatively short amortization periods since construction funds are very limited and many other high priority projects also compete for funding.

Life-cycle costing is the primary tool for analyzing energy retrofit projects. Economic analyses are performed for all construction and revitalization projects in excess of $1.5 million.

Facility Energy Audits

During FY 2001, NASA completed audits for 9.6 percent of its total building square footage, including comprehensive audits covering 3.8 million gross square feet and walk-through audits covering 1.1 million gross square feet. Among these were two FEMP-sponsored Assessment of Load and Energy Reduction Techniques (ALERT) audits for DFRC and the Goldstone Deep Space Network Communications Complex. From FY 1991 through FY 2001, NASA completed comprehensive energy audits for 86.7 percent of its total building square footage, including 79.7 percent of non-exempt square footage, and 94.4 percent of exempt and industrial square footage.

NASA headquarters sponsored a continuous commissioning pilot project involving three buildings at DFRC. The project is being performed under a Cooperative Research and Development Agreement with the Texas Engineering Experiment Station, Energy Systems Laboratory, Texas A&M University.

Financing Mechanisms

NASA made continued progress in implementing ESPC and UESC contracts. By the end of FY 2001, NASA had awarded six ESPC delivery orders and four UESCs at the Ames Research Center, Glenn Research Center, Goddard Space Flight Center, JSC, and KSC, and other alternatively-financed contracts at the DFRC and KSC. These actions have resulted in $36.6 million in energy improvements for NASA facilities that are saving $4.6 million annually. These totals include the following FY 2001 accomplishments:

- Goddard Space Flight Center issued its third ESPC delivery order under its own multiple award indefinite delivery, indefinite quantity (IDIQ) ESPC contracts. This $425,000 delivery order installed lighting system upgrades in five buildings. Annual savings of $55,000 are anticipated.

- KSC issued its second UESC contract to FPL Services for $2.5 million in energy efficiency improvements to Space Shuttle facilities. The project includes HVAC upgrades, lighting, and compressed air system upgrades that will save $358,000 annually. The project also qualified for $41,000 in utility incentives.

- Jet Propulsion Laboratory (JPL), a Federally funded research and development center in Pasadena, California, continued work on its own commercial-type ESPC contract.

ENERGY STAR® and Other Energy-Efficient Products
NASA Centers and Component Facilities are actively procuring energy efficient goods and products that are the most life-cycle cost-effective, pursuant to the requirements of the Federal Acquisition Regulations.

NASA took the following actions in FY 2001 to purchase ENERGY STAR® and other energy efficient products:

- NASA Headquarters provided detailed guidance to KSC to incorporate DOE energy efficient product recommendations into NASA's Specifications-Kept-Intact (SPECSINTACT) construction guide specification system. KSC, as Lead Center for SPECSINTACT, will revise appropriate guide specification sections in FY 2002.

- KSC replaced all copiers at the Center with new ENERGY STAR® duplexing copiers.

- KSC set the default power-saving mode for monitors to activate after 20 minutes of inactivity for all NASA computers at the Center. About 1,900 contractor-owned computer monitors now automatically go into the ENERGY STAR® low-power standby mode after 30 minutes of inactivity.

Sustainable Building Design
NASA continued development of an integrated sustainable design policy that will combine sustainability concepts with building commissioning. Detailed implementation procedures and guidelines are being developed along with a companion in-house training course. Despite lack of an approved Agency-wide policy, the Centers continued work on several facility project designs that incorporate sustainable design features. Some examples are:

- The Space Experiment Research and Processing Laboratory at KSC will incorporate an innovative passive storm water retention area, 100 percent native plants with low water requirements, a central light well for natural light, low volatile organic compound paints and coatings, high efficiency lighting with occupancy sensors, variable frequency drives on air handlers, chilled water pumps and cooling towers, high efficiency chillers and passive solar thermal mass principles.

- The Operations Support Building II at KSC is designed to exceed energy efficiency requirements and will use at least 47 percent less energy than the offices it will replace. The project will incorporate an automatic irrigation system, 100 percent native plants with low water requirements, high efficiency lighting with occupancy sensors and daylight-compensating dimmer controls, variable air volume HVAC systems with and chilled water pumps, and advanced filtration to maintain indoor air quality.

Industrial Facility Efficiency Improvements
NASA completed a number of projects in FY 2001 to improve the energy efficiency of energy-intensive industrial facilities, including:

- Glenn Research Center completed projects to replace HVAC units, install modern energy controls, upgrade lighting systems, and replace obsolete laboratory fume hood controls in several laboratories and program support facilities.

- The Payloads Processing organization at KSC implemented several low or no-cost operational changes that are saving significant amounts of energy. Hot water consumption was reduced in the Space Station Processing Facility by changing set points and modifying control algorithms. Exhaust and conditioned make-up air requirements for the high bay clean work area were reduced by 35,000 cubic feet per minute. Operating procedures were also revised to eliminate the requirement for an "ammonia sweep" mode during special processing operations that required large quantities of conditioned outside air. Together these measures saved $236,000. Revised standard operating procedures for four other processing facilities allow indoor environmental set points to be relaxed and nonessential HVAC equipment deactivated when space flight hardware was not being processed. This measure saved $70,000. Energy consumption in the Payload Hazardous Processing Facility and the Vertical Processing Facility was reduced by 40 and 25 percent respectively by reducing the number of HVAC systems operated in support certain missions. Together these measures saved $60,000.

- Langley Research Center completed roofing and HVAC replacement projects at a cost of $2.4 million. These projects will save $490,000 annually. The Center also completed a project to improve substation metering for Langley Air Force Base.

Highly Efficient Systems
Langley Research Center initiated a Steam Optimization and Utilization Project (SOUP) to identify cost-effective ways to utilize approximately 150 million pounds per year of excess steam that is now vented to the atmosphere at a nearby solid waste energy facility.

JPL received a preliminary ESPC proposal from Sempra Energy Solutions that includes a 6.3 megawatt combined heat and power system and several microturbines. Approval was given approval for Sempra to proceed to the detailed audit phase.

Off-Grid Generation
NASA completed the following actions in FY 2001 to install new solar hot water, solar electric, solar outdoor lighting, small wind turbines, fuel cells, and other off-grid alternatives:

- NASA Headquarters sponsored a study to determine the feasibility of a grid-integrated photovoltaic power system for the DFRC.

- The Space Shuttle organization at KSC used utility rebate funds to modify the controls of a 200-kilowatt emergency generator to enable the Industrial Area to participate in Florida Power and Light's Commercial/Industrial Load Control program. This program allows the Center to receive a lower utility rate for part of its electrical load in return for agreeing to bring the generator on-line during infrequent load emergency events.

- Ames Research Center began operating a small windmill to power a remote storm water pumping station, installed under the Center's ESPC contract. The windmill cost $18,000, will save $2,000 annually, and will serve as a symbol of energy efficiency and "green" power for the aeronautical research center.

Electrical Load Reduction Measures
NASA completed actions in FY 2001 to reduce peak demand for electricity, particularly in areas experiencing short-term electricity shortages, including:

- NASA Headquarters issued guidance on emergency energy-reduction measures to all NASA Centers and Component Facilities.

- NASA Centers and Component Facilities in California implemented voluntary measures to reduce electrical load including use of emergency generators, reduced interior and exterior lighting levels, reduced operating hours for building heating, ventilating, and air-conditioning systems, and adjusted indoor space temperatures. They also established procedures to alert employees and contractors to conserve energy when Stage 3 emergencies are anticipated.

- The Goldstone Deep Space Communications Complex operated emergency generators up to three hours per day to help relieve load on the California power grid. An ALERT team audit at Goldstone investigated the feasibility of extending generator operating hours to sell power back to the grid.

Water Conservation
NASA completed the following actions in FY 2001 to improve water efficiency:

- A comprehensive new NASA directive was issued which provides agencywide procedures and guidelines for meeting water conservation goals, using alternative financing, and evaluating renewable energy and water conservation opportunities. Procedures for developing individual Center Energy and Water 5-Year Plans and implementing Best Management Practices for water conservation are contained in the directive.

- Goddard Space Flight Center installed two 500-foot potable water wells through a UESC contract. The wells will supply 7 million gallons of make-up water to the Center's cooling towers. The $854,000 project will reduce demand on the local water utility's potable water supply and has a payback period of less than three years.

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Q. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

Management and Administration
The Senior Energy Official for the National Archives and Records Administration (NARA) is the Assistant Archivist for Administrative Services.

Management Tools

Training
NARA implemented an aggressive employee education program on energy conservation at the Archives I and Archives II facilities in FY 2001.

In FY 2001, three employees received energy management training.

Energy Efficiency Performance

Industrial and Laboratory Facilities
NARA owns and operated 13 separate facilities, all dedicated to the preservation, storage, display, and use of historical documents and artifacts. These documents and artifacts must be maintained in a controlled environment 24 hours per day, 365 days per year. The facilities are designated as energy intensive for the purpose of Executive Order 13123.

NARA initiated the development of an agency Energy Plan in 1996 in concert with the agency's Strategic Planning Process. NARA has a policy to operate its facilities as efficiently as possible to meet energy reduction goals, and still maintain the environmental conditions required for preservation and safe storage of the nation's archival documents.

The Archives II building, approximately 50 percent of NARA's square footage, was not operational until 1996, thus no 1990 baseline data is available. NARA's FY 2001 energy consumption showed a reduction of 34 percent in natural gas usage versus FY 2000, and a one percent increase in electricity usage.

In FY 2001, various steps were taken to implement energy conservation measures at the Archives facilities and the Presidential Libraries. At the Carter Library, energy efficient refrigerating units for cold storage were installed. Energy efficient chilled water pumps were installed at the Johnson Library.

Major renovations to the Truman museum were completed in FY 2001. New temperature controls, lightings, air handling units, direct digital controls, and variable frequency drives were installed as part of the renovation.

Greenhouse Gas Reduction Goal
NARA reported carbon emissions of 18,172 metric tons of carbon equivalent (MTCE) in FY 2001, a 420.6 percent increase versus data reported for the FY 1990 baseline year.

Water Conservation
In FY 2001, NARA water consumption was 55.7 million gallons, a nine percent decrease as compared to FY 2000 consumption.

Two NARA facilities have developed Water Management Plans.

Implementation Strategies

Facility Energy Audits
Eight percent of NARA facility space was audited during FY 2001. Since FY 1992, 22 percent of facilities have received energy audits.

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R. NUCLEAR REGULATORY COMMISSION (NRC)

Management and Administration
The Senior Agency Official for the Nuclear Regulatory Commission (NRC) is the Deputy Executive Director for Management Services.

NRC formed an agency energy team in FY 2000, consisting of procurement, legal, budget, management, and technical representatives. The team is responsible for expediting and encouraging the NRC's use of appropriations and alternative financing mechanisms necessary to meet the energy reduction goals and requirements.

Management Tools

Awards
NRC uses its award program to recognize exceptional performance in energy management.

Performance Evaluations
Performance plans and evaluations for the Senior Energy Official and for facilities/energy managers take into account programmatic responsibility for implementation of Executive Order 13123.

Greenhouse Gas Reduction Goal
Energy used in NRC facilities resulted in emissions of 3,723 metric tons of carbon equivalent (MTCE) in FY 2001.

Renewable Energy
Self-Generated Renewable Energy
Energy audits conducted in FY 2000 at the One White Flint North (OWFN) and Two White Flint North (TWFN) facilities concluded that self-generated renewable energy projects were not economically feasible.

Water Conservation
Water consumption at OWFN in FY 2001 was 8.7 million gallons, at a cost of $57,800. Consumption at TWFN was 11.6 million gallons, costing $75,000.

Implementation Strategies

Life-Cycle Cost Analysis
In FY 2001, energy audits were conducted at OWFN and TWFN to identify potential energy conservation projects. In FY 2002, NRC plans to conduct comprehensive, investment grade energy audits using life-cycle costing to identify energy conservation projects.

Facility Energy Audits
In FY 2001, one preliminary audit was conducted at OWFN. Comprehensive audits for OWFN and TWFN are planned for FY 2002.

Financing Mechanisms
NRC has researched opportunities for using alternative financing tools. NRC plans to work with GSA and PEPCO Energy Services in FY 2002 to finalize terms and conditions of a GSA Area-Wide utility contract to perform the planned retrofits.

ENERGY STAR® and Other Energy-Efficient Products
All specifications for renovation projects performed by NRC ensure the incorporation of energy efficient equipment and systems. The building operation and maintenance contract specifications for OWFN and TWFN ensure that all building support replacement products and components are energy efficient. The NRC's Affirmative Procurement Program for Recovered Materials provides Internet links to on-line training for Federal purchase card users on ENERGY STAR® and other energy efficient products.

Energy Efficiency in Lease Provisions
GSA serves as the leasing agent for all NRC facilities. Prior to the execution of new leases, renegotiations, or lease extensions, NRC will request the opportunity to review all proposed leases to ensure their compliance with the Model Lease Provison.

Electrical Load Reduction Measures
NRC continues to participate in the PEPCO Load Curtailment Program. During high demand periods, NRC, at the request of PEPCO, reduces its energy load by securing non-critical building support equipment. Additionally, an employee awareness program encourages employees to secure extraneous appliances at work stations during high demand periods.

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S. RAILROAD RETIREMENT BOARD (RRB)

Management and Administration
The Director of Supply and Service is the Senior Energy Official for the Railroad Retirement Board (RRB), and is responsible for administering the agency's energy program to ensure all aspects of RRB's energy conservation plan are effectively implemented.

Management Tools

Performance Evaluations
The RRB Senior Official and the facility energy manager have performance standards that require the successful implementation of Executive Order 13123.

Energy Efficiency Performance

Standard Buildings
RRB reported that in FY 2001, the energy intensity of its standard buildings and facilities decreased 18 percent as compared to its estimated baseline. Facility energy use during the year was 36.0 billion Btu.

The RRB Headquarters building, located in Chicago, Illinois, is the only building over which the RRB has operational control. RRB operates and maintains the building under a delegation of authority established in 1986 with the General Services Administration.

Greenhouse Gas Reduction Goal
The energy used in the RRB facility resulted in emissions of 1,072 metric tons of carbon equivalent (MTCE) in FY 2001, a 21.6 percent decrease versus data reported for the FY 1990 baseline year.

Renewable Energy

Purchased Renewable Energy
In FY 2001, RRB participated with GSA Region 5 in the development of an Illinois Electric Solicitation, which included that a portion of the supplied energy be generated from renewable sources. A contract was awarded to Exelon Energy Corporation, and the switch to purchased renewable power will begin in FY 2002. RRB expects to purchase approximately 23 megawatthours of renewable power in FY 2002, and 46 megawatthours in FY 2003.

Water Conservation
RRB consumed 760,000 gallons of water during FY 2001, at a cost of more than $18,000. RRB has reduced its water consumption by 12.6 percent from the FY 2000 baseline year.

Implementation Strategies

Life-Cycle Cost Analysis
RRB uses life-cycle cost (LCC) analysis techniques in the development of its energy strategy in order to determine energy projects. RRB and the DOE Office of Industrial Technologies used LCC analysis to initiate a project involving incorporation of variable speed drives onto HVAC supply and return fans.

ENERGY STAR® and Other Energy-Efficient Products
RRB supports procurement of energy efficient products, and mandates the purchase of Energy Star computers and office equipment. Energy efficient criteria have been incorporated into all RRB/GSA guide specifications and product specifications for new construction and renovation projects.

Sustainable Building Design
RRB supports the use of sustainable design principles in all phases of facility construction and maintenance.

Off-Grid Generation
In FY 2001, a study was completed on the feasibility of providing a small microturbine to generate electricity for the critical loads at the RRB facility.

Electrical Load Reduction Measures
RRB signed an agreement with Commonwealth Edison to participate in a load curtailment program. The program will enable RRB to save on electrical costs and help to reduce the electrical load for the area. The RRB emergency plan of action will be initiated when emergency electricity load reductions are required. As part of the PPLR program, an energy tracking system was installed on all electrical meters to monitor electrical consumption and control electrical loads.

Water Conservation
RRB has taken steps toward improving water conservation in its Headquarters facility. All sinks and urinals have automatic faucets and flush valves with reduced consumption type diagrams.

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T. SOCIAL SECURITY ADMINISTRATION (SSA)

Management and Administration

The Social Security Administration's (SSA) Senior Energy Official is the Deputy Commissioner for Finance, Assessment, and Management (DCFAM). Members of the SSA Energy Team represent the sections of SSA with responsibilities for energy management, and include facilities specialists, contracting officers, representatives from field offices, and others.

SSA also established an executive-level Energy Policy Steering Committee to increase the agency's emphasis on energy conservation. Within the committee, subcommittees for Management Tools, Life-Cycle Cost Analysis, Energy Audits and Financing Mechanisms, Sustainable Building Design, Electrical Load Reduction Measures and Off-grid Generation, Systems Integration and Benchmarking exist to further SSA's performance toward the energy reduction goals.

Management Tools

Awards

SSA recognizes employees whose jobs involve energy management and whose overall performance or individual acts are exceptional. SSA is reevaluating its awards and incentives program and anticipates establishing honorary awards within the agency in FY 2002. In FY 2001, many of SSA's energy and building managers received performance awards for their contributions to the energy program. SSA also recognizes individual contributions to energy savings through employee suggestion and performance award programs.

SSA annually submits energy projects for the DOE/FEMP awards programs for recognition. In FY 2001, SSA received awards from DOE for its contributions to the "You Have the Power" campaign and for water conservation improvements at the Western Program Service Center, in Richmond, California.

Performance Evaluations

SSA has included energy conservation duties in many of the energy team position descriptions and in the building/energy manager specialist positions in the delegated field facilities. SSA plans to add performance measures in energy conservation to other position descriptions as well.

Training

In FY 2001, 40 SSA personnel were trained in energy management. SSA employees attended several conferences and training sessions during FY 2001. Thirty-one employees attended the Energy 2001 conference. Others attended training including workshops on Super ESPCs, FEMP workshops on Assessment of Load and Energy Reduction Techniques, and other events. SSA staff attend meetings with the General Services Administration (GSA), DOE, and Amercian Society of Heating and Air Conditioning Engineers (ASHRAE), and participate on numerous committees such as the "You Have the Power" campaign. Appropriate training is also provided to energy/building managers.

Within SSA, employees are educated on energy conservation through an awareness program, Commissioner memorandums, newletters, and other publications. Many SSA facilities sponsor exhibits for Energy Awareness Month and National Recycling Day to promote and publicize efforts in these areas.

Energy Efficiency Performance

Standard Buildings

SSA became an independent agency in 1996, which serves as the baseline year for the agency. Despite progress in reducing energy consumption, energy use has increased 11.8 percent versus the baseline year, and eight percent as compared to FY 2000.

SSA attributes the increases in energy use to increased automation of operations, expanded hours of operation at many of its facilities, higher costs due to renovation projects, and consolidation of employees within facilities.

SSA is evaluating options to reduce energy consumption and costs by installing energy saving features such as lighting control devices, updating energy management systems, and replacing inefficient equipment and systems.

Industrial and Laboratory Facilities

SSA has designated the National Computer Center (NCC) as an energy intensive facility. It operates 24 hours per day, 365 days per year.

Tactical Vehicle and Equipment Fuel Use

All vehicles used by SSA are leased from GSA. SSA has an extensive ridesharing program for employees and a limited Transit Subsidies program for qualified employees.

Greenhouse Gas Reduction Goal
SSA reported carbon emissions of 40,132 metric tons of carbon equivalent (MTCE) in FY 2001. SSA lacks FY 1990 data, thus comparisons versus the baseline data cannot be made.

Renewable Energy
SSA has analyzed the potential for using a variety of solar and renewable energy technologies for its headquarters buildings. In FY 2001, daylighting was used extensively in the renovated Annex building at the headquarters complex.

SSA is also working with GSA and an energy services company to evaluate the feasibility of using solar technology and other renewables in the Richmond, California, facility.

Solar lighting was installed in FY 2001 in a parking area of the Mid-Atlantic Social Security Center in Philadelphia, Pennsylvania.

Petroleum
In FY 2001, SSA used approximately 34,024 gallons of fuel oil, 48 percent less than in the baseline year.

Implementation Strategies

Life-Cycle Cost Analysis
SSA uses life-cycle cost analysis for energy audits, conservation projects, and prospective projects.

Facility Energy Audits
Since FY 1992, SSA has audited 100 percent of its facility space. In FY 2001, SSA initiated an energy audit at the Security West building, a 720,000 square foot leased facility located at the headquarters site.

Financing Mechanisms
SSA has made extensive use of Utility Enery Service Contracts. In FY 2001, SSA awarded lighting projects to energy service companies for Baltimore and Chicago facilities through area-wide contracts.

ENERGY STAR® and Other Energy-Efficient Products
SSA purchases energy efficient and ENERGY STAR® products whenever possible. Energy efficient specifications have been incorporated into construction criteria for renovation projects as well. Language has been incorporated into SSA contracts on purchasing energy efficient computers, motors, equipment, and building systems. SSA trains purchase card holders in procuring energy efficient products.

Sustainable Building Design
Sustainable design principles are being used for renovations at the headquarters complex. Among the features installed are energy efficient central heating and air conditioning plants, central computer-based energy management systems, daylighting, and efficient lighting and lighting controls.

In addition, the new childcare facility at SSA headquarters incorporated sustainable design features.

Highly Efficient Systems
The Annex building at SSA headquarters was renovated in FY 2001 and includes energy conserving and demand management features, such as an ice storage air conditioning system, daylighting, variable speed drives, energy efficient motors and pumps, and energy management systems.

Electrical Load Reduction Measures
SSA has a plan that identifies building curtailment activities in all government-owned delegated buildings nationwide. The Western Program Service Center facility has reduced electrical use by 10 percent by raising temperatures in computer rooms, completing minor lighting retrofits, turning off monitors, increasing employee awareness, and compressing the available hours of overtime on weekends.

Water Conservation
SSA continues to upgrade fixtures to energy efficient models in an effort to increase water conservation. Four SSA facilities have water management plans in place.

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U. TENNESSEE VALLEY AUTHORITY (TVA)

Management and Administration

The Executive Vice President of Administration serves as TVA's Senior Energy Official. TVA formed the Agency Energy Management Committee (AEMC) to facilitate compliance with Federal statutes, Executive Orders, VA energy and related environmental management objectives, and obligations under the Environmental Protection Agency's (EPA) Green Lights Program, and the ENERGY STAR® programs. The AEMC is comprised of representatives from each TVA organization responsible for energy management and associated environmental considerations inside the agency. The AEMC also provides an avenue for sharing lessons learned and replicating success.

Management Tools

Awards

TVA uses pay-for-performance as one method to reward employee efforts toward meeting agency goals. The AEMC is investigating ways to further reward employees for their energy management contributions.

Performance Evaluations

To the extent to which employees are responsible for activities that are related to the objectives of Executive Order 13123, their performance is evaluated in terms of accomplishing the energy management goals.

Training

TVA trains employees to accomplish objectives of its Internal Energy Management Program (IEMP). Energy management and environmental training is provided to managers and employees as needed. Employee awareness activities are used to educate employees on how they impact energy consumption and the environment through their daily activities at work and home. TVA also educates staff in energy and environmental topics through the TVA University.

TVA also provides training and assistance to its industrial, commercial, and residential customers, through initiatives that help customers identify and implement energy projects, encourage the selection of energy efficient equipment, and help solve other energy-related issues.

Showcase Facilities

The TVA Chattanooga Office Complex (COC) is TVA's designated Showcase facility. The COC was completed in 1986 and encloses approximately 1.2 million square feet of floor area. It integrates the use of passive energy strategies, energy management practices, and environmental programs and activities. Energy and environmental awareness programs have been established to inform the occupants how they affect facility performance. The combination of original design elements, energy and environmental activities, and aggressive energy reduction operation and maintenance efforts have resulted in the COC becoming a model facility.

Energy Efficiency Performance

Standard Buildings

In FY 2001, TVA reported a 27.9 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot. TVA received credit for purchases of 1.6 billion Btu of renewable electricity. This lowered the energy intensity of its standard buildings from 59,516 Btu/GSF to 59,363 Btu/GSF. TVA continues to reduce energy use in its facilities through the coordination of energy management efforts.

Tactical Vehicle and Equipment Fuel Use

TVA encourages employees to use mass transit systems, vans for group travel, and carpools when available. The use of coordinated TVA vendor delivery, pickup routing schedules, and just-in-time delivery has been expanded throughout TVA. A coordinated effort avoids double handling, multiple trips to the same sites, and reduces deadheading.

As a major supplier of electricity, TVA is particularly interested in supporting the use of electric vehicles (EVs). TVA has incorporated EVs into its fleet operations, and supports power distributors and local communities with EV technology demonstrations. TVA currently has 19 EVs in its fleet, comprised of four U.S. Electricar Prism sedans, five U.S. Electricar S-10 pickup trucks, five Solectrica Ford sedans, and five Ford Ranger pickup trucks.

Greenhouse Gas Reduction Goal

Energy used in TVA facilities resulted in emissions of 29,475 metric tons of carbon equivalent (MTCE) in FY 2001, a 54.2 percent increase versus data reported for the FY 1990 baseline year. TVA was credited 74.5 MTCE for purchases of renewable electricity made during the year.

Renewable Energy

TVA and twelve public power companies launched Green Power Switch (GPS) on Earth Day, April 22, 2000. GPS provides consumers with the opportunity to

participate in TVA's development of green power; in particular, the power generated by three wind turbines and 10 solar-generating sites. GPS expanded the program in 2001 to include electricity generated from methane gas at a landfill in Murfreesboro, Tennessee and a wastewater treatment plant in Memphis, Tennessee. Future expansion plans include additional solar installations at locations across the Tennessee Valley.

