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

Fiscal Year 1994

October 6, 1995

U.S. Department of Energy
Assistant Secretary, Energy Efficiency and Renewable Energy
Office of Federal Energy Management Programs

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October 6, 1995

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

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
I. OVERVIEW OF FEDERAL ENERGY MANAGEMENT ACTIVITIES	6
A. Overview of Federal Energy Management Policy and Legislative Mandates	6
B. Overall Federal Energy Consumption and Costs	10
C. Federal Coordination	16
D. Personnel and Energy Awareness Activities	17
E. Funding for Energy Efficiency in Buildings and Facilities	24
- Federal Energy Efficiency Fund	26
- Energy Savings Performance Contracts	28
- Demand Side Management (DSM) Program Participation	31
F. Life-Cycle Costing (LCC)	32
G. Procurement Policy	32
H. Public Education Programs	34
II. ENERGY MANAGEMENT IN BUILDINGS AND FACILITIES	37
A. Energy Consumption and Costs for Buildings and Facilities	37
B. Progress Toward the Mandated Goals for Buildings and Facilities	44
C. Federal Building Energy Performance Standards	47
III. ENERGY INTENSIVE OPERATIONS IN FEDERAL FACILITIES	49
A. Energy Consumption and Costs for Energy Intensive Operations	49
B. Legislative Background and Progress Toward Goals for Industrial Facilities	51
IV. ENERGY MANAGEMENT IN VEHICLES AND EQUIPMENT	54
A. Energy Consumption and Costs for Vehicles and Equipment	54
B. Progress Toward the Reduction Goals for Gasoline and Diesel Consumption	59
C. Alternative Fuel Vehicles	60
D. The Administrative Fleet	62
V. FEDERAL AGENCY ENERGY MANAGEMENT ACTIVITIES	63
1. Department of Agriculture	63
2. Department of Commerce	65
3. Department of Defense	67
4. Department of Energy	71
5. Department of Health and Human Services	73
6. Department of Housing and Urban Development	75
7. Department of the Interior	77
8. Department of Justice	79
9. Department of Labor	81
10. Department of State	83
11. Department of Transportation	85

12.	Department of the Treasury	87
13.	Department of Veterans Affairs	89
14.	Environmental Protection Agency	91
15.	Federal Emergency Management Agency	93
16.	Federal Energy Regulatory Commission	95
17.	General Services Administration	97
18.	National Aeronautics and Space Administration	99
19.	Nuclear Regulatory Commission	101
20.	Panama Canal Commission	103
21.	Railroad Retirement Board	105
22.	Tennessee Valley Authority	107
23.	United States Postal Service	109

TABLES

Table 1	Total Net Energy Consumption By Federal Agencies	12
Table 2	Federal Petroleum Usage in FY 1994	15
Table 3	Agency Expenditures for Energy Conservation Retrofits and Capital Equipment, FY 1985 through FY 1994	24
Table 4	Federal Energy Consumption in Buildings and Facilities	38
Table 5	Petroleum-Based Fuel Consumption in Buildings and Facilities ...	41
Table 6-A	Defense and Civilian Federal Costs for Buildings Energy in FY 1994	42
Table 6-B	Consumption and Costs of Federal Buildings Energy by Fuel Type in FY 1994, FY 1993, and FY 1985	43
Table 7	Federal Buildings and Facilities Use Per Gross Square Foot, FY 1985 and FY 1994	45
Table 8	Federal Energy Consumption in Excluded Buildings/ Process Operations	50
Table 9	Defense and Civilian Federal Costs for Excluded Buildings/ Process Energy in FY 1994	52
Table 10	Federal Energy Consumption in Vehicle and Equipment Operations	55
Table 11-A	Defense and Civilian Federal Costs for Vehicle and Equipment Energy in FY 1994	57
Table 11-B	Consumption and Costs of Vehicle and Equipment Energy by Fuel Type in FY 1994, FY 1993, and FY 1985	58
Table 12	Federal Agency Progress Toward the Goals of Section 10 of Executive Order 12759, FY 1991 and FY 1994	59
Table C	Federal Energy Expenditures and Cost Avoidance, FY 1985 through FY 1994	C-2
Table D-1	Total Energy Consumption by Federal Agencies - Source Conversion	D-2
Table D-2	Federal Buildings and Facilities Use Per Gross Square Foot - Source Conversion, for FY 1985 and FY 1994	D-3
Table D-3	Federal Energy Consumption in Buildings and Facilities - Source Conversion	D-4

FIGURES

Figure ES-1	Energy Efficiency Funding in Buildings and Annual Cost Avoidance from 1985	2
Figure ES-2	Decrease in Btu per Gross Square Foot in Federal Buildings and Facilities from 1985	3
Figure ES-3	Federal Consumption of Petroleum-Based Fuels 1985 through 1994	4
Figure 1	Federal Energy Consumption, FY 1994	13
Figure 2	Federal Energy Costs, FY 1994	14
Figure 3	Energy Conservation Retrofit Expenditures	25
Figure 4	Defense and Civilian Federal Energy Consumption in Buildings & Facilities by Fuel Type, FY 1994	37
Figure 5	Consumption of Electricity and Other Fuels in Buildings and Facilities, FY 1985 through FY 1994	39
Figure 6-A	Energy Expenditures (Nominal Dollars) in Buildings & Facilities, FY 1985 through FY 1994	40
Figure 6-B	Energy Expenditures (Constant Dollars) in Buildings & Facilities, FY 1985 through FY 1994	40
Figure 7	Federal Government Progress Toward the Mandated Energy Reduction Goals for Buildings and Facilities, FY 1985 through FY 1994	44
Figure 8	Range of Energy Intensity (Btu/GSF) in Buildings and Facilities by Agency in FY 1994	47
Figure 9	Defense and Civilian Federal Energy Consumption in Vehicles and Equipment by Fuel Type, FY 1994	56
Figure C	Federal Government Average Annual Energy Costs, FY 1985 through FY 1994	C-3

APPENDICES

Appendix A	List of Authorities	A-1
Appendix B	Data Collection	B-1
Appendix C	Federal Energy Expenditures and Cost Avoidance FY 1985 through FY 1994	C-1
Appendix D	Federal Performance Utilizing "Source" Conversion Factors	D-1
Appendix E	Buildings Exempted From NECPA's Performance Goal in FY 1994	E-1
Appendix F	Department of Energy: Education, Extension, and Information Services	F-1
Appendix G	Federal Agency Energy Management Contacts	G-1
Appendix H	Personnel of Department of Energy's Office of Federal Energy Management Programs	H-1

AGENCY ACRONYMS

Commodity Futures Trading Commission	CFTC
Department of Agriculture	USDA
Department of Commerce	DOC
Department of Defense	DoD
Department of Energy	DOE
Department of Health and Human Services	HHS
Department of Housing and Urban Development	HUD
Department of the Interior	DOI
Department of Justice	DOJ
Department of Labor	DOL
Department of State	ST
Department of Transportation	DOT
Department of the Treasury	TRSY
Department of Veterans Affairs	VA
Environmental Protection Agency	EPA
Equal Employment Opportunity Commission	EEOC
Federal Communications Commission	FCC
Federal Emergency Management Agency	FEMA
Federal Energy Regulatory Commission	FERC
Federal Trade Commission	FTC
General Services Administration	GSA
National Aeronautics and Space Administration	NASA
National Archives and Records Administration	NARA
National Science Foundation	NSF
Nuclear Regulatory Commission	NRC
Office of Personnel Management	OPM
Panama Canal Commission	PCC
Railroad Retirement Board	RRB
Tennessee Valley Authority	TVA
United States Information Agency	USIA
United States Postal Service	USPS

EXECUTIVE SUMMARY

This report on Federal Energy Management for Fiscal Year (FY) 1994 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. § 8251-8261, and Title VIII of NECPA, 42 U.S.C. § 8287-8287b. This report also describes the energy conservation and management activities of the Federal Government under the authorization of section 381 of the Energy Policy and Conservation Act (EPCA), as amended, 42 U.S.C. § 6361. Implementation activities undertaken during FY 1994 by the Federal agencies under the Energy Policy Act of 1992 (EPACT) and Executive Order 12759 on Federal Energy Management are also described in this report.

Executive Order 12902, Energy Efficiency and Water Conservation at Federal Facilities, was signed by President Clinton on March 8, 1994, the middle of FY 1994. Initial activities implementing the Executive Order are discussed in this report. A full reporting of activities under the Executive Order will be contained in the next annual report for FY 1995.

During FY 1994, the total (gross) energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.72 quadrillion British Thermal Units (quads).¹ These 1.72 quads consumed by the Government in buildings, facilities, and operations to provide essential services to its citizens, including the defense of the Nation, represent approximately 2.0 percent of the total 85.34 quads² 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.

Based on reports submitted to DOE by 28 Federal agencies, the Federal Government consumed 1.20 quads during FY 1994 when measured in terms of energy actually delivered to the point of use. This report uses the site-measured conversion factors for electricity and steam. Information on gross energy consumption of the Government utilizing source-measured conversion factors is provided in Appendix D. The total net energy consumption in FY 1994 decreased 16.9 percent from the FY 1985 base year, a reduction of 244.6 trillion Btu. This reduction of 244.6 trillion Btu could satisfy the energy needs of the State of Vermont for over 2 years.³ The Government consumes slightly more energy than the entire State of Alabama.⁴

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¹Gross energy consumption considers all resources used to generate and transport electricity and steam. The source conversion factors of 11,600 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam are used to calculate gross energy consumption. See Appendix D.

²DOE/EIA-0035(95/03), *Monthly Energy Review*, March 1995.

³Based on net energy consumption estimates for 1992 in the residential, commercial, industrial, and transportation sectors (103.8 trillion Btu). Source: DOE/EIA-0214(92), *State Energy Data Report, 1992*, Tables 1, 7, 8, 9, and 10; May 1994.

⁴Based on net energy consumption estimates for 1992 in the residential, commercial, industrial, and transportation sectors (1,200.7 trillion Btu). Source: DOE/EIA-0214(92), *State Energy Data Report, 1992*, Tables 1, 7, 8, 9, and 10; May 1994.

The total cost of the 1.20 quads was approximately \$8.0 billion in FY 1994. This is \$2.4 billion less than the \$10.4 billion reported in FY 1985, a 22.9 percent⁵ decrease in nominal costs. In constant 1987 dollars, this equates to a decrease of 42.3 percent from \$11.1 billion in FY 1985 to \$6.4 billion in FY 1994. The Federal energy bill for FY 1994 decreased \$899.3 million from the \$8.9 billion reported for FY 1993.

Federal agencies report energy consumption under three categories: buildings and facilities, energy intensive operations, and vehicles and equipment.

Buildings and Facilities

In FY 1994, the Federal Government used 385.0 trillion British Thermal Units (Btu) to provide energy to approximately 500,000 buildings and facilities. This consumption represents an 18.2 percent decrease compared to FY 1985 and a 4.5 percent decrease relative to FY 1993 as displayed in Table 4. The nominal cost of energy for buildings and facilities in FY 1994 was \$3.8 billion, a decrease of approximately \$91.8 million from FY 1993 expenditures, and a decrease of 4.0 percent from the FY 1985 expenditure of almost \$4.0 billion.⁶ In constant dollars, energy costs for buildings and facilities decreased 28.2 percent from \$4.2 billion in FY 1985 to \$3.0 billion in FY 1994.

In FY 1994, direct appropriated funding identified by agencies for energy conservation retrofits and capital equipment increased 90.5 percent from \$120.9 million in FY 1993 to \$230.2 million. FY 1995 funding is projected at \$354.2 million based upon reports from the agencies.

Figure ES-1 compares direct Federal funding for energy efficiency with the annual cost avoided from 1985 for buildings and facilities energy. From 1985 through 1994, investments of almost \$1.3 billion for energy efficiency in buildings contributed to a cumulative cost avoidance of \$3.6 billion (see Table 3 and Appendix C).

FIGURE ES-1
Energy Efficiency Funding in Buildings
and Annual Cost Avoidance from 1985

Energy Intensive Operations

The energy intensive operations category covers energy used in buildings excluded from the 10 and 20 percent reduction goals for buildings and facilities under section 543 of NECPA. This category includes the energy consumed in industrial operations, certain R&D activities, and in electronic-intensive facilities.

⁵Calculation of percent changes do not account for rounding of numbers in text.

⁶Cost 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.

In FY 1994, the Federal Government used 93.1 trillion Btu of energy in energy intensive operations, approximately 7.8 percent of the total 1.20 quads consumed. Total energy consumption in this category increased 132.2 percent relative to FY 1985 and 31.5 percent relative to FY 1993. This increase is primarily the result of changes in reporting procedures by individual agencies.

The Federal Government spent \$975.3 million on operations energy in FY 1994, \$371.0 million more than the FY 1993 expenditure of \$604.3 million.

Vehicles and Equipment

The vehicles and equipment category includes aircraft and naval fuels, automotive gasoline and 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 1994, the Federal Government used an estimated 722.9 trillion Btu of energy in vehicles and equipment, approximately 60.2 percent of the total 1.20 quads consumed. Total energy consumption in vehicles and equipment decreased 22.7 percent relative to FY 1985 and 6.6 percent relative to FY 1993. The Department of Defense consumed 674.6 trillion Btu or 93.3 percent of all vehicles and equipment energy used by the Federal Government.

The Federal Government spent approximately \$3.3 billion on vehicles and equipment energy in FY 1994, almost \$1.2 billion less than the FY 1993 expenditure of \$4.4 billion. FY 1994 is the first year in the history of Federal energy reporting (since 1975), that the cost of vehicle and equipment fuel was lower than the cost of energy used in buildings and facilities.

During FY 1994, the General Services Administration procured 3,931 alternative fuel vehicles (AFVs). Direct AFV purchases by the Departments of Defense, Energy, Commerce, the Interior, and Agriculture accounted for 132 additional vehicles. In FY 1994, AFV purchases totalled 4,063 vehicles.

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. Executive Order 12902 adds an additional goal of reducing energy consumption by 30 percent by the year 2005 relative to 1985 consumption levels. During FY 1994 agencies provided data to DOE that indicated a decrease in energy consumption per gross square foot by 11.2 percent relative to FY 1985. The Government's performance for each year since FY 1985 is illustrated in Figure ES-2. This

FIGURE ES-2
Decrease in Btu per Gross Square Foot
in Federal Buildings and Facilities from 1985

reduction was the result of significant decreases in the consumption of fuel oil, natural gas, and coal. Although the use of non-electric fuels in Federal buildings has declined approximately 29.7 percent since 1985, the consumption of electricity has increased approximately 7.7 percent. The increase in electricity may result from the installation and increased use of electricity-driven electronic equipment. Electricity now represents about 71.2 percent of the total energy costs of Federal buildings and accounts for 40.4 percent of total energy consumption in buildings. This is compared to 30.7 percent of the total energy consumption in buildings in FY 1985.

Agency efforts undertaken in FY 1994 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;
- procurement of energy-efficient goods and products.

Executive Order 12902 expands the scope of Federal energy management activities beyond the NECPA mandates by establishing goals for industrial operations. Section 301(b) of Executive Order 12902 requires agencies to implement programs in industrial facilities to increase energy efficiency by 20 percent in FY 2005 in comparison to FY 1990 consumption levels to the extent that measures undertaken to achieve the goal are cost-effective.

Section 10 of Executive Order 12759 directs each agency operating at least 300 commercially designed motor vehicles domestically to develop a plan to reduce gasoline and diesel consumption by 10 percent between FY 1991 and FY 1995. The Administrator of General Services, in consultation with the Secretary of Energy, has issued guidance to assist agencies in meeting this goal. During FY 1994, gasoline consumption by the agencies decreased 12.9 percent to 237.1 million gallons from 272.2 million gallons in FY 1991. Diesel consumption decreased 14.7 percent in FY 1994 to 980.4 million gallons compared to 1,150.0 million gallons consumed in FY 1991. Diesel fuel consumption data reported by the agencies includes fuel used in off-road vehicles and equipment as well as on-road passenger cars and trucks.

Procurement of Energy-Efficient Products

Section 507 of Executive Order 12902 requires all Federal agencies to buy "best practice" products, when practicable and cost-effective. Best practice products are those which are in the upper 25 percent of energy efficiency for all similar products, or products that are at least 10 percent more efficient than the minimum level that meets Federal standards. During FY 1994, DOE initiated a program to assist agencies in implementing the EPACT and Executive Order requirements for energy efficient procurement.

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 1994, petroleum-based fuels accounted for 0.79 quads of the total 1.20 quads consumed by the Federal Government. Of that, 0.73 quads were used by the Department of Defense primarily for jet fuel and distillate/diesel for vehicles and equipment. The Government consumed 24.9 percent less petroleum-based fuel in FY 1994 than in FY 1985. Figure ES-3 illustrates the trend in the Government's use of petroleum fuels.

Due to the strategic nature of petroleum-based fuels, Executive Order 12902 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 1994, 60.7 trillion Btu of petroleum-based fuels were used for buildings and facilities energy, a 45.4 percent decrease from FY 1985 and a 7.3 percent decrease from FY 1993. This represents almost 15.8 percent of total buildings and facilities energy consumption.

FIGURE ES-3
Federal Consumption of Petroleum-Based Fuels
1985 through 1994

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:

- Overall cost of energy consumption in the Federal Government has fallen from \$10.4 billion in FY 1985 to \$8.0 billion in FY 1994. During this period, the Government's cumulative annual energy cost avoidance was \$3.8 billion. (See Appendix C)
- The total net energy consumption in FY 1994 decreased 16.9 percent from FY 1985.
- Energy consumption in buildings in FY 1994 decreased 18.2 percent from FY 1985.
- On a Btu-per-gross-square-foot basis, the 11.2 percent reduction in buildings energy puts the Federal Government past the 10 percent reduction goal for 1995.
- Ten agencies, the Departments of Agriculture, Defense, Energy, the Interior, Justice, Transportation, Veterans Affairs, the Federal Emergency Management Agency, General Services Administration, and the National Aeronautics and Space Administration have already achieved a 10 percent reduction in buildings energy use from 1985.
- Three agencies, the Departments of Energy and Justice, and the Federal Emergency Management Agency have already achieved a 20 percent reduction in buildings energy use from 1985.
- Energy consumption is used for the following purposes:

<i>End Use</i>	<i>Percentage</i>	<i>Cost</i>
Buildings & Facilities	32%	\$3.8 billion
Energy Intensive Operations	8%	\$1.0 billion
Vehicles & Equipment	60%	\$3.3 billion

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) 1994 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. § 8251-8261, and Title VIII of NECPA, 42 U.S.C. § 8287-8287b. Implementation activities undertaken during FY 1994 by the Federal agencies under the Energy Policy Act of 1992 (EPACT) and Executive Order 12759 on Federal Energy Management are also described in this report. In compliance with section 381(c) of the Energy Policy and Conservation Act, 42 U.S.C. § 6361(c), this report also describes the energy conservation and management activities of the Federal Government under the authorization of section 381 of the Energy Policy and Conservation Act, as amended, (EPCA), 42 U.S.C. § 6361.

Executive Order 12902, Energy Efficiency and Water Conservation at Federal Facilities, was signed by President Clinton on March 8, 1994, the middle of FY 1994. Initial activities implementing the Executive Order are discussed in this report. A full reporting of activities under the Executive Order will be contained in the next annual report for FY 1995.

Requirements of National Energy Conservation Policy Act (NECPA) and Energy Policy Act of 1992 (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 directed 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 methodology and procedures, budget treatment for energy conservation measures, incentives for Federal agencies, reporting requirements, new technology demonstrations, and agency surveys of energy-saving potential.

Section 543 of NECPA, as amended by EPACT, requires 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 requires a 20 percent reduction in Btu per gross square foot by FY 2000. 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 are reporting data for leased space to the maximum extent practicable.⁷ Federal agencies reported

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⁷The General Services Administration 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.

an 11.2 percent decrease in energy consumption in buildings in FY 1994, compared to FY 1985, measured on a Btu-per-gross-square-foot basis.

Section 543(b) of NECPA, as amended by EPACT, requires that not later than January 1, 2005, each agency shall, to the maximum extent practicable, install in Federal buildings owned by the United States all energy and water conservation measures with payback periods of less than 10 years, as determined by using the Federal life cycle costing methods and procedures.

In order to achieve the requirements, each agency is required to:

- 1) prepare or update a plan describing how the agency intends to meet the requirements;
- 2) perform energy surveys of its Federal buildings to the extent necessary and update such surveys as needed;
- 3) using such surveys, determine the cost and payback period of energy and water conservation measures likely to achieve the requirements;
- 4) install energy and water conservation measures that will achieve the requirements through Federal life cycle costing methods and procedures; and
- 5) ensure that operation and maintenance procedures applied under NECPA are continued.

NECPA requires DOE to establish life-cycle costing methods to determine cost-effectiveness of proposed energy efficiency projects. DOE issued a final rulemaking on life-cycle cost methods on November 20, 1990. At the beginning of FY 1994, the 1994 edition of energy prices and discount factors for life-cycle cost analysis, developed with the technical assistance of the National Institute of Standards and Technology, was published and distributed to Federal energy managers.

NECPA, as amended, requires the President to transmit to the Congress, along with each budget that is submitted to the Congress the amount of appropriations requested in such budget, if any, on an individual agency basis, for electric and other energy costs to be incurred in operating and maintaining agency facilities; and compliance with the provisions of NECPA, the Energy Policy and Conservation Act (42 U.S.C. 6201 et seq.) and all applicable Executive Orders. Reports from Federal agencies indicated that \$230.2 million was spent in FY 1994 on energy efficiency projects in Federal facilities.

NECPA, as amended, also requires Federal agencies to establish a program of incentives to expedite Federal energy savings performance (ESP) contracts (formerly known as shared energy savings (SES) contracts), authorized under Title VIII of NECPA. These contracts can provide Federal agencies with private sector capital to finance their retrofit projects. In turn, the private sector contractor receives a share of the savings for undertaking the investment. During FY 1994, 3 ESP contracts were awarded by Federal agencies, bringing the total number of awarded contracts to 19.

Section 546(b) of NECPA, as amended, requires DOE to establish a Federal Energy Efficiency Fund to provide grants to agencies to assist them in meeting NECPA's energy management requirements. Section 546(c) encourages agency participation in utility incentive programs and provides for the retention of 50 percent of energy and water cost savings by agencies for additional energy efficiency measures. Information on these incentives is contained in Section I(E) of this report.

Section 157 of EPACT requires Federal agencies to establish and maintain programs to train energy managers and to increase the number of trained energy managers within each agency. The Act defines a "trained energy manager" as "a person who has completed a course of study in the areas of: (1) fundamentals of building energy systems, (2) building energy codes and applicable professional standards, (3) energy accounting and analysis, (4) life-cycle cost methodologies, (5) fuel supply and pricing, and (6) instrumentation for energy surveys and audits." Training activities are discussed in Section D of this report.

DOE also coordinated activities to expedite energy efficiency by providing technical assistance and training and through the provision of technical and analytical models.

DOE is directed to include in this report to Congress a description of activities undertaken under section 381 of the Energy Policy and Conservation Act (EPCA). These activities are addressed in Section I(C), Federal Coordination; Section I(F), Life-Cycle Costing; and Section I(H), Public Education Programs.

Requirements of Executive Orders 12759 and 12902

During FY 1994 two Executive Orders were in effect for Federal agencies. At the beginning of FY 1994, Executive Order 12759 on Federal Energy Management provided direction to the Government's energy management activities. Signed by President Bush in April 1991, it expanded the scope of Federal energy management activities beyond the NECPA requirements to include industrial facilities and Federal vehicles. Executive Order 12902, Energy Efficiency and Water Conservation at Federal Facilities, signed by President Clinton on March 8, 1994, supersedes Executive Order 12759 but leaves in effect sections 3, 9, and 10 of that Order. The requirements of both Orders are described below. Initial activities implementing Executive Order 12902 are discussed in this report. A full reporting of activities under the Executive Order will be contained in the next annual report for FY 1995.

Reduction Goals for Buildings

Executive Order 12759 established the 20 percent energy reduction goal for Federal buildings from 1985 to 2000, as long as the improvements are cost-effective and minimize the life-cycle cost of the facility. This was later incorporated into NECPA with the passage of EPACT. Executive Order 12902 establishes a 30 percent reduction goal for Federal buildings by 2005 compared to 1985 consumption levels on a Btu-per-gross-square-foot basis.

Reduction Goals for Industrial Facilities

Executive Order 12759 established for industrial facilities a goal of 20 percent improvement in energy efficiency for Federal industrial facilities from FY 1985 to FY 2000 with each agency to develop appropriate indicators of energy efficiency for measuring progress toward the goal.

Executive Order 12902 changes this goal to require an increase in energy efficiency by at least 20 percent by 2005 as compared to the 1990 benchmark. Measures undertaken to achieve this goal must be cost-effective, and agencies are also directed to implement all cost-effective water conservation projects.

Implementation Strategy

Executive Order 12759 allowed the agencies flexibility in adopting an implementation strategy. If available resources at agencies fell short of requirements, the Order directed that energy efficiency projects should be prioritized by the savings-to-investment ratio or the adjusted internal rate of return. Executive Order 12902 provides a more structured approach to implementation. It requires agencies to conduct a prioritization survey of all facilities which can then be used to establish priorities for conducting comprehensive facility audits. Agencies are required to implement a 10-year plan to conduct comprehensive facility audits, so that approximately 10 percent of the agency's facilities are completed each year. Within 180 days of the completion of the comprehensive facility audit of each facility, agencies are required to begin implementing cost-effective recommendations for installation of energy efficiency, water conservation, and renewable energy technologies for that facility.

Minimization of Petroleum Use in Facilities

Section 3 of Executive Order 12759 directs agencies to minimize the use of petroleum products for facilities operations or building purposes through switching to an alternative energy source if it is estimated to minimize life cycle costs and which will not violate Federal, State, or local clean air standards. Executive Order 12902 also contains this requirement but further directs agencies to improve the efficiency with which they use the petroleum in facilities where alternative fuels are not practical or cost-effective. Both Executive Orders require agencies to survey buildings and facilities that utilize petroleum-based fuel systems to determine where the potential for a dual-fuel capability exists and provide dual-fuel capability where cost-effective and practicable.

Procurement of Energy-Efficient Products

Executive Order 12759 directed each agency to require vendors of goods to provide data that could be used to assess the life-cycle costs of goods, including building energy system components, lighting systems, office equipment, and other energy-using equipment. Executive Order 12902 expands the scope of activities in this area by directing agencies to strive to purchase products in the top 25 percent of their class for energy efficiency, wherever such products are cost-effective and meet the agency's performance requirements. It also contains provisions for a "Federal Procurement Challenge" inviting each Federal agency to commit a specified fraction of their purchases to advanced energy-efficient and water-conserving technologies that are technically and commercially feasible but not yet available on the open market. The Government's activities to emphasize energy efficiency in procurement policy is detailed in Section I(F) of this report.

Energy Performance Standards for Buildings/Showcases

Executive Order 12759 directed agencies to implement all applicable rules and regulations in current Federal buildings space and to comply with applicable energy performance standards for the construction of new Federal buildings. Executive Order 12902 strengthens this provision to ensure that the design and construction of facilities meets or exceeds the energy performance

standards applicable to Federal buildings, local building standards, or a Btu-per-gross-square-foot ceiling, whichever will result in a lower life cycle cost over the life of the facility. Information of the status of Federal building energy performance standards is contained in Section II(C) of this report.

Executive Order 12902 also contains provisions for the establishment of agency facility commissioning programs and obligates agencies to designate new and existing buildings to showcase the best energy and water efficiency, and renewable energy technologies to the public.

Energy-Efficiency Goal for Vehicles

Section 10 of Executive Order 12759 establishes an energy-efficiency goal for Federal vehicles. Each agency operating at least 300 commercially designed motor vehicles domestically is directed to develop a plan to reduce gasoline and diesel consumption by 10 percent by FY 1995 in comparison to FY 1991. Agency progress toward the gasoline and diesel reduction goals is detailed in Section IV(B) of this report.

Alternative Fuel Vehicles

Section 11 of Executive Order 12759 establishes requirements for the acquisition of alternative fuel motor vehicles by the end of model year 1995. Agencies electing to use these vehicles receive credit toward meeting the vehicle energy efficiency goal. Information on Federal Government activities related to alternative fuel vehicles is included in Section IV(C) of this report.

B. Overall Federal Energy Consumption and Costs

During FY 1994, the total (gross) energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.72 quadrillion British Thermal Units (quads).⁸ These 1.72 quads represent 2.0 percent of the total 85.34 quads⁹ used in the United States, and reflect Government energy consumption in buildings, facilities, 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 28 Federal agencies, the Government consumed 1.20 quads during FY 1994 when measured in terms of energy actually delivered to the point of use. As shown in Table 1, Federal agencies reported a 16.9 percent decrease in total net energy consumption compared to FY 1985, and a 3.8 percent decrease from FY 1993. The cost of this energy was \$8.0 billion and represented approximately 0.6 percent of the total Federal

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⁸Gross energy consumption considers all resources used to generate and transport electricity and steam. The source conversion factors of 11,600 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam are used to calculate gross energy consumption. See Appendix D.

⁹DOE/EIA-0035(95/03), *Monthly Energy Review*, March 1995.

expenditures of \$1.461 trillion¹⁰ for all purposes in FY 1994. The Federal energy bill for FY 1994 decreased approximately \$899.3 million from the \$8.9 billion reported for FY 1993.¹¹

In FY 1994, the Department of Defense spent \$5.7 billion for energy of the total Federal energy expenditure of \$8.0 billion. Overall, the Department of Defense used 21.9 percent less energy in FY 1994 than in FY 1985. The Department of Energy continues to be the largest consumer of energy among civilian agencies, due to its involvement in energy-intensive nuclear research and weapons development.

Figures 1 and 2 depict the percentage of total energy used by the Federal Government in FY 1994 and its cost. As illustrated, jet fuel and electricity account for approximately 63.7 percent of the total energy consumption represented in Figure 1 and approximately 74.6 percent of the total energy costs in Figure 2.

The strategic importance of petroleum-based fuels to the Federal Government is shown in Table 2. In FY 1994, petroleum-based fuels accounted for 0.79 quads of the total 1.20 quads consumed by the Federal Government. Of that, approximately 0.73 quads were used by the Department of Defense primarily for jet fuel and distillate/diesel for vehicles and equipment energy. Only 0.06 quads of petroleum-based fuels were used for Federal buildings and facilities energy.

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¹⁰Source: Office of External Affairs, Office of Management and Budget.

¹¹Appendix C indicates the annual cost of energy used in Federal buildings and facilities, vehicles and equipment, and energy intensive operations for FY 1985 through FY 1994. Federal energy cost avoidance is also represented, based on the value of annual energy savings in then-year dollars. The average unit cost for energy in each fiscal year is depicted in Figure C of Appendix C.

TABLE 1
TOTAL NET ENERGY CONSUMPTION BY FEDERAL AGENCIES
(In Billions of British Thermal Units, Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10¹⁵])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	% CHANGE 85-94	% CHANGE 93-94
DOE	52,271.5	49,930.5	48,238.4	49,791.7	41,892.3	43,389.9	41,779.9	44,371.1	43,601.4	41,215.5	-21.1	-5.4
USPS	27,762.5	26,036.6	26,474.7	29,618.2	30,306.7	30,616.2	30,817.0	31,674.2	33,725.1	34,950.8	25.9	3.6
VA	25,144.7	25,020.9	24,877.5	26,255.1	26,249.3	24,898.4	25,050.4	25,254.9	25,741.2	25,587.8	1.8	-0.6
TVA ¹	980.9	962.6	960.6	932.9	818.0	904.5	961.3	834.4	892.1	25,300.5	2,479.3	2,736.1
DOT	19,534.9	19,394.0	19,003.8	18,715.6	16,507.2	18,965.2	17,863.7	18,350.9	20,704.7	19,717.7	0.9	-4.8
GSA	17,330.7	14,003.0	13,081.8	12,385.4	12,659.9	14,226.0	13,956.9	13,842.0	14,149.4	13,963.0	-19.4	-1.3
NASA	10,827.9	11,166.8	11,059.7	11,213.8	12,102.7	12,321.4	12,435.4	12,527.7	12,373.2	12,689.7	17.2	2.6
DOJ	8,176.0	8,592.7	8,123.5	9,439.0	7,749.4	6,961.6	8,016.3	7,544.3	5,091.7	10,263.6	25.5	13.0
USDA	8,358.7	6,797.9	7,309.5	7,784.1	9,667.1	9,519.6	9,599.6	9,100.6	9,332.9	9,412.9	12.6	0.9
HHS	6,983.4	6,219.9	6,559.3	6,386.5	6,729.3	7,957.0	7,107.1	7,954.7	8,146.3	8,408.3	20.4	3.2
DOI	7,767.7	6,857.9	6,631.9	6,976.3	7,148.8	7,391.9	7,094.8	6,992.4	7,482.1	7,892.2	1.6	5.5
TRSY	2,770.0	2,702.1	3,679.3	7,118.7	5,242.4	3,391.6	4,177.1	4,620.4	4,913.7	4,558.3	64.6	-7.2
DOC	2,489.1	2,274.6	2,144.5	2,522.9	2,959.2	4,476.3	2,722.2	2,460.1	2,336.4	2,858.3	14.8	22.2
DOL	2,385.2	2,416.0	2,403.3	2,501.1	2,430.1	2,376.0	2,446.0	2,452.4	2,514.9	2,527.9	6.0	0.5
EPA	585.0	1,273.1	485.3	439.4	439.3	421.5	426.4	578.3	1,011.0	1,049.3	79.4	3.8
PCC	724.2	805.9	899.0	847.9	916.1	873.1	806.1	923.5	914.9	921.0	27.2	0.7
ST	146.9	264.7	305.0	301.2	302.9	302.6	274.2	273.8	390.2	422.3	71.0	8.2
PRMA	96.1	151.9	157.9	171.9	192.5	215.1	199.4	204.1	199.3	173.9	88.0	-8.2
OPM	54.3	54.5	54.5	67.3	72.1	70.8	74.6	81.4	161.5	161.5	197.3	0.0
HUD	114.4	117.4	119.4	123.8	139.1	140.3	162.3	156.9	149.0	144.5	26.3	-3.0
FCC	23.6	22.4	24.3	22.4	20.6	23.9	22.1	19.9	20.3	20.7	-12.1	3.7
OTHER*	257.8	342.6	405.0	433.7	1,859.4	1,889.1	1,109.0	1,165.0	1,254.3	1,646.6	538.6	31.3
CIVILIAN AGENCIES TOTAL	194,885.7	187,336.9	186,035.1	194,048.5	189,284.1	191,321.9	187,104.7	191,400.8	199,085.5	223,095.3	14.9	12.5
12 DOD	1,250,613.8	1,222,801.5	1,280,539.2	1,165,755.3	1,274,443.5	1,241,655.8	1,269,291.5	1,103,990.1	1,048,772.9	977,040.4	-21.9	-6.8
ALL AGENCIES TOTAL	1,445,499.5	1,410,138.4	1,466,574.3	1,359,803.8	1,463,727.7	1,433,977.8	1,456,396.2	1,295,391.0	1,247,858.4	1,200,935.7	-16.9	-3.8
MBOE	248.2	242.1	251.6	233.4	251.3	246.0	250.0	222.4	214.2	206.2		
Petajoules	1,524.9	1,487.6	1,546.1	1,434.5	1,544.2	1,511.7	1,536.4	1,366.6	1,316.4	1,266.9		
ANNUAL CHANGE FROM 1985												
BBTU		-35,361.1	20,074.8	-85,695.7	16,226.2	-12,521.7	10,896.7	-150,108.5	-197,641.0	-244,563.7		
MBOE		-6.1	3.4	-14.7	3.1	-2.1	1.9	-25.8	-33.9	-42.0		
Petajoules		-37.3	21.2	-90.4	19.2	-13.2	11.5	-158.4	-208.5	-258.0		
CUMULATIVE SAVINGS FROM 1985												
BBTU		35,361.1	15,286.2	100,981.9	83,753.7	95,275.4	84,378.7	234,487.2	432,128.2	676,692.0		
MBOE		6.1	2.6	17.3	14.3	16.4	14.5	40.3	74.2	116.2		
Petajoules		37.3	16.1	106.5	87.3	100.5	89.0	247.4	455.9	713.9		

DATA AS OF 07/20/95

*Other includes, for certain years, Commodity Futures Trading Commission, Equal Employment Opportunity Commission, Federal Trade Commission, National Archives and Records Administration, National Science Foundation, Nuclear Regulatory Commission, Railroad Retirement Board, U.S. Information Agency, and Federal Energy Regulatory Commission.

¹TVA's large increase in energy consumption for FY 1994 is the result of first-time reporting of electricity consumed at power plants for station service use.

Note: FY 1994 contains estimated data for the following agencies: Departments of the Treasury, Federal Trade Commission, and Office of Personnel Management. 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

FIGURE 1
Federal Energy Consumption, FY 1994

TOTAL
1.20 quads

*Other includes Coal, Steam, Auto Gas, Aviation Gas, LPG/Propane, Navy Special, and Other

BUILDINGS AND FACILITIES
0.38 quads

*Other includes LPG/Propane, Steam, and Other

VEHICLES & EQUIPMENT/ ENERGY INTENSIVE OPERATIONS
0.82 quads

*Other includes Navy Special, LPG/Propane, Aviation Gas, and Other

Data as of 07/20/95

Source: Federal Agency Annual Energy Management Data Reports

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

FIGURE 2
Federal Energy Costs, FY 1994
(Nominal Dollars)

TOTAL
\$8.05 Billion

*Other includes Coal, Steam, Auto Gas, Aviation Gas, LPG/Propane, Navy Special, and Other.

BUILDINGS AND FACILITIES
\$3.82 Billion

*Other includes LPG/Propane, Steam, and Other.

VEHICLES & EQUIPMENT/ENERGY INTENSIVE OPERATIONS
\$4.23 Billion

*Other includes Navy Special, LPG/Propane, Aviation Gas, and Other.

Data as of 07/20/95

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

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

TABLE 2
FEDERAL PETROLEUM USAGE IN FY 1994
(in Thousands of Gallons, Billions of British Thermal Units,
and Petajoules [Joule x 10¹⁵])

	Unit Total (K Gal)	BBTU* DOD	BBTU* Civilian	BBTU* Total	Petajoules* Total
Buildings & Facilities					
Fuel Oil	415,063.8	48,235.7	9,333.7	57,569.3	60.73
LPG/Propane	32,549.3	2,050.0	1,058.5	3,108.5	3.28
Energy Intensive Ops.					
Fuel Oil	48,540.8	4,604.1	2,128.5	6,732.6	7.10
LPG/Propane	983.8	21.8	72.2	94.0	0.10
Vehicles & Equipment					
Motor Gas	237,080.0	4,336.5	25,298.5	29,635.0	31.26
Dist-Diesel & Petrol.	980,392.7	127,366.5	8,613.9	135,980.5	143.48
Aviation Gas	4,806.9	15.8	585.2	600.9	0.63
Jet Fuel	4,236,407.1	540,781.5	9,951.4	550,732.9	581.00
Navy Special	15,120.0	2,097.1	0.0	2,097.1	2.21
LPG/Propane	325.3	0.0	31.1	31.1	0.03
Other	3,782.8	0.0	3,782.8	3,782.8	3.99
Total		729,509.1	60,824.5	790,333.6	833.80

DATA AS OF 07/20/95

*Uses a conversion factor of:

95,500 BTUs/gallon for LPG/propane

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

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

130,000 BTUs/gallon for jet fuel

947.9 Billion BTUs/Petajoule

Note: FY 1994 contains estimated data for the following agencies: Departments of the Treasury, Federal Trade Commission, and Office of Personnel Management. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

C. Federal Coordination

A number of Federal coordination activities were carried out in FY 1994. A meeting of the Federal Interagency Energy Policy Committee ("656" Committee) took place on October 20, 1993. The meeting was attended by the Secretary of Energy, Hazel O'Leary, and the Deputy Secretary of Energy, Bill White, as well as Congressman Philip R. Sharp, Chairman of the Energy and Power Subcommittee of the House Energy and Commerce Committee, and representatives from the Federal agencies. Secretary O'Leary sounded the Clinton Administration theme of saving money by conserving resources. Congressman Sharp stressed the importance of elevating the Federal Government as a model to demonstrate what can be accomplished in the area of energy efficiency. He noted the importance of having champions for the cause of energy efficiency throughout the Government. Deputy Secretary White challenged the Committee to develop budget strategies that establish incentives for capital expenditures which generate savings in out-years, and to adopt the total quality management principle of measuring the progress made toward achieving clearly stated goals. Other speakers included representatives from a state energy office, an energy service company, the Office of Management and Budget, and a utility company.

The Interagency Energy Management Task Force was established by Section 547(a) of NECPA, as amended, 42 U.S.C. § 8257. The Task Force met eight times during FY 1994. The Task Force met on December 15, 1993 to discuss agency activities and new initiatives, share information for program support, and agree on follow-up actions from the October meeting of the Federal Interagency Energy Policy Committee meeting. Among the topics discussed at the meeting were training, the SAVEnergy Program, guidance for the Federal Energy Efficiency Fund, the development of fenestration rating standards, energy savings performance contracting, the 1994 Federal Energy and Water Management Awards, utility incentives, and the possibility of a new Executive Order on energy management.

On February 23rd members of the Task Force convened primarily to discuss the pending Executive Order on energy efficiency and water conservation at Federal facilities. Representatives from the White House Office on Environmental Policy presented highlights of the proposed Executive Order and outlined several goals that would surpass those established by the Energy Policy Act of 1992.

Task Force meetings were held on March 16th and April 20th to review the provisions of Executive Order 12902, Energy Efficiency and Water Conservation at Federal Facilities. Task Force members examined its requirements and established the following working groups to meet periodically and examine issues more closely:

- Energy Savings Performance Contracting,
- Training,
- Retention of Savings,
- Energy Audits,
- Energy Surveys,
- Water Conservation,
- Life-cycle Costing in Leased Facilities,
- Industrial Energy,

- Quality Metrics/Measurement,
- 10-year Payback Plan,
- Awareness and Awards,
- Solar and Renewable Energy,
- New Space, and
- Alternative Fuels.

A second meeting of the Federal Interagency Energy Policy Committee was convened by Ms. Christine Ervin, Assistant Secretary of Energy for Energy Efficiency and Renewable Energy and Chair of the "656" Committee, on April 16, 1994. The purpose of the meeting was to provide Committee members with an overview of what the different agencies were doing to address the new requirements established in Executive Order 12902. Mr. Mark Ginsberg, Chairman of the Federal Interagency Energy Management Task Force moderated a discussion of four topics related to implementing Executive Order 12902. The topics of high priority for Federal agencies were agency prioritization surveys, project implementation, showcase demonstrations, and innovative financing.

The Task Force met on June 8th, August 10th, August 24th, and September 27th, 1994 to discuss progress toward Executive Order 12902 goals made by the individual working groups and to identify barriers to the implementation of the Executive Order. Central to these discussions of barriers was the work done by each of the working groups to specify the barrier and to develop strategies for reducing or eliminating the barriers.

D. Personnel and Energy Awareness Activities

Training

During FY 1994, DOE's Federal Energy Management Program (FEMP) conducted 61 training workshops and symposia for 1,954 attendees in the efficient use and conservation of energy, water, and renewable energy in Federal facilities.

The Federal Energy Management course provided guidance on meeting the qualifications of "trained energy manager" as defined by EPACT. Nine workshops were conducted for over 195 participants nationwide. In addition, the Water Resource Management course presented instruction to help Federal facility managers improve the efficiency of water use, consistent with legal and environmental requirements. Three workshops were conducted for 98 participants at sites across the country.

The Designing Low Energy Buildings (Non-Residential) course, formerly named Passive Solar Design Strategies, was presented 3 times for 120 participants, in conjunction with major industry conferences. The "Residential" version of the course was presented 3 times at requesting agencies' sites for 91 attendees. The one-day courses include analyses and case studies of building design using passive solar heating, natural ventilation and cooling, and daylighting, as well as glazing and overhangs.

The Federal Relighting Initiative (FRI) course was conducted 5 times for a total of 178 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 include: basic lighting concepts; a comprehensive process for Federal relighting project development and implementation; application of the Federal Lighting Expert (FLEX) System and other analytical software tools; and the use of professional lighting design services. During the first day of this training course, participants received lighting efficiency training, and the second day consisted of an overview on implementing Federal relighting projects. A third half-day provided hands-on training in the use of Federal Lighting Energy Expert (FLEX) software tool.

Nine Federal Energy Decision Screening (FEDS) workshops were held during FY 1994 for 330 attendees. This is a training course for Federal facility managers on whole-site analysis of energy conservation technical and financial opportunities utilizing the FEDS-Level 1 project screening software and the FEDS-Level 2 project implementation software.

FEMP, in conjunction with the National Institute of Standards and Technology, conducted six 3-day workshops on life-cycle costing (LCC) and building retrofit simulation for 172 students. The first 2 days of each workshop provided hands-on training in LCC procedures that Federal agencies are required to use in evaluating energy and water conservation projects. The LCC sessions focused on techniques for selecting the most cost-effective building energy projects based on the present value of all energy, construction, and maintenance costs over the life of the projects. The third day of the workshop focused on the use of the building retrofit analytical software called A Simplified Energy Analysis Method (ASEAM). The ASEAM-3.0 methodology was designed to assist Federal energy managers in analyzing building energy requirements and identifying and assessing the impact of various energy conservation opportunities. Federal energy managers, State and local government personnel, and representatives from private industry were among the participants who received training at the workshops. An additional 5 sessions of the LCC workshop were provided for 128 students by FEMP-trained "DOE-qualified instructors."

Eight three-day courses on energy savings performance contracting (ESPC) were conducted in FY 1994 for 195 participants. In each course, 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. ESPC allows energy-efficient improvements to be installed by private contractors with no up-front capital costs. During the first two days, the course describes how to manage a multi-disciplinary team in developing ESPC projects and to identify the engineering and contracting aspects of ESPC solicitation design and development, proposal evaluation, and contract award and implementation. The third day is for hands-on analysis of students' prospective projects. Among the agencies that have participated in the courses and produced project solicitations are the National Park Service in Ellis Island, New York (Department of the Interior), the Forbes Field National Guard in Topeka, Kansas (Department of Defense), and the Department of Veterans Affairs Medical Center in Washington, D.C. Each of these facilities has issued a CBD notice.

FEMP introduced its new Water Resource Management course with 2 workshops for 61 attendees in FY 1994. The course is designed to assist Federal site managers and agencies in meeting the water conservation requirements of EPACT and Executive Order 12902.

During FY 1994, FEMP organized and participated in seven panel discussions on Federal energy efficiency, water conservation, and renewable energy topics at the Association of Energy Engineer's annual conferences around the country. Four FEMP symposia at industry conferences attracted 386 attendees.

