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

Fiscal Year 1992

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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) 1992 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 1992 by the Federal agencies under Executive Order 12759 on Federal Energy Management are also described in this report.

The Energy Policy Act of 1992 (EPACT) was signed into law October 24, 1992, during FY 1993; consequently, activities under EPACT provisions will begin to be reported in the next annual report for FY 1993. Although EPACT legislation will have extensive Federal energy management implications, these requirements are consistent with activities undertaken thus far. Specifically, a major aspect of Executive Order 12759 is mandated into Federal law under EPACT legislation: the requirement for each Federal agency to implement cost-effective energy conservation measures "so that the energy consumption per square foot of its Federal buildings in use during fiscal year 2000 is at least 20 percent less than the energy consumption per square foot of its Federal buildings in use during fiscal year 1985."

During FY 1992, the total (gross) energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.76 quadrillion British Thermal Units (quads).¹ These 1.76 quads consumed by the Government in buildings, facilities, and operations to provide essential services to its citizens, including the defense of the Nation, represent nearly 2.1 percent of all energy 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 27 Federal agencies, the Federal Government consumed nearly 1.29 quads during FY 1992 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. This comports with the definition of energy use from Executive Order 12759. The total net energy consumption in FY 1992 decreased 10.5 percent from the FY 1985 base year and decreased 11.3 percent from FY 1991. Information on gross energy consumption of the Government utilizing source-measured conversion factors is provided in Appendix F.

The total cost of the 1.29 quads was about \$8,656.9 million in FY 1992. This is \$1,762.0 million less than the \$10,418.9 million reported in FY 1985, a 16.9 percent decrease in nominal costs. In constant 1987 dollars, this equates to a decrease of 35.1 percent from \$11,037.0 million in FY 1985 to \$7,160.4 million in FY 1992. The Federal energy bill for FY 1992

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 F.

decreased approximately \$2.6 billion from the \$11.3 billion reported for FY 1991. Significantly higher Federal energy costs during FY 1991 were a result of increased military use during Desert Shield and Desert Storm operations and the spike in oil prices during the first quarter of FY 1991.

Federal agencies report energy consumption under two broad categories: buildings and facilities, and general operations.

Buildings and Facilities

In FY 1992, the Federal Government used 412.6 trillion British Thermal Units (Btu) to provide energy to over 500,000 buildings and facilities. This consumption represents a 12.1 percent decrease compared to FY 1985 and an 2.3 percent increase relative to FY 1991. The nominal cost of energy for buildings and facilities in FY 1992 was \$3,650.5 million, a decrease of approximately \$95.1 million from FY 1991 expenditures, and a decrease of 7.4 percent from the FY 1985 expenditure of \$3,944.0 million.² In constant dollars, energy costs for buildings and facilities decreased 27.7 percent from \$4,177.9 million in FY 1985 to \$3,019.5 million in FY 1992.

In FY 1992, funding identified by agencies for energy conservation retrofits and capital equipment increased 29.1 percent from \$110.1 million in FY 1991 to \$142.1 million. FY 1993 funding is projected at \$196.9 million based upon reports from the agencies to DOE.

General Operations

The general operations category covers energy used in vehicles and equipment and energy used in energy-intensive buildings exempted under section 543 of NECPA, which includes process energy. The energy reported includes aircraft and naval fuels, automotive gasoline consumed by Federally-owned and -leased vehicles and privately-owned vehicles used for official business, the energy used in Federal construction, as well as the energy consumed in industrial operations, certain R&D activities, and in electronic intensive facilities.

In FY 1992, the Federal Government used 0.88 quads of energy in general operations, approximately 68.1 percent of the total 1.29 quads consumed. Total energy use in general operations decreased 9.7 percent relative to FY 1985 and decreased 16.4 percent relative to FY 1991. This higher level of consumption in FY 1991 was primarily a result of the Desert Shield and Desert Storm operations and associated military activities. The Department of Defense consumed 808.3 trillion Btu or 91.8 percent of all general operations energy used by the Federal Government. Fuels consumed by vehicles and equipment represent 88.8 percent of the energy used in general operations; the remaining 11.2 percent is attributed to exempted building energy including process energy.

The Federal Government spent \$5,006.4 million on operations energy in FY 1992, \$2,528.9 million less than the FY 1991 expenditure of \$7,535.3 million. The decreased expenditure during FY 1992 is due to lower levels of consumption and to significantly lower prices for

²Cost 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.

gasoline, diesel fuel, jet fuel, and other petroleum-based fuels. Vehicle and equipment fuel costs represent 82.1 percent of the total energy cost of general operations; the remaining 17.9 percent is attributed to the cost of fuel used in exempted buildings, including process energy costs.

Agency Progress in Meeting Energy Reduction Goals

The NECPA, as amended in 1988, requires agencies to take the steps necessary to reduce energy consumption in Federal buildings by 10 percent by 1995 compared to 1985, based on Btu per gross square foot. Executive Order 12759 sets a goal of 20 percent reduction by 2000. During FY 1992 agencies provided data to DOE that indicated a decrease in energy consumption per gross square foot by 7.2 percent relative to FY 1985. This 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 19.0 percent since 1985, the consumption of electricity has increased approximately 3.5 percent. The increase in electricity results from the installation or increased use of such electricity-driven devices as mainframe and desktop computers, simulators, word processors, and additional air conditioning. Electricity now represents about 69.6 percent of the total energy costs of Federal buildings and accounts for 36.1 percent of total energy use in buildings. This is compared to 30.7 percent of the total energy use in buildings in FY 1985 and 37.8 percent in FY 1991.

Agency efforts undertaken in FY 1992 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 12759 expands the scope of Federal energy management activities beyond the NECPA mandates by establishing goals for industrial operations and for gasoline and diesel consumption. Section 2 of Executive Order 12759 requires industrial facilities to increase energy efficiency per square foot by 20 percent in FY 2000 in comparison to FY 1985 to the extent that measures undertaken to achieve the goal are cost-effective and minimize life-cycle costs. Each agency is required to develop appropriate indicators of energy efficiency for their industrial facilities in order to measure progress toward this goal.

Strategic Importance of Reducing Petroleum-Based Fuel Consumption

Effective management of energy resources is of strategic importance to the Federal Government as well as the Nation. Petroleum-based fuels account for 0.88 quads of the total 1.29 quads consumed by the Federal Government. Of that, approximately 0.82 quads were used by the Department of Defense primarily for jet fuel and distillate/diesel for vehicles and equipment energy.

Due to the strategic nature of petroleum-based fuels, Executive Order 12759 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 1992, 76.5 trillion Btu of petroleum-based fuels were used for buildings and facilities energy, a 31.2 percent decrease

from FY 1985. This represents approximately 18.6 percent of total buildings and facilities energy consumption.