Under the GPS program, residential, commercial, and industrial customers sign up for green power blocks of 150 kilowatts each, which represent approximately 12 percent of a typical home's monthly energy use. The associated reduction of atmospheric carbon dioxide is equivalent to the reduction produced by planting an acre of trees. As of October 31, 2001, a total of 13,543 blocks of green power had been purchased.

TVA also has a wind and solar technology monitoring project, to follow the development of technologies for wind turbines, solar photovoltaics, and solar thermal and evaluate sites within the Tennessee Valley for potential wind farm siting.

The scope of the wind and solar technology monitoring project is to install photovoltaics and wind turbines as needed to support the TVA green pricing market test. TVA may use power purchase agreements for this generation.

The wind monitoring program has been identifying and developing potential wind sites. Recommendations to conduct advanced monitoring are currently under consideration. The solar technology following program will continue to assess technology advances and pricing trends. A photovoltaic installation to support green pricing will be a visible demonstration of this technology.

Self-Generated Renewable Energy
TVA is in the process of incorporating renewable energy options such as passive solar heating, geothermal heat pumps and daylighting in its new Customer Service Center building design.

TVA has installed photovoltaic panels and wind electric generators in many locations in its service area to provide renewable energy to its customers through its GPS program.

Purchased Renewable Energy
TVA purchased 450 megawatthours from the TVA GPS program for use in its Knoxville Office Complex.

Million Solar Roofs
TVA's current efforts are directed toward large scale solar installations through its GPS program, however, individual building installations are also being considered.

Petroleum
TVA consumed 10,712 gallons of petroleum in building operations in FY 2001, a decrease of 51 percent from the FY 1985 baseline of 21,920 gallons.

Water Conservation
TVA consumed 376.6 million gallons of potable water in FY 2001 with an estimated cost of more than $800,000, a reduction in consumption of 0.3 percent from FY 2000 levels.

Implementation Strategies
TVA has implemented many energy management measures through its operation and maintenance activities and building retrofits. For example, through TVA's SWAP program, controls are placed on lighting and other energy consuming equipment, and inefficient lighting is replaced when these actions are determined to be life-cycle cost effective. This program is implemented through the operation and maintenance staff as part of its daily activities. TVA has also installed energy management control systems (EMCSs) in the majority of its corporate facility space and considers the use of EMCSs for all facilities when their use is life-cycle cost effective.

Life-Cycle Cost Analysis
TVA's Energy Plan provides that life-cycle analysis will be used in making investment decisions regarding energy conservation measures.

Facility Energy Audits
TVA has evaluated its building inventory for potential energy conservation measures. In FY 2001, TVA revisited most of its fossil facilities to uncover potential energy saving opportunities.

Financing Mechanisms
Funding procedures for energy management and related environmental projects are reviewed through the IEMP and the AEMC. Projects for facilities are primarily funded through renovation, operation, maintenance, and modernization efforts. Projects covered under general operations are ranked for economic benefit compared to other TVA projects to determine funding availability and implementation status and are funded mainly through the capital budgeting process.

ENERGY STAR® and Other Energy-Efficient Products
TVA's Energy Plan provides that TVA will strive to meet the ENERGY STAR® Building criteria for energy performance and indoor environmental quality as described in Executive Order 13123. This includes purchasing ENERGY STAR® and other energy efficient products when feasible.

TVA continues its efforts to buy materials which have positive environmental qualities including soy ink, rechargeable batteries, low mercury lamps, and non-toxic supplies. TVA also purchases materials which meet sustainable architecture criteria. These are non-toxic building materials which have recycled content, and their creation, use, and disposal do not damage the environment.

TVA demonstrates a commitment to environmental stewardship through the implementation of its environmental programs and activities at the COC. Examples of these efforts include toxic reduction, affirmative procurement, waste minimization, and recycling.

TVA signed on as a Federal Charter Partner in the EPA "WasteWise Program" in FY 2001. Through this program, TVA has made a commitment to achieve results in waste prevention, collection of recyclables, and use of recycled materials. This aligns with TVA's mission of stimulating economic growth by protecting the Tennessee Valley's natural resources and building partnerships for the public good. TVA has established the Solid Waste Leverage Team and a Solid & Hazardous Waste Regulatory Policy Team to support the "WasteWise Program."

ENERGY STAR® Buildings
TVA's Edney building received an ENERGY STAR® Building Label during FY 2001. The building incorporates an energy efficient water source heat pump system, energy management system, energy efficient lighting with occupancy sensors, and other energy and environmentally friendly systems. This brings the percentage of TVA buildings meeting the ENERGY STAR® criteria to approximately 11 percent of TVA's overall corporate square footage.

Sustainable Building Design
TVA is incorporating sustainable design criteria into renovation and new construction efforts. Sustainable design guidelines have been written and are currently being reviewed. All of these efforts are being incorporated into an agency sustainable program under TVA's IEMP.

Energy Efficiency in Lease Provisions
Where applicable, TVA uses model lease provisions based on those recommended by GSA, and such provisions will be incorporated into new and renewed leases provided they are cost-effective.

Industrial Facility Efficiency Improvements
Many energy management and related environmental projects were completed at TVA hydro plants during FY 2001. Benefits from these projects include maintaining plant availability, reducing energy consumption, lowering maintenance costs, increasing overall efficiency, and supporting environmental stewardship.

Many nuclear energy reduction projects were also completed in FY 2001. Energy management and related environmental projects were completed at TVA Fossil plants during FY 2001. TVA supports projects which include heat rate improvements, maintaining plant availability, reducing energy consumption, lowering maintenance costs, environmental stewardship, and increasing overall efficiency.

Highly Efficient Systems
TVA considers the implementation of high efficiency systems when life-cycle cost effective.

Off-Grid Generation
TVA is currently researching, testing, and demonstrating the use of green power technologies.

Electrical Load Reduction Measures
As part of its operation and maintenance function, TVA has an emergency curtailment procedure which reduces energy use in its buildings during energy emergencies.

Water Conservation
The AEMC evaluates the Best Management Practices for application to TVA facilities. Facilities were evaluated for water usage in FY 2001 and high use areas were noted. At present, TVA has implemented certain Best Management Practices in corporate facilities, the COC, and public use areas.

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V. UNITED STATES POSTAL SERVICE (USPS)

Management and Administration

In the United States Postal Service (USPS), the Vice President of Engineering is the Senior Energy Official, with overall responsibility for design and implementation of energy efficiency policies and practices within the agency.

The USPS Headquarters energy management team consists of representatives from the legal, finance, purchasing, operations, facilities, and maintenance departments. The team is responsible for providing technical guidance in their respective functional areas, support to program development and implementation, and program effectiveness reviews.

Each of the nine USPS Area offices has a designated energy coordinator to provide program direction and coordination, consistent with national program objectives, within his/her geographical areas of responsibility. The Areas are comprised of District offices. In each District, there is a person responsible for identifying and coordinating energy activities and projects. In addition, each Area and District is instructed to establish committees to oversee energy-related activities within their geographical boundaries.

Management Tools

Awards

USPS employees receive monetary awards for their energy accomplishments. These awards are given at the discretion of the supervisor on a case-by-case basis. In some instances, Vice President "spot" awards are given. The energy program uses the existing USPS award system and procedures to recognize noteworthy employee contributions.

Performance Evaluations

Through annual goal setting and review, appropriate managers are evaluated on actions related to the USPS energy program. Relevant position descriptions include responsibilities and accountability for energy management. Energy management has a link to the overall financial performance of USPS, a factor considered in evaluations of senior management and managers throughout the organization.

Training

USPS employees receive ongoing training as part of the Corporate Voice of the Employee goal. Employees are encouraged to participate in the various educational and training opportunities presented by FEMP. Also, energy training is integrated into broader training for employees with facility Operations and Maintenance responsibilities. For example, training with respect to management HVAC systems routinely covers energy efficiency aspects of such systems. Such in-house training programs are provided to employees at the USPS National Training Center.

Showcase Facilities

The Showcase facility initiative has been integrated with the environmental "green building" program. The Eighth Avenue Station building, in Ft. Worth, Texas, was the first USPS green building. Since then, the main post office in Corrales, New Mexico, and a facility in Raleigh, North Carolina, have been included in the program. The green building program is managed by the USPS facilities department and involves the use of sustainable design principles and renewable materials. At its core, the green building program has three central objectives; increased energy efficiency, improved environmental performance, and a healthier workplace.

Energy Efficiency Performance

Standard Buildings

For FY 2001, USPS reported a 16.5 percent decrease in energy consumption from FY 1985 for its standard buildings when measured in Btu per gross square foot. Part of this is due to an increase in facility space, which rose by about 2.7 percent. However, the major factor was probably weather. For the U.S. as a whole, heating degree days increased 23.4 percent between the FY 2000 and the FY 2001 heating seasons, and cooling degree days by 3.3 percent between the two years' cooling seasons. Also, budgetary conditions forced USPS to defer capital spending on energy conservation projects. On a Btu per gross square foot basis, FY 2001 energy consumption was about 5 percent greater than in FY 2000 but was about 16.6 percent below consumption in FY 1985.

Exempt Facilities

The USPS has no exempt facilities. However, a proportion of total facility energy use is process energy, which is excluded from the requirements of Executive Order 13123.

Greenhouse Gas Reduction Goal

Energy used in USPS facilities resulted in carbon emissions of 849,231 metric tons of carbon equivalent (MTCE) in FY 2001, a 23.5 percent increase versus data reported for the FY 1990 baseline year.

Renewable Energy

Self-Generated Renewable Energy
Facilities in California and Rhode Island are operating photovoltaic units. Geothermal heat pumps have been installed at USPS facilities in the Mid-Atlantic, New York Metro, Southwest, and Midwest areas. At least 11 facilities are using this technology and USPS continues to seek new opportunities to do so.

Purchased Renewable Energy
USPS continues to seek opportunities to purchase renewable energy and encourages suppliers to do so in instances where there is competition to supply power.

Million Solar Roofs
USPS operates solar installations in Rancho Mirage, California, and Block Island, Rhode Island.

Petroleum
USPS petroleum use in FY 2001 was 6.5 million gallons, versus 6.2 million gallons in FY 2000, a decrease of 5.4 percent. As petroleum is mainly used for heating purposes in postal facilities, it is likely that weather-related factors account for most of the year-to-year increase.

Water Conservation
USPS facility water use in FY 2001 was 4.8 billion gallons, at a cost of $19.4 million. In FY 2000, 4.9 billion gallons were consumed, a decrease of 1.4 percent.

Total water use shows a decrease from FY 2000 to FY 2001 while expenditures rose over that period. Water use has declined slightly in each of the past three years. USPS has set a water consumption goal of 25 gallons per net square foot at its facilities. Using annual expenditures for water and current prices for specific geographic areas, it has been determined that in FY 2001, 81 of 87 Postal Service facility clusters met or exceeded the goal, up from 69 of 87 in FY 1997. To continue this trend, USPS has prepared an educational briefing for all facilities that provides guidance on implementing water conservation programs.

Implementation Strategies

Life-Cycle Cost Analysis
Within USPS, energy conservation projects are subjected to rate of return analysis, with a minimum required return on investment of 20 percent. In determining prospective returns on any project, the amount of energy saved, the cost of that energy, and changes in maintenance or other activities are taken into account. While USPS can identify projects with promising returns, it also is subject to extreme budgetary pressure and therefore has sought outside sources of capital investment through Shared Energy Savings programs whenever possible.

Facility Energy Audits
Energy audits are performed within USPS in connection with broader project analyses. Since 1992, all facilities larger than 250,000 gross square feet have been surveyed. In addition, some USPS Areas have used a "Do it Yourself" audit mechanism for facilities with less than 5,000 square feet. For example, in Florida, a focused survey unearthed 236 potential energy efficiency projects.

Financing Mechanisms
USPS makes extensive use of Shared Energy Savings contracts, employing this device in all sections of the country. While many of these are local, USPS also is experimenting with Area-wide shared energy savings concepts, and has successfully implemented a pilot program in the Midwest. Because of this success, consideration now is being given to a program that is national in scope. USPS has found shared energy savings to be one of the most efficient means available to reduce energy use while preserving needed capital for other purposes.

ENERGY STAR® and Other Energy-Efficient Products
USPS has formed an energy-related purchasing team that is investigating various kinds of energy-related procurements. The team has placed an emphasis on securing ENERGY STAR® products. In addition, USPS has issued an Environmental Products Directory to aid personnel in locating energy efficient products and services.

ENERGY STAR® Buildings
In FY 2001 USPS completed a beta test to develop specific ENERGY STAR® criteria for postal facilities. The results indicate that there is no one set of criteria that easily apply to all of the various kinds of USPS facilities. Efforts are being made to establish different ENERGY STAR® criteria for each type of facility.

Sustainable Building Design
USPS has developed a variety of sustainable building designs and also has created a "green addendum" which it has incorporated into its standard building designs. These design principles are contained in master specifications for facilities and are applied to all new construction projects and retrofits. In addition, there is ongoing review to ensure that the sustainable design

principles remain current and consistent with new technology.

Energy Efficiency in Lease Provisions
For leased facilities where USPS pays for utilities, USPS energy policy and standards are applied. These facilities are included in national energy program initiatives, and in some instances USPS retrofits facilities to meet current energy standards. In leased space where the owner pays utility costs, lease provisions are negotiated on a case-by-case basis.

Highly Efficient Systems
USPS facilities are seeking to improve their energy efficiency with new technologies. For example:

- The Corrales, New Mexico, facility uses straw bales, a sustainable renewable resource, as insulation. The R factor for the straw bale design is two to three times greater than conventional insulating materials. The Corrales facility was recognized by GSA in its annual Achievement Award for Real Property Innovation in 2001.

- A Lincoln, Nebraska, facility uses geothermal energy to run its HVAC systems. Energy savings from the hookup are monitored and compared to a conventionally-powered USPS facility nearby. Also, the USPS has a Memorandum of Understanding with the Geothermal Heat Consortium to obtain design assistance when a new or replacement facility is considering geothermal as an energy source.

- The South Raleigh Annex, North Carolina, facility includes a wide variety of energy-saving devices. These include light colored roofing, an aluminum storefront with a thermal break, LED exit lights, dimmable energy efficient HID pendent lighting, passive solar controls, low-e glazing, occupancy sensors in areas with intermittent use, increased R-value, high efficiency HVAC system with full economizers, minimum SEER of 10, heat recovery and positive pressure, and direct digital controls. This facility also incorporates water efficiency improvements such as xeriscaping, elimination of an unneeded irrigation system, and installation of sensor operated faucets and flush valves.

Off-Grid Generation
The Anchorage, Alaska, Processing and Distribution Center is powered by four 200 kilowatt fuel cells. Any power not consumed by the facility is fed back to the grid. Two solar projects are in operation at Rancho Mirage, California, and at Block Island, Rhode Island. New opportunities will also be investigated, including solar installations in the Los Angeles area, geothermal in Nebraska and in the Chicago area, and additional fuel cell applications.

Electrical Load Reduction Measures
The USPS has made plans for load reduction and has participated in tests and other measures in anticipation of further reductions. USPS updated its 2000 Energy Management Plan and its Energy Management and Conservation Implementation Plan in May 2001, developed a Pacific Area Energy Conservation Report and a Plan of Action for Energy Conservation in the USPS New York Metro Area, developed action plans in other areas, and coordinated with FEMP on energy conservation strategies. USPS also participated in a load reduction test in California, and has invited DOE's ALERT teams to survey larger USPS facilities for purposes of identifying further load reduction options.

Water Conservation
In FY 2001, a study identified USPS areas with potential for further water conservation and cost savings. The study material was incorporated into a briefing that provides guidance on initiating new water conservation projects, including best management practices, to curb excess water use. A goal was set for water usage at postal facilities, and efforts were made to increase the number of facilities reaching the goal.

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APPENDIX A
LIST OF AUTHORITIES

ENERGY POLICY ACT (Public Law 102-486), October 1992

FEDERAL ENERGY MANAGEMENT IMPROVEMENT ACT OF 1988 (Public Law 100-615), November 1988

NATIONAL ENERGY CONSERVATION POLICY ACT (Public Law 95-619), November 1978

DEPARTMENT OF ENERGY ORGANIZATION ACT (Public Law 95-91), August 1977
TITLE III - TRANSFERS OF FUNCTIONS

ENERGY POLICY AND CONSERVATION ACT (Public Law 94-163), December 1975
SECTION 381 - FEDERAL ENERGY CONSERVATION PROGRAMS

EXECUTIVE ORDER 13221, July 31, 2001
ENERGY-EFFICIENT STANDBY POWER DEVICES

EXECUTIVE ORDER 13123, June 3, 1999
GREENING THE GOVERNMENT THROUGH EFFICIENT ENERGY MANAGEMENT

SUPPLEMENT NO. 1 TO OFPP POLICY LETTER 76-1, July 2, 1980

OFPP POLICY LETTER NO. 76-1, August 6, 1976
FEDERAL PROCUREMENT POLICY CONCERNING ENERGY POLICY AND CONSERVATION

OTHER FEDERAL REGULATIONS

REVISION TO FEDERAL ACQUISITION REGULATION
48 C.F.R. 23.2 (2002)

FEDERAL ACQUISITION REGULATION
48 C.F.R. §§ 23.201-203 (1995)

FEDERAL ENERGY MANAGEMENT AND PLANNING PROGRAMS
10 C.F.R., Part 436 (1996)

FEDERAL PROPERTY MANAGEMENT REGULATION
41 C.F.R., Part 101-25 (1996)

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APPENDIX B
DATA COLLECTION

Standard Buildings and Facilities, Energy Intensive Facilities, and Exempt Facilities

The Federal agencies that own or control buildings are required to report the energy consumption in these buildings to FEMP 45 days 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 buildings operated by agencies pursuant to GSA delegations, 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. Tables 1-A, 5-A, and 8-B of this report account for primary energy use, which is the sum of the energy directly consumed by end users (site energy) and the energy consumed in the production and delivery of energy products. According to the Energy Information Administration, in 1999, steam electric utility plants (the largest source of electricity generation) were estimated to have used 10,346 Btu of fossil fuel energy to generate 1 kilowatt-hour of electricity. 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 vehicles and equipment to FEMP within 45 days 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.

Calculation of Estimated Carbon Emissions

In the past, DOE tracked and reported aggregate energy use for all Federal agencies and estimated carbon emissions using national fuel-specific emission factors. This approach, however, resulted in less accurate emission estimates for electricity use because carbon emission factors for electricity vary significantly by utility and State depending on the resource used to generate the electricity (e.g., coal, gas, nuclear, hydro).

To obtain a greater level of accuracy in estimating emissions from electricity use, DOE developed a new approach that places little or no additional reporting burden on the agencies. Agencies continue to report their aggregated national-level electricity consumption data as they have in the past. DOE then takes that total consumption figure and apportions it across the States in which the agency has facility locations. DOE will then multiply the apportioned electricity usage by the appropriate regional-level carbon emission factor assigned to each State. Once emissions from electricity use are calculated, these will be added to the emissions estimated from the other fuels used by the agency to determine total carbon emissions. (National factors may be appropriately used for fuel oil, natural gas, LPG/propane, coal, and purchased steam.)

DOE estimated State electricity usage by determining the percentage of facility floor area for the agency and apportioning the reported total electricity use according to that percentage. For the purposes of estimating changes in greenhouse gas emissions over time, DOE is assuming that floor area can be used as a reasonable proxy to represent the State-level usage pattern for electricity consumption for an agency. DOE uses historical square footage data for Government-owned buildings from the General Services Administration's Office of Governmentwide Policy, Office of Real Property to determine each agency's percentage floor area for each State.

DOE uses factors derived from data from the Energy Information Administration (EIA) for estimating carbon emissions from non-electric fuels on a nation-wide basis. The regional emissions factors for electricity were calculated by summing the annual EIA data on electricity sales and carbon emissions for each State in a given region. These sums were then used to calculate the regional emissions/kWh (which were then converted to MMTCE/Quad). This value will be used for each State in a particular region.

Non-Electric Fuel National Coefficients
Million Metric Tons of Carbon Equivalent (MMTCE) per Site-Delivered Quad
(or Metric Tons of Carbon Equivalent [MTCE] per Site-Delivered Billion Btu)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Fuel Oil	19.95	19.95	19.95	19.95	19.95	19.95	19.95	19.95	19.95	19.95	19.95	19.95
Natural Gas	14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47
LPG/Propane	16.99	16.98	16.99	16.97	17.01	17.00	16.99	16.99	16.99	16.99	16.99	16.99
Coal	25.58	25.60	25.62	25.61	25.63	25.63	25.61	25.63	25.63	25.63	25.63	25.63
Purchased Steam	35.63	35.63	35.63	35.63	35.63	35.63	35.63	35.63	35.63	35.63	35.63	35.63

Source: EIA's *Emissions of Greenhouse Gases in the United States,* 1998, Tables 11 and B1, DOE/EIA-0573(98), October 1999. The factor for purchased steam is derived from the coefficient for coal adding associated losses for generation and transportation (using a factor of 1.39 to convert site-delivered to primary energy).

Electricity Regional Coefficients
Million Metric Tons of Carbon Equivalent (MMTCE) per Site-Delivered Quad
(or Metric Tons of Carbon Equivalent [MTCE] per Site-Delivered Billion Btu)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
AK	49.51	49.51	49.51	49.51	44.66	44.66	44.66	44.66	51.92	84.07	84.07	84.07
AL, GA, MS, NC, SC, TN, VA	43.28	43.28	43.28	43.28	45.27	45.27	45.27	45.27	45.36	45.47	45.47	45.47
AR, KS, LA, MO, OK	57.92	57.92	57.92	57.92	57.74	57.74	57.74	57.74	62.22	63.39	63.39	63.39
AZ, CO, NM	82.50	82.50	82.50	82.50	68.44	68.44	68.44	68.44	69.26	69.13	69.13	69.13
CA	15.12	15.12	15.12	15.12	13.42	13.42	13.42	13.42	12.81	17.02	17.02	17.02
CT, MA, ME, NH, RI, VT	33.08	33.08	33.08	33.08	32.27	32.27	32.27	32.27	27.84	32.02	32.02	32.02
DC, DE, MD, NJ, PA	47.39	47.39	47.39	47.39	43.36	43.36	43.36	43.36	46.14	46.24	46.24	46.24
FL	46.61	46.61	46.61	46.61	44.34	44.34	44.34	44.34	47.05	45.38	45.38	45.38
HI	61.59	61.59	61.59	61.59	49.47	49.47	49.47	49.47	44.70	49.96	49.96	49.96
IA, MN, NE, ND, SD	73.55	73.55	73.55	73.55	66.89	66.89	66.89	66.89	48.69	47.59	47.59	47.59
ID, MT, NV, OR, UT, WA, WY	41.83	41.83	41.83	41.83	40.12	40.12	40.12	40.12	44.26	39.80	39.80	39.80
IL, WI	44.50	44.50	44.50	44.50	51.37	51.37	51.37	51.37	49.90	49.76	49.76	49.76
IN, KY, MI, OH, WV	82.23	82.23	82.23	82.23	77.30	77.30	77.30	77.30	78.84	78.20	78.20	78.20
NY	40.59	40.59	40.59	40.59	25.95	25.95	25.95	25.95	28.63	26.69	26.69	26.69
TX	55.75	55.75	55.75	55.75	52.42	52.42	52.42	52.42	58.21	55.82	55.82	55.82

Note: Regions match those defined in the Energy Information Administration's (EIA's) Electricity Market Module of the National Energy Modeling System. 1991 through 1993 use the coefficients developed for 1990, 1994 through 1997 use the coefficients developed for 1997. Coefficients were developed for 1998 and 1999 with the years 2000 and 2001 using the coefficients developed for 1999.

Sources: For 1990 generation: EIA, Electric Power Annual 1991 Volume II, Tables 26 and 73, DOE/EIA-0348(98)/2, December 1991. (used 1990 data).

For 1997 generation: EIA, Electric Power Annual 1998 Volume II, Tables 4 and 61, DOE/EIA-0348(98)/2, December 1998. (used 1997 data)

For carbon emissions: EIA, Electric Power Industry Estimated Carbon Emissions 1990 and 1997

For 1998 and 1999 coefficients:

EIA - Electric Power Annual - 1999 (Vol. 2), Form-861, "Annual Electric Utility Report".

EIA - Electric Power Annual - 1999 (Vol. 2), Form-860B, "Annual Electric Generator Report, Non-Utility".

EIA - Electric Power Annual - 1999 (Vol. 2), Form-767, "Steam-Electric Plant Operation and Design Report," Form-759. "Monthly Power Plant Report".

EIA - Electric Power Annual - 1999 (Vol. 2), Form-860B, "Annual Electric Generator Report, Non-Utility".

Vehicle & Equipment Fuel National Coefficients, 1990 - 2001
Million Metric Tons of Carbon Equivalent (MMTCE) per Site-Delivered Quad
(or Metric Tons of Carbon Equivalent [MTCE] per Site-Delivered Billion Btu)

Gasoline		19.35
Diesel	19.95	
Aviation Gas		18.87
Jet Fuel		19.33
Navy Special		21.49

Source: EIA's *Emissions of Greenhouse Gases in the United States,* 1998, Tables 11 and B1, DOE/EIA-0573(98), October 1999.