The Federal Energy Management Program introduced its new Training Course Locator System last year to assist Federal agencies in training energy managers and in meeting the requirements of the EPACT. The Locator System connects those seeking particular training courses with the sponsoring organization for those courses by responding to numerous requests from Federal energy managers and coordinators, utility managers, engineers, building operators, and facility personnel.

During FY 1994, the locator System received 150 course descriptions from sponsors and maintained an updated schedule of courses being offered to improve energy savings and conserve water. The Training Locator System includes course sponsors from the private and public sector. Course sponsors include the U.S. Department of Energy, the National Renewable Energy Laboratory, Johnson Controls, Inc., the Association of Power Administration, the Lighting Design Lab, the U.S. Army Corps of Engineers, the University of Wisconsin, North Carolina State, and Texas A&M.

EPACT requires GSA to hold five workshops per year to promote coordinated energy management strategies with Federal, State, local, tribal, and county public officials. In 1994, the workshops were held in Atlanta, GA, Kansas City, MO, Tysons Corner, VA, San Francisco, CA, Seattle, WA, Austin, TX, Denver, CO. Topics covered included demand side management, building life cycle costing, train-the-trainer, and current energy issues.

FEMP, DOE's Kansas City Support Office, NIST, and GSA jointly developed a "train-the-trainer" program for the Building Life Cycle Costing (BLCC) class. Through this program, 16 instructors were qualified to teach the academia, state governments, and the Federal government. Through this process, the BLCC class is now widely offered throughout the U.S.

Recognition

Outstanding accomplishments in energy efficiency and water conservation in the Federal Sector were recognized with the presentation of Federal Energy and Water Management Awards on October 6, 1994 at the Dirksen Senate Office Building in Washington, D.C. The Federal Energy Efficiency, Renewables and Water Conservation Awards are sponsored by the Federal Interagency Energy Policy Committee ("656" Committee) and the Department of Energy. Awardees were selected from outstanding Federal energy managers and contributors who:

- Improved energy performance, through increased energy efficiency, use of renewables and water conservation.
- Implemented proven energy efficiency measures; energy and water conservation techniques, devices, equipment, or procedures; and renewable energy projects.
- Developed and implemented training programs for facility energy and water managers, operators, and maintenance personnel.
- Developed and implemented employee awareness programs.

- Succeeded in generating utility incentives, or energy savings performance contracts, and other Federally approved performance based energy and water savings contracts.
- Made successful efforts to fulfill compliance with energy and water reduction mandates.

Special emphasis categories in 1994 included mobility energy efficiency and sustained exemplary service. Mobility energy involves the efficient use of energy for aircraft, ship, and off-highway vehicles. Sustained exemplary service involves exceptional service over a number of years in creating and instituting increased use of renewable energy, water and energy conservation programs, projects, or technologies.

Recipients of this year's awards were selected from 125 nominees submitted by 13 Federal agencies. Forty individuals and members of small groups received cash awards totalling \$156,000. The cash awards ranged from \$2,000 to \$10,000 each. Distribution of awards among the Federal agencies for accomplishments in FY 1993 is indicated below. Awards were presented in the following categories:

Agency	Sustained Service/Energy	Sustained Service/Water	Mobility	Individual	Organization	Small Group	Water Conservation
DoD	1						
DOE	1			5	2	1	1
DOI	1						
DOL	1						
GSA				4	3	4	
HHS				1	1		
NASA				1	2		1
USDA		1					
USPS	1			1			
Air Force				1			
Army				4	5	1	1
Navy			3		2		
Treasury						1	
TOTALS	5	1	3	17	15	7	3

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. Examples of employee awareness activities at the agencies follow.

The Department of Agriculture has included in its implementation strategy initiatives to institute and/or emphasize energy conservation awareness with facility managers and building occupants and to provide incentive awards to facility managers and others who contribute to the energy efficiency of the Department.

The Department of Commerce included in its revised Department Administrative Order on Federal Energy Management, a strategy to promote energy and water conservation through employee training, awareness, and outreach programs.

At the Department of Health and Human Services, the Social Security Administration Headquarters Complex has an employee energy efficiency campaign underway which includes articles in a monthly bulletin to explain its energy conservation strategies and examples of how employees can participate.

The Department of Housing and Urban Development encourages employees to participate in its rideshare assistance program through promotional flyers and displays. The Department has also implemented a nationwide transit subsidy program to encourage the use of mass transportation.

At the Department of the Interior, Departmental Energy Conservation Committee meetings allowed for dissemination of information and emphasis on increased management awareness of the energy management program. The bureaus were reintroduced to computer programs, training courses, and reading materials available on energy management. Through an ongoing energy-notice program building occupants received written notification through random surveys and scheduled inspections when energy-consuming equipment such as lights, radios, and fans have not been turned off. Energy awareness discussions have been held during lunch time. The Department of Interior also has a computerized rideshare program and bureaus in some areas have provided free parking incentives for car-pooling and ridesharing.

The Department of Labor's Fuel Efficiency Outreach Program includes ridesharing activities and employee awareness programs sponsored by the General Services Administration, local governments, and transit authorities.

The Department of State has an active agency-wide employee education program which promotes the idea that conservation of energy in buildings, facilities, vehicles and equipment is the responsibility of each and every employee.

The Department of Transportation distributes information on new procedures, products, and contracting methods that will facilitate more efficient operation of facilities through its

Departmental Energy and Water Management Committee. The Department also has an ongoing ridesharing program and an active transit benefit program.

Employee awareness plays an integral part of the Treasury Department's energy management program. The Department and individual bureaus seek to make employees aware of the positive aspects of energy conservation. For example, the Birmingham Financial Center has a continuing education program for its employees; the Internal Revenue Service educates employees about ridesharing and energy conservation; and the Secret Service uses posters to educate its employees and public transportation incentives to encourage the use of mass transit. Locally, in Washington, D.C., most Treasury bureaus offer public transportation incentive programs; among them Departmental Offices and the Internal Revenue Service. The IRS is also closer to implementing a national Flexiplace Program designed to reduce fuel energy consumption and air pollution by allowing employees to work at home or at a satellite office, rather than commuting long distances to work. Presently, it is in a "pilot stage" in the Seattle District Office of the IRS.

The Environmental Protection Agency's energy and water conservation program includes the Conservation Information Clearinghouse and Hotline, a newsletter, an Awareness Materials Package for energy managers, a summary document on energy efficient and water conserving technologies for facility managers, program and technology briefings.

The Federal Emergency Management Agency, National Emergency Training Center distributed an Energy Gram newsletter that lists energy conservation suggestions.

The General Services Administration included as one point in its Seven Point Energy and Water Reduction Plan issued in 1993, employee and tenant conservation awareness. GSA is the lead agency in the Federal Ridesharing Program and has recently taken the lead in implementing the Federal Employees Clean Air Incentives Act which authorizes agencies to provide transit subsidies to Federal employees.

Field installations at the National Aeronautics and Space Administration have implemented various outreach programs to reduce the use of vehicle petroleum fuels by agency and contractor employees. Ridesharing and use of public transportation is emphasized.

The Nuclear Regulatory Commission, has an ongoing employee awareness program at its One and Two White Flint North Buildings which provides information to employees regarding their responsibilities and contributions in achieving energy reduction goals. NRC participates in a ridesharing network; offers public transportation subsidies to all employees; uses non-monetary incentives such as flextime, compressed work schedules and priority parking assignments for car and van pools; and provides facilities for bicyclists, including locker rooms and showers. NRC also promotes reduction in fuel consumption through transportation fairs, employee announcements, and newsletters.

The Panama Canal Commission (PCC) furnishes agency-wide directives and prints articles in English and Spanish in its official bimonthly publication (*The Spillway*) as a means of disseminating energy-related concerns to its employees. Canal area U.S. Military components also publish a weekly newspaper and operate an English language TV station accessible to

PCC, which actively carries relevant energy saving and conservation objectives, tips and other energy use issues. The PCC Incentive Awards Suggestion Program further stimulates employee energy conservation awareness and participation.

Employee awareness and recognition programs at the U.S. Postal Service also included mailing of the DOE "Energy Awareness" poster to all 37,000 postal facilities and publication of notices for a "Turn Off the Lights Campaign". The Postal Service continues its ridesharing program which includes transit subsidies, preferential parking, a newsletter, educational activities, flexible work hours, and recognition awards. The Postal Service began an initiative in FY 1994 to educate purchasing personnel on issues such as energy conservation and sources of supply for energy efficient products. In addition to briefings and training, a quarterly newspaper was published for purchasing personnel covering energy and environmental issues.

The Tennessee Valley Authority's Facilities Services Energy Reduction Team implemented an employee energy awareness campaign during FY 1994. The team displayed monthly energy use posters and periodic post-it notes to remind employees to turn off unnecessary equipment. TVA is also working to combine its energy awareness program with its solid waste minimization program.

The Department of Energy, the Office of Personnel Management, and the Railroad Retirement Board offer employee energy awareness programs.

Energy Awareness Month, celebrated in October 1994, promoted energy awareness with the theme "Energy - Our Future is Today!". DOE designed and distributed posters and a camera-ready logo for use in publications.

E. Funding for Energy Efficiency in Buildings and Facilities

The National Energy Conservation Policy Act 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 3 presents total agency funding reported from FY 1985 through FY 1994 for energy conservation retrofits and capital equipment. Funding for energy conservation declined from \$258.6 million in FY 1985 to a low of \$52.2 million in FY 1989. Reports from Federal agencies indicated that \$120.9 million was spent in FY 1993 on retrofit expenditures and \$230.2 million in FY 1994, with FY 1995 funding projected to be \$354.2 million. In some cases, the data provided by the agencies includes funding from operation and maintenance accounts that was specifically identified as contributing to energy efficiency. Figure 3 illustrates agency spending trends for the five largest energy consuming agencies and other Federal agencies.

Table 3
Agency Expenditures for Energy Conservation Retrofits and Capital Equipment,
FY 1985 through FY 1994 (Thousands of Nominal Dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Projected 1995
DOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	872	N/A	51	N/A
DOD	136,100	120,000	5,550	5,280	1,500	1,020	10,000	49,669	14,444	109,000	221,000
DOE	14,800	14,500	16,500	18,900	19,400	19,500	20,400	20,650	20,950	24,850	30,400
DOI	3,198	5,535	0	0	4,338	0	1,272	9,800	4,859	1,662	605
DOJ	0	0	0	195	454	6,100	26,400	0	N/A	1,284	1,500
DOL	238	31	105	142	584	17	35	16	0	0	0
DOT	13,650	15,000	12,104	12,700	2,908	0	460	143	593	5,970	3,678
EPA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	500	N/A	N/A
GSA	6,700	6,100	2,900	9,400	4,868	11,125	30,123	37,000	30,000	37,000	45,000
HHS	0	0	0	427	427	427	427	0	1,813	1,915	2,800
HUD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	43	30	0
NASA	11,800	12,100	1,700	1,400	4,499	2,943	7,556	7,086	25,072	24,658	16,617
PCC	1,274	73	1,174	600	378	361	807	249	500	608	140
RRB	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16	13	12
STATE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	67	100
TRSY	0	0	2,977	2,393	2,823	1,134	836	N/A	1,344	4,826	4,707
TVA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	475	844	929
USDA	2,500	0	0	500	500	1,547	1,752	7,300	7,045	7,277	4,780
USPS	55,300	9,300	5,100	3,800	4,040	4,000	4,000	2,293	1,116	1,123	10,000
VA	13,000	11,500	9,500	9,860	5,500	11,200	9,970	10,000	12,100	9,050	11,960
TOTAL	258,560	194,139	57,611	65,597	52,209	59,374	114,038	145,078	120,870	230,228	354,228

Note: Bold indicates top five energy users in buildings and facilities. DOE expenditures also include 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

The Defense Department identified \$109.0 million in expenditures for energy efficiency projects in FY 1994. This amount includes \$50.0 million in appropriated Energy Conservation Investment Program funds and \$59.0 million from operations and maintenance accounts. Additional funds were expended by DoD to support energy efficiency, but no reporting system exists to track these additional expenditures. DoD projects expenditures of \$221.0 million for energy efficiency projects in FY 1995.

FIGURE 3
ENERGY CONSERVATION RETROFIT EXPENDITURES
 (Nominal Dollars)

Source: Federal Agency Annual Energy Management Data Reports

The General Services Administration spent \$37 million in FY 1994 on 235 energy efficiency projects. Although there were additional projects with energy savings, these components were not tracked separately. GSA plans expenditures of \$45 million in FY 1995 for energy efficiency.

At DOE, funding for energy surveys in buildings and processes amounted to \$6.3 million in FY 1994. DOE invested \$18.6 million on 82 retrofit projects in building and metered process facilities. These projects included the installation of energy monitoring and control systems; modification of HVAC systems, mechanical equipment, and boilers; improvements in lighting and electrical power systems; and the addition of building insulation and storm windows. The anticipated savings from these retrofit projects in FY 1994 is 780 billion Btu. The projected level of funding for retrofits for FY 1995 is approximately \$30.4 million.

Federal Energy Efficiency Fund

The Federal Energy Efficiency Fund was established by section 546(b) of NECPA, as amended by EPACT, to provide grants to agencies to assist them in meeting the mandated energy efficiency and water conservation requirements. The legislation anticipated that these funds would enhance and stimulate other funding sources, such as agency appropriations, utility demand side management investments, and energy savings performance contracts.

During FY 1993, DOE developed guidelines to be followed by agencies for submitting proposals for grants from the Fund. The "Guidelines for Proposals for Federal Energy Efficiency Fund Support" were signed into effect on December 29, 1993. A supplement to the Guidelines, "Special Clarifications for Life Cycle Cost Inputs," was issued to the agencies on February 11, 1994. The Special Clarifications provide detailed information on the accounting, application of life cycle costing techniques, and special calculations to be used in submitting proposals.

Initial proposals were received in March 1994. In total, 42 proposals were received from March through September of FY 1994. These proposals requested over \$10.5 million in grants from the Fund. Twenty-three of these proposals were selected for grant funding and received commitments equal to the \$6 million available in FY 1994 funds.

As the number of proposals increased, the limited funding was directed to those proposals which were most competitive considering the four factors listed below:

- (A) The cost-effectiveness of the project. (such as the savings-to-investment ratio)
- (B) The amount of energy and cost savings anticipated to the Federal Government.
- (C) The amount of funding committed to the project by the agency requesting financial assistance.
- (D) The extent that a proposal leverages financing from other non-Federal sources.

In some cases, proposals were rejected due to minimal cost-effectiveness of the project. In many cases, agencies were advised that there was insufficient funds available to provide grants for their otherwise worthy proposals and that the proposals would be funded in FY 1995 as appropriations were made available.

Overall, the funded projects that were submitted in FY 1994 will leverage an additional \$2.5 million in agency and non-Federal funding. The combined investment from the Fund and other sources will generate over \$21 million in energy and water cost savings in future budget years.

Both the amount of non-Federal investment and the savings to the taxpayer are expected to increase as future proposals are submitted to the Fund seeking grants to put Energy Savings Performance Contracts in place. In FY 1994, discussions were held with several agencies on the preparation and submission of such proposals in FY 1995. At least seven agencies are expected to submit one or more such proposals in FY 1995.

Examples of some of the first project funded are described below.

Dangling Rope Marina Project, National Park Service, Department of the Interior

This project will fund the installation of photovoltaics at the National Park Service marina on Lake Powell at Dangling Rope, Utah. The project will combine \$350,000 from the Federal Energy Efficiency Fund with \$438,500 in non-Federal funds contributed by the state, the utility, and the park vendor, along with \$404,500 in Park Service and other Federal funding. Besides the 59 percent improvement in energy efficiency and the cost savings of \$270,149 (net after investment), the project offers environmental benefits which reinforce its value. Chief among these is the reduced use of diesel fuel which is barged into the marina to power the generators. In addition to a reduction of exhaust gases which can accumulate at lake level during certain weather conditions, several minor fuel spills have occurred in the past, and a recent mishap nearly resulted in the diesel tanker sinking in the lake. The cost of cleaning such an oil spill has been estimated at over \$1 million.

Kennedy Space Center Project, National Aeronautics and Space Administration

The NASA Kennedy Space Center project includes the relighting of office spaces, hangar bays, and laboratories. It also includes heating, ventilating, and air conditioning (HVAC) duct modifications and the installation of heat pipes into the HVAC system to passively recover energy used in air conditioning the building. The grant request was for \$88,900 and the project is also expected to qualify for an \$11,000 rebate from the local utility. The project will save nearly \$370,000.

The Yellowstone National Park Project, National Park Service, Department of the Interior

The first of two projects at Yellowstone National Park will improve the energy efficiency of several of the widely-dispersed facilities at the Park, saving well over 100 billion Btu, and will result in over \$600,000 in savings to the taxpayer. The projects include simple retrofits such as insulating walls and ceilings and replacing windows and doors with more efficient products, as well as more complicated projects such as replacing a diesel generator with a more efficient generator and battery storage system. Also included will be modifications to district heating systems and propane storage systems to improve efficiency. Lighting retrofits will be implemented in a variety of buildings. Private project funding of approximately \$70,000 will be provided by the Yellowstone Institute.

The second project, funded under a separate grant, will improve building insulation, reduce ceiling height to reduce the volume of conditioned space, replace incandescent lighting with

fluorescent lighting, and replace an oil heating system with a high efficiency gas system. The modifications will improve energy efficiency by more than 60 percent and save over \$300,000.

*Northwest Fisheries Science Center, National Oceanic and Atmospheric Administration,
Department of Commerce*

The first water conservation project to be funded by the Federal Energy Efficiency Fund will recycle water that is currently passed once through fish culture tanks at the Center and drained to the waste water system. Approximately 218 million cubic feet per year of water will be saved or approximately 90 percent of the water used at the Center. As one of the largest water users in the City of Seattle, the reduction will make a measurable difference in the water demand for the City. For that reason, the City is providing \$216,173 in funding for the project. The Federal Energy Efficiency Fund will provide \$471,399 and the remaining \$173,654 will come from the Department of Commerce. The project will save over \$2.3 million and will have a simple payback period of 5 years.

Energy Savings Performance Contracting

Section 155 of EPACT amended Title VIII of NECPA, sections 801 to 804, relating to shared energy savings contracts. Section 801, as amended, gives agencies the authority to enter into energy savings performance (ESP) contracts and describes the methodology of contract implementation. Energy savings performance contracts are designed to reduce the cost of energy in Federal buildings without capital investment by the building owner. Typically, the terms of such a contract provide for contractor purchase, installation, and maintenance of energy conservation measures with a guarantee of annual energy cost savings in consideration for a share of such savings. Under these contracts, the contractor is expected to bear the risk of performance, make a significant initial capital investment, guarantee significant energy savings to the government agency, and from these savings, the agency, in effect, makes payment to the contractor.

Section 801 requires DOE to issue appropriate rules containing: (1) methods and procedures for selecting, monitoring, and terminating energy savings performance contracts; and (2) "substitute regulations" for provisions of the Federal Acquisition Regulation (FAR) which are inconsistent with the intent of section 801 as amended and which may be revised consistent with generally applicable procurement statutes.

On April 11, 1994, DOE published a notice of proposed rulemaking under section 155 of EPACT. DOE held a public hearing on June 1, 1994, and the closing date for receipt of written comments was June 10, 1994. Nineteen interested persons filed written comments of which 13 presented oral comments at the public hearing. A notice of final rulemaking was published on April 10, 1995. DOE fully considered all of the suggestions and arguments made in the comments in revising the proposed regulations and the draft model solicitations developed by DOE. The model solicitations provide uniform formats and standardized contract provisions recommended for Federal agency use in energy savings performance contracts. The model solicitations include some provisions that have been determined necessary to accommodate the unique nature of energy conservation services which often require third-party financing.

The Act requires that DOE obtain the concurrence of the Federal Acquisition Regulatory Council in the issuance of the final rule. The final rule is expected to be issued in mid-FY 1995.

Initiatives taken by Federal agencies to actively pursue energy savings performance contracts produced three ESP contract awards in FY 1994, bringing the total number of awarded ESP contracts to 19. ESP contracts awarded during FY 1994 are briefly described below. Through FY 1994, the total contractor investment in Federal ESP contract projects was approximately \$39.8 million. The Government share of the projected savings over the lives of these projects is approximately \$44.5 million. The chart on the next page lists all ESP contracts awarded through FY 1994, providing project descriptions and the dollar amounts for contractor investment and Government share of savings for each contract.

On January 31, 1994 the U.S. Army awarded a contract at Fort Polk, Louisiana to install closed loop ground source heat pumps at 4,003 family housing units. The contractor will also concurrently insulate attics, add weather stripping and caulking, install low-flow shower heads and residential hot water desuperheaters, insulate water heaters, and retrofit interior and exterior lighting. The contract term is for 20 years with a contractor capitol investment of \$18 million. The Army's projected share of savings is almost \$10 million (22 percent) with the contractor's share of savings projected at \$34 million (78 percent).

The U.S. Air Force awarded two ESP contracts in FY 1994. The first phase of an ESPC project at Randolph Air Force Base, Texas has been completed. Awarded in February 1994, it involves relamping several large facilities with options to add other facilities. The first phase included changing out over 15,000 old, inefficient, fluorescent and incandescent light fixtures for a savings of 4.5 million kilowatt hours, netting over \$239,000 in energy savings. Phase II provides for follow-on negotiations of other electrical savings initiatives. Randolph's energy manager has already identified over 11,000 fixtures to replace in phase two. Initial estimates indicate saving of 3.4 million kilowatt hours and \$170,000.

An ESP contract was awarded at Hill Air Force Base, Utah in early July 1994. This is a base-wide ESP contract with supplemental funding from the local utility company. Estimated savings are 44,200 MWH (\$1.5 million) over a 5 year period and should reduce the base's peak load by 18 percent.

Agencies have reported that ESP contracting is a difficult procedure, which must be executed under Federal Acquisition Regulations (FAR) that are procedurally complex, extremely time-consuming, and therefore burdensome for small and mid-sized energy service companies typically interested in ESP contract business. In addition, many procurement officials are unfamiliar with ESP contract conditions under the FAR. Because ESP contracts are a relatively new option, there are many concerns as to what is appropriate under FAR and how to evaluate and award contracts.

**Shared Energy Savings Contracts/Energy Savings Performance Contracts
Awarded Through FY 1994**

Project Name/Location	Project Description	Contractor Investment	Government Share of Savings
DOE Lawrence Berkeley Lab Berkeley, CA	HVAC controls, fume hoods, lighting controls, packaged cogeneration in a reinforced concrete structure with 545,658 square feet of space	\$328,000	\$150,000 over 10 years
DOE Headquarters - Forrestal Building Washington, DC	Lighting retrofit to include fixtures, ballasts, lamps, reflectors, and controls in a three-building complex containing 1.7 million square feet	\$1,372,000	\$1,072,959 over 7 years
USPS General Mail Facility San Diego, CA	Lighting retrofit of 15-year-old general mail facility with 398,626 square feet of workroom floor space and office space	\$164,714	\$593,390 over 7 years
USPS General Mail Facility Oklahoma City, OK	Lighting retrofit of 25-year-old general mail facility with 111,420 square feet of workroom floor space and office space	\$265,091	\$31,630 over 5 years
USPS General Mail Facility New Orleans, LA	Lighting retrofit of 27-year-old general mail facility with 241,639 square feet of workroom floor and office space	\$307,905	\$56,110 over 5 years
USPS Southern Maryland General Mail Facility/Bulk Mail Center	Lighting retrofit of 4-year-old general mail facility with 249,036 square feet of workroom floor and office space	\$237,083	\$57,065 over 5 years
Randolph Air Force Base San Antonio, TX	Base-wide lighting retrofits in 44 various-type buildings	\$797,250	\$175,120 over 7 years
Hill Air Force Base, Utah	Base-wide retrofits	TBD	TBD
Corpus Christi Army Depot Corpus Christi, TX	Chiller retrofit and upgrade of electrical service in aircraft hangar building housing aircraft paint bays and offices	\$755,850	\$3,460,791 over 25 years
Alamaneu Army Family Housing Area, Honolulu, HI	Chiller retrofit, EMS expansion, controls, and lighting retrofits in a family housing complex that includes a shopette/gas station, athletic facilities and a chapel	\$10,160,088	\$7,841,061 over 15 years
Gas Air/Propane Mixing Plant Fort Stewart, GA	Base-wide peak shaving project for propane-air mixing plant	\$921,570	\$4,042,091 over 20 years
Gas Air/Propane Mixing Plant Fort Gillem/Fort McPherson, GA	Base-wide peak shaving project for propane-air mixing plant	\$1,052,000	\$7,077,969 over 20 years
Army Family Housing Area Fort Polk, LA	Replace heating and air conditioning units with ground source coupled heat pumps and implement additional renovations/retrofits in 4,003 housing units	\$18,000,000	\$9,954,974 over 20 years
Navy Training Center, Building 3400, Great Lakes, IL	Lighting retrofits and energy management system in four-story building with approximately 250,000 square feet of space	\$500,000	\$76,000 over 10 years
Naval Air Test Center Pattuxent River, MD	Lighting retrofits in a complex of 52 administrative buildings covering 1.2 million square feet	\$350,000	\$172,000 over 10 years
Navy San Diego Region Commissaries, CA	Lighting retrofits in one commissary	\$158,434	\$76,283 over 10 years
Navy San Diego Region Commissaries, CA	Lighting retrofits in 9 commissaries and associated office and storage space with combined electric utility bills of \$409,000	\$550,000	\$499,000 over 10 years
NASA's Michoud Assembly Facility, New Orleans, LA	Energy cost reduction program for improvements in operations and maintenance at GOCO facility	Negligible	\$8,246,286 over 6 years
Veterans Affairs Medical Center West Haven, CT	Chiller plant replacement and facility wide lighting retrofit in 49-year-old building with approximately 1 million square feet	\$3,940,000	\$880,000 over 16 years

Demand Side Management (DSM) Program Participation

Utility-sponsored demand side management programs represent a significant source of funds to help Federal agencies finance conservation projects. In these programs, utilities pay a portion of the cost of purchasing new, more energy efficient equipment in the form of a rebate. Rebate programs promote the installation of more energy efficient measures such as lighting systems, insulation, cooling equipment, efficient motors, etc., but require the customer, in this case the Federal Government, to finance a portion of the equipment cost. DSM programs provide leverage for the user's energy investment dollars and at the same time help the utility to avoid the cost of building new power plants. EPACT and the Executive Order authorities place heavy emphasis on DSM as a means for Federal agencies to achieve energy conservation requirements.

The following agencies reported participation in demand side management programs in FY 1994:

- Department of Agriculture
- Department of Commerce
- Department of Defense
- Department of Energy
- Department of Health and Human Services
- Department of Housing and Urban Development
- Department of the Interior
- Department of Justice
- Department of State
- Department of Transportation
- Department of the Treasury
- Department of Veterans Affairs
- General Services Administration
- National Aeronautics and Space Administration
- Nuclear Regulatory Commission
- United States Postal Service

DSM activities reported by the agencies occurred at installations widely distributed across the country. This decentralization of DSM participation makes it difficult for agencies to track all DSM activities undertaken by all respective sub-agencies, bureaus, and field offices. FY 1994 DSM activities which were reported and quantified totaled approximately \$7.2 million in rebates or credits received by Federal agencies. Agencies identified estimated annual savings of 904.4 billion Btu resulting from DSM activities. These totals do not, however, reflect the total DSM benefits received by the Federal Government as a whole for FY 1994.

At the Department of Energy, DSM activities during FY 1994 saved approximately \$448,300. GSA received rebates of approximately \$3.0 million for energy conservation projects in FY 1994. Rebates are typically offered within a geographic area, and rebates received by GSA are generally returned to the regions for additional energy project funding.

F. 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 of operating Federal buildings, including the life-cycle energy requirements and potential savings for such buildings, and the life-cycle capital costs for energy systems of new buildings, as well as those required for retrofit of existing structures. 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.

On November 20, 1990, DOE issued a Notice of Final Rulemaking to amend Title 10 of the Code of Federal Regulations, Part 436, which sets forth guidelines applicable to Federal agency in-house energy management programs. The principal regulatory changes involved amending the life-cycle cost methodology and procedures to provide for an annually determined market-based discount rate and for a more effective system to revise annually the energy cost escalation rates that Federal agencies are required to assume. In developing the final amendments, the Department of Energy actively consulted with the Office of Management and Budget, the Department of Defense, and the General Services Administration. At the beginning of FY 1994, the 1994 edition of energy prices and discount factors for life-cycle cost analysis, developed with the technical assistance of the National Institute of Standards and Technology, was published and distributed to Federal energy managers.

G. Procurement Policy

The Federal Government is the single largest purchaser of energy-related products and the largest user of energy in the United States. There is enormous potential for energy and dollar savings through procurement policies emphasizing energy efficiency. Such policies will not only reduce energy costs in the Federal budget, but will expand the market for efficient products, create a strong "market pull" for new technologies, and set a clear example for other government and corporate purchasers.

Section 161 of EPACT directs the General Services Administration, the Department of Defense, and the Defense Logistics Agency (DLA) to include energy efficiency in their procurement and supply functions. The Office of Federal Procurement Policy (OFPP) within the Office of Management and Budget (OMB) develops guidance for all senior agency procurement executives to encourage the procurement and acquisition of energy efficient products.

During FY 1994, the President signed Executive Order 12902, "Energy Efficiency and Water Conservation at Federal Facilities," which both reinforces and broadens the section 161 mandate. Specifically, section 507 of the Executive Order requires all Federal agencies to buy "best practice" products, when practicable and cost-effective. Best practice products are those which are in the upper 25 percent of energy efficiency for all similar products, or products that are at least 10 percent more efficient than the minimum level that meets Federal standards.

DOE FEMP initiated a program to assist agencies in implementing the EPACT and Executive Order requirements for energy efficient procurement. The *Energy-Efficiency and Resource-Conservation Challenge* ("Procurement Challenge") is co-sponsored by DOE, the White House

Council on Environmental Quality and OMB/OFPP. FEMP began actively working with many Federal agencies to implement the Challenge program during FY 1994, hosting bi-monthly meetings with agency representatives.

FEMP has a broad mandate for promoting energy efficiency in the Federal Government, and product energy efficiency is being incorporated into many active programs. Both EPACT and Executive Order 12902 assign DOE a technical advisory role in the identification of energy efficient products. Since the Federal Government is such a large buyer of energy-related products and services, part of the effort during FY 1994 focused on determining more precisely what and how much is bought by each agency. This assessment, along with a better understanding of how the Federal procurement system operates, is an important step in having a greater influence on purchasing decisions, and therefore, a major impact on energy consumption.

Reflecting this broad orientation, DOE has identified three overall program objectives to guide procurement of energy efficient products. These are to make the Federal Government a leader in buying cost-effective, high-efficiency products, an environmentally responsible buyer, and a force for advancement of energy efficiency in the marketplace.

Another DOE FEMP activity explicitly directed by EPACT is a study to investigate the potential for using Federal purchasing power to promote the development and commercialization of energy efficient products. This initiative centers on products with commercial potential, but which are not commercially produced. This effort is to be conducted in consultation with utilities, manufacturers and other interested organizations. A public meeting is planned for 1995 to develop a list of candidate products and a plan for implementation. As candidate products are identified they will be incorporated into the Federal Procurement Challenge.

In addition to programs directly focused on energy efficient purchasing, other FEMP programs indirectly promote energy efficient products. These include programs in specific areas, such as the Federal Relighting Initiative, and those with a broader scope, such as the SAVEnergy program for audits of Federal buildings. In addition, FEMP's extensive training curriculum and interagency outreach include promotion of energy efficient products.

Other DOE offices are promoting high efficiency products also. For example, DOE's "market transformation" program includes Federal procurement of high efficiency equipment, including residential appliances and building heating, ventilating and air conditioning (HVAC) equipment. Initiated in response to EPACT, this program aims to change the market in a fundamental way so that demand for highly efficient equipment becomes permanent.

There are numerous programs and activities already underway which promote energy efficient procurement. Both DLA and GSA have active programs which include product energy efficiency. Special publications either focus on or include energy efficiency, such as the Energy Efficient Lighting Catalog published by DLA's Defense General Supply Center and GSA's Environmental Products Guide. Both supply agencies are developing other resources to educate their customers on energy efficiency. For example, GSA, DLA, DOE and EPA are establishing a common symbol to identify energy efficient products, to be used throughout Federal procurement and supply. Both GSA and DLA also provide training and workshops which include energy efficiency information.

The Environmental Protection Agency has targeted energy savings as a means of reducing carbon dioxide emissions and preventing pollution through its Energy Star labeling program. This program initially focused on office equipment because of its rapid growth in sales and the concomitant increase in energy use over the past decade. The program was given a major boost when Executive Order 12845 was issued, directing all Federal agencies to purchase Energy Star computer equipment. The Energy Star labeling program is now being expanded to include other office equipment, as well as residential HVAC and appliances.

DOE and other Federal agencies are supporting several non-Federal programs which promote energy efficient products, including the Energy Efficient Procurement Collaborative, spearheaded by the State of New York. The goal is to improve the overall purchasing practices of government at the state and local levels and influence industry to develop more high-efficiency products. The Collaborative is developing voluntary procurement policies, consensus efficiency guidelines and specifications, and data systems. Another non-Federal organization, the Consortium for Energy Efficiency, has initiated programs to create market pull for high efficiency products and to support the objectives of its member utilities' demand-side management programs.

H. Public Education Programs

Section 551(b) of NECPA 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), as amended, 42 U.S.C. § 6361.

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.

In FY 1994, through its Federal Highway Administration, DOT obligated about \$53 million of 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, nearly \$466 million in Federal-aid highway funds has been spent on such projects in an effort to establish self-sufficient programs across the Nation.

During FY 1994, a new series of reports was published and distributed through the DOT Technology Sharing Program. "Implementing Effective Travel Demand Management Measures: Inventory of Measures and Synthesis of Experience" is one of three current reports available that is based on joint research on Travel Demand Management (TDM) by the Federal Highway Administration and the Federal Transit Administration. Over 2,000 copies of this report have been distributed during FY 1994. The other two reports are entitled "Guidance Manual for Implementing Effective Employer-based Travel Demand Management Programs" and "Overview of Travel Demand Management Measures." Other planned reports on this topic will address Government-based TDM programs and market research in TDM. A microcomputer

analysis tool (with documentation) for the evaluation of TDM projects is also available through the University of Florida, Center for Microcomputers in Transportation, 512 Weil Hall, Gainesville, FL 32611-6585; telephone: 800-226-1013.

All of these reports and analysis tools are intended to provide technical assistance to individuals in the public and private sectors who are responsible for planning, implementing, operating, and/or monitoring TDM activities. They also are designed to educate these individuals on the state-of-the-practice and guide in the development of TDM programs.

The Department of Energy'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.

In January 1994, two DOE information services, the Conservation and Renewable Energy Inquiry and Referral Service and the National Appropriate Technology Assistance Service, were combined and are now known as the Energy Efficiency and Renewable Energy Clearinghouse (EREC). EREC provides basic, technical, and financial information on various energy efficiency/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. In FY 1994, EREC disseminated over 130,000 publications in response to approximately 45,000 inquiries.

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, and data tapes produced by the DOE Energy Information Administration. NEIC provides information on an on-line bulletin board service (202) 586-2557 that permits access by Federal employees and the public. Electronic inquiries may be sent via Internet at the following address infoctr@eia.doe.gov. In 1994, NEIC staff responded to 42,000 inquiries and distributed approximately 80,000 publications.

The Office of Scientific and Technical Information (OSTI) provides coordination and direction for the management of scientific and technical information resulting from the DOE's multi-billion dollar research and development activities. In support of national competitiveness, OSTI collects, processes, and disseminates all DOE-originated research information and selected worldwide research literature on subjects of interest to domestic communities. OSTI is responsible for providing centralized scientific and technical information (STI) services to, or on behalf of, DOE elements in support of Departmental mandates, missions, and objectives. OSTI served the public directly or indirectly through agreements with the National Technical Information Service, Government Printing Office, depository libraries, and commercial vendors. OSTI also assisted in the development of the Internet based DOE Home Page, which is accessed over 20,000 times per month by individuals seeking information about DOE.

OSTI manages a comprehensive collection of approximately one million scientific and technical information documents, representing nearly 50 years of energy-related activities, and maintains

the Energy Science and Technology Database (EDB), which has over three million summaries of DOE and worldwide information. The database 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 1994, OSTI added 175,000 research summaries to the database and provided 21,000 full-text documents for public availability to the National Technical Information Service and the Government Printing Office Depository Library Program. Other services include printing and publishing for DOE offices; providing information management advice and consultation to the Departmental 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 Technical Information Program, operated by the National Renewable Energy Laboratory, provides information on energy efficiency and renewable energy to decision-makers at the Federal, State, and local levels as well as professionals in the buildings, industrial, utilities, and transportation sectors. TIP develops and produces communications products in support of EERE goals and technologies, including brochures, fact sheets, resource directories, videos, exhibits, and compilations of photos and documents.

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

- the Institutional Conservation Program (ICP), which encourages investment in energy conservation for public and private schools and hospitals through matching grants for engineering analyses and retrofit activities. Since its inception in 1979, 15,634 schools, 5,518 hospitals, and 4,982 colleges have participated in ICP programs. In FY 1994, funding for state grants was \$29 million;
- the Energy Analysis and Diagnostic Center (EADC), which stimulates industrial energy conservation through audits of manufacturing processes conducted by students and faculties from participating accredited engineering schools (currently 30 schools); conducted 5100 energy efficiency audits, and at the end of FY 1994 had 280 students in training.
- the Pre-Freshman Enrichment Program (PREP), which provides funding for summer seminars in math and science-based subjects at colleges and universities nationwide and is targeted at underrepresented populations.

The Office of Federal Energy Management Programs (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 primary goal of this service is to assist Federal agencies in meeting the legislative requirements. The Help Desk responds to requests for information via a toll-free automated telephone service, electronic mail, and through the Internet. During FY 1994, this service responded to over 1,600 technical inquiries of which over 90 percent were from Federal energy managers.

A full list of DOE's energy education, extension, and information services is Appendix F to this report.

II. ENERGY MANAGEMENT IN BUILDINGS AND FACILITIES

A. Energy Consumption and Costs for Buildings and Facilities

The Federal Government provides energy to approximately 500,000 buildings and facilities comprising approximately 3.1 billion square feet of floor area. This energy is used to provide lighting, heating, ventilation, air conditioning, and other standard building services, as well as a significant amount of process operations that are not reported separately.¹² 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.¹³ Section II(B) describes major legislative requirements and highlights agency progress in meeting goals. Section V of this report discusses individual agency efforts in greater detail.

Table 4 shows that agencies have decreased overall buildings energy consumption by 18.2 percent, from 470.9 trillion Btu in FY 1985 to 385.0 trillion Btu in FY 1994. A comparison to FY 1993 shows a decrease of 4.5 percent in total buildings energy consumption. The State Department's 83.1 percent increase from the previous year is attributable to the redesignation of some of its properties from the "excluded" category.

Of the 26 agencies represented on the table for FY 1994, 11, including DoD, consume over 98 percent of the reported buildings energy. Energy used in buildings accounts for approximately 32.1 percent of the total 1.20 quads used by the Federal Government. The mix of Federal buildings energy for Defense and civilian agencies is depicted in Figure 4. Electricity constitutes 40.4 percent (155.6 TBtu) of Federal buildings energy; 32.4 percent is accounted for by natural gas (124.5 TBtu), and 15.0 percent by fuel oil (57.6 TBtu). Small amounts of coal, purchased steam, liquefied petroleum gas (LPG)/propane, and "other" energy (comprised mainly of chilled water and renewable energy), account for the remaining 12.2 percent.

FIGURE 4
Defense and Civilian Energy Consumption in
Buildings and Facilities by Fuel Type, FY 1994

Figure 5 illustrates the proportion of energy consumption in buildings and facilities that is attributable to electricity for the fiscal years 1985 through 1994. 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 1994, electricity consumption, including energy used at the source

¹²Process 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 were part of the energy used for standard building services.

¹³The legislative authorities for Federal agencies and are detailed in Appendix A.

TABLE 4
FEDERAL ENERGY CONSUMPTION IN BUILDINGS AND FACILITIES
(In Billions of British Thermal Units, Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10¹⁵])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	% CHANGE 85-94	% CHANGE 93-94
DOE	32,923.2	31,763.7	30,510.1	31,795.4	28,875.0	29,186.2	27,875.9	28,859.8	30,500.8	28,482.4	-13.5	-6.6
VA	24,552.0	24,425.3	24,217.5	25,625.0	25,619.9	24,380.1	24,733.0	24,620.0	25,077.2	25,213.4	3.7	0.6
USPS	16,238.3	16,448.4	16,751.8	17,624.9	18,225.3	18,480.0	18,620.8	19,449.2	21,159.8	21,602.2	33.0	2.1
GSA	16,563.0	13,869.1	12,971.1	12,267.6	12,550.1	13,937.3	13,216.3	13,061.4	13,075.2	12,832.9	-22.5	-1.9
HHS	6,610.2	5,888.0	6,200.9	6,180.3	6,325.0	7,957.0	7,107.1	7,954.7	7,969.1	8,231.9	24.5	3.3
DOT	6,112.0	6,450.9	5,928.1	7,455.7	5,597.0	4,863.8	5,894.3	3,869.2	6,245.8	6,143.9	0.5	-1.6
DOI	4,713.7	3,752.5	3,664.6	3,878.5	4,073.2	4,039.4	3,886.2	3,173.4	3,974.3	3,922.1	-16.8	-1.3
DOT	4,112.1	5,168.4	3,928.4	3,951.8	3,368.5	3,750.4	3,297.6	3,918.0	3,886.6	3,903.0	-5.1	0.4
NASA	2,947.9	3,086.4	3,109.0	3,094.0	3,246.4	3,208.1	3,080.5	3,093.9	2,962.3	3,010.8	2.1	1.6
USDA	2,096.3	1,900.0	2,130.7	1,826.5	1,857.7	2,363.0	2,342.4	2,151.6	2,234.8	2,164.5	3.3	-3.1
DOL	2,153.0	2,179.3	2,153.2	2,230.7	2,191.1	2,137.1	2,044.1	2,063.7	2,145.8	2,158.3	0.2	0.6
TRSY	615.0	647.0	1,486.1	4,196.9	2,529.2	1,918.4	1,494.7	1,749.1	1,568.0	1,624.7	164.2	3.6
EPA	452.8	1,240.1	452.8	401.7	399.8	411.5	426.4	578.3	910.3	951.6	110.1	4.5
DOC	540.3	1,214.9	1,136.3	1,294.2	1,325.1	1,376.0	1,406.9	531.0	571.9	752.9	39.3	31.6
TVA	402.4	462.0	466.8	452.5	417.2	427.8	426.6	425.6	439.8	682.2	69.5	55.1
FEMA	96.1	253.9	157.9	171.5	192.5	215.1	198.4	204.1	188.3	172.9	80.0	-8.2
HUD	114.4	117.4	119.4	123.8	139.1	140.3	129.6	123.9	127.4	113.8	-0.5	-3.0
OFM	54.3	54.5	54.5	67.3	72.1	70.8	74.6	78.8	86.3	86.3	58.9	0.0
ST	232.1	248.7	275.3	263.9	264.2	267.7	274.2	273.8	45.3	82.9	-64.3	83.1
PCC	26.6	26.7	27.2	28.4	28.2	28.6	32.4	30.1	32.5	31.4	17.9	-3.4
FCC	11.2	11.8	12.6	13.1	12.1	14.8	14.9	13.4	12.9	14.1	26.6	9.0
OTHER*	218.6	290.8	362.7	391.1	437.0	412.6	230.8	235.5	151.3	144.6	-33.8	-4.4
CIVILIAN AGENCIES TOTAL	121,785.7	119,597.8	116,115.9	123,335.0	117,945.7	119,586.0	116,707.7	116,456.5	123,355.8	122,322.9	0.4	-0.8
DOD	349,076.7	327,583.1	351,882.9	319,876.4	322,205.6	321,101.6	286,865.7	295,719.8	279,726.5	262,661.5	-24.8	-6.1
ALL AGENCIES TOTAL	470,862.4	447,180.9	467,998.8	443,211.3	440,151.3	440,687.5	403,593.5	412,176.2	403,082.3	384,984.4	-18.2	-4.5
MBOE	80.8	76.8	80.3	76.1	75.6	75.7	69.3	70.8	69.2	66.1		
Petajoules	496.7	471.8	493.7	467.6	464.3	464.9	425.8	434.8	425.2	406.1		
ANNUAL CHANGE FROM 1985												
BBTU	-23,681.5	-2,863.6	-27,651.1	-30,711.1	-30,174.9	-67,268.9	-58,686.2	-67,780.1	-85,878.0			
MBOE	-4.1	-0.5	-4.7	-5.3	-5.2	-11.5	-10.1	-11.6	-14.7			
Petajoules	-25.0	-3.0	-29.2	-32.4	-31.8	-71.0	-61.9	-71.5	-90.6			
CUMULATIVE SAVINGS FROM 1985												
BBTU	23,681.5	26,545.1	54,196.2	84,907.2	115,082.1	182,351.0	241,037.2	308,817.2	394,695.2			
MBOE	4.1	4.6	9.3	14.6	19.8	31.3	41.4	53.0	67.8			
Petajoules	25.0	28.0	57.2	89.6	121.4	192.4	254.3	325.8	416.4			

DATA AS OF 07/20/95

*Other includes for certain years the Commodity Futures Trading Commission, Equal Employment Opportunity Commission, Federal Trade Commission, National Archives and Records Administration, National Science Foundation, Nuclear Regulatory Commission, Railroad Retirement Board, the U.S. Information Agency, and the Federal Energy Regulatory Commission.

Note: FY 1994 contains estimated data for the following agencies: Department of Treasury, Federal Trade Commission and Office of Personnel Management. 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: Agency Annual Energy Management Data Reports

FIGURE 5
Consumption of Electricity and Other Fuels
in Buildings and Facilities,
FY 1985 through FY 1994

¹Includes 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).

²Uses 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.

³Amount 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 11,600 Btu per kilowatt hour.

Source: Federal Agency Annual Energy Management Data Reports

of generation, accounted for approximately 69.2 percent of the total gross Btu consumed in buildings and facilities. Of this amount, approximately 29.4 percent or 155.6 trillion Btu reached the site of use. The remaining 70.6 percent, 373.3 trillion Btu, was lost during the generation and transmission processes.

Decreases in consumption relative to FY 1993 were seen in every energy type except for fuels reported under the category of "other," which increased 2.5 percent. Decreases from the previous year were evident in electricity (1.1 percent), natural gas (6.5 percent), LPG/propane (8.3 percent), fuel oil (7.2 percent), coal (8.4 percent), and purchased steam (2.5 percent).

As shown in Table 5, fuel switching and conservation of fuel oil and LPG/propane in buildings contributed to a 45.4 percent decrease in consumption of petroleum-based fuels in buildings compared to FY 1985 and a 7.3 percent decrease from FY 1993. These reductions are partially attributable to efforts by agencies to utilize natural gas as a cost-effective substitute for petroleum-based fuels in buildings. Petroleum fuel consumption in buildings during FY 1994 represented only 15.8 percent of all energy consumed in Federal buildings. Of this amount, 94.9 percent is attributed to fuel oil and the remaining 5.1 percent to LPG/propane.