Section 10 of the Executive Order 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 1992, gasoline consumption by the agencies increased 2.7 percent to 285.0 million gallons from 277.6 million gallons in FY 1991. Diesel consumption decreased 29.2 percent in FY 1992 to 815.5 million gallons compared to 1,151.5 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.

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 \$8.7 billion in FY 1992. During this period, the Government's cumulative annual energy cost avoidance was \$1.2 billion.
- The total net energy consumption in FY 1992 decreased 10.5 percent from the FY 1985 baseline.
- Energy consumption in buildings in FY 1992 decreased 12.1 percent from the FY 1985 baseline.
- On a Btu-per-gross-square-foot basis, the reduction in buildings energy puts the Federal Government 72 percent of the way toward the 1995 10 percent reduction goal.
- Six agencies, the Departments of Agriculture, Energy, Health and Human Services, Justice, Veterans Affairs, and the Federal Emergency Management Agency, have already achieved the required 10 percent reduction goal for 1995.
- Two agencies, the Departments of Energy and Justice, have already achieved the required 20 percent reduction goal for the year 2000.
- Energy consumption is used for the following purposes:

<i>End Use</i>	<i>Percentage</i>	<i>Cost</i>
Buildings & Facilities	31.9%	\$3.7 billion
Exempted Buildings/Process	7.6%	\$0.9 billion
Vehicles & Equipment	60.5%	\$4.1 billion

- The Federal Government remains the largest energy consumer in the country, using 2.1 percent of all gross energy consumed in 1992. That is down from 2.4 percent in 1991.

I. OVERVIEW OF FEDERAL ENERGY MANAGEMENT ACTIVITIES

A. Introduction

This report on Federal Energy Management for Fiscal Year (FY) 1992 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, as amended (NECPA), 42 U.S.C. 8251-8261, and Title VIII of NECPA, 42 U.S.C. 8287-8287b. In compliance with section 2(b) of the Federal Energy Management Improvement Act of 1988 (FEMIA), 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.

Implementation activities undertaken during FY 1992 by the Federal agencies under Executive Order 12759 on Federal Energy Management are also described in this report. Specific provisions of the Executive Order include:

- a 20 percent improvement in energy efficiency per square foot in Federal buildings from 1985 to 2000 to the extent that the improvements are cost-effective and minimize life-cycle costs;
- a 20 percent improvement in energy efficiency in industrial facilities from 1985 to 2000 to the extent that the improvements are cost-effective and minimize life-cycle costs;
- a reduction in motor vehicle petroleum use of 10 percent by 1995 over 1991 levels;
- a requirement that the maximum number of alternative fuel vehicles practicable will be acquired by the end of 1995, consistent with the Alternative Motor Fuels Act of 1988.

Other provisions of the Executive Order include the procurement of energy-efficient products, encouragement of utility demand side management program participation, and compliance with energy performance standards for new Federal buildings. Agencies are also directed to minimize petroleum use in facilities, comply with efficiency standards for current buildings, and conduct vehicle fuel efficiency programs.

The Energy Policy Act of 1992 (EPACT) was signed into law October 24, 1992, during FY 1993; consequently, EPACT provisions will begin to be reported in the next annual report, for FY 1993. Although EPACT legislation will have extensive Federal energy management implications, these requirements are consistent with activities undertaken thus far. Specifically, a major aspect of Executive Order 12759 is mandated into Federal law under EPACT legislation: the requirement for each Federal agency to implement cost-effective energy conservation measures "so that the energy consumption per square foot of its Federal buildings in use during fiscal year 2000 is at least 20 percent less than the energy consumption per square foot of its Federal buildings in use during fiscal year 1985."

Federal Energy Consumption and Costs

During FY 1992, the total (gross) energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.76 quadrillion British Thermal Units (quads).³ These 1.76 quads represent 2.1 percent of the total 82.36 quads⁴ 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,⁵ although its pattern of consumption is widely dispersed.

Based on reports submitted to DOE by 27 Federal agencies, the Government consumed 1.29 quads during FY 1992 when measured in terms of energy actually delivered to the point of use. As shown in Table 1, Federal agencies reported a 10.5 percent decrease in total energy consumption compared to FY 1985, and a 11.3 percent decrease from FY 1991. The cost of this energy was \$8.7 billion and represented approximately 0.6 percent of the total Federal expenditures of \$1.38 trillion⁶ for all purposes in FY 1992. The Federal energy bill for FY 1992 decreased approximately \$2.6 billion from the \$11.3 billion reported for FY 1991.⁷ Significantly higher Federal energy costs during FY 1991 were a result of increased military use during Desert Shield and Desert Storm operations and the spike in oil prices during the first quarter of FY 1991.

In FY 1992, the Department of Defense spent \$6.7 billion for energy of the total Federal energy expenditure of \$8.7 billion. Overall, the Department of Defense used 11.7 percent less energy in FY 1992 than in FY 1985. The Department of Energy continues to be the largest consumer of energy among civilian agencies. This is 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 1992 and its cost. As illustrated, jet fuel and electricity account for approximately 63.3 percent of the total energy use represented in Figure 1 and approximately 78.1 percent of the total energy costs in Figure 2.

³Gross 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 F.

⁴DOE/EIA-0384(92), *Annual Energy Review*, June 1993.

⁵National Energy Conservation Policy Act (NECPA), Title V, Part 3, Section 541(1).

⁶Source: Office of External Affairs, Office of Management and Budget.

⁷Appendix E indicates the annual cost of energy used in Federal buildings and facilities and general operations for FY 1985 through FY 1992. Federal energy cost avoidance is also represented, based on the value of annual energy savings in current year dollars. The average unit cost for energy in each fiscal year is depicted in Figure E of this appendix.

The strategic importance of petroleum-based fuels to the Federal Government is shown in Table 2. In FY 1992, petroleum-based fuels accounted for 0.88 quads (875,508.1 billion Btu) of the total 1.29 quads consumed by the Federal Government. Of that, approximately 0.82 quads were used by the Department of Defense primarily for jet fuel and distillate/diesel for vehicles and equipment energy. Only 0.08 quads of petroleum-based fuels were used for Federal buildings and facilities energy.