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APPENDIX C
FEDERAL ENERGY EXPENDITURES, FY 1985 THROUGH FY 2001

TABLE C
FEDERAL ENERGY EXPENDITURES, FY 1985–FY 2001
(CONSTANT 2001 DOLLARS)

Year	Annual Energy Use (BBTU)	Annual Energy Cost ($ MILLION)	Annual Energy Cost ($/MMBTU)	Change in Energy Costs from 1985[1] ($ MILLION)
Standard Buildings & Facilities				
1985	419,017.1	$5,312.435	$12.678	$0.000
1986	444,348.8	$5,371.959	$12.090	$59.524
1987	466,091.3	$5,368.712	$11.519	$56.277
1988	441,066.0	$4,888.508	$11.083	-$423.928
1989	438,197.1	$4,538.557	$10.357	-$773.878
1990	428,213.8	$4,903.923	$11.452	-$408.513
1991	397,569.5	$4,530.578	$11.396	-$781.857
1992	402,259.9	$4,248.426	$10.561	-$1,064.009
1993	392,090.7	$4,442.507	$11.330	-$869.928
1994	374,093.9	$4,254.124	$11.372	-$1,058.311
1995	356,855.5	$3,966.757	$11.116	-$1,345.678
1996	348,407.4	$3,881.292	$11.140	-$1,431.143
1997	341,241.3	$3,756.432	$11.008	-$1,556.003
1998	334,369.9	$3,648.400	$10.911	-$1,664.035
1999	331,069.9	$3,514.585	$10.616	-$1,797.850
2000	324,125.0	$3,447.533	$10.636	-$1,864.902
2001	327,475.3	$3,936.125	$12.020	-$1,376.310
Energy Intensive Facilities				
1985	76,497.3	$1,010.046	$13.204	$0.000
1986	22,474.5	$366.726	$16.317	-$643.320
1987	22,736.5	$326.760	$14.372	-$683.286
1988	53,743.7	$695.048	$12.933	-$314.998
1989	50,549.8	$537.060	$10.624	-$472.986
1990	67,400.9	$793.838	$11.778	-$216.208
1991	77,123.6	$835.587	$10.834	-$174.459
1992	90,402.3	$943.876	$10.441	-$66.170
1993	64,124.0	$616.005	$9.606	-$394.041
1994	64,414.9	$599.564	$9.308	-$410.482
1995	62,328.5	$543.719	$8.723	-$466.327
1996	62,395.1	$572.585	$9.177	-$437.461
1997	61,582.4	$569.587	$9.249	-$440.459
1998	61,880.5	$525.113	$8.486	-$484.933
1999	58,070.3	$488.506	$8.412	-$521.540
2000	62,577.7	$549.767	$8.785	-$460.279
2001	60,733.9	$618.252	$10.180	-$391.794

[1]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.

Source: Federal Agency Annual Energy Management Data Reports

TABLE C (Continued)
FEDERAL ENERGY EXPENDITURES, FY 1985–FY 2001 (CONSTANT 2001 DOLLARS)

Year	Annual Energy Use (BBTU)	Annual Energy Cost ($ MILLION)	Annual Energy Cost ($/MMBTU)	Change in Energy Costs from 1985[1] ($ MILLION)
Exempt Facilities				
1985	21,467.4	$299.997	$13.975	$0.000
1986	18,473.3	$246.502	$13.344	-$53.495
1987	18,589.5	$249.829	$13.439	-$50.168
1988	18,605.5	$237.685	$12.775	-$62.312
1989	15,935.9	$223.721	$14.039	-$76.276
1990	15,894.0	$240.059	$15.104	-$59.938
1991	16,484.5	$234.910	$14.250	-$65.087
1992	18,929.1	$239.921	$12.675	-$60.076
1993	17,865.7	$224.935	$12.590	-$75.062
1994	16,832.7	$228.777	$13.591	-$71.220
1995	22,915.0	$209.439	$9.140	-$90.558
1996	13,280.5	$218.981	$16.489	-$81.016
1997	24,022.7	$272.269	$11.334	-$27.728
1998	14,534.9	$222.593	$15.314	-$77.404
1999	19,253.9	$230.962	$11.996	-$69.035
2000	28,157.1	$367.900	$13.066	$67.903
2001	27,168.2	$435.311	$16.023	$135.314
Vehicles & Equipment				
1985	934,268.4	$8,996.276	$9.629	$0.000
1986	924,833.7	$5,452.980	$5.896	-$3,543.296
1987	958,904.3	$5,780.918	$6.029	-$3,215.358
1988	846,896.2	$5,482.128	$6.473	-$3,514.148
1989	959,994.6	$6,160.953	$6.418	-$2,835.323
1990	926,994.8	$6,660.972	$7.186	-$2,335.304
1991	970,454.3	$8,224.390	$8.475	-$771.886
1992	783,122.4	$4,891.915	$6.247	-$4,104.360
1993	772,633.8	$5,150.562	$6.666	-$3,845.714
1994	722,790.5	$3,703.183	$5.123	-$5,293.093
1995	687,137.4	$3,820.504	$5.560	-$5,175.772
1996	675,111.5	$3,750.986	$5.556	-$5,245.290
1997	665,386.0	$4,325.372	$6.501	-$4,670.904
1998	627,339.2	$4,599.228	$7.331	-$4,397.048
1999	607,527.2	$4,082.391	$6.720	-$4,913.885
2000	579,135.6	$3,280.127	$5.664	-$5,716.149
2001	586,845.6	$4,646.804	$7.918	-$4,349.472

[1]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.

Source: Federal Agency Annual Energy Management Data Reports

TABLE C (Continued)
FEDERAL ENERGY EXPENDITURES, FY 1985–FY 2001 (CONSTANT 2001 DOLLARS)

Year	Annual Energy Use (BBTU)	Annual Energy Cost ($ MILLION)	Annual Energy Cost ($/MMBTU)	Change in Energy Costs from 1985[1] ($ MILLION)
Total Energy - All End-Use Sectors				
1985	1,451,250.2	$15,618.754	$10.762	$0.000
1986	1,410,130.3	$11,438.167	$8.111	-$4,180.588
1987	1,466,321.6	$11,726.220	$7.997	-$3,892.534
1988	1,360,311.4	$11,303.368	$8.309	-$4,315.386
1989	1,464,677.4	$11,460.292	$7.824	-$4,158.463
1990	1,438,503.5	$12,598.793	$8.758	-$3,019.962
1991	1,461,631.9	$13,825.465	$9.459	-$1,793.290
1992	1,294,713.7	$10,324.139	$7.974	-$5,294.615
1993	1,246,714.2	$10,434.008	$8.369	-$5,184.746
1994	1,178,132.0	$8,785.648	$7.457	-$6,833.106
1995	1,129,236.4	$8,540.419	$7.563	-$7,078.335
1996	1,099,194.5	$8,423.845	$7.664	-$7,194.910
1997	1,092,232.4	$8,923.661	$8.170	-$6,695.094
1998	1,038,124.5	$8,995.335	$8.665	-$6,623.420
1999	1,015,921.3	$8,316.444	$8.186	-$7,302.310
2000	993,995.4	$7,645.327	$7.692	-$7,973.428
2001	1,002,223.0	$9,636.491	$9.615	-$5,982.263

[1]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.

Source: Federal Agency Annual Energy Management Data Reports

APPENDIX D
INDUSTRIAL, LABORATORY, RESEARCH, AND OTHER ENERGY INTENSIVE FACILITIES

Department of Agriculture

Agricultural Research Service

Agriculture Research at NC State University, Raleigh, NC
Agronomy Farm - Soil Tilth, Boone, IA
Animal Physiology Research, Columbia, MO
Appalachian Fr Research Station, Kearneysville, WV
Appalachian Soil & Water Con, Beckley, WV
Aquatic Weed Research Lab, Fort Lauderdale, FL
Aquatic Weeds Control Research Lab, Davis, CA
ARS Food Animal Protection Research & Southern Crops Research Laboratory), College Station, TX
ARS Research Fac Purdue University, West Lafayette, IN
ARS Research Fac University of Illinois, Urbana, IL
ARS Research Fac University of Nebraska, Lincoln, NE
Arthropod-borne Anim Dis, Laramie, WY
Avian Disease & Oncology Lab, East Lansing, MI
BARC Worksite - Aroostook Farm, Presque Isle, ME
BARC Worksite - Aroostook Farm, Presque Isle, ME
Beltsville Agricultural Research Center, Beltsville, MD
Beneficial Insects Research, Newark, DE
Biological Insect Control Lab, Columbia, MO
Bruner Farm - Corn Insects, Ames, IA
Cattle Fever Tick Research Lab, Mission, TX
Central Great Plains Research Sta, Akron, CO
Central Plains Exp Range, Nunn, CO
Cereal Crops Research, Madison, WI
Cereal Rust Research Lab, St. Paul, MN
Children's Nutrition Research Ctr, Houston, TX
Citrus & Subtropical Prod Lab, Winter Haven, FL
Citrus Research Foundation Farm, Leesburg, FL
Coastal Plain Soil/Water Cons., Florence, SC
Columbia Plateau Con Research Center, Pendleton, OR
Conserv & Prod Research Lab, Bushland, TX
Corn Insects & Crop Genetics, Ames, IA
Cotton Quality Research Station, Clemson, SC
Cropping Sys & Plant Genetics, Columbia, MO
Cropping Systems Research Lab, Lubbock, TX
Crops Research Laboratory, Fort Collins, CO
Dairy Forage Research Center, Campus Facility , Madison, WI
Dairy Forage Research Facility, Prairie du Sac, WI
Eastern Reg Research Center, Wyndmoor, PA
Forage & Range Research Lab, Logan, UT
Ft Keogh Livestock & Range, Miles City, MT
Germplasm Intro Research Unit, Kingshill, USVI
Golden Nematode Research Farm, Prattsburg, NY
Grand Forks Human Nutrition Rc, Grand Forks, ND
Grassland Soil & Water Research Lab, Temple, TX
Grassland Soil & Water Research Lab, Riesel, TX
Grazing Lands Research Lab, El Reno, OK
Hayden Bee Research Center, Tucson, AZ
High Plains Grasslands Research Sta, Cheyenne, WY
Honeybee, Soil & Water Research, Baton Rouge, LA
Horticultural Crops Research Lab, Corvallis, OR
Horticultural Crops/water Mgmt, Fresno, CA
Hruska US Meat Animal Research Center, Clay Center, NE
Insect Biology & Population Research Laboratory, Tifton, GA
Irrigated Agriculture Research, Prosser, WA
Jamie Whitten Delta States RC, Stoneville, MS
Jean Mayer Hum Nutr Research Center, Boston, MA
Jornada Experimental Range, Las Cruces, NM
Knipling-Bushland US Livestock, Kerrville, TX
Landscape Ecol. of Range Land, Reno, NV
Mayaguez Inst Tropical Agri, Isabela, PR
Medical & Veterin. Entomology, Gainesville, FL
Mississippi State Research Center, Mississippi State, MS
N. Central Soil Conser Worksite, Morris, MN
Nat. Clonal Germplasm Rep, Corvallis, OR
National Agricultural Library, Beltsville, MD
National Animal Disease Center, Ames, IA
National Aquaculture Research Ctr, Stuttgart, AR
National Arboretum, Washington, DC
National Clonal Germplasm Rep, Riverside, CA
National Clonal Germplasm Rep, Hilo, HI
National Peanut Research Lab, Dawson, GA
National Seed Storage Lab, Fort Collins, CO
National Soil Tilth Lab, Ames, IA
National Soil Tilth Lab, Treynor, IA
National Soils Dynamics Lab, Auburn, NC
Natl Clnl Grmplasm Repository, Davis, CA
Natl Center for Agric Util Research, Peoria, IL
Nat'l Forage Seed Prot Tes Center, Corvallis, OR
Natl Small Grains Research Facility, Aberdeen, ID
Natural Resources Research Center, Fort Collins, CO
NE Watershed Research Center, Klingerstown, PA
Nematology Growth Lab, Baton Rouge, LA
Nemotology Investigations, Ithaca, NY
New Enlgand Plant Soil Water, Orono, ME
No. Appalachian Exp Watershed, Coshocton, OH
No. Cen Soil Conserv Research Center, Morris, MN
Northern Grain Insects Research Lab, Brookings, SD
Northern Great Plains Research Lab, Mandan, ND
Northern Plains Soil & Water, Sidney, MT

Nothern Great Basin Exp Range, Burns, OR
NW Watershed Research Center, Boise, ID
OARDC Research Facility, Wooster, OH
Office-Port Terminal, Orient Point, NY
Palouse Cons Field Station, Pullman, WA
Pecan Genet & Improv Research Lab, Brownwood, TX
Pecan Genetics & Improvement, Somerville, TX
Plant Genetic Resources Unit, Geneva, NY
Plant Introduction Research, Ames, IA
Plant Introduction Sta, Glenn Dale, MD
Plant Pathology & Genetics, Davis, CA
Plant Science & Water Conserv, Stillwater, OK
Plum Isle Light Station, Greenport, NY
Plum Isle Animal Disease Center, Greenport, NY
Potato Research Lab, East Grand Forks, MN
Red River Valley Agric. Research Center, Fargo, ND
Reg Pasture Research Lab, State College, PA
Regional Plant Introduction St, Experiment, GA
Regional Poultry Research Lab, Georgetown, DE
Rice Research, Beaumont, TX
Richard Russell Agric. Research Center, Athens, GA
SE Fruit Tree Nut Research Lab, Byron, GA
Small Fruit Research Station, Poplarville, MS
Snake River Conser Research Center, Kimberly, ID
So. Central Family Farms Center, Booneville, AR
So. Great Plains Watershed, Chickasha, OK
Soil & Water Mgmt Research Worksite, Rosemount, MN
Soil & Water Pollution Research., Baton Rouge, LA
Soil & Water Shop, Baton Rouge, LA
Soil Drainage, Ohio State Univ, Columbus, OH
South Central Agric Research Lab, Lane, OK
Southeast Poultry Research Lab, Athens, GA
Southern Piedmont Cons Research Center, Watkinsville, GA
Southern Plains Range Research Sta, Woodward, OK
Southern Regional Research Center, New Orleans, LA
Stored Products Insects Lab, Newberry, FL
Subtropical Agri. Research Lab, Weslaco, TX
Subtropical Agricultural Research, Brooksville, FL
Subtropical Horticulture Research, Miami, FL
Sugarbeet, Bean & Cereal Research, East Lansing, MI
Sugarcane Production Research, Canal Point, FL
SW Cotton Ginning Research Lab, Mesilla, NM
Tree Fruit Research Center, Wenatchee, WA
Trop. Fruit Fly & Veg. Research lab, Honolulu, HI
Tropical Agricultural Research Sta, Mayaguez, PR
Tropical Fruit & Veg Research Lab, Kapaa, HI
Tropical Fruit & Veg. Research Lab, Hilo, HI
U.S. Grain Mkt Research Lab, Manhattan, KS
U.S. Horticultural Laboratory, Plymouth, FL
U.S. Agricultural Research Sta, Salinas, CA
U.S. Big Spring Field Station, Big Spring, TX
U.S. Horticultural Research Lab, Orlando, FL
U.S. Plant, Soil & Nutrition, Ithaca, NY
U.S. Salinity Laboratory, Riverside, CA
U.S. Sedimentation Laboratory, Oxford, MS
U.S. Sedimentation Laboratory, Holly Springs, MS
U.S. Sheep Experiment Station, Dubois, ID
U.S. Sugarcane Research Unit, Houma, LA
U.S. Vegetable Research Lab, Charleston, SC
U.S. Water Conservation Lab, Phoenix, AZ
Vegetable Crop Research, Arlington, WI
Virus Free Decidous Tree Sta, Moxee City, WA
Walnut Gulch Watershed, Tombstone, AZ
Western Cotton Research Lab, Phoenix, AZ
Western Regional Research Center, Albany, CA
Yakima Agricultural Research Lab, Wapato, WA

Animal & Plant Health Inspection Service
ADC District Headquarters, Rock Springs, WY
Animal Inspection Facility, Sweetgrass, MT
Animal Research Building, Fort Collins, CO
Biological Control Station, Niles, MI
Bird Quarantine Facility, Otay, CA
Blackbird Experimental Station, Stuttgart, AR
Chemical Gas Storage, Ames, IA
Center for Pl.health Sci.& Tech., Oxford, NC
Fire Ant Program, Gulfport, MS
Golden Nematode Station, West Hampton Beach, NY
Loyote Rabies Abatement Project, Laredo, TX
Medfly Rearing Facility, Waimanalo, HI
National Veterinary Labs, Ames, IA
Natl. Mon.& Research Analysis Lab, Gulfport, MS
Natl. Plant Germ Plasma Q.C., Beltsville, MD
New York Animal Import Center, Newburgh, NY
PPQ Field Station, Wilmington, NC
Predator Research, Logan, UT
Tick Force Office, Del Rio, TX
U.S. Plant Introduction Sta., South Miami, FL
USDA, AMS, Lsmg, Omaha, NE
USDA, APHIS, Mission, TX
USDA, APHIS, ADC Supply Depot, Pocatello, ID
USDA, APHIS, Aero, Raleigh, NC
USDA, APHIS, PPQ Hawthorne, CA
USDA, APHIS, PPQ Brawley, CA
USDA, APHIS, PPQ Amityville, NY
USDA, APHIS, PPQ San Bruno, CA
USDA, APHIS, PPQ San Saba, TX
USDA, APHIS, PPQ Fallbrook, CA
USDA, APHIS, PPQ Carolina, PR
USDA, APHIS, PPQ Des Moines, WA
USDA, APHIS, PPQ Chicago, IL
USDA, APHIS, PPQ, Pelham, AL
USDA, APHIS, PPQ, Spokane, WA
USDA, APHIS, PPQ, New Albany, NY
USDA, APHIS, PPQ, Lewiston, NY
USDA, APHIS, PPQ, Housing Quarters, Presidio, TX
USDA, APHIS, VS, Ames, IA
USDA, APHIS, VS, Hawthorne, CA

USDA, APHIS, VS, Ames, IA
USDA, APHIS, VS, Ames, IA
USDA, APHIS, WS, Boardman, OH
USDA, APHIS, PPQ, San Juan, PR
Wildlife Research Center, Gainesville, FL

Department of Defense

Holston Army Ammunition Plant, Kingsport, TN
Radford Army Ammunition Plant, Radford, VA
AAFES Food Processing Plant, Grünstadt, Germany
Laundry Facility, Ft. Leonard Wood, MO
SIMA, Pascagoula, MS
COMOPTEVFOR, Norfolk, VA
NAVSPASURFLDSTA, Chula Vista, CA
NAVSPASURFLDSTA, Hawkinsville, GA
NAVSPASURFLDSTA, Hollandale, MS
NAVSPASURFLDSTA, Maricopa, AZ
NAVSPASURFLDSTA, Savannah, GA
NAVSPASURFLDSTA, Wetumpka, AL
NAVSPASURFLDSTAELPHAB, Trorc, NM
NAVSPASURFLDSTAKIKLK ACH CT, TX
NAVSPASURFLDSTAREDRVR LWSV, AR
TRIREFFAC, Kings Bay, GA
MCLB, Albany, GA
MCLB, Barstow, CA
NAVAVNDEPOT, Cherry Point, NC
NAVAVNDEPOT, Jacksonville, FL
NAVAVNDEPOT, North Island, CA
NAVORDMISTESTSTA, White Sands, NM
NAVWPNINDRESPLNT, Toledo, OH
NWIRP Bethpage, NY
NWIRP Bloomfield, CT
NWIRP Dallas, TX
NWIRP McGregor, TX
NSWC DIV, Indian Head, MD
NSY, Norfolk, VA
NSY, Portsmouth, NH
NSY PUGET SOUND Bremerton, WA
NUWC DIV, Keyport, WA
WV ABL, Mineral, CO
FISC, Pearl Harbor, HI
FISC, San Diego, CA
FISC, Yokosuka, Japan
NAVSHIPREPFAC, Yokosuka, Japan
NSY, Pearl Harbor, HI
SIMA, San Diego, CA
NAVPBRO, Magna, UT
NIROP, Pittsfield, MA
NIROP, Sunnyvale, CA
POMFLANT, Charleston, SC
SWFLANT, Kings Bay, GA
SWFPAC, Bangor, WA
AMFORRDRESINS, Bethesda, MD
NWS YORKTOWN SJC ANNEX
NSC, Jacksonville, FL
NSC, Norfolk, VA
NSC, Oakland, CA
NSC, Pensacola, FL
NSC PUGET SOUND, Bremerton, WA
NSD Guam
INTCOMBATSYSTESTFAC, San Diego, CA
UNISERUOFHEASCN, Bethesda, MD
Hill AFB, UT
Tinker AFB, OK
Robins AFB, GA
Kelly AFB, TX (closed)
McClellan, CA (closed)
Arnold AFB, TN

Commissary Stores
ABERDEEN, Baltimore, MD
MCLB ALBAN, Albany, GA
ALTUS, Altus, OK
ANCHORAGE, Anchorage, AK
ANDERSEN AFB, Yigo, Guam
ANDREWS AFB, Camp Springs, MD
ANNAPOLIS, Annapolis, MD
ARDEC, Patterson, NJ
ARNOLD AFB, Tullahoma, TN
ATHENS NSCS, Athens, GA
ATSUGI, Yokohama, Japan
BANGOR, Silverdale, WA
BANGOR ANGB, Bangor, ME
BARBERS POINT, Pearl City, HI
BARKSDALE AFB, Bossier City, LA
BARSTOW MCLB, Barstow, CA
BEALE AFB, Marysville, CA
BOLLING AFB, Washington, D.C.
BREMERTON, Bremerton, WA
BROOKS, San Antonio, TX
BRUNSWICK NAS, Portland, ME
C. E. KELLY, Pittsburgh, PA
CAMP CARROLL, Taegu, South Korea
CAMP CASEY, Tongduchon, South Korea
CAMP COURTNEY, Gushikawa, Japan
CAMP FOSTER, Naha, Japan
CAMP HOWZE, Munson, South Korea
CAMP HUMPHREYS, Pyongtaek, South Korea
CAMP KINSER, Naha, Japan
CAMP KURE, Hiroshima, Japan
CAMP LEJUENE, Jacksonville, NC
CAMP MERRILL, Dahlonega, GA
CAMP PAGE, Taegu , South Korea
CAMP PENDLETON, Oceanside, CA
CAMP STANLEY, Uijongbu , South Korea
CAMP ZAMA, Tokyo, Japan
CANNON AFB, Clovis, NM

CARLISLE, Carlisle, PA
CHARLESTON AFB, Charleston, SC
CHARLESTON NWS, Charleston, SC
CHERRY POINT, Havelock, NC
CHINA LAKE, Ridgecrest, CA
CHINHAE NAS, Chinhae, South Korea
COLUMBUS AFB, Columbus, MS
CORPUS CHRISTI, Corpus Christi, TX
CRANE NWSC, Crane, IN
CUTLER, Machias, ME
DAHLGREN, Fredericksburg, VA
DAVIS-MONTHAN, Tucson, AZ
DDC (New Cumberland), Harrisburg, PA
DOVER, Dover, DE
DSCR, Richmond, VA
DUGWAY, Dugway, UT
DYESS AFB, Abilene, TX
EDWARDS, Rosamond, CA
EGLIN AFB, Niceville, FL
EIELSON AFB, Fairbanks, AK
EL CENTRO, El Centro, CA
ELLSWORTH AFB, Rapid City, SD
F. E. WARREN, Cheyenne, WY
FAIRCHILD, Spokane, WA
FALLON, Fallon, NV
FITZSIMONS, Aurora, CO
FT. BELVOIR, Alexandria, VA
FT. BENNING, Columbus, GA
FT. BLISS, El Paso, TX
FT. BRAGG - NORTH, Fayetteville, NC
FT. BRAGG - SOUTH, Fayetteville, NC
FT. BUCHANAN, San Juan, Puerto Rico
FT. CAMPBELL, Clarksville, TN
FT. CARSON, Colorado Springs, CO
FT. DETRICK, Frederick, MD
FT. DRUM, Watertown, NJ
FT. EUSTIS, Newport News, VA
FT. GILLEM, Atlanta, GA
FT. GORDON, Augusta, GA
FT. GREELY, Delta Junction, AK
FT. HAMILTON, New York, NY
FT. HOOD I , Killeen, TX
FT. HOOD II, Killeen, TX
FT. HUACHUCA, Sierra Vista, AZ
FT. HUNTER-LIGGETT, King City, CA
FT. IRWIN, Fort Irwin, CA
FT. JACKSON, Columbia, SC
FT. KNOX, Louisville, KY
FT. LEAVENWORTH, Leavenworth, KS
FT. LEE, Petersburg, VA
FT. LEONARD WOOD, Waynesville, MO
FT. LEWIS, Tacoma, WA
FT. MCCOY, La Crosse, WI
FT. MCPHERSON, Atlanta, GA
FT. MEADE, Laurel, MD
FT. MONMOUTH, Eatontown, NJ
FT. MONROE, Hampton, VA
FT. MYER, Arlington, VA
FT. ORD (MONTEREY), Monterey, CA
FT. POLK, Leesville, LA
FT. RILEY, Junction City, KS
FT. RUCKER, Daleville, AL
FT. SAM HOUSTON, San Antonio, TX
FT. SHAFTER, Honolulu, HI
FT. SILL, Lawton, OK
FT. STEWART, Hinesville, GA
FT. WAINWRIGHT, Fairbanks, AK
GOODFELLOW, San Angelo, TX
GRAND FORKS AFB, Grand Forks, ND
GREAT LAKES NTC, Waukegan, IL
GUAM (OROTE), Agat, Guam
GULFPORT NCBC, Gulfport, MS
GUNTER AFB, Montgomery, AL
HANNAM VILLAGE, Seoul, Korea
HANSCOM, Bedford, MA
HARIO HOUSING, Hario, Japan
HARRISON VILLAGE, Indianapolis, IN
HICKAM AFB, Honolulu, HI
HILL AFB, Ogden, UT
HOLLOMAN AFB, Alamogordo, NM
HUNTER AAF, Savannah, GA
HURLBURT FIELD, Fort Walton Beach, FL
IMPERIAL BEACH, Imperial Beach, CA
IWAKUNI MCAS, Iwakuni, Japan
JACKSONVILLE, Jacksonville, FL
KADENA AFB, Naha, Japan
KANEOHE BAY, Kaneohe Bay, HI
KEESLER AFB, Biloxi, MS
KEFLAVIK, Keflavik, Iceland
KELLY, San Antonio, TX
KEY WEST NAS, Key West, FL
KINGS BAY NSB, St. Marys, GA
KINGSVILLE, Kingsville, TX
KIRTLAND AFB, Albuquerque, NM
KUNSAN AFB, Kunsan City, South Korea
LACKLAND AFB, San Antonio, TX
LAKEHURST, Toms River, NJ
LANGLEY AFB, Hampton, VA
LAUGHLIN AFB, San Antonio, TX
LEMOORE, Fresno, CA
LITTLE CREEK NAB, Virginia Beach, VA
LITTLE ROCK AFB, Jacksonville, AR
LOS ANGELES AFB, Los Angeles, CA
LUKE AFB, Phoenix, AZ
MACDILL AFB, Tampa, FL
MALMSTROM AFB, Great Falls, MT
MARCH AFB, Riverside, CA
MAXWELL AFB, Montgomery, AL
MAYPORT NS, Atlantic Beach, FL
MCCHORD AFB, Tacoma, WA
MCCLELLAN AFB, North Highlands, CA
MCCONNELL AFB, Wichita, KS
MCGUIRE AFB, Wrighttown, NJ
MEMPHIS NAS, Memphis, TN