The energy used in buildings in FY 1994 accounted for approximately 47.5 percent of the total Federal energy bill. Tables 6-A and 6-B show that the Federal Government spent approximately \$3,821.2 million for buildings energy during the fiscal year, a decrease of approximately \$91.8 million from FY 1993 expenditures. The average cost for buildings energy in FY 1994 was \$9.93 per million Btu, up 2.2 percent from the average cost of \$9.71 reported in FY 1993 (see Appendix C).

Figure 6-A illustrates energy expenditures for buildings and facilities in nominal current year dollars for FY 1985 through FY 1994. Figure 6-B depicts energy expenditures in constant dollars for the same period to address the influence of inflation. In constant 1987 dollars, Federal energy costs for buildings and facilities decreased 28.2 percent from \$4,218.0 million in FY 1985 to \$3,030.3 million in FY 1994. The average cost for buildings energy in constant dollars in FY 1994 was \$7.87 per million Btu, down 12.2 percent from \$8.96 per million Btu in

FIGURE 6-A
Energy Expenditures (Nominal Dollars)
in Buildings and Facilities FY 1985 - FY 1994

FIGURE 6-B
Energy Expenditures (Constant Dollars*)
in Buildings and Facilities FY 1985 - FY 1994

TABLE 5
PETROLEUM-BASED FUEL* CONSUMPTION IN BUILDINGS AND FACILITIES
(In Billions of British Thermal Units)

AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	% CHANGE 85-94	% CHANGE 93-94
DOD	96,817.3	85,607.3	90,403.2	78,345.1	70,701.8	69,030.1	59,451.5	65,654.1	55,585.9	50,285.7	-48.1	-9.5
VA	2,176.7	2,118.5	2,261.3	2,488.2	2,328.8	2,219.3	1,404.9	1,506.0	1,533.9	1,827.4	-16.0	19.1
DOE	1,650.8	1,257.1	1,488.0	1,547.1	1,757.1	1,953.8	1,978.2	2,034.7	1,942.8	1,924.4	16.6	-0.9
HEH	3,199.6	2,680.8	2,642.8	2,008.1	2,059.8	2,138.7	1,545.9	2,144.2	1,765.2	1,525.7	-30.6	-13.6
DOI	1,591.6	1,430.7	1,272.1	1,364.7	1,376.7	1,273.9	1,141.1	919.1	1,181.9	1,560.6	-1.9	32.0
USPS	1,673.2	1,591.6	1,556.3	1,602.6	1,855.7	1,502.2	1,219.4	1,195.8	988.8	983.7	-41.2	-0.5
DOT	2,363.4	3,564.0	2,107.2	2,100.0	1,534.8	1,524.2	1,308.4	1,426.0	854.8	1,001.6	-57.6	17.3
GSA	991.3	667.8	530.3	561.8	544.0	668.1	443.1	418.2	359.4	379.8	-61.7	5.7
DOL	437.8	414.5	427.0	387.3	194.5	331.2	258.3	263.6	276.1	277.5	-36.6	0.5
DOJ	381.7	363.4	467.3	970.3	310.8	371.6	503.7	383.8	250.8	234.8	-38.5	-6.4
TRST	22.5	25.4	172.9	294.2	319.3	281.3	127.7	84.2	190.5	160.8	615.9	-15.6
NASA	230.2	233.2	262.0	253.1	291.2	277.8	161.6	217.6	134.5	139.6	-39.4	3.8
USDA	414.2	260.7	191.0	206.4	229.1	260.0	291.3	242.9	255.6	236.3	-43.0	-7.6
DOC	130.3	95.5	78.9	85.1	36.8	77.6	13.1	9.8	23.8	52.4	-59.8	120.3
FEMA	56.7	62.8	73.2	77.0	77.8	72.3	59.1	66.9	67.6	49.1	-13.5	-27.4
EPA	36.9	25.5	14.8	0.0	0.0	0.0	0.0	1.9	15.5	33.6	-8.9	117.3
TVA	4.2	2.9	1.6	3.0	1.2	3.2	0.1	1.3	2.7	9.5	-18.6	27.6
FCC	1.7	1.6	1.4	1.7	1.5	1.9	1.0	1.3	1.3	1.3	-24.8	-2.1
USIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	N/A	N/A
EEOC	0.0	0.0	0.0	0.0	2.3	1.9	0.0	0.0	0.0	0.0	N/A	N/A
TOTAL	111,180.2	100,403.4	103,953.1	92,295.8	83,523.3	81,989.0	69,908.2	76,571.7	63,430.2	60,677.8	-45.4	-7.3

DATA AS OF 07/20/95

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

Note: FY 1994 contains estimated data for the following agencies: Department of Treasury, Federal Trade Commission, and Office of Personnel Management.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

TABLE 6-A
DEFENSE AND CIVILIAN FEDERAL COSTS FOR BUILDINGS ENERGY IN FY 1994
(IN MILLIONS OF NOMINAL DOLLARS)

	ELECTRICITY	FUEL OIL	NATURAL GAS	LPG/ PROPANE	COAL	PURCHASED STEAM	OTHER	TOTAL
DEFENSE	1,665.279	242.469	326.683	13.555	58.272	172.022	1.539	2,479.819
CIVILIAN	1,055.586	40.572	174.891	6.597	16.905	45.315	1.479	1,341.347
	-----	-----	-----	-----	-----	-----	-----	-----
	2,720.865	283.041	501.574	20.152	75.177	217.337	3.018	3,821.166

AVERAGE COST PER UNIT, BASED ON REPORTS FROM AGENCIES

ELECTRICITY	=	59.67	/ MWH
FUEL OIL	=	0.68	/ GALLON
NATURAL GAS	=	4.15	/ THOUSAND CUBIC FEET
LPG/PROPANE	=	0.62	/ GALLON
COAL	=	64.59	/ SHORT TON
PURCHASED STEAM	=	14.43	/ MILLION BTU
OTHER	=	5.84	/ MILLION BTU

DATA AS OF 07/20/95

42

Note: Contains estimated data for the following agencies: Federal Trade Commission and Office of Personnel Management.
Sum of components may not equal total due to independent rounding.

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

TABLE 6-B
CONSUMPTION AND COSTS OF FEDERAL BUILDINGS ENERGY
BY FUEL TYPE IN FY 1994, FY 1993, AND FY 1985 (NOMINAL DOLLARS)

FY 1994				
ENERGY TYPE	BILLIONS OF BTUs	COST PER MILLION BTUs	COST (IN MILLIONS OF DOLLARS)	
ELECTRICITY	155,572.8	17.4893	2,720.865	
FUEL OIL	57,569.3	4.9165	283.041	
NATURAL GAS	124,549.9	4.0271	501.574	
LPG/PROPANE	3,108.5	6.4829	20.152	
COAL	28,607.1	2.6279	75.177	
PURCHASED STEAM	15,059.7	14.4317	217.337	
OTHER	517.1	5.8362	3.018	
TOTAL	384,984.4		3,821.166	

AVERAGE COST PER MBTU = \$ 9.926

FY 1993				
ENERGY TYPE	BILLIONS OF BTUs	COST PER MILLION BTUs	COST (IN MILLIONS OF DOLLARS)	
ELECTRICITY	157,316.2	17.9084	2,817.278	
FUEL OIL	62,038.7	4.7752	296.246	
NATURAL GAS	133,168.2	3.7930	505.113	
LPG/PROPANE	3,391.5	6.2064	21.049	
COAL	31,213.7	2.0078	62.669	
PURCHASED STEAM	15,449.6	13.4765	208.207	
OTHER	504.4	4.7605	2.401	
TOTAL	403,082.3		3,912.964	

AVERAGE COST PER MBTU = \$ 9.708

FY 1985				
ENERGY TYPE	BILLIONS OF BTUs	COST PER MILLION BTUs	COST (IN MILLIONS OF DOLLARS)	
ELECTRICITY	144,427.3	16.6341	2,402.422	
FUEL OIL	107,595.7	5.9355	638.629	
NATURAL GAS	144,458.6	4.6144	666.597	
LPG/PROPANE	3,604.0	6.9170	24.929	
COAL	58,068.7	2.3472	136.296	
PURCHASED STEAM	7,998.2	11.2765	90.192	
OTHER	4,709.9	4.8185	22.695	
TOTAL	470,862.4		3,981.760	

AVERAGE COST PER MBTU = \$ 8.456

DATA AS OF 07/22/95

Note: FY 1994 contains estimated data for the following agencies: Department of Treasury, Federal Trade Commission, and Office of Personnel Management. 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

FY 1985. It should be noted that inter-year comparisons between FY 1985 and FY 1994 should be viewed with caution due to fluctuations in reporting and adjustments to yearly data by agencies excluding certain energy-intensive buildings and costs from their totals as provided for in section 543(a)(2) of NECPA.

Electricity costs of \$2,720.9 million represent approximately 71.2 percent of the total expenditures of \$3,821.2 million for buildings energy in FY 1994. Natural gas costs account for approximately 13.1 percent of the total, expenditures for fuel oil account for 7.4 percent, with the remaining 8.3 percent attributable to expenditures for LPG/propane, coal, purchased steam, and "other."

In FY 1994, the cost of all energy used in Federal buildings was \$1.23 per gross square foot. Of the \$1.23 spent per square foot Government-wide, \$0.88 was spent for electricity, \$0.16 was spent for natural gas, \$0.09 was spent for fuel oil, and the remaining \$0.10 was spent for purchased steam, coal, LPG/propane, and other fuels.

B. Progress Toward the Mandated Goals for Buildings and Facilities

Overall, the Federal Government reduced its energy consumption in buildings and facilities by 11.2 percent in FY 1994 compared to FY 1985 when measured in terms of British Thermal Units consumed per gross square foot (Btu/GSF) of floor area. Federal Government progress toward the 10 and 20 percent energy reduction goals of NECPA and Executive Order 12759 is illustrated in Figure 7. Table 7 illustrates the FY 1994 performance of the individual agencies in Btu/GSF compared to FY 1985. Contributing to the overall reduction of 11.2 percent were the percentage reductions made by the following agencies: 11.7 percent by the Department of Defense, 23.2 percent by DOE, 37.7 percent by the Department of Justice, 13.2 percent by the Department of Veterans Affairs and the Department of the Interior, 12.2 percent by the General Services Administration, 18.7 percent by NASA and 22.7 percent by the Federal Emergency Management Agency.

FIGURE 7
Progress Toward the Mandated Energy Reduction Goals for Buildings and Facilities, FY 1985–FY 1994

These 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 1994, 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

TABLE 7
FEDERAL BUILDINGS AND FACILITIES USE PER GROSS SQUARE FOOT,
FY 1985 AND FY 1994

	FISCAL YEAR 1985			FISCAL YEAR 1994			% CHANGE 1985-1994
	GSP x 10 ³	BTU x 10 ³	BTU/GSF	GSP x 10 ³	BTU x 10 ³	BTU/GSF	
DOE	73,093.1	32,923.2	450,429	82,347.0	28,482.4	345,882	-23.2
VA	123,650.0	24,552.0	198,560	146,250.0	25,213.4	172,399	-13.2
USPS	189,400.0	16,238.3	85,736	258,702.0	21,602.2	83,502	-2.6
GSA	196,341.4	16,563.0	84,358	173,353.9	12,832.9	74,027	-12.2
HHS	22,611.3	6,610.2	292,340	30,853.3	8,231.9	265,809	-8.7
DOJ	20,768.8	6,112.0	294,289	33,506.6	6,143.9	183,363	-37.7
DOI	54,140.8	4,713.7	87,064	51,926.5	3,922.1	75,532	-13.2
DOT	29,477.7	4,112.1	139,497	31,120.1	3,903.0	125,419	-10.1
NASA	11,509.0	2,947.9	256,140	14,465.0	3,010.8	208,145	-19.7
USDA	28,980.5	2,096.3	72,336	33,400.0	2,164.5	64,806	-10.4
DOL	18,268.3	2,153.0	117,852	17,506.1	2,158.3	123,287	4.6
TRSY	5,776.9	615.0	106,463	10,423.4	1,624.7	155,867	46.4
EPA	1,455.0	452.9	311,227	2,248.1	951.6	423,270	36.0
DOC	5,611.5	540.3	96,292	6,609.0	752.9	113,921	18.3
TVA	-4,886.6	402.4	82,357	8,245.8	682.2	82,736	0.5
FEMA	606.0	96.1	156,579	1,411.0	172.9	122,561	-22.7
HUD	1,432.0	114.4	79,878	1,432.0	113.8	79,478	-0.5
OPM	853.9	54.3	63,609	938.4	86.3	91,947	44.5
ST	2,597.0	232.1	89,390	872.0	82.9	95,115	6.4
PCC	492.5	26.6	54,079	512.4	31.4	61,288	13.3
FCC	121.0	11.2	92,182	124.8	14.1	113,141	22.7
OTHER*	1,098.6	218.6	198,982	1,820.8	144.6	79,442	-60.1
CIVILIAN AGENCIES							
TOTAL	793,171.9	121,785.7	153,543	908,068.2	122,322.9	134,707	-12.3
DOD	2,578,984.0	349,076.7	135,354	2,197,853.0	262,661.5	119,508	-11.7

TOTAL	3,372,155.9	470,862.4	139,632	3,105,920.2	384,984.4	123,952	-11.2

DATA AS OF 07/20/95

*Other includes the Federal Trade Commission, National Archives and Records Administration, National Science Foundation, Nuclear Regulatory Commission, Railroad Retirement Board, the U.S. Information Agency, and the Federal Energy Regulatory Commission.

Note: FY 1994 contains estimated data for the following agencies: Department of Treasury, Federal Trade Commission, and Office of Personnel Management. 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

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. Utility-sponsored demand side management programs were often pursued as supplemental sources of funding, as well as shared energy savings contract initiatives.

Other energy conservation activities include energy awareness programs featuring energy awareness seminars, the identification of no-cost or low-cost measures, the designation of building energy monitors, publication of materials promoting energy conservation, the procurement of energy-efficient goods and products, increased maintenance training, and increased engineering assistance.

Performance toward the goals of NECPA and Executive Order 12759 is measured using site-based conversion factors for electricity and steam consistent with the definition of "energy use" as defined in Executive Order 12759 as "energy used at a building or facility measured in terms of energy delivered to the building or facility." See Appendix D for equivalent source-based consumption.

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." 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, and the U.S. Information Agency. The National Science Foundation is also grouped under this category due to inconsistencies in its reporting.

In FY 1994, 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. Two agencies, the Department of Health and Human Services and the Department of Commerce, adjusted their baseline year consumption and GSF figures during FY 1988 to reflect GSA delegations. Much of the building space acquired by HHS is operated by the Social Security Administration. DOC added the Jeffersonville Federal Center to its data reports, which greatly increased its gross square footage. In addition, three Commerce Bureaus, the Bureau of Economic Affairs, the National Technical Information Service, and the Patent and Trademark Office, all became eligible for reporting in FY 1989 as a result of leasing delegation.

The Treasury Department's large increase in buildings energy consumption since FY 1985, is a result of the addition of the Internal Revenue Service delegated buildings to the Department's building inventory. Also contributing to the increase were the addition, in FY 1989, of the Office of Thrift Supervision's square footage and the GSA delegation of building management authority for the Financial Management Service. The energy consumption and square footage for these delegated buildings were included in GSA's FY 1985 reports.

Figure 8 illustrates the range of energy intensity in agency buildings measured in terms of Btu/GSF. DOE's high rate of Btu/GSF is the result of unmetered process energy reported under the buildings category. DOE estimates that approximately 80 percent of its building energy is consumed in unmetered process and production operations, with about 20 percent used for HVAC, lighting, and building services. If more than 80 percent of a facility's metered energy is dedicated to process operations, then the entire facility's energy is excluded from the buildings category. GSA's relatively low Btu/GSF results from the lack of energy intensive activities (i.e., laboratories, hospitals, etc.) in space under its control. The wide range of rates of Btu/GSF among different agencies is a result of the varying missions of the agencies as well as their varying criteria for excluding energy intensive facilities.

FIGURE 8
Range of Energy Intensity (BTU/GSF) in Buildings and Facilities by Agency in FY 1994

Note: Figure uses a conversion factor for electricity of 3,412 Btu/kwh.

C. Federal Building Energy Performance Standards

Federal agencies are subject to the provision of 10 CFR part 435 which sets forth interim building energy performance standards for new Federal buildings. These standards were issued under the Energy Conservation Standards in New Buildings Act of 1976, as amended, 42 U.S.C. 6831 *et seq.* In addition, Executive Order 12759 requires each agency to establish certification procedures to ensure that new Federal buildings are designed and constructed to comply with the standards.

DOE, in response to the Energy Policy Act of 1992, has analyzed the Council of American Building Officials Model Energy Code, 1992 and 1993; the current Federal residential standard, and the codified version of the American Society of Heating, Refrigerating, and Air Conditioning Engineers' Standard 90.2-1993 (Standard 90.2-1993). Based on these continuing analyses, DOE expects to propose a Federal residential standard during fiscal year 1995 that utilizes the Model Energy Code format and that contains those economically justified and technologically feasible requirements that are part of the current Federal residential standard, the Model Energy Code, and the codified version of Standard 90.2-1993.

The existing Federal commercial standard currently has a format similar to Standard 90.1-1989 and has more rigorous criteria than the provisions of that standard. The main difference can be found in the lighting requirements area, with the existing Federal commercial standard having

more stringent requirements. The Federal commercial code that will be published in the first quarter of FY 1995 is expected to be substantially similar to the current Federal commercial standard but in a codified form.

The proposed Federal residential and commercial energy-efficiency standards will be published in the Federal Register during FY 1995. The notices will also announce public hearings and a public comment period for interested parties to respond to the requirements of the standards.

Title V, subtitle H, of the Energy Security Act requires certain Federal agencies to reach a consensus regarding factors and data used for developing energy conservation standards for residential, commercial, and agricultural buildings. The Department of Energy (DOE) has endeavored to fulfill these requirements by developing common energy conservation standards for all new Federal buildings and by issuing life cycle costing procedures for use by Federal agencies in the assessment of energy conserving investments for buildings. DOE has also worked closely with HUD in coordinating the technical factors and data used to develop HUD's Manufactured Housing Standards and has committed to work closely with all Federal agencies to coordinate and upgrade the standards applied by these agencies to non-Federal buildings.

III. ENERGY INTENSIVE OPERATIONS IN FEDERAL FACILITIES

A. Energy Consumption and Costs for Energy Intensive Operations

NECPA 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 excluded/process energy. The reporting of energy used in excluded buildings assures that total Federal energy consumption is monitored.

The designation of excluded buildings is at the discretion of each agency. Currently, 14 agencies are excluding specific facilities from the NECPA goal: the Departments of Agriculture, Commerce, Defense, Energy, Justice, State, Transportation, and the Treasury, the General Services Administration, the National Aeronautics and Space Administration, the National Archives and Records Administration, the Panama Canal Commission, the Tennessee Valley Authority, and the U.S. Information Agency. Lists of the excluded buildings that have been identified by the agencies are included in Appendix E.

Table 8 shows that fuels consumed by excluded/process energy have increased 132.2 percent compared to FY 1985 and 31.5 percent over FY 1993. During FY 1994, the Department of Defense consumed 39.8 trillion Btu of excluded/process energy, 42.7 percent of all excluded/process energy used by the Federal Government. Some of the fluctuations in consumption of excluded/process energy resulted from agencies changing data collection and reporting procedures. The large increase in reported energy in this category for FY 1994 is the result of the first-time reporting by TVA of electricity used in power plants for station service use. TVA electricity consumption comprised 25.9 percent of the energy used in this category. The Department of Justice also commenced reporting energy consumption in its excluded buildings during FY 1994. Increases in consumption of excluded/process energy compared to FY 1985 is also partially attributable to DoD's reallocation, beginning in the FY 1988 reporting year, of energy previously reported in the buildings category to the process category. Also contributing to this increase was the Treasury Department's initial reporting of process energy in FY 1991. Treasury neither reported process energy prior to 1991 nor revised its building energy consumption prior to 1990 to exclude process energy. NASA began reporting process energy in FY 1989 and has revised its prior year data. USIA also began reporting energy under this category in FY 1989. USIA has not reported any process energy consumption for any prior years. GSA began reporting energy in excluded buildings in FY 1990 and has backed out this energy consumption from its FY 1985 buildings data. The Departments of Agriculture and Commerce both began excluding buildings where energy intensive activities occur 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 FY 1985 base year data only to reflect the exclusion of its energy intense facilities. The State Department and NARA began reporting excluded/process energy in FY 1993 and have not revised data for any prior years.

Energy used in energy intensive operations accounts for approximately 7.8 percent of the total 1.20 quads used by the Federal Government. Electricity constitutes 62.4 percent of the energy used in energy intensive operations; 20.6 percent is accounted for by natural gas, 6.9 percent by

TABLE 8
FEDERAL ENERGY CONSUMPTION IN EXCLUDED BUILDINGS/PROCESS OPERATIONS
(In Billions of British Thermal Units, Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10¹⁵])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	% CHANGE 85-94	% CHANGE 93-94
TVA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24,138.0	N/A	N/A
DOE	16,401.6	15,279.1	14,967.0	15,235.0	12,301.3	11,691.6	11,536.6	13,433.2	10,859.3	10,657.0	-35.0	-1.9
NASA	5,907.3	6,242.2	6,479.8	6,569.7	7,206.4	7,376.6	7,490.8	7,556.5	7,612.9	7,619.0	32.4	2.7
DOT	3,260.4	3,318.9	3,615.8	3,727.3	3,724.6	3,064.0	3,323.0	4,406.8	4,703.8	2,952.5	-9.4	-37.2
USDA	1,942.8	1,655.3	1,530.5	1,657.5	2,026.0	2,204.3	2,133.3	1,966.3	2,166.9	2,119.3	9.1	-2.2
DOC	938.6	0.0	0.0	0.0	0.0	0.0	0.0	976.6	770.8	1,110.2	18.3	44.0
GSA	623.6	0.0	0.0	0.0	0.0	160.6	746.2	677.6	994.6	1,060.2	70.0	6.6
OSIA	0.0	0.0	0.0	0.0	1,354.4	1,406.9	850.6	828.5	796.8	861.1	N/A	8.1
TRSY	0.0	0.0	0.0	0.0	0.0	0.0	1,026.8	814.1	923.7	771.8	N/A	-16.5
DOJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	668.4	N/A	N/A
NARA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	274.7	610.7	N/A	122.3
ST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	337.4	339.4	N/A	0.6
PCC	167.2	179.2	195.7	190.0	187.6	190.8	197.1	193.9	197.5	201.3	20.4	1.9
CIVILIAN AGENCIES TOTAL	29,241.4	26,674.8	26,778.8	27,379.5	26,800.3	26,094.6	27,304.4	30,855.5	29,638.4	53,309.6	82.3	79.9
DOB	10,857.2	11,449.9	11,890.3	42,284.8	36,792.9	39,209.1	56,372.1	67,913.1	61,159.3	39,781.4	266.4	-3.3
ALL AGENCIES TOTAL	40,098.6	38,124.6	38,669.1	69,664.3	63,593.2	65,303.7	83,676.5	98,768.6	70,797.7	93,091.0	132.2	31.5
MBOE	6.9	6.5	6.6	12.0	10.9	11.2	14.4	17.0	12.2	16.0		
Petajoules	42.3	40.2	40.8	73.5	67.1	68.9	88.3	104.2	74.7	98.2		
ANNUAL CHANGE FROM 1985												
BBTU	-1,974.0	-1,429.5	29,565.7	23,494.6	25,205.1	43,577.9	58,670.0	30,699.1	52,992.4			
MBOE	-0.3	-0.2	5.1	4.0	4.3	7.5	10.1	5.3	9.1			
Petajoules	-2.1	-1.5	31.2	24.8	26.6	46.0	61.9	32.4	55.9			
CUMULATIVE SAVINGS FROM 1985												
BBTU	1,974.0	3,403.4	-26,162.3	-49,656.8	-74,862.0	-118,439.8	-177,109.8	-207,808.9	-260,801.4			
MBOE	0.3	0.6	-4.5	-8.5	-12.9	-20.3	-30.4	-35.7	-44.8			
Petajoules	2.1	3.6	-27.6	-52.4	-79.0	-124.9	-186.8	-219.2	-275.1			

DATA AS OF 07/20/95

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

coal, and 7.2 percent by fuel oil. Small amounts of purchased steam, liquefied petroleum gas (LPG)/propane, and "other" energy account for the remaining 3.0 percent.

The energy used in energy intensive operations in FY 1994 accounted for approximately 12.1 percent of the total Federal energy bill. Table 9 shows that the Federal Government spent approximately \$975.3 million for excluded/process energy during the fiscal year. The average cost for excluded/process energy in FY 1994 was \$10.48 per million Btu, up 22.7 percent from the average cost of \$8.54 reported in FY 1993 (see Appendix C).

B. Statutory Background and Progress Toward Goals for Industrial Facilities

Under section 543(a)(2) of NECPA, buildings that house energy-intensive activities may be excluded from NECPA's performance goal for buildings. These buildings are listed in Appendix E. Most energy used in excluded buildings is process energy. Process energy is consumed in industrial operations, certain R&D activities, and in electronic-intensive facilities.

Executive Order 12759 expanded the scope of Federal energy management activities beyond the NECPA mandates by establishing goals for industrial operations. It required industrial facilities to increase energy efficiency by at least 20 percent by FY 2000 in comparison to FY 1985 to the extent that measures undertaken are cost-effective and minimize life-cycle costs. Executive Order 12902 changes this goal to require an increase in energy efficiency by at least 20 percent by 2005 as compared to 1990. Measures undertaken to achieve this goal must be cost-effective, and agencies are also directed to implement all cost-effective water conservation projects. The Executive Order goal applies to certain buildings currently excluded under NECPA where industrial operations are performed. During FY 1994, a working group of the Interagency Energy Management Task Force concentrated efforts on developing appropriate indicators for measuring performance under this goal.

The Department of Defense excludes two types of energy from the NECPA performance goal: process energy and "cold iron" energy. Process energy is used in facilities that perform production or industrial functions. "Cold iron" energy is used to supply power to Navy ships docked in port. Both types of energy are included in this report under the category of excluded/process.

The Department of Energy reports its use of metered energy in extensive experimental research and production processes under excluded/process energy. The metered process energy used by DOE includes energy consumed in: production nuclear reactors, industrial-type operations for weapons and nuclear fuel production, and research and development facilities such as experimental nuclear reactors and linear accelerators. Excluded/process energy totalled 10.7 trillion Btu in FY 1994, which represents 25.9 percent of all energy consumed by DOE. The use of excluded process energy by DOE in FY 1994 was 35.0 percent less than in FY 1985, and 1.9 percent less than FY 1993.

NASA excludes from the NECPA performance goal facilities which fall under its definition of mission-variable facilities. These highly specialized, energy-intensive facilities house space science experimental and testing activities, as well as some industrial operations. Examples are

TABLE 9
DEFENSE AND CIVILIAN FEDERAL COSTS FOR EXCLUDED BUILDINGS/PROCESS ENERGY IN FY 1994
(IN MILLIONS OF NOMINAL DOLLARS)

	ELECTRICITY	FUEL OIL	NATURAL GAS	LPG/ PROPANE	COAL	PURCHASED STEAM	OTHER	TOTAL
DEFENSE ¹	208.129	14.939	36.896	0.166	10.554	6.618	3.875	281.177
CIVILIAN ²	651.278	10.281	22.468	0.442	0.945	8.416	0.294	694.122
	859.407	25.220	59.364	0.608	11.499	15.034	4.169	975.299

AVERAGE COST PER UNIT, BASED ON REPORTS FROM AGENCIES

ELECTRICITY	=	50.51	/ MWH
FUEL OIL	=	0.52	/ GALLON
NATURAL GAS	=	3.20	/ THOUSAND CUBIC FEET
LPG/PROPANE	=	0.62	/ GALLON
COAL	=	44.22	/ SHORT TON
PURCHASED STEAM	=	9.36	/ MILLION BTU
OTHER	=	3.91	/ MILLION BTU

DATA AS OF 07/20/95

¹Includes DoD costs for process and cold iron energy.

²Includes DOE costs for metered process energy and energy costs for buildings excluded from performance measurement by DOC, DOJ, DOT, GSA, NASA, NARA, PCC, STATE, TRSY, TVA, USDA, and USIA.

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

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

wind tunnels driven by multi-thousand horsepower electric motors, launch facilities, space simulation chambers, space communication facilities, and research analysis centers.

The Department of Commerce excludes buildings operated by three of its agencies: the National Institute of Standards and Technology (NIST), the National Oceanic and Atmospheric Administration (NOAA), and the Bureau of the Census. NIST installations have been excluded because they 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.

Within the Department of Transportation, the Federal Aviation Administration excludes all buildings involved in implementing the National Airspace System Plan. These buildings house energy-intensive electronic equipment with the associated HVAC requirements to maintain an environment for reliable equipment operation.

The U.S. Information Agency designates domestic and overseas Voice of America Relay Stations as energy-intensive facilities and reports this consumption as process energy excluded from the NECPA performance goal.

A substantial amount of the Panama Canal Commission energy consumption is dedicated to process functions, primarily comprising the locks, industrial, and other canal ancillary or support facilities.

The GSA excludes from the NECPA performance goal 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. GSA's excluded buildings, due to these factors, could distort GSA's actual progress toward meeting the energy reduction goal.

Energy reported by the Treasury Department under the category of excluded/process energy is comprised mainly of industrial energy consumption by the Bureau of Engraving and Printing and the Mint.

The State Department excludes unique, special-use facilities with special security and operational requirements including the President's guest house, a computer facility, the International Chancery Center, and the Main State Facility.

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.

IV. 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 gasoline consumed by Federally-owned and leased vehicles and privately-owned vehicles used for official business, and the energy used in Federal construction.

Table 10 shows that in FY 1994, the Federal Government used approximately 722.9 trillion Btu of energy for vehicles and equipment, a decrease of 22.7 percent relative to FY 1985. DoD's vehicle and equipment energy consumption decreased 24.3 percent from FY 1985, while the civilian agencies increased consumption by 10.0 percent. Overall, vehicle and equipment consumption decreased 6.6 percent from FY 1993. Federal energy consumption in vehicles and equipment is at its lowest level since Federal agencies began reporting consumption in 1975. This is mainly attributable to decreased operations by the Department of Defense.

Jet fuel consumption accounted for 76.2 percent of all vehicle and equipment energy in FY 1994. In FY 1994 compared to the previous year, jet fuel consumption decreased 10.1 percent from 612.4 trillion Btu to 550.7 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 in order to lessen the growth of vehicle and equipment fuel consumption.

Increased mission activities accounted for higher levels of operations energy use by some agencies. The Commerce Department's significant increase in consumption during FY 1990 was due primarily to increased miles driven by Census personnel in conducting the 1990 Census. Energy consumption in DOC's vehicles has declined by 67.9 percent in FY 1994 from FY 1990.

Other fluctuations in consumption of vehicle fuels resulted from changes in data collection and reporting procedures. The significant decrease in vehicular fuel consumption compared to FY 1985 reported by the Department of Health and Human Services is the result of data collection difficulties which omitted from their reports fuel consumed by leased vehicles and privately-owned vehicles authorized for Government service after FY 1987. HHS reported no vehicles under the agency's control during FY 1990, FY 1991, and FY 1992.

TABLE 10
FEDERAL ENERGY CONSUMPTION IN VEHICLE AND EQUIPMENT OPERATIONS
(In Billions of British Thermal Units, Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10¹⁵])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	% CHANGE 85-94	% CHANGE 93-94
USPS	11,524.2	11,588.2	11,722.9	11,893.3	12,081.4	12,136.3	12,196.2	12,235.0	12,565.3	13,348.6	15.8	6.2
DOT	12,162.5	10,706.6	11,457.7	11,036.6	11,414.2	12,150.8	11,243.1	10,026.2	12,114.3	12,862.1	5.8	6.2
USDA	4,319.6	3,242.7	3,648.3	4,300.1	4,793.4	4,952.3	5,123.8	4,982.7	4,931.2	5,129.1	18.7	4.0
DOI	3,853.9	3,105.4	2,967.3	3,097.8	3,075.5	3,352.5	3,208.6	3,819.3	3,507.8	3,970.0	30.0	13.2
DOJ	2,064.0	2,141.8	2,195.3	1,983.3	2,152.3	2,097.9	2,124.0	3,675.1	2,835.9	3,451.3	67.2	21.7
TRST	2,155.0	2,055.1	2,193.3	2,921.9	2,713.2	1,473.3	1,655.7	2,065.2	2,420.9	2,161.0	0.3	-10.7
DOE	2,946.7	2,897.6	2,761.3	2,761.3	2,706.1	2,513.1	2,367.4	2,078.2	2,241.3	2,085.3	-29.2	-7.0
NASA	1,972.1	1,928.1	1,510.0	1,550.1	1,649.9	1,736.7	1,864.0	1,875.4	1,798.0	1,859.9	-5.7	3.4
DOC	1,010.2	1,059.8	1,008.2	1,228.7	1,534.1	3,100.3	1,315.2	995.5	995.7	995.2	-1.5	0.0
FCC	530.4	600.0	686.2	629.5	700.3	653.7	578.6	699.6	684.9	688.4	29.8	0.5
TVA	578.5	440.6	493.8	480.4	400.8	476.6	534.7	408.8	452.4	480.3	-17.0	6.2
VA	592.8	595.5	660.0	630.1	619.4	618.3	317.4	634.9	663.9	374.4	-36.8	-43.6
DOL	232.2	236.7	250.1	270.4	239.8	239.0	401.9	388.7	369.1	369.6	59.2	0.1
HHS	373.3	331.9	358.4	208.2	204.3	0.0	0.0	0.0	177.3	176.3	-52.8	-0.5
EPA	132.2	33.0	32.5	37.7	29.4	0.0	0.0	0.0	100.7	97.8	-26.0	-2.9
OPM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6	75.2	75.2	N/A	0.0
OSA	144.1	134.0	110.7	117.6	109.8	128.1	94.5	102.9	79.6	69.9	-51.5	-12.2
HUD	0.0	0.0	0.0	0.0	0.0	0.0	32.7	33.6	31.6	30.7	N/A	-3.0
FCC	12.4	9.6	11.7	9.3	8.6	9.1	7.2	7.5	7.2	6.6	-46.8	-8.6
ST	14.8	16.0	25.7	37.4	38.8	34.9	0.0	0.0	7.5	0.0	N/A	N/A
FEMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N/A	N/A
OTHER*	39.2	51.8	42.3	42.5	67.9	69.6	27.6	101.0	31.5	30.2	-23.2	-4.3
CIVILIAN AGENCIES TOTAL	43,858.6	41,064.3	42,140.3	43,334.0	44,538.1	45,641.4	43,092.6	44,088.9	46,091.3	48,262.8	10.0	4.7
DOD	890,679.9	883,768.6	916,766.0	803,594.2	915,445.1	881,345.1	926,033.6	740,357.2	727,887.2	674,597.5	-24.3	-7.3
ALL AGENCIES TOTAL	934,538.5	924,832.9	958,906.3	846,928.1	959,983.2	926,986.5	969,126.2	784,446.1	773,978.4	722,860.3	-22.7	-6.6
MBOE	159.4	158.6	164.6	145.4	164.8	159.1	166.4	134.7	132.9	124.1		
Petajoules	985.9	975.7	1,011.6	893.5	1,012.7	977.9	1,022.4	827.6	816.5	762.6		
ANNUAL CHANGE FROM 1985												
MBOE	-9,705.6	24,367.9	-87,610.3	25,444.7	-7,552.0	34,587.7	-150,092.3	-160,560.1	-211,678.2			
MBOE	-1.7	4.2	-15.0	4.4	-1.3	5.9	-25.8	-27.6	-36.3			
Petajoules	-10.2	25.7	-92.4	26.8	-8.0	36.5	-158.3	-169.4	-223.3			
CUMULATIVE SAVINGS FROM 1985												
MBOE	8,705.6	-14,662.3	72,948.0	47,503.3	55,055.3	20,467.5	178,559.9	331,120.0	542,798.2			
MBOE	1.7	-2.5	12.5	8.2	9.5	3.5	29.3	56.8	93.2			
Petajoules	10.2	-15.5	77.0	50.1	58.1	21.6	179.9	349.3	572.6			

DATA AS OF 07/20/95

*Other includes for certain years the Commodity Futures Trading Commission, Department of Housing and Urban Development, National Science Foundation, Nuclear Regulatory Commission, Office of Personnel Management, and the U.S. Information Agency.

Note: FY 1994 contains estimated data for the following agency: Office of Personnel Management.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

Figure 9 depicts the vehicles and equipment fuel mix within DoD and civilian agencies. Jet fuel accounts for 550.7 trillion Btu or 76.2 percent of the total energy usage in the category, with 18.8 percent attributed to diesel and distillate fuel, 4.1 percent to auto gasoline, and 0.9 percent to aviation gasoline, navy special, LPG/propane and other fuels, combined.

As shown in Tables 11-A and 11-B, the Federal Government spent \$3,251.9 million on vehicles and equipment energy in FY 1994, 26.6 percent less than the FY 1993 expenditure of \$4,430.4 million in nominal dollars. In FY 1994, the average price for all types of vehicles and equipment energy was \$4.50 per million Btu, down 21.4 percent from the \$5.72 reported in FY 1993. The average cost of gasoline to the Federal Government decreased 3.9 percent from \$1.03 per gallon in FY 1993 to \$0.99 per gallon in FY 1994. The unit costs for diesel/distillate fuel and jet fuel decreased 9.5 percent and 24.1 percent respectively. Lower unit costs combined with decreased consumption pushed the cost of vehicles and equipment fuels below the cost of buildings and facility energy for the first time in the Federal Government.

When compared to FY 1985 using constant 1987 dollars, energy costs for vehicles and equipment decreased 59.8 percent from \$6,417.5 million to \$2,578.8 million in FY 1994. During that same period, the Government's average cost for vehicles and equipment energy, in constant dollars, fell 48.0 percent from \$6.87 per million Btu to \$3.57 per million Btu.

Vehicle and equipment fuel costs in FY 1994 represent 40.4 percent of the Government's total energy costs of \$8.0 billion.

FIGURE 9
Defense and Civilian Energy Consumption in Vehicles and Equipment by Fuel Type, FY 1994

TABLE 11-A
DEFENSE AND CIVILIAN FEDERAL COSTS FOR VEHICLES AND EQUIPMENT ENERGY IN FY 1994
(IN MILLIONS OF NOMINAL DOLLARS)

	AUTO GAS	DIESEL	LPG/ PROPANE	AVIATION GAS	JET FUEL	NAVY SPECIAL	OTHER	TOTAL
DEFENSE	20.137	519.061	0.000	0.106	2,356.091	4.885	0.000	2,900.280
CIVILIAN	213.949	50.220	0.189	5.598	68.424	0.000	13.226	351.607
	234.086	569.281	0.189	5.704	2,424.515	4.885	13.226	3,251.887

AVERAGE COST PER UNIT, BASED ON REPORTS FROM AGENCIES

VEHICLES AND EQUIPMENT

AUTO GAS	"	0.99	/ GALLON
DIST/DIESEL	"	0.58	/ GALLON
LPG/PROPANE	"	0.58	/ GALLON
AVIATION GAS	"	1.19	/ GALLON
JET FUEL	"	0.57	/ GALLON
NAVY SPECIAL	"	0.32	/ GALLON
OTHER	"	3.50	/ MILLION BTU

DATA AS OF 07/20/95

Note: Contains estimated data for the following agency: Office of Personnel Management.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

TABLE 11-B
CONSUMPTION AND COSTS OF VEHICLES AND EQUIPMENT
ENERGY BY FUEL TYPE IN FY 1994, FY 1993, AND FY 1985 (NOMINAL DOLLARS)

FY 1994				
ENERGY TYPE	BILLIONS OF BTUs	COST PER MILLION BTUs	COST (IN MILLIONS OF DOLLARS)	
AUTO GASOLINE	29,635.0	7.8990	234.086	
DIST/DIESEL	135,980.5	4.1865	569.281	
LPG/PROPANE	31.1	6.0873	0.189	
AVIATION GASOLINE	600.9	9.4932	5.704	
JET FUEL	550,732.9	4.4023	2,424.515	
NAVY SPECIAL	2,097.1	2.3294	4.885	
OTHER	3,782.8	3.4965	13.226	
TOTAL	722,860.3		3,251.887	

AVERAGE COST PER MBTU = \$ 4.499

FY 1993				
ENERGY TYPE	BILLIONS OF BTUs	COST PER MILLION BTUs	COST (IN MILLIONS OF DOLLARS)	
AUTO GASOLINE	34,483.9	8.2702	285.187	
DIST/DIESEL	124,298.0	4.6284	575.300	
LPG/PROPANE	18.8	7.2140	0.136	
AVIATION GASOLINE	658.2	6.4394	4.239	
JET FUEL	612,366.2	5.8001	3,551.769	
NAVY SPECIAL	10.8	2.7397	0.030	
OTHER	2,142.4	6.4168	13.747	
TOTAL	773,978.4		4,430.407	

AVERAGE COST PER MBTU = \$ 5.724

FY 1985				
ENERGY TYPE	BILLIONS OF BTUs	COST PER MILLION BTUs	COST (IN MILLIONS OF DOLLARS)	
AUTO GASOLINE	50,484.7	7.5598	381.655	
DIST/DIESEL	169,412.1	6.0247	1,020.655	
LPG/PROPANE	149.4	7.0069	1.047	
AVIATION GASOLINE	1,882.3	11.9489	22.491	
JET FUEL	705,675.5	6.5094	4,593.559	
NAVY SPECIAL	6,695.9	5.5884	37.419	
OTHER	238.6	5.3939	1.287	
TOTAL	934,538.5		6,058.113	

AVERAGE COST PER MBTU = \$ 6.482

DATA AS OF 07/22/95

Note: FY 1994 contains estimated data for the following agency: Office of Personnel Management.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

B. Progress Toward the Reduction Goals for Gasoline and Diesel Consumption

Section 10 of Executive Order 12759 establishes an energy-efficiency goal for Federal vehicles. Each agency operating at least 300 commercially designed motor vehicles domestically is directed to develop a plan to reduce gasoline and diesel consumption by ten percent by FY 1995 in comparison to FY 1991. GSA, in consultation with DOE, issued guidance on October 14, 1992, to assist agencies in meeting this goal.

Table 12 shows Federal agency progress in FY 1994 in meeting the goals of section 10. Of the agencies reporting gasoline consumption, the level of consumption overall decreased 12.9 percent from 272.2 million gallons in FY 1991 to 237.1 million gallons in FY 1994.

Of the agencies reporting consumption of diesel fuel, the overall level of consumption decreased 14.7 percent from 1,150.0 million gallons in FY 1991 to 980.4 million gallons in FY 1994. DoD's 14.4 percent decrease in diesel consumption is the main contributing factor in this decrease. The high level of diesel consumption by DoD during FY 1991 is attributed to Desert Shield/Desert Storm operations. Diesel consumption data may include other types of off-road vehicles and equipment, in addition to on-road passenger cars and trucks.

Section 11 of the Executive Order establishes requirements for the acquisition of alternative fuel motor vehicles by the end of model year 1995. Agencies electing to use these vehicles receive credit toward meeting the vehicle energy efficiency goal. Information on Federal Government activities related to alternative fuel vehicles is included in the next section of this report.

TABLE 12
FEDERAL AGENCY PROGRESS TOWARD THE GOALS OF SECTION 10
OF EXECUTIVE ORDER 12759, FY 1991 and FY 1994

GASOLINE CONSUMPTION (THOU. OF GALLONS)				DIESEL CONSUMPTION (THOU. OF GALLONS)			
AGENCY	1991	1994	% CHANGE	AGENCY	1991	1994	% CHANGE
OSPS	72,152.0	89,257.6	23.7	DOJ	1,073,084.0	918,288.0	-14.4
USDA	37,949.6	36,805.1	-3.0	DOT	30,390.7	27,575.9	-9.3
DOJ	95,958.0	34,692.0	-63.8	USPS	22,907.0	15,799.5	-31.0
DOJ	14,260.1	19,760.7	38.6	PCC	3,869.0	4,741.3	22.5
DOI	17,834.8	16,771.5	-6.0	DOC	6,637.1	4,737.0	-28.6
DOE	8,594.9	9,495.5	10.5	USDA	2,201.7	2,305.0	4.7
TRSY	5,666.7	7,721.4	36.3	DOE	5,601.3	2,056.9	-63.3
DOT	5,591.2	5,006.1	-10.5	DOJ	775.2	1,560.8	101.3
NASA	2,576.0	3,274.0	27.1	DOI	1,514.2	1,195.9	-21.0
DOL	3,215.0	2,955.5	-8.1	TVA	1,791.0	886.8	-50.5
TVA	2,234.0	2,776.9	24.3	NASA	644.0	627.0	-2.6
VA	2,094.0	2,465.0	17.7	VA	401.0	478.0	19.2
DOC	2,525.0	2,143.0	-15.1	USIA	81.5	55.9	-31.4
HHS	0.0	1,384.3	N/A	EPA	0.0	38.9	N/A
EPA	0.0	724.8	N/A	HHS	0.0	22.9	N/A
OPM	0.0	601.7	N/A	TRSY	61.8	20.0	-67.6
GSA	756.2	559.2	-26.1	MRC	1.2	1.9	58.3
PCC	335.9	246.0	-26.8	FCC	1.7	1.0	-41.2
HUD	261.5	213.0	-18.5				
USIA	90.1	93.6	3.9	TOTAL	1,149,962.4	980,392.7	-14.7
EEOC	0.0	61.2	N/A				
FCC	55.8	51.8	-7.2				
NRC	35.5	20.2	-43.1				
TOTAL	272,188.7	237,080.0	-12.9				

Note: FY 1994 contains estimated data for the following agency: Office of Personnel Management.

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

Source: Federal Agency Annual Energy Management Data Reports

C. Alternative Fuel Vehicles

Alternative fuel vehicles (AFV) are designated and manufactured by an original equipment manufacturer or converted to operate as either a bi-fuel, flexible fuel, or dedicated vehicle. A bi-fuel vehicle has the ability to operate on either an alternative fuel or gasoline, whereas a flexible fuel vehicle has the ability to operate on a mixture of alternative fuel and petroleum-based fuels. Dedicated vehicles are designed to operate only on alternative fuel. The alternative fuels currently used by Federal agencies are: M-85 (85 percent methanol, 15 percent gasoline), E-85 (85 percent ethanol, 15 percent gasoline), CNG (compressed natural gas), LNG (liquified natural gas), LPG (liquified petroleum gas), and electricity.