TABLE 1
TOTAL NET ENERGY USE 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	% CHANGE 85-92	% CHANGE 91-92
DOE	52,241.8	49,930.5	48,238.4	49,791.7	43,882.3	43,389.9	41,779.9	44,371.1	-15.1	6.2
USPS	27,762.5	28,036.6	28,474.7	29,618.2	30,306.7	30,616.2	30,817.0	31,674.2	14.1	2.8
VA	25,144.7	25,020.9	24,877.5	26,255.1	26,249.3	24,898.4	25,262.2	25,254.9	0.4	0.0
DOT	19,534.9	19,394.0	19,001.8	18,715.6	18,507.2	18,965.2	18,771.9	15,777.8	-19.2	-16.0
GSA	17,118.1	14,003.0	13,081.8	12,385.4	12,659.9	14,226.0	13,956.9	13,842.0	-19.1	-0.8
NASA	10,857.0	11,179.0	11,100.0	11,216.6	12,106.8	12,328.9	12,448.2	12,548.5	15.6	0.8
USDA	8,358.7	6,797.9	6,617.9	7,784.1	7,637.4	9,922.2	9,158.3	9,100.6	8.9	-0.6
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	13.9	11.9
DOJ	8,176.0	8,592.7	8,123.5	9,439.0	7,749.4	6,961.6	8,018.3	7,544.3	-7.7	-5.9
DOI	6,457.9	6,857.9	6,631.9	6,976.3	7,148.8	7,391.9	6,854.2	6,992.4	8.3	2.0
TRSY	2,770.0	2,702.1	3,679.3	7,118.7	5,242.4	3,391.6	4,177.1	4,628.4	67.1	10.8
DOL	2,385.2	2,416.0	2,403.3	2,501.1	2,430.1	2,376.0	2,446.0	2,483.6	4.1	1.5
DOC	2,489.1	2,274.6	2,144.5	2,522.9	2,859.2	4,476.3	2,722.2	2,460.1	-1.2	-9.6
PCC	724.2	805.9	899.0	847.9	916.1	873.1	808.1	923.5	27.5	14.3
TVA	980.9	902.6	960.6	932.9	818.0	904.5	961.3	834.4	-14.9	-13.2
EPA	585.0	1,273.1	485.3	439.4	429.2	411.5	426.4	578.3	-1.2	35.6
ST	246.9	264.7	305.0	301.2	302.9	302.6	274.2	273.8	10.9	-0.2
FEMA	96.1	151.9	157.9	171.5	192.5	215.1	198.4	204.1	112.3	2.9
HUD	114.4	117.4	119.4	123.8	139.1	140.3	162.3	156.9	37.1	-3.4
OPM	54.3	54.5	54.5	67.3	72.1	70.8	74.6	91.4	8.2	22.5
FCC	23.6	21.4	24.3	22.4	20.6	23.9	22.1	19.9	-15.9	-10.1
OTHER*	257.8	342.6	405.0	433.7	1,859.4	1,889.1	1,109.0	1,165.0	351.8	5.1
CIVILIAN AGENCIES TOTAL	193,362.6	187,359.1	184,344.8	194,051.3	188,258.6	191,732.1	187,555.6	188,879.7	-2.3	0.7
DOD	1,250,613.8	1,222,801.5	1,280,539.2	1,165,755.3	1,274,443.6	1,241,655.8	1,269,291.5	1,103,990.1	-11.7	-13.0
ALL AGENCIES TOTAL										
BBTU	1,443,976.4	1,410,160.6	1,464,884.0	1,359,806.6	1,462,702.1	1,433,387.9	1,456,847.1	1,292,869.8	-10.5	-11.3
MBOE	247.9	242.1	251.5	233.4	251.1	246.1	250.1	222.0		
Petajoules	1,523.3	1,487.7	1,545.4	1,434.5	1,543.1	1,512.2	1,536.9	1,363.9		
ANNUAL CHANGE FROM 1985										
BBTU		-33,815.8	20,907.6	-84,169.8	18,725.7	-10,588.5	12,870.7	-151,106.6		
MBOE		-5.8	3.6	-14.4	3.2	-1.8	2.2	-25.9		
Petajoules		-35.7	22.1	-88.8	19.8	-11.2	13.6	-159.4		
CUMULATIVE SAVINGS FROM 1985										
BBTU		33,815.8	12,908.2	97,078.0	78,352.3	88,940.8	76,070.1	227,176.7		
MBOE		5.8	2.2	16.7	13.5	15.3	13.1	39.0		
Petajoules		35.7	13.6	102.4	82.7	93.8	80.3	239.7		

DATA AS OF 08/18/93

*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.

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 Quarterly Energy Use Reports, DOE Form 6200.2.

FIGURE 1
Federal Energy Use, FY 1992

TOTAL
1.29 quads

*Other includes Navy Special, Lpg/propane, Aviation Gas, and Other.

BUILDINGS AND FACILITIES
0.41 quads

*Other includes Navy Special, Lpg/propane, Aviation Gas, and Other.

GENERAL OPERATIONS
0.88 quads

*Other includes Navy Special, Lpg/propane, Aviation Gas, and Other.

Data as of 08/18/93

Source: Federal Agency Quarterly Energy Use Reports, DOE Form 6200.2.

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

FIGURE 2
Federal Energy Costs, FY 1992
(Nominal Dollars)

TOTAL
\$8.66 Billion

*Other includes Navy Special, Lpg/propane, Aviation Gas, and Other.

BUILDINGS AND FACILITIES
\$3.65 Billion

*Other includes Navy Special, Lpg/propane, Aviation Gas, and Other.

GENERAL OPERATIONS
\$5.01 Billion

*Other includes Navy Special, Lpg/propane, Aviation Gas, and Other.

Data as of 08/18/93

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 1992
(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	530,757.9	63,682.8	9,933.4	73,616.1	77.66
LPG/Propane	30,706.0	1,971.3	961.1	2,932.4	3.09
Process					
Fuel Oil	122,505.4	15,273.6	1,717.9	16,991.5	17.93
LPG/Propane	1,017.0	32.4	64.7	97.1	0.10
Vehicles & Equipment					
Auto Gasoline	285,042.2	12,242.0	23,388.3	35,630.3	37.59
Dist-Diesel & Petrol.	815,544.9	104,197.9	8,918.2	113,116.1	119.36
Aviation Gas	7,792.2	28.4	945.7	974.0	1.03
Jet Fuel	4,823,280.9	620,453.9	6,572.7	627,026.5	661.49
Navy Special	426.0	59.1	0.0	59.1	0.06
LPG/Propane	137.6	0.0	13.1	13.1	0.01
Other	5,065.0	3,376.0	1,689.0	5,065.0	5.34
Total		821,317.3	54,190.8	875,508.1	923.60

DATA AS OF 08/18/93

*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: Columns may not equal total due to independent rounding.

Source: Federal Agency Quarterly Energy Use Reports.

B. Federal Coordination

A number of Federal coordination activities were carried out in FY 1992. A meeting of the Federal Interagency Energy Policy Committee ("656" Committee) was held in April 1992, with representatives of 14 agencies and the Council on Environmental Quality attending. The meeting was chaired by the Honorable J. Michael Davis, P.E., Assistant Secretary for Conservation and Renewable Energy, and focused on the status of plans and policies being developed by the agencies to implement Executive Order 12759 on Federal Energy Management. Mr. Jerry Allsup of the Office of Alternative Fuels, DOE, described the strategy and activities of his office in response to Section 11 of the Executive Order regarding the procurement of alternative fuel vehicles for the Federal fleet. Mr. Mark Ginsberg, Director, Office of Federal Energy Management Programs, DOE, led discussions on other issues including the Federal Relighting Initiative, the use of life-cycle cost analysis, and demand side management as it relates to Federal energy efficiency projects. Mr. B. Reid Detchon, Principal Deputy Assistant Secretary for Conservation and Renewable Energy, DOE outlined components of the proposed National Energy Strategy legislation which contains provisions that could impact Federal agencies.