MERIDIAN NAS, Meridian, MS
MINOT AFB, Minot, ND
MIRAMAR NAS, San Diego, CA
MISAWA AFB, Misawa, Japan
MITCHEL FIELD, Garden City, NY
MOFFETT FIELD, Mountain View, CA
MOODY AFB, Valdosta, GA
MTN HOME AFB, Mountain Home, ID
NELLIS AFB, Las Vegas, NV
NEW LONDON, Groton, CT
NEW ORLEANS NSA, New Orleans, LA
NEW RIVER MCAS, Jacksonville, NC
NEWPORT, Newport, RI
NORFOLK NB, Norfolk, VA
NORTH ISLAND, San Diego, CA
OCEANA NAS, Virginia Beach, VA
OFFUTT AFB, Bellevue, NE
OSAN AFB, Osan, South Korea
PARRIS ISLAND, Beaufort, SC
PATRICK AFB, Cocoa Beach, FL
PATUXENT, Lexington Park, MD
PEARL HARBOR, Honolulu, HI
PENSACOLA, Pensacola, FL
PETERSON, Colorado Springs, CO
POINT MUGU, Point Mugu, CA
POPE AFB, Fayetteville, NC
PORT HUENEME, Port Hueneme, CA
PORTSMOUTH, Portsmouth, NH
PORTSMOUTH NNSY, Portsmouth, VA
PRESIDIO OF SF, San Francisco, CA
PUSAN, Pusan, South Korea
QUANTICO, Woodbridge, VA
RANDOLPH AFB, San Antonio, TX
REDSTONE ARSENAL, Huntsville, AL
ROBINS AFB, Macon, GA
ROCK ISLAND AR, Rock Island, IL
ROOSEVELT ROADS, Ceiba, Puerto Rico
SAGAMI DEPOT, Tokyo, Japan
SAGAMIHARA, Tokyo, Japan
SAN DIEGO NS, San Diego, CA
SAN ONOFRE, San Clemente, CA
SASEBO, Sasebo, Japan
SCHOFIELD BKS, Wahiawa, HI
SCOTIA, Schenectady, NY
SCOTT AFB, Belleville, IL
SELFRIDGE ANG, Mt Clemens, MI
SEYMOUR JOHNSON, Goldsboro, NC
SHAW AFB, Sumter, SC
SHEPPARD AFB, Wichita Falls, TX
SIERRA, Herlong, CA
SMOKEY POINT NS, Marysville, WA
TAEGU, Taegu, South Korea
TINKER AFB, Oklahoma City, OK
TOBYHANNA, Scranton, PA
TRAVIS AFB, Fairfield, CA
TWENTYNINE PALMS, Twentynine Palms, CA
TYNDALL AFB, Panama City, FL
USAF ACADEMY, Colorado Springs, CO
VANCE AFB, Enid, OK
VANDENBERG AFB, Lompoc, CA
WALTER REED, Washington, D.C.
WEST POINT, Highland Falls, NY
WHIDBEY ISL NAS, Oak Harbor, WA
WHITE SANDS MR, Las Cruces, NM
WHITEMAN AFB, Knob Noster, MO
WHITING FIELD, Pensacola, FL
WINTER HARBOR, Bangor, ME
WRIGHT-PATTERSON, Dayton, OH
YOKOSUKA NESC, Yokosuka, Japan
YOKOTA AB, Tokyo, Japan
YONGSAN, Seoul, South Korea
YUMA MCAS, Yuma, AZ
YUMA PG, Yuma, AZ

Department of Energy

Argonne National Laboratory- East
Advanced Photon Source (APS)
Buildings 400-402, 411-413, 415, 420, 431-435, 438, 450, 460
Intense Pulsed Neutron Source (IPNS)
Buildings 360, 361, 363-379, 370T1, 374A, 375-TR11, 382, 385, 389B, 390, 391, 399 399-TR03, 399-TR04

Metered Utilities
Buildings 108, 115, 116, 128, 129, 572, 573, 574, 576, 582, 583, 595

Fermilab
003 Feynman Computer Center
323 Collider Detector Facility/Cdf
325 D0 Assembly Building
400 Meson Wonder Enclosure
402 Ms-1 Meson Service Building
404 Ms-2 Meson Service Building
406 Ms-3 Meson Service Building
408 Meson Detector Building
410 Meson Central Cryogenics
412 Meson Assembly Building
414 Meson Service #4
416 Polarized Proton Lab - Mp
418 Meson Service Ms7
420 Meson West Lab -- MW9
422 Meson Counting Bldg Mw9
500 Proton Pagoda
502 Proton Assembly
504 Proton Tagged Photon

506 High Intensity Laboratory
508 Proton Service #1
510 Proton Service #2
512 Proton Service #3
514 Proton Service #4
516 Proton Service #5
518 Proton Service #6
520 Proton Pole Building
522 Exp Area Operations Ctr
600 Neutrino Lab A
602 Neutrino Lab B
603 Rd T&M Shop
604 Neutrino Lab C
605 Lab C-D Cross Connect Building
606 Neutrino Lab D
608 Neutrino Lab E
610 Laboratory F
612 Laboratory G
613 Neutrino Service Building #E
614 Neutrino Lab Nwa
615 Neutrino Service #0
616 Neutrino Service #1
618 Neutrino Service #2
620 Neutrino Service #3
622 Neutrino Service #4
623 Neutrino Service Building #7
624 Neutrino Target Service
625 Neon Compressor Building
626 Wide Band Lab
628 Pb6/Pb7
630 KTeV
700 Muon Laboratory
800 Industrial Building #1
801 Industrial Building #2
803 Industrial Shed #2A
804 Industrial Building #3
805 Industrial Building #4
806 Industrial Center
807 Industrl Compressor Bldg
809 Magnet Storage
840 Low Level Waste Handling Bldg.
850 Super Shed/Lundy Barn
855 Caseys Pond Pump House
921 Site 37 Shop
922 Site 38 Maintenance
923 Roads/Grounds Equip Stge
924 Site 38 Equipment Building
926 Site 39
928 Site 38 HUS Building
929 Fuel Service Center
930 Site 38 Barn
931 Radiation Physics Calibration
932 Site 38 Fire Station
934 Site 38 Extinguisher Bldg
936 Site 38 Hazardous Storage
938 Receiving Warehouse #1
940 Receiving Warehouse #2
941 Scale House
T004-T009 Trailers
T016 Trailers
T017 Trailers
T022-25 Trailers
T027-T029 Trailers
T032 Trailers
T034 Trailers
T035 Trailers
T038-T040 Trailers
T045 Trailers
T046 Trailers
T049-T054 Trailers
T057 Trailers
T058 Trailers
T060 Trailers
T061 Trailers
T066-T069 Trailers
T072 Trailers
T076 Trailers
T077 Trailers
T079 Trailers
T081-T087 Trailers
T091-T108 Trailers
T110 Trailers
T111 Trailers
T115 Trailers
T116 Trailers
T119-T122 Trailers
T124 Trailers
T128-T130 Trailers
T132 Trailers
T134 Trailers
T136-T149 Trailers
T151 Trailers
T156-159 Trailers
T162 Trailers
T163 Trailers
T164-T171 Trailers
T173-T176 Trailers

Lawrence Livermore National Laboratory
All facilities are classified as Industrial and other Energy Intensive Facilities.

National Renewable Energy Laboratory
Golden, Colorado site
Alternative Fuels User Facility
Field Test Laboratory Building
High Flux Solar Furnace
Outdoor Testing Facility
Solar Energy Research Facility
Thermal Test Facility
Waste Handling Facility

Boulder, Colorado site
252 Blade Test Facility

Buildings 253, 248, 249, 257
255 Dynomometer Spin Test Facility
256 Modal Test Facility
H-1 Hybrid Power Test Bed Facility

Stanford Linear Accelerator Center
3 Auxiliary Control Building
23 Central Lutility Building
24ES& H Building
25Light Fab. Building
025S LFB Sub-Station
26Heavy Fab. Building
28 Warehouse/Users Offices
29 Metal Stores Shelter
33 Light Assembly Building
34 Electronics Building Annex
35 PMU Shops Building
36 Chemical Storage Shelter
38 Treatment Plant Plating
40 Central Laboratory
41 Administrative and Engineering
42 Cafeteria
43 Auditorium
44 Test Laboratory
45 Test Lab. Facility
050S Comp. Center Sub-Station
81 Gen. Services Building
82 Fire Station
83 Main Gatehouse
84 Central Lab. Addition
101 Cooling Tower 101
123 Hyd. Furnace Housing
126 Transportation Tire Shop
241 Sem. Office Trailer East
242 Sem. Office Trailer West
243 Facilities Design Office
272 Training & Conference Center
280 Physics/Engineering Building
299 EPR Office Trailer
449 Metal Finishing Facilities

Pacific Northwest National Laboratory
105KE Reactor Facility
105KW Reactor Facility
105NA Emergency Diesel Building
107N Recirculation Cooling Building
108F Biology Laboratory - Abandoned
108N Chemical Unloading Facility
109N Heat Exchanger Building
117NVH Valve Control House
1313N Change & Control Building
1314N Liquid Waste Loadout Building
1315N Reactor Effluent Valve House
1316N Valve House
1322N Waste Treatment Pilot Plant
142K Cold Vacuum Drying Facility
151B Primary Substation
151D Primary Substation
151N 230 Kv Electrical Substation
153N Switchgear Building
1604K Nuclear Waste Processing/handling bldg.
166AKE Material Storage Building
1705N Instrum & Elec Facility
1706KEL Development Laboratory
1706KER Water Studies Recircultn Bldg
1713KE Area Shop Building
1713KER Warehouse
1714KW Oil and Paint Storage Building
1714NA Receiving & Inspection Facility
1717K Maintenance Shop
1722N Decontamination Hot Shop Bldg.
181B River Pump House
181D River Pump House
181KE River Pumphouse
181KW River Pumphouse
181N River Water Pump House
181B Reservoir Pump House
182D Reservoir & Pump House
182-K Emergency Water Reservoir Pump House
182N High Lift Pump House Building
183.1KE Head House/Chlorine
183.1KW Head House/Chlorine
183.5KE Lime Feeder Building
183.6KE Lime Feeder Building
183.6KW Other Industrial Facility
183D Filter Plant
183KE Filter Plant Head House, Chlorine
183KW Filter Plant Head House, Chlorine
183N Water Filter Plant Building
184N Plant Service Boiler House
184NA Auxiliary Power Annex Building
184NB Air Handler Main Building
184NC Air Handler Annex Building
1908KE Effluent Water Monitoring Sta
190DR Main Pump House
190KE Warehouse
2025E Other Industrial Facility
202A Purex Canyon & Service Facility
202S Redox Canyon & Service Facility
203A Acid Pumphouse
204AR Waste Unloading Facility
206A Vacuum Acit Fractionator Bldg.
211A Chem Makeup Tank Farm Pmphouse
212A Fission Product Loadout Station
212B Fission Product Loadout Station
212H Canister Storage Facility
213A Fission Product Loading Station
213W Waste Compactor Building
216A Valve Control Facility
216A271 Valve Control House
216Z9B Industrial Building
220A Other Industrial Facility
221B Process Treatment Building
221BB Process Steam & Condensate Bldg

221BF Condensate Effl. Discharge Fac.
221BG B Plant Cooling Water Sampling
221T Process Canyon/Lab/Office
221T Process Canyon/Lab/Office
221TA Vent Fan House
222S Control Laboratory
222SA Standards Process Develop Lab
222SB Filtration Building
224UA Calcination Facility
225B Waste Encpsltn. & Storage Bldg
225BB Other Industrial Facility
225BC Encapsulation Compressor Fac
225BG WESF Closed Loop Cooling Equipment Bldg.
231Z Materials Engineering lab
2336W WRAP - 1 Facility
234-5Z Plutonium Fabrication Facility
236Z Plutonium Reclamation Facility
2403EA Compressor Leanto
2404E Dmrhf Compressor Building
241A271 Tank Farm Control House
241A401 Tank Farm Condensor House
241AN273 Compressor Building
241AZ Waste Disposal Tank Farm
241SX281 Emergency Cooling Water Pump hse
241SX701 Waste Disposal Condenser House
241SY271 Instrumnt & Elect Contrl Hse
241SY272 Electrical Building
241T601 Chemical Makeup Building
242A Evaporator Building
242A702 Other Industrial Facility
242S Evaporator Building
242T Waste Disposal Evaporator Bldg.
242T601 Control Facility
242TB Vent Facility
244U Salt Well Receiver Vault
251W Primary 230KV Switching Statn
254BY Control House
267Z Riser #9 Valve House
2703E Chemical Engineering Laboratory
2706T Equipment Decontamination Bldg
2706TA Equipment Decontamination Bldg
2706TB Equipment Decontamination Bldg
2710S Inert Gas Generator Bldg.
2711A Air Compressor Building
2711B Breathing Air Compressor House
2711E 200 East Garage
2711EA Regulated Equipment Maint. Shop
2711EB Maintenance Shop
2712A Pumphouse
271T Office & Service Building
2728W Dimensional Inpectn Bldg
272W Machine Shop Building
2736ZB Plutonium Storage Support Fac
276-U Solvent Recovery Facility
277T Blow Down Building
277W Fabrication Shop
277W Fabrication Shop
282E Pumphouse & Reservoir
282EC Included with 282E facility
282W Reservoir Pumphouse building
283E Water Filtration Plant
283W Water Filtration Plant
284E Power House & Steam Plant
284W Power House Steam Plant
291A Exhaust Air Fltr & Stack Plenm
291AD Filter Pit & Shack
291AR Exhaust Air Filter Stack Bldg
291B Exhaust Air Control Building
291BD Air Control House
291U Exhst Fan Cont Hse, Sand Filtr
291Z Exhst Air Filter Stack Bldg
292T Fission Products Release Lab
293A Off-Gas Treatment Facility
295AA Scd Sample & Pumpout Station
3020 William R. Wiley EMSL
303C Materials Evaluation Lab
305 Engineering Testing Facility
305B Hazardous Waste Storage Fac.
306W Materials Development Lab
309 Sp-100 Ges Test Facility
310 Treated Effluent Disposal Fac.
312 Water Plant Building
315 Filter Water Plant Building
318 Radiological Calibrations Lab
320 Analysis & Nuclear Reserch Lab
321 Hydromechanical/Seismic Fac
323 Mechanical Properties Lab
324 Waste Tech Engineering Lab
324 324 High Bay
325 Radiochemical Processing Lab
326 Materials Sciences Lab
327 Post Irradiation Test Lab
329 Chemical Sciences Lab
331 Life Sciences Lab
331B Dog Kennel
331C PNNL Facility/on BPA bill
331D Biomagnetic Effects Lab
331G Interim Tissue Repository
331H Aerosol Wind Tunnel Res Fac
333 N Fuels Building
335 Sodium Test Facility
336 High Bay Test Facility
337B High Bay & Service Wing
338 Materials Research and Development
340 Waste Neutralization Facility
340B Included with 340 facility
350 Plnt Oprns and Maint Fac
350A Paint Shop
3621B Emergency Generator Building
3621D Emergency Generator Bldg & Shop
3708 Radioanalytical Lab
3714 Organic Chemistry Laboratory
3720 Environmental Sciences Lab

3730 Gamma Irradiation Fac
3731 Graphite Machine Shop
3731A Graphite Machine Shop
3745 Radiological Sciences Lab
3745B Positive Ion Accelerator Lab
377 Geotechnical Engineering Lab
382 Pump House Building
382B Fire Pump Station
408A Main Heat Dump, East
408B Main Heat Dump, South
408C Main Heat Dump, West
409A Closed Loop Heat Dump, East #1
409B Closed Loop Heat Dump, East #2
427 Fuels & Material Exam. Fac
427A Argon/Hydrogen Mixing Building
4621E Auxiliary Equip. Bldg., East
4621W Auxiliary Equip, Bldg., West
616 Nonradioac Haz Chem Waste Fac
622A Elevator Control Bldg
622R Meteorology Lab
6266 Waste Sampling & Chrctrztn Fac
6266A Contaminated Liq. Waste Vault
6266B Vas Pump Building
6267 Env'L Sample Archive Facility
6290 Rigging Services Facility
6652C Space Science Facility
6652D Pumphouse
6652DOME2 Atmospheric Facility
6652E Lysimeter Preparation Bldg
6652H Ale Laboratory I
6652J Ale Laboraty II
6652LP Rattlesnake Mtn Lowr Pumphouse
6652M Fallout Laboratory
5541UP Upper Pumphouse
747A Whole Body Counter
MO-045 Body Count Lab
MO-426 Sample Rec/Prep Storg @ 1120n
MO-719 Calibration Laboratory @ 272w

Y-12 National Security Complex
9201-01 Manufacturing / Industrial
9201-01W Manufacturing / Industrial
9201-05 Manufacturing / Industrial
9201-05N Manufacturing / Industrial
9201-05W Manufacturing / Industrial
9202 Laboratory / Office
9203 Laboratory / Office
9203A Laboratory Development
9204-02 Manufacturing / Industrial
9204-02E Manufacturing / Industrial
9204-04 Manufacturing / Industrial
9205 Laboratory
9206 Processing / Industrial
9212 Processing / Industrial
9215 Manufacturing / Industrial
9217 Manufacturing / Industrial
9217-01 Manufacturing / Industrial
9401-03 Steam Plant
9404-11 Manufacturing / Industrial
9731 Manufacturing / Industrial
9737 Laboratory / Office
9769 Laboratory
9770-03 Laboratory / Storage
9980 Laboratory - Physical Testing
9981 Laboratory - Physical Testing
9995 Laboratory
9996 Manufacturing / Industrial
9998 Manufacturing / Industrial

Lawrence Berkeley National Laboratory
002 Advanced Materials Lab
002A Storage
004 ALS Support Facility
005 AFR
005A Storage Container
005B Storage Container
006 The ALS (Advanced Light Source)
007 ALS Support Facility
007A Storage
007C Offices
010 ALS Support Facility
010A Telecommunications Equipment
013A Environmental Monitoring Station
013B Environmental Monitoring Station
013C Environmental Monitoring Station
013D Environmental Monitoring Station
013E Environmental Monitoring Station
013F Environmental Monitoring Station
013G Environmental Monitoring Station
013H Environmental Monitoring Station
014 ES LAB
016 AFR LAB
016A Storage
017 EHS
017A Storage Container
017B Storage Container
025 ENG Shops
025A ENG Shops
025B Storage
026 Health Services, EH&S
027 ALS Support Facility
029 (vacant)
029A (vacant)
029B (vacant)
029C EE
029D (vacant)
030A Storage Container
030B Storage Container
030C Storage Container
030D Storage Container
030E Storage Container
030F Storage Container
030R Storage Container
030S Storage Container

031A FA
031B ES Storage Container
031C ES Storage Container
031D ES Storage Container
031L Office Trailer
033A Strawberry Canyon Guard House
033B Blackberry Canyon Guard House
033C Grizzly Peak Guard House
034 ALS Chiller Building
036 Grizzly Substation
037 Utility Services Building
040 Storage
041 Communications Lab
043 Site Air Compressor/FD Emerg Gen
044 ENG
044A PHY
044B ENG
045 Fire Apparatus
045A Equipment Storage - FD
046 AFR, EE, ENG, Printing
046A ENG Division Offices
046B ENG
046C AFR
046D AFR
047 AFR
048 Fire Station, Emerg. Command Ctr.
048A Storage Container
050 AFR, PHY, Auditorium, Library
050A Directorate, PHY, NSD
050B PHY, CSD
050C CSD, NERSC
050D CSD
050E CSD
050F CSD - ICS, NERSC
051 The Bevatron
051A Bevatron
051B EPB Hall
051F ES, EET
051G PHY
051L Comp Sci - Training
051N ES
051Q ES
052 Cable Winding Facility
052A Storage
053 E&E, AFRD
053A Storage
053B AFR
054 Cafeteria
054A Automated Teller
055 LS
055A LS
055B Emergency Generator Building
056 Biomed Isotope Facility
058 Heavy Ion Fusion
058A Accelerator R&D Addition
060 Hibay Lab
061 Storage
062 MS, CS Lab
062A EE, MS
062B Telephone Equip. Storage
062C Storage Container
062D Storage Container
063 EE
064 LS/ES
064B FAC
065 OFFICES
065A Offices
065B Offices
066 Ctr for Surface Sci. Catalysis
067B EE: Mobile Window Therml Test Fac
067C EE: Indoor Environment Lab
067D Mobile Lab
067E Storage
068 Upper Pump House
069 FACILITIES DEPT. OPERATIONS
070 NS, EE LAB
070A NS, LS, CS, ES, ENG LAB
070B Telephone Equip. Storage
070E Storage Container
070G Storage
071 ION BEAM TECH, CTR BEAM PHY
071A Low Beta Lab
071B CTR BEAM PHYS
071C Offices
071D Offices
071F Offices
071G Offices
071H Offices
071J Offices
071K Offices
071P Offices
071Q Restroom Trailer
072 Nat'l Ctr for Electron Microscopy
072A High Voltage Electron Microscopy
072B Atomic Resolution Microscope
072C ARM Support Lab
073 ATM AEROSOL RSCH
073A Utility Equipment Building
074 LS LABS
074F Dog Kennel
075 NTLF, Radioisotope Services
075A EH&S
075B EH&S
075C Calibration Building
075D Storage
075E EH&S Offices
076 FAC Shops
076K FA Offices
076L FA Offices
077 ENG Shops077A Ultra High Vacuum Facility
077H Utility Storage
077J Storage Container w/pwr & FP
077K Storage Container w/pwr & FP
077L Storage Container w/pwr & FP

077M Storage Container w/pwr & FP
077N Storage Container w/pwr & FP
077P Storage Container
077Q Storage Container w/pwr & FP
077R Storage Container w/pwr & FP
077S Storage Container w/pwr & FP
078 Craft Stores
079 Metal Stores
080 ALS Support Facility
080A ALS Support Facility
081 Chemical Storage
082 Lower Pump House
083 LS LAB
083A LS Lab Trailer
084 LS Human Genome Lab
084B Utility Building
085 Hazardous Waste Handling Facility
085A Storage Racks
085B Offices
085D Storage Container
085E Storage Container
085F Storage Container
085G Storage Container
085H Storage Container
085J Storage Container
085K Storage Container
088 88 CYCLOTRON
088D Emergency Generator Building
090 DOE, EE, EHS, ES Offices
090B Offices
090C FA Offices
090F FA Offices
090G FA Offices
090H FA Offices
090J FA Offices
090K FA Offices
090P ES
090Q Restroom Trailer
090R Transformer Equipment
100/400 Joint Genome Institute
903 Warehouse, Receiving
937 Berkeley Tower
941 2000 Center St.
943 Oakland Scientific Facility

Department of Health and Human Services

Centers for Disease Control and Prevention
Clifton Road facility, Atlanta, Georgia
Chamblee facility, Atlanta, Georgia
Lawrenceville facility, Lawrenceville, Georgia
Cincinnati Taft North facility, Cincinnati, Ohio
Cincinnati Hamilton facility, Hamilton, Ohio
Morgantown facility, Morgantown, West Virginia
San Juan facility, San Juan, Puerto Rico
Ft. Collins facility, Ft. Collins, Colorado
Spokane facility, Spokane, Washington
Pittsburgh facility, Pittsburgh, Pennsylvania

Food and Drug Administration
Module I and II (MOD I and 2), Beltsville, Maryland
Beltsville Research facility, Beltsville, Maryland
Gulf Technical Services, Dauphin Island, Alabama
Winchester Engineering and Analytical Center (WEAC), Winchester, Massachusetts
San Juan District and Laboratory, San Juan, Puerto Rico
Atlanta Offices and Laboratory, Atlanta, Georgia
Los Angeles Offices and Laboratory, Los Angeles, California
National Center for Toxicology Research (NCTR), Jefferson, Arkansas

Indian Health Service
Aberdeen Service Area, SD, ND, NE, 49 buildings
Albuquerque Service Area, New Mexico, 26 buildings
Anchorage Service Area, Alaska, 23 buildings
Bemidji Service Area, MN, 9 buildings
Billings Service Area, MT, WY, 16 buildings
Nashville Service Area, MS, NC, 4 buildings
Navajo Service Area, NM, AZ, 54 buildings
Oklahoma City Service Area, OK, KS, 20 buildings
Phoenix Service Area, AZ, CA, NV, UT, 40 buildings
Portland Service Area, WA, OR, ID, 23 buildings
Tucson Service Area, AZ, 6 buildings