Sections 301 to 311 of Title III of EPACT contain provisions affecting Federal fleets. These sections of EPACT expand and confirm the activities and goals of section 11 of Executive Order 12759. Executive Order 12759, section 11, requires that the Federal Government acquire the maximum number practicable of AFVs. To meet the requirements of Executive Order 12759, each Federal agency has developed a 5-year plan for introducing AFVs into its fleet. Section 303 of EPAct mandates the fleet requirements for new acquisitions to the Federal Fleet listed in the first column of the following table. With the Executive Order 12844 of April 21, 1994, the President has established even more aggressive goals for increased AFV usage. Under this Executive Order, each agency should exceed EPACT requirements by 50 percent for FY 1993 to 1995. The targets for Federal fleets under this order are listed below.

AFV Requirements for New Acquisitions in Federal Fleet

	EPACT	Executive Order 12844
FY 1993	5,000	7,500
FY 1994	7,500	11,250
FY 1995	10,000	15,000
FY 1996	12,500 ¹⁴	35 percent ¹⁵
FY 1997	16,667 ¹⁶	40 percent ¹⁵

Section 308 of Title III of EPACT requires agencies to measure the aggregate percentage of alternative fuel use in bi-fuel vehicles in their fleets. The Department of Energy, in cooperation with other Federal agencies, has revised the Annual Energy Management Data Report to include a section to report the number of alternative fuel vehicles in each agency's fleet and the alternative fuel used in these vehicles. This information will be collected for both dedicated and

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¹⁴ These figures based on DOE/CE-0362P. Section 303 of the EPACT states that 25 percent of all new acquisitions in 1996 must be AFVs.

¹⁵ DOE estimates.

¹⁶ This target based on DOE/CE-0362P. Section 303 of EPAct states that 33 percent of all new acquisitions in 1997 must be AFVs.

bi-fuel AFVs. The collection of the above information will begin with the FY 1995 report on Federal Government Energy Management and Conservation Programs.

Through its Interagency Fleet Management System (IFMS) and the Automotive Commodity Center, the General Services Administration plays a key role in the implementation of AFV legislation. GSA provides vehicles and support services to other Federal agencies through the IFMS. The IFMS accounts for approximately 25 percent of the total Federally owned inventory of 550,000 vehicles. During FY 1994, GSA procured 3,931 AFVs for the IFMS; the types and models of these are shown below. This brings the total AFVs procured for IFMS from FY 1991 through FY 1994 to 10,250. Direct AFV purchases by the Departments of Defense, Energy, Commerce, the Interior, and Agriculture accounted for 132 additional vehicles. In FY 1994, AFV purchases totalled 4,063 vehicles.

FY 1994 New Agency Vehicle Assignments by Vehicle Type (GSA Assigned)

MAKE and MODEL	FUEL	NUMBER PURCHASED
Dodge Spirit Compact Sedan	M85 Flexible Fuel	3,555
Ford Taurus Mid-Size Sedan	M85 Flexible Fuel	64
Ford Taurus Mid-Size Sedan	E85 Flexible Fuel	25
Dodge B250 8-Passenger Van	CNG Dedicated	105
Dodge B250 Cargo Van	CNG Dedicated	37
Dodge Caravan (Mini-van)	CNG Dedicated	120
Chevrolet Half-Ton Pickup Truck	CNG Bi-Fuel	25

Also within GSA is the Automotive Commodity Center, which is the central source for establishing Federal contracts with manufacturers for the purchase of vehicles. The Center handles the acquisition of all light and medium duty vehicles for all Federal agencies, including the IFMS. The Center, as part of its effort under the Alternative Motor Fuels Act (AMFA), developed specifications and procurement descriptions for the acquisition of AFVs with original equipment manufacturers (OEM).

The U.S. Postal Service continues to operate the largest CNG fleet in the country. In FY 1994, the Postal Service converted over 1,000 delivery vehicles to operate on CNG. The Postal Service now has 1,663 vehicles operating on CNG. The Postal Service received eight methanol vehicles in FY 1994 and has ordered five ethanol vehicles.

The Department of Energy has made efforts to provide the private and public sector with information on issues concerning AFVs. An Alternative Fuels Hotline (1-800-423-1DOE) was established in June 1992 to provide callers from Federal agencies, industry and the public with answers to questions on AFVs. By calling the toll free number, callers can request information on AFVs. In 1994, 7,346 calls were received. Most callers had questions concerning

conversions, especially vehicle conversions to AFVs, EPACT and Clean Air Act requirements, and tax incentives.

The public may also access the Alternative Fuels Data Center (AFDC), which is located at the National Renewable Energy Laboratory (NREL) in Golden, Colorado. The AFDC is the central repository for data from DOE's alternative fuel vehicle demonstration programs. The AFDC stores data on demonstration programs that receive funding support authorized by the AMFA of 1988. Information collected and provided by the AFDC includes:

- data on 600 government fleet vehicles;
- refueling site information for CNG, LPG, Ethanol, and Methanol;
- information on emissions, mileage, fuel economy;
- information on emissions, for flexible fuel vehicles running on alcohol fuels and gasoline;
- repair and maintenance logs of alternative fuel fleet vehicles;
- heavy duty and transit bus data for performance, emissions, fuel economy, and mileage;
- data on the Clean Fleet Program - run by Federal Express and South Coast Air Quality Management District (a study on five fuels).

Federal efforts to expand deployment of AFVs were boosted by the new Clean Cities Program. The Clean Cities Program, initiated by the DOE in September 1993, is a voluntary program designed to encourage fleet vehicle conversion to alternative fuel use while providing refueling and maintenance facilities for their operations. It encourages partnerships between fuel suppliers, vehicle manufacturers, consumers, fleet managers, utilities, environmental groups and Federal, state, and local government agencies. DOE supports Clean Cities participants through the placement of Federal vehicles and by maintaining two national hotlines and ten regional support offices. The Secretary of Energy made a commitment to enroll 25 Clean Cities by the end of calendar year 1994. This goal was surpassed and a total of 34 communities had been designated Clean Cities. DOE has established a number to handle inquiries from communities interested in joining the program: 1-800-CCITIES.

D. The Administrative Fleet

In August 1982, Executive Order 12375 set forth guidance for fuel efficiency standards for automobiles acquired by Federal agencies in accordance with the Motor Vehicle Information and Cost Savings Act, 15 U.S.C. § 2001-2012. The fuel efficiency standard for passenger vehicles (sedans and wagons) acquired in FY 1994 was 27.5 mpg. For nonpassenger vehicles acquired in FY 1994, the standard for light trucks was 20.5 mpg. The General Services Administration reports that the 17,796 passenger vehicles acquired by the Federal Government in FY 1994 achieved an average of 27.7 mpg, while the 19,970 newly-acquired light trucks achieved an average of 20.6 mpg. Vehicles designed for use in law enforcement, emergency rescue, and combat related missions are exempt from the fuel efficiency requirements.

V. FEDERAL AGENCY ENERGY MANAGEMENT ACTIVITIES

1. DEPARTMENT OF AGRICULTURE

Energy Efficiency Performance and Implementation Strategies

In FY 1994, the United States Department of Agriculture reported a decrease of 10.4 percent in Btu per gross square foot compared to FY 1985.

The USDA Energy Management Plan was revised to incorporate the requirements of Executive Order 12759 and was submitted to DOE in July 1992. Also in July 1992, the Plan was formally issued to USDA agency heads for implementation. Components of the strategy include increasing occupant awareness, properly maintaining building envelope and systems, implementing no-cost and low-cost energy conservation actions, and using energy-saving building operation procedures. In July 1994, the Agriculture Research Service (ARS) held a four-day energy conference and a task force developed an updated ARS Energy Management Plan. USDA is planning issuance of a new USDA Plan in June 1995.

Starting in FY 1994 and continuing into FY 1995, USDA is working to conduct a prioritization survey and to begin comprehensive audits of numerous facilities over 10,000 square feet. DOE's SAVEnergy audit program was requested in March 1994 to help conduct audits of numerous USDA facilities, including Forest Service (FS), ARS, Animal and Plant Health Inspection Service, and Soil Conservation Service (SCS) facilities. DOE reached an agreement with FS to conduct audits of 13 FS facilities in FY 1994, and more are expected in FY 1995.

Training

In FY 1994, agencies report that 88 employees received energy management training at a cost of about \$20,000.

Funding

USDA agencies and the Office of Operations (OO) expended about \$7.3 million on energy conservation improvements in FY 1994, excluding surveys. USDA implemented numerous energy conservation actions, such as roof and wall insulation, converting furnaces to natural gas, installing high efficiency fluorescent tubes and solid state ballasts, caulking, steam system repairs, motion sensor light switches, and repairs of HVAC equipment and systems under operations and maintenance activities. Examples of projects funded in FY 1994 include the following:

- Thermal Storage System, Sub-Central Plant (OO)
- Replace Court 3 Windows, South Building (OO)
- Energy Efficient Lights, Phase II, South Building (OO)
- Replace Court 6 Windows, South Building (OO)
- Replace Chiller No. 3, Ames, IA (ARS)
- Emergency Generator, Fargo, ND (ARS)
- Upgrade HVAC, Mandan, ND (ARS)
- Renovate HVAC and Boiler, Stoneville, MS (ARS)
- Insulate Main Building, Byron, GA (ARS)
- Solar Panels and Solar-Powered Pump, Beaverhead National Forest (FS)
- Energy Efficient Lights, Gallatin National Forest (FS)
- Replace Oil Furnaces with Gas, Lewis and Clark National Forest (FS)
- Replace (16) Windows with Thermal Windows, Apache-Sitgreaves National Forest (FS)

Energy Savings Performance Contracts

USDA conducted studies in FY 1993 to consider viable ESPC projects. In FY 1993, the Office of Operations conducted a study to determine the viability of constructing a chilled water plant (estimated cost \$10 million) to serve the Headquarters Complex under an

ESPC contract. This project is being considered further in FY 1995.

Demand Side Management

The Office of Operations is obtaining rebates from the Potomac Electric Power Company for lighting retrofits in the South Agriculture and Administration Buildings, as well as for a new thermal storage system. The simplest method of receiving rebates has been found to be as a credit on the utility bills. The USDA Plan encourages all USDA agencies to use DSM services, ESPCs, rebates, and incentives offered by utilities and other private sector energy services providers. USDA agencies report difficulties relating to the small size of some facilities, lack of utility DSM programs available, and lack of technical manpower to manage such efforts.

Vehicles

The Department's alternative fuel vehicle (AFV) procurement plan aggressively proposes acquiring hundreds more AFVs, as funding and vehicle availability permit. Between FY 1993 and 1995, USDA has acquired approximately 155 AFVs. This total includes acquiring original equipment manufactured vehicles and converting existing fleet vehicles. Alternative fuel types include E-85 and M-85 flexible fuel sedans, dedicated and bi-fuel compressed natural gas (CNG) trucks and vans, and a number of converted LPG trucks. USDA published and distributed a directory of 3,500 service stations that sell ethanol-blended gasoline.

The Department's Agriculture Property Management Regulations instruct agencies to implement vehicle sharing programs with co-located, and closely situated agencies and activities in the field. The objectives of this program are to maximize vehicle utilization and to reduce associated cost and fuel consumption through vehicle pooling and sharing. The regulations also require operators to perform routine energy-saving tasks: inspect vehicles annually, follow the manufacturer's recommended maintenance schedule, check tire inflations, and obey posted speed limits.

The Department of Agriculture is in the process of developing a Department-wide energy conservation and alternative fuel use outreach program. This program will include issuance of fact cards, to be placed in the vehicle, to remind operators of energy conservation measures, such as removal of unnecessary weight from truck beds and trunks, proper inflation of tires to manufacturer's recommended levels on the tire sidewall, and preventive maintenance. The program will also emphasize the need for acquisition of alternative fuel vehicles to adhere to the requirements of the Executive Orders and EPACT.

Environmental Activities

Under the Office of Operations design and construction program, older chillers are being replaced with energy-efficient non-CFC chillers, air handling systems are being cleaned and modified to improve energy efficiencies and indoor air quality, and PCB-contaminated light fixtures are being replaced with energy-efficient lights.

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2. DEPARTMENT OF COMMERCE

Energy Efficiency Performance and Implementation Strategies

In FY 1994, the Department of Commerce reported an increase in buildings energy consumption of 18.3 percent in buildings energy consumption in Btu per gross square foot compared to FY 1985.

The Department of Commerce is circulating for clearance a Department Administrative Order on Federal Energy Management. This document assigns responsibilities and provides program guidance on DOC's energy management program. Strategies include:

- Establish a program to comply with all Public Laws, Executive Orders, and Federal regulations concerning energy and water management and the use of renewable energy sources.
- Implement a Federal energy and water management program to reduce consumption and costs and achieve efficiency goals for buildings, facilities, and vehicles.
- Ensure that all new DOC-constructed buildings are designed and built in accordance with applicable energy performance standards.
- Use life-cycle costing methodology in all procurement decisions in the acquisition of energy efficient goods and services including retrofits, new building design, new building systems and the selection of leased buildings.
- Perform energy surveys on all buildings as funds and programs allow.
- Promote energy conservation through employee training and awareness outreach programs.

Activities at the Commerce Department bureaus and sub-agencies are identified below.

The nature of laboratory operations and required environmental conditions make the National Institute of Standards and Technology (NIST) an energy intensive facility and thereby exempt from meeting the goals in section 543(a)(2) of NECPA, as amended. In order to define specific energy reduction goals for the NIST facility, NIST plans to hire an energy conservation consultant to analyze the existing site conditions, determine realistic long-term goals, and recommend future conservation projects. NIST's immediate goal is to develop a comprehensive program to promote energy efficiency and reduce per square meter operating cost, through profitable investments and an energy saving performance contract, to the lowest practical levels. NIST continues to make every effort to ensure the most efficient operation of NIST buildings and equipment.

Development of a Site Utilities Master Plan includes a comprehensive site analysis to provide NIST with detailed energy conservation goals, cost-effective recommendations, and a technical plan and timeline for project implementation. The analysis will incorporate all possible variables, including: occupancy, energy bills, maintenance, cost/benefit and life-cycle economics, utility rebates, equipment performance data, project cost and financing alternatives, changing utility rates, environmental issues and comfort. Projects with a simple payback period of less than 1 year may be funded by the NIST facilities budget. Larger projects will be used to develop the basis for an energy savings performance contract.

The Capital Improvement Facilities Plan to build a new Advanced Technology Laboratory and renovate several existing laboratories is currently in the design stage. Consideration of the many design options, including natural daylighting, building envelope, building materials, building ventilation, and lighting controls, concerning energy conservation is being addressed and implemented as practical.

The Patent and Trademark Office (PTO) is currently reporting energy consumption for GSA-delegated buildings with leases that expire in 1996 and 1997. Consequently, DOC cannot justify spending for improvements because the payback periods exceed the terms of the lease. PTO's long-range housing plans include a combination of long-term leased and owned

buildings. Energy conservation will be a major consideration in the solicitation to acquire these facilities.

The National Technical Information Service (NTIS) reports energy consumption for one GSA-delegated leased facility. The current GSA schedule calls for NTIS relocation to a single site within 2 years, which makes it impractical for NTIS or its lessors to make major retrofit investments to reduce energy consumption. The draft solicitation ensures the new NTIS facility will comply with Federal energy performance standards.

At the Census Bureau, an energy audit was conducted by National Energy Management Institute of Indiana, and an ESPC survey was conducted by Rayback, Inc. The availability of funds and the cost-effectiveness will be factored in the decision-making process.

The Census Bureau completed more than 20 energy conservation projects, including lighting, air conditioning, controls, steam systems, insulation, windows, and others. Proposed projects include: electric motors, roof insulation, vestibules, expanding the energy management system, and others.

Funding

DOC obtains funding for projects from numerous sources. In some facilities where DOC is in GSA-delegated buildings, GSA provides funding and contract oversight. For example, \$5.8 million is approved in FY 1995 to replace lighting systems at the Herbert C. Hoover Building with new energy efficiency fixtures, electronic ballasts, and T-8 lamps. The project includes daylighting controls in offices with windows and motion/occupancy sensors in less frequently used areas. In addition, \$10 million is approved for FY 1995 to replace existing chillers with three energy efficient CFC-free chillers. The local utility company, Potomac Electric Power Company, is reviewing the application for rebates as part of their demand side management program.

Energy Savings Performance Contracts

Large projects identified as part of the NIST Site Utilities Master Plan will be used to develop the basis for an energy savings performance contract. At the Census Bureau, an energy audit and an ESP contract survey was conducted.

Demand Side Management

The National Oceanic and Atmospheric Administration (NOAA) is participating with the local utility company to obtain rebates for energy conservation projects at two sites where DSM programs are offered. Recently the utility company has reduced or eliminated rebates offered.

PTO has initiated discussions with Virginia Power regarding the utility company's three-stage audit program. Under this program, Virginia Power first does an audit of electric billings, and an analysis of customer's usage compared to the normal range. Next, Virginia Power performs on-site surveys and finally (if indicated) Virginia Power provides a recommendation based on life-cycle cost analysis.

The Census Bureau plans to achieve the energy efficiency goals by working with Public Service Indiana (PSI), the local utility company, to develop a program for DSM. The PSI has conducted an energy audit and provided recommendations to the Bureau.

Vehicles

Emphasis has been placed on the procurement of the most energy-efficient vehicles. Budget restrictions and program reductions have decreased the number of miles driven in agency-owned, commercially-leased, privately-owned, and GSA Motor Pool vehicles.

NOAA and NIST continue to procure alternative fueled vehicles through GSA. An attempt to procure natural gas-fueled vehicles failed, but GSA is currently attempting to find an alternate source.

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3. DEPARTMENT OF DEFENSE

Energy Efficiency Performance and Implementation Strategies

In FY 1994, the Department of Defense reported a decrease in its buildings and facilities energy of 11.7 percent in Btu per gross square foot compared to FY 1985.

Each component of the Defense Department has the responsibility for developing and implementing its own plan for meeting the mandated energy management requirements.

The implementation strategy of the U.S. Army is to give the major Army Commands and installations the flexibility to run their own individual energy programs. The general objectives of the Army is to improve energy efficiency and eliminate energy waste by investing in energy efficient technologies, installing energy monitoring and control systems, updating Architectural and Engineering Instructions design specifications, and using energy savings performance contracts and utility-sponsored demand side management incentives to leverage energy efficiency investment.

In April 1994, the Chief of Naval Operations (CNO) issued OPNAVINST 4100.5D in response to guidance and requirements contained in EPACT and Executive Order 12902. In May 1994, CNO issued its Navy Energy Plan. In August 1994, the Navy submitted its revised Shore Facilities Energy Implementation Plan to meet the requirements of Executive Order 12902 as well as outline a strategy to identify and implement a method and funding requirements to accomplish these requirements.

The Air Force uses a decentralized approach to implement energy conservation requirements. The Headquarters issues general policy statements to advise of requirements. Major Commands (MAJCOMs) are

expected to implement necessary actions to achieve the goals within their commands. MAJCOMs have initiated their own plans and work through energy steering groups to put more emphasis on energy programs. MAJCOMs encourage their bases to develop individual plans and work through their base level energy steering groups.

In February 1994, "Marine Corps Energy Conservation Campaign Plan" was published. This plan outlined the Marine Corps strategy for achieving the energy use reduction requirements. Headquarters Marine Corps has increased emphasis on energy awareness, improved communication with field activities and provided greater focus on identification and development of energy conservation projects. Marine Corps installations are continuing to update and issue orders tailored to their specific situations, update base Master Plans, establish Appraisal Boards to involve all activity personnel in the planning and oversight of energy management, and ensure design and construction criteria with life cycle cost analysis are integrated into the facilities acquisition process.

Improved operations and maintenance (O&M) activities are a critical element in the DoD energy management program.

O&M procedures are continually being reviewed and updated by the Navy to ensure efficiency and cost effectiveness. The Navy is pursuing an aggressive campaign to heighten the energy awareness and increase the training of all design, installation, operation, supply, and maintenance personnel.

Major O&M initiatives are occurring throughout the Air Force to reduce energy usage. Examples of operational changes include establishing a base-wide compressed work week schedule (Hill AFB), establishing no-heating/no-cooling seasons (Robins AFB), eliminating portable electric space heaters and stocking of energy efficient lamps (Wright-Patterson AFB), and removing small office refrigerators (Kirtland AFB). The Air Force continues to emphasize the direct link between equipment maintenance and energy conservation. Adequate training is emphasized to ensure personnel are trained in the correct maintenance procedures for their equipment. Emphasis has been placed on monitoring and maintaining major energy consumers such as central heating systems, lighting systems, and HVAC systems. Finally, Air Force bases are encouraged to actively pursue metering of all major energy consumers.

Throughout the Marine Corps, there is a continued emphasis on operation and maintenance of energy systems with the use of computerized programs and remotely located, automatic controls. Headquarters Marine Corps completed development of an artificial intelligence demonstration program at the Marine Corps Air Ground Combat Center in Twenty-nine Palms, California. This project provides central heating plant operators real-time monitoring of the central plant and diagnostics of efficiency degradation. The project has resulted in sustained operation at greater efficiency and provides continual training of the plant operators. The system will begin to be exported to other Marine Corps heating plants and utility systems in FY 1995. Development work in FY 1994 cost \$486,000.

Surveys

In FY 1994, the Navy spent nearly \$3.0 million for energy surveys and energy project development. The surveys concentrated principally on identifying lighting retrofits. Over \$186 million of potential projects (of all types) were identified, and the Navy is currently developing an execution plan for these projects.

In FY 1994, the Marine Corps spent nearly \$1.4 million for energy surveys. The 1994 surveys and studies addressed: lighting retrofits, steam system and condensate line replacement and insulation, gas line leaks, EMCS and direct digital control (DDC) feasibility applications, facility envelope insulation, window replacement, infrared analysis, high efficiency motors applications, and electrical distribution system upgrades.

Several Air Force MAJCOMs and bases have used auditing programs available from their local utility company where applicable. Some MAJCOMs use in-house personnel to conduct audits. Air Combat Command headquarters personnel use a four member Facility Energy Assistance Team to perform energy audits at their bases in conjunction with base energy managers. The Air National Guard completed full base comprehensive energy surveys at 22 bases and have 30 more planned for FY 1995.

Training

The Huntsville Division of the U.S. Army Corps of Engineers (COE) sponsored by the Center for Public Works conducted 10 one-week courses to train energy managers in FY 1994. The course meets the requirements of EPACT for trained energy managers. The COE Center for Public Works also conducted a workshop for energy managers and energy coordinators to provide information on funding for DoD Energy Conservation Investment Program (ECIP) and DSM programs in June 1994. The U.S. Army Logistics Evaluation Agency presented the

34-hour training course for Army Energy Coordinators at the Army Logistics Management College, Fort Lee, Virginia twice during FY 1994. Army personnel also participated in several professional development opportunities including the World Energy Engineering Congress.

The Navy conducted four sessions of an in-house energy management course. The course covered funding available for projects, a wide variety of technologies, energy data reporting and measurement, and presentations by Defense Logistics Agency, Pacific Northwest Laboratory, and activity energy managers. Input was solicited from successful Navy energy managers on redesigning the in-house course to comply with EPACT. In FY 1994, the Navy spent \$856,100 to train 382 energy managers in areas required by EPACT.

The Air Force conducted two training seminars in conjunction with base energy managers meetings. In four energy manager training classes, 150 energy managers were trained. Additional energy manager training classes are scheduled in FY 1995 and will be conducted as part of the Air Force Civil Engineer School's regular schedule. A new course was developed at Wright Patterson AFB to address energy efficiency.

As of the end of FY 1994 Headquarters Marine Corps has scheduled its second one-week seminar for installation energy managers for February 1995. Headquarters Marine Corps is continuing to fund energy training through the use of O&M funds by programming \$200,000 for energy training during FY 1995.

Funding

In FY 1994, \$50 million was available DoD-wide to be expended on projects programmed in the military construction-funded ECIP program. The criteria for prioritization for projects funded through ECIP is based on shortest discounted payback using the Federal life-cycle costing methodology. Projects are also evaluated for additional factors such as probability of savings longevity, technical maturity, use of renewable energy resources, and related environmental and mission support benefits. An additional \$59 million in O&M funds were dedicated DoD-wide to energy efficiency projects.

Energy Savings Performance Contracts

DoD has 11 energy savings performance contracts in place, three of which were awarded during FY 1994.

The Army has awarded five ESPC contracts to date. On January 31, 1994 a contract was awarded at Fort Polk, Louisiana to install closed loop ground source heat pumps at 4,003 family housing units. The contractor

will also concurrently insulate attics, add weather stripping and caulking, install low-flow shower heads and residential hot water desuperheaters, insulate water heaters, and retrofit interior and exterior lighting. The contract term is for 20 years with a contractor capital investment of \$18 million. The Army's projected share of savings is almost \$10 million (22 percent) with the contractor's share of savings projected at \$34 million (78 percent).

The other Army ESPC projects include:

- Replacement of a steam fueled absorption chiller with an electrical chiller at the Corpus Christi Army Depot, Texas. This contract was awarded in September 1988 and has a term of 25 years.
- Replacement of AC units, EMCS controls, lighting retrofit, shower head replacement, water heater insulation, and other energy conservation actions at Aliamann Housing Reservation, Fort Shafter, Hawaii. This contract was awarded in February 1991 and has a contract term of 15 years.
- Upgrade and expansion of a propane-air mixing plant to provide backup capability for natural gas system at Fort Stewart, Georgia. This contract was awarded in March 1992 and has a term of 15 years with a 5 year option.
- Installation of a propane-air mixing plant to supplement the natural gas system at Fort McPherson/Gillem, Georgia. The propane-air mixing plant permits Fort McPherson to buy interruptible rate natural gas during peak demand periods. The contract was awarded in July 1992 and has a term of 15 years with a 5 year option.

The Air Force has two ESPC projects in place both of which were awarded in FY 1994. The first phase of an ESPC project at Randolph Air Force Base, Texas has been completed. Awarded in February 1994, it involves relamping several large facilities with options to add other facilities. The first phase included changing out over 15,000 old, inefficient, fluorescent and incandescent light fixtures for a savings of 4.5 million kWh, netting over \$239,000 in energy savings. Phase II provides for follow-on negotiations of other electrical savings initiatives. Randolph's energy manager has already identified over 11,000 fixtures to replace in phase two. Initial estimates indicate saving of 3.4 million kWh and \$170,000.

An ESPC was awarded at Hill Air Force Base, Utah in early July 1994. This is a base-wide ESPC with

supplemental funding from the local utility company. Estimated savings are 44.2 million kWh (\$1.5 million) over a 5 year period and should reduce the base's peak load by 18 percent.

The Navy has two active ESPCs, one at Naval Training Center, Great Lakes, installed in November 1990, the other at Naval Air Warfare Center, Patuxent River, installed in February 1992. The Great Lakes project includes one building lighting retrofit and an EMCS for building air handlers, boilers and chillers. The Patuxent River project retrofits lighting in 52 administrative and community buildings.

The Defense Commissary Agency (DeCA) currently has two energy savings performance contracts in place: one for Miramar Naval Station Commissary and one for eight other locations in the San Diego area. Both contracts were transferred to DeCA for administration in March 1992. The contractor installed Edison 21 energy governors, reduced the number of light fixtures and reduced the watts of the remaining fixtures from 100 watts to 60 watts. The Government should achieve a gross annual savings of \$153,532. The Navy originally projected an energy cost savings of nearly \$1.7 million over the life of the contract.

Demand Side Management

Numerous actions were initiated within the Army to take advantage of utility DSM programs. Guidance was provided to major commands and installations for taking advantage of DSM opportunities. Meetings have been held with Commands and installations to expedite program implementation. A session covering DSM was added to the Energy Coordinator Course and the Energy Awareness Seminar program.

The Navy has negotiated a Basic Ordering Agreement (BOA) with San Diego Gas and Electric (SDG&E) Company for a DSM program at Marine Corps Base (MCB) Camp Pendleton. The BOA was selected for recognition in the National Performance Review. A San Diego area-wide lighting retrofit program is also underway with SDG&E. The Navy has participated with Southern California Edison, Pacific Gas & Electric Co., GSA, and other government agencies to take advantage of DSM programs with these utility companies. Agreements are in process with the Bonneville Power Authority (BPA) to permit naval activities to accept incentives from BPA. The Navy has held exploratory discussions with several utility companies to determine possible beneficial relationships. A pilot project with the new Southern California Edison ENVEST program is under consideration.

During FY 1994, the Air Force conducted ongoing activities with several electric and gas utility companies to develop mutually agreeable generic and project specific DSM contracts. A generic agreement between Sacramento Municipal Utility District (SMUD) and McClellan AFB, California was signed in which SMUD will provide partial funding, up-front financing and turn-key project work. Contract negotiations are in also advanced stages with Niagara Mohawk Power Corporation, Nevada Power Company, Pacific Gas and Electric Company and Southern California Edison for generic agreements.

The Air Force Academy has volunteered to be part of a Colorado Springs public utility company DSM pilot program for energy audits. Hanscom AFB is currently involved in a DSM program with Boston Edison to retrofit motors, lighting, and heating systems. The base is a member of the Boston Edison Energy Cooperative (local industries who agree to curtail electrical use during peak loads) and have received \$200,000 in rebates over the last 4 years. Eglin AFB is also pursuing a gas fired chiller DSM project with Oskaloosa Gas. A DSM project was initiated between McClellan AFB and its utility company to do lighting retrofits. The initial costs will be funded by the utility company which will recover costs by actual energy savings and monthly prorated billing based on the initial construction cost minus actual energy savings. Other bases including Edwards, Los Angeles, and Robins are working with their local utilities to develop similar saving opportunities. Patrick AFB and Cape Canaveral AFS have entered into a DSM effort with Florida Power and Light. The initial phase of the effort will retrofit lighting in the vertical integration building at Cape Canaveral. This retrofit when completed will save 2.8 billion Btu and \$42,500 dollars annually.

In September 1994, Dover AFB and Chesapeake Utilities signed an agreement whereby the utility will extend a natural gas main over 3 miles to a metering point adjacent to Dover's central heat plant. In return, Dover AFB will pay the utility \$420,000 to extend natural gas from the metering station to the central heat plant and convert two of the boilers there to primary natural gas firing, with #6 fuel oil firing as backup. Energy cost savings are estimated at \$500,000 annually over the first 5 years.

The Marine Corps Installations and Logistics Department assisted in the development of a pilot project developing a base-wide open scope ESP/DSM contract at MCB Camp Pendleton, CA. Marine Corps installations are receiving rebates and services from local utilities.

Vehicles

The Air Force greatly expanded its Alternative Fueled Vehicle (AFV) program in FY 1994. With over 675 Air Force-owned AFVs located at 14 installations, the Air Force has been steadily increasing its inventory of Compressed Natural Gas (CNG) vehicles along with infrastructure needed to support them. In addition to the 54 AFVs already bought with Air Force vehicle procurement funds, the Air Force anticipates being able to acquire approximately 700 additional CNG vehicles and 15 additional CNG stations utilizing FY 1994 funds available to the Air Force from the DoD Advanced Research Projects Agency (ARPA) and DOE.

On the infrastructure front, the Air Force has been successful in having the natural gas industry build CNG stations in Florida and Colorado by guaranteeing the fuel provider a given number of CNG vehicles will refuel at these facilities. Increased CNG infrastructure will permit additional vehicle requirements to be converted from gasoline and diesel to CNG in the future.

The Air Force has seven bases actively participating in ARPA's electric vehicle demonstration program by field testing a variety of vehicle types from sedans and pickup trucks to vans and shuttle buses. The bases are Edwards AFB, McClellan AFB, and Vandenberg AFB in California; Hanscom AFB, Massachusetts; Patrick AFB, Florida; Robins AFB, Georgia; and Hickam AFB, Hawaii. In addition, three electric pickup trucks were ordered through DOE and will be field tested at Wright-Patterson AFB, Ohio; Tinker AFB, Oklahoma; and Langley AFB, Virginia.

The Marine Corps continues to buy fuel efficient vehicles and substitute portions of its standard fuel Garrison Mobile Equipment fleet with alternative fuel and electric vehicles. The Navy is procuring state-of-art fuel efficient vehicles through GSA for replacement of an aging fleet. The Navy acquired, purchased, converted, and leased 1,010 alternative fuel vehicles during FY 1994. The Army leases all of its administrative vehicles through GSA, including alternative fuel vehicles.

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4. DEPARTMENT OF ENERGY

Energy Efficiency Performance and Implementation Strategies

During FY 1994, the Department of Energy reported a 23.2 percent reduction in buildings consumption in Btu per gross square foot compared to FY 1985.

The DOE Energy Management Plan was revised to incorporate the requirements of Executive Order 12759 and the Energy Policy Act. The new Energy Management Plan describes a comprehensive program to accomplish the goals and requirements of the Executive Order. Further revision is underway as a result of Executive Order 12902.

Operation and maintenance procedures are used to increase energy efficiency at DOE through efficient operation of buildings, improved preventive maintenance, and improved energy training for personnel. Examples include:

- Thermograph techniques to locate "hot spots" in energy systems;
- HVAC Maintenance Program
- Set back and shutdown of laboratory fumehood exhaust systems;
- Use of pre-engineered operating schedules to optimize chiller plant operations;
- An aggressive steam-trap inspection and replacement program;
- Annual boiler tune-up procedures.

Many DOE sites have also implemented a number of ongoing energy-saving measures such as: installation of EMCS, replacement of roofs, replacement of mercury vapor lamps with higher efficiency metal halide lamps where feasible, replacing old fluorescent lamps and ballasts with high efficiency lamps and electronic ballasts, installation of energy-efficient lighting with automatic on-off control systems, replacements of

building satellite boilers, and maintenance and upgrade of HVAC equipment and systems to optimize performance.

Examples of energy-efficiency projects funded and accomplished in FY 1994 include the following:

- The Fluorescent Lighting Replacement Project at the Headquarters Germantown Building, Germantown, Maryland was jointly funded by HQ In-house Energy Management and the GSA for approximately \$900,000, this project will reduce lighting consumption by 60 percent. The estimated annual savings are 2,454,503 Kwh and \$176,000. The local utility, Potomac Electric Power Company will provide a rebate of \$115,534.
- Reheat Control Design for the Headquarters Forrestal Energy Management and Control System (EMCS). Project cost is estimated at \$1.2 million and is projected to save 3.3 billion Btu per year.
- Replacement of electromagnetic ballasts with electronic ballasts, downlamping fixtures, and installation of motion sensors at Argonne National Laboratory-East (ANL-E) in Argonne, Illinois. This project's estimated cost is \$1.1 million with an estimated annual savings of \$228,900 per year. ANL-E also replaced an inefficient 800-ton CFC chiller with two 400-ton high efficiency chillers in building 200 at a cost of \$650,000 with estimated savings of \$85,600 per year. Also, a 1000-ton inefficient steam absorption chiller was replaced at a cost of \$710,000 with estimated savings of \$144,300 annually.
- Naval Petroleum Reserves in California (NPR-1) completely retrofitted all remaining T-12 four-foot standard fluorescent lamps to energy saving electronic T-8 ballasts and lamps. This project resulted in annual savings of 1,145,475 kWh and received a rebate of \$31,444 from the local utility company, Pacific Gas & Electric Company (PG&E).
- The Oak Ridge National Laboratory in Oak Ridge, Tennessee completed the direct digital controls project which will save \$350,000 annually in energy cost and recoup all investment cost in 3.1 years.

Funding

At DOE, funding for energy surveys in building and processes amounted to \$6.3 million in FY 1994, with

a total expenditure of \$47 million since FY 1978. Also during FY 1994, DOE invested \$18.6 million in 82 retrofit projects in building and metered process facilities. The anticipated savings in buildings from DOE's FY 1994 retrofit program is 780 billion Btu. Since the beginning of the retrofit program in FY 1977, 1,100 projects costing \$290 million were funded to reduce energy consumption and costs in buildings and metered process. The funded projects have a projected annual savings of 42.5 trillion Btu and \$101.4 million. These savings represent a 2- to 3-year payback.

Energy Savings Performance Contracts

Currently the Department has two energy saving performance contracts in place. Lawrence Berkeley Laboratory had one ESPC awarded in FY 1991. The scope of this project included a variable frequency drive on the main air handling system, automatic controls of central plant equipment, motor replacements, hot water valve replacements, lighting upgrades to T-8 lamps and electric ballasts, and LED exit signs.

The HQ Forrestal Building had an ESPC signed in FY 1993. The annual savings at DOE's Forrestal building will amount to approximately \$400,000 and over 6 million kWh. This ESPC is for 7 years. DOE's share of the savings will be \$108,000 in the first 3 years of the contract and increasing to \$339,000 in the remaining 4 years of the contract.

Demand Side Management

DOE sites continue to participate in utility company demand-side management programs. Examples of DOE sites participating in demand-side management programs include the following:

- NPR-1 received a rebate of \$208,822 from the local utility PG&E resulting from the Waterflood Flow Monitor project. This project results in energy savings of 9.5 million kWh annually. NPR-1 also received a \$184,000 rebate from PG&E as a result of the Waterflood Replacement Pump project. Installation of these high efficiency pumps saved a total of 5.4 million kWh annually.
- The Nevada Test Site (NTS) has implemented a load management scheme on selected buildings with plans for update/expansion of the existing system. NTS also participates in a rate management program with its local utility, The Nevada Power Company.
- During FY 1994 the Western Area Power Administration (WAPA) sponsored or co-sponsored workshops on demand-side planning, new load management technologies, load management for

smaller utilities, power quality, marketing, infrared cameras, electric heating, irrigation pump testing, power factor improvement, load analysis and monitoring, and lighting technology. These workshops are aimed at customers however, WAPA employees are encouraged to attend as participants or observers.

- The Hanford Site in Richland, Washington received six rebate checks totaling \$46,546 from their local utility. Also, the city of Richland provided \$163,000 to Pacific Northwest Laboratory at Hanford for its newest building, the Environmental Technology Building with energy features that reduce electrical consumption by 30 percent.

Vehicles

To meet the energy conservation goals of minimizing the use of petroleum products and decreasing gasoline and diesel fuel consumption by 10 percent by FY 1995, DOE has acquired more energy efficient vehicles and alternative fueled vehicles, downsized vehicles when appropriate, upgraded preventive maintenance programs, and implemented driver awareness training, and employee outreach.

Fleet vehicles in a number of locations were, or will soon be, converted from gasoline to methanol or dual fuel. Liquefied petroleum gas, liquefied natural gas, compressed natural gas, and electric vehicles are some of the other alternative fuels currently in use.

Environmental Benefits

Examples of environmental benefits at DOE during FY 1994 were, reduction of chlorofluorocarbons (CFCs) through projects to replace CFC chillers with new higher efficiency, non-CFC chillers, refrigerant recovery programs, safely disposing of obsolete fluorescent ballasts, and reduction of tailpipe emissions from the use of compressed natural gas vehicles at many of the DOE sites. The use of soy-based inks which are environmentally friendly are used in some DOE print plants. Site-wide recycling of aluminum beverage cans, batteries, paper products, and fluorescent lamps, are in existence at many of the DOE sites.

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5. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Energy Efficiency Performance and Implementation Strategies

The Department of Health and Human Services reported an 8.7 percent reduction in buildings consumption in Btu per gross square foot in FY 1994 when compared to FY 1985.

In 1985, HHS developed and implemented a Department-wide energy reduction plan. The operating divisions of HHS—Social Security Administration (SSA), Public Health Service (PHS), Health Care Financing Administration, and Office of the Secretary—have established implementation plans consistent with the provisions of legislative and Executive Order authorities.

During FY 1994, HHS accomplished energy savings despite the fact that new, energy intensive medical treatment equipment and laboratory operations continue to increase electrical usage throughout many HHS hospitals, outpatient clinics, laboratories, and research facilities. During FY 1994, HHS continued the successful implementation of many no-cost and low-cost energy conservation measures.

In FY 1994, the SSA undertook a number of energy efficiency activities which are described below.

- Replaced existing lighting in the Metro West Complex with energy-efficient T-8 lamps and high pressure sodium lighting. The project will save approximately \$280,000 annually in electrical and maintenance costs and 2 million kWh of electricity per year. The project was funded by GSA at a cost of over \$1.1 million and should provide a \$400,000 rebate from the utility.
- Replaced existing lighting in the Supply Building to energy-efficient T-8 lamps and high pressure sodium lighting. The project should save \$27,000

annually in electrical and maintenance costs and 275,000 kWh of electricity per year. The project was funded by GSA at a cost of \$57,000 and should provide a \$17,000 rebate from the utility.

- Replaced existing motors in the Operations Building with energy-efficient motors. The project should save \$17,000 annually in electrical costs and 171,000 kilowatt hours of electricity per year. The project was funded by GSA at a cost of \$55,000 and should provide a \$3,000 rebate from the utility.
- Installed new steam traps in many of its mechanical spaces at the Headquarters complex. SSA funded this project at a cost of \$23,000.

An employee energy efficiency campaign at SSA continues that includes articles in a monthly bulletin to explain SSA's energy conservation strategies and provides examples of how the employees can participate.

In FY 1994, the Public Health Service conducted the following activities:

- Upgraded lighting, replaced existing boilers and chillers, and other building service equipment with more energy efficient models as part of regular building upgrading.
- Some older, energy inefficient buildings were replaced with new buildings that have a strong design emphasis on energy efficiency.
- Installed thermal energy storage facilities and cogeneration equipment as part of major infrastructure renovations.
- Added insulation, installed thermally-efficient windows, upgraded lighting fixtures and other equipment in existing buildings.
- Converted the Parklawn Building in Rockville, Maryland, from a strictly oil based facility to a dual oil/natural gas operation.

At the Office of the Secretary of Health and Human Services, the following energy conservation activities have taken place in FY 1994:

- Expanded the use of motion sensor lighting controls throughout the Headquarters building.

- Updated the recently installed HVAC control and monitoring system.
- Used "free-cooling" whenever outside air temperatures permit to avoid the need for chiller operations when indoor temperature is too high.
- All public restrooms, conference rooms, and corridors utilize T-8 fluorescent tubes, electronic ballasts and motion sensors.

In an effort to meet energy management goals, the Health Care Financing Administration (HCFA) monitors the delegated HCFA-leased buildings daily to ensure lessor compliance with lease requirements, energy management requirements, and Federal Property Management Regulations for heating, cooling, and lighting.

Training

Operating divisions throughout HHS have sent policy managers, building managers and staff to a variety of training classes ranging from alternative fuels, lighting, controls, and demand-side management practices.

Funding

Components throughout HHS are developing plans for funding energy conservation projects. For example, SSA has received several million dollars from the GSA fund (\$1.4 million in FY 1994) for financing energy reduction projects. SSA also spent \$600,000 of its own funds on energy efficiency projects.

All HHS components have been instructed to develop energy conservation projects that will qualify for the DOE Federal Energy Efficiency Fund (two have been accepted for FY 1995). Components have also been instructed to prioritize energy efficient investments according to their savings-to-investment ratios.

Energy Savings Performance Contracts

SSA has technical and contracting employees fully trained in ESP contracting. Energy audits are currently being conducted to develop ESP contracts. In the next 6 years, many of SSA's delegated facilities will see extensive renovations as part of the SSA/GSA prospectus program. Many of the projects noted in the prospectus make ideal candidates for ESP contracts and are included in the overall plan.

PHS reports that a significant percentage of PHS facilities are facing the possibility of a major change in function (e.g., from office to laboratories) due to evolving agency missions. Many of the remaining buildings are scheduled or proposed for renovation or

replacement, due to age or increasing demand on the facilities. As a result, energy conservation planning is included with retrofit or renovation projects and not considered as long-term shared energy activities.

The Indian Health Service (IHS) has entered into discussions with the Navajo Tribe concerning the possibility of implementing an energy savings performance contract for IHS facilities on the reservation.

Demand Side Management

The Office of the Secretary of Health and Human Services received \$21,700 in rebates from Potomac Electric Power Company during 1994 for lighting conservation measures.

PHS's larger installations such as the National Institutes of Health and the Centers for Disease Control have had agreements with local utility companies for load shedding during peak demand. As standard operating procedure, plant operators monitor demand loads and minimize them whenever possible to achieve the lowest rate.

SSA Headquarters is actively participating in DSM rebate programs. SSA expects approximately \$400,000 in rebates in FY 1995 for projects awarded late in FY 1994 and FY 1995.

Water Conservation

SSA accomplished two projects in FY 1994 in the area of water conservation. The first was the installation of low flow aerators for faucets (\$23,000) and the second was the purchase of automatic flush valves for water closets and urinals (\$23,500). The aerators were installed late in the fiscal year and no data is available regarding the amount of water saved. Additional materials must be ordered to install the new flush valves. This project will be completed in FY 1995.

SSA has installed water meters on all cooling towers make-up lines at its Headquarters buildings. SSA receives a credit at the end of the year for water used in the cooling towers. In FY 1994, SSA earned a \$80,000 savings credit on its waste water bill.

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6. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Energy Efficiency Performance and Implementation Strategies

During FY 1994, the Department of Housing and Urban Development reported a 0.5 percent decrease in buildings consumption in Btu per gross square foot compared to FY 1985.

HUD aggressively pursues Energy Conservation Measures (ECMs), continuously reviewing operations to identify opportunities for energy savings. HUD submits energy ECMs to GSA for funding through their special energy fund for buildings which have been delegated to agency control. HUD's Office of Procurement and Contracts has accelerated the procurement process to award ECMs within the fiscal year they are proposed.

In FY 1994, HUD implemented the following energy conservation measures at its Headquarters Building:

- Replaced mercury vapor lights in the loading dock with high pressure sodium lights (funded by GSA), and
- Continued participation in Potomac Electric Power Company's (PEPCO) Electrical Load Curtailment Program.

With the implementation of the following future initiatives, including an energy savings performance contract, HUD expects to meet or exceed the mandated energy efficiency goals:

- Upgrade interior and exterior lighting,
- Install economizer,
- Replace chillers and cooling tower,

- Install direct digital controls,
- Improve lighting controls,
- Replace packaged air conditioning units,
- Install occupancy sensors,
- Replace emergency exit signs with LED,
- Install photovoltaic system,
- Install water conservation devices, and
- Install perimeter office lighting daylight controls.

HUD's Rideshare Assistance Program enables employees to be matched with compatible commuters to and from work. Program effectiveness is due to the Department's access to the Metropolitan Washington Council of Governments databank of over 10,000 registered commuters. Additionally, rideshare promotional fliers are prominently displayed in highly visible locations within the Department. During HUD's annual parking recertification period, carpool applicants are advised to complete a rideshare application to ensure having a needed replacement to meet membership requirements. There is a display of rideshare information available in the main lobby for employees and visitors. In June 1994, the Department implemented a nationwide transit subsidy program to encourage the use of mass transportation. Currently, Headquarters and 26 field offices are providing transit subsidies to 3,638 employees. Also, the Department's Office of Human Resources informs all new employees of the Department's rideshare and transit subsidy programs.

Training

Several key HUD personnel involved in energy conservation received Energy Savings Performance Contracting training through the Department of Energy.