The Interagency Energy Management Task Force was established by Section 547(a) of NECPA, as amended, 42 U.S.C. 825. The Task Force met three times during FY 1992 and early in FY 1993. The first Task Force meeting was held on February 20, 1992, with Mr. Mark Ginsberg, Executive Director of the Interagency Energy Management Task Force, presiding. The first part of the meeting was devoted to a discussion of efforts being made by the agencies to implement Executive Order 12759. The working group session which followed focused on the concept of a Federal energy efficiency fund and how implementation of such a fund would be undertaken by DOE. Representatives from nine agencies participated in the Task Force meeting.

In July 1992, a second meeting of the Task Force briefed members on agency activities related to the implementation of Executive Order 12759 and further examined issues involved in the development of recommendations for the Federal energy efficiency fund program. In addition, Mr. David Rodgers of the Office of Transportation Technologies, DOE, briefed members on the status and findings of the Interagency Alternative Fuels Commission and discussed the development of the agency five years plans for the acquisition of alternative fuel vehicles by the Federal Government. Representatives from 14 agencies participated in the Task Force meeting.

The Task Force met on September 21, 1992, to consider a variety of issues impacting Federal energy management. The group discussed industrial process energy as it relates to the energy reduction goals of NECPA and Executive Order 12759 and FEMP's requirement to report annually on the status of the mandatory standards for new Federal construction. Mr. David Rodgers and Mr. Frank Mallgrave of the Office of Transportation Technologies, DOE, discussed further the agency 5-year plans for acquiring alternative fuel vehicles. Mr. Ginsberg of FEMP also reported on the status of a Memorandum of Understanding among the Environmental Protection Agency, the Department of Energy, and other Federal agencies for participation in a proposed joint Federal Green Lights Program.

Both the "656" Committee and the Interagency Energy Management Task Force met early in FY 1993 to discuss the Energy Policy Act of 1992. The "656" Committee meeting was hosted by DOE on October 1, 1992. The Task Force met on November 10, 1992, after the October 24th enactment of the Energy Policy Act of 1992. Task Force members were briefed on the content of the legislation, discussed its impact on Federal energy management activities, and considered activities to be taken to meet the mandated goals and deadlines.

C. Progress Toward Meeting the Goals

Overall, the Federal Government reduced its energy consumption in buildings and facilities by 7.2 percent in FY 1992 compared to FY 1985 when measured on a Btu-per-gross-square-foot-basis. Federal Government progress toward the energy reduction goals of NECPA and Executive Order 12759 is illustrated in Figure 3. Contributing to this overall reduction were the percentage reductions made by the following agencies: 6.6 percent by the Department of Defense, 20.6 percent by DOE, 11.6 percent by the Department of Health and Human Services, 53.8 percent by the Department of Justice, and 11.5 percent by the Department of Veterans Affairs and by the Department of Agriculture. 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 1992, the implementation of many no-cost and low-cost energy conservation measures was continued, such as reducing lighting levels, lowering hot water temperatures, turning off unused equipment, and installing energy-efficient windows, insulation, weather stripping, and set-back thermometers.

Numerous energy-efficient building retrofits and energy conservation projects were undertaken to supplement the no-cost, low-cost measures. These initiatives can be categorized by lighting system replacement, HVAC equipment modernization, building envelop 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, establishment of ride-sharing programs, increased maintenance training, and increased engineering assistance.

FIGURE 3
FEDERAL GOVERNMENT PROGRESS TOWARD THE MANDATED ENERGY
REDUCTION GOALS FOR BUILDINGS AND FACILITIES, FY 1985 TO FY 1992

Note: This figure uses a conversion factor for electricity of 3,412 Btu per kilowatt hour.

Source: Federal Agency Quarterly Energy Use Reports, DOE Form 6200.2.
 Annual reports submitted by Agencies to DOE.

Executive Order 12759 expands the scope of Federal energy management activities beyond the NECPA mandates by establishing goals for industrial operations. Section 2 requires 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. The Executive Order goal applies to certain buildings currently exempt under NECPA where industrial operations are performed. On September 10, 1992, a working group of the Interagency Energy Management Task Force met to discuss issues related to the industrial facilities goal. The group recommended guidelines for assisting agencies in defining industrial facilities and confirmed that the responsibility for developing energy efficiency indicators rests with the individual agencies. In FY 1992, agencies which use industrial energy began to take steps to develop appropriate indicators of energy efficiency for their industrial facilities in order to measure progress toward the 20 percent reduction goal.

Section 10 of Executive Order 12759 establishes energy-efficiency goals 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 1992. The Administrator of General Services, in consultation with the Secretary of Energy, developed guidance during FY 1992, which was issued on October 14, 1992, to assist agencies in meeting this goal.

Of the agencies reporting gasoline consumption, the level of consumption overall increased 2.7 percent from 277.6 million gallons in FY 1991 to 285.0 million gallons in FY 1992. Of the agencies reporting consumption of diesel fuel, the overall level of consumption decreased 29.2 percent from 1,151.5 million gallons in FY 1991 to 815.5 million gallons in FY 1992. The Defense Department's 30.0 percent decrease from FY 1991 in diesel consumption is the main contributing factor in this significant decrease. The higher level of diesel consumption during FY 1991 is attributed to Desert Shield/Desert Storm operations. It should be noted that the diesel consumption data may include other types of off-road vehicles and equipment, in addition to on-road passenger cars and trucks.

D. Funding for Energy Efficiency

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 1993 for energy conservation retrofits and capital equipment. Funding for energy conservation declined from \$257.5 million in FY 1985 to \$49.7 million in FY 1989, although the trend from FY 1990 to FY 1992 appears to be reversing. Reports from Federal agencies indicated that \$110.1 million was spent in FY 1991 on retrofit expenditures and \$142.1 million in FY 1992, with FY 1993 funding projected to be \$196.9 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 4 illustrates agency spending trends for five key agencies and other Federal agencies.