National Institutes of Health
Bethesda Campus & NIHAC, Bethesda, Maryland, and Poolesville, Maryland

Research Triangle Park, Research Triangle, North Carolina
Frederick Cancer Research and Development Center (FCRDC), Frederick, Maryland
Rocky Mountain Laboratory, Hamilton, Montana
Gerontology Research Center, Baltimore, Maryland
5 Research Court, Rockville, Maryland
Federal Building, Bethesda, Maryland
12441 Parklawn, Rockville, Maryland
12300 Twinbrook, Rockville, Maryland
Twinbrook I & II, Rockville, Maryland

Department of Justice

FBI Headquarters, J.Edgar Hoover Federal Building, Washington, D.C.
FBI Training Facility, Quantico, Virginia
Western Regional Data Center
FBI Complex, Clarksburg, West Virginia
Justice Data Center, Rockville, Maryland

Department of the Treasury

Bureau of Alcohol, Tobacco, and Firearms
Canine Training Center, Front Royal, Virginia

Bureau of Engraving and Printing
Washington Currency Facility, Washington, D.C.
Western Currency Facility, Fort Worth, Texas

Internal Revenue Service
Martinsburg Computer Center, Martinsburg, West Virginia
Andover Service Center, Andover, MassachusettsAtlanta Service Center, Atlanta, Georgia
Austin Service Center, Austin, Texas
Brookhaven Service Center, Holtsville, New York
Cincinnati Service Center, Cincinnati, Ohio
Fresno Service Center, Fresno, California
Memphis Service Center, Memphis, Tennessee
Ogden Service Center, Ogden, Utah
Philadelphia Service Center, Philadelphia, Pennsylvania

U.S. Mint
Philadelphia Mint, Philadelphia, Pennsylvania
Denver Mint, Denver, Colorado
San Francisco Mint, San Francisco, California
West Point Bullion Depository, West Point, New York
Fork Knox Bullion Depository, Fort Knox, Kentucky

U.S. Secret Service
Rowley Training Center, Beltsville, Maryland

General Services Administration

Federal Center-Admin, Waltham, MA
Boston New Ch, Boston, MA
EPA Laboratory, Lexington, MA
US Border Station, Calais, ME
US Border Station, Coburn Gore, ME
US Border Station, Fort Fairfield, ME
US Border Station, Houlton, ME
US Border Station, Jackman, ME
US Border Station, Limestone, ME
US Border Station, Orient, ME
US Border Station, Vanceboro, ME
US Border Station, Van Buren, ME
US Border Station, Calais, ME
St. Pamphille, Saint Francis, ME
US Border Station, Madawaska, ME
USBP Sec Hd Houlton, Hodgdon, ME
US Border Station, Fort Kent, ME
USBS/TWP20, Saint Francis, ME
USBS, Township 11, Saint Francis, ME
US Border Station, Derby Line, VT
US Border Station, Norton, VT
US Border Station, Beebe Plain, VT
US Border Station, Alburg Springs, VT
US Border Station, North Troy, VT
US Border Station, West Berkshire, VT
US Border Station USPO, Derby Line, VT
US Border Station, Beecher Falls, VT
US Border Station, Canaan, VT
USBS East Richford, Richford, VT
US Border Station, Richford, VT
USBP Sector Hdqtrs, Swanton, VT
USBS, Highgate Springs, VT
Swanton Border Patrol Bldg, Highgate Springs, VT
Administration Bldg., Champlain, NY
Inspection Bld Borde, Chateaugay, NY
Temp Frme Gar Bdr St, Massena, NY
Inspection Building, Mooers, NY
Border Station, Fort Covington, NY
Border Station, Rouses Point, NY
Border Station, Rouses Point, NY
Border Station, Trout River, NY
US Mission to the UN, New York-Manhattan, NY
Rainbow Br Pt Entry, Niagara Falls, NY
Food and Drug Admin., New York-Queens, NY
Chas. E. Bennett FB, Jacksonville, FL
Airside Commerce, Orlando, FL
Columbus, Miami, FL
2385 Chamblee Tucker, Atlanta, GA
Gnann House, Plains, GA
GSA/FBI Motor Pool, Memphis, TN
Southplace Office Park, Nashville, TN
Federal Building, Chicago, IL
Minton-Capehart F/B, Indianapolis, IN
US Border Station, Sault Ste Marie, MI

Cust Cargo Inspection Facility, Detroit, MI
Food & Drug, Detroit, MI
Ambassador Bridge, Detroit, MI
Detroit Computing Ct, Detroit, MI
Border Station, Grand Portage, MN
Custom & Immigration Station, Noyes, MN
US Border Station, International Falls, MN
Prop. Border Station, Baudette, MN
FDA Fornsc Chem Center, Cincinnati, OH
25 Funston Road, Kansas City, KS
11510 West 80th, Lenexa, KS
Federal Bldg, Kansas City, MO
Executive Hills, Kansas City, MO
Buckeye Industr. Park, Kansas City, MO
USBP SH Bldg 13, New Orleans, LA
USBS Import Dock, Santa Teresa, NM
Border Station, Columbus, NM
Austin Finance Ctr, Austin, TX
USBS B&M-Admin Bldg, Brownsville, TX
Gateway USBS Bldg A, Brownsville, TX
USBS-Columbia Admin, Laredo, TX
US Border Station, Laredo, TX
USBS Admin Building, Del Rio, TX
BPSH Bldg 1, Hqtrs, Del Rio, TX
USBS Br Of The Amers, El Paso, TX
USBS Amdin Building, Eagle Pass, TX
USBS Admin Building, Hidalgo, TX
Juarez-Lincoln USBS, Laredo, TX
USBS Admin Building, Los Indios, TX
BPSH Bldg A, Laredo, TX
Los Tomates USBS Ad, Brownsville, TX
BPSH Administratn Bd, Mcallen, TX
Headquarters Bldg, Marfa, TX
USBS Pharr Admin Bld, Pharr, TX
USBS Paso Del Norte, El Paso, TX
USBS Admin Building, Progreso, TX
USBS Admin Building, Roma, TX
USBS Main Building, El Paso, TX
Federal Building, Dallas, TX
US Border Station, Fabens, TX
USBS Intl RR, Laredo, TX
US Border Station, Presidio, TX
Eagle Pass Border PT, Eagle Pass, TX
World Trade Bridge U., Laredo, TX
Chief Mtn BS & Qtrs, Babb, MT
Piegan BS & Qtrs, Babb, MT
Roosville BS, Eureka, MT
Sweetgrass BS, Sweetgrass, MT
Border Patrol Sector Hq, Havre, MT
Turner B, Turner, MT
Ambrose BS, Ambrose, ND
Dunseith BS, Dunseith, ND
Portal BS, Portal, ND
St John BS, St John, ND
Bldg A Main Building, Pembina, ND
Border Patrol Sector Hq, Grand Forks, ND
Lukeville Dock, Lukeville Arizona, AZ
BS Old Cus Bldg, Nogales, AZ
BS Garage, Sasabe, AZ
BS Main Bldg, Douglas, AZ
Border Patrol Sector Hqrs, Tucson, AZ
BS Main Bldg, San Luis, AZ
BS Main Bldg, Naco, AZ
BS Office Bldg, Nogales, AZ
BS Old Customs Bldg, Calexico, CA
BS Exist Main Bldg, San Diego, CA
BS Main Bldg, Andrade, CA
New Commercial Fac, San Diego, CA
BS Main Bldg, Tecate, CA
BS Bulk Lot Bldg, Calexico, CA
US Border Patrol Station, Calexico, CA
Parkway Centre, Alameda, CA
Dalton Cache Bor Sta, Haines, AK
Station Building, Tok, AK
Post Office Ct Jail, Nome, AK
Housing Unit No 2, Nome, AK
Int Ag Motor Pool, Anchorage, AK
Skagway Border Station, Skagway, AK
US Border Station, Eastport, ID
US Border Station New, Porthill, ID
E.Green - W.Wyatt FB, Portland, OR
Station Bldg, Blaine, WA
Danville Border Station, Danville, WA
Station & Quarters, Curlew, WA
Station, Laurier, WA
Station, Metaline Falls, WA
US Border Station, Oroville, WA
US Border Station, Sumas, WA
Kenneth G. Ward BS, Lynden, WA
Fed Bldg USDJ INS, Seattle, WA
Fed Bldg USPO & CH, Richland, WA
Border Patrol Sect Hq, Blaine, WA
Border Patrol Sec Hq Annex, Blaine, WA
Border Patrol Sect Hq, Spokane, WA
Jackson FB, Seattle, WA
FDA Bldg, Bothell, WA
New Border Station, Point Roberts, WA
Pacific Hiway Border, Blaine, WA
Border Patrol Annex, Spokane, WA
Central Heating Plant Stm, Washington, D.C.
West Heating Plnt Stm, Washington, D.C.
Wilbur J. Cohen Bldg, Washington, D.C.
Reagan Bldg FOB, Washington, D.C.
U.S. Secret Service Headquarters, Washington, D.C.
Flam Lab- Bldg "A", Gaithersburg, MD
1401 Research Blvd, Rockville, MD
Rickman Building, Rockville, MD
New Carrollton Fed, Lanham, MD
The Gaither Dist Ctr, Gaithersburg, MD
Census Computer Facility, Bowie, MD

Environmental Protection Agency

Robert S. Kerr Environmental Research Lab, Ada, Oklahoma
National Vehicle and Fuel Emissions Laboratory, Ann Arbor, Michigan
National Exposure Research Laboratory, Athens, Georgia
Science and Ecosystem Support Division, Athens, Georgia
Andrew W. Breidenbach Environmental Research Center, Cincinnati, Ohio
National Health and Environmental Effects Research Laboratory - Western Ecology Division, Corvallis, Oregon
National Health and Environmental Effects Research Laboratory - Mid-Continent Ecology Division, Duluth, Minnesota
Region 2 Laboratory, Edison, New Jersey
Environmental Science Center, Fort Meade, Maryland
Region 8 Laboratory, Golden, Colorado
National Health and Environmental Effects Research Laboratory - Gulf Ecology Division, Gulf Breeze, Florida
Environmental Laboratory, Houston, Texas
University of Nevada, Las Vegas - On Campus EPA Facilities, Las Vegas, Nevada
Region 10 Laboratory, Manchester, Washington
National Air and Radiation Environmental Laboratory, Montgomery, Alabama
National Health and Environmental Effects Research Laboratory - Atlantic Ecology Division, Narragansett, Rhode Island
National Health and Environmental Effects Research Laboratory - Western Ecology Division, Newport, Oregon
Central Regional Laboratory, Richmond, California
Research Triangle Park, Research Triangle Park, North Carolina

National Aeronautics and Space Administration

Ames Research Center, Moffett Field, CA
Model Development Facility
Technical Services Shop
Central Computation Facility
Thermal Protection Facility
Arc Jet Facility
Model Construction Facility
Program Support Communication Network Facility
Flight Data Complex
Numerical Aeronautics Simulator
Unitary Plan Wind Tunnel Auxiliary Building
Advanced Computation Facility
Flight Data Facility
High Pressure Air Housing

Glenn Research Center, Cleveland, OH
Chemistry Laboratory
Instrument Research Laboratory
Operations/Integration Building

Goddard Space Flight Center, Greenbelt, MD
Central Flight Control Range
Instrument Construction/Development Laboratory
Payload Testing Facility
Environmental Testing Laboratory
Network Control Center
Spacecraft Operations Facility
Data Interpretation Laboratory
EOS/DIS Building
Goddard Geophysical and Astronomical Observatory Area

Jet Propulsion Laboratory, Pasadena, CA
Environmental Laboratory
25 Foot Space Simulator
Spacecraft Assembly Facility
Space Flight Operations Facility
10 Foot Space Simulator
Space Flight Support
Frequency Standards Laboratory
Earth & Space Sciences Laboratory
Micro Devices Laboratory

Johnson Space Center, Houston, TX
Crew Systems Laboratory
Photographic Technology Laboratory
Central Heating & Cooling Plant
Auxiliary Chiller Facility
Space Environment Simulation Laboratory
Life Sciences Laboratory
Central Computing Facility
Vibration and Acoustic Test Facility
Atmospheric Re-Entry Materials & Structures Evaluation Facility
Radiant Heat Facility

Thermo Chemical Test Area
Sonny Carter Training Facility
Avionics Systems Laboratory
Planetary & Earth Science Laboratory

Kennedy Space Center, Kennedy Space Center, FL
Hangar L, Life Sciences Support Facility
Hangar AE, Missile Assembly Building
First Wash Building
East High Pressure Wash/Surf Prep
Robot Wash Building
Media Blast
Program Support Communication
Electromagnetic Lab
Central Instrumentation Facility
Film Storage
PGOC Warehouse
Warehouse #1
Operations and Checkout Building
Space Station Processing Facility
Payload Support Building
Canister Rotation Facility
Multi-Payload Processing Facility
Spacecraft Assembly & Encapsulation Facility
Payload Hazardous Servicing Facility
Vertical Processing Facility
Ordnance Storage

Langley Research Center, Hampton, VA
East Area Compressor Station (Closed)
Hydrodynamics Research Facility
Space Environmental Effects Laboratory
Structures and Materials Research Laboratory
Steam to Hot Water Exch/Pump House
Central Heating and Steam Generation Plant
Conference Center
Central Scientific Computing Facility
Refuse-Fired Steam Generating Facility
Flight Dynamics Drop Model Facility (Closed)
Anechoic Noise Facility
Compressor Station
Vacuum Pumping Station - Gas Dynamics Complex
Flight Simulation Laboratory
Central Scientific Computing Facility
Earth Orbiting System-DIS-DAAC Facility
Cockpit Motion Facility

Michoud Assembly Facility, New Orleans, LA
Entire Facility is Industrial

Marshall Space Flight Center, Huntsville, AL
Microwave Anechoic Chamber
Communications Facility
Photographic Laboratory
SSME - Block II Facility
LIDAR Facility
Power Systems Laboratory
MAST/FSL Simulation Facility
Space Science Labortory
Laboratory & Office Building
Test Stand Support Building
Test Facility 300
Test Facility 116
Structural Test Facility
Test Facility Terminal Building
Hot Gas Test Facility
Test Control and Service Building
TPTA Refurbishment Facility
Pump and Boiler House
Propulsion and Structural Test Facility
Test & Data Recording Facility
Space Environmental Effects Laboratory
Air Compressor Building
Materials & Processes Laboratory
Atmospheric Research Facility
Heat Treatment Facility
Structural Dynamics & Thermal Vacuum Laboratory
Hydrogen Test Facility
Air Compressor Building
High Pressure Test Facility
Multi-Purpose High Bay Facility
Hydraulic Equipment Development Facility
LH2 Vaporization Facility
High Pressure GN2 Facility
Boiler Plant
Computer Facility
Pump House
Advanced Engine Test Facility
Test Support Building
Block House
Boiler House
Helium Compressor Building
Non-Destructive Evaluation Laboratory
Shops & Neutral Buoyancy Simulator
Productivity Enhancement Facility
Engineering & Developmental Laboratory
Developmental Processes Laboratory
X-Ray Calibration Facility
Office and Wind Tunnel
Compressed Air Facility
Air Compressor Facility
High Bay Shop Building
Space Station Development Laboratory
Surface Treatment Facility
High Reynolds Number Facility
Low Density Flow Facility
Engine Dynamic Fluid Flow Facility

NASA Industrial Plant, Downey and Palmdale, CA
NASA Industrial Plant (Downey) and USAF Plant 42, Production Site 1 (Palmdale)

Santa Susana Field Laboratory, Canoga Park, CA
Entire facility is laboratory space.

Wallops Flight Facility, Wallops Island, VA
Mainland/Island Areas
Radar Facility
Machine Shop - Fabrication
Aircraft Projects/Hangar Area
Electronics Support/Storage

National Archives and Records Administration

National Archives I, Washington, D.C.
National Archives II, Washington, D.C.
Hoover Presidential Library, West Branch, Iowa
Roosevelt Presidential Library, Hyde Park, New York
Truman Presidential Library, Independence, Missouri
Eisenhower Presidential Library, Abilene, Kansas
Johnson Presidential Library, Austin, TX
Ford Presidential Library, Ann Arbor, Michigan
Ford Museum, Grand Rapids, Michigan
Carter Presidential Library, Atlanta, Georgia
Reagan Presidential Library, Simi Valley, California
Kennedy Presidential Library, Boston, Massachusetts
Bush Presidential Library, College Station, Texas

Social Security Administration

National Computer Center (NCC), Baltimore,
Maryland

APPENDIX E
EXEMPT FACILITIES

Department of Defense

Cold Iron Facilities
SUBASE, New London, CT
NSY, Norfolk, VA
PWC, Norfolk, VA
WPNSTA, Charleston, SC
NAS, Pensacola, FL
NAS, Key West, FL
NAVSTA Roosevelt Roads, PR
SUBASE, Kings Bay, GA
NAVSTA, Mayport, FL
WPNSTA EARLE Colts Neck, NJ
NAVSTA, Gauntanamo, Cuba
NSWC COASTSYSTA, Panama City, FL
NAVPHIBASE, Little Creek, VA
NETC, Newport, RI
NAVSTA ROTA SP
NAVSTA, Pascagoula, MS
NAVSTA, Ingleside, TX
NUSC, New London Laboratory
NSC, Oakland, CA
NAVSTA, San Diego, CA
NAS NORTH IS San Diego, CA
NSY Puget Sound Bremerton, WA
NSY, Pearl Harbor, HI
SUBASE, Pearl Harbor, HI
FLEASWTRACENPAC, San Diego, CA
FLEET ACTIVITIES, Chinhae, South Korea
WPNSTA, Concord, CA
COMFLEACT, Yokosuka, Japan
NAVSTA, Guam
CBC Port Hueneme, CA
NAVSHIPREPFAC, Guam
COMFLEACT, Sasebo, Japan
PWC, Pearl Harbor, HI
NAVSTA, Pearl Harbor, HI
SUBASE, San Diego, CA
NAVRESREDCOMREG 22, Seattle, WA
SUBASE, Bangor, WA
NAVSTA, Everett, WA

Simulators
WPNSTA, Charleston, SC
NAS, Pensacola, FL
NAS, Jacksonville, FL
NAS, Dallas, TX
NAS, Kingsville, TX
NAVAIRDEVCEN, Warinster, PA
NAS, Lemoore, CA
NSWC DIV, Pt. Hueneme, CA
MCAS, Miramar, CA

Transmitters
NAS, Jacksonville, FL
NAVSECGRUACT, Winter Harbor, ME
NRTF DIXON
RADTRANF, Annapolis, MD
NAVRADTRANFAC SADDLEBUNCH KEYS
NAVSECGRUACT, Sabana Seca, Puerto Rico
NAVCOMMSTA, Jacksonville, FL
NAVRADSTA /T/ Jim Creek, WA
NAVSECGRUACT GALETA IS PN

Other
NAS, Dallas, TX
NAVCOMMU, Washington, D.C.
NAF, El Centro, CA
NSWC COASTSYSTA, Panama City, FL
COMFLEACT, Yokosuka, Japan
NAVOBSY, Washington, D.C.
NAF, Atsugi, Japan
CBC, Port Hueneme, CA
CBC, Gulfport, MS
MCAS, Iwakuni, Japan
PWC, Pearl Harbor, HI
NAVSTA ROTA SP
NAS, Keflavik, Iceland
NAVCOMMSTA, Keflavik, Iceland
DoD SCHOOLS, Keflavik, Iceland
HDQTRS 4TH MARDIV, New Orleans, LA
NAVSTA, Pascagoula, MS

"Other" category includes energy consumed by non-Defense activities, private parties, contractors, and State and local governments.

Department of Energy

Lawrence Berkeley National Laboratory
050B PHY/CSD Building
943 Oakland Scientific Facility

Fermilab
201 Ap30 Service
202 Ap10 Service
203 Ap50 Service
204 Apo Target Hall

205 Ap50 Gas Storage
206 Booster Gallery East & West
207 Booster Tower Southwest
208 Booster Tower Southeast
212 Accelerator - Linac, X-Gallery
214 Central Utility
216 A0 Kicker
217 A0 Lab
218 A-O Service Bldg./Vehicle
220 A-1 Service Building
221 A-2 Service Building
222 A-3 Service Building
223 A-4 Service Building
224 B-O Service Building
225 B-1 Service Building
226 B-2 Service Building
227 B-3 Service Building
228 B-4 Service Building
229 B-48 Kicker Building
230 C-O Service Building
231 C-1 Service Building
232 C-17 Kicker Building
233 C-2 Service Building
234 C-3 Service Building
235 C-4 Service Building
236 C-4 Pump House
237 C-48 Kicker Building
238 D-0 Service Building
239 D-0 Vehicle Access Building
240 D-1 Service Building
241 D-2 Service Building
242 D-3 Service Building
243 D-4 Service Building
244 D-48 Kicker Building
245 E-0 Service Building
246 E-1 Service Building
247 E-17 Kicker Building
248 E-2 Service Building
249 E-3 Service Building
250 E-4 Service Building
251 F-0 (Rf) Service Building
252 F-1 Service Building
253 F-2 Service Building
254 F-23 Power Supply Building
255 F-27 Power Supply Building
256 F-3 Service Building
257 F-4 Service Building
258 D0 Gas Shed
259 B12 Gas Shed
267 F-17 Service Building
283 Switchyard Service Building
299 A-1 Refrigeration Building
300 A-2 Refrigeration Building
301 A-3 Refrigeration Building
302 A-4 Refrigeration Building
303 B-1 Refrigeration Building
304 B-2 Refrigeration Building
305 B-3 Refrigeration Building
306 B-4 Refrigeration Building
307 C-1 Refrigeration Building
308 C-2 Refrigeration Building
309 C-3 Refrigeration Building
310 C-4 Refrigeration Building
311 D-1 Refrigeration Building
312 D-2 Refrigeration Building
313 D-3 Refrigeration Building
314 D-4 Refrigeration Building
315 E-1 Refrigeration Building
316 E-2 Refrigeration Building
317 E-3 Refrigeration Building
318 E-4 Refrigeration Building
319 F-1 Refrigeration Building
320 F-2 Refrigeration Building
321 F-3 Refrigeration Building
322 F-4 Refrigeration Building
324 G2 Service Building
330 C0 Experimental Hall
708 MI 8 Service Building
710 MI 10 Service Building
720 MI 20 Service Building
730 MI 30 Service Building
740 MI 40 Service Building
750 MI 50 Service Building
752 MI 52 Service Building
760 MI 60 Service Building
762 MI 62 Service Building
851 Central Helium Liquefier
854 Master Sub-Station
860 Kautz Road Sub-Station
Rpt 20 OSF (FIMS Enclosures)

Brookhaven National Lab
518 Treatment Facility
519 Well House
521 Air Sparge/Soil Vapor Extraction
598 Ground Water Treatment Plant
645 Well Control House
704 Fan House
0707A Pumphouse
0707B Water Treatment House
715 Stack Monitoring Station
725 National Synchrotron Light Source
750 High Flux Beam Reactor
751 Cold Neutron Facility
0901A Van De Graff Building
906 Pet Imaging Laboratory
907 Heavy Ion Power Supply A
908 Heavy Ion Power Supply B
909 Heavy Ion Beam Tunnel
912 AGS Experimental Halls
0912A Mechanical Equipment Building
913 AGS Tunnel
0913A Fan House A-Northeast
0913B Fan House B-North

0913C Fan House C-Northwest
0913D Fan House D-Southwest
0913E Fan House E-Southwest
0913F Proton House D18
0913G Proton House E18
0913H Proton House F18
0913I Proton House G18
0913J Proton House H18
0913K Proton House I18
0913L Proton House J18
0913M Proton House K18
0913N Proton House L18
0913O Proton House L18A
0913P Proton House A18
0913Q Proton House B18
0913R Proton House C18
0913S H-10 Equipment House
0913T Storage
914 Booster Equipment
915 AGS Well101
916 AGS Well 102
917 AGS Well103
918 AGS Warehouse
919 G-2 Experiment Group
0919A AGS Crogenics/Target Group
0919B Works Building
0919C G-2 PLAN-B Refrigerator Room
0919F G-2 Pump House
0919G G-2 R&D Refrigerator Room
0919H PTR Rect.House #1
0919I PTR Rect.House #2
0919J PTR Rect.House #3
920 E-10 Power Building
921 EXP. Power Supply Bldg G-2
922 Scientific Assembly
923 Electronic Equip. Repair
925 Works Building
927 N. Experimental Tunnel
928 Siemens MG Power Supply
929 RF Power Supply
930 200 MEV LINAC
931 BLIP
932 F-10 House Equipment
940 Online Data Facility
941 Power Supply and Support Bldg
942 AGS Booster Tunnel
946 Beam Stop Pump House
949 G -2 Tunnel
951 Tower Equipment
952 Storage
953 Rectifier House A
961 Storage
962 Storage
963 Storage
964 Storage
966 EXPMTNL COPUTER/ELE
975 Machine Shop/SPS
1000 Injection Tunnel
1000P W-Line Power Supply
1002 BRAHMS Experimental Hall
1002A Instrumentation/BRAHMNS Service
1002B 2 O'clock Cryo Service Building
1002C Fast Electronics Hut
1002D Brahms Counting House
1004A RHIC RF Support Building
1004B 4 O'Clock Cryo/Main Power Supply
1005E East Ejection Power Supply
1005H Rhic Facility Compress Bldg
1005P Cooling Tower NO.7
1005R Cryogenics Refrigerator Wing
1005S Collider Center
1006 Star Experimental Hall
1006A Star Service Building
1006B 6 O' Clock Cryo Service Buildi
1006C Star Counting House
1006D Office Modulars
1007W West Ejection Power Supply
1008 Phenix Experimental Hall
1008A Phenix Service Building
1008B SERVICE BLDG
1008C Phenix Counting House
1008E Office Modular
1008F Mixing Building
1010 Phobos Experimental Hall
1010A 10 O'Clock Cryo/Phobos Service
1010B Phobos Counting House
1012 Future Facility/ Experimental
1012A 12 O'clock Cryo/Polarimeter S.
1013 Equipment Storage
1070 Environmental Monitoring Station
1101 Assembly Building
Various Trailers