HUD's energy coordinators during FY 1994 attended DOE's FEMP University which included classes on Life Cycle Cost Analysis, Federal Relighting Initiatives, Federal Energy Decision Screening, A Simplified Energy Analysis Method, and Energy Rate Analysis. Personnel also attended the 1994 Environmental Management Team '94 Conference and the follow-up workshop for energy savings performance contracting.

Funding

All energy conservation measures completed during FY 1994 were either funded through the GSA special energy fund for delegated agencies or HUD's Building Operations Repair and Alterations Funding. These projects were prioritized according to savings to investment ratio and payback period.

Energy Savings Performance Contracting

HUD is currently developing an ESPC solicitation which it plans to have out for competitive bid in FY 1995.

Demand Side Management

Each year since 1985, HUD has participated in PEPCO's curtailment load program (CLP). In addition, HUD operates its own CLP to not exceed a specified demand level. HUD also participates in PEPCO's rebate program and will receive rebates for the high pressure sodium lights installed at the Headquarters Building.

Vehicles

During FY 1994, HUD's overall vehicle inventory was reduced from 404 to 372. Gasoline consumption was also reduced by 10,593 gallons from the previous year. GSA's 12-point fuel reduction tips were issued to all field offices, along with instructions to follow the manufacturer's recommended schedule for tuneups and to use a multi-grade energy conserving motor oil. Additionally, the following steps are planned to meet HUD's 1995 fuel usage goal:

- Headquarters will implement a system to monitor the monthly status of vehicles to ensure energy conservation methods are being used.
- Switch to 21 methanol fueled vehicles for FY 1995.
- Streamline the Department's nationwide fleet of vehicles to reduce quantity and possibly engine size.
- Coordinate field activities so that directional trips and/or travelers go at the same time.

Nationwide, gasoline type vehicles were replaced with 93 methanol fueled vehicles. During FY 1993, HUD was successful in acquiring 84 methanol-fuel type vehicles through the GSA. During FY 1994, the Department was successful in acquiring an additional 9 methanol-fuel type vehicles. As the remaining 279 standard fuel vehicles reach their disposal timeframe, GSA is committed to replacing them with alternative fuel vehicles.

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7. DEPARTMENT OF THE INTERIOR

Energy Efficiency Performance and Implementation Strategies

In FY 1994, the Interior Department reported a decrease in energy consumption in buildings of 13.2 percent in Btu per gross square foot compared to FY 1985.

In July 1992, DOI instituted an Energy Management Plan for Buildings and Facilities which updated the Ten-Year Operations Plan developed under NECPA. The July 1992 Plan was updated further in December 1993. In FY 1994, a draft plan initiating the implementation of Executive Order 12902 was developed.

Bureaus continued to perform energy studies on major facilities. The studies have led to removal of electric space heaters and reinforcement of basic maintenance procedures to ensure that space heaters that are needed are in top operating condition, locking thermostats where cost effective, and turning off furnace pilots during the cooling season. Heightened awareness of energy management has led to employee suggestions including installation of greenplugs on equipment with 110 volt motors.

The Fish and Wildlife Service (FWS) completed pilot energy studies at three energy-intensive research installations in FY 1993. These studies pointed out the need for a more accurate, uniform, and cost-effective methodology for determining building and process energy consumption. In FY 1994, FWS developed a Process Energy Evaluation Model in a user-friendly format that was presented to the other bureau energy coordinators.

Operations and maintenance efforts continued to be aimed at identifying where high costs occur, determining their cause, and pursuing corrective action. A re-emphasis of basic maintenance on systems and machinery was part of the overall program to reduce energy consumption. Bureau maintenance management

systems help identify energy conservation opportunities and training programs will increase basic hands-on maintenance skills for facilities management staffs.

Awareness programs instituted in prior years were continued. Through an energy notice program, building occupants receive written notification of energy-consuming equipment such as lights, radios, and fans that have not been turned off through random surveys and scheduled inspections. DOI also has a computerized ridesharing program.

Training

The Bureau of Land Management held its first energy coordinators meeting in Boise, Idaho, in May 1994. The Bureau of Reclamation sent most of its energy managers to the DOE-sponsored Federal Energy Decision Screening training. The Bureau's Provo Area Office developed a short video on value landscaping and water conservation.

DOI estimated expenditures for training totaled \$35,000 and included courses from DOE's Federal Energy Management Program University and courses for those qualifying for trained energy manager status. Scarce resources has precluded additional training.

Funding

DOI funded \$1.66 million in retrofit and capital equipment for FY 1994 and estimates funding of \$600,000 for FY 1995. As in previous years, DOI funding for retrofit and capital improvements result from expenditures from the bureaus' operations, maintenance, construction, and rehabilitation funds. Energy surveys have been conducted by contractors, utilities in conjunction with demand side management services, and utilizing in-house expertise. Surveys have identified additional energy conservation opportunities and retrofit projects with implementation costs far exceeding the estimated funding for FY 1995. Maintenance projects are reviewed for their relation to energy conservation measures and a high priority is placed on those projects that would result in reducing energy consumption. Projects requiring procurement actions are subject to value engineering procedures.

Energy Savings Performance Contracts

DOI's procurement offices, architect and engineering divisions, and facility managers are the management structure for implementing energy savings performance contracts. They are expected to assist each other in specifying the requirements of the projects, qualifying

contractors, and awarding contracts. Presently there are no ESPCs in place so procedures for use of the cost savings have not been developed.

Problems identified by DOI in implementing ESPCs include the lack of buildings with the economies of scale necessary to attract a contractor's interest. DOI owns many relatively small buildings, some of which are in poor condition and have low energy consumption. These buildings have low potential for an ESPC.

Demand Side Management

Participation in utility DSM programs continued in FY 1994. In August 1993, the Fish and Wildlife Service (FWS) published "Demand Side Energy Management Guidelines." The guidelines, intended to assist regional FWS personnel to obtain DSM services from utilities, were distributed throughout the Department. In addition, literature on rebate programs and other services offered by utility companies was distributed to the bureaus.

Vehicles

In FY 1994, DOI had a fleet of little over 33,000 vehicles, though the precise number of vehicles at any one time fluctuates due to seasonal requirements, with continuous disposal and acquisition of vehicles throughout the year. DOI coordinated with other agencies, utilities, and automobile manufacturers to plan and facilitate the introduction of alternative fueled vehicles (AFVs) into its fleet and to establish infrastructure support, as well as plans to reduce DOI's dependence on petroleum. DOI designated the Presidio of San Francisco as its first Clean Transportation Zone, as defined through an interagency agreement with DOE, the Departments of the Army and Transportation, and GSA. As a Clean Transportation Zone, the Presidio will be a proving ground for testing energy-efficient transportation systems and technologies for AFVs. In addition, DOI, through the assistance of DoD's Advanced Research Projects Agency and one of its regional consortium, acquired Interior's first electric transit vehicle at the Patuxent National Wildlife Research Center.

As of November 1994, DOI bureaus operated a total of 345 AFVs. This represents an increase of 94 AFVs in DOI's fleet since April 1994. DOI's AFVs dedicated to operate on compressed natural gas (CNG), and those that can use methanol (M-85) and ethanol (E-85) are leased through GSA. In addition, vehicles in the fleet that have been retrofitted to use CNG or liquefied petroleum gas (LPG) are DOI-owned vehicles. The use of blended and alternative fuels, and improved vehicle efficiency resulted in the average mile per gallon for the DOI fleet in FY 1994 increasing to about 16.5 miles

per gallon, an improvement over the FY 1991 average of about 14.8 miles per gallon.

DOI will continue to emphasize fuel conservation by employing a diverse strategy based on the assumption that no single method or action will enable DOI to meet its goal. A combination of strategies is being implemented at all organizational levels. The strategies include:

- 1) management support;
- 2) vehicle energy conservation planning and guidance;
- 3) introduction of AFVs, identification of convenient fueling infrastructure, and participation in DOE's Clean Cities program;
- 4) employee awareness;
- 5) program incentives; and
- 6) program oversight and evaluation.

The extent and the timeliness in which these strategies are carried out will depend on the availability of funding, new AFVs produced by the auto manufacturers, convenient AFV fueling and servicing infrastructure, and government and non-government organizations to partner with DOI on energy conserving and AFV initiatives.

Environmental Activities

Recycling programs are in effect in many bureaus. Bureaus continued their implementation of affirmative procurement programs. FWS's program included procurement of cement and concrete containing fly ash, recycled paper and paper products, lubricating oils containing recycled oil, retread tires, and buildings insulation products containing recycled materials. The FWS "showcase" facility, the National Education and Training Center, West Virginia, will be built to specifications including requirements for the use of fly ash in the cement, reclaimed metals in the metal roof and siding, and recovered materials in the insulation.

Wherever possible, environmentally-compatible non-chlorofluorocarbon (CFC) materials or CFC substitutes are recommended for use in heating, ventilating, and air conditioning systems. Disposal of obsolete fluorescent ballasts is in compliance with local environmental regulations for solid waste disposal.

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8. DEPARTMENT OF JUSTICE

Energy Efficiency Performance and Implementation Strategies

In FY 1994, the Department of Justice reported a decrease of energy consumption in buildings of 37.7 percent in Btu per gross square foot compared to FY 1985.

By April 1995, the Department of Justice intends to update the existing energy management and conservation plan for dissemination to its bureaus. The revised plan will include the requirements established by Executive Order 12902, Energy Efficiency and Water Conservation at Federal Buildings. The Department also will develop the required plan to implement all energy and water conservation measures with a 10-year or less payback. Requirements outlined in Executive Order 12902, such as developing a plan to implement audits of all required facilities within a 10-year period, also will be incorporated and developed under the Department's energy conservation strategy. The Bureau of Prisons has updated portions of its facilities operations manual to reflect changes necessitated by the passage of EPACT.

Energy surveys and comprehensive audits, as also required by Executive Order 12902, began in FY 1994 and will continue until all required Department facilities have been audited. Additionally, a plan will be prepared to ensure that all required facilities receive a comprehensive audit/survey in a 10-year time frame.

In GSA-delegated buildings and Bureau of Prisons facilities, the Justice Department O&M procedures are based on a computer software package detailing preventive maintenance (PM) and O&M on building systems and equipment. These PM packages are designed to ensure maximum efficiency of equipment/building system operation, thus conserving energy to the maximum extent practical. In delegated buildings, GSA approves the PM package utilized.

The Justice Department procures goods and products in accordance with current Federal Acquisition Regulations and GSA supply/service regulations, policies and guidelines. The Department regularly receives GSA and commercial vendor literature and product catalogs which contain energy-efficient goods and products. Energy-efficient products are purchased based on a life-cycle methodology.

The Justice Department has undertaken numerous actions to ensure energy efficiency in newly-constructed buildings. The Federal Bureau of Investigation is working closely with the architect and engineering firm designing the new Identification Division facility under construction in West Virginia. Many energy-efficient concepts have been included in the design of that facility. The design of the new Washington, DC facility will be undertaken with a similar emphasis on energy efficiency, as well as including this project in the Potomac Electric Power Company's (PEPCO) efficient new building program. Also, the Main Justice Building in Washington, DC, is scheduled to receive a prospectus-level modernization by GSA in FY 1997. Energy-efficient systems and equipment will be installed where practical.

DOJ has the capability to network with the Washington Metropolitan Council of Governments computerized program to assist personnel in obtaining carpool/vanpool information. This year, the Department Employee Transportation Coordinator served as Government representative on a committee to select software to bring the existing system forward to the year 2000. A recent analysis of the Department's Rideshare program has shown a considerable increase in placement of applicants. Currently, the placement figure has increased from 33 percent to approximately 75 percent of all applicants. Quarterly checks with applicants have shown the value of the program. Although the applicant numbers may vary, continued support of the Ridesharing Program indicates that Department employees are being informed and are interested in this program.

Training

Due to budgetary constraints, the Department has limited funds to expend on any training activities, including energy management. The Department does, however, attend low- or no-cost classes (DOE/FEMP-sponsored classes, GSA classes) whenever possible. Notification of such classes are immediately passed on to the Department's bureaus in order for their energy managers to attend. Also, energy conservation is a topic during

the bi-annual Bureau of Prisons facilities management training course.

Funding

Funding requests for energy conservation retrofits and capital equipment requirements are considered on a case-by-case basis. Projects are prioritized in order of emergency, life and fire safety, mission operational, or maintenance necessity. Consideration is given to life-cycle cost effectiveness, equipment condition, savings-to-investment ratio and initial costs. The Justice Department also continues to seek funding from other agencies (GSA and DOE) to accomplish energy saving projects and energy audits.

Energy Savings Performance Contracts

The Bureau of Prisons has entered into a Cooperative Research and Development Agreement (CRADA) with the National Renewable Energy Laboratory and Industrial Solar Technology, Inc. The CRADA is administered through the Construction Contracting Section of the Central Office. The end result of this CRADA will be an energy savings performance contract. The ESPC will be utilized for the domestic hot water provided at several locations within the Federal Correctional Institution, Phoenix, Arizona. In order to verify savings of this ESPC, meters will be installed to measure the amount of energy delivered with consideration given to the cost of acquiring this energy from the local utility provider.

Demand Side Management

The Federal Bureau of Investigation J. Edgar Hoover Building (JEH) and the Main Justice Building currently participate in a PEPCO load curtailment program. The Main Justice Building and JEH buildings also continue to participate in PEPCO's rebate program. The Bureau of Prisons has a number of institutions that have been able to receive equipment and materials at discounted prices through major utility companies throughout the nation. Other institutions have received utility audits aimed at the conservation of particular fuels. The Bureau also has implemented efforts to purchase "spot gas," resulting in monetary savings.

Vehicles

The Justice Department vehicle fleet consists of law enforcement, surveillance, or emergency and special vehicles that are exempt from the requirements of this section. There are 30 vehicles within the fleet that are fueled by M85 or compressed natural gas and 5 electric vehicles used on a limited basis. The vehicles were leased through GSA's Interagency Fleet Management System on a test basis to evaluate the future possibilities of alternative fuel vehicles as law enforcement assets. Due to the unique characteristics required for fleet law

enforcement vehicles, alternative fuel vehicles do not meet the Department vehicle requirements to be in any significant number at this time. The Department continues to participate on interagency committees and symposiums for alternative fuels and keeps abreast of any advancements in alternative fueled vehicles for possible inclusion in the general fleet at a later date.

Environmental Activities

The Department is consistently aware of environmental matters as they relate to energy conservation activities. Where asbestos is present during energy retrofits, it is handled according to current safety regulations. Engineers in the Main Justice Building are proceeding to obtain certification in the handling of chlorofluorocarbons from GSA.

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9. DEPARTMENT OF LABOR

Energy Efficiency Performance and Implementation Strategies

In FY 1994, the Department of Labor reported a 4.6 percent increase in buildings consumption in Btu per gross square foot compared to FY 1985.

The component agencies within the Labor Department energy management program are: the Employment and Training Administration Job Corps Centers (JCC), located throughout the country, the Frances Perkins Building (FPB), which is the DOL headquarters in Washington, DC, and the Mine Safety and Health Administration (MSHA) Training Academy in Beckley, West Virginia, and the Approval and Certification Center in Triadelphia, West Virginia.

In FY 1994, DOL focused on the installation of energy-efficient lighting and lighting controls to complete those known energy saving opportunities for lighting at FPB, its largest building. In this regard, GSA replaced the T12 lamps and ballasts with a variety of T8 models in all lobbies, corridors, offices, and lavatories. To complement GSA's efforts, DOL installed occupancy sensors in common-use areas which are sporadically used. DOL also began installing occupancy sensors in the 1,000 individual offices throughout FPB. To date, FPB lighting retrofits save almost 16 billion Btu of electricity each year. Finally, FPB began converting the 150 and 250 watt incandescent lamps in the exterior overhangs to 52 watt compact fluorescent units, and will finish installation during FY 1995. Since all the known lighting retrofits will soon be completed, FPB will redirect efforts to those energy saving projects identified in the energy audit currently underway.

Over the next few years, DOL plans to relocate 9 JCCs and build 12 new JCCs. DOL estimates that the increased size of the relocated JCCs and the new JCCs will increase DOL's total GSF by 16 percent but only

increase our overall consumption by 11.2 percent as compared with FY 1985. The very moderate increase in energy consumption is achieved by applying all Federal energy efficiency standards to new construction and major rehabilitation projects.

DOL began two comprehensive energy audits during FY 1994 at the DOL Headquarters facility and the Glenmont JCC. These two facilities represent 11.5 percent of DOL's total gross square footage (1,800,000 and 206,821 GSF, respectively). These facilities were selected for the first audits because of their known energy saving potential. In the future, comprehensive audits will be prioritized using the results of the survey required by section 302(a) of Executive Order 12902.

DOL facility managers also worked to reduce energy waste while maintaining acceptable tenant comfort levels. Staff reminded tenants to turn off their lights overnight (Lights-Out Program) or automatically "set-back" lights and fans during unoccupied hours (some Job Corps Centers) and addressed energy- and conservation-related issues at periodic tenant advisory meetings (Frances Perkins Building).

The DOL Fuel Efficiency Outreach Program includes ride sharing activities (a carpool locator and parking program at Frances Perkins) and employee awareness programs sponsored by GSA, local governments, and transit authorities.

Training

Several Energy Managers from DOL participated in the Federal Energy Management Program's Water Conservation and Federal Energy Management workshops.

Funding

DOL completed several energy conservation projects in FPB which use a combination of agency funding, GSA energy funds for delegated buildings, GSA capital improvement funds, and/or utility rebates. Agency funds from MSHA improved energy efficiency by enhancing the current preventive maintenance strategy to include: (1) calibrating the electric hot water tanks and the fan coil units for the dorms, (2) sealing all the skylights, and (3) calibrating the energy management system once weekly. The JCCs did not have agency funds available for energy conservation projects separate from repair and alteration funds.

Demand Side Management

DOL and GSA used the demand side management services of the local utility, the Potomac Electric Power Company (PEPCO), to reduce the Federal expenditure of the major lighting retrofit and one occupancy sensor retrofit in FPB. PEPCO paid for 25 percent of the major lighting project and 37 percent of an occupancy sensor project for a total investment of \$884,000. These two retrofits should yield 8.7 billion Btu of energy savings each year.

JCC also reviewed the demand side management programs offered by utilities around the country. Lack of funding for projects in FY 1994, however, made JCC unable to take advantage of these opportunities. To overcome funding obstacles, JCC is pursuing the use of third party financing through energy savings performance contracting and is preparing project proposals for the Federal Energy Efficiency Fund.

Vehicles

The DOL vehicle fleet consists of 3,782 GSA Interagency Fleet Management vehicles (IFMSs), an undetermined number of privately-owned vehicles, 161 agency-owned vehicles (AOVs), and 18 commercially-leased vehicles. During FY 1994, DOL decreased its inventory of GSA IFMSs by 56 vehicles. Fewer vehicles did not, however, reduce fuel consumption overall; in fact, vehicle fuel consumption rose 0.1 percent as compared to FY 1993 to 369.6 billion Btu.

To conserve vehicle fuel, DOL drivers employ the fuel efficient driving techniques recommended by DOE and GSA and perform routine maintenance on the vehicles. Thus, the FY 1994 consumption total is 8 percent less than the fuel consumed in FY 1991. DOL expects to achieve the 10 percent reduction goal during the next fiscal year.

The number of alternative fuel vehicles (AFVs) increased to 7 percent during FY 1994 as a proportion of DOL's combined total of GSA IFMSs, AOVs, and commercially-leased vehicle inventory. All AFVs are a part of the GSA IFMS group. The majority of DOL's AFVs are flexible-fuel cars (275) which use either

- (1) a mixture of 85 percent methanol and 15 percent gasoline,
- (2) a mixture of 85 percent ethanol and 15 percent gasoline, or
- (3) 100 percent gasohol during the year. Four of DOL's AFVs are dedicated-fuel vans which use compressed natural gas.

Environmental Activities

DOL drafted a Secretary's Order on the "Procurement and Use of Environmentally Preferable Products and Services," which was circulated for comment to all the component agencies in the Department during FY 1993. The proposed Secretary's Order will establish a program in DOL for a cost-effective procurement preference program favoring the purchase of products and services that maximize energy and water conservation, use recycled and recyclable products, minimize waste, utilize alternative fuels, and are less harmful to human health and the environment in their use and disposal.

It will also require that DOL agency heads include in acquisition planning for all agency procurement actions, and in the evaluation and award of contracts, life cycle cost and environmental preferability, and develop and implement an agency plan for energy conservation through changes in procurement practices, investment in energy efficient technology, and reduction of demand.

Guidance concerning the various regulations, initiatives, and procurement actions associated with the preference for environmentally preferable procurement actions will be developed during FY 1995. Currently, DOL agencies received guidance on procurement of Energy Star computers, recycled paper, and recycled toner cartridges.

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10. DEPARTMENT OF STATE

Energy Efficiency Performance and Implementation Strategies

In FY 1994, the Department of State reported an increase in buildings energy of 6.4 percent in Btu per gross square foot compared to FY 1985.

The Department of State activated its Energy Management and Conservation Plan in 1993 to meet the FY 1995 and FY 2000 energy management goals. The Department of State's overall strategy is based on the elements of its Energy Management and Conservation Program. Highlights include the following:

- Establishment of policy standardizing the purchase of energy savings products and adoption of energy efficient building operating guidelines and procedures. Building Managers will acquire energy efficient motors for replacement of failed units and install T-8 fluorescent tubes and electronic ballasts with specular reflectors where economically feasible. In addition, installation of compact fluorescent and LED lighting alternatives in place of existing incandescent fixtures will continue, where applicable.
- New construction and renovation projects in domestic buildings will consistently include energy efficient lighting alternatives as a standard design element.
- Procurement of Energy Star computer, printers, and fax equipment. In addition, equipment acquisitions include consideration of energy conserving technologies as they become known, understood, and are marketable.

The State Department requires installation of energy efficient goods and products which are proven to be cost-effective, pursuant to the requirements of the Federal Acquisition Regulations. To the extent practicable, the

State Department also requires vendors of goods to provide appropriate data that can be used to assess life-cycle costs of each good or product, including building energy systems components, lighting systems, office equipment, and other energy using equipment. GSA and commercial vendor literature and catalogues which highlight energy efficient goods and products are regularly received. The State Department regularly evaluates these items for energy efficiency and cost for possible application in its buildings.

When the State Department is responsible for new Federal construction, it generally involves occupancy by special use domestic and international functions, (i.e., computer centers, training centers, embassies, and overseas residences). Adherence to energy efficiency standards is routinely noted in architectural/engineering (A/E) contracts, which include the development of specifications for the design and construction of Department of State-owned facilities. The A/E firm's compliance with the energy efficiency requirements is reviewed and monitored as part of the normal design and construction review process.

The Department of State has ridesharing information available to assist personnel. The State Department has been involved in the Washington Metropolitan Council of Governments network to expand and enhance the ridesharing effort. The State Department's parking program promotes carpools and vanpools in the distribution of permits in accordance with the Federal Property Management Regulations. Parking permits are issued to vanpools automatically.

Training

The State Department had one senior manager credentialed as a Certified Energy Manager (CEM) through the Association of Energy Engineers certification process. Plans call for additional managers to be certified in the next few years. In addition, building management personnel will receive relevant instruction on energy management topics. Personnel will attend individual courses targeting life-cycle costing, lighting, and other technologies and fundamentals of energy management available through the Association of Energy Engineers and other sources. Staff will also attend trade shows and seminars to keep current on relevant technology and energy management fundamentals.

Funding

Funding requests for energy conservation retrofit and capital equipment replacement are included in the State

Department's budget process. Projects are prioritized in order of emergency, life and fire safety, mission, operation, or maintenance necessity. Consideration is given to life-cycle cost effectiveness, equipment condition, and savings-to-investment ratios.

Energy Savings Performance Contracts

The Department of State has not actively sought out the services of energy savings performance contractors as our current building inventory is not generally conducive for such initiatives. In the near future, the Main State Complex in Washington, DC, is scheduled for a complete renovation that will span 6 to 8 years. Therefore, there remains only 3 years to recover costs and profit through energy savings performance contracting payment terms. Due to the short return on investment time periods and the complexity of energy savings performance contracting, contractors have expressed more interest in utility rebate programs where a rebate is assigned to them for payment in lieu of relying on energy savings for payment.

Demand Side Management

The Department of State seeks out and takes advantage of all rebate and incentive programs offered by local utilities and energy service providers wherever available. Eligible rebates in excess of \$1.6 million have been filed and approved for the Potomac Electric Power Company (PEPCO) rebate program in the District of Columbia prior to its recent termination. The agency works with PEPCO in buildings in Maryland jurisdictions, Virginia Power in Virginia, and utilities in New Hampshire and other States to identify and pursue energy conservation opportunities (ECOs). Continued involvement in the DOE FEMP audit program will be helpful in identifying ECOs for inclusion in new or succeeding lease negotiations between lessors and GSA.

The agency participates in the PEPCO Load Curtailment Program for the Main State Complex, as one of the areas largest curtailers. Main State regularly reduces demand approximately 2,550 to 3,000 KW per curtailment call, which results in a credit of between \$23,000 to \$28,000 for each event.

Vehicles

The Department of State is exempt from the reporting requirements, as the number of domestic vehicles falls below the reporting threshold of 300 vehicles in the domestic fleet, when special purpose and law enforcement type vehicles are removed from the overall composition. However, the agency acquired six alternative fueled vehicles (15 passenger van type) from GSA and is also using a methanol fueled vehicle (4-door sedan) provided by GSA.

Environmental Activities

The Department of State recycles lighting ballasts through hazardous waste contractors and disposes of fluorescent tubes in accordance with hazardous waste removal standards and procedures. Oils, solvents, and paints are recycled by the hazardous waste collection contractor. The Department of State recycles paper, glass, aluminum and steel cans, as well as polystyrene used in the cafeteria operation, all on a daily basis.

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11. DEPARTMENT OF TRANSPORTATION

Energy Efficiency Performance and Implementation Strategies

During FY 1994, the Department of Transportation reported a 10.1 percent reduction in buildings consumption in Btu per gross square foot compared to FY 1985.

Due to the decentralized structure of DOT and the varied types of facilities and programs in each of the operating administrations, an independent plan was developed by each and consolidated for submission to the DOE. The Department's Energy Management Implementation Plan was revised in December 1993 to include the requirements of the Energy Policy Act of 1992. This plan will be further revised in the spring of 1995 to include the provisions of Executive Order 12902.

Energy surveys and energy conservation measures which were completed in FY 1994 are listed below:

- The Office of the Secretary has completed the first phase of a two-phase retrofit of existing fluorescent fixtures with T-8 lamps, electronic ballasts, reflectors and new prismatic lens at DOT headquarters in the Nassif Building. This year, 14,000 fixtures were completed which is expected to save \$200,000 annually.
- The United States Coast Guard (USCG) completed 32 energy conserving projects at a cost of \$1.5 million with a projected annual savings of \$153,000. The major projects included \$256,000 for the replacement of windows at the USCG Academy, \$180,000 for a boiler replacement at Support Center New York, \$175,000 for HVAC system replacement at Air Station Detroit, and \$100,000 for an HVAC automation project at Group Philadelphia.
- The Federal Aviation Administration (FAA) has completed an energy survey of three of the highest

energy use buildings at the Technical Center, Atlantic City, New Jersey. Three separate surveys have been completed by local utilities in FAA's Southwest Region.

- As part of their \$6.5 million renovation of the Fairbanks Building, McLean, Virginia, the Federal Highway Administration has installed a variable air volume system which is expected to significantly reduce the energy required for heating and cooling.
- The Maritime Administration has completed the first phase of the three-phase upgrade of the Merchant Marine Academy's heating plant. This \$10.5 million project is expected to reduce the use of fossil fuels for heating by 33 percent. A project for the installation of energy-efficient windows was completed at the Merchant Marine Academy at a cost of \$900,000. Several major buildings at the academy have been re-roofed and re-insulated, improving energy efficiency, at a cost of \$1.2 million.
- The Research and Special Programs Administration is continuing with relighting efforts at the Volpe National Transportation Center. This project includes T-8 lamps, electronic ballasts, specular reflectors, occupancy sensors, and replacement of incandescent lamps with compact fluorescent lamps.
- The Saint Lawrence Seaway Development Corporation has completed the replacement of approximately 85 percent of the windows with more energy-efficient double pane windows.

Operation and maintenance continue to be emphasized as a major component in the effort to achieve energy reduction goals. Basic procedures include securing HVAC equipment as well as unnecessary lighting during unoccupied hours. The FAA even reduces airport lighting when practical, without compromising safety of aircraft operations. New procedures, products, and contracting methods that would facilitate more efficient operation were distributed through the Departmental Energy and Water Management Committee.

Where practicable, facilities with access to natural gas are converting from fuel oil to gas or to dual fuel capability. The Support Center in Governor's Island, New York, has completed the conversion from fuel oil to natural gas which reduced oil consumption by 1.6 million gallons per year. The Reserve Training Center

in Yorktown, Virginia, is pursuing conversion from oil to natural gas as described below. The Merchant Marine Academy and the Turner/Fairbanks buildings use interruptible natural gas service with fuel oil backup in their dual fuel boilers.

The Department has an ongoing ride-sharing program with a minimum occupancy requirement for a parking permit at Headquarters buildings. Over 290 parking permits have been terminated and 1,227 people have left the parking system at Headquarters as a result of this program.

Training

The Department has conducted a training survey of all facility energy supervisors and energy managers within the Department. The purpose of the survey was to establish what the training level is and what the needs are. During FY 1994, 2 people were trained in Energy Savings Performance Contracting for a total of 26 people from the Department. Several people attended Federal Energy Decision Screening (FEDS) software training sponsored by DOE. A 1-day course on electric rate structure and energy conservation was conducted by Florida Power and Light Company for 23 FAA employees.

Funding

An accurate identification of the total funding specifically dedicated to energy conservation actions is not available. Many of the energy conservation actions are inseparable parts of major renovation or expansion projects. Some small, quick payback, projects are funded locally as part of the operations and maintenance function. Progress is being made in having energy conservation projects identified in the budget process.

Energy Savings Performance Contracts

The implementation of ESPCs is decentralized within DOT. It is the responsibility of the individual operating administrations to develop and award ESPCs, and the management structure is the same as that for the energy conservation program. At the present, DOT does not have any ESPCs in place. The Federal Aviation Administration is currently finalizing a proposal for the installation of a chilled water and ice thermal storage system at the Aeronautical Center in Oklahoma City.

The major problem implementing ESPCs at DOT is the large up front investment in time and training for procurement and technical personnel while staffing is being reduced. Other concerns include the reluctance by some contracting officers to enter into such contracts without clear authority in the Federal Acquisition Regulations.

Demand Side Management

The use of utility DSM incentives is strongly encouraged throughout the Department. DOT has a project underway for the retrofit of 13,500 fluorescent fixtures with T-8 tubes, electronic ballasts, and reflectors at the Headquarters Nassif Building. The Potomac Electric Power Company is expected to provide a rebate in excess of \$500,000 for the project. The Coast Guard Academy is negotiating a contract with Connecticut Light and Power for a full facility energy audit.

Vehicles

The Department developed a plan to meet the 10 percent reduction in consumption of gasoline and diesel fuel by FY 1995. The goal will be met by acquiring more efficient vehicles, driver awareness training, and close examination of vehicle use.

The DOT motor fleet is made up of 8,686 general purpose vehicles. Approximately 93 percent of these vehicles are obtained through the General Services Administration's (GSA's) Interagency Fleet Management Systems. The other 7 percent are agency-owned or commercially-leased vehicles and are located primarily in Alaska.

DOT met the goal for FY 1994 for replacement of 276 (33 percent) of the 798 vehicles (sedans and light trucks) eligible for replacement based on age and metropolitan area. Currently, there are 652 AFVs in the fleet which includes all of the Headquarters executive fleet vehicles. DOT will continue to work with GSA to obtain the maximum number of AFVs for the fleet.

Environmental Activities

FAA has developed a technical guide entitled "Production Phaseout of Chlorofluorocarbons (CFC) and Halons Pursuant to Title VI of the Clean Air Act Amendments of 1990 Assessment Report." The guide was published in May 1994 and includes portable halon recharge/recovery units and recovering, recycling, and recharging units for CFC-R11.

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12. DEPARTMENT OF THE TREASURY

Energy Efficiency Performance and Implementation Strategies

During FY 1994, the Department of the Treasury reported a 46.4 percent increase in buildings consumption in Btu per gross square foot compared to FY 1985.

In 1994, the Department of the Treasury revised its Departmental directives and policies to meet legislative and Presidential goals and objectives. The Department provided greater latitude to its bureaus to adopt those innovative approaches initiated by other Federal Departments and agencies. The Treasury Department also has encouraged its bureaus to revisit current bureau policies and procedures to ensure they are up-to-date and consistent with Departmental and the mandated objectives.

Bureaus executed various aspects of their energy management plans to meet the FY 1995 and prepare for the FY 2000 goals. Plans emphasize:

- participation in public utility company demand side management programs;
- training for energy managers and related personnel;
- acquisition of energy efficient goods, equipment, and services;
- employing energy savings performance contracting at selected facilities to gain the economies accruing from private sector involvement;
- experimenting with the use of alternative fueled vehicles and smaller vehicles in a variety of mission-related situations; and

- maximizing the use of all available technical, financial, and engineering expertise available to the Department and its bureaus.

The Internal Revenue Service (IRS), the Treasury's largest energy user, reported that its GSA-delegated sites completed Energy Management and Conservation Guidelines and incorporated them into building operations plans. These guidelines set schedules for startup and shutdown of HVAC equipment. A study on the status of the energy impact on the modernization of IRS Service Centers was conducted.

Power consumption in the all-electric Bureau of Public Debt facility at Ravenswood, West Virginia was reduced to 47 percent of FY 1985 levels. At the facility in Parkersburg, West Virginia electrical consumption dropped more than 12 percent from FY 1993 to FY 1994 and electrical use has dropped by over 25 percent since peaking in FY 1987. These reductions were achieved in spite of increases in building populations, elevator usage, additional HVAC, and new automated data processing equipment.

In FY 1994, the Federal Law Enforcement Training Center was working on or had completed energy improvement projects involving HVAC improvements, ceiling and lighting projects, energy-efficient boilers, energy-efficient windows, siding improvements, and electrical renovation projects. Similar projects are being funded during FY 1995 at many locations at the Training Center.

Training

The Treasury Department bureaus have on-going programs where employees are sent to seminars or courses on energy efficiency and management or are trained on the job to respond to energy conservation initiatives. The bureaus reported training 21 personnel during FY 1994.

Funding

The IRS expended \$3.6 million for energy-related projects in FY 1994 and has made plans to perform additional energy efficiency projects at its facilities in FY 1995. Among the FY 1994 expenditures were \$90,000 for lighting modernization projects, \$190,000 for chiller replacement projects, HVAC repair and replacement projects at \$210,000, and EMS system installation projects at \$1.2 million. Proposed project expenditures for FY 1995 total almost \$2.2 million.

Funding for energy-related projects at U.S. Mints in FY 1994 was as follows:

- Philadelphia - \$680,000;
- Denver - \$206,400; and
- San Francisco - \$82,800.

Projected funding at U.S. Mints for energy-related projects in FY 1995 include:

- Philadelphia - \$559,000;
- Denver - \$355,000;
- San Francisco - \$400,000;
- West Point - \$300,000; and
- Fort Knox - \$30,000.

Energy Savings Performance Contracts

There has been a significant increase in the level of interest in and development of energy savings performance contracts in the Department during FY 1994. Treasury bureaus reported efforts to develop four such projects in 1994. In FY 1995, Departmental Offices, Treasury's Headquarters Office, anticipates embarking upon a ESP contract for electrical and other services in the Main Treasury and Annex buildings. It also expects to use the completed projects as exhibits in its "showcase facilities." The attempt to institute ESP contracting at GSA-delegated facilities continues to be unsuccessful. The dual management of these facilities (Treasury bureau and GSA) presents a barrier.

Demand Side Management

Treasury bureaus continue to work with local utilities to take advantage of DSM programs. The Internal Revenue Service, Financial Office of Thrift Supervision, Bureau of Engraving and Printing, the U.S. Mints, and the U.S. Secret Service took advantage of these programs in FY 1994.

Vehicles

Treasury bureaus have taken steps to increase the efficiency in the use of motor vehicles. The U.S. Customs Service has diversified its fleet over the past several years, reducing its larger Class IV vehicle fleet. The bureau also has implemented the Vehicle Information Management System which tracks vehicle usage and maintenance, including fuel consumption, mileage, and indicators of poor performance. Vehicle-to-employee ratios are used to assign vehicles to specific duty positions within the bureau and have resulted in the disposal of older, less economical vehicles. The Bureau of Alcohol, Tobacco and Firearms distributes information on the conservation of fuel to vehicle operators through the publication of newsletters. Official mileage in

personal vehicles has dropped within the Bureau of Public Debt.

The bureaus have also indicated a willingness to acquire alternative fuel vehicles (AFV). The Bureau of Alcohol, Tobacco and Firearms acquired three dual-fueled AFVs, for use in the Washington, DC, and Landsdale and Pittsburgh, Pennsylvania areas. The Federal Law Enforcement Training Center (FLETC) will receive four compressed natural gas vehicles from GSA. Three FLETC-owned vehicles, two high-speed pursuit vehicles and a minivan, are being converted to dual-fueled vehicles. An AFV fueling station has been installed onsite at FLETC's headquarters in Glynco, Georgia. Because most Treasury vehicles are law enforcement vehicles, it is important that the Enforcement bureaus address the Executive Order requirements without compromising mission effectiveness.

Environmental Benefits

Treasury Directive 75-06 requires Treasury bureaus to ensure all facilities are covered by a program to control environmental pollution. The programs include environmental surveys of facilities, plans to correct identified problems, budgeting for necessary resources and training employees involved in environmental programs. The reports provided by Treasury bureaus indicate the adoption of a variety of means to comply with the Treasury directive and address environmental concerns.

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13. DEPARTMENT OF VETERANS AFFAIRS

Energy Efficiency Performance and Implementation Strategies

During FY 1994, the Department of Veterans Affairs reported a 13.2 percent reduction in buildings consumption in Btu per gross square foot compared to FY 1985.

The Department of Veterans Affairs developed an agency 15-year plan for FY 1985 to FY 2000 and submitted it to DOE. The implementation of this plan will help the VA to meet the requirements of NECPA, EPACT, and Executive Order 12759.

As part of the VA's plan to implement Executive Order 12759, each medical center has been assigned a target goal in Btu per gross square foot for FY 2000 that it is required to meet. Energy consumption at the medical centers is monitored, and progress toward the goal is published quarterly in energy management reports which are distributed to each medical center.

During FY 1994, the VA has continued to concentrate heavily on the research and development of cost-effective methods to reduce overall electrical consumption and associated costs. Increased demands to satisfy the needs of modern medical care have resulted in an increase of electrical consumption (in kilowatt hours) of 29 percent compared to consumption in FY 1985. The following methods have been implemented to reduce this increase:

- The design criteria for all new construction and retrofit projects now includes the use of the most energy-efficient lighting fixtures.
- New construction is designed to operate at an electrical power factor of 0.95 or higher.

- Energy management and control systems with direct digital controls are specified as part of new construction, and retrofit of HVAC systems.

The VA has one cogeneration plant that it owns, operates, and maintains, and the VA is currently evaluating the cost-effectiveness of using thermal storage systems at many medical centers.

Building retrofit projects include the installation of energy management control systems, modifications of the existing HVAC systems, steam trap replacement, improvement of boiler efficiency and lighting and power systems, and installation of additional insulation and storm windows.

Training

VA conducted a nationwide survey to determine how many energy managers at the medical centers are qualified as Trained Energy Managers under the requirements of EPACT. The survey results were submitted to the Department of Energy, and it was determined that many energy managers would need some additional of training before they could be qualified as Trained Energy Managers. The Engineering Staff at the medical centers have been informed of the different courses they need to take and their availability in different regions. These courses are offered by the Association of Energy Engineers in cooperation with the Department of Energy. Many medical centers took advantage of these training classes during FY 1994.

Funding

Funding for energy conservation retrofits and capital improvements was \$9.05 million for FY 1994. Funding of \$11.96 million for projects that have been approved by the Central Office for accomplishment of energy efficiency projects at the medical centers in FY 1995.

Energy Savings Performance Contracts

During FY 1992, the West Haven VA Medical Center became the first Veteran's Hospital to award an energy savings performance contract. This \$2.4 million project, awarded to EJA Cogenex Corporation, is a 15-year contract. The entire cost of the lighting system replacement and the cooling system installation, together with the maintenance of the new chiller equipment, will be funded from rebate programs provided by Southern Connecticut Gas and United Illuminating Company, as well as from guaranteed savings in energy costs achieved over 15 years of operation. The medical center is now reviewing an additional energy conservation

project proposed by the contractor. Other medical centers are also evaluating this concept to accomplish their projects.

Demand Side Management

The VA is actively participating in the utility rebate programs and has funded many projects during FY 1994 at facilities that can participate in these programs.

VA has been working with Southern California Edison to develop an electricity saving program at the West Los Angeles VA Medical Center. The project would replace lighting and air conditioning equipment with much more efficient systems. All project costs would be paid from savings in electricity costs resulting from the new equipment. While technically not an energy savings performance contract, the endeavor replaces inefficient electrically-powered equipment and requires no capital expenditure by the government.

Vehicles

VA did not purchase any alternative fueled vehicles (AFVs) during FY 1994. AFVs are generally leased through GSA. Alternative fueled vehicles and their fuel infrastructures are to be concentrated in the 22 non-attainment and 125 metropolitan statistical areas. VA believes that GSA will accommodate the VA in those areas with leased vehicles when the infrastructures and AFVs become available.

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14. ENVIRONMENTAL PROTECTION AGENCY

Energy Efficiency Performance and Implementation Strategies

In FY 1994, the Environmental Protection Agency reported an increase in buildings energy of 36.0 percent in Btu per gross square foot compared to FY 1985.

EPA's energy management program consists of three phases which function concurrently. During Phase I, site-specific information is collected from facilities. That information is evaluated to identify conservation opportunities for each site during Phase II. The final Phase includes prioritizing, planning, and implementing conservation projects. During FY 1994, EPA's efforts concentrated on researching baseline data, gathering facility information, establishing program tools to aid program development, and disseminating conservation information to EPA Energy Managers to garner program support.

EPA has developed numerous tools to assist regional energy managers with their conservation efforts such as an information clearinghouse and hotline to efficiently disseminate information on regulations, energy-efficient products, publications, and conservation-related associations. Clearinghouse staff produced an awareness program guidance document to assist the regions in garnering conservation program support. Additionally, the clearinghouse publishes and distributes a quarterly newsletter, *Energy and Water Conservation News*, which serves as a focal point to educate and inform EPA staff involved in conservation efforts. Several other key tools have been developed to assist conservation efforts including a *Sample Policy Statement* for EPA facilities to adopt as a foundation for their Energy and Water Conservation Program, a revised *Conservation Manual* establishing responsibilities and requirements for managing energy and water resources in EPA facilities, and a database for tracking audit findings from site visits.

EPA updated its building standards to emphasize energy and water conservation. Additionally, EPA's program of requirements for newly constructed Federal buildings requires adherence to 10 CFR Part 435 and current ASHRAE standards. Also, as a Green Lights Partner, EPA has agreed to design all new buildings with energy-efficient lighting systems. Moreover, efforts continue to be made to design new laboratories as showcase facilities highlighting state-of-the-art energy and water conservation technologies.

To demonstrate successful conservation projects, several pilot projects have been initiated and are in early stages of development, including:

- ECO-P3 (Waterside Mall Energy and Water Public-Private Partnership). EPA's Waterside Mall Headquarters was selected during FY 1994 as an Energy Star Showcase Facility. Building on the success of Green Lights, the Energy Star Buildings program focuses on profitable investment opportunities using proven technologies. A staged approach provides a strategic framework for making comprehensive efficiency upgrades. First, the lighting system is retrofitted with a high efficiency lighting system; second, the building is recommissioned and tuned; third, the HVAC load is reduced; and fourth, the heating and cooling equipment is improved. So far, energy efficient lighting has been installed in two towers of the facility, nearly 400,000 square feet of space. The rest of the facility is scheduled to be retrofitted during 1995.
- Energy-Efficient Laboratory Design—Annapolis Laboratory. EPA is evaluating the feasibility of incorporating energy-efficient lighting, desiccant gas cooling, and fuel cell technologies into the Annapolis Laboratory building design.
- EPA's Ann Arbor facility began evaluating the feasibility and cost effectiveness of installing a desiccant cooling system equipped with heat pumps to recover waste lost during one-pass air system operation.

EPA plans to implement a transit subsidy program at its Washington, DC headquarters location. Region 2 implemented a public transit fare subsidy program in October 1992. Presently, 800 employees receive reimbursement for their commuting costs up to \$21 per month. Region 3 has operated an employee transit subsidy program since April 1993, which reimburses

employees \$45 per fiscal quarter for using public transportation. Due to financial cutbacks, however, this program has been temporarily suspended. Region 8 participates in the Regional Transportation District "Eco-Pass" program and provides yearly bus passes to each full time permanent employee. In July of 1993, Region 10 implemented a transit subsidy program which offers employees \$10 per month for public transportation costs.

Training

EPA has been engaged in and hosted numerous training events during FY 1994. Program staff regularly attended energy and water conservation conferences and seminars, including GSA's TEEM '94, the Natural Gas Cooling Summit, and the FEMP Water Resource Management training workshop. Program staff also regularly arranged product demonstration seminars with various vendors for EPA's engineers and architects to keep them abreast of the most innovative technologies. EPA also worked closely with contract staff who are certified trained energy managers.

Funding

For FY 1994, EPA's Energy and Water Conservation Program had a budget of approximately \$1.3 million. Nearly one-third of the budget was allocated to developing program tools, 50 percent of the budget went to energy efficient lighting retrofits, and the balance was allocated among other conservation projects, facility audits, and technical and administrative support. In addition to the EPA's centrally-managed Program funds, Regional Facility Managers had authority for approving up to \$75,000 per facility project. While FY 1994 reporting did not capture all of these expenditures, EPA will continue to research methods to more completely track these expenses. The Energy and Water Conservation Program budget will be approximately \$1.7 million for FY 1995.

Energy Savings Performance Contracts

EPA has been working with the Waterside Mall facility's non-government building owner to secure third party financing for a desiccant cooling system for this facility. However, barriers inhibiting the use of third party financing and incentives in the Federal sector still exist, making it difficult for EPA to use this incentive. To date, EPA has not used energy savings performance contracting or utility rebates program funding or rebates.

Demand Side Management

EPA has not yet participated in any utility rebate programs, but EPA's energy coordinator has been working with an Interagency Energy Management Task

Force working group to develop ways utilize these incentives.

Vehicles

Approximately 50 percent of EPA's vehicles are leased from GSA. EPA has developed a plan for replacing 444 owned and leased vehicles from FY 1994 to FY 1998, which will constitute approximately 78 percent of the fleet of light duty vehicles assigned to EPA Regions, laboratories, and other in-house activities. This was accomplished by negotiation of aggressive replacement plans with each regional EPA Motor Vehicle Coordinator. Of EPA's total fleet of 1,190 vehicles, 134, or 11 percent, are alternative fuel vehicles. Additional plans include acquisition of electric vehicles from Pennsylvania Electric Power Company by Region 3, and conversion of at least two new vehicles to liquid propane gas by Region 6.