Table 3
Agency Expenditures for Energy Conservation Retrofits and Capital Equipment,
FY 1985 through FY 1993 (Thousands of Nominal Dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	Projected 1993
USDA	2,500	0	0	500	500	1,547	1,752	7,300	8,000
DOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	872	N/A
DoD	136,100	120,000	5,550	5,280	1,500	1,020	10,000	49,669 ¹	109,000
DOE	14,000	10,680	15,000	17,000	17,432	17,400	16,500	17,700	17,000
HHS	0	0	0	427	427	427	427	0 ²	N/A
DOI	3,198	5,535	0	0	4,338	0	1,272	9,800	3,700
DOJ	0	0	0	195	484	6,100	26,400	0	N/A
DOT	13,650	15,000	12,104	12,700	2,908	0	460	143 ³	741
TRSY	0	0	2,977	2,393	2,823	1,134	836	N/A	0 ⁴
VA	13,000	11,500	9,500	9,860	5,500	11,200	9,970	10,000	12,000
GSA	6,700	6,100	2,900	9,400	4,868	11,125	30,123	37,000	30,000
NASA	11,800	12,100	1,700	1,400	4,499	2,943	7,556	7,086	14,206
PCC	1,274	73	1,174	600	378	361	807	249	245
USPS	55,300	9,300	5,100	3,800	4,000	4,000	4,000	2,293	2,000
TOTAL	257,522	190,288	56,005	63,555	49,657	57,257	110,103	142,112	196,892

Source: Data submitted to DOE by Federal Agencies.

¹ DOD figure includes ECIP (MILCON) funds, O&M funds, and Defense Commissary Surcharge funds.

² HHS received \$2.7 million of GSA funds for Social Security Administration projects.

³ Only funds for the Coast Guard and the Office of the Secretary of Transportation were identified.

⁴ The Internal Revenue Service is projected to receive \$1.4 million of GSA funds for FY 1993.

FIGURE 4
ENERGY CONSERVATION RETROFIT EXPENDITURES
(Nominal Dollars)

Source: Annual reports submitted by Agencies to DOE.

The Defense Department identified \$49.7 million in expenditures for energy efficiency projects in FY 1992 and projects \$109.0 million to be spent in FY 1993, representing a two-fold increase in expenditures. This amount includes funds from military construction accounts, operations and maintenance accounts, and Defense Commissary Agency Surcharge funds.

The General Services Administration spent \$37 million in FY 1992 specifically on energy conservation projects. Although there were additional projects with energy savings, these components were not tracked separately. Of the \$37 million spent for energy conservation projects in FY 1992, \$5.4 million was funding for projects at buildings where GSA has delegated operating authority to the tenant agency. Of the \$30 million planned for FY 1993, \$5.9 million is planned for delegated agency projects.

At the DOE, funding for energy surveys in building and processes amounted to \$3.6 million in FY 1992. DOE invested \$17.7 million in 68 retrofit projects in building and metered process facilities. The anticipated savings from these retrofit projects in FY 1992 is 325 billion Btus. The proposed budgeted level of expenditures for retrofits for FY 1993, is approximately \$17.0 million.

Shared Energy Savings

Initiatives taken by Federal agencies to actively pursue shared energy savings (SES) contracts have produced six SES contract awards in FY 1992, bringing the total number of awarded SES contracts to 13. SES contracts awarded during FY 1992 are briefly described below. SES contracts awarded prior to FY 1992 include the General Mail Facility in San Diego, CA; the Corpus Christi Army Depot, TX; the U.S. Army Aliamanu Family Housing Area in Honolulu, HI; the Navy Training Center in Great Lakes, IL; the Naval Air Test Center in Patuxent River, MD; the San Diego Region Commissaries, CA; and NASA's Michoud Assembly Facility, LA. Through FY 1992, the total contractor investment in Federal SES projects is approximately \$18 million. The Government's share of the projected savings over the lives of these projects is approximately \$21 million.

As shown below, the contractor investment in SES projects awarded in FY 1992 was approximately \$6 million. The Government's share of the savings generated over the lives of the FY 1992 contracts is estimated to be \$4.5 million.

FY 1992 Projects	Contractor Investment (Thou. Dollars)
DOE Lawrence Berkeley Lab - Berkeley, CA	\$328
USPS General Mail Facility - Oklahoma City, OK	\$265
USPS General Mail Facility - New Orleans, LA	\$308
USPS Southern Maryland General Mail Facility/ Bulk Mail Center	\$237
Gas Air/Propane Mixing Plant - Fort Stewart, GA	\$922
Veterans Affairs Medical Center, West Haven, CT	\$3,940
Total	\$6,000

On December 2, 1991, the U.S. Postal Service awarded a SES contract for a lighting retrofit project to be performed at the 25-year-old Oklahoma City General Mail Facility. The project is estimated to save the Government \$78,101 per year for 5 years. The USPS awarded a second SES contract on January 30, 1992. This contract, implemented at the General Mail Facility in New Orleans, LA, is also a lighting retrofit project. It is projected to save the Government \$72,648 over 5 years. The USPS awarded a third SES contract at its Southern Maryland General Mail Facility on March 12, 1992. The project consists of a lighting retrofit of a 4-year-old general mail facility and is estimated to save the Government \$71,331 over 5 years.

DOE awarded a SES contract at its Lawrence Berkeley Laboratory in Berkeley, CA in FY 1992. For this contract, extensive submetering was conducted within the building to characterize the energy consumption of major components. This submetering will be continued throughout the contract term to verify the energy and cost savings. The contract includes HVAC controls, fume hoods, lighting controls, and packaged cogeneration. It is expected to save the government \$7,200 in the first year increasing to \$47,200 in the last year. The contract is not to exceed 15 years.

The U.S. Army awarded a SES contract for a gas air/propane mixing plant project at Fort Stewart, GA on March 31, 1992. It consists of a base-wide peak shaving project for propane-air mixing plant and the expected Government share of the savings is \$4,042,091 over 20 years. The contract term is 15 years, with 5 option years. A similar SES contract was awarded on July 28, 1992 at Fort Gillem/Fort McPherson, GA, which will save the Government \$7,077,969 over 20 years.

Awarded during FY 1992, the West Haven Veterans Affairs Medical Center (VAMC) has become the first VAMC to award a SES contract. This \$2.4 million project is a 15-year contract and will provide an estimated annual savings of \$600,000. 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 VAMC West Haven replaced two 800-ton centrifugal chillers installed in 1963, with a new 800-ton electric chiller and a 1,000-ton steam absorption chiller. Additionally, the contractor will perform a facility-wide lighting retrofit to replace over 7,000 fixtures with more energy-efficient fixtures. This retrofit will result in an annual savings of \$220,000. Under the terms of the SES contract the contractor will receive 90 percent of the savings and the Medical Center will retain 10 percent of the savings for chilled water use up to 1.8 million ton hours per year. Once this baseline level is exceeded, the contractor receives 25 percent and the remainder goes to the Medical Center. A total of \$317,582 in rebates from the local electric company (United Illuminating) and gas company (Southern Connecticut Gas) contributed to this project.

SES contracts are service contracts, yet they usually result in the modification of facilities and/or the installation of installed fixtures and equipment, whose cost is financed out of savings achieved. The contracts, therefore, contain complex terms for balancing contractor and Government risk and interests. These terms are unusual for service contracting and require expertise beyond that typically applied to other contracts of comparable value.