East Tennessee Technology Park
101 Offices and Storage
131 Maintenance Shop
413 Product Withdrawal Facility
601 LMES Offices - North End of 1st Flr
631 Tails Withdraw
633 ORGDP Test Loop-Facility
711WSU K-711 Flammable Haz/Mix Waste
719 Storage Bldg.
722 Property Sales
723 Property Sales
726 PCB Waste
731 K-27 & K-29 Switch House
736 Scrap Storage (previously ADJ 725)
761 K761 Switch House K-31
766 CRBR Sampling Storage Shed (S K-720)
791K791 Switch & Control Room
797 Electrical Switchgear Room K-1004-J
798 K-1023 Elect Switchgear Rm (M&EC)
799 Generator Bldg
801 Intake Water Pump House

802 Recirculating Water Pump House
803 Valve House
804 Valve House
806 McKinney Ridge Site Radio Reptr Stn.
814 Radio Repeater - McKinney Ridge Site
822 Pump House
832 Recirculatin Water Pump House
833 Cooling Water Return Pump House
834 Valve House
891 Raw Water Poplar Creek Pumphouse
892 K-892 Laydown Area
895 Cyl Disposal House/Destruct Facility
901 Clinch Riv Raw H2O Pump Stn
1000 Visitor Control Center
1002 Cafeteria, Auditorium, Document Cenetr
1003 IH Department
1005 Leased Offices (M&EC)
1006 Development Lab (MCL)
1007 Computer Science Facility
1010 Lab-Receiving & Handling (M&EC)
1015 Laundry
1018 Laborer Storage (No longer in use)
1020 Health Physics, Training Offices
1021 Emergency Response Equip Stg Bldg
1023 Computer Science Office (M&EC)
1024 Offices
1030 National Security Program Office
1035 K-1035 West (PME)
1036 K-1036 Middle Area
1037 Avlis Research
1039 Telephone Bldg.
1052 Advanced Machine Dev Lab (M&EC)
1055 Gas Cylinder Storage Shed
1056 Materials Warehouse (BSI)
1058 K-1058 Laydown Area (STA)
1059 Materials Warehouse
1061 Oil Storage Bldg
1095 K-1095 Former Paint Shop (STA)
1098 Maintenance Shop/Storage Plumbers
1099 Seismac Instrument House
1101 Air Plant
1102 Fan & Transfer Bldg.
1132 HF Storage Tank Shed
1133 HF Storage Tank Shed
1200 K-1200 South Bay (M&EC)
1203 Waste Water Treatment Plant
1207 Storage Bldg
1210 Component Test Facility
1211 CTF Storage
1216 Scale House on Blair Road
1220 Centrifuge Plant Demo bldg.
1231 Process bldg.
1232 WSU K-1232 - Chemical Recovery Fac.
1233 Collection Facility
1301 Nitrogen Production Facility (Vacant)
1302 RCRA Storage - Cells A,B,D
1303 Mercury Distillation Recov Unit Area
1400 Waste Management Project Offices
1401 Maintenance Bldg
1402 Electrical Control House
1413 Laboratory
1414 Garage & Gas Station
1415 Storage Shed (SFL)
1416 Storage Bldg
1419 Operations Control Room for CNF
1420 Decontamination Bldg
1423 K-1423 Repack Fac. (West High Bay)
1425 Waste Oil Storage
1430 TSCAI Maintenance Shops
1501 Steam Plant
1513 Pump House and Sample Station
1515 Water Filtration Plant
1547 Visitors Overlook
1548 Canteen Trailer (N K-1007)
1550 Restroom Facility
1556 Office Trailer (N K-1007)
1600 Computer Maintenance Shops
1652 Plant Protection Headquarters
1004-A Laboratory
1004-B Laboratory
1004-C Laboratory
1004-D Laboratory
1004-E Lab Storage Bldg.
1004-F Laboratory Storage Bldg
1004-J Special Development Bldg.
1004-L Pilot Plant
1004-M 1004L Electrical Switchgear Room
1004-P Test Facility-Isostatic
1004-Q Laboratory
1004-R Laboratory
1004-S Laboratory
1004-T T-Laboratory
1004-U Offices
1006-C Chiller bldg (MCL)
1007-A Canteen
1008-A Changehouse
1008-B Changehouse
1008-C HP Offices/Respirator Cleaning & TST
1008-D Physical Therapy/HVAC Shop
1008-F Maintenance Administration
1010-A Lab Receiving & Handling Fac (M&EC)
1024-B Storage W 1024
1024-C Equipment Stroage
1024-D Prefab N of 1024 (Former 1310-AU)
1024-E Prefab Storage Unit (Former 1310-AV)
1024-F 9x32 Storage Container N 1024
1024-G 9x32 Storage Container N 1024
1024-I Blue Trailer
1025-A Rad Source Control Bldg
1025-B Drum Warehouse
1025-C WSU K-1025-C- Haz/Mixed Waste
1025-D Rad Source Control Bldg
1025-E Warehouse
1028-40 Gatehouse Near K-1414 (Not In Use)

1028-45 Gate House Portal 4
1028-47 Gate House Portal 5
1028-49 Gate House Portal 10
1028-50 Gate House Portal 6
1028-55 Gate House Portal 7
1028-57 Gate House Portal 2 (Main)
1028-58 Gate House Portal (N K-1007)
1028-59 Gate House Portal 2 (East)
1028-60 Gate House Portal @ K-1070 C/D
1028-62 Gate House Portal 10
1028-65 Gate House Portal 3
1028-70 Gate House Portal 1, K-1007
1028-72 Gate House Portal 11
1028-73 Gate House Portal 12
1028-74 Gate House Portal (Closed)
1028-75 Gate House Portal (Closed)
1030-A Product Certification
1030-B Product Certification
1030-DP K-1030 DP
1034-A Plant Records Vault
1037-C Smelter House
1039-1 Integrated Comm Office
1040 Maintenance Shop, K-633
1045 Maint Office & Carpenter Storage
1045-C Storage Building
1052-B Component Test & In Process (M&EC)
1055-A Chlorine Storage Shed (STA)
1059-A Materials Stg Bldg. (Frmr 1134)
1064-B Salvage Material Yard Office
1064-E Salvage Yard Shop
1064-G Drum Deheading Facility
1064-H Storage Shed
1064-J Storage Shed
1064-K Salt Shed
1065-A RCRA Storage Facility
1065-B RCRA Storage Facility
1065-C RCRA Storage Facility
1065-D RCRA Storage Facility
1065-E RCRA Storage Facility
1098-D Maintenance Offices
1098-E Heat Treatment Facility (Cook)
1098-F K-1098-F Laydown Area (Sta)
1098-G Heavy Equip. Storage Shed
1102-A Fan & Transfer Bldg.
1102-B Fan & Transfer Bldg.
1131-D Sprinkler Valve House
1203-04 Chlorination Control RM
1210-A Process Area
1210-B Office Area
1232-D Equipment Storage Shed
1232-G Pump House
1310-A Office Trailer (S K-1004-B)
1310-AA K-1423 Office Trailer (W of K-1423)
1310-AB K-1423 Office Trailer (W of K-1423)
1310-AC K-1423 Office Trailer (W of K-1423)
1310-AD K-1423 Office Trailer (N of K-1423)
1310-AE K-1423 Office Trailer (N of K-1423)
1310-AF K-1423 Office Trailer (N of K-1423)
1310 AG K-1423 Office Trailer (N of K-1423)
1310-AH K-1423 Office Trailer (N of K-1423)
1310-AI K-1423 Office Trailer (N of K-1423)
1310-AJ K-1423 Office Trailer (N of K-1423)
1310-AK K-1423 Office Trailer (N of K-1423)
1310-AL K-1423 Office Trailer (N of K-1423)
1310 -AM K-1407/CNF Office Trlr (NW K-1420)
1310-AN K-1407/CNF Office Trlr (NW K-1420)
1310-AP K-1407/CNF Office Trlr (NW K-1420)
1310-AQ Prefab Bldg (E of K-1200)
1310-AW Prefab Bldg HP (E K-1220)
1310-AX Bioassay Station @ Portal 3
1310-AY Bioassay Station (W of K-1435-A)
1310-B Office Trailer (S of K-1004-B)
1310-BA K-1407/CNF Changehouse (W K-1419)
1310-BB K-1407/CNF Stg Trailer (S K-1407-F)
1310-BC K-1407/CNF Stg Trailer (E K-1407-D)
1310-BD K-1407/CNF Stg Trailer (W K-1407-F)
1310-BE K1407/CNF Office Trailer (BTWN K-1407G/K)
1310-BJ Storage Bldg. Fay K-1310bj
1310-BK Storage Bldg. Fay K-1310bk
1310-BM Maintenance Office and Breakroom
1310-BN Storage Trailer
1310-BN Equip Storage Trailer (Near K-1414)
1310-BP Equip Storage Trailer (Near K-1414)
1310 BQ STSOD Storage Trailer (E K-302-1)
1310-BR WTSOD Storage Trailer (E K- 301-5
1310-BS Storage Trailer @ Portal 9
1310-BT WTSOD Storage Trailer
1310-BW WTSOD Storage Trailer @ K-1066-H
1310-BX WTSOD Storage Trailer @ K-1066-H
1310-BY Storage Trailer (N K-1004-L)
1310-BZ Office Trailer at K-1098
1310-C Officer Trailer (N K-1004-C)
1310-CA Conference Room (SE K-1098-D)
1310-CB Office Trailer
1310-CC Officer Trailer
1310-CD SW-31 Transfer Station (E K-1008-D)
1310-CE Personnel Monitoring Station @K1417
1310-CG Deactivated Boundary Control Station
1310-CH Storage Bldg (K-1066-G)
1310-CJ Storage Trailer (N K-1131)
1310-CK Supervisor Field Office (K-1417)
1310-CL Supervisor Field Office (L-1065)
1310-CM Office/Supply Trailer (@K-1417)
1310-CN Office/Supply Trailer (@K-1417)
1310-CP Break Room
1310-CQ Cool Down Unit
1310-CR Cool Down Unit
1310-CS Personnel Monitoring Station @ K-1417
1310-CW Changehouse Trailer
1310-CX Storage Shed (Near K-1414)
1310-D Office Trailer (N K-1004-C)
1310-DC RAD Vacuum Cleaner Facility
1310-DE Property Sales Office

1310-DF Property Sales
1310-DL Portable Trailer
1310-DN Storage Bldg.
1310-DP Sale Bldg.
1310-DX Frisker Station - East of 302-01
1310-DY Frisker Station - East of 309-01
1310-DZ Frisker Station - East of 310-02
1310-E Office Trailer
1310-EA Frisker Station - West of 305-12
1310-EB Frisker Station - West of 304-04
1310-ED Office Trailer
1310-EE Storage Shed East of K-1004-D
1310-EJ Office Trailer
1310-EK CNF 90-Day Storage Shed
1310-EP Boundary Control Station @ K-1419
1310-EQ Construction Access Monitor Gate
TRA1310-ER Wood Framed & Siding Trailer
1310-ES Office Trailer (ORISE)
1310-ET 8 x 18 Trailer
1310-EX Forklift Changing Station
1310-F Office Trailer
1310-H Office Trailer - SW K-1210 (M&EC)
1310-J Office Trailer (E of K-25-310-03)
1310-K Office Trailer - S K-1210 (M&EC)
1310-L Office Trailer - Portal 3 (ESC)
1310-M Office Trailer - Portal 3 (DIG)
1310-N Officer Trailer - Portal 3 (DIG)
1310-P Office Trailer - Portal 3 (GLR)
1310-U Body Count Trailer @ K-1020
1314-A Prefab Storage Bldg.
1314-B Prefab Storage Bldg.
1314-C Prefab Storage Bldg.
1314-D Prefab Storage Bldg.
1314-E Prefab Storage Bldg.
1314-G Blast/Paint Facility (South) CMP
1407-H Central Neutralization FAC (CNF)
1407-J Settling Basin
1407-K Chemical Addition
1407-P Electrical Field Shop @ K-1407-A
1408-A Pyrofax Heating Unit
1414-C Storage
1420-D Sprinkler Valve House
1423-AWSU WSU Reserved for TSCAI Support
1423-BWSU WSU NDA/NDE Support
1423-C Office/Change House
1423-D Trailer
1423-EWSU WSU TSCAI & NDE Support
1423-F WTSOD Office Trailer
1423-G Property Sales
1423-Office Office Space & Document Center
1430-A TSCAI Instrument Shop
1430-B TSCAI Instrument/Electrical Shop
1435-A Office, Lab, Control Bldg.
1435-B Drum Storage & Drum Handling
1435-C1 Bldg Office/Cooldown K-1435-C1
1435-D5 Trailer Portable Metal Pig.
1435-E Maintenance Field Office
1435-F Instrument Shop in D A
1435-G Office Trailer
1435-H Office Trailer & Storage
1435-I TSCA Office Trailer
1435-I1 Operations Office
1435-J Motor Control Center
1435-K Office Bldg.
1435-L Fire Foam House
1435-P Nitrogen Bottle Station
1435-Q Project Management Trailer
1435-R DOE Office & Project Support Trailer
1435-S Waste Processing Office
1435-T Technical Support Office
1435-U Operations Support Office
1435-V CONF-Lunchroom
1435-W Mens Changehouse
1435-X Computer Trailer
1435-Z Restroom Trailer
1501-C Foam House
1501-E Crusher Transfer Bldg.
1501-H Maintenance Shop
1501-Q Electrical Maintenance Shop
1515-E Production Support Bldg.
1515-H Chlorine Feed Bldg.
1545-A Office Trailer
1546-C Office Trailer
1550-J Office Trailer
1550-K Office Trailer
1550-W Office Trailer
1600-A TTF Office Addition
1704-1 Personnel Monitoring Station
1704-2 Personnel Monitoring Station
1775-A TVS Office Railer
1775-B Breakroom Trailer
1775-C TCGRS Office Trailer
1775-D TCGRS Control Room
1775-E TCGRS Analysis Lab
25-301-01 Process Bldg.
25-301-02 Process Bldg.
25-301-03 Process Bldg.
25-301-04 Process Bldg 301-4
25-301-05 Process Bldg 301-5
25-302-01 Process Bldg 302-1
25-302-02 Process Bldg. 302-2
25-302-03 Process Bldg 302-3
25-302-04 Process Bldg 302-4
25-302-05 Process Bldg 302-5
25-303-01 Process Bldg 303-1
25-303-02 Process Bldg 303-2
25-303-03 Process Bldg 303-3
25-303-04 Process Bldg 303-4
25-303-05 Process Bldg 303-5
25-303-06 Process Bldg 303-6
25-303-07 Process Bldg 303-7
25-303-08 Process Bldg 303-8
25-303-09 Process Bldg 303-9
25-303-10 Process Bldg 303-10

25-304-07 Process Bldg 304-1
25-304-02 Process Bldg 304-2
25-304-03 Process Bldg 304-3
25-304-04 Process Bldg 304-4
25-304-05 Process Bldg 304-5
25-305-01 Process Bldg 305-1
25-305-02 Process Bldg 305-2
25-305-03 Process Bldg 305-3
25-305-04 Process Bldg 305-4
25-305-05 Process Bldg 305-5
25-305-06 Process Bldg 305-6
25-305-07 Process Bldg 305-7
25-305-08 Process Bldg 305-8
25-305-09 Process Bldg 305-9
25-305-10 Process Bldg 305-10
25-305-11 Process Bldg 305-11
25-305-12 Process Bldg 305-12
25-306-01 Process Bldg 306-1
25-306-02 Process Bldg 306-2
25-306-03 Process Bldg 306-3
25-306-04 Process Bldg 306-4
25-306-05 Process Bldg 306-5
25-306-06 Process Bldg 306-6
25-306-07 Process Bldg 306-7
25-309-01 Process Bldg 309-1
25-309-02 Process Bldg 309-2
25-309-03 Process Bldg 309-3
25-310-01 Process Bldg 310-1
25-310-02 Process Bldg 310-2
25-310-03 Process Bldg 310-3
25-311-01 Process Bldg 311-1
25-312-01 Process Bldg 312-1
25-312-02 Process Bldg 312-2
25-312-03 Process Bldg 312-3
27-402-01 Process Bldg 402-1
27-402-02 Process Bldg 402-2
27-402-03 Process Bldg 402-3
27-402-04 Process Bldg 402-4
27-402-05 Process Bldg 402-5
27-402-06 Process Bldg 402-6
27-402-07 Process Bldg 402-7
27-402-08 Process Bldg 402-8
27-402-09 Process Bldg 402-9
300-C Coolant Pump Bldg.
300-C-1 Coolant Unloading Bldg.
300-C-2 Coolant Storage
300-C-3 Coolant Drying Bldg.
502-1 Process Bldg 502-1
502-2 Process Bldg 502-2
502-3 Process Bldg 502-3
602-1 Process Bldg 602-1
602-2 Process Bldg 602-2
602-3 Process Bldg 602-3
602-4 Process Bldg 602-4
602-5 Process Bldg 602-5
602-6 Process Bldg 602-6
633-D Equip. Trailer (NW of K-633)
708-E Scale House and Pit
710-A Sewage Treatment Pump House
710-E Compressor House
720-A Storage Bldg. (E K-1414)
720-B Gas Metering Station B (X-10)
720-C Gas Metering Station C (Y-12)
733-A Oil Filter and Handling
733-D West Sprinkler Valve House
733-E East Sprinkler Valve House
733-J Storage Shed
741-B Elza Swicht House @ Y-12 (OLD)
743-C Oil Transfer House @ Y-12
791N K791N Switch House N K33
791S K791S Switch House S K33
801-A Water Treatment Facility
892Y Storage Bldg.
902-1 Process Bldg 902-1
902-2 Process Bldg 902-2
902-3 Process Bldg 902-3
902-4 Process Bldg 902-4
902-5 Process Bldg 902-5
902-6 Process Bldg 902-6
902-7 Process Bldg 902-7
902-8 Process Bldg 902-8
Storage1 Parts Storage Bldg (K1414)

Oak Ridge National Laboratory
3092 Off-Gas Scrubber Facility
6000 Holifield Radioactive Ion Beam Facility
7900 High Flux Isotope Reactor

Department of Health and Human Services

National Institutes of Health
Bethesda Campus Multilevel Parking Garages,
Bethesda, Maryland

Department of State

Harry S Truman Building, Washington, D.C.
Charleston Regional Center, Charleston, SC

Department of Transportation

Federal Aviation Administration
Oklahoma City, OK
Air Route Surveillance Radar-1D
Air Route Surveillance Radar-3 Main Building
Air Route Surveillance Radar-3 Equip. Building
Air Route Surveillance Radar-3 Tower Building
Airport Surveillance Radar-8 Training Lab
Building 213 (Airport Surveillance Radar-8 Stor.)
Antenna Range Shop
Antenna Test Shop
Ant. Test Tower (ATCBI)
Base Maintenance
Building "K" (Credit Union)
Line Maintenance Building
Line Maintenance Shed
Radar Antenna Bldg.
VHF Omni-Range-700 Antenna Test
Air Route Surveillance Radar-3 Radar Test (RMM)
Air Route Surveillance Radar-4
Airport Surveillance Detection Equipment-3
Airport Surveillance Radar-7 Training Facility
Airport Surveillance Radar-9
Building 210 (Airport Surveillance Radar-9 Stor.)
FPS-66 Training Fac.
IND. Waste Treament Plant
Prog. Supt. Fax. (Terminal Doppler Weather Radar2)
Terminal Doppler Weather Radar #2 EQUIP. Bldg.
RADIO RFI
SPECIAL PURPOSE Bldg.
Terminal Doppler Weather Radar #1 Building
Thomas P. Stafford
TSI Lab Building
Waste Coll. Sys. Stg. Bldg.
TSI Compressor Buld'g.
Air Route Surveillance Radar-3 Storage
TSI Storage
Guard House (North)
Guard House (South)
VHF Omni-Range/Distance Measuring Equipment/TACAN
G National Air Space System
Systems Support Facility
Hazardous Waste Building
MARK 1 F (Conn. to Instrument Landing System Complex)
MARK 1-E (Conn. to Instrument Landing System Complex)
MARK 1-F (Conn. to Instrument Landing System Complex)
MARK 20 (Conn. to Instrument Landing System Complex)
MARK 20 Annex (Conn. to Instrument Landing System Complex)
LSTC (Conn. to Instrument Landing System Complex)
Mark1-B (Conn. to Instrument Landing System Complex)
Digital Remote Switch
Grounds Maintenance II

Atlantic City, NJ
Shelter (PUMP)
Storage/General
Office Building
Water Treatment Plant
Hazmat Storage
Communications Building
Fuel Farm
Fuel Farm
Fuel Farm
Pump House
Pump House
Exp. Lighting Storage
JP-4 Pump House
Treatment Plant
JP-4 Trans Bldg.
Office Building Addition
Radar Beacon Bldg.
Radio Communications Link
RCL Trailers was #291
Airport Surveillance Radar-5 Building
Peripheral Communications
Garage
WSR-57 Modulator
Doppler VHF Omni-Range #2
Generator Bldg.
Storage
Upper Air Facility
Exp. VHF Omni-Range Tac
Mode S Site
Mode S Trailer
Mode S Trailer
Aircraft Safety
FAM Logistics Office
Fire Safety
Wind Tunnel
Metal Shop/Aircraft Test
Project Storage
Pump House
Fuel Tank and Generator
Fuel Test/Cardox Storage
Fire Test Cell
Fuel Storage
Fuel Pump House
Crashworthiness Lab
Catapult Storage Metal Building
Sewage Lift Station
Drop Test Facility
Storage
Sprinkler Test Building

Drum Storage Building
Eair Radar
Central Communications
Storage
Sewage Lift Station
Storage
Aircraft Blower
Pump House
Compressor Bldg.
Fire Test Facility/Office
Air Test Bldg.
Chemical Labs
Log Cabin/Fuel Farm Office
Pump House
Guard Hose @ 18-A Gate
New Helipad Building
Storage
Fuel Test Lab
Friction Test Bldg.
Airport Surveillance Detection Equipment Bldg.
RCL (Modular Lab)
Vapor Extraction Building
Biotreatment Building
Extraction Control Building
Pavement Test Facility
FAA Fire Station
Power Conditioning System
Storage
Storage
Refeuler Repair
Faa Wash Rack
Storage
Storage Trailer
Pump House
Instrumentation Trailer
Engine Enclosure
Aircraft Maint. Storage
R/G Sand Storage
Aviation Security Bldg.
Aircraft Battery Shop
Bulk Storage Building
Trace Storage Building

Massena, NY
Eisenhower Lock
Snell Lock

Other locations
Flight Service Station, Bettles, AK
Flight Service Station (10)
Air Traffic Building Maintenance, Tanana, AK
Air Traffic Building Maintenance (7)
Utility Building Cold Bay, AK
Air Traffic Control Tower, Fairbanks, AK
VHF Omni-Range, Kotzebue, AK
VHF Omni-Range (25)
Homing Beacon, Ambler, AK
Homing Beacon (11)
Airport Surveillance Radar, Fairbanks, AK
Air Traffic Control Tower- Bethel, AK
QS, Dillingham, AK
Tower Building, Anchorage, AK
Utility Building, Middleton, AK
Tower Building, Kodiak, AK
Air Traffic Control Tower- Kansas City, MO
Air Traffic Control Tower- Des Moines, IA
Automated Flight Service Station, Columbia, MO
Air Route Traffic Control Center, Olathe, KS
Air Traffic Control Tower- Sioux City, IA
Automated Flight Service Station, Chesterfield, MO
Radio Communications Link Terminal, Columbia, MO
Air Route Surveillance Radar, Kirksville, MO
Air Route Surveillance Radar (6)
Airport Surveillance Radar, Wichita, KS
Airport Surveillance Radar (5)
Air Traffic Control Tower, St. Louis, MO
Air Traffic Control Tower (17)
Flight Service Station, Wichita, KS
Air Traffic Building Maintenance, Springfield, MO
VHF Omni-Range, Goodland, KS
VHF Omni-Range/TACR (49)
Remote Communications Air Ground, Salina, KS
Headquarters Facility (Airway Facilities Field), Kansas, MO
Automated Flight Service Station, Columbus, NE
Headquarters Facility (5) (Airway Facilities Field)
Air Traffic Building Maintenance, Chanute, KS
Air Traffic Building Maintenance, Scotts Bluff, NE
Air Traffic Building Maintenance, Lincoln, NE
Remote Communications Air Ground, Manhattan, KS
Air Route Traffic Control Center, Islip, NY
Air Traffic Control Tower, Rochester, NY
Automated Flight Service Station, Islip, NY
Automated Flight Service Station, Millville, NJ
Air Traffic Control Tower, Pittsburgh, PA
Automated Flight Service Station, Leesburg, VA
Flight Service Station, Islip, NY
Air Route Traffic Control Center, Leesburg, VA
Air Traffic Control Tower, Washington, DC
Air Route Surveillance Radar, Benton, PA
Air Traffic Control Tower, Caldwell, NJ
International Flight Service Station Transmitter, Sayville, NJ
Automated Flight Service Station, Williamsport, PA
Air Traffic Control Tower, Long Island, NY
VHF Omni-Range, Calverton, NY
VHF Omni-Range (78)