Also, the EPA Headquarters Transportation Management Section is close to completing a computerized motor vehicle operations database and tracking system which will provide detailed information regarding utilization, maintenance, fuel consumption, and operation costs for each EPA-owned, GSA-leased, and commercially-leased vehicle and for the fleet as a whole. This system will enable managers to pinpoint vehicles which are over-aged and more costly to operate, as well as vehicles which are under-used. EPA plans to implement a timely vehicle replacement program, downsizing with smaller, more fuel-efficient vehicles and to reduce the fleet size by elimination or consolidation of vehicles which consistently fail to achieve minimum mileage goals for their type of use.

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15. FEDERAL EMERGENCY MANAGEMENT AGENCY

Energy Efficiency Performance and Implementation Strategies

In FY 1994, the Federal Emergency Management Agency reported a decrease of 22.7 percent of buildings energy in Btu per gross square foot compared to FY 1985.

FEMA has undertaken the following initiatives:

- developed explicit instructions to ensure that reports on energy management comply with DOE requirements;
- designated an Energy Management Conservation Officer to oversee FEMA's Energy Management and Conservation Program and to ensure that FEMA is successfully meeting its energy reduction goals; and
- developed plans for installing energy-efficient measures in FEMA-controlled facilities that directly pay utility costs having an 10 year or less payback by the year 2005.

During FY 1994, the National Emergency Training Center (NETC) in Emmitsburg, Maryland, replaced lighting systems in 20 buildings with high efficiency lighting systems to include all interior and exterior lights. A combination of lights were used including fluorescent T-8 lamps with electronic ballasts and 3 watt LED exit signs. Exterior site lighting was retrofitted with high pressure sodium fixtures. The retrofit will save approximately \$18,000 annually in lighting cost.

Future projects at the NETC include the following:

- Installation of insulation on exterior walls and use of energy-efficient lighting and mechanical/electrical systems for existing structures.

- Implementation of an Energy Management System to include demand monitoring, occupancy sensors, and cycling of mechanical systems.

The plan for meeting the NECPA goals developed by the Special Facility Management Division in Berryville, Virginia, includes three basic elements: (1) to incorporate the latest energy conservation features and techniques in all new facilities constructed at the Special Facility; (2) to include the latest energy conservation features and techniques in all of its equipment replacement, major maintenance, and major renovation projects; and (3) to maintain all equipment and systems that affect energy usage to ensure that they remain at or near peak efficiency at all times. This plan did not change for FY 1994, and no changes are expected for FY 1995. FEMA is planning to apply for funding from the Federal Energy Efficiency Fund to upgrade some facility lighting systems. On August 10, 1994, FEMA staff met with a representative from DOE and obtained guidance on how to apply for this funding.

An energy conservation project, the Area B Heat Recovery System, was completed by the Special Facility Management Division in FY 1994. It involved the replacement of a fuel oil fired boiler with an electric heat pump to provide heat and hot water to about one-third of the Special Facility. The heat pump extracts waste heat from these buildings and uses this to help generate heat and hot water, and thus uses electricity and wastes heat instead of fuel oil. It has reduced the use of fuel oil by these buildings from a FY 1993 total of 87,500 gallons to a FY 1994 total of 8,600 gallons, most of which was used before the system was put on line. This project cost \$175,000; the expected savings should pay for it in approximately 3 years.

The Federal Regional Center, located in Denton, Texas (Region VI), is waiting for a recommendation proposal from the installer of the Region's Environmental Management Control System that will further increase energy efficiency and the conservation of fuel.

The Federal Support Center in Olney, Maryland, replaced the electric meter at the facility to more efficiently track electric power consumption.

Training

FEMA identified sources of energy management training for our facility energy manager this fiscal year. Because of the limited amount of available training funds, priority was given to training which was necessary to maintain

required employee certifications, and training for maintenance of critical site equipment. Funds were not available for energy management training.

Funding

FEMA did not expend any significant funds for energy conservation projects this fiscal year. The Area B Heat Recovery System was funded primarily in FY 1992. The budget is limited and priority has been on equipment repair, replacement, and capital improvement projects which are necessary to operate and maintain the facility. FEMA does not anticipate a change in this situation in the near future.

Energy Savings Performance Contracts

FEMA did not participate in energy savings performance contracts during FY 1994. Also, FEMA's progress towards meeting NECPA goals is such that it is not anticipating the pursuit of these contracts at this time.

Demand Side Management

During FY 1994, the National Emergency Training Center in Emmitsburg, Maryland, received rebates from the local Potomac Electric Power Company for its lighting retrofits in 20 buildings. The rebates were available for retrofits or new installations.

Vehicles

FEMA has a motor vehicle management program that ensures motor vehicle drivers operate vehicles in a fuel-efficient manner. FEMA operates a small fleet of 207 vehicles and, therefore, is exempted from developing a plan to reduce motor vehicle gasoline and diesel consumption by 10 percent by FY 1995.

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16. FEDERAL ENERGY REGULATORY COMMISSION

Energy Efficiency Performance and Implementation Strategies

In FY 1994, the Federal Energy Regulatory Commission (FERC) reported a 8.0 percent increase in building energy consumption in Btu per gross square foot compared to FY 1985.

FERC revised its energy management plan to promote energy efficiency and meet energy goals of both the National Energy Conservation Policy Act (NECPA) and Executive Order 12759. These revisions establish general energy performance objectives for building operations. FERC undertook the following energy efficiency activities during the year:

- Implemented and emphasized energy conservation awareness among building occupants
- Reviewed and updated building operation plans to ensure compliance with energy guidelines
- Implemented no-cost and low cost energy conservation methods
- Reviewed and implemented changes in agency operational policies, such as reduction of overtime use of facilities
- Monitored energy usage in facility and analyzed consumption data
- Performed surveys to identify energy conservation opportunities and improved building operational procedures
- Used outside air for cooling when possible

Training

As required by section 157 of EPACT, FERC energy managers received training in the area of energy efficiency and management. This training was developed and presented by the Association of Energy Engineers.

Funding

FERC invested in small energy conservation projects during the year. Building corridors were delamped and incandescent light fixtures were replaced with compact fluorescent fixtures and lamps in restrooms. Further investment in energy efficient retrofits and equipment is not planned for the 825 North Capitol Street building due to the near expiration of the building's lease and planned consolidation into a new building.

Demand Side Management

FERC participated in the Potomac Electric Power Company's (PEPCO) Load Curtailment Program and Custom Rebate Program which pays customers for energy reduction projects such as lighting retrofits. These savings appeared as credits on utility bills.

FERC continued working with the General Services Administration and its future building owner to complete the construction of its energy efficient building. FERC's new building will fully comply with EPACT and will also comply with or exceed PEPCO's New Building Design Program standards.

Energy Savings Performance Contracts

FERC has no ESP contracts in place at the current time.

Vehicles

FERC replaced some gasoline vehicles with alternative fueled vehicles. These energy-efficient vehicles are fueled by compressed natural gas and methanol. The number of executive motor vehicles was reduced by one-half.

FERC continued operating its successful transit subsidy program to encourage its employees to use public transportation. FERC also operated an agency-wide ridesharing program that cross references zip codes and/or cities to assist employees who are seeking to join or start car or vanpools.

Environmental Activities

FERC's program is designed to protect our external and internal environments. The program works to conserve resources, prevent pollution, and encourage employee safety and health. During FY 1994, FERC operated a recycling program to collect unused office items, printer/copier toner cartridges, aluminum cans, glass, newspaper, and high grade white paper; procured and used alternative fuel vehicles and recycled office products; and monitored indoor air quality.

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17. GENERAL SERVICES ADMINISTRATION

Energy Efficiency Performance and Implementation Strategies

In FY 1994, GSA reported a 12.2 percent decrease in energy consumed in owned and leased buildings compared to FY 1985 in Btu per gross square foot.

On February 10, 1993, GSA issued its Seven Point Energy and Water Reduction Plan to all its regions. This plan represents a broad-based, multidisciplinary approach to activities to meet Federal energy goals in buildings and facilities. The seven Points include:

1. Planning and Monitoring;
2. Identification and Implementation of Energy Conservation Technologies;
3. Improving Building Operations;
4. Employee and Tenant Conservation Awareness;
5. Energy Conservation in Leased Buildings;
6. Procurement of Energy Efficient Products and Services; and,
7. Training

GSA has developed a comprehensive audit plan that incorporates 10 percent of the inventory each year for 10 years. All energy and water conservation projects identified as a result of these audits will be implemented pending funding availability. As audit funding is limited, current project development procedures will remain in effect for 1995 and 1996.

To promote the Federal Ridesharing Program, the GSA regions worked with the Councils of Governments, state and county ridesharing units, and commuter transportation associations. The regions also conducted training for employee transportation coordinators and participated in ridesharing fairs.

Training

GSA has a network of energy coordinators in each region and all coordinators are provided yearly technical training

in state-of-the-art technology and procedures to conserve energy. All are encouraged to become Certified Energy Managers (CEM) through the Association of Energy Engineers, a designation that qualifies them as trained energy managers. GSA presently has 12 CEMs.

In FY 1994, GSA continued annual training for its nationwide/regional energy coordinators. At *The Energy and Environmental Management Conference (TEEM '94)*, energy coordinators learned about a variety of the latest technologies and approaches to energy, environmental, and water management. These included areas such as renewable energy, Energy Star computers, test bed demonstrations, building energy standards and codes, lighting technologies, environmental products, alternative fuel vehicles, water conservation, HVAC systems, chillers, and other current issues. GSA energy coordinators in post-conference sessions reviewed strategies and problem solving sessions.

Funding

In FY 1994, GSA funded \$37 million for 235 energy conservation projects nationwide. Types of projects included: retrofitting existing lighting systems; installing energy management and control systems; upgrading HVAC, boilers, and chiller control systems; improving buildings envelope and increasing insulation; and others. The majority of these projects focused on lighting systems because they constitute as much as 40 percent of a building's electrical consumption. All GSA energy projects are selected based on life-cycle cost analysis before they are initiated. GSA expects to award \$45 million in energy projects in FY 1995 and \$58 million in FY 1996.

Energy Savings Performance Contracts

GSA has no ESP contracts in place at the current time. However, GSA is in the process of evaluating the feasibility of having a multiple-award, indefinite-quantity contract with energy service companies (ESCOs) to reduce the procurement time and resources needed for repetitive ESPCs. An additional benefit of having a single contract with multiple ESCOs will be to fulfill the requirement of providing access to ESCOs to other agencies from the same GSA contract.

Overall, the ESPC concept is less attractive to GSA than that of direct investment in energy retrofit projects and/or utility rebate programs because of the higher cost of funds and greater administrative requirements. However, GSA informed all delegated agencies that these contracts are a viable option to accomplishing

energy conservation projects in buildings where funds are unavailable.

Demand Side Management

The GSA Seven Point Energy and Water Reduction Plan contained a specific action requirement for the utilization of DSM programs, utility company rebates, and other funding sources. GSA received \$3 million in FY 1994 from utility company rebate programs.

GSA has extended its DSM pilot program with utility companies in California to utilities in Colorado, Georgia, Maryland, New Jersey, Virginia, Washington, and the District of Columbia. The various utilities that service these jurisdictions are providing comprehensive energy surveys of GSA-owned Federal buildings. These no-cost surveys will be used as baselines for pursuing partnership opportunities. The energy audits represent a significant cost savings to GSA and they are currently being conducted on an expedited schedule using area-wide utility contracts.

Water Conservation

GSA has established a water program unit to coordinate a nationwide water conservation effort. This includes evaluating existing water conservation technologies, establishment of a water consumption tracking system, and assuming the role of facilitator for implementation of water projects in facilities nationwide.

A new GSA guidebook, *Water Management—A Comprehensive Approach For Facility Managers*, has been widely distributed in the Federal sector and is currently used in the curriculum of several courses. GSA is actively involved in water efficiency partnership demonstrations with other agencies as well as initiating in-house projects. Additionally, an effort to track water usage nationwide (in those GSA buildings which consume the most water) is currently underway.

Vehicles

GSA has a wide range of energy reduction plans for motor vehicle operations. Steps are being taken to increase fuel efficiency by reducing the number of fleet vehicles and by emphasizing fuel conservation in motor vehicle operations. GSA is procuring energy-efficient vehicles, reducing the number of on-hand vehicles, reducing vehicle usage, thus reducing mileage and fuel consumption, and downsizing vehicles with smaller, fuel-efficient vehicles. Vehicle sharing/pools will be encouraged, and plans are underway to educate and provide employees with fuel-efficient driving techniques that will reduce fuel usage.

GSA is actively progressing in the procurement and use of alternative fuel vehicles. The major objective is to obtain the following amounts of AFVs for its own use: 54 in FY 1993, 67 in FY 1994, 89 in FY 1995, 183 in FY 1996, and 251 in FY 1997.

Environmental Activities

GSA's environmental program is composed of the following elements: (1) resource conservation; (2) pollution prevention; and, (3) employee safety and health. With the combination of these elements, the GSA program protects external and internal environments. GSA achieves external environment resource conservation, and pollution prevention through waste minimization, source reduction efforts, recycling, alternative fuel vehicles, procurement of recycled products, energy saving programs, water conservation programs, a monitoring program for underground storage tanks, the use of more efficient packaging and shipping methods, alternative worksites, flexitime, and ridesharing.

Also, GSA achieves internal environment resource conservation and pollution prevention through waste minimization, energy conservation projects, the procurement and use of energy efficient appliances, control of smoking, the control of hazardous waste, indoor air quality monitoring, daytime cleaning programs, and initiatives to control asbestos, radon, and pests.

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18. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Energy Efficiency Performance and Implementation Strategies

During FY 1994, the National Aeronautics and Space Administration reported a 18.7 percent reduction in buildings energy consumption in Btu per gross square foot compared to FY 1985.

NASA manages 10 major centers in the United States, as well as other field installations and overseas tracking stations. NASA Management Instruction (NMI) 8832.1, Energy Management through FY 2000, was approved by the Administrator on February 2, 1993. The NMI establishes NASA policy to comply with Federal energy management requirements of Executive Order 12759 and public law. It sets goals and assigns organizational responsibilities for managing and reducing energy consumption at NASA installations. Projects and surveys are proposed by the energy manager at each center, and the projects and surveys compete for funding along with other center requirements. To compete successfully, projects having energy conservation as their sole purpose must have relatively short amortization periods since construction funds are very limited and have many high-priority competing projects.

Energy efficiency activities conducted by NASA centers and field installations fall under four main categories: surveys, metering, operation and maintenance procedures, and energy efficiency projects. The energy efficiency projects are as follows:

- Kennedy Space Center (KSC) completed several energy conservation projects which resulted in an annual energy savings of 71 billion Btu and a savings of nearly \$1.1 million. These projects included replacement of inefficient chillers, installation of variable speed chilled water pumping systems, installation of variable air volume systems, installation and upgrade of HVAC controls, and

installation of energy efficient indoor and outdoor lighting systems. Solar powered photovoltaic security perimeter lighting was installed at the Merritt Island Launch Annex, increasing the number of solar power applications at KSC to 24.

- Marshall Space Flight Center initiated or completed many conservation projects during FY 1994 including refurbishment of fluorescent lighting in office spaces, energy efficient high-bay lighting, installation of variable speed drives on air handling units and cooling towers, and the replacement of all incandescent lamps on the Center with compact fluorescent lamps.
- Dryden Flight Research Center installed a central energy monitoring and control system to ensure the efficient control of HVAC systems.
- Ames Research Center (ARC) installed an ice storage system in the Flight and Guidance Simulation Laboratory. The system shifts electrical consumption of mechanical refrigeration equipment to off-peak hours, and provides cost effective back-up capacity for computer cooling. An estimated savings of \$18,000 was realized during FY 1994.
- In FY 1994, NASA field installations submitted seven proposals for almost \$1.1 million in funding from the DOE Federal Energy Efficiency Fund. The proposals were primarily for lighting retrofit projects.

NASA field installations have implemented various programs to reduce the use of vehicle fuels. Ridesharing and use of public transportation is emphasized. At NASA Headquarters, employees are encouraged to use carpools and vanpools or to participate in the subsidized public transit program. Carpools and vanpools are offered priority parking at NASA field installations.

Training

NASA Headquarters conducted an in-house energy manager training course for 20 NASA employees in February 1994. The course covered the six competency areas defined in EPACT. Another 5 NASA employees and 19 contractor employees attended similar FEMP-sponsored or commercial training courses, and 33 NASA energy managers and contractor employees received Certified Energy Manager (CEM) certification.

Funding

NASA-funded facilities energy conservation projects are divided into two categories: minor capital improvement projects (under \$200,000) that can be achieved with field installation funds and major capital improvement projects (over \$200,000) requiring Construction of Facilities (CoF) program funding. At the present time, energy conservation projects must compete with all other construction projects for CoF funding. During FY 1994, nearly \$24.7 million were expended by NASA on projects that included significant energy efficiency and water conservation features.

Energy Savings Performance Contracts

The Michoud Assembly Facility (MAF), a Government-owned, contractor-operated (GOCO) facility, implemented an Energy Cost Reduction Program with Martin Marietta Space Systems (MMSS) in 1988. Under this program, MMSS's prime contract with NASA was modified to include an energy conservation incentive clause. The program rewards MMSS for exceptional performance in the management of energy use at MAF by providing energy savings achieved as an additional award fee. The program also includes provisions for sharing savings achieved through energy conservation projects proposed by MMSS. MMSS achieved a 18 percent reduction in energy usage below the negotiated baseline in FY 1994. Energy cost savings for FY 1994 totaled \$2.2 million, of which MMSS received 16.4 percent as an additional contract award fee.

Demand Side Management

The Goldstone Deep Space Network complex utilizes onsite generation equipment to reduce the amount of power purchased from Southern California Edison during summer and winter peak and mid-peak periods, saving an estimated \$300,000 per year by operating diesel generators during these periods. In FY 1994, Goddard Space Flight Center achieved estimated savings of \$137,400 by participating in a load curtailment program with the Potomac Electric Power Company. Wallops Flight Facility received a \$30,000 credit for its load shedding agreement during peak summer demand periods with Delmarva Power Company. ARC participates in the Western Area Power Administration Diversity Plan curtailing high electrical consumption processes during high demand conditions and accounting for refunds of \$3.0 million in FY 1994. NASA installations received a total of \$365,098 in utility rebates during FY 1994.

Vehicles

In June 1993, KSC initiated a compressed natural gas (CNG) vehicle pilot program. The pilot CNG fleet consisted initially of three dedicated CNG half-ton pickup trucks and a small portable refueling facility to

serve them. Later, two dedicated 8-passenger vans were added, as well as a bi-fuel (fueled by either gasoline or natural gas) sedan. Due to the problems the manufacturer experienced with ruptured CNG fuel tanks in early 1994, the three pickups were returned. However, the Center has received 1 dedicated 44-passenger bus, 7 dedicated 8-passenger vans, and 10 dedicated minivans. To date in FY 1994, there are 21 AFVs on site. To support these CNG vehicles at KSC and outyear AFV procurement, a permanent refueling facility for CNG vehicles is currently under construction at KSC.

MAF operates a fleet of 60 NASA-owned AFVs, including 23 small cargo vans, 26 pickup trucks, and 11 special purpose vehicles. Most are bi-fuel (fueled by either gasoline or propane), but a few are dedicated propane-only vehicles. In FY 1994, Johnson Space Center leased a total of seven AFVs from GSA. ARC also leased a total of five AFVs from GSA.

Water Conservation Projects

KSC initiated or completed several water conservation projects which will save approximately 38 million gallons of water per year. These projects included installation of ozone water treatment in cooling towers and wastewater recycling systems.

Lewis Research Center installed a cooling tower chilled water recirculation system at the Energy Conservation Laboratory and installed two closed loop recirculation research rig cooling water systems. These systems resulted in savings of approximately 550,000 gallons of water per day for a cost savings of \$132,000 per year.

Environmental Activities

Replacement or retrofit of chlorofluorocarbon (CFC) chillers continued at NASA field installations. Examples include the elimination of CFC refrigerants in 3 chillers totaling over 1,800 tons at MAF and 2 chillers totaling over 450 tons at Stennis Space Center.

KSC has a program for the handling and disposal of discarded fluorescent lamps and obsolete ballasts. It is estimated that during FY 1994, 4,060 ballasts and over 96,000 linear feet of fluorescent lighting tubes were safely disposed.

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19. NUCLEAR REGULATORY COMMISSION

Energy Efficiency Performance and Implementation Strategies

NRC's Energy Management Implementation Plan was developed in FY 1989 and is updated annually to incorporate new initiatives, programs, and strategies to meet the goals of Executive Order 12759. The energy conservation strategies implemented in FY 1994 and consumption information are detailed below.

One White Flint North (OWFN) Building

- Use of an automated energy management system to maximize energy efficiency of HVAC equipment systems
- Use of occupancy sensors to control interior lighting
- Replacement of incandescent bulbs with compact fluorescent bulbs
- Replacement of incandescent exit signs with fluorescent exit signs
- Implementation of an employee awareness program
- Utilization of heat exchangers to provide free cooling
- Conducting of energy audits to identify potential lighting retrofit projects
- Participation in the Potomac Electric Power Company (PEPCO) rebate program
- Participation in the PEPCO voluntary load curtailment program

During the first quarter of FY 1994, an automated energy management system was installed. The system was programmed to ensure efficient operation of heating, ventilation, and air conditioning equipment. During the third quarter, incandescent signs were retrofitted with fluorescent conversion kits.

Two White Flint North (TWFN) Building

- Use of an automated energy management system to maximize energy efficiency of HVAC equipment systems
- Implementation of an employee awareness program
- Conducting of energy audits to identify potential lighting retrofit projects
- Participation in PEPCO voluntary load curtailment program

The interior build-out of TWFN was completed in April 1994. Phased-in occupancy began in April 1994 and total building occupancy was completed in July 1994.

Phillips Building

- Utilization of occupancy sensors to control interior lighting

- Replacement of incandescent bulbs with compact fluorescent bulbs
- Revised chiller and boiler operating plan to maximize energy savings

NRC's consolidation efforts were completed in FY 1994, resulting in the relocation of agency personnel from the Phillips building to the newly constructed TWFN building. The phased move-out of agency personnel began in April 1994 and was completed in October 1994. The FY 1993 consumption was 11,555 million Btu compared to 7,518 million Btu in FY 1994. The 35 percent reduction is attributed to the discontinuation of lighting and HVAC as each floor was vacated. During the first and second quarter of FY 1994 when the building was totally occupied, the energy conservation strategy consisted of the implementation of no-cost initiatives. Existing time clocks were reprogrammed to reduce run time on HVAC equipment. Thermostats were recalibrated and an employee awareness program resulted in employees turning off fan coil units and office lights in unoccupied offices.

NRC is a full participant in the Metropolitan Washington Council of Governments Ride Finders Network Program. A centralized database allows NRC employees to join existing carpools or establish carpools with other commuters. NRC offers public transit subsidies to all employees; uses non-monetary incentives such as flexitime, compressed work schedules and parking assignment priority for employees who use car pools or van pools to commute to work; and, provides facilities for bicyclists, including locker rooms and showers. NRC also promotes reduction in fuel consumption through transportation fairs, employee announcements, and newsletters.

Training

An on-going energy management training program has been established for NRC facility managers. NRC is an active participant in the Interagency Energy Management Task Force and the Professional Energy Managers Association. As participants in the GSA 1994 Energy and Environmental Management Conference, NRC staff members received training in the following disciplines: 1) Building Technologies: HVAC and Lighting; 2) Energy-Efficient Computing Technology; and 3) Water Conservation.

Energy Savings Performance Contracts

No energy savings performance contracts were awarded in FY 1994 by the NRC. In FY 1995, NRC will examine the feasibility of awarding performance contracts to install occupancy sensors, LED exit signs, and electronic ballasts.

Demand Side Management

During FY 1994, NRC participated in the PEPCO Rebate Program for the installation of fluorescent exit signs. No impediments or problems were encountered during the application, approval, and installation process.

Vehicles

Executive Order 12759 requires all Federal agencies operating 300 or more commercially designed motor vehicles to reduce fuel consumption by 10 percent. Although NRC is not subject to this order because we have less than 300 vehicles in our fleet, NRC acquires only the minimum number and size vehicle necessary to meet its needs. NRC is also in the process of reducing its number of vehicles as a result of our headquarters consolidation. This follows actions taken in FY 1992 and FY 1993 to reduce the number and size of agency vehicles.

Although acquisition of alternative fueled vehicles is voluntary for agencies with less than 300 vehicles, NRC intends to participate in the program by replacing GSA assigned vehicles with alternative fueled vehicles as they become available through GSA.

Environmental Activities

To ensure compliance with the Clean Air Act of 1990, NRC installed refrigerant purifier purge equipment on the chillers at OWEN. The equipment minimizes the level of ozone depleting chlorofluorocarbons (CFCs) which are vented to the atmosphere. Additionally, NRC has been a full participant in GSA's recycling program since FY 1991.

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20. PANAMA CANAL COMMISSION

Energy Efficiency Performance and Implementation Strategies

During FY 1994, the Panama Canal Commission reported a 13.3 percent increase in buildings energy consumption in Btu per gross square foot compared to FY 1985.

The Commission, given its unique mission in the Republic of Panama, is not bound by targeted reductions of electrical power and associated energy for buildings/facilities, reductions of fuel use by vehicles, and procurements of alternative-fueled vehicles under Executive Order 12759. Nevertheless, PCC will continue to manage the waterway consistent with these Federal efforts to the extent practical, until termination of the Commission and United States operation of the Panama Canal in December 1999.

The Office of Executive Planning oversees agency-wide actions to implement energy plans and achieve projected goals through its Environmental/Energy Unit, and prepares guidance on procedures, policies and other matters governing Federal energy management. Technical and engineering coordinators at major and specialized energy consuming areas of the organization additionally provide assistance needed to maintain maximum operational energy efficiencies. To most effectively monitor consumption trends, reports on unit-level usage of electrical power, gasoline, diesel and distillate fuel are submitted monthly to the Environmental/Energy Unit.

The Commission's long-range Buildings Energy Plan is the basis for its ongoing buildings maintenance, monitoring and improvement programs. PCC is responsive to technical advances in the industry which enhance energy efficiencies, and state-of-art energy savings measures are incorporated where practical in buildings and facilities under construction or renovation. Largest and heaviest consuming buildings/facilities

normally receive first priority for energy related lighting and air conditioning improvements, irrespective of Standard Buildings Services or Process/Industrial energy usage category.

Recurring maintenance includes mass relamping and light fixture cleaning every 3 years or as lamp problems appear. This effort was established in coordination with surveys performed to help determine specific requirements for reflectors, new ballasts, lenses, and changes from incandescent or mercury vapor to fluorescent or high pressure sodium/metal halide lights. Virtually all of the Commission's buildings have been retrofitted with energy conserving lamps and light fixtures as a result of an aggressive upgrading program since 1988.

In FY 1994, two major projects were initiated to improve night lighting sources at the locks and channel. One involves modification of 100-foot high-mast luminaires at the three sets of locks. A total of 92 masts, each currently fitted with six 1,000-watt metal-halide bulbs will be retrofitted to eight 600-watt high-pressure sodium bulbs. The new fixtures have instant re-start capability and provide 12 percent more light with 15 percent less power, yielding annual savings of about \$24,000. The second related modification underway since FY 1994 involves 259 light fixtures along the eight-mile long Gaillard Cut, where lamps are being converted from 218-watt to 50-watt systems to improve efficiency and achieve annual savings approximating \$10,000. PCC also installed a programmable logic controller with motion detectors which provides automatic partial-area office lighting. This modest example of ongoing PCC projects reduces use of office lights when not needed and saves almost \$1,000 per year in electrical power usage. During FY 1994, PCC also began installing computer monitors that consume less energy during idle time. All new computers purchased by the agency now meet the EPA Energy Star requirements stipulated by Executive Order 12845, and include the energy-saving monitors.

Diesel fuel needed each year by dredges, drillboats, towboats, launches and other floating gear dominates PCC energy consumption; operation of this heavy equipment is governed by cyclic maintenance and improvement schedules, ship traffic, and other requirements beyond agency control. Over the years PCC engineers have significantly improved fuel conservation in its dredges, the major consumers, by replacement or conversion of old heavy fuel oil steam-powered plants to diesel units and by intense renovation and moderniza-

tion. As an example, the large class hydraulic-cutterhead dredge MINDI (which in FY 1994 removed over 5.6 million cubic yards of material at the Canal), has undergone a series of upgrading efforts since 1987 that save an average 8 gallons of fuel for every 10 cubic yards excavated.

The U.S. Military in Panama publish a weekly newspaper and operate an English language TV station accessible to Commission employees, which actively promotes conservation and carries tips and information on energy use issues. PCC also furnishes agency-wide directives and prints articles in English and Spanish in its bimonthly official publication, THE SPILLWAY, to disseminate energy-related concerns. Employee energy awareness within the agency additionally has been fostered by the PCC Incentive Awards Suggestion Program, underway for many years.

Funding

The PCC functions on a self-financing basis, with recovery of all operating costs, including interest, depreciation, capital for plant replacement, expansion and improvements, and payments to the Republic of Panama for public services and annuities, through tolls, and other revenues. Revenues from tolls and all other sources are deposited with the United States Treasury into the Panama Canal revolving fund. Resources in this account are available for continuous use and serve to finance Canal operating and capital programs, which are reviewed annually by Congress. PCC does not seek separate funding of its energy-related projects. PCC funds dedicated to ballasts, upgrading channel lights, final improvements to the chilled water system and other buildings/facilities energy conservation modifications totaled \$607,800 in FY 1994, and are projected to be \$140,000 in FY 1995.

Energy Savings Performance Contracts

The Commission did not enter into energy savings performance contracts during the fiscal year. There is not sufficient economic opportunity for this type of initiative with PCC, given its self-financing basis, location overseas and terminal status, in addition to the advanced service life of most of its buildings.

Demand Side Management

Electrical power for agency operations is not purchased by the Panama Canal Commission from a servicing utility, thus discounts or other benefits from rebate programs are not available. The Commission maintains its own electrical power generation systems, including two hydropower plants that harness energy from Canal reservoirs. PCC additionally distributes electrical power from its plants to other Canal area consumers, primarily

U.S. military components which implement their own energy conservation programs in accordance with Federal guidelines and objectives.

Vehicles

PCC's gasoline-operated vehicles have been aggressively replaced by diesel units where feasible and that program was virtually completed in FY 1992. PCC vehicles are combined under a single motor pool for optimal administrative control and consistent preventive maintenance, review of fuel usage/repair rates and evaluation for replacement. Agency policy further supports vehicle fuel savings by ensuring appropriate classes of vehicles for assignments, driver training, conservative driving practices, trip consolidation and similar measures. Gasoline and diesel/petroleum distillate fuel consumption for FY 1994 totaled 246,000 and 4,741,300 gallons respectively, at costs of \$214,500 and \$2,765,300.

Environmental Activities

Close procurement coordination with PCC operating units ensures that environmentally-friendly products are obtained for buildings retrofits, replacements and other energy improvement work. The Commission considers conservation and efficiency in acquisition decisions and purchases recycled items when they meet criteria for availability, cost and needed performance standards, and where consistent with a satisfactory level of competition (PCC is required by the Panama Canal Treaty to give preference to these purchases locally).

Among PCC's currently active recycling projects is the sale of paper by lot, including recovery of computer paper for offer in Panama at fair market value. Scrap iron, used oil, surplus and excess items also are collected for resale and recycling as part of conservation and waste minimization operations.

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21. RAILROAD RETIREMENT BOARD

Energy Efficiency Performance and Implementation Strategies

In FY 1994, the Railroad Retirement Board reported an energy consumption decrease of 1.4 percent in Btu per gross square foot compared to FY 1986, the first year it was delegated control of its building.

The Headquarters building in Chicago, Illinois, is the only building over which RRB has operational control. RRB operates and maintains the building under a delegation of authority agreement with GSA.

RRB updated its energy conservation plan in March 1993 to incorporate the requirements of NECPA, Executive Order 12759, and EPACT. The plan lists some of the conditions and equipment additions which have hindered energy reduction efforts, as well as initiatives that RRB and GSA have taken or have planned in order to meet the energy reduction goals for buildings.

The following energy efficiency actions reduced energy consumption:

- Installation of an additional hot water heater, eliminating the need to operate a boiler
- Implementation of the following recommendations made in a GSA energy audit of the building:
  - reduction of operating hours for air handling units;
  - reduction of the number of personal computers, terminals, and printers left on-line during non-business hours; and
  - increase in the use of energy efficient compact fluorescent bulbs in mechanical areas.
- Coordination of daily cleaning procedures with the janitorial services contractor so that lights were turned off earlier on certain floors.
- Reduction in the number of hours that lighting in public areas of the building was operated.
- Replacement of all large electric motors with high efficiency motors, upon the recommendation of their electric utility company.

The following projects/actions, which will further reduce energy consumption, are planned for fiscal year 1995:

- installation of energy-saving T8 lamps and electronic ballasts in all remaining office areas and in washrooms, and installation of additional lighting controls in office areas;
- installation of more energy-efficient motors on all building air handling units; and
- reduction of agency man-hours worked on Saturdays.

Training

This agency does not meet the definition of an executive department under section 101 of Title 5 and therefore is not subject to the energy management training provision of this Act. However, personnel responsible for energy management will receive the additional training which is to be provided by GSA under the Energy Policy Act of 1992 as early as possible.

Funding

Between \$10,000 and \$20,000 of building operating funds are used for energy conservation measures annually, and \$30,000 annually is budgeted for energy-saving initiatives. GSA, as the Government owner of the RRB building, continues to fund projects over \$50,000. GSA has future projects planned, but not budgeted, that may reduce energy consumption.

Energy Savings Performance Contracts

RRB has not entered into any ESPC contracts. The comparatively small size of potential contracts available to RRB—at a \$50,000 limit because of the delegation of authority agreement with GSA—is not practical for this type of procurement.

Demand Side Management

No opportunities now exist from utility companies for demand-side services, incentives, or rebates, but RRB will continue to monitor its utilities for opportunities that may develop.

Vehicles

The agency is developing information to be provided to our employees concerning ridesharing awareness of fuel usage reduction measures.

Environmental Activities

New electric chillers being installed by GSA will use approved R-22 refrigerant. All obsolete fluorescent ballasts have been and will continue to be disposed of safely and properly. Energy management activities are conducted with appropriate concern for the building

environment in which RRB employees work. Appropriate amounts of outside air are provided to ensure proper environmental conditions.

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22. TENNESSEE VALLEY AUTHORITY

Energy Efficiency Performance and Implementation Strategies

During FY 1994, the Tennessee Valley Authority reported a 0.5 percent increase in energy consumption in Btu per gross square foot compared to FY 1985.

TVA developed its Agency Energy Plan and submitted it to DOE on March 1, 1994. TVA is currently updating this Plan and is developing a TVA Energy Policy to be submitted to the TVA Board for approval in FY 1995.

To insure TVA's proper compliance with Federal Regulations and obligations under the Green Lights Program, TVA formed an interagency Energy Conservation Committee (ECC). This committee is comprised of representatives from each TVA organization responsible for energy consumption in buildings, facilities, operations, and equipment inside the agency. The ECC reduces the chance of duplication of effort and the possibility of missing the chance to implement important energy or environmental applications.

During FY 1994, TVA identified 163 operation, maintenance, and 33 water objectives. The following operations and maintenance programs have been implemented to date by TVA.

- Use of the most efficient lighting systems available
- Reduce lighting levels where light output exceeds requirements for the space
- Install light switches or motion sensors in areas not currently controlled
- Install photocell control on outdoor lighting.
- Night setback thermostats or EMCS installations.
- Use outside air for cooling when possible.
- Report building energy consumption data on a per building basis for major energy use buildings for accurate tracking of energy usage trends.

- Review maintenance procedures and make repairs to reduce energy consumption.
- At Skull Island and Mallard Creek Campgrounds, the well water systems were abandoned and water is now obtained from the local utility. This eliminated the local pump and biweekly inspection trips to the well houses.
- At Norris, Tennessee facility, the HVAC unit serving the computer room was replaced with a more efficient unit.
- A regular steam line insulation maintenance program has been implemented.
- Electric driven boiler feed water pumps are now being used for the main boiler. The steam driven pumps are used only for backup.
- The controls on the package boiler are now under a regular maintenance program to maintain maximum performance.
- An energy monitor has been appointed and steam traps are now on a regular inspection and maintenance program. The estimated cost reduction for FY 1995 is \$92,000.
- Buildings with only partial occupancy are only heated in the occupied areas.
- Any unused steam or electric lines were eliminated to reduce standby losses.
- Installed two small natural gas fired boilers to replace one large natural gas boiler for a first month savings of \$20,000.

During FY 1994, an employee energy awareness campaign was implemented by the Facilities Services energy reduction team. Initiatives of the team included displaying monthly energy use posters in large office buildings, periodic notes to remind employees to turn off unnecessary equipment, and "Energy Fair 1993" held in Knoxville, Chattanooga, and Muscle Shoals to enhance energy education. TVA is also working to combine TVA's employee energy awareness program with its solid waste minimization program.

TVA encourages employees to ride share and, in some cases, will find employees travelling to the same destination to avoid the use of multiple vehicles. They also promote the use of mass transit systems when available and feasible.

Training

TVA has appointed building energy monitors for each of its major facilities and provides ongoing energy management training for these individuals. TVA also provides updates on current Federal requirements and

regulations for employees and their managers upon request.

Funding

TVA is currently establishing a funding procedure for energy conservation projects. Past energy efficiency projects have been funded through building renovation and modernization efforts. TVA considers for implementation all cost-effective opportunities, which are evaluated using life-cycle cost methodology and implemented as funds become available. TVA's current procurement policy includes a statement that energy management and efficiency will be considered along with environmental impacts when new or replacement energy-consuming equipment is purchased.

During FY 1994, TVA spent \$349,164 for surveys of 46 buildings covering almost 2.1 million square feet. One hundred eleven cost-effective energy conservation opportunities were identified. Estimated cost to implement these was \$1.6 million with a potential yearly savings of \$407,000.

Energy Savings Performance Contracts

TVA considers the use of energy savings performance contracts when cost-effective to TVA and its customers. TVA did not enter into any energy savings performance contracts during FY 1994.

Demand Side Management

TVA is an electric utility and, therefore, establishes demand side activities when cost-effective and in the best interest of its customers.

Vehicles

During FY 1994, TVA expanded its AFV fleet with the addition of 20 M85 sedans and 5 electric pickup trucks. This brought TVA's AFV fleet to a total of 31, consisting of 13 M85 Dodge Spirits, 10 M85 Ford Taurus, 2 CNG Dodge vans, 1 electric van, and 5 electric pickups. The 10 Chevrolet Corsicas on order were canceled due to manufacturing problems. One important fact concluded from the first full year of AFV fleet involvement was the difficulty of procuring a reliable and cost competitive supply of methanol. This difficulty, along with the growing support for electric vehicles (EVs) as the type most compatible with TVA's long-term plans as an all electric utility, have lead to greater interest and support for focusing on EVs. TVA has established a public EV Information Center in conjunction with an expanded local transit authority facility highlighting electric buses. In addition, TVA is developing an educational program for secondary schools and partnering with local electric distributors to assist vocational and technical schools on EV technology.

During FY 95, plans are to add an additional 6 electric AFVs, to finalize an electric transportation policy, and to complete the AFV field test.

TVA-owned vehicle inventory at the end of FY 1994, excluding construction equipment and trailers, was as follows: 1,456 sedans, 206 station wagons, 2,040 light trucks, and 151 motor scooters for a total of 3,853.

Environmental Activities

TVA became the first Federal agency to join the EPA Green Lights program. TVA has set as one of its three major corporate goals to become an environmental leader. TVA has embarked on a solid waste minimization program, sustainable architectural program and a by-products with recycle content program. Listed below are some of the efforts in these areas.

A solid waste reduction program was phased into TVA's corporate facilities during FY 1994. The program goal is to reduce by 80 percent the amount of waste going to landfills through elimination, reuse, or recycling. Highlights of the program to date include the use of hand dryers in place of paper towels; reusable beverage mugs in place of styrofoam and paper cups; and recycling of white and mixed paper, cardboard, newspaper, plastic, glass and steel and aluminum cans.

Sustainable architecture is designing and constructing buildings that have a minimum negative impact on the environment. TVA is developing ways to utilize the approaches of sustainable architecture. Reusable wall partitions are being evaluated to replace drywall. Low toxic materials are being introduced. Recycling old materials and purchasing new materials from recycled components is being explored. The immediate goal of the sustainable architecture project is to impact the renovation work taking place in TVA's Knoxville corporate office building. The long-term goal is to incorporate sustainable architecture in all TVA renovation and new construction work.

TVA is one of the first utilities to announce a plan to reduce its greenhouse emissions, which come primarily from coal-fired plants.

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23. UNITED STATES POSTAL SERVICE

Energy Efficiency Performance and Implementation Strategies

In FY 1994, energy use in U.S. Postal Service facilities decreased by 2.6 percent in Btu per gross square foot compared to FY 1985.

The U.S. Postal Service's energy management plans encompass all aspects of energy conservation and incorporate financial, procurement and operating strategies, and include a strong emphasis on demand side management, alternative fuels, and the environment. The plans establish energy performance goals by region. As a result of restructuring, the energy plans will establish performance goals consistent with the new Area structure.

The Postal Service has established Area Energy Coordinators consistent with the Area Management structure. Additionally, each Area Energy Coordinator has designated field energy coordinators and facility energy coordinators. The Postal Service compiled a composite listing of all individuals responsible for energy conservation and assessed their credentials relative to the trained energy manager criteria set forth in EPACT.

The Postal Service is unique among agencies in its use of the Federal Acquisition Regulations. This has allowed the Postal Service the flexibility to adopt the best purchasing principles of both the private and public sector. As such, it allows flexibility to adapt purchasing policy to accommodate the changing environment in which purchasing is done by considering the energy efficiency of goods and products and environmental waste management. Under the Postal Service's "best value" buying philosophy, price and price-related factors are not the key elements in a buying decision. Other factors, such as energy consumption, efficiency and other life-cycle costing factors carry as much or more weight in determining contract awards.

In FY 1994, USPS began an initiative to educate purchasing personnel regarding responsibilities under EPACT as well as other energy conservation issues, such as sources of supply for energy-efficient products. This was accomplished through a series of briefings to all levels of management concerning both energy and environmental issues. In addition, a special 2-day training session was held in August 1994 with the field energy coordinators as well as purchasing representatives. A quarterly newspaper for purchasing personnel covers specific energy and environmental issues. Training materials have been developed emphasizing the role and responsibility of contracting officers in complying with energy and environmental regulations. Development of energy-specific guidance for inclusion in the Postal Service Procurement Manual is ongoing.

FY 1994 is the fourth year of the Postal Service ridesharing program in the south coast area of Southern California. Employees are offered a number of direct incentives including a transit subsidy, a guaranteed ride home and preferential parking. The program also includes a newsletter, educational activities, flexible work hours and recognition awards. The Postal Service will begin trip reduction programs in additional non-attainment areas as defined by the Clean Air Act.

Training

During September 1994, 20 energy coordinators attended an in-depth training course in energy surveys. This training was developed and presented by the Association of Energy Engineers.

Funding

Energy projects within the Postal Service are prioritized using criteria such as operational need, safety issues, and economic benefits. Economic benefits are measured by net present value and return on investment to the Postal Service. Projects are identified during surveys conducted by field maintenance personnel. Funding to accomplish the projects may come from local budgets or Headquarters.

During FY 1994, projects totaling almost \$3.0 million were approved for Headquarter's funding with over \$1.1 million actually expended. The difference is due to project implementation time frames. Several of the projects involved rebates from the local utility company. The USPS energy conservation program budget for FY 1995 is projected at \$10 million. These funds will be used for energy surveys, studies, and retrofit projects.

In FY 1994, USPS finalized the development of "special" contractual instruments that will simplify the process of contracting for the identification and fielding of energy retrofit projects, either through the energy savings performance contract concept or demand side management.

Energy Savings Performance Contracts

The Postal Service has shared energy savings contracts currently in place at four locations: San Diego General Mail Facility, Oklahoma City General Mail Facility, New Orleans General Mail Facility, and Southern Maryland General Mail Facility/Bulk Mail Center. Project summaries are as follows:

<i>Project Location</i>	<i>Annual Savings</i>	<i>USPS Share</i>
San Diego	\$138,968	61.0%
Oklahoma City	\$ 78,101	8.1%
New Orleans	\$100,194	11.2%
So. Maryland	\$ 95,109	12.0%

Based upon lessons learned from these projects and current market trends, Headquarters Maintenance Policies and Programs in a joint effort with Headquarters Purchasing Policies developed generic contract and technical documents for national use on energy savings performance contract projects.

Demand Side Management

Demand side management services are one of the central strategies of the Postal Service energy management program. During 1994, the Postal Service participated in several utility demand reduction and rebate programs. The partnership efforts with Baltimore Gas and Electric (BG&E) is an example. Working with BG&E, the Postal Service offered facilities for investigation of BG&E's "Energy Saver Switch" program. This program is designed to reduce consumption in smaller facilities by cycling the air conditioning system's compressor. The net result was installation of the "Energy Saver Switch" at 60 Postal facilities. The Postal Service received a bonus amount for the installation of the switches and credits appear on the monthly utility bills for each of the facilities. The Postal Service is continuing to work with BG&E for inclusion of the Baltimore processing and distribution center in its DSM program.

The Postal Service continues to work closely with Wisconsin Power installing efficient lighting fixtures in facilities throughout the Milwaukee area. Rebates continue to be received from Wisconsin Power as projects are completed.

The Postal Service recently received an award for successful energy-saving efforts from Portland General Electric and a rebate of \$51,740 resulting from energy savings in excess of \$180,000. These savings were realized by installing efficient lighting fixtures in 10 locations around the Oregon area which reduced lighting costs by almost 48 percent.

Of particular note was the continual development of our partnership arrangement, along with other Federal agencies, with Pacific Gas and Electric. Using a standard contract format, PG&E will survey facilities and identify energy retrofit projects that will provide the greatest return on investment. These projects will not be limited in scope to energy retrofits, but will cross the complete spectrum of energy conservation. Possible funding mechanisms include billing via the utility bill.

Vehicles

The Postal Service continues to operate the largest compressed natural gas (CNG) fleet in the country. The alternative fuel vehicle program is continuing as an energy conservation and environmental strategy. The Postal Service Alternative Fuel Vehicle (AFV) program is a Headquarters-funded program. During FY 1994, \$4.0 million was spent on AFV conversions, with \$8.0 million budgeted for this program for FY 1995. The large variance is due to contract award time frames. State and local funding assisted in accomplishing CNG conversions.