Agencies have reported that SES 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 SES business. In addition, many procurement officials are unfamiliar with SES contract conditions under the FAR. Because SES contracts are a relatively new option, there are many concerns as to what is appropriate under FAR and how to evaluate and award contracts.

Another obstacle to greater use of SES contracts is the requirement to establish an energy baseline to measure potential savings and to verify achieved savings after contract completion. The determination of the energy baseline continues to be a problem. Reliable, metered, historical energy data are seldom available from installations. Often, energy baselines are determined through the use of calculations based solely on engineering judgment, which may not be capable of accounting for environmental factors affecting future use. This limitation, combined with the complexity and time involved in Federal contracting, increases the potential for loss of savings to the Government and financial risk for the contractor. Because of these features, SES contracts are often less attractive instruments for energy savings than those funded and accomplished through other procedures. However, SES contracts can sometimes be used if the project is cost-effective and other funding mechanisms are not available.

The Energy Policy Act (EPACT) of 1992 made a few modifications concerning SES contracting. The term SES contracting has been changed to Energy Savings Performance (ESP) Contracting. An EPACT section on ESP encourages development of uniform Government-wide procedures concerning SES contracts. These procedures are supposed to relieve Federal agencies of the need to individually develop performance contract procedures and methods and to encourage energy service companies to contract with Federal agencies on a uniform basis. The aim of the Office of Federal Energy Management Programs is to assist with development of such a generic solicitation procedure.

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. Executive Order 12759 and EPACT 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 1992:

- 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 Labor
- Department of Transportation
- Department of the Treasury
- Department of Veterans Affairs
- General Services Administration
- National Aeronautics and Space Administration
- Nuclear Regulatory Commission
- Office of Personnel Management
- Railroad Retirement Board
- United States Postal Service

DSM activities reported by the agencies in FY 1992 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 1992 DSM activities which were reported and quantified totaled approximately \$5.4 million in rebates or credits received by Federal agencies for projects which reduced energy costs by approximately \$5.6 million. These totals do not, however, reflect the total DSM benefits received by the Federal Government as a whole for FY 1992.

At the Department of Energy, DSM activities through FY 1992 saved 30 million kWh of electricity and approximately \$1.3 million. GSA received rebates of approximately \$1.2 million for energy conservation projects in FY 1992. Rebates are typically offered within a geographic area, and rebates received by GSA are generally returned to the regions for additional energy project funding. The Department of Veterans Affairs has designated \$3 million in FY 1993 for projects at the medical centers where utility companies will contribute rebates.

E. Alternative Fuel Vehicles

Executive Order 12759, Section 11, requires that the Federal Government acquire the maximum number practicable of alternative fuel vehicles (AFVs). AFV refers to a vehicle either designated and manufactured by an original equipment manufacturer or a converted vehicle designed to operate either dual-fuel, flexible fuel, or dedicated. A dual-fuel vehicle has the ability to operate on either alternative fuels or gasoline, whereas a flexible fuel vehicle also has the ability to operate on a mixture of alternative fuel and petroleum-based fuels. Dedicated vehicles are designed to operate on one alternative fuel. The alternative fuels currently used by Federal agencies are: Methanol, Ethanol, M-85 (85 percent methanol, 15 percent gasoline), E-85 (85 percent Ethanol, 15 percent gasoline), CNG (compressed natural gas), LNG (liquefied natural gas), LPG (liquefied petroleum gas), and electricity.

Executive Order 12759 supplements the demonstration and testing program established by Congress under the Alternative Motor Fuels Act (AMFA) of 1988. The primary goal of Section 11 of Executive Order 12759 is for the Federal Government to play a leading role in the acquisition and use of AFVs. The experience and leadership of Federal agencies can make public and private adoption of AFVs more efficient and less costly. To meet the requirements of Executive Order 12759, each Federal agency has developed a 5-year plan for introducing AFVs into its fleet. The 5-year Federal procurement plan has encouraged auto manufacturers to scale up production and reduce per-unit costs of AFVs. It will also encourage fuel suppliers to develop the necessary service infrastructure.

The General Services Administration operates about 25 percent of the Federal fleet. During FY 1992, GSA procured 3,287 AFVs (up from 65 AFVs in 1991) for the Interagency Fleet Management System (IFMS), making it the largest Federal fleet user of AFVs. These vehicles, provided by the original equipment manufacturers, included: 2,565 flexible-fuel methanol sedans (operating on methanol, unleaded gasoline, or any combination), 20 flexible-fuel methanol vans, 25 flexible-fuel ethanol sedans (operating on ethanol, unleaded gasoline, or any combination) and 600 dedicated compressed natural gas (CNG) pickup trucks and 77 dedicated CNG vans. These vehicles were acquired under the legislative authority of the Alternative Motor Fuels Act of 1988.

Agency Assigned Vehicles by Vehicle Type (GSA Assigned)

MAKE	MODEL	FUEL	NUMBER PURCHASED
Chevrolet	3/4 ton pickup truck	CNG	600
Dodge	B250 vans	CNG	77
Ford	Taurus Sedans	M 85	40
Chevrolet	Lumina Sedans	M 85	25
Ford	Econoline vans	M 85	16
Chevrolet	Lumina Sedans	E 85	25

The U.S. Air Force initiated the largest single Federal fleet vehicle conversion in FY 1992 at Tinker Air Force Base in Oklahoma. The base will convert over 200 vehicles into dual fuel vehicles which will be able to use CNG or gasoline. The conversion project will place the Base at the forefront in state air pollution efforts with the largest CNG fleet in Oklahoma.

The U.S. Postal Service continues to operate the largest CNG fleet in the country. During FY 1992, a total of 837 vehicles were converted to dedicated CNG vehicles. They were deployed at eight different sites throughout the country. FY 1993 plans are to convert an additional 1,400 vehicles at 12 new locations. AFV procurement/conversions are funded by USPS Headquarters. During FY 1992, over \$1.5 million was spent on AFV conversions. The budget for this program in FY 1993 is \$3.9 million.

The Department of Energy acquired a total of 125 AFVs in FY 1992. This total consists of 61 trucks, 35 utility vehicles, 26 vans, and 3 sedans. Vehicle conversions are being implemented at 17 DOE sites. DOE's goal is to have AFVs comprise 30 percent, 40 percent, and 50 percent of new light duty vehicle acquisitions for FY 1996, FY 1997, and FY 1998, respectively.

The Department of Transportation relies on IFMS for vehicle support rather than on agency-owned fleets. DOT's efforts have been focused on being in the forefront of agencies obtaining IFMS AFVs. DOT has been working closely with GSA to maximize the number of AFVs both at Headquarters and in the field. By the end of FY 1992, DOT obtained 14 compressed natural gas vehicles and 42 methanol-powered vehicles from GSA, and these numbers will increase as more vehicles become available.