Headquarters Facility, Charleston, WV
Flight Service Station, Salisbury, MD
Flight Service Station (4)
Headquarters Facility (6) (Airway Facilities Field),

Norfolk, VA
Utility Building, Roanoke, VA
Headquarters Facility (Airway Facilities Field), Poughkeepsie, NY
Air Traffic Building Maintenance, Long Island, NY
Airport Surveillance Radar, Syracuse, NY
Airport Surveillance Radar (13)
Air Route Surveillance Radar, Riverhead, NY
Air Route Surveillance Radar (7)
Air Traffic Control Tower, Islip, NY
Air Traffic Control Tower (25)
Automated Flight Service Station, Altoona, PA
Airport Surveillance Radar, Chicago, IL
Airport Surveillance Radar (16)
Air Route Surveillance Radar, Cooperville, MI
Air Route Surveillance Radar (13)
Air Traffic Control Tower, W. Chicago
Air Traffic Control Tower (38)
Air Traffic Building Maintenance, Columbus, OH
VHF Omni-Range, Stronghold, IL
VHF Omni-Range (80)
Headquarters Facility (Airway Facilities Field), Willmar, MN
Headquarters Facility (6) (Airway Facilities Field)
Tower Building, Flint, MI
Tower Building (8)
MULTI, Dayton, OH
MULTI (7)
Automated Flight Service Station, Grand Forks, ND
Automated Flight Service Station, Huron, SD
Headquarters Facility (Airway Facilities Field), Traverse City
Headquarters Facility(5) (Airway Facilities Field)
Air Route Traffic Control Center, Oberlin, OH
Automated Flight Service Station, Lansing, MI
Flight Service Station, Dayton, OH
Automated Flight Service Station, Kankakee, IL
Air Traffic Control Tower, Grand Rapids, MI
Automated Flight Service Station, Green Bay, WI
Air Route Traffic Control Center, Aurora, IL
Automated Flight Service Station, Princeton, MN
Automated Flight Service Station, Terre Haute, IN
Air Route Traffic Control Center, Farmington, MN
Air Route Traffic Control Center, Indianapolis, IN
Air Traffic Control Tower, Detroit, MI
MULT, Minneapolis, MN
Air Traffic Control Tower, Rapid City, SD
MULT, Indianapolis, IN
Air Traffic Control Tower, Minneapolis, MN
Airport Surveillance Radar, Nantucket, MA
Airport Surveillance Radar, Boston, MA
Air Route Surveillance Radar, Cummington, MA
Air Traffic Control Tower, New Haven, CT
Air Traffic Control Tower (19)
Airport Surveillance Radar, Manchester, NH
Airport Surveillance Radar, Portland ME
VHF Omni-Range, Augusta, ME
VHF Omni-Range (14)
Automated Flight Service Station, Bangor, ME
Automated Flight Service Station, Burlington, VT
Headquarters Facility, Boston, MA
Air Traffic Control Tower, Providence, RI
Automated Flight Service Station, Bridgeport, CT
Air Route Surveillance Radar, North Truro, MA
Air Traffic Control Tower, Boston, MA
Air Traffic Control Tower, Otis AFB, MA
Air Route Traffic Control Center, Boston, MA
Air Route Surveillance Radar, St. Albans, ME
Air Route Surveillance Radar, Bucks Harbor, ME
Automated Flight Service Station, Cedar City, UT
Automated Flight Service Station, Great Falls, WY
Automated Flight Service Station, Casper, WY
Remote Communications Air Ground, Alamosa, CO
Remote Communications Air Ground (8)
Remote Transmitter Receiver, Ogden, UT
Tower Building, Tobe, CO
Remote Transmitter Receiver, Renton, WA
Remote Transmitter Receiver, Spokane, WA
Distance Measuring Equipment, Wenatchee, WA
Remote Transmitter Receiver, Seattle, WA
Air Route Surveillance Radar, Klamath Falss, OR
Airport Surveillance Radar, Salt Lake City, UT
Airport Surveillance Radar (12)
Air Route Surveillance Radar (15)
Air Traffic Control Tower, Denver, CO
Air Traffic Control Tower (21)
VHF Omni-Range, Myton, UT
VHF Omni-Range (63)
Flight Service Station, Redmond, OR
Flight Service Station (13)
Tower Building, Spokane, WA
Storage Building, Mica Peak, WA
Air Route Traffic Control Center, Auburn, WA
Air Route Traffic Control Center, Salt Lake City, UT
Air Route Traffic Control Center, Longmont, CO
Automated Flight Service Station, Boise, ID
Automated Flight Service Station, Seattle, WA
Automated Flight Service Station, Denver, CO
Air Route Surveillance Radar, Malstrom AFB, MT
Air Traffic Control Tower, Colorado Springs, CO
Air Route Surveillance Radar, Salt Lake City, UT
Automated Flight Service Station, Bosie, ID
Automated Flight Service Station, Casper, WY
Air Traffic Control Tower, Eugene, OR
Automated Flight Service Station, McMinnville, OR
Air Traffic Control Tower, Grand Junction, CO
Air Route Surveillance Radar, Lake Side, MT
Air Traffic Control Tower, Twin Falls, ID
Flight Service Station (8)
Air Traffic Building Maintenance, Tallahassee, FL
Air Traffic Building Maintenance (7)
Remote Transmitter Receiver, Briltol, TN
Automated Flight Service Station, Miami, FL
Automated Flight Service Station, Anderson, SC

Automated Flight Service Station, Greenwood, MS
MULTI, Orlando, FL
Remote Communications Air Ground, London, KY
Air Route Surveillance Radar, Newport, MS
Air Route Surveillance Radar (16)
Airport Surveillance Radar, Atlanta, GA
Airport Surveillance Radar (36)
Remote Transmitter Receiver, Savannah, GA
Air Traffic Control Tower, Mobile, AL
Air Traffic Control Tower (53)
VHF Omni-Range, San Juan, PR
VHF Omni-Range (82)
Flight Service Station, Mccombs, MS
Air Route Traffic Control Center, Memphis, TN
Automated Flight Service Station, Raleigh Durham, NC
Automated Flight Service Station, Nashville, TN
Automated Flight Service Station, Louisville, KY
Air Traffic Control Tower, Pensacola, FL
Air Traffic Control Tower, Greer, SC
Automated Flight Service Station, Jackson, MS
Air Traffic Building Maintenance, Tri City, TN
Air Traffic Control Tower, Wilmington, NC
Air Traffic Control Tower, Atlanta, GA
Air Route Traffic Control Center, Miami, FL
Center Radar Approach Control, San Juan, PR
Air Traffic Building Maintenance, Jacksonville, FL
Air Traffic Control Tower, Orlando, FL
Automated Flight Service Station, Gainsville, FL
Air Traffic Control Tower, Opa Locke, FL
Automated Flight Service Station, Macon, GA
Air Traffic Control Tower, Memphis, TN
Air Traffic Control Tower, Charleston, SC
Air Traffic Control Tower, Charlotte, NC
Air Route Traffic Control Center, Atlanta, GA
Air Route Traffic Control Center, Jacksonville, FL
VHF Omni-Range, New Orleans, LA
VHF Omni-Range/TACR (65)
Air Traffic Control Tower, Corpus Christi, TX
Air Traffic Control Tower (37)
Airport Surveillance Radar, El Paso, TX
Airport Surveillance Radar (17)
Air Route Surveillance Radar, Rogers, TX
Air Route Surveillance Radar (17)
Remote Communications Air Ground, El Paso, TX
Remote Communications Air Ground (5)
Terminal Doppler Weather Radar, Houston, TX
Flight Service Station, Gallup, NM
Flight Service Station (10)
Air Route Traffic Control Center, Houston, TX
Air Route Traffic Control Center, Albuquerque, NM
Air Traffic Control Tower, Houston, TX
Air Traffic Control Tower, Albuquerque, NM
Automated Flight Service Station, Albuquerque, NM
Air Traffic Control Tower, Lafayette, LA
Automated Flight Service Station, De Ridder, LA
Automated Flight Service Station, Conroe, TX
ARTS, El Paso, TX
Automated Flight Service Station, Ft. Worth, TX
Air Traffic Control Tower, Oklahoma City, OK
Air Route Traffic Control Center, Fort Worth, TX
Automated Flight Service Station, San Angelo, TX
Air Traffic Control Tower, Lubbock, TX
Automated Flight Service Station, McAleaster, OK
Air Traffic Control Tower, San Antonio, TX
Flight Service Station, Austin, TX
Air Traffic Control Tower, Dallas-Fort Worth, TX
Flight Service Station, Fort Worth, TX
Flight Service Station, Jonesboro, AR
Air Traffic Control Tower, Tyler, TX
Electrical Distribution, Lafayette, LA
Air Traffic Control Tower, El Paso, TX
ADQF1, Jonesboro, AR
Mobile Air Traffic Control Tower, Dallas-Fort Worth, TX
ARTS, Oakland, CA
Airport Surveillance Radar, Oakland, CA
Airport Surveillance Radar (13)
Air Route Surveillance Radar, Fallon, NV
Air Route Surveillance Radar (6)
Air Traffic Control Tower, Las Vegas, NV
Air Traffic Control Tower (40)
ATCB, Las Vegas, NV
Headquarters Facility, Reno, NV
Headquarters Facility (5)
Flight Service Station, Red Bluff, CA
Flight Service Station (11)
VHF Omni-Range, Kaunakakai, HI
VHF Omni-Range/TACR (62)
Tower Building, Long Beach, CA
Tower Building (6)
Automated Flight Service Station, San Diego, CA
Terminal Radar Approach Control, Phoenix, AZ
Air Route Traffic Control Center, Fremont, CA
Center Radar Approach Control, Honolulu, HI
Flight Service Station, Prescott, AZ
Air Route Surveillance Radar, Mount Luguna, CA
Air Route Surveillance Radar, Mill Valley, CA
Automated Flight Service Station, Ranco Muirieta, CA
Air Route Surveillance Radar
Automated Flight Service Station, Riverside, CA
Automated Flight Service Station, Oakland, CA
Automated Flight Service Station, Hawthorne, CA
Air Route Traffic Control Center, Palmdale, CA
Air Route Surveillance Radar, Crescent City, CA
Automated Flight Service Station, Honolulu, HI
Air Traffic Control Tower, Sacramento, CA
Air Traffic Building Maintenance, Ontario, CA
Air Traffic Control Tower, Fresno, CA
VHF Omni-Range, San Catalina, CA
Air Traffic Control Tower, Birmingham, AL
Terminal Radar Approach Control, Peachtree, GA
Honolulu Combined Facility, Honolulu, HI

Automated Flight Service Station, Chesterfield, MO
Turner-Fairbanks Facility, McLean, VA
James River Reserve Fleet, Newport News, VA
Beaumont Reserve Fleet, Beaumont, TX
Suisun Bay Reserve Fleet, San Francisco, CA

General Services Administration

Connecticut Bank Building, Norwich, CT
Dummy for FBI, New Haven, CT
GSA CD Depot 234, Watertown, MA
Parking Facility, Portland, ME
Merchants Bank Building, Brattleboro, VT
Queens Plaza South, New York-Queens, NY
Silvio V Mollo FB, New York-Manhattan, NY
Federal Building, New York-Queens, NY
WS Jamiesons Line, Burke, NY
4288 BWY, New York-Manhattan, NY
Corporate Tower, New Rochelle, NY
MIL - Pine Plaza, Niagara Falls, NY
Greenway Plaza, Melville, NY
2025 Richmond Ave ASO, Richmond, NY
No. 7 World Trade Ct., New York-Manhattan, NY
29 NO Middletown Road, Nanuet, NY
841 Canandaigua Road, Geneva, NY
76 Eleventh Avenue, New York-Manhattan, NY
Picotte Building, Schenectady, NY
2389 Richmond Ave., Richmond, NY
15 Lewis Street, Geneva, NY
6560 Niagara Falls B, Niagara Falls, NY
1 Corporate Dr., Holtsville, NY
1196 Fulton Street, New York-Kings, NY
65TH INF Shopping Center, Rio Piedras, San Juan, PR
Centro Europa, SANTURCE, San Juan, PR
Villa Captain II, Mayaguez, Mayaguez, PR
O'Neale Commercial C, St. Croix, U.S. VI
SSA Metro West, Baltimore, MD
BWI Commerce Park-9, Hanover, MD
Windsor Corporate PA, Woodlawn, MD
Winding River Plaza, Brick Town, NJ
First National Bank, Camden, NJ
USPO CTHSE, Danville, VA
Federal Building, Farmville, VA
Customhouse, Norfolk, VA
Wise County Plaza, Wise, VA
Birmingham, Bolt Bldg, Duffield,
Old PO and Courthouse, Martinsburg,
Frank Johnson Annex, Montgomery, AL
Federal Building, Sarasota, FL
1425 Building, Miami, FL
FB-PO-CT, Clarksdale,
FB, Greenville, SC
SSA Building, Rockford, IL
GSA INTERAG MTR POOL, Chicago, IL
OHARE Lake Office Plaza, Des Plaines, IL
Clyde Savings Bldg, North Riverside, IL
2100 N California, Chicago, IL
WASH Bicentennial Bldg, Springfield, IL
Smoke Tree Bus Park, North Aurora, IL
10 West Jackson Blvd, Chicago, IL
One Congress Center, Chicago, IL
E Empire Eastport, Bloomington, IL
Burrell Building, Chicago, IL
1279 North Milwaukee, Chicago, IL
Bank of America, Chicago, IL
901 Warrenville Road, Lisle, IL
1700 South Wolf Road, Des Plaines, IL
Elm Plaza So. Tower, Hinsdale, IL
IL Business Center, Springfield, IL
2360 E Devon Ave., Des Plaines, IL
River Center, Chicago, IL
Schaumburg Atrium, Schaumburg, IL
600 Joliet Rd, Willowbrook, IL
2350 E Devon, Des Plaines, IL
Gateway IV, Chicago, IL
Citicorp Center, Chicago, IL
29 North Wacker Drive, Chicago, IL
Governors Offfice Park, Olympia Fields, IL
One Oakbrook Terrace, Oakbrook Terrace, IL
Xerox Centre, Chicago, IL
Stewart Square, Rockford, IL
Midway Business Ctr, Chicago, IL
635 Butterfield Rd., Oakbrook Terrace, IL
5353 S Laramie, Chicago, IL
Illinois Fin Center, Springfield, IL
Northwestern Bldg, Evanston, IL
The Rookery, Chicago, IL
Heritage Place, Moline, IL
1600 Corporate Center, Rolling Meadows, IL
4849 N Milwaukee Ave, Chicago, IL
ATT Corporate Center, Chicago, IL
801 Warrenville Road, Lisle, IL
1000 Tower Lane Bldg, Bensenville, IL
Olympian Office Center, Lisle, IL
The PK at NW Point, Elk Grove Village, IL
945 Lakeview Parkway, Vernon Hills, IL
2860 River Road, Des Plaines, IL
One S. Wacker Bldg, Chicago, IL
1830 2nd Ave., Rock Island, IL
The Esplanade, Downers Grove, IL
Network Centre, Effingham, IL
Burr Ridge Executive, Burr Ridge, IL
Firstar Bank Bldg, Vernon Hills, IL
Two ILL Center, Chicago, IL
EMCO Plaza Bldg, Joliet, IL
SSA Bldg, Elkhart, IN
Pendleton Trade Ctr, Indianapolis, IN

429 Penn Center, Indianapolis, IN
Fed Bldg PO, Benton Harbor, MI
Fed Parking Facility, Detroit, MI
595 East 16th Street, Holland, MI
Pontiac Place Bldg, Pontiac, MI
9622 Grand River, Detroit, MI
29 Pearl Street, Grand Rapids, MI
605 N. Saginaw, Flint, MI
Dominos Farm House, Ann Arbor, MI
Brewery Park Phase I, Detroit, MI
3440 Broadmoor, Grand Rapids, MI
Woodcrest Office Park, Troy, MI
Arlington Plaza, Sault Ste Marie, MI
Danser Building, Petoskey, MI
Broadmoor Assoc II, Grand Rapids, MI
USPS Bldg Courthouse, Fergus Falls, MN
Federal Building, Minneapolis, MN
Food and Drug Admin. Bldg, Minneapolis, MN
Frank T. Bow Federal Bldg, Canton, OH
Federal Bldg, Toledo, OH
Fed Parking Facility, Dayton, OH
Plaza Nine Bldg, Cleveland, OH
Commerce Place, Middleburg Heights, OH
Plaza South II Middleburg Heights, OH
Sanning Apartments, Cincinnati, OH
One Cleveland Ctr, Cleveland, OH
Lakewood Center West, Lakewood, OH
2026 West Main Street, Springfield, OH
4411 Montgomergy Road, Norwood, OH
CBLD Building, Cincinnati, OH
Moraine Bus Ctr 2, Moraine, OH
Bank One Center, Cleveland, OH
Eaton Center, Cleveland, OH
Renaissance, Cleveland, OH
6747 Engle Road, Middleburg Heights, OH
228th Lake Shore B, Euclid, OH
Society Tower, Cleveland, OH
6161 Oaktree, Independence, OH
Rockside Center III, Independence, OH
BP Amercia Bldg, Cleveland, OH
5 Point Shopping Ct. Cleveland, OH
Moraine Bus. Ctr 3, Moraine, OH
Building One Moraine, Moraine, OH
Federal Bldg, Wausua, WI
Social Security Off, Wisconsin Rapids, WI
Ace Industrial Dr., Cudahy, WI
700 Regent St., Madison, WI
State ST Square Bldg, Marshalltown, IA
I 80 Building, West Branch, IA
Service BG-Eisenhower, Abilene, KS
U S CT and Custom House, St. Louis, MO
Federal Bldng, Sedalia, MO
Social Security Bldg, Independence, MO
2610 Ave "Q" Kearney, Kearney, NE
Federal Bldg, Harrison, NE
Federal Bldg Courthouse, Lafayette, LA
Open Land - FDA Site, New Orleans, LA
Bldg 27, Houma, LA
Federal Bldg Courthouse, Ardmore, OK
SSA District Office, Ardmore, OK
Federal Building, Muskogee, OK
Seminole Agency Bldg, Wewoka, OK
U S Border Station, Rio Grande City, TX
U S Courthouse, Corpus Christi, TX
Federal Bldg USPO, Fairfield,TX
Courthouse, Corpus Christi, TX
Bush Ranch, Crawford, TX
Unnamed Warehouse, Houston, TX
Starr Camargo Bridge, Rio Grande City, TX
Unnamed Building, Laredo, TX
Unnamed Road, Crawford, TX
University Gardens, Austin, TX
Nueces Place Condos, Austin, TX
GSA Parking Lot, Denver, CO
GSA Storage Bldg, Bismarck, ND
New Parking Lot, Bismarck, ND
EQPT Depot MP SHOP, Ogden, UT
Sunbeam Appl Svc, Salt Lake City, UT
Garage, Cheyenne, WY
U. S. Courthouse, Tucson, AZ
Sandra Day O'Connor Bldg, Phoenix, AZ
Building 1, Flagstaff, AZ
2160 E Van Buren Ave, Phoenix, AZ
U.S. Old Mint Bldg, San Francisco, CA
General Services, San Francisco, CA
POT ANX 1, Washington, D.C.
White House, Washington, D.C.
US International TR, Washington, D.C.
Judiciary Center, Washington, D.C.
425 7th Street NW, Washington, D.C.
625 D Street NW, Washington, D.C.
628 E Street NW, Washington, D.C.
1310 L Street NW, Washington, D.C.
DELASALLE, Avondale
3200-3244 Hubbard Rd, Landover, MD
SS Metro Plaza 2, Silver Spring, MD
Beltsville Warehouse, Beltsville, MD
MAT Land CO, Glendale Heights, MD
12100 Parklawn Dr, Rockville, MD
Hunter Building, McLean, VA
6700 Springfield Ctr Dr, Springfield, VA
Fillmore, McLean, VA
Crystal Mall 2-3-4, Arlington, VA
883,885,901-27 South Pickett, Alexandria, VA
841881 South Pickett, Alexandria, VA

National Aeronautics and Space Administration

Ames Research Center, Moffett Field, CA
Pilot Model of 3.5 Foot Hypersonic Wind Tunnel
12 Foot Pressure Wind Tunnel
Pressurized Ballistic Range
Flight Support Facility
7 X 10 Foot Wind Tunnel #1
7 X 10 Foot Wind Tunnel #2
Magnetic Calibration Laboratory
14 Foot Transonic Wind Tunnel Laboratory
40 X 80 Foot Wind Tunnel
2 X 2 Foot Transonic Wind Tunnel
Electrical Substation
6 X 6 Foot Transonic Wind Tunnel
Unitary Plan Wind Tunnel Building
3.5 Foot Hypersonic Wind Tunnel
Fluid Dynamics Laboratory
Hypervelocity Free Flight Facility
Life Sciences Research Laboratory
Airborne Missions/Life Science Facility
Vestibular Research Facility
Vertical Motion Simulator
Space Projects Facility
Space Sciences Research Laboratory
Aircraft Service Facility
Outdoor Aerodynamic Research
Man-Vehicle System Research Facility
High Altitude Aircraft Support Facility
Fluid Mechanics Laboratory
Biomedical Research Laboratory
Human Performance Research Laboratory
Automated Sciences Research Facility
Computational Fluid Dynamics Building
Vertical Gun
12 Foot Wind Tunnel Auxiliaries
Propulsion Simulations Calibration Laboratory
Model Preparation Facility
Model Assembly
Magnetic Test Laboratory
14 Foot Electrical Equipment Building
Fan Blade Shop
20-G Centrifuge
80 X 120 Foot Wind Tunnel
Electrical Substation North
11 Foot Transonic Wind Tunnel
9 X 7 Foot Subsonic Wind Tunnel
8 X 7 Foot Subsonic Wind Tunnel
3.5 Foot Hypersonic Wind Tunnel Auxiliary Building
3.5 Foot Hypersonic Wind Tunnel Storage Building
Thermal Protection Boiler
Life Sciences Equipment Facility
Life Sciences Flight Experiments
Vertical Motion Simulator Equipment Facility
Aircraft Service Facility
Aircraft Service Facility
RSRA Calibration Facility
Aircraft Service Facility
Bioscience Laboratories

Goldstone Deep Space Communications Complex, Goldstone, CA
Entire facility is exempt.

Glenn Research Center, Cleveland, OH
Engine Research Building
Icing Research Tunnel - Refrigeration Building
Icing Research Tunnel - Cooling Tower No. 1
Icing Research Tunnel
Engine Research Building - West Wing
Special Projects Laboratory
Materials Research Laboratory
Engine Research Building - Northwest Wing
Engine Research Building - High Pressure Facility
8 X 6 Ft. Supersonic Wind Tunnel
8 X 6 Ft. Supersonic Wind Tunnel - Cooling Tower No. 2
Materials & Structures Laboratory
8 X 6 Ft. Supersonic Wind Tunnel - Drive Equipment Building
8 X 6 Ft. Supersonic Wind Tunnel - Air Dryer Building
Central Air Equipment Building
Central Air Equipment Building - PSLCooling Tower No. 3
Central Air Equipment Building - Cooling Tower Water Pump Building
Engine Research Building - Spray Cooler Building
Engine Research Building - Cooling Tower No. 4
10 X 10 Ft. Supersonic Wind Tunnel
10 X 10 Ft. Supersonic Wind Tunnel - Office & Control Building
10 X 10 Ft. Supersonic Wind Tunnel - 2nd Compressor & Drive Building
10 X 10 Ft. Supersonic Wind Tunnel - Air Dryer Building
10 X 10 Ft. Supersonic Wind Tunnel - Substation "K"
10 X 10 Ft. Supersonic Wind Tunnel - Main Compressor & Drive Building
10 X 10 Ft. Supersonic Wind Tunnel - Low Pressure Fuel Pump Building
10 X 10 Ft. Supersonic Wind Tunnel - High Pressure Fuel Pump Building
10 X 10 Ft. Supersonic Wind Tunnel - Cooling Tower No. 5
10 X 10 Ft. Supersonic Wind Tunnel - Cooling Tower Water Pump Building
Central Air Equipment Building - PSL Desiccant Air Dryer
Engine Research Building Combustion Air Heater
Engine Components Research Laboratory

Materials Processing Laboratory
Basic Materials Basic Materials Laboratory
10 X 10 Ft. Supersonic Wind Tunnel - Shop Building (#86)
10 X 10 Ft. Supersonic Wind Tunnel - Exhauster Building
PSL Heater Building
PSL Engine Test Building
Central Air Equipment Building - PSL Cooling Tower No. 6
Aero-Acoustic Propulsion Laboratory & Control Room
Electric Power Laboratory
Energy Conversion Laboratory
Space Power Research Laboratory

Goddard Space Flight Center, Greenbelt, MD
Spacecraft Systems Development/Integration Facility

Johnson Space Center, Houston, TX
Jake Garn Simulator and Training
Mission Simulation Development Facility
Mission/Space Station Control Center
Emergency Power Building

Langley Research Center, Hampton, VA
8-Foot Transonic Pressure Tunnel (Closed)
University of Virginia & ART Management Office Building
30 X 60 Foot Tunnel
Transonic Dynamic Tunnel
16 Foot Transonic Tunnel
Subsonic Tunnel Offices
Hypersonic Propulsion Facility
Frequency Converter Building
National Transonic Facility (NTF)
Drive Control Facility
0.3-Meter Transonic Cryogenic Tunnel
Atmospheric Sciences/Systems Development Laboratory
Unitary Wind Tunnel
8 Foot High Temperature Tunnel
TDT Complex--Cooling Tower
16 Foot TWT Cpx.--Equipment Fac.
16 Foot TWT Cpx.--Valve House
16 Foot TWT Cpx.--Cool.Twr/Pump Hse
16 Foot TWT Complex--Annex
16 Foot TWT Complex--Annex
16 Foot TWT Complex--Annex
16 Foot TWT Cpx.--Gas Stor. Shed
16 Foot TWT Cpx.--Motor House #1
16 Foot TWT Cpx.--Motor House #2
16 Foot TWT Complex--Annex
16 Foot TWT Cpx.--Air Exchange Twr.
16 Foot TWT Complex--Annex
16 Foot TWT Complex--Access Area
High Speed 7 X 10 Foot Tunnel
14 X 22 Foot Subsonic Tunnel
High Intensity Noise Research Laboratory
Hypersonic Propulsion Facility
Hypersonic Propulsion Facility
Hypersonic Propulsion Facility
Hypersonic Propulsion Facility
NTF Annex--ME
NTF Annex--Vent Structure
NTF Tunnel Model Storage
NTF Annex
Foundry & Glass Blowing Shop
0.3 Meter Tunnel Annex
Gas Dynamics/Fluid Mechanics Research Facility
Hypersonic Facilities Complex - West Wing
Hypersonic Facilities Cooling Tower
Hypersonic Facilities Complex - East Wing
60-Inch M18 Helium Tunnel Facility
Atmospheric Sciences Laboratory Annex
Unitary Complex--31 Inch M10 Annex
Unitary Complex Cooling Tower
Unitary Complex Annex--Chem. Treat.
Unitary Complex Annex--Sprink. House
Unitary Complex Annex--Flamm. Stor.
8 Foot HTT Complex--Bottle Storage
8 Foot HTT Complex--Combuster Fac.
8 Foot HTT Complex--Cooling tower
8 Foot HTT Complex--Fuels Equip. Fac
8 Foot HTT Complex--Storage Annex
8 Foot HTT Cpx--6000PSI Bottle Fld
8 Foot HTT Complex--Annex

Plum Brook Station, Sandusky, OH
Entire facility is exempt.