In 1994, the Postal Service converted over 1,000 of its delivery vehicles to operate on CNG. Now, there are 1,663 vehicles operating on CNG. It received eight methanol vehicles in 1994 and has ordered five ethanol vehicles.

Energy Management Contact

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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), January 1988

**NATIONAL ENERGY CONSERVATION POLICY ACT (Public Law 95-619),
November 1978**

**ENERGY POLICY AND CONSERVATION ACT (Public Law 94-163), December 1975
SECTION 381 - FEDERAL ENERGY CONSERVATION PROGRAMS**

**OFPP POLICY LETTER NO. 76-1, August 6, 1976
FEDERAL PROCUREMENT POLICY CONCERNING ENERGY POLICY AND
CONSERVATION**

**EXECUTIVE ORDER 12759, April 17, 1991
FEDERAL ENERGY MANAGEMENT**

**DEPARTMENT OF ENERGY ORGANIZATION ACT (Public Law 95-91), August 1977
TITLE III - TRANSFERS OF FUNCTIONS**

SUPPLEMENT NO. 1 TO OFPP POLICY LETTER 76-1, July 2, 1980

PERTINENT FEDERAL REGULATIONS

**FEDERAL ACQUISITION REGULATIONS (23.2) (SUPERSEDES FEDERAL
PROCUREMENT REGULATIONS [1-1.339-1])**

DEFENSE ACQUISITION REGULATIONS (7.103(h)2) - SUPPLEMENTAL TO 7.101 FAR

**FEDERAL ENERGY MANAGEMENT AND PLANNING PROGRAMS
(TITLE 10 CFR Chapter 11, Part 436)**

**FEDERAL PROPERTY MANAGEMENT REGULATION
(TITLE 4 CFR Chapter 101, Subchapter E, Part 101-25)**

APPENDIX B DATA COLLECTION

Buildings and Facilities

Excluded Buildings/Process Operations

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 which have been delegated by GSA to other agencies, 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 buildings' energy management.

The Federal agencies submit their annual reports expressed in the following units: megawatt hours 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

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

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.

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:

Automotive 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

Missing data and anomalies are addressed in the same fashion as those described previously in this appendix.

APPENDIX C
FEDERAL ENERGY EXPENDITURES AND COST AVOIDANCE,
FY 1985 THROUGH FY 1993

TABLE C
FEDERAL ENERGY EXPENDITURES AND COST AVOIDANCE,
FY 1985 THROUGH FY 1994 (NOMINAL DOLLARS)

YEAR	ANNUAL ENERGY USE (BBTU)	ANNUAL ENERGY COST (\$ MILLION)	ANNUAL ENERGY USE REDUCTION REL. TO FY 1985 (BBTU)	AVERAGE ANNUAL ENERGY COST (\$/BBTU)	ANNUAL ENERGY COST AVOIDANCE (\$ MILLION)
Buildings and Facilities					
1985	470,862.4	3,981.760	0.0	8.456	0.000
1986	447,188.9	3,705.302	23,681.5	8.286	136.223
1987	467,998.8	3,814.631	2,863.6	8.151	23.341
1988	443,211.3	3,591.499	27,651.1	8.103	224.066
1989	440,151.3	3,421.740	30,711.1	7.774	238.749
1990	440,687.5	3,969.860	30,174.9	9.008	271.825
1991	403,593.5	3,744.435	67,268.9	9.270	624.103
1992	412,176.2	3,645.657	58,686.2	8.845	519.102
1993	403,082.3	3,912.984	67,780.1	9.708	657.982
1994	384,984.4	3,821.166	85,878.0	9.926	852.382
B&F Total					3,607.774
Vehicles & Equipment					
1985	934,538.5	6,058.113	0.0	6.482	0.000
1986	924,832.9	3,757.103	9,705.6	4.062	39.429
1987	950,906.3	4,098.682	-24,367.9	4.274	-104.156
1988	846,928.1	4,018.398	87,610.3	4.745	415.683
1989	959,983.2	4,688.388	-25,444.7	4.884	-124.267
1990	926,986.5	5,268.779	7,552.0	5.684	42.924
1991	969,126.2	6,737.818	-34,587.7	6.952	-240.470
1992	784,446.1	4,110.782	150,092.3	5.240	786.538
1993	773,978.4	4,430.407	160,560.1	5.724	919.078
1994	722,860.3	3,251.887	211,678.2	4.499	952.264
V&E Total					2,687.021
Energy Intensive Ops					
1985	40,098.6	396.130	0.0	9.929	0.000
1986	38,124.6	385.384	1,974.0	10.109	19.954
1987	38,669.1	391.758	1,429.5	10.131	14.482
1988	69,664.3	667.409	-29,565.7	9.580	-283.250
1989	63,593.2	564.446	-23,494.6	8.876	-208.535
1990	65,303.7	659.880	-25,285.1	10.105	-254.692
1991	83,676.5	795.607	-43,577.9	9.508	-414.344
1992	98,768.6	900.190	-58,670.0	9.114	-534.731
1993	70,797.7	604.308	-30,699.1	8.536	-262.039
1994	93,091.0	975.299	-52,992.4	10.477	-555.193
EI Ops Total					-2,478.348
Total All Energy					3,816.446

DATA AS OF 07/20/95

NOTE: This table incorporates revisions to previously published energy consumption and cost data submitted to DOE by Federal agencies. National Science Foundation's energy data for FY 1988 and FY 1989 and the Department of Health and Human Services' cost data for FY 1989 are estimated.

Source: Federal Agency Annual Energy Management Data Reports

FIGURE C
FEDERAL GOVERNMENT
AVERAGE ANNUAL ENERGY UNIT COSTS,
FY 1985 THROUGH FY 1994 (NOMINAL DOLLARS)

Source: Federal Agency Annual Energy Management Data Reports

APPENDIX D FEDERAL PERFORMANCE UTILIZING "SOURCE" CONVERSION FACTORS

Appendix D and the accompanying tables are included to show performance using the source conversion factor of 11,600 Btu per kilowatt hour of electricity instead of the site conversion factor of 3,412 that is used throughout this report. These tables also use the source conversion factor of 1,390 Btu per pound of steam instead of the site conversion factor of 1,000 Btu per pound. The source conversion factors represent the average number of Btu required at the point of generation (source energy) rather than the actual amount of Btu delivered to the site. The tables in this Appendix are provided to illustrate the Federal Government's total impact on actual energy resources.

Using the conversion factor of 3,412 Btu per kilowatt hour of electricity provides comparability with the measurement of energy usage in private sector buildings. The factor of 3,412 Btu per kilowatt hour of electricity is the average number of Btu actually received at the point of use (site energy) from that original 11,600 Btu input. The difference between site and source units reflects efficiency losses during power generation, transmission, and distribution to final users.

The accompanying tables show agency performance using the conversion factor of 11,600 Btu per kilowatt hour of electricity. This is the same consumption and performance reported in Tables 1, 4, and 7, but expresses electricity and steam use in terms of source Btu instead of site Btu.

TABLE D-1
TOTAL ENERGY USE BY FEDERAL AGENCIES - SOURCE CONVERSION
(In Billions of British Thermal Units, Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10¹⁵])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	% CHANGE 85-94	% CHANGE 93-94
TVA ¹	1,899.5	1,966.0	2,045.0	1,980.6	1,784.5	1,887.1	1,950.1	1,830.8	1,917.5	84,834.0	4,366.1	4,324.2
DOE	97,530.9	92,001.4	93,184.9	96,732.8	89,891.0	89,341.8	85,703.9	89,286.5	85,710.1	82,614.4	-15.5	-3.6
USPS	50,968.1	51,457.3	53,327.2	55,794.7	57,865.1	59,097.8	60,543.2	62,372.2	66,638.9	68,794.2	35.0	3.2
VA	42,926.5	43,135.4	42,363.5	44,839.5	45,267.5	44,337.2	45,271.6	45,394.6	46,284.4	46,639.8	8.7	0.8
GSA	42,963.0	34,002.8	32,374.8	30,411.7	31,026.2	36,590.2	36,852.7	36,282.5	37,008.9	36,468.2	-15.1	-1.5
NASA	23,365.1	24,633.6	25,183.6	25,353.9	27,519.0	28,192.1	29,121.6	29,432.5	29,350.5	29,960.7	28.2	2.1
DOT	28,560.2	28,525.2	28,721.5	28,533.7	28,129.3	28,379.3	27,922.0	32,036.6	35,175.8	29,810.6	4.4	-15.3
DOJ	11,026.6	11,681.6	11,485.8	13,143.3	12,081.8	11,474.0	14,162.8	12,961.0	14,835.4	16,632.6	50.8	12.1
NHS	12,978.7	10,654.3	11,227.6	12,136.6	12,880.3	16,181.3	14,353.7	15,857.0	16,264.1	16,497.0	27.1	1.4
USDA	12,152.0	10,761.5	11,493.8	12,005.7	12,950.7	14,397.6	14,590.7	14,039.6	14,426.5	14,494.1	19.3	0.5
DOI	11,440.0	9,955.3	9,659.7	10,460.3	10,820.5	10,864.3	10,955.6	10,643.5	11,829.6	12,156.2	6.3	2.8
TRSY	3,606.0	3,479.0	3,601.9	3,813.4	8,370.1	6,477.3	7,960.4	8,699.7	8,561.0	8,419.7	133.5	-1.7
DOC	4,038.8	3,631.2	3,493.9	3,912.4	4,597.0	6,327.7	4,536.0	4,372.8	4,636.9	5,392.2	33.5	16.3
DOL	3,920.0	3,989.4	4,035.1	4,185.3	4,119.4	4,103.2	4,196.7	4,209.9	4,324.2	4,403.2	12.3	1.8
EPA	1,341.8	2,131.5	1,082.3	1,008.3	1,005.0	1,004.6	1,047.3	1,496.8	2,018.6	2,107.2	57.0	4.4
POC	1,189.4	1,300.1	1,409.8	1,372.2	1,434.0	1,399.5	1,358.9	1,461.0	1,467.0	1,479.4	24.4	0.8
ST	704.0	740.5	832.8	810.4	835.1	852.2	845.4	829.4	1,177.8	1,263.2	79.4	7.2
FEMA	190.5	295.6	312.1	351.8	395.3	459.6	442.7	493.6	421.5	410.3	115.3	-2.7
HUD	340.6	350.1	355.7	373.0	417.0	426.5	446.0	418.0	381.9	354.8	4.2	-7.1
OPM	168.1	174.6	175.1	200.6	214.0	218.2	227.1	239.2	312.3	312.3	85.8	0.0
ECC	42.0	41.6	46.2	44.5	41.0	50.1	50.9	41.3	42.3	46.0	9.7	8.8
OTHER*	628.1	938.7	961.3	1,039.8	4,154.5	3,390.4	2,409.5	2,443.1	2,755.4	3,695.8	468.4	34.1
CIVILIAN AGENCIES TOTAL	351,976.6	334,826.4	339,473.6	354,335.3	355,797.9	365,461.9	364,946.7	374,801.6	385,539.4	466,586.0	32.6	21.0
DOD	1,494,704.2	1,460,467.5	1,537,276.3	1,424,872.8	1,564,051.2	1,536,176.1	1,554,075.0	1,388,726.4	1,330,916.1	1,253,516.9	-16.1	-5.8
ALL AGENCIES TOTAL	1,846,680.9	1,795,314.0	1,876,749.8	1,779,208.1	1,919,849.1	1,901,638.0	1,919,021.7	1,763,528.0	1,716,455.6	1,720,103.0	-6.9	0.2
MBOE	317.0	308.2	322.2	305.4	329.6	326.5	329.4	302.8	294.7	295.3		
Petajoules	1,948.2	1,894.0	1,979.9	1,877.0	2,025.4	2,006.2	2,024.5	1,860.5	1,810.8	1,814.5		
ANNUAL CHANGE FROM 1985												
BBTU		-51,366.9	30,069.0	-67,472.8	73,168.2	54,957.1	72,340.8	-83,152.9	-130,225.3	-126,577.9		
MBOE		-8.8	5.2	-11.6	12.6	9.4	12.4	-14.3	-22.4	-21.7		
Petajoules		-54.2	31.7	-71.2	77.2	58.0	76.3	-87.7	-137.4	-133.5		
CUMULATIVE SAVINGS FROM 1985												
BBTU		51,366.9	21,297.9	88,770.7	15,602.5	-39,354.6	-111,695.4	-38,542.5	101,682.7	226,260.6		
MBOE		8.8	3.7	15.2	2.7	-6.8	-19.2	-4.9	17.5	39.2		
Petajoules		54.2	22.5	93.6	16.5	-41.5	-117.8	-30.1	107.3	240.8		

DATA AS OF 07/20/93

*Other includes the Commodity Futures Trading Commission, Equal Employment Opportunity Commission, Federal Trade Commission, National Archives and Records Administration, Nuclear Regulatory Commission, Railroad Retirement Board, The U.S. Information Agency, and the Federal Energy Regulatory Commission for FY85 to FY89.

¹TVA's large increase in energy consumption for FY 1994 is the result of first-time reporting of electricity consumed at power plants for station service use.

Note: FY 1994 contains estimated data for the following agencies: Departments of the Treasury, State, Environmental Protection Agency, Federal Trade Commission, and Office of Personnel Management. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

TABLE D-2
FEDERAL BUILDINGS AND FACILITIES USE PER GROSS SQUARE FOOT - SOURCE CONVERSION
FOR FY 1985 AND FY 1994
(WHEN ELECTRICITY EQUALS 11,600 BTU/KWH)

	FISCAL YEAR 1985			FISCAL YEAR 1994			% CHANGE 1985-1994
	GSF x 10 ³	BTU x 10 ⁹	BTU/GSF	GSF x 10 ³	BTU x 10 ⁹	BTU/GSF	
USPS	189,400.0	39,441.0	208,242	258,702.0	55,445.6	214,322	2.9
DOE	73,093.1	57,430.1	785,711	82,347.0	53,270.6	646,904	-17.7
VA	123,650.0	42,333.7	342,367	146,250.0	46,265.4	316,344	-7.6
GSA	196,341.4	41,207.0	209,874	173,353.9	33,661.4	194,177	-7.5
HHS	22,611.3	12,605.4	557,484	30,853.3	16,320.7	528,977	-5.1
DOJ	20,768.8	8,962.7	431,545	33,506.6	11,390.0	339,932	-21.2
DOT	29,477.7	7,360.8	249,706	31,120.1	8,427.4	270,803	8.4
DOI	54,140.8	8,386.0	154,893	51,926.5	8,186.2	157,649	1.8
NASA	11,509.0	6,373.3	553,771	14,465.0	7,299.4	504,626	-8.9
USDA	28,980.5	4,347.2	150,004	33,400.0	5,253.7	157,295	4.9
TRSY	5,776.9	1,451.0	251,178	10,423.4	4,351.0	417,428	66.2
DOL	18,268.3	3,687.8	201,871	17,506.1	4,033.6	230,410	14.1
TVA	4,886.6	1,321.0	270,333	8,245.8	2,290.1	277,730	2.7
DOC	5,611.5	1,189.1	211,905	6,609.0	2,047.3	309,774	46.2
EPA	1,455.0	1,209.6	831,313	2,248.1	2,009.4	893,826	7.5
FEMA	606.0	190.5	314,426	1,411.0	410.3	290,766	-7.5
HUD	1,432.0	340.6	237,862	1,432.0	324.2	226,364	-4.8
OPM	853.9	168.1	196,822	938.4	237.1	252,704	28.4
ST	2,597.0	689.2	265,377	872.0	235.6	270,180	1.8
FCC	492.5	90.5	189,854	512.4	106.8	208,363	13.3
FCC	121.0	29.5	244,132	124.8	39.4	315,897	29.4
OTHER*	1,098.6	588.9	536,037	1,820.8	375.9	206,439	-61.5
CIVILIAN AGENCIES							
TOTAL	793,171.9	239,403.1	301,830	908,068.2	261,981.0	288,504	-4.4
DOD	2,578,984.0	581,170.2	225,349	2,197,852.0	502,215.0	228,503	1.4
TOTAL	3,372,155.9	820,573.4	243,338	3,105,920.2	764,196.0	246,045	1.1

DATA AS OF 07/20/95

*Other includes the Commodity Futures Trading Commission, Equal Employment Opportunity Commission, Federal Trade Commission, National Archives and Records Administration, Nuclear Regulatory Commission, Railroad Retirement Board, and the U.S. Information Agency.

Note: FY 1994 contains estimated data for the following agencies: Department of Treasury, Federal Trade Commission, and Office of Personnel Management. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

TABLE D-3
FEDERAL ENERGY USE IN BUILDINGS AND FACILITIES - SOURCE CONVERSION
(In Billions of British Thermal Units, Millions of Barrels of Oil Equivalent [MBOE], and Petajoules [Joule x 10¹⁵])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	% CHANGE 85-94	% CHANGE 93-94
USPS	39,441.0	39,869.0	41,604.2	43,801.4	45,783.8	46,961.6	48,347.0	50,147.1	54,073.7	55,445.6	40.6	2.5
DOE	57,430.1	55,158.4	54,354.4	56,601.2	53,934.8	54,656.2	52,657.6	53,745.2	56,896.1	53,270.6	-7.2	-6.4
VA	42,331.7	41,539.9	41,703.6	44,208.4	44,638.1	43,818.9	44,954.2	44,759.7	45,620.4	46,265.4	9.3	1.4
GSA	41,207.0	33,948.9	32,264.2	30,314.2	30,916.4	35,985.0	34,685.4	34,300.3	34,198.2	33,661.4	-18.3	-1.6
HHS	12,605.4	10,322.4	10,869.2	11,930.4	12,676.1	16,191.3	14,353.7	15,857.0	16,086.8	16,320.7	29.5	1.5
DOJ	8,962.7	9,539.8	9,290.5	11,160.0	9,929.5	9,376.1	12,038.8	9,285.9	11,999.4	11,390.0	27.1	-5.1
DOT	7,360.8	8,694.0	7,377.3	7,315.5	6,692.7	7,114.8	6,609.9	8,355.1	8,687.6	8,427.4	14.5	-3.0
DOI	8,386.0	6,849.9	6,692.3	7,366.5	7,745.0	7,511.8	7,746.9	6,824.4	8,320.9	8,186.2	-2.4	-1.6
NASA	6,373.3	6,710.6	6,875.1	6,995.9	7,305.3	7,363.2	7,388.3	7,151.6	7,056.1	7,299.4	14.5	3.4
USDA	4,347.2	4,210.0	4,734.5	4,366.4	4,399.9	5,397.9	5,604.9	5,339.6	5,477.6	5,253.7	20.9	-4.1
TRSY	1,451.0	1,423.9	3,488.5	6,691.5	5,656.9	5,004.1	4,372.2	4,805.4	4,250.4	4,351.0	199.9	2.4
DOL	3,687.8	3,751.7	3,785.1	3,914.9	3,880.5	3,864.3	3,784.8	3,821.2	3,955.1	4,033.6	9.4	2.0
TVA	1,121.0	1,526.2	1,551.2	1,500.1	1,383.8	1,410.5	1,423.4	1,422.0	1,465.1	2,290.1	73.4	56.3
DCC	1,169.1	2,571.4	2,485.7	2,683.6	3,062.9	3,227.4	3,220.7	1,483.1	1,664.7	2,047.3	72.2	23.0
EPA	1,209.6	2,098.3	1,049.8	970.6	975.7	1,004.6	1,047.3	1,496.8	1,917.9	2,009.4	66.1	4.8
FEMA	190.5	295.6	312.1	351.8	395.3	459.6	442.7	453.6	421.5	410.3	115.3	-2.7
MUD	340.6	350.1	355.7	373.0	417.0	426.5	413.4	384.4	350.3	324.2	-4.8	-7.5
OPM	168.1	174.6	175.1	200.6	214.0	218.2	227.1	226.6	237.1	237.1	41.2	0.0
ST	689.2	724.5	803.1	781.1	796.4	817.3	845.4	829.4	133.4	235.6	-65.8	76.6
PCC	90.5	90.8	92.4	96.6	95.8	97.2	110.2	102.3	110.5	106.8	17.9	-3.4
PCC	29.5	31.9	34.5	35.2	32.4	41.0	43.7	33.9	35.1	39.4	33.5	12.4
OTHER*	588.9	786.9	939.0	997.3	1,147.8	1,070.0	611.3	593.5	376.6	375.9	-36.2	-0.2
CIVILIAN AGENCIES TOTAL	239,403.1	230,669.1	230,837.7	242,656.2	242,079.9	252,011.4	250,929.0	251,418.1	263,334.5	261,982.0	9.4	-0.5
DOD	581,170.2	552,598.9	595,765.7	546,127.6	576,994.6	580,184.6	523,370.8	524,164.8	523,295.3	502,215.0	-13.6	-4.0
ALL AGENCIES TOTAL	820,573.4	783,267.8	825,603.4	788,783.7	819,074.5	832,196.0	774,299.8	775,582.8	786,629.8	764,196.0	-6.9	-2.9
MBOE	140.9	134.5	141.9	135.4	140.6	142.9	132.9	133.1	135.0	131.2		
Petajoules	865.7	826.3	872.0	833.1	864.1	977.9	816.9	818.2	829.9	806.2		
ANNUAL CHANGE FROM 1985												
BBTU		-37,305.5	6,030.0	-31,789.7	-1,498.9	11,622.6	-46,273.6	-44,990.6	-33,943.6	-56,377.4		
MBOE		-6.4	1.0	-5.5	-0.3	2.0	-7.9	-7.7	-5.8	-9.7		
Petajoules		-39.4	6.4	-33.5	-1.6	12.3	-48.8	-47.5	-35.8	-59.5		
CUMULATIVE SAVINGS FROM 1985												
BBTU		37,305.5	31,275.6	63,065.2	64,564.1	52,941.5	99,215.1	144,205.6	178,149.3	234,526.7		
MBOE		6.4	5.4	10.8	11.1	9.1	17.0	24.8	30.6	40.3		
Petajoules		39.4	33.0	66.5	68.1	55.9	104.7	152.1	187.9	247.4		

DATA AS OF 07/20/95

*Other includes the Commodity Futures Trading Commission, Equal Employment Opportunity Commission, Federal Trade Commission, National Archives and Records Administration, Nuclear Regulatory Commission, Railroad Retirement Board, the U.S. Information Agency, and the Federal Energy Regulatory Commission for FY85 to FY89.

Note: FY 1994 contains estimated data for the following agencies: Department of Treasury, Federal Trade Commission, and Office of Personnel Management. Sum of components may not equal total due to independent rounding.

Source: Federal Agency Annual Energy Management Data Reports

APPENDIX E

BUILDINGS EXEMPTED FROM NECPA'S PERFORMANCE GOAL IN FY 1994

Section 543(a)(2) of NECPA states, "An agency may exclude from the requirements of paragraph (1) any building, and the associated energy consumption and gross square footage, in which energy intensive activities are carried out. Each agency shall identify and list in each report made under section 548(a) the buildings designated by it for such exclusion." These buildings are not included in the calculations for determining performance toward the buildings Btu/GSF reduction goals. Instead, they are included under the category of excluded buildings/process energy. The energy consumed in these buildings is included on tables and figures which show total consumption (buildings and facilities, vehicles and equipment, and excluded buildings/process).

Department of Commerce

National Institute of Standards and Technology

Gaithersburg, Maryland Sites

101 Administration
102 Gate House
202 Eng. Mech.
205 Fire Research
206 Concr. Mtrls.
220 Metrology
221 Physics Lab
222 Chemistry
223 Mtrls. Test.
224 Polymers
225 Technology
226 Building Research
230 Fluid Mech.
231 Industrial
233 Sound
235 Reactor
CNRF
236 Hazards
237 Non-magnetic
238 Non-magnetic
245 Radiation
301 Supply and Ptn.
302 SCWPG
Cooling TWR
303 Service
304 Instr. Shops
305 Switchgear
306 Elec. Sub.
307 Chemical Waste
308 Bowman House
309 Grounds
310 Hazards Strg.

311 Grounds Strg.
411 TRF
412 Temp. Ofc
413 Temp. Ofc
415-418 Temp. Ofc
419 Temp. Childcare

Boulder, Colorado Sites

1 Radio
1A Radio Building
1B Radio Building
1C Radio Building
1D Radio Building
2 Cryogenics
2A Cryogenics - Annex A
3 Liquifier
3A Liquifier - Annex A
4 Camco
5 Camco Annex
8 Mesa Test Site
9 Gas Meter
11 Ionospheric Observatory
14 Field Strength
21 Maintenance Garage
22 Warehouse
24 Plasma Physics
24A Plasma Physics - Annex A
25 Maintenance Shops
26 Day Care Facility
27 High Frequency

National Oceanic and Atmospheric Administration

AKW011 E.T. Shop
AKW129 Elec. Storg. Bldg. & Fac.
AKW130 Marine Warehouse
ARM004 WFO
CAW072 SW Fisheries Cntr
CAW107 WSO
CA4486 WSFO
COC004 WSFO
COM017 Optics Bldg & Fac.
COM018 Lab. Bldg
COM019 Lab. Bldg
COM053 Lab. Bldg
CTE005 Chem. Storg. Bldg. & Fac.
FLE078 Port of Miami
FLM024 WSO
HIW015 WSO
LAM048 Ofc. Bldg
MAE032 Morris Island Observ
MEE00S NWS Forecast Ofc
MOC036 WSFO
MOC037 NEXRAD Bldg

MSM011 WFO
MTW006 Radar Bldg
MTW0119 Balloon Inftm. Bldg
NCC001 Dive Locker & Fac.
NEC008 Balloon Inftm. Bldg. & Fac.
NMM021 WFO
NVW016 Balloon Inftm. Bldg
NY5451 30 Rockefeller Plaza
ORW012 Fire Station/WSO
ORW065 WSO
PAE013 Storage Bldg. & Fac.
TNM006 WFO
TXM029 WSO
UTW004 Balloon Inftm. Bldg
VAE014 Antenna Deck & Fac.
WAW052 Behavior Lab. & Fac.
WVE002 NWS Bldg

Bureau of Census

Charlotte Computer Center

Department of Defense

Process energy use at Department of Defense (DoD) facilities, or "buildings" under the definition of PL 100-615, is separately identified from the building and facilities energy use reported under the goal of section 543. Some DoD facilities have both building and facility use, and process energy use. DoD actively manages "process energy" facilities in such a manner as to achieve a ten percent energy efficiency improvement goal by FY 1995. The following lists those facilities which report process energy and are exempt from NECPA's performance goal.

Army

Cold Region R&E Lab,
Hanover, NH
Dist. Engr., Huntington, WV
Dist. Engr., Jacksonville, FL
Dist. Engr., Mobile, AL
Dist. Engr., Wilmington, NC
Dist. Engr., Charleston, SC
Dist. Engr., Little Rock, AR
Dist. Engr., Galveston, TX
Dist. Engr., Rock Island, IL
Dist. Engr., Detroit, MI
Dist. Engr., Kansas City, MO
Dist. Engr., Omaha, NE
Dist. Engr., Los Angeles, CA
Dist. Engr., San Francisco, CA
Stratford Engine Plant, CT
21st SUPCOM, Germany
Dist. Engr., New York, NY
Dist. Engr., Baltimore, MD
Lima ARMODCTR, OH
Tobyhanna ARDEP, PA
Scranton AAP, PA
Radford AAP, VA
Redstone Arsenal, Huntsville, AL
V Corps, Frankfurt, Germany
Holston AAP, Kingsport, TN
Pine Bluff Arsenal, AR
Dist. Engr., New Orleans, LA
Louisiana AAP, Shreveport, LA
Sunflower AAP, Lawrence, KS
Detroit Arsenal, Warren, MI
Lake City AAP, Independence, MO
Fort Leonard Wood, Waynesville, MO
Dist. Engr., Sacramento, CA
Mississippi AAP, Picayune, MS

Air Force

Tyndall AFB, Panama City, FL
Rhein Main AB, Germany
Little Rock AFB, AR
Pope AFB, Fayetteville, NC
Dover AFB, DE

Offutt AFB, Omaha, NE
Beale AFB, Marysville, CA
Holloman AFB, Alamogordo, NM
Seymour Johnson AFB, Goldsboro, NC
MacDill AFB, Tampa, FL
Canon AFB, Clovis, NM
Bergstrom AFB, Austin, TX
Davis Monthan AFB, Tucson, AZ
Mountain Home AFB, ID
Sparrevohn AFS, Alaska
Shemya AFB, Alaska

Navy

NSY, Portsmouth, NH
NSY, Philadelphia, PA
NAC, Indianapolis, IN
NSY, Portsmouth, VA
NSC, Norfolk, VA
NSY, Charleston, SC
NSY, Mare Island, CA
NSC, Oakland, CA
NSC, San Diego, CA
NSY, Puget Sound, WA
NSY, Pearl Harbor, Hawaii
NAVSUBASE, Pearl Harbor, Hawaii
NSC, Puget Sound, WA
NSC, Pearl Harbor, Hawaii
NSC, Charleston, SC
NSY, Long Beach, CA
NAPC, Trenton, NJ
NSRF Guam, Marianas Islands
NSSPO, Magna, UT
NARF, Alameda, CA
NARF, Jacksonville, FL
NARF, Norfolk, VA
NARF, San Diego, CA
NARF, Pensacola, FL
NARF, Cherry Point, NC
NSPASURSTA, Chula Vista, CA
NSPASURSTA, Maricopa, AZ
NSPASURSTA, Truth or Consequences, NM
NSPASURSTA, Archer City, TX
NSPASURSTA, Lewisville, AR
NSPASURSTA, Hillandale, MS

NSPASURSTA, Wetumpka, AL
 NSPASURSTA, Hawkinsville, GA
 NSPASURSTA, Savannah, GA
 NWIRP, Toledo, OH
 NIROP, Rochester, NY
 Grumman Aerospace, Bethpage, NY
 NIROP, Pittsfield, MA
 NIROP, Minneapolis, MN
 NIROP, Sunnyvale, CA

Allegany Ballistics Lab, Pinto, WV
 NIRP, St. Paul, MN
 NWIRP, Bloomfield, CT
 NIROP, Pomona, CA
 NWRIP, Bedford, MA
 Grumman Aircraft Eng., Calverton, NY

DLA
 DCSC, Columbus, OH

Department of Energy

Los Alamos National Laboratory

117 Lab Trailers
 36 Permanent Lab Buildings
 29 Transportable Lab Buildings
 4 Pan Am Trailers
 Zia Craft Shop
 Pre-Engineered Shed
 Welding Shop
 Lab Office Bldg
 Equipment Test Lab
 Lab Meson Facility
 Operations Bldg
 Service Corridor
 Accelerator Tec Bldg
 LANSCE/WNR Bldg
 Proton Storage Ring
 High Res Beam Facility
 General Purpose Lab
 WNR Lab Support Bldg
 Warehouse
 Proton Storage Staging Ring
 FMIT Bldg
 Accelerator Tec Bldg
 Modulator Bldg
 Development & Testing
 Computer Maintenance
 Data Analysis Center
 Accelerator Maintenance Bldg
 Sub-Stockroom/Whse
 JCI Craft Shop
 Proton Storage Ring Eqp
 Experimental Area
 Neutron Scattering Exper
 NPB Technical Support
 Shop & Storage Bldg
 Office Bldg
 Warehouse
 Office Bldg
 Med Resolution Spect
 Neutron Exper Service

ATSU Facility
 ML Neutron Scattering Fac

Kansas City Plant

Industrial Wastewater Pretreatment Facility

Mound Facility, Miamisburg, Ohio

COS Building
 HH Building
 M Building
 Building 28
 Building 36
 Building 60
 Building 85
 Building 87
 Building 105

Pantex Plant

16-4/Paint and Sand Blast
 16-10/Vehicle Wash

Rocky Flats

025 Broomfield Warehouse
 122 Medical Addition
 124 Water Treatment Plant
 125 Standards Calibration Lab
 129 Water Treatment
 223 Gaseous Nitrogen Plant
 333 Paint Shop
 371 PU Recovery Facility
 374 PU Recovery
 439 Modification Center Support
 440 Modification Center
 444 General Fab and Tool Ctrl
 445 Carbon Storage
 447 Manufacturing
 460 Non-Nuclear Mfg Building

566 Protective Clothing Decontamination
 559 PU Analytical Lab
 569 Crate Counter
 707 PU Fab and Assy
 771 PU Recovery
 774 Process Waste Treatment
 776 Manufacturing Building
 777 Assembly
 779 PU Development Building
 790 Radiation Calibration Laboratory
 865 Process Development R&D
 881 Manufacturing Support
 883 Manufacturing
 886 Nuclear Safety Facility
 889 Hillside Treatment Plant
 910 Reverse Osmosis

Precision Forge

002 Administration Offices
 003 Machine Shop and Met Lab
 004 Grinding Shop
 005 Press Shop
 006 Hammer Shop

*Sandia National Laboratories, Albuquerque
 (Site No. 0112)*

858/Microelectronics Development Lab
 878/Process Devel Lab
 963/Strategic Defense Facility II

*Sandia National Laboratories, Livermore (Site
 0113)*

Computer Center

Argonne National Lab-East (Site 0302)

145 AMPEL Facility
 146 Fuel Control OFC
 360 IPNS CNTL
 361 Injector Building
 363 Shops and Assembly
 364 Center Building
 365 Ring Building
 366 and 366A HEP Storage
 367 IPNS Storage
 368 Power Building
 369 EPB-I
 370 OTEC, HIF
 371 Heavy Ion Fusion
 372 IEP Office
 373 HEP Assembly
 374A Storage
 375, 375A, 375D IPNS and Storage

376 IPNS and RMPS Storage
 377 Cooling Tower
 377A, 377B, 377C Technical Equipment and
 Storage
 378 Supply
 379 Supply
 380 SSD-HP Office
 381 CPFF
 382 Cryogenic Lab
 384 Storage
 385 Survey Laboratory
 389 RF Power Supply
 390 Cryogenic Control Room and Lab
 391 Rapid Cycle Synchrotron
 399 IPNS Control
 549A and 549B Electric Substations

Argonne National Lab-West (Site 0303)

Building 704
 Building 753
 Building 754
 Building 757
 Building 757A
 Building 758
 Building 764A
 Building 765
 Building 766
 Building 767
 Building 768
 Building 786
 Building 798
 Building 799
 Building 720
 Building 776
 Building 707

Brookhaven National Lab

Medical Research Reactor
 Pumphouse, Cooling Tower
 Valvehouse
 Equipment House
 Instrument House, Ducts (DEC)
 Canal House (DEC)
 Synchrotron Light Source
 High Flux Beam Reactor
 Cold Neutron Facility
 Fanhouse
 Tandem Van De Graafs
 Dynamitron/Van De Graaf
 Cyclotron
 Accelerator Development
 Cryogenic Test Facility
 Pett VI

Heavy Ion Power Supply
 Heavy Ion Power Supply B
 Heavy Ion Beam Tunnel
 Experimental Halls, AGS
 Mechanical Equipment
 AGS Tunnel
 A.C. House Northeast
 A.C. House North
 A.C. House Northwest
 A.C. House Southwest
 A.C. House Southeast
 Proton House Complex
 Beam Components
 7 Works Buildings
 E-10 Power Supply
 2 Scientific Assembly Buildings
 N. Experimental Tunnel
 MG Power Supply
 RF Power Supply
 200 MeV Linac
 Irradiation Facility (CLIFF)
 Isotope Producer (BLIP)
 F-10 Equipment
 Cryogenic Power Transmission
 Electrical Testing
 Radiation Effects Tunnel
 Magnet Power Supply
 Production Holding
 Blip Pump House
 5 R&D Facilities
 Neutrino Facility Building
 Beam Analysis
 Experimental Counting House
 Compressor Building
 Collider Center

Princeton Plasma Physics Laboratory

D-Site (TFTR)
 LOB Basement
 CS Building (Basement)
 RF Building (1, 2, 3 Floor, Center Room)
 System Test Building
 MG Building (Basement, 1 Floor, Mezz.)
 PLT 1 Power Building
 Cooling Tower

Idaho Operations

INEL (0603)
 Idaho Falls (0602)
 Laundry
 Equipment Building
 Laboratory
 Boiler House, Oil-Fired

New Waste Calcining Facility
 Coal-Fired Steam Generator Facility (CFSGF)
 CFSGF Coal Unloading Building
 Liquid Effluent Treatment and Disposal Facility
 Manufacturing/Assembly and Hot Cell
 SMC Manufacturing and Waste Treatment
 ATR Reactor Building
 ATR Secondary Pump House
 ATR Deep Well Pump House
 TRA Diesel Generator Building
 ATR Waste Heat Recovery System Pump House
 TRA Secondary Pump House

WVDP (0607)

Process Plant
 Cement Solidification System
 Maintenance
 T & S Building
 Low Level Waste Treatment Facility
 Lag Storage
 Warehouse
 New Warehouse
 Annex
 Trailer City
 Component Test Stand
 STS Process
 STS Support
 Miscellaneous Trailers
 Plant Office
 Utility Room
 Laundry
 Waste Tank Farm
 Bulk Storage Warehouse
 New York Disposal Area
 Rad Treatment System Drum Cell
 Conference Room
 Schoolhouse
 Z1-Z23 Trailers
 OBI Office Building
 Expanded Environmental Laboratory
 7-24 to 7-26 Trailers
 AA-1 to AA-7 Trailers
 AA-8 to AA-14 Trailers
 AA-15 to AA-21 Trailers

Grand Junction (0608)

North Sample Plant/Office Core Sample Storage
 Data Processing/Office Computer Center
 Oak Ridge Office
 Chemistry Laboratory
 3 Trailers

Oak Ridge National Lab (Site 1004)

High-Flux Isotope Reactor
Holifield Heavy Ion Research Facility
Electron Linear Accelerator
Oak Ridge Research Reactor
Isotope Tech Lab
Radioscopic Production Lab
Off-gas Facility/Waste Monitor Control Facility

Y-12 Plant (Site 1006)

Building 9999-3

Paducah Gaseous Diffusion Plant (Site 1008)

Purge and Product Building
Product Withdrawal Building
Surge and Waste Building
4 Process Buildings
Feed Vaporization Facility
Feed Vaporization Building
Power Building
Metals Building
Slag Building
Toll Transfer and Sampling
Stabilization Building
Feed Plant
Greensalt Plant

Portsmouth Gaseous Diffusion Plant (Site 1009)

3 Process Buildings
Switch House
2 Test and Repair Buildings
2 Oil Houses
4 Valve Houses
Switch House
Gas Reclaim Cart Garage
3 Recirculation Water Pump Houses
Pump House
Sewage Treatment Facility
Conv Shop and Cleaning Building
Air Conditioning Equipment Building
Lime House
Water De-ionization Facility
Neutralization Building
Effluent Monitoring Facility
Decontamination Building
Incinerator
Heat Boost Pump Building
Maintenance and Stores Building
Radio Base Station
Paint and Storage Building
Hazardous Waste Storage

Raw Water Pumphouse
Water Treatment Plant
Lagoon Pumping Station
Filter Building
Recarbonization Inst Building
Liquid Effluent Control Facility
Fire Training Building
South Portal and Shelter
North Portal and Shelter
SNM Monitoring Portal
SNM Portal N.W.
S. Environmental Sample Building
2 N. Environmental Sample Buildings
Environmental Storage Building
Steam Plant Shop Building
Diesel Generator Building
S. PH Control Facility
N. Holding Pond Storage Building
Explosion Test Facility
4 Non UEA Warehouses
Material Receiving and Inspection
Electronic Maintenance Facility
Pike Avenue Portal
2 Personnel Monitor Buildings
Personnel Monitor Trailer
Transformer Clean and Storage Building
Sanitary Water Control House

Pittsburgh Naval Reactors

Bettis (Site 1201)

AT-BAT Complex
MEL and Alpha Facility
F-Shop
G-Building
L-Building
N-Complex
C-CA-CAM Complex
Hangar #2
Rotoclone Building
CY-Building
J-Building
E-Building
Main Guard Station

NRF (Site 1202)

Expended Core Facility
SIW Prototype

Richland Operations Office

2 River Pump Houses
2 Reservoir/Pump Houses
Filter Building
2 Main Pump Houses

Solvent Storage
 Filter Plant
 2 Development Labs
 Main Process Pump House
 Process Pump House Annex
 Storage Pump House
 Process Pump Annex
 Vertical Rod Test Tower
 2 Reactor Buildings
 Power Control Building
 2 Oil Storage Buildings
 Water Studies
 Coolant Systems Development Lab
 Water Studies Recirculation
 Area Shop
 3 Warehouses
 2 Maintenance and Transportation Buildings
 2 Emergency Pump Houses
 Filter House/Head House
 Lime Feeder
 Head House/Chlorine
 Effluent Water Monitoring
 Reactor
 Basin Recirculated
 Chemical Pumping
 Heat Exchanger Building
 Steam and Flow Instrument
 Filter Building
 Valve Control
 Chemical Waste Storage
 Change and Control
 Waste Loadout
 2 Valve Houses
 2 Water Plants
 Air Sample
 Electric Switchgear
 Auxiliary Power Building
 Demineralization Water Building
 Oil Pump House
 2 Equipment Development Buildings
 2 Warehouses
 Receiving and Inspection
 Hot Shop
 2 Storage Buildings
 2 Pump Houses
 Filter Water Building
 Auxiliary Power House
 Auxiliary Power House Annex
 2 Separation Buildings
 Waste Unloading Facility
 Encapsulation Building
 Evaporation Building
 Sludge Vault Storage and Processing
 Reservoir/Pump House
 Filter Plant

2 Power Houses
 Redox Laboratory
 2 Uranium Oxide Plants
 Plutonium Finishing Building
 Plutonium Reclamation Building
 Evaporator Facility
 Laundry and Mask Cleaning
 Reservoir/Pump House
 Filter Plant
 Exhaust Air Filter Stack
 12 Metered Process Buildings in Area 400
 1 Metered Process Building in Area 600
 Rat. Mt. Pump House
 A.L.E. Pump House

Savannah River Operations Office

3 Pumphouses
 4 Reactor Buildings
 4 Area Cooling Water Pumphouses
 4 Area Fuel Unloading Facilities
 4 Emergency Diesel Generator/Fuel Oil Storage Facilities

Schenectady Naval Reactors

Knolls Test Computer Facility
 Kesselring Prototype and SEB
 Windsor Prototype and SEB

Naval Petroleum and Oil Shale Reserves in Colorado, Utah, and Wyoming

Maintenance Shop
 LTS Gas Plant Main Compressor Building
 Steam Generator #1 Facility
 Warehouse Quonset
 Water Treatment Facility
 North Waterflood Plant
 Steam Generator #2 Facility
 Steam Generator #3 Facility
 Steam Generator #4 Facility
 Steam Generator #5 Facility
 Field Operations Office
 Environmental, Safety, and Health Office
 Water Treatment Facility Expansion
 UPS Building
 LTS Gas Plant Office
 Peripheral Waterflood Plant
 LTS Gas Plant Shop
 Polymerflood Plant
 LTS Gas Plant PAMCO Building
 LTS Gas Plant Lab
 LTS Gas Plant Pump House
 Fireflood Pump Building

South Terminal Main Building
Main Gate Guard Shack
South Gate Guard Shack

Strategic Petroleum Reserve Project Office

Bayou Choctaw Facility

Administration Building
BLDG, MSRMT and Test Equipment Storage
Control Building
2 Filter Storage Trailers
Flammable Storage Building
Foam Desludge Building
Foam Storage Building A
Guard House, Main Entrance
Instrument Shop Building
Maintenance Building
Potable Water Filtration Building
Property Warehouse Building
RWIS Pump House
Security Operations Center
5KVA Switchgear Building
Gun Clearing Building

Big Hill Facility

Administration Facility Building
Control Center Office Building
Covered Laydown Building
DOE Construction Building
Firewater Pumphouse Building
Foam Proportioning Building
Gatehouse #3
Hardened Gatehouse Front
Sample Storage Building
Vehicle Maintenance Building
Warehouse/Maintenance Building
Wash Rack Building
Wheeled Equipment Storage Building
Hardened Guardhouse RWIS Building
Substation Building
Control RWIS Building
Microwave Building
Security Operations Center
Communications RWIS

Bryan Mound Facility

5KV Switchgear MCC F&G Building
Administration Building
Control Office Building
Electrical Shop
Electrical MCC Building
Fire Equipment Storage Building
Fire Pump on RWIS
Flammable Storage Building
Foam Generator Building

3 Foam Storage Buildings
2 Guard Houses
Maintenance Facility
Radio Repeater Building
Substation Electrical Building
Warehouse Rec. Building
2 5KV Switchgear Buildings
HPP/Permit/Fire Pump Building
Audit Trailer
Property Trailer
Quality Assurance Trailer
Security Trailer
Storage D Trailer
SOC Building
MCC Building

St. James Facility

Administration Building
Control Center Building
Flammable Storage Building
Foam Deluge Building
4 Foam Prop. Facilities
2 Guard Houses
Laboratory
Maintenance Receiving Building
Radio Tower Building
Spare Parts Warehouse
Fire Pump House DKI Building
Foam Prop. Building
Foam Prop. Building, Dock 2
Operator Building, Dock 1
Operator Building, Dock
5KV Switchgear Building
Gun Clearing Building

Sulphur Mines Facility

Control Center Building
2 Foam Storage Buildings
Trailer Guard House
Gun Clearing Building
Security Ops. Center Building
Warehouse 2 Building
4 Mobile Trailers
5 Trailers

Weeks Island Facility

Firewater Pumphouse
Administration Building
Control Building
Equipment Storage Building
Fill Site Storage Building
Fire Transformer Del. Building
Fire Truck Building
Flammable Storage Building

Guardhouse LDWN Building
 Gun Clearing Building
 Hose Reel Building
 Inert Gas Generator Building
 MCC3 S/S Area Building
 P/S Guardhouse
 P/S Head Frame Building
 P/S Hoist and MCC Building
 Pump House Foam Building
 S/S Guardhouse
 S/S Head Frame Building
 S/S Hoist Building
 Sample Lab Building
 Warehouse Building
 Well Water Pump House
 5KV Switchgear Building
 Construction and Maintenance Building
 Guard House

West Hackberry Facility

RWIS Computer Control Building
 Communications Building
 Control Center Building
 Film Storage Building
 Fire at Black Lake Building
 Foam Desludge Building
 Foam Generator Building
 3 Foam Storage Buildings
 Guardhouse SOC Building
 Main Fire Water Building
 Maintenance and Warehouse Building
 Warehouse Building
 Administration Building
 Guard Construction Gate Building
 Microwave RWIS Building
 7 Trailers
 Property Warehouse A
 UPS RWIS Building
 Gun Clearing Building
 RWIS Building
 Switch Gear Building

FERMI National Accelerator Laboratory

Feynman Computer Facility
 Cooling Ring
 3 Service Buildings
 Target Hall
 Gas storage Building
 Booster Gallery East and West
 2 Booster Towers
 Accelerator - Linac, X-Gallery
 Central Utility Building
 6 Kicker Buildings
 Lab Building