The U.S. Department of Agriculture has a mandatory requirement to use alcohol-blended fuels in its owned and leased fleets. Several USDA agencies are participating in the use of AFVs within IFMS, and one agency has converted a number of vehicles to CNG and LPG for use in its owned fleet. Currently, USDA uses a variety of fuels, including gasoline, diesel, blended fuel, E-85, M-85, CNG, and LPG.

In FY 1991, the Secretary of the Interior issued a policy statement requiring the use of blended gasoline (ethanol and methanol) when such fuels are available and reasonably priced. In FY 1992, DOI continued to direct and oversee the implementation of the AFV program. DOI obtained a commitment by GSA to provide CNG vehicles to the DOI fleet, enabling DOI to surpass its FY 1992 goal of placing 100 CNG vehicles in the fleet.

The Department of Commerce is presently working with its bureaus to initiate a comprehensive AFV program. Presently, there are four M-85 sedans located at the National Oceanic and Atmospheric Administration in Silver Spring, MD. Within the Department of the Treasury, the IRS has begun to procure AFV vehicles in its non law-enforcement fleet. In FY 1992, the IRS had two AFVs, both are fueled by M-85. The Federal Energy Regulatory Commission has leased two CNG vehicles.

DOE established an Alternative Fuels Hotline (1-800-432-1DOE) in June 1992 to provide callers from Federal agencies, industry and the public with answers to questions on alternative fuel vehicles. By calling the toll free number, callers can request information of AFVs. As of November 1992, over 1,000 calls were received. Most callers had questions concerning conversions, especially CNG and LPG conversions.

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 include:

- AFV production information from the major U.S. auto and heavy duty engine manufacturers;
- data on government fleet vehicles;

- refueling site information;
- new service on refueling sites: MapInfo program; this program will allow data center users and hotline callers to obtain a map of any area, city, county, highway, state, or the entire U.S., showing the relative location of alternative fuel refueling stations;
- data on cooperative efforts with states;
- information on emissions, for dual fuel vehicles CNG and gasoline; and
- repair and maintenance logs of alternative fuel fleet vehicles.

F. Training

During FY 1992, the Federal Relighting Initiative course, sponsored by DOE's Office of Federal Energy Management Programs (FEMP), was conducted four times for a total of 123 participants in San Francisco, CA; New York, NY; Philadelphia, PA; and Washington, DC. During the first day of this training course, participants received lighting efficiency training, and the second day consisted of an overview of the five steps for implementing the Federal Relighting Initiative.

Three Federal Energy Decision Screening workshops were held during FY 1992 for 83 attendees in Williamsburg, VA; Las Vegas, NV; and Fort Belvoir, VA. This is a training course for Federal facility managers on whole-site analysis of energy conservation opportunities and negotiation of contracts with utilities and energy service companies for funding and management of retrofits.

In FY 1992, FEMP, in conjunction with the National Institute of Standards and Technology, conducted five 3-day workshops on life-cycle costing (LCC) and building energy management. The first 2 days of each workshop provided "hands-on" training in LCC procedures that Federal agencies are required to use in evaluating energy 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 A Simplified Energy Analysis Method - Version 3.0 (ASEAM-3.0). The ASEAM-3.0 methodology was designed to assist Federal energy managers in analyzing building energy requirements and identifying conservation opportunities. The use of ASEAM-3.0, in conjunction with life-cycle costing, significantly upgrades the accuracy of energy savings projections and thus the accuracy of the life-cycle costing analyses. ASEAM-3.0 has also proven to be a valuable tool in establishing building energy baselines for shared energy savings contracts. The workshops offered instruction on the use of IBM-PC compatible (DOS operating system) software developed for both the LCC and ASEAM-3.0 analyses.

Federal energy managers, State and local government personnel, and representatives from private industry were among the 175 participants who received training at the five workshops held in St. Louis, MO; Kansas City, MO; San Francisco, CA; and two in Washington, DC.

FEMP and the GSA Interagency Training Center conducted three 2-day courses on Shared Energy Savings (SES) Contracting for Federal Agencies. In each course, facility managers, contract specialists, and building engineers were taught the benefits of SES contracting and how to identify suitable SES projects. SES contracting allows energy-efficient improvements to be installed by private contractors with no up-front capital costs. The SES course described how to manage a multi-disciplinary team in developing SES projects and to identify the engineering and contracting aspects of SES solicitation design and development, proposal evaluation, and contract award and implementation. Participants learned SES terms and concepts and the SES provisions of pertinent legislation.

During FY 1992, 78 individuals participated in the three SES courses which were held twice in Washington, DC, and once in Atlanta, GA.

G. Recognition

Outstanding accomplishments in energy efficiency were recognized with the presentation of Federal Energy Efficiency Awards to 10 individuals, 5 small groups, and 15 organizations in the Federal sector. Four Special Awards were also presented in two different categories: to one individual and one small group for their efforts to promote the development of solar energy in the public sector; and two organizations for their achievements in integrated resource planning. The Federal Energy Efficiency Awards, sponsored by the Federal Interagency Energy Policy Committee ("656" Committee) and the Department of Energy, rewarded outstanding commitment to energy conservation by individuals and organizations within the Federal Government. They were presented during Energy Awareness Month at a ceremony in the Russell Senate Office Building, Washington, D.C., on October 30, 1992.

Winners were recognized for energy conservation accomplishments including:

- improved performance through increased efficiency and/or reduced consumption of energy;
- new concepts, devices, equipment, or procedures which were proven in practice;
- effective training programs for energy managers, operators, or maintenance personnel; and
- employee awareness programs.

Distribution of awards among the Federal agencies for accomplishments in FY 1992 is indicated below, and a list of award recipients with a summary of their accomplishments is contained in Appendix H.

<u>Agency</u>	<u>Special</u>	<u>Individual</u>	<u>Organization</u>	<u>Small Group</u>
DOE	1	1	2	1
DOI	-	1	-	-
GSA	1	2	3	2
NASA	-	-	-	1
TRSY	-	-	1	-
TVA	-	-	-	1
USDA	1	-	-	-
USPS	-	2	1	-
U.S. Air Force	-	-	1	-
U.S. Army	-	3	2	-
U.S. Marine Corps	-	-	1	-
U.S. Navy	1	1	2	-
VA	-	-	2	-
TOTALS	<hr/> 4	<hr/> 10	<hr/> 15	<hr/> 5

II. ENERGY MANAGEMENT IN BUILDINGS AND FACILITIES

A. Overview of Federal Energy Management Policy and Legislative Mandates

The Federal Government provides energy to approximately 500,000 buildings and facilities comprising approximately 3.2 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.⁸ 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.⁹ This section describes major legislative requirements and highlights agency progress in meeting goals. Remaining sections of the report discuss agency efforts in greater detail.