Spaceflight and Data Network, Ponce de Leon, FL
Entire facility is exempt.

White Sands Complex, White Sands, New Mexico
Entire facility is exempt.

White Sands Test Facility, Las Cruces, New Mexico
Boiler Building
Water Treatment Building
300 Area Cooling Pond
Boiler Building
Switchgear Building
Altitude Simulation System Building
Steam Generator Support Building
Treated Water Storage Facility
Altitude Simulation System (Steam Generator)

Tennessee Valley Authority

Bandy, R. H. 115 kV Switch House
O2H Water Level Gauge House
Engineering Labs Building P
Grandview Radio/Microwave
Columbia 161 Well House
Brindley 46 kV Switch House
Sebastopole Radio Repeater
Estill Springs 46 kV Switch House
Hillsboro 46 kV Switch House
Salem Carpet Mills 46 kV Switch House
Unionville 46 kV Switch House
Cerulean 69 kV Switch House
Haletown 69 kV Switch House
Peedee 69 kV Switch House
Adairville 69 kV Switch House
Pembroke 69 kV Switch House
Etowah Switch House 69 kV Switch House
Williamsport 46 kV Switch House
Cornersville 46 kV Switch House
Wellhouse
Kirkmansville 69 kV Switch House
Marble 69 kV Switch House
Rienzi 46 Switch House
Bluff City 161 kV Pump House
Tuscumbia Microwave
Brawley Mtn Microwave/Radio
Hopkinsville Microwave
Nickajack FTC Elec Sim Control
Centerville Microwave
Columbia 161 kV Pump House
Waynesboro Radio Repeater
Great Falls Microwave
Courtland 46 kV Switch House
Wellhouse (Watauga Dam)
Broadview Microwave
Hornbeak Radio/Microwave
Lena Radio/Microwave
Wauchecha Bald Radio
Fort Mountain Radio Station
White Oak Mountain Radio
Bruce Radio Station
Clarksville Water Tower/COMM
Weyerhauser 161 kV Switch House
Bryant 161 kV Switch House
Grove Oak 46 kV Switch House
Section 46 kV Switch House
South Macon 161 kV Switch House
Columbus Air Force Base 46 kV Switch House
Cowan 46 kV Switch House
Sewanee 69 kV Switch House
Middale 69 kV Switch House
Hopkinsville 161 Well House
Falling Water 161 kV Switch House
Weyerhaeuser Co. 161 kV Switch House
Lebanon 161 kV Pump House
South Calvert 161 kV Switch House
Clarksburg 161 kV Switch House
Martin Radio
Russellville District 69 kV Switch House
Culleoka 46 kV Switch House
Kirkville 46 kV Switch House
Charlotte 69 kV Switch House
Dupont 69 kV Switch House
Hendersonville 161 kV Switch House
Jersey Miniere Zinc-Elmwood
Jersey Miniere Zinc Co 161 kV Switch House
Greeneville Ind Park 161 kV Switch House
Holston Mountain Load
Roane Mountain Microwave
Dunmor 69 kV Switch House
Roane Mountain 161 kV Switch House
Bonicord 69 kV Switch House
North Sardis 161 kV Switch House
Terrapin Mtn Radio
Booneville District 46 kV Switch House
Ludlow 46 kV Switch House
Belfast 161 kV Pump House
Hickory Valley 161 kV Pump House
TFH Spillway Emergency Generator Building
GFH Intake House
Ridgedale 161 kV Switch House
Sherwood 46 kV Switch House
SHF Coal Yard Lighting
Hinze Radio/Microwave
WTH Electrical Equipment Building
Burney Mountain Microwave
Holston Mountain Microwave
Scottsboro Pump House
RPS Discharge Structure Pumping Station
Nickajack FTC New Pump House
Kerr-Mcgee Inc. 161 kV Switch House
Elkton Hill Radio/Microwave
O1H Diesel Generator Building
Old Pump House
Big Sandy Pumphouse - Heat/Ltg
Big Sandy Pumphouse - Motor
Camden 161 kV Pump House
Lexington Water Pump (Temporary)
West Sandy Pump House
West Sandy Pump House (Lts/Ht)
APH Diesel Generator Building
O2H Trash Rack House
O2H Water Treatment Plant
South Jackson 161 kV Generator Bldg
West Point 500 kV Pump House
Lightfoot 69 kV Switch House
Fultondale Battery Building
O2H Penstock Valve House
Saulsbury 46 kV Switch House
COF Gas Turbine Switchgear 1

TFH Diesel Generator Building
MHH Diesel Generator Bldg
NJH Diesel Generator Building
Bonicord
O2H Well Pump House
TLH Emergency Generator Building
Dandridge Pump Sta. (Doug Dam)
FNH Diesel Generator Building
Hardwick Clothes Inc
Lynchburg 46 kV Switch House
Brownsville 161 kV Switch House
Dry Creek Primary 161 kV Switch House
Moscow 161 kV Switch House
Sardis 161 kV Switch House
Russellville 161 kV Switch House
Huntsville 161 kV Storage
Guntersville 161 Kv Switch House
Guntown 161 kV Switch House
Red Bay 161 kV Switch House
Collinsville 161 kV Switch House
Casky 69 kV Switch House
GAF Breaker Switchgear Bldg
Volunteer 500 kV Pump House
Fultondale 115 kV Switch House
Sequoyah Training Radio
Bristow
DAYTON 161KV
Ellis Mountain Microwave
Aberdeen
Savannah 161 kV Switch House
Water Valley 161 kV Switch House
Glasgow 161 kV Switch House
Aberdeen 161 kV Switch House
Hickman Microwave
Shawnee Repeater Station
Franklin 161 kV Switch House
Logan Aluminum
Bolivar District 46 kV Switch House
Elkton 69 kV Switch House
Penchem 69 kV Switch House
Hopson 69 kV Switch House
Fultondale AL 115kv Switch House
Waynesboro 161 kV Switch House
Erin 161 kV Switch House
Livingston 161 kV Switch House
Alamo 161 kV Switch House
Braytown 161 kV Switch House
Scott 115 kV Switch House
Green Top Mountain Microwave
JSF Sample Bldg.
O2H Oil Purification Building
Rollins 46 kV Switch House
Sequatchie Valley Radio Station
Fain Mountain Microwave
Trace Park Microwave
Rock Springs Microwave
Lynn Grove Microwave
Anderson Microwave
Russell Hill Microwave
Fabius Microwave
Phipps Bend 500 Pump House
Starkville (New) 161 kV Switch House
Cranberry 161 kV Switch House
Lewisburg 161 kV Switch House
Wininger Microwave
Smithville Radio
Monte Sano VHF
Signal Mountain Microwave
Lambert Chapel Microwave
Pickwick Microwave
New Castle Microwave
Beech Grove Microwave
Donelson Microwave
Monsanto Microwave
Beech Grove Microwave
Nickajack FTC Ventilator Building
CHH Diesel Generator Building
GAF Hydrogen Trailer Port A
Finger
Norton Hill Microwave
McEwen Microwave
Church Hill Microwave
Combs Knob Microwave
Rockhouse, Buckeye, Bagwell Pump House
WCF Coal Sampling Bldg.
Sewanee Microwave
Bunker Hill Microwave
Van Vleet Radio/Microwave
Sharps Ridge Microwave
Pump Station (Watts Bar Res)
Woodall Mountain Microwave
Lamar Microwave
Graham Microwave
Morristown District 69 kV Switch House
Morristown Microwave
Hollis Chapel Microwave
Bowling Green Microwave
Stephensville Microwave
Johnsonville Microwave
Spring Hill Microwave
New Johnsonville Microwave
Singleton Compressor/Phone Bldg
CUF Coal Sample Bldg
Duck River Ltg/Heat
Bolivar
Clinton 161 kV Switch House
Monsanto Chemical 161 kV Switch House
Solutia Switch House
Hiwassee Microwave
Morristown 161 kV Switch House
Vanleer Microwave
Cottonport Radio
Grand River Radio/Microwave
Rogersville Microwave

Germantown Microwave
KIF Transfer Station D
Model TN Microwave9097S-Utilities
Oak Ridge Microwave
Thorton Town Microwave
Oswald Dome Microwave
Nance 161 kV Switch House
Olive Branch 161 kV Switch House
Stevenson 161 kV Switch House
Casky 161 kV Switch House
Davidson 500 kV Pump House
Roosevelt Mt Microwave
Jackson 500 kV Switch House
Moulton 161 kV Switch House
Monte Sano Microwave
Montlake Microwave
Eaves Bluff Microwave/Radio
Sturgis 161 kV Switch House
TFH Aeration and Compressor Building
Henegar 161 kV Switch House
Martin Pump House
Pump House
Weakley 500 kV Pump House
Roane 500 kV Pump House
Cordova 500 kV Pump House
Madison 500 kV Pump House
Sullivan 500 kV Pump House
Wilson 500 kV Pump House
Shelby 500 kV Pump House
Montgomery 500-kV-Pump House
Trinity 500 kV Pump House
KIF Transfer Station C
WTH Oil Purification Building
Louisville 161 kV Switch House
BRH Small Turbine Generator
N Maintenance Building
NTH Compressor and Blower Building
Manchester 161 kV Switch House
Bolivar 161 kV Switch House
Marshall Pump House
Louisville 161 kV Switch House
State Line Microwave
Coffeeville 161 kV Switch House
Boiler Building
Raccoon Mtn Microwave
WBF Plant 161 kV Switch House
Copper Basin 161 kV Switch House
BRH Spillway Equipment Building
WEH Oil Purification Building
East Bowling Green 161 kV Switch House
WBN Diesel Generator Building Dg-2
GAF Transfer Station C
FTL Modular Unit
Glasgow Modular Unit
Nickajack Modular Unit
WBH Modular Unit
O3H Valve House
Whiteside Pump House
Meredith Microwave
Dekalb 161 kV Switch House
Leake 161 kV Switch House
Booneville 161 kV Switch House
Lewisburg 46 kV Switch House
Shelbyville 46 kV Switch House
Raccoon Mtn Pump House
Newport 161 kV Switch House
Centerville Fallout Shelter
Centerville 161 kV Switch House
Aquatic Biology Lab-Hatchery
North Huntsville 161 kV Switch House
Selmer 161kV Switch House
Carthage 161 kV Switch House
Arab 161 kV Switch House
Oakland 161 kV Switch House
Tusculum 161 kV Switch House
Springfield 161 kV Switch House
Holly Springs 161 kV Switch House
Pigeon Forge 161 kV Switch House
Elizabethton 161 kV Switch House
Edgoten 161 kV Switch House
Nixon Road 161 kV Switch House
GFH Rock House
Loudon 161 kV Switch House
Murphy 161 kV Switch House
Hartsville N.P. 161kV Switch House
Chl/Dc/Msc Coal Laboratory
BRF Sewage Treatment Plant
GAF Hopper Bldg
JOF Draft System Electrical Bldg.
Albertville District 46 kV Switch House
Highway 412 Switch House
Calhoun City 161 kV Switch House
Portland 161 kV Switch House
Pin Hook 161 kV Switch House
FTL Plant 161 kV Switch House
Tri State 161KV Switch House
McGregor Chapel 161 kV Switch House
Smyrna 161 kV Switch House
Corinth 161 kV Switch House
Cadiz 161 kV Switch House
Huntsville 161 kV Switch House
Double Bridges 161 kV Switch House
NASA 161 kV Switch House
Columbus District 46 kV Switch House
SQN Node Bldg
Miller 161 kV Switch House
Dickson 161 kV Switch House
Oxford 161 kV Switch House
Knoxville 161 kV Switch House
N Engineering Lab Bldg H
East Shelbyville 161 kV Switch House
Goose Pond 161 kV Switch House
Columbia District 46 kV Switch House
Ardmore 161 kV Switch House

North Pigeon Forge 161 kV Switch House
Valley Creek 115 kV Switch House
Farley 161 kV Switch House
Murfreesboro 161 kV Switch House
GAF Oil Pumping Station
TFH Intake Structure
Burnsville 161 kV Switch House
Concord 161 kV Switch House
Concord 161 kV Switch House
East McMinnville 161 kV Switch House
McMinnville 161 kV Switch House
BRF Aux Hopper
GAF 161 kV Switch House
COF Transfer Station E
Lowland 69 kV Switch House
Alpha 69 kV Switch House
West Ringgold 230kV Switch House
Columbia Primary 161 kV Switch House
KIF Truck Sample Prep Bldg.
Union City 161 kV Switch House
Mt. Pleasant 161 kV Switch House
BRF Breaker Bldg
National Carbide 161 kV Switch House
BRF Electrical Switchgear Bldg
Freeport Abandoned Switch House
WCF Sample Prep Bldg
Backwater Protection
Asbury Microwave
APH Valve House
PDW Pumping Station
BFN Telephone Node Bldg. (W-19)
JSF Transfer Station B
Cullman 161 kV Switch House
Athens 161 kV Switch House
APH Dam
Fort Payne 161 kV Switch House
West Cookeville 161 kV Switch House
Reynolds 161 kV Switch House
Spring City 161 kV Switch House
Starkville (Old) 161 kV Switch House
Finley 161 kV Switch House
Brownsville District 161 kV Switch House
Humboldt 161 kV Switch House
Batesville 161 kV Switch House
CUF PPTR Control Bldg 1A
GAF Coal Sample Collection Bldg
BRF Hydrogen Trailer Port
KIF Fly Ash Reclaim
Columbia 161 kV Shelter
GAF Conveyor Control Bldg
Murfreesboro Maintenance Building
CUF Accessory Bldg.
Franklin 500 kV Switch House
Martin 161 kV Switch House
Monsanto 161 kV Switch House
JSF Reclaim Hoppers
COF Transfer Stations C & D
Jetport 161 kV Switch House
Counce 161 kV Switch House
Bluff City 161 kV Switch House
Engineering Labs Building A
North Bristol 161 kV Switch House
WPM Philadelphia
Philadelphia 161 kV Switch House
BFN Toxicity Testing Lab
KIF Chlorination Bldg
Hartsville HTSE Warehouse
Mayfield 161 kV Switch House
Lebanon 161 kV Switch House
Fleet Harbor Pumping Station
Dyersburg 161 kV Switch House
Lawrenceburg 161 kV Switch House
Smithville 161 kV Switch House
GAF Transfer Station D
BRF Pptr Control Bldg
Tupelo 161 kV Switch House
JSF Chlorination Bldg
Calvert 161 kV Switch House
Decatur 161 kV Switch House
Norris Modular Unit
Melton Hill Modular Unit
KIF Transfer Station B
SHF Demineralizer Bldg 1
Shoals 161 kV Switch House
Aquatic Biology Lab-Tractor Shed
ALF Switchgear Bldg.
SHH Intake and Access Tunnel
SHF Railroad Hopper Bldg
Pulaski Radio Tower
Pulaski Microwave
Wilson 500 kV Maintenance Bldg - M1
JSF Breaker Structure
North Knoxville 161 kV Switch House
DGH Modular
COF New Water Treatment Bldg.
CUF Water Supply Pumping Station
Moccasin 161 kV Switch House
GAF Transfer Station B
Aquatic Biology Lab.-Shed
JSF Conveyor Switchgear Bldg
BFN Biothermal Research
Aquatic Biology Lab-Wet Lab
Okolona 161 kV Switch House
Experimental Greenhouse
RPS Ventilation Fan Building
Mount Pleasant 161 kV Switch House
Scottsboro 161 kV Switch House
Wartrace 161 kV Switch House
Charleston 161 kV Switch House
Catalyzer # 2 - Nitro Fertilization Lab
SQN Intake Pump.Stat.
Clarksville 161 kV Switch House
East Cleveland 161 kV Switch House
Paducah 161 kV Switch House

Columbus 161 kV Switch House
CUF Reclaim Hopper
North Nashville 161 kV Switch House
Chesterfield 161 kV Switch House
New Albany 161 kV Switch House
Rockwood 161 kV Switch House
COF Transfer Station F
White Pine 161 kV Switch House
Lafayette 161 kV Switch House
CUF Transfer Station F
Franklin 161 kV Switch House
Covington 161 kV Switch House
Hickory Valley 161kV Switch House
JSF Hopper Bldg
Midway 161 kV Switch House
Davidson 500 kV Switch House
Milan 161 kV Switch House
Fayetteville 161 kV Switch House
Belfast 161 kV Switch House
Sullivan 500 kV Switch House
BRF Live Pile Hopper
WBF Control Bldg
WBF Hopper Bldg
Oglethorpe 161 kV Switch House
Bowling Green 161 kV Switch House
Chemical Feed House
BRF Transfer Sta C
O3H Dam/Gallery
Albertville 161 kV Switch House
Hopkinsville 161 kV Switch House
MSW Plant
Huntsville 161 kV Switch House
Summer Shade 161 kV Switch House
Crossville 161 kV Switch House
Winchester 161 kV Switch House
Shelby 500 kV Switch House
CUF Transfer Station A
TLH Dam
Athens 161 kV Switch House
BRH Powerhouse
West Nashville 161 Kv Switch House
COF Water Supply Pumping Station
West Point 500 kV Switch House
Alcoa 161 kV Switch House
CTH Powerhouse/Dam
Baxter 161 kV Switch House Land
Murffessboro Ind Park 161 kV Switch House
JSF Fly Ash Silo
Northeast Substation
Sullivan Static Condensor
PAF Scrubber Maintenance Bldg
Weakley 500 kV Switch House
BRF Transfer Sta B
Truck Coal Sample Station
COF Conveyor Control Bldg
SHF Surge Hopper Bldg 1
BFN Radwaste Evaporator Bldg
BRF Transfer Sta A
Well Houses
COF Transfer Stations A & B
Roane 500 kV Switch House
Union 500 kV Switch House
Engineering Labs Building D
CUF Surge Hopper Bldg
ALF Transfer Tower
ALF Water Intake Structure
JOF Draft Sys. Electrical Building
SHF Demineralization Bldg 2
SHF Fly Ash Blower Bldg
JOF Hopper Bldg
WCF Hopper Bldg
Wilson 500 kV Switch House
Northeast Johnson City 161 kV Switch House
PAF Coal Wash Laboratory
Aquatic Biology Lab (Main)
Great Lakes SW Station
Maury 500 kV Switch House
Lowndes 500 kV Switch House
NTH Powerhouse
COF Barge Unloader Building 1
ALF Combustion Turbine Maint Facility
GAF Combustion Turbine Maintenance Bldg
WBF Fuel Handling
Madison 500 kV Switch House
RPS Service Equipment Building
RPS Power Storage Building
Jackson 500 kV Switch House
BRF Live Storage Silo
Limestone 500 kV Switch House
KIF Hopper Bldg No. 2
Freeport 500 kV Switch House
Trinity 500 kV Switch House
WCF Breaker Bldg.
SHF Hopper Bldg
CUF Transfer Station C
Lonsdale 161 kV Switch House
COF Old Water Treatment Plant
Phipps Bend 500 kV Switch House
Powerhouse
Radnor 161 kV Switch House
South Jackson 161 kV Switch House
JSF Demineralizer Bldg
JSF Water Treatment Plant
WCF Forced Oxidation Blower Bldg.
Boiler House
KIF Sample & Hopper Bldg No. 1
WBN Intake Pumping Station-Intake
PAF Barge Unloader
PAF Conditioner Bldg
Marshall 500 kV Switch House
GAF Water Treatment Plant
Catalyzer # 1 - Mineral Lab
Catalyzer # 4 - Radio/High Pressure Lab
Catalyzer # 5 - Plant

Catalyzer # 6 - Nitro Fertilization Office
Catalyzer # 3 - Plant
PAF Breaker Building N
CUF Breaker Structure
COF 161 kV Switch House
COF Dry Fly Ash Eqpt Bldg
BRF Pumping Station
National Center For Emmissions Research
GFH Powerhouse
WTH Control Building
CUF Transfer Station B
WIH Powerhouse/Dam
Raccoon Mtn Ps Plant 500 kV (161 kV)
CUF Transfer Station D&E
SHH Powerhouse
SQN Diesel Gen. Bldg.
South Jackson
WCF Crusher Bldg
O2H Powerhouse/Dam
TFH Powerhouse/Dam
SHF Ash Handling System
Hartsville Admin # 1
JOF Crusher Bldg
CUF Live Storage Silos
KIF Water Supply Pumping Station
WBN Diesel Generator Building Dg-1
ALF Crusher Tower
WCF Switchyard Control Bldg
South Nashville 161 kV Switch House/Nash ADCC
Nashville ADCC/Switch
PAF Transfer Station A
O3H Powerhouse/Control Bay
KIF Water Treatment Plant
WBN Makeup Water Treatment Plant Mwp
Niles Ferry 69 kV Switch House
JSF Control Bldg
HIH Dam
KIF Switchyard Control Bldg
GAF Utility Bldg
Vonore 69 kV Switch House
KIF Crusher Bldg
PAF Limestone Preparation Bldg
BFN Unit 1 & 2 Dsl.Gen. Bldg
PAF Scrubber Control Bldg
BFN Unit 3 Diesel Generator Bldg
Cable Tunnels
BRF Control Wing
Engineering Lab Annex
WTH Powerhouse
Western Area Radiological Lab
BFN Low Lvl Rdwst Bldg. (E-32)
WBN Reactor Building Reac
WBH Control Bldg
JSF 161kV Switch House Structure
N Engineering Lab Bldg N
N Engineering Lab Bldg B
FPH Powerhouse/Dam
CUF Utility Bldg
WCF Water Supply
O1H Powerhouse/Dam
BFN Unit 3 Restart
HIH Powerhouse/Control Building
SHF Limestone Conditioner Bldg
JOF Water Supply Bldg
APH Powerhouse
RPS Surge Chamber and Tunnel
WCF Scrubber Unit 8
Prototype Operations Building, Plant
Substation # 1 Plant
WCF Scrubber Unit 7
BFN Control Building
BOH Powerhouse/Dam
SQN Control Bldg.
Chemical Engineering Building Lab
SHF AFBC Boiler Bay (Pilot Plant)
Prototype Opers Bldg (Pilot Plant)
BLN Control Bldg
MHH Powerhouse/Dam
WCF Service Bldg B
WCF Fuel Handling System
SQN Reactor Bldg.
SHF Fuel Handling
KIF Fuel Handling
Chl/Dc/Msc Laboratory Bldg/Power Stores
L&N Building East, Plant
WCF Service Bldg. A
NJH Powerhouse/Dam
KYH Powerhouse/Dam
WBH Powerhouse/Dam
BLN Reactor Bldg
NOH Powerhouse/Dam
GUH Powerhouse/Dam
CRH Powerhouse/Dam
DGH Powerhouse/Dam
FLH Powerhouse/Dam
GAF Fuel Handling
CHH Powerhouse/Dam
WBN Turbine Building Tb
FNH Powerhouse/Dam
SHF AFBC Boiler Bldg
WBF Boiler Bay
Monteagle Place
WBF Service Bay
PKH Powerhouse/Dam
WEH Powerhouse/Dam
BLN Auxiliary Bldg
SQN Aux.Bldg
WBN Auxillary Building Aux
SHF Bag House
RPS Powerplant Chamber and Tunnels
PAF Coal Wash Plant
SQN Turbine Bldg.
BLN Turbine Bldg
BFN Reactor Building

ALF Powerhouse
BFN Turbine Building
CUF Absorber Building
WCF Powerhouse Plant A
GAF Powerhouse
BRF Powerhouse
JSF Powerhouse
WCF Powerhouse Plant B
SHF Powerhouse
COF Powerhouse
JOF Powerhouse
KIF Powerhouse
CUF Powerhouse
PAF Powerhouse
WBF Powerhouse

APPENDIX F
FEDERAL INTERAGENCY ENERGY POLICY COMMITTEE
(656 COMMITTEE)
FY 2001

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APPENDIX G
PERSONNEL OF THE DEPARTMENT OF ENERGY'S
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