Service Building/Vehicle
 30 Service Buildings
 Pump House
 Vehicle Access Building
 2 Power Supply Buildings
 Switchyard Service Building
 24 Refrigeration Buildings
 Collider Detector Facility
 Assembly Building
 Meson Wonder Enclosure
 5 Meson Service Buildings
 Meson Detector Building
 Meson Central Cryogenics
 Meson Assembly Building
 Meson West Lab
 Polarized Proton Lab
 Meson Counting Building
 Proton Pagoda
 Proton Assembly
 Proton Taggen Photon
 High Intensity Laboratory
 6 Proton Service Buildings
 Proton Pole Building
 Exp Area operations Center
 5 Neutrino Labs
 Laboratory F
 Laboratory G
 Neutrino Lab WWA
 5 Neutrino Service
 Neutrino Target Service
 Wide Band Lab
 PB6/PB7
 Muon Laboratory
 4 Industrial Buildings
 Industrial Shed
 Industrial Center
 Industrial Compressor Building
 Magnet Storage
 Central helium Liquifier
 Master Sub-Station
 Caseys Pond Pump House
 Wilson Hall & Auditorium
 Science Education Bldg
 11 Sauk Circle
 1 Sauk Circle-Residence
 3 Sauk Circle-Dorm 7
 4 to 19 Sauk Circle-Residence
 1 Sauk Blvd-Aspen East
 14 Sauk Blvd-Residence
 15 Sauk Blvd-Residence
 18 Sauk Blvd-Vending/Laundry
 20 Sauk Blvd-Residence
 1 Shabbona-Dorm 3
 22 Sauk Blvd-Residence
 24 Sauk Blvd-Residence

24A Sauk Blvd-Garage
 26 Sauk Blvd-Residence
 28 Sauk Blvd-Residence
 28A Sauk Blvd-Garage
 28B Sauk Blvd-Greenhouse
 28C Sauk Blvd-R&G Equipment Shed
 29 Sauk Blvd-Residence
 30 Sauk Blvd-Maid Hdqtrs
 30A Sauk Blvd-Pole Building
 31 Sauk Blvd-Pump House
 32 Sauk Blvd-Dorm 1
 33 Sauk Blvd-Residence
 34 Sauk Blvd-Residence
 36 Sauk Blvd-Metals Dev.
 2 Che Che Pinqua-Users Center
 1 Che Che Pinqua-Kuhn Barn
 13 Neququa-Residence
 16 Neququa-Residence
 18 Neququa-Residence
 19 Neququa-Residence
 20 Neququa-Lab 7 House
 22 Neququa-Lab 7 House
 23 Neququa-Residence
 25 Neququa-Residence
 26 Neququa-Lab 6 House
 26A Neququa-Lab 6-Garage
 28 Neququa-Lab 6 House
 30 Neququa-Lab 6 House
 28A Neququa-Lab 6 Pole Building
 32 Neququa-Lab 6 House
 34 Neququa-Lab 5 House
 36 Neququa-Lab 5 House
 36A Neququa-Lab 5 Pole Bldg
 38 Neququa-Lab 5 House
 36 Shabbona-Lab 5 House
 27A Winnebago-Lab 1 House
 27B Winnebago-Lab 1 House
 27C Winnebago-Lab 1 House
 29 Winnebago-Machine Repair
 32 Winnebago-Lab 4 House
 35A Winnebago-Lab 2 Compressor
 40 Shabbona-Lab 4 House/Office
 30 Winnebago-Machine Repair
 22 Blackhawk-Residence
 25 Blackhawk-Residence
 24 Blackhawk-Lab 8 House
 25 Blackhawk-Lab 8 House
 25A Blackhawk-Lab 8 South
 27 Blackhawk-Lab 8 House
 29 Blackhawk-Residence
 31 Blackhawk-Lab 8 House
 31A Blackhawk-Lab 8 North
 33 Blackhawk-Lab 8 House
 35 Blackhawk-Residence
 2 Shabbona-Dorm 2

8 Shabbona-Residence
 8A Shabbona-Garage
 10 Shabbona-Residence
 12 Shabbona-Residence
 14 Shabbona-ES&H House
 14A Shabbona-ES&H House
 19 Shabbona-Residence
 20 Shabbona-Shelter
 21 Shabbona-ES&H House
 CURIA I-34 Shabbona
 33 Shabbona-Residence
 35A Shabbona-Lab3 House
 35B Shabbona-Lab 3 House
 35C Shabbona-Lab 3 House
 35D Shabbona-Lab 3 House
 35E Shabbona-Lab 3 House
 37A Shabbona Material Dev. Lab
 37 Shabbona Material Dev. Lab
 39 Shabbona Material Dev. Lab
 11 to 15 Potawatomi-Residence
 15A Potawatomi-Garage
 16 Potawatomi-Shower Rooms
 16A Potawatomi-Exercise Rooms
 16B Potawatomi-Gym
 17 Potawatomi-Residence
 17A Potawatomi-Garage
 18 Potawatomi-Residence
 20 Potawatomi-Dorm 4
 20A Potawatomi-Dorm 4
 22 Potawatomi-Residence
 24 Potawatomi-Residence
 27 Winnebago-Lab 1
 35 Winnebago-Lab 2 Butler Bldg
 35 Winnebago-Lab 3
 38 Shabbona-Lab 4
 36A Shabbona-Lab 5 Butler Bldg
 32A Neququa-Lab 6 Butler Bldg
 22A Neququa-Lab 7 Butler Bldg
 27A Blackhawk-Lab 8 Butler Bldg
 AP30 Service Building
 AP10 Service Bldg
 AP50 Service Building
 APO Target Hall
 AP50 Gas Storage Bldg
 Booster Gallery East & West
 Booster Tower SW
 Booster Tower SE
 Accelerator-LINAC,X-Gallery
 Central Utility Bldg
 AO Kicker Bldg
 AO Lab Bldg
 AO Service Bldg/Vehicle
 A1 to A4 Service Buildings
 B0 to B4 Service Bldgs
 B48 Kicker Bldg

C0 to C4 Service Bldg
 C17 Kicker Bldg
 C48 Kicker Bldg
 D0 to D4 Service Bldg
 D0 Vehicle Access Bldg
 D48 Kicker Bldg
 E0 to E4 Service Bldg
 E17 Kicker Bldg
 F0(RF) to F4 Service Bldg
 F23 Power Supply Bldg
 F27 Power Supply Bldg
 Switchyard Service Bldg
 A1 to A4 RF Bldg
 B1 to B4 RF Bldg
 C1 to C4 RF Bldg
 NEUTRINO Lab D-G
 NEUTRINO Lab NWA
 NEUTRINO Service #0 to #4
 NEUTRINO Target Service
 WIDE BAND Lab
 PB6/PB7
 MUON Lab
 Industrial Bldg #1 to #4 (#2B)
 Industrial Center
 Industrial Compressor Bldg

Lawrence Berkeley Laboratory

Advanced Light Source
 Electronic Instrumentation, Life Sciences
 Utilities Service
 Compressor Building
 Systems Engineering
 Accelerator Development, ALS, RTSS
 Physics, Information & Computer Science Service
 Center
 Bevalac/Bevatron
 Bevatron Experimental Area
 External Particle Beam Hall
 2 Accelerator and Fusion Research Buildings
 Energy & Environment, Nuclear Science
 Chemical, Earth, Life, & Nuclear Sciences
 Center for Beam Physics
 Nuclear Science, Applied Science, and Earth
 Sciences
 Nuclear Science, Materials and Chemical Sciences,
 Earth Sciences
 Heavy Ion Linear Accelerator (HILAC)
 HILAC Rectifier
 HILAC Annex
 National Center for Electron Microscopy (NCEM)
 High Voltage Electron Microscope (HVEM)
 Atomic Resolution Microscope (ARM)
 ARM Support Laboratory
 Atmospheric Research Center

Liquid Gas Storage
 Lower Pump House
 88-Inch Cyclotron
 Blackberry Canyon Gatehouse
 Biomedical Facilities
 Bevatron Plumbers Storage
 Bevatron Electricians Shop
 Bevatron Electrical Storage
 3 HISS Buildings
 VAX Trailer, User Facility
 Bevatron Trailer
 Bevalac Patient Facility
 Life Sciences
 Office Trailer
 Electronics Engineering, Computer Sciences
 Compressor Shelter & Storage
 Flammable Gas/Liquid Storage
 Emergency Generator
 Bevatron Riggers
 2 AFR Experimental Studies
 Chemical Sciences
 AFR, Chemical Studies
 6 Office Trailers

Energy Technology Engineering Center

MG Building, B/461
 SPTF, B/462
 TTF, B/013
 LLTR, B/059
 SCTL, B/356
 LMDL-1, B/032
 LMDL-2, B/057
 SCTL, B/026
 HTF, B/863
 CHCF, B/463

Western Area Power Administration

10 Buildings, Phoenix
 10 Buildings, Sacramento
 45 Buildings, Billings
 11 Buildings, Salt Lake City
 30 Buildings, Loveland

Department of Transportation--Federal Aviation Administration

62 Automated Flight Service Stations	39 Fan Markers
Airport Information Desk	20 Flight Service Data Processing Systems
Automated International Flight Service Station	189 Flight Service Stations
119 Approach Light Systems	46 Ground/Air Transmitter Receivers
Airway Beacon	Guidance Light Facility
127 Air Route Surveillance Radar -	Gap Filler Radar
FAA and Military	85 Geostationary Operational
Air Route Traffic Control Center	Environmental Satellite Systems
189 Automated Radar Terminal Systems	864 Glide Slopes
23 Airport Surface Detection Equipment	1143 Homing Radio Beacons
647 Altimeter Setting Indicators	5 Central Heating Facilities - Per Unit
263 Airport Surveillance Radar -	22 Heliports
FAA and Military	Homing Radio Beacon - High Power
568 Airway/Terminal Building Maintenance	1 International Aeronautical
23 Air Traffic Control Beacon Interrogator	Telecommunications Switching Center
331 Air Traffic Control Radar Beacons	260 Integrated Communications
464 Airport Traffic Control Towers	Switching Systems
398 Automatic Terminal Information Systems	26 Identification, Friend or Foe
356 Automated Weather Observing Systems	International Flight Service Station
Aerial Tramway	International Flight Service
597 BRITE Radar Indicator Terminal Equipment	Transmitter Station
294 Backup Emergency Communications	81 Inner Markers
116 Computer Based Instruction	136 VHF/UHF Link Terminals
2 Central Computer Complexes	23 Localizer Type Directional Aids
120 Closed Circuit TVs	20 Lead-in Light Facilities
229 Common Digitizers	37 Living Quarters
10 Cloud Height Indicators	114 Low Level Wind Shear Alert
Computer Display Channel	Systems
Combined Center/RAPCO	Compass Locator at the ILS
11 Control Circuit Equipment	Middle Marker
407 Control Line Maintenance	4 Link Repeaters
17 Communications Microwave Link Terminals	1053 ILS Localizers
23 Command Communications Outlets	473 Compass Locators at the ILS
Center Building Maintenance	Outer Marker
23 Direct Access Radar Channels	94 Medium-Intensity Approach
Display Channel Complex	Lighting Systems
337 Direction Finders - VHF	633 Medium-Intensity ALS (MALSL)
226 Direction Finder Indicators	with Runway Alignment
584 Distance Measuring Equipment	Indicator Lights (RAIL)
51 Distance Measuring Equipment Remaining	4 Meteorological and Aeronautical
558 Data Multiplexors	Presentation Systems
811 Data Terminal Equipment	9 Marine Equipment Boats and Docks
En Route Automated Radar	625 Multichannel Recorders
Tracking System	17 Military Height Finder Radar
5 Electronic Data Processing Systems	33 Military Interface Groups
468 Electrical Distribution Systems	Military Interface Modification
12 Emergency Operating Facilities	272 Microwave Landing Systems
50 Flight Data Entry and Printout	Azimuth
23 Flight Data Input/Output Centers	160 Microwave Landing Systems
391 Flight Data Input/Output Remotes	Back Azimuth
Flight Data Remoting System Intermediate	271 Microwave Landing System Distance
Fields and Landing Areas	Measuring Equipment Precision

276 Microwave Landing System Elevation	95 Radar Remote Weather Display Indicators
1 Microwave Landing System Flare	135 Radar Remote Weather Display Systems
828 Middle Markers	12 Remote Tower Communications
14 Mobile Laboratories	Control Systems
105 Mode S/Data Links	1222 Remote Transmitter Receivers
46 Maintenance Processing Systems	537 Runway Visual Range
400 Mobile Engines or Generator Plants	Shortened Approach Light System
28 National Data Interchange Networks	Sanitation System
1282 National Radio Communications Systems	661 Storage Buildings
39 Next Generation Weather Radar	Systems Command Center
65 Off Airways Weather Stations	Sensor, Receiver, and Processor
50 Omnidirectional Airport Lighting Systems	72 Simplified Short Approach Lighting
Oceanic Display and Planning System	Systems with Runaway Alignment
325 Heavy Equipment and Off-Road Vehicles	Indicator Lights (RAIL)
831 Outer Markers	Simplified Short Approach Lighting System
General Oil Distribution System	Self Sustained Outlet
180 Precision Approach Path Indicators	49 Sewerage Systems
2 Precision Approach Radar	666 Tactical Air Navigation
707 Power Conditioning Systems	8 Tower Cab Digital Displays
19 Primary Power Engines or Generator Plants	144 Terminal Data Display Systems
68 Quarters Building - Other than	496 Telephone Exchanges
Living Quarters	589 TELC Interface Maintenance
8 Radar Approach Control - Air Force	19 Terminal Information Processing Systems
111 Rotating Beam Ceilometers	125 Television Microwave Link Indicators
11 Radar Bright Display Equipment	110 Television Microwave Link Repeaters
22 Radar Beacon Data Processor Equipment	138 Television Microwave Link Transmitters
277 Remote Beacon Performance Monitor	414 Tower Buildings
685 Remote Center Air/Ground	529 Trails and Roads
Communications Facilities	25 Terminal Radar Approach Controls
99 Remote Control Interface Units	17 Teletypewriter Facilities
752 Radio Communications Link Repeat	137 Transcribed Weather Broadcast
233 Radio Communications Link Terminals	743 Utility Buildings
1837 Remote Communications Outlets	1387 Visual Approach Slope Indicators
692 Runway End Identification Lights	769 Vehicle Maintenance
215 Remote Monitor Control Facilities	1025 VHF Omnidirectional Range
214 Radar Microwave Link Repeaters	95 VHF Omnidirectional Range Test
138 Radar Microwave Link Terminals	Weather Message Switching Center
189 Remote Readout Hygrothermometers	Water System Maintenance

General Services Administration

EXCLUDED GSA OWNED AND OPERATED BUILDINGS

GSA CD Depot 234, Watertown, MA	US Border Station, St. Francis, ME
Federal Bldg USCT, Worcester MA	US Border Station, Madawaska, ME
US Border Station, Calais, ME	US Border Station, Hodgdon, ME
US Border Station, Coburn Gore, ME	Parking Facility, Portland, ME
US Border Station, Fort Fairfield, ME	US Border Station, Fort Kent, ME
US Border Station, Houlton, ME	GSA Reg. FSS MP, Concord, NH
US Border Station, Jackman, ME	US Border Station, Derby Line, VT,
US Border Station, Limestone, ME	US Border Station, Highgate Springs, VT
US Border Station, Orient, ME	US Border Station, Norton, VT
US Border Station, Vanceboro, ME	US Border Station, Beers Plain, VT
US Border Station, Van Buren, ME	US Border Station, Alburg Springs, VT
US Border Station, Calais, ME	US Border Station, North Troy, VT

US Border Station, West Berkshire, VT
 US Border Station, Derby Line, VT
 US Border Station, Beecher Falls
 US Border Station, Canaan, VT
 USBS East Richford, Richford, VT
 US Border Station, Richford, VT
 USBP Sector HDQTRS, Swanton, VT
 Administration Bldg., Champlain, NY
 Inspection Bldg Border, Chateaugay, NY
 Temp Frme Gar Bdr St, Massena, NY
 Inspection Bldg, Mooers, NY
 Border Station, Fort Covington, NY
 Border Station, Rouses Point, NY
 Border Station, Rouses Point, NY
 Border Station, Trout River, NY
 Administration Bldg, Alexandria Bay, NY
 Beltway Bldg, Woodlawn, MD
 Bldg. No. 1, Belle-Mead, NJ
 M.H. Cohen US Courthouse, Camden, NJ
 Cedar Crest Pro Park, Allentown, PA
 Treasury Facility, Philadelphia, PA
 Maintenance Building, Wilkes Barre, PA
 FARC, Chicago, IL
 GSA Interagency Motor Pool, Chicago, IL
 Fed Building & US Courthouse, Urbana, IL
 Fed Supply Depot Chicago, IL
 US Border Station, Sault Ste Marie, MI
 Fed Parking Facility, Detroit, MI
 Cust Cargo Inspec. Fac, Detroit, MI
 Border Station, Grand Portage, MN
 Custom & Immigration Station, Noyes, MI
 Border Station, International Falls, MN
 Federal Bldg, Zanesville, OH
 Federal Parking Facility, Dayton, OH
 Fed Building & Courthouse, Youngstown, OH
 Building 87, Fort Des Moines, IA
 Fed Building, Wichita, KS
 New US Courthouse, Kansas City, KS
 T-Hangar "G", Grand Island, NE
 FOB/CTHS Complex, Baton Rouge, LA
 USBP SH Bldg 13, New Orleans, LA
 Federal Bldg USPO, Jonesboro, LA
 Open Land-FDA Site, New Orleans, LA
 US Federal Courthouse, Shreveport, LA
 Border Station, Columbus, NM
 Border Station, Santa Teresa, NM
 Federal Bldg, Tulsa, OK
 Gateway USBS, BLDG A, Brownsville, TX
 BPSH Bldg 1 HQTRS, Del Rio, TX
 BPSH Blvd of the Amers, El Paso, TX
 BPSH Bldg A, Laredo, TX
 BPSH Admin. Bldg., McAllen, TX
 HQTRS Bldg, Marfa, TX
 USBS Paso Del Norte, El Paso, TX
 USBS Main Bldg, El Paso, TX

US Appraisers Stores, Houston TX
 US BS, Laredo, TX
 USBS, Eagle Pass, TX
 USBS, Del Rio, TX
 Juarez-Lincoln USBS, Laredo, TX
 USBS, Los Indios, TX
 USBS B&M Bridge, Brownsville, TX
 USBS Good Neighbor, El Paso, TX
 Byron White US Courthouse, Denver, CO
 GSA Parking Lot, Denver CO
 Chief Mtn BS & Quarters, Babb MT
 Piegan BS & HQTRS, Babb, MT
 Roosville BS, Eureka, MT
 Sweetgrass BS, Sweetgrass, MT
 BDR Patrol Sector HQ, Havre, MT
 Ambrose BS, Ambrose, ND
 Dunseith BS, Dunseith, ND
 Portal BS, Portal, ND
 St John BS, St John, ND
 Pembina BS, Pembina, ND
 BDR Patrol HQTRS, Grand Forks, ND
 Garage, Cheyenne, WY
 USBS, Lukeville, AZ
 BS Office Bldg, Nogales, AZ
 BS Garage, Sasabe, AZ
 BS Main Bldg, Douglas, AZ
 BDR Patrol Sector HQTRS, Tucson, AZ
 BS Main Bldg, San Luis, AZ
 BS Main Bldg, Naco, AZ
 BS Office Bldg, Nogales, AZ
 Tucson L.E. Suite, Tucson, 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
 J.Weinberger US CTH, San Diego, CA
 Phillip Burton Fed Bldg, San Francisco, CA
 US Border Patrol Station, Calexico, CA
 San Jose Cthse & FB, San Jose, CA
 Parking Garage, Los Angeles, CA
 Oakland Fed Bldg, Oakland, CA
 Dalton Cache BS, Haines, AK
 Station Bldg, Tok, AK
 INT AG Motor Pool, Anchorage, AK
 Skagway Border Station, Skagway AK
 USBS, Eastport, ID
 US Border Station New, Porthill, ID
 Fed Bldg, US Cthse, Boise, ID
 Station Bldg, Blaine, WA
 Station Bldg No 2, Blaine, WA
 Danville Border Station, Danville, WA
 Station & Quarters, Curlew, WA
 USBS, Laurier, WA
 USBS, Metaline Falls, WA

USBS, Oroville, WA
USBS, Sumas, WA
Ken G. Ward BS, Lynden WA
Federal Building, Olympia, WA
USBS, Point Roberts, WA
Fed Office Bldg., Seattle, WA

Fed Bldg US Post Off., Spokane, WA
Border Patrol Sect HQ, Blaine, WA
Bor Patrol HQ Annex, Blaine, WA
Bord Patrol Sect HQ, Spokane, WA
White House, Washington, DC
Delasalle, Avondale, MD

GSA EXCLUDED LEASED BUILDINGS

33 Corinth Ave, Boston, MA
4 Copley Place, Boston, MA
One Center Plaza, Boston, MA
USBS Township 15, Saint Francis ME
USBS Township 2C, Saint Francis ME
USBS Township 11, Saint Francis ME
USBS Township 15, Saint Francis ME
Fleet Center, Providence, RI
The West Pavilion, Providence, RI
Swanton Buildings, Highgate Springs, VT
Gateway I, Newark, NJ
Innovation Plaza, Little Falls, NJ
W/S Jamiesons Lane, Burke, NY
609 W. Washington St, Geneva, NY
67-10 Myrtle Ave, New York, NY
617-619 Beach 20 St, New York, NY
5 Washington Square, Albany, NY
Greenway Plaza, Melville, NY
76 Eleventh Ave, New York, NY
Federal Centre, Buffalo NY
Vassar Main Bldg, Poughkeepsie, NY
Starret Lehigh, New York, NY
28-18 Steinway St, New York, NY
Metrotech Center, New York, NY
27 Pennsylvania Ave, New York, NY
Playtoggs Plaza, Middletown, NY
Sta Maria Exec Hall, Ponce Ponce, PR
Braddock Square Mall, LaVale, MD
American Enterprise, Ewing Twnshp, NJ
1000 California Ave, Pittsburgh, PA
Gateway, Philadelphia, PA
Wise County Plaza, Wise, VA
2914 Hungary Spring, Richmond, VA
610 West Office Pk, Fredericksburg, VA
Hampton Warehouse, Huntington, WV
915 Weimacker Ave, Mobile AL
500 Building, Birmingham, AL
2206 Building, Miami, FL
611 Amman Bldg., Ft. Lauderdale, FL
David Moss Bldg., Miami, FL
Norman Berry Bldg, East Point, GA
MTS Techwood, Atlanta, GA
2250 Newmarket No. 11, Marietta, GA
Judicial Bldg, Biloxi MS
Beaufort Courthouse, Beaufort, SC
One Oak Brook Ter, Oak Brook, IL

Xerox Centre, Chicago, IL
Stewart Square, Rockford, IL
635 Butterfield Rd, Oakbrook Terrace, IL
Governors Off PK IV, Olympia Fields, IL
Glenwood Plaza, Glenwood, IL
Business Centre Bldg, Oakbrook Terrace, IL
Northwestern Bldg, Evanston, IL
The Rookery, Chicago, IL
Heritage Place, Molins, IL
1600 Corporate Center, Rolling Meadows, IL
4849 N Milwaukee Ave, Chicago, IL
AT&T Corporate Center, Chicago, IL
801 Warrenville Road, Lisle, IL
100 Tower Lane Bldg, Bensenville, IL
Olympian Office Center, Lisle, IL
The Pk at NW Point, Elk Grove Village, IL
945 Lakeview Pkwy, Vernon Hills, IL
1110 McConnell Road, Woodstock, IL
2860 River Road, Des Plaines, IL
2124 Greenbay Road, Evanston, IL
Fox River Center, Ottawa, IL
Lakeside Ofc Bldg, Indianapolis, IN
Pendleton Trade Cntr, Indianapolis, IN
429 Penn Center, Indianapolis, IN
The Furniture Co., Grand Rapids, MI
Harr Building, Owosso, MI
Ambassador Bridge, Detroit, MI
Arlington Plaza, Sault Ste Marie, MI
Good Speed Building, Grand Rapids, MI
5015 South Cedar St, Lansing, MI
Domino's Farm House, Ann Arbor, MI
Brewery Park Phase I, Detroit, MI
Gateway Business Ctr, Roseville, MN
Atrium Office Plaza, Cleveland, OH
Plaza Nine Bldg, Cleveland, OH
Center West Office, Rocky River, OH
Tennyson Guyer FB, Lima, 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
113 St Clair Ave, Cleveland, OH
Bankers Building, Chicago, IL
Fed Hwy Adm Reg Off, Homewood, IL

Glen Mill Ofc Pk, Glen Ellyn, IL
 Social Security Bldg, Danville, IL
 O'Hare Office Bldg 2, Rosemont, IL
 Park Ridge Office Center, Park Ridge, IL
 O'Hare Lake Ofc Plz, Des Plaines, IL
 Mid-Continental Plz, Chicago, IL
 Insurance Exchange Bldg, Chicago, IL
 Plaza Tower Office, Evergreen Park, IL
 Clyde Savings Bldg, North Riverside, IL
 2100 N California, Chicago, IL
 Wash Bicentennial Bg, Springfield, IL
 Smoke Tree Bus Park, N Aurora, IL
 Glen Hill North Bg, Glen Ellyn, IL
 County Bank Plaza, Urbana IL
 Trans Union Bldg, Chicago, IL
 10 West Jackson Blvd, Chicago, IL
 Farnsworth Center, Aurora, IL
 O'Hare Lake Off Pla, Des Plaines, IL
 One Congress Center, Chicago, IL
 E Empire & Eastport, Bloomington, IL
 Burrell Building, Chicago, IL
 Oakmont Corporation, Westmont, IL
 1455 Golf Mill Road, Des Plaines, IL
 203 North Vine, Urbana, IL
 1279 North Milwaukee, Chicago, IL
 Bank of America, Chicago, IL
 901 Warrenville Road, Lisle, IL
 1700 South Wolf Road, Des Plaines, IL
 175 East Hawthorn Pk, Vernon Mills, IL
 Quail Ridge Off Center, Westmont, IL
 Elm Plaza So Tower, Hinsdale, IL
 Soc Sec Office, Chicago, IL
 125 Fairfield Way, Bloomington, IL
 IL Business Center, Springfield, IL
 2360 E Devon Ave, Des Plaines, IL
 923-25 Dillon, Wood Dale, IL
 Glen Hill North Bd, Glen Ellyn, IL
 River Center, Chicago, IL
 Schaumburg Atrium, Schaumburg, IL
 600 Joliet Rd, Wilkbrook, IL
 2350 E Devon, Des Plaines, IL
 Gateway IV, Chicago, IL
 Citicorp Center, Chicago, IL
 Liberty Business Pa, Elk Grove Village, IL
 29 N Wacker Dr, Chicago, IL
 Governors Off Park, Olympia Fields, IL
 North Point Tower, Cleveland, OH
 Warehouse 3, Dayton, OH
 Bank One Center, Cleveland, OH
 Eaton Center, Cleveland, OH
 Wright Executive Ctr, Fairborn, OH
 Renaissance, Cleveland, OH
 228th & Lake Shore Blvd, Euclid, OH
 Society Tower, Cleveland, OH
 6161 Oaktree, Independence, OH

Old Bayfield Ctise, Bayfield, WI
 Soc Sec Office, Wisconsin Rapids, WI
 Vander Heyden II, West Bend, WI
 575 Lester Street, Onalaska, WI
 Kirschling Offices, Wausau, WI
 301 High Ave E, Oskaloosa, IA
 323 1/2 E College St, West Branch, IA
 Rosana Square 7720, Overland Park, KS
 1103 Southwest Blvd, Jefferson City, MO
 VA Building, St Louis, MO
 1319 Dielman Road, St Louis, MO
 St Louis Business Ctr, St Louis, MO
 14-15 St Cass-Chicago, Omaha, NE
 Portion Lots 8 to 12, Little Rock, AR
 Unnamed Bldg, Fort Smith, AR
 Unnamed Bldg, Metairie, LA
 Bldg 27, Houma, LA
 Sun Belt Bus Ctr, Albuquerque, NM
 SSA District Office, Poteau, OK
 Klag Building, Corsicana, TX
 3223 Briarpark Bldg, Houston, TX
 Unnamed Building, Houston, TX
 Regency Building, San Antonio, TX
 US Border Station, Presidio, TX
 Unnamed Bldg, Laredo, TX
 Unnamed Bldg, Addison, TX
 T&P Building, Fort Worth, TX
 IRS/ACS Facility, Englewood CO
 Tatum Parking Lot, Helena, MT
 1560 Juliesse St, Sacramento, CA
 39176 State Street, Fremont, CA
 Motor Pool, San Francisco, CA
 874 E Hobsonway, Blythe, CA
 327 W 2nd Street, Calexico, CA
 Parkway Centre, Alameda, CA
 1818-C Arnold Ind Pl, Concord CA
 200 Kanoelchua Ave, Hilo, HI
 The Portals, Washington, DC
 Penn 17, Washington, DC
 701 Lamont St NW, Washington, DC
 1800 G Street NW, Washington, DC
 1919 M Street NW, Washington, DC
 MD 50 Industrial Center, Landover, MD
 So Maryland Courthouse, Greenbelt, MD
 SS Metro Center 4, Silver Spring, MD
 12225-12231 Wilkins, Rockville, MD
 The Hamptons, Capitol Heights, MD
 SS Metro Center 3, Silver Spring, MD
 301 N Stonestreet Ave, Rockville, MD
 12100 Parklawn Dr, Rockville, MD
 4934-40 Boil Brook, Rockville, MD
 A-M Building, Arlington, VA
 Hunter Building, McClean, VA
 Melpar, Falls Church, VA
 Kimberly Bldg, Springfield, VA

National Aeronautics and Space Administration

Johnson Space Center

Flight Operations Facility
Flight Operations
Mission Simulation & Training Facility
Crew Systems Laboratory
Photographic Technology Laboratory
Central Data Office
Avionics Systems Laboratory
Central Heating & Cooling Plant
Auxiliary Chiller Facility
Mission Control Center - Houston
Planetary & Earth Sciences Laboratory
Space Environment Simulation Laboratory
Mission Simulation Development Facility
Life Sciences Laboratory
Central Computer Facility
Emergency Power Building
Vibration/Acoustic Test Facility
Atmos. Re-Entry Materials & Structures Eval. Fac.
Radiant Heat Facility
Thermochemical Test Area

*NASA Industrial Plant (Downey) and USAF Plant
42, Production Site 1 (Palmdale)*

Entire Facilities

White Sands Test Facility

Entire Facility

Kennedy Space Center

Hanger S, Automated Payload Facility
Hanger L, Life Sciences Support Facility
Spin Test Building
Instrumentation laboratory
Hangar AO, Spacecraft Building #2
Hangar AM, Spacecraft Building #1
Hangar AE, Missile Assembly Building
Hangar AF, SRB Recovery Building
SRB Paint Building
SRM X-Ray Facility
Landing Aids Control Building
Rotating/Processing Building
Orbiter Modification and Refurbishment Facility
Thermal Protection Facility
Vehicle Assembly Building
Orbiter Processing Facility
Launch Control Center
Utility Annex

Processing Control Center
Repeater Station
Converter/Compressor Building
Propellant Laboratory and LP/HP Gas Facility
Manufacturing Building
Launch Complex 39 A&B
Communication Distribution & Switching Center
Operations Building
Operations and Checkout Building
Space Station Processing Facility
Payload Support Building
Launch Equipment Test Facility
Parachute Refurbishment Facility
Canister Rotation Facility
Hypergol Module Process North
Hypergol Support Building
Spacecraft Assembly & Encapsulation Facility
Hypergol Module Process South
Payload Hazardous Service Facility
Vertical Processing Facility

Marshall Space Flight Center

Microwave Anechoic Chamber
Communications Facility
Photographic Laboratory
Hardware Simulation Laboratory
Celestial and Optical Sensors Facility
Power Systems Laboratory
Aviation Simulation Laboratory
Space Science Laboratory
Laboratory & Office Building
Test Support Building
Propulsion System & Comp. Altitude Test Facility
Acoustic Model & Comp. Test Facility
Structural Test Facility
Test Facility Terminal Building
Hot Gas Test Control/Support Building
Test Control and Service Building
TPTA Refurbishment Facility
Pump and Boiler House
Propulsion and Structural Test Facility
Test & Data Recording Facility
Environmental Effects Laboratory
Materials & Processes Laboratory
Atmospheric Research Facility
Heat Treatment Facility
Structures & Mechanics Laboratory
Cryogenic Testing 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
 Propulsion Technology Test Facility
 Test Facility Support Building
 Blockhouse
 Boiler House
 Helium Compressor Building
 Non-Destructive Evaluation Laboratory
 Shops & Neutral Buoyancy Simulator
 Productivity Enhancement Facility
 Engineering & Development Laboratory
 Developmental Processes Laboratory
 X-Ray Calibration Facility
 Office and Wind Tunnel Facility
 Compressed Air Facility
 Air Compressor Building
 High Bay Shop Building
 Multi-Purpose High Bay Facility
 Surface Treatment Facility
 High Reynolds Number Facility
 Low Density Flow Facility
 Engine Dynamic Fluid Flow Facility

Michoud Assembly Facility

Entire Facility

Santa Susana Field Laboratory

Entire Facility

Slidell Computer Complex

Entire Facility

NASA Tracking Stations

Deep Space Network, Goldstone, CA
 TDRSS Ground Terminals, White Sands NM
 STDN Site, Ponce de Leon, FL

Ames Research Center

Computational Fluid Dynamics Building
 Vertical Gun
 3.5 Wind Tunnel Model Building
 12 Ft Pressure Wind Tunnel
 12 Ft Wind Tunnel Auxiliaries
 Propulsion Simulations Calibration Laboratory
 Ballistic Range
 Flight Support Facility

Model Development Facility
 7 X 10 Ft Wind Tunnel #1
 7 X 10 Ft Wind Tunnel #2
 Model Preparation Facility
 Model Assembly
 Magnetic Calibration Laboratory
 Magnetic Test Laboratory
 14 Ft Transonic Wind Tunnel
 14 Ft Electrical Equipment Building
 Fan Blade Shop
 Technical Services Shop
 40 X 80 Ft Wind Tunnel
 20-G Centrifuge
 80 X 120 Ft Wind Tunnel
 2 X 2 Transonic Wind Tunnel
 Electrical Substation
 Electrical Substation North
 6 X 6 Supersonic Wind Tunnel
 Unitary Plan Wind Tunnel Building
 11 Ft Transonic Wind Tunnel
 9 X 7 Subsonic Wind Tunnel
 8 X 7 Subsonic Wind Tunnel
 Unitary Plan Wind Tunnel Auxiliary Building
 3.5 Ft Hypersonic Wind Tunnel
 3.5 Ft Hypersonic Wind Tunnel Auxiliary Building
 3.5 Ft Hypersonic Wind Tunnel Storage Building
 Fluid Dynamics Laboratory
 Central Computation Facility
 Advanced Computation Facility
 Thermal Protection Facility
 Thermal Protection Boiler
 Bioscience Laboratories
 Hypervelocity Free Flight Facility
 Arc Jet Facility
 Life Sciences Research Laboratory
 Life Sciences Equipment Facility
 Airborne Missions/Life Science Facility
 Vestibular Research Facility
 Vertical Motion Simulator
 Vertical Motion Simulator Equipment Facility
 Space Projects Facility
 Space Sciences Research Laboratory
 Model Construction Facility
 Aircraft Service Facility
 Aircraft Service Facility
 Aircraft Service Facility
 RSRA Calibration Facility
 Aircraft Service Facility
 Outside Aerodynamic Research Facility
 High Pressure Air Housing
 Propane Facility
 Program Support Communication Network Facility
 Flight Data Complex
 Flight Data Facility
 Man-Vehicle System Research Facility

Numerical Aeronautics Simulator
 High Altitude Aircraft Support Facility
 Fluid Mechanics Laboratory
 Biomedical Research Laboratory
 Human Performance Research Laboratory
 Hazardous Material Storage Facility
 Automated Sciences Research Facility
 Mission Variable Trailers

Dryden Flight Research Center

Entire Facility

Langley Research Center

Low Turbulence Tunnel & Compressor Station
 Transonic Tunnel
 6 X 19 Transonic Tunnel
 8 Ft Transonic Tunnel & Support Building
 30 x 60 Ft Tunnel
 12 Ft Low Speed Tunnel
 20 Ft Vert Spin Tunnel
 Spin Research Office Facility
 East Area Compressor Station
 General Rotor Aeroelasticity Lab
 Transonic Dynamic Tunnel
 Hydrodynamics Research Facility
 East Area Storage Facility
 Vortex Research Facility
 Space Environment Effects Laboratory
 16 Ft Transonic Tunnel
 Structures & Material Research Lab
 Pyrotechnics System - Environmental Test
 Flight Management Research Facility
 Advanced Technology Research Laboratory
 Aeronautic Electronics/Flight Dynamics &
 Control Lab
 Materials Research/Light Alloy Laboratory
 Acoustics Research Laboratory
 Aero Acoustics Branch Offices
 Subsonic Tunnel Offices
 High Speed 7 X 10 & Subsonic 14 X 22 Tunnels
 Basic Aerodynamics Research Tunnel
 Steam Generation Plant
 Conference Center
 Anechoic Noise Facility
 Information Systems Research Facility
 Hyper Propulsion Facility
 High Intensity Noise Research Laboratory
 Advanced Machine Development Laboratory
 Technology Applications/Structures Laboratory
 Hazard Material Metallurgy Laboratory
 Experimental Testing Technology
 Gas Flow Calibration Laboratory

Nondestructive Evaluation Laboratory
 Space Systems & Concepts Laboratory
 Metals Technology Development Laboratory
 AFGE Union Building Local 2755
 Jet Exit Test Facility
 Frequency Converter Building
 National Transonic Facility (NTF)
 NTF Tunnel Model Storage
 Models Technology Electronics Support Lab
 Foundry & Glass Blowing Shop
 Electronics Technology Laboratory
 Electronics Technology/Microelectronics Dev.
 Composites & Model Development Laboratory
 Drive Control Facility
 0.3 Meter Transonic Cryogenic Tunnel
 Aero Systems Analysis/Flight Ops. & Support Fac.
 Hangar Support
 Flight Operations Support Facility
 Gas Dynamics/Fluid Mechanics Research Facility
 Hypersonic Facilities Complex - West Wing
 Hypersonic Facilities Complex - East Wing
 High Pressure Air Facility
 60-Inch M18 Helium Tunnel Facility
 Atmospheric Sciences/Systems Development Lab.
 Atmospheric Sciences Laboratory Annex
 Unitary & Connected Flow Hyper. Wind Tunnels
 Aircraft Landing Dynamics Facility
 Aircraft Landing Dynamics Office/Shop
 HPB Ceramic Heated Combination Facility
 8 Ft High-Temperature Structures
 Thermal Structures Laboratory (TSL)
 Materials Processing and Development Shop
 TSL Cooling System Facility
 Central Scientific Computing Facility
 Flight Simulation Laboratory
 Central Scientific Computing Facility
 Printed Circuit & Encapsulation Laboratory
 Composite Preparation Building
 Composite Storage Building
 Chemical Treatment Facility
 Radiation Re-Entry Research
 Engineering & Fabrication Laboratory
 Storage Facility
 Component Verification Building
 Cloud Chemistry Laboratory
 Polymeric Materials Laboratory
 Structural Dynamics Laboratory
 Materials Properties & Nondestructive
 Evaluation Lab
 Impact Dynamics Support Building
 Aircraft Crashworthiness Preparation Facility
 Impact Dynamics Support Facility
 Aircraft Guidance & Control Laboratory
 Flight Electronics/Electromagnetics Laboratory

Lewis Research Center

Engine Research Building
Chemistry Laboratory
Icing Research Tunnel
Special Projects Laboratory
Materials Research Laboratory
Materials & Structures Laboratory
Central Air Equipment Building
Instrument Research Laboratory
Engine Research Building Combustion Air Heater
Engine Components Research Laboratory
Materials Processing Laboratory
Basic Materials Laboratory
PSL Heater Building
Electric Power Laboratory
Energy Conversion Laboratory
Space Power Research Laboratory
8 x 6 Ft Supersonic Wind Tunnel
10 x 10 Ft Supersonic Wind Tunnel

Plum Brook Station

Entire Facility

Goddard Space Flight Center

Research Projects Laboratory
Flight Control Range Operations
Instrument Development Laboratory
Payload Testing Facility

Environmental Testing Laboratory
Network Control Center
Spacecraft Operations Facility
High Capacity Centrifuge Facility
Space & Terrestrial Applications Facility
Data Interpretation Laboratory
Technical Processing Facility
Spacecraft Systems Development/Integration
Quality Assurance/Detector Development Lab.
Optical Test Site
Spacecraft Magnetic Test Site

Wallops Flight Facility

Radar Facility
Machine Shop - Fabrication
Aircraft Projects/Hangar Area
Electronics Support/Storage
Mainland/Island

Jet Propulsion Laboratory

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

Panama Canal Commission

Marine Bureau (159 buildings)

Lock chambers
Electrical towing locomotives
Canal navigational lighting
Computerized marine traffic control
Repair facilities
Related infrastructure

Engineering & Construction Bureau (257 buildings)

Industrial sector

Tug, locomotive, and dredging-related equipment
repair shops
Potable water processing
Communication
Utility services

General Services Bureau (239 buildings)

Vehicle maintenance and repair shops
Fire stations
Sanitation and grounds management facilities
High energy-consuming activities

U.S. Information Agency

Relay Station, Greenville, North Carolina
Relay Station, Delano, California
Relay Station, Dixon, California (inactive)
Relay Station, Bethany, Ohio
Relay Station, Munich, Germany
Relay Station, Kavala, Greece
Relay Station, Rhodes, Greece

Relay Station, Bangkok, Thailand
Relay Station, Tangier, Morocco
Relay Station, Colombo, Sri Lanka
Relay Station, Botswana
Relay Station, Belize
Relay Station, Philippines

U.S. Department of Agriculture

242 Barns
2 Bus Stations
87 Chemical Storage Buildings
8 Engineering Facilities
4 Filling Stations
5 Fire Stations
479 Greenhouses
76 Garages
98 Headhouses
137 Housing Buildings
2 Incinerator Buildings
514 Laboratory Buildings

78 Office Buildings
85 Office/Laboratory Buildings
Chapel
6 Restroom Buildings
215 Sheds
158 Shops
426 Storage Buildings
54 Trailers
Weather Station
2 Waste Treatment Buildings
494 Other Building Types

U.S. Department of State

Main State Complex
Blair House Complex

Beltsville Information Management Center
International Chancery Center

National Archives and Records Administration

National Archives Building, Washington DC,
National Archives at College Park, MD
Herbert Hoover Library, West Branch, IA
Harry S Truman Library, Independence, MO
Dwight D. Eisenhower Library, Abilene, KS
Lyndon B. Johnson Library, Austin, TX

Gerald R. Ford Library, Ann Arbor, MI
Gerald R. Ford Museum, Grand Rapids, MI
Jimmy Carter Library, Atlanta, GA
Ronald Reagan Library, Simi Valley, CA
John Fitzgerald Kennedy Library, Boston, MA

APPENDIX F
DEPARTMENT OF ENERGY: EDUCATION, EXTENSION,
AND INFORMATION SERVICES

Energy Efficiency and Renewable Energy Clearinghouse (EREC)

Contact: Mary Corrigan, (202) 586-1708

Office of Public Affairs

Contact: F. Chester Gray, (202) 586-6827

Energy Analysis and Diagnostic Center (EADC) Program

Contact: Charles J. Glaser, (202) 586-1298

Energy-Related Inventions Program (ERIP)

Contact: Terry Leviason, (202) 586-1478

Gas Mileage Guide

Contact: Shelia Perez, (202) 586-6723

Institutional Conservation Program (ICP)

Contact: Robert K. Volk, Jr., (202) 586-8034

National Energy Information Center, Energy Information Administration (NEIC/EIA)

Contact: Sandra Wilkens, (202) 586-1173

Office of Federal Energy Management Programs (FEMP)

Contact: Mark Ginsberg, (202) 586-5772

Office of Scientific and Technical Information (OSTI)

Contact: Brian Hitson, (615) 576-1222

Pre-Freshman Enrichment Program (PREP)

Contact: John Ortnan, (202) 586-1634

Technical Information Program, National Renewable Energy Laboratory (NREL)

Contact: Nancy Reeca, (303) 275-3688

State Energy Conservation Program (SECP)

Contact: Ernestine Gibson, (202) 586-8294

Technical Information and Communication Program

Contact: Marsha Quinn, (202) 586-2097

Weatherization Assistance Program

Contact: Jim Gardner, (202) 586-2204

APPENDIX G
FEDERAL INTERAGENCY ENERGY POLICY COMMITTEE
"656" COMMITTEE

"656" Committee Chair

The Honorable Christine Ervin
Assistant Secretary
Energy Efficiency and Renewable Energy

Task Force Executive Director

Mr. Mark Ginsberg
Director, Office of Federal Energy
Management Programs
U.S. Department of Energy, EE-90
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Agriculture

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Commerce

Mr. Thomas R. Bloom
Chief Financial Officer and
Assistant Secretary for Administration
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Defense

Mr. Joshua Gotham
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Education

Mr. Rodney A. McCowan
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Human Resources and Administration
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Environmental Protection Agency

Mr. Jonathan Z. Cannon
Assistant Administrator and
Chief Financial Officer
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Environmental Protection Agency
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Fax: 202-260-0835

General Services Administration

Mr. Kenneth R. Kimbrough
Commissioner of Public
Buildings Service
General Services Administration
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Fax: 202-219-2310

Health and Human Services

Ms. Elizabeth James
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Housing and Urban Development

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Interior

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Justice

Mr. Stephen R. Colgate
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Labor

Ms. Cynthia A. Metzler
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Room S-2514
200 Constitution Avenue, NW
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National Aeronautics and
Space Administration

Ms. Benita A. Cooper
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National Aeronautics and
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Transportation

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Treasury

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Veterans Affairs

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APPENDIX H
PERSONNEL OF THE DEPARTMENT OF ENERGY'S
FEDERAL ENERGY MANAGEMENT PROGRAM

FY 1994 Personnel

Christine Ervin
Assistant Secretary, Energy Efficiency and Renewable Energy
and Chair, Federal Interagency
Energy Policy Committee

Office of Federal Energy Management Programs Staff:

Mark Ginsberg, Director
Executive Secretary, Federal Interagency Energy Policy Committee,
Executive Director, Interagency Energy Management Task Force

John Archibald
Veronica Bellamy
Ted Collins
Mark Decot
K. Dean DeVine, P.E.
Judy Florance
Louis Harris
Rick Klimkos
Bob McLaren
Deborah Miller
Pat O'Brien
Tanya Sadler
Anne Sprunt Crawley
Tatiana Strainic Muessel
Joan Stone
Nellie Tibbs
Deborah Rose