National Energy Conservation Policy Act (NECPA) Requirements

NECPA provides major policy guidance to Federal agencies to improve energy management in their facilities and directs DOE to establish life-cycle costing methods and coordinate Federal conservation activities through the Interagency Energy Management Task Force.

In keeping with NECPA mandates, as they existed prior to amendments subsequent to the close of the reporting period enacted as part of the Energy Policy Act of 1992 (Pub. L. 102-486), each agency was required 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. The amendments revised section 543 of NECPA to raise the goal to 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.¹⁰ Federal agencies reported a 7.2 percent decrease in energy consumption in buildings in FY 1992, compared to FY 1985, measured on a Btu-per-gross-square-foot basis.

⁸Process 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.

⁹The energy reporting requirements for Federal agencies and legislative authorities are detailed in Appendices A and B, respectively.

¹⁰The 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.

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

- 1) prepare or update a plan describing how the agency intends to meet the goal;
- 2) perform energy surveys of its Federal buildings to the extent necessary;
- 3) apply energy conservation measures to obtain the goal in the most cost-effective manner practicable; and
- 4) ensure that operation and maintenance procedures applied under NECPA are continued.

Additionally, NECPA requires each agency, in support of the President's annual budget request to Congress, to specifically set forth and identify funds requested for energy conservation measures. Reports from Federal agencies indicated that \$142.1 million was spent in FY 1992 on retrofit expenditures. (See Table 3, page 16)

NECPA also requires Federal agencies to establish a program of incentives to expedite Federal 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 1992, six SES contracts were awarded by Federal agencies, bringing the total number of awarded contracts to 13. (Energy Policy Act amendments to NECPA require DOE to establish guidelines for SES contract methods and procedures. DOE will be reporting about the guidelines in future annual reports.)

The Department of Energy is directed to report on progress to achieve the objectives of NECPA, as well as to identify difficulties Federal agencies have in entering into SES contracts. Additionally, DOE is to identify proposed solutions to these difficulties. During FY 1992, certain problems were identified regarding the need to streamline the process of contractor selection. These problems and some proposed solutions are reported in Section I(D) Funding on page 19.

NECPA requires DOE to establish life-cycle costing methods and to coordinate Federal activities to promote energy conservation and the efficient use of energy through the Interagency Energy Management Task Force. DOE issued a final rulemaking on life-cycle cost methods on November 20, 1990. DOE also coordinated activities to expedite energy efficiency and shared energy savings 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 (B), Federal Coordination; Section II (C), Life-Cycle Costing; Section II (D), Federal 10-Year Buildings Plan; and Section V (A), Public Education Programs.

Executive Order 12759 Requirements

Executive Order 12759 on Federal Energy Management mandates stricter requirements of the Federal agencies and expands the scope of Federal energy management activities from those mandated by NECPA (see Appendix C). The sections of the Executive Order relevant to facility energy management are discussed below.

Section 1 of Executive Order 12759 extends the NECPA goal from FY 1995 to FY 2000, and increases the energy reduction goal from 10 percent to 20 percent for all Federal buildings, as long as the improvements are cost-effective and minimize the life-cycle cost of the facility. Thus, up to a 20 percent improvement in energy efficiency per square foot is directed for Federal buildings from FY 1985 to FY 2000, depending on cost-effectiveness. Each Federal agency is required to develop and implement a plan to meet the new energy efficiency goals.

Section 2 establishes the same buildings goal for industrial facilities with the same requirements for cost-effectiveness and requires each agency to develop appropriate indicators of energy efficiency for measuring progress toward the goal. A goal of 20 percent improvement in energy efficiency per square foot is set for Federal industrial facilities from FY 1985 to FY 2000. (The Energy Policy Act amendments to NECPA enacted this goal into law.)

The scope of Federal energy management activities is expanded in Sections 4 through 6, which direct agencies to adopt a suitable implementation strategy. The Executive Order allows the agencies flexibility in the measures selected, from changes in procurement practices, to participation in demand side management programs and shared energy savings agreements offered by private companies, to investment in energy efficiency measures. If available resources fall short of requirements, energy efficiency projects should be prioritized by the savings-to-investment ratio or the adjusted internal rate of return.

In order to procure energy-efficient goods and products which are the most life-cycle cost-effective, each agency shall require vendors of goods to provide data that can be used to assess the life-cycle costs of goods, including building energy system components, lighting systems, office equipment, and other energy-using equipment.

In addition, agencies are directed to remove any impediments to receiving and using demand side management services, incentives, and rebates offered by utilities and other private sector energy service providers.

Sections 7 and 8 of the Executive Order direct 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. (Pursuant to Title I of the Energy Policy Act, the Department of Energy will be issuing a Federal building energy efficiency code which will supercede the performance standards that were in effect during the reporting period.)

The balance of the Executive Order dealing with vehicles is discussed later in the report.

B. Federal Agency Energy Use in Buildings and Agency Progress Toward the Mandated Goals

As shown in Table 4, in FY 1992 Federal agencies reported a 7.2 percent decrease in buildings energy use relative to FY 1985, measured in terms of British Thermal Units consumed per gross square foot (Btu/GSF) of floor area. 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 F 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. The State Department data reflect the Main State Department building only. For FY 1990 and forward, FERC 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 Commodity Futures Trading Commission, the Equal Employment Opportunity Commission, 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 1992, 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 interyear 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 use 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.

TABLE 4
FEDERAL BUILDINGS AND FACILITIES USE PER GROSS SQUARE FOOT,
FY 1985 AND FY 1992

	FISCAL YEAR 1985			FISCAL YEAR 1992			% CHANGE 1985-1992
	GSF x 10 ³	BTU x 10 ⁹	BTU/GSF	GSF x 10 ³	BTU x 10 ⁹	BTU/GSF	
DOE	70,739.4	32,146.7	454,438	79,964.6	28,859.8	360,907	-20.6
VA	123,650.0	24,552.0	198,560	140,126.0	24,620.0	175,699	-11.5
USPS	189,400.0	16,238.3	85,736	229,734.8	19,449.2	84,659	-1.3
GSA	202,020.1	16,887.2	83,591	169,555.1	13,061.4	77,033	-7.8
HHS	22,611.3	6,610.2	292,340	30,797.3	7,954.7	258,293	-11.6
DOT	29,477.7	4,112.1	139,497	31,093.4	3,918.0	126,006	-9.7
DOJ	20,768.8	6,112.0	294,289	28,460.0	3,869.2	135,951	-53.8
NASA	11,518.0	3,039.8	263,919	13,852.0	3,455.7	249,476	-5.5
DOI	50,959.5	3,405.9	66,836	50,123.3	3,173.4	63,311	-5.3
USDA	28,980.5	2,096.3	72,336	33,618.4	2,151.6	64,001	-11.5
DOL	18,268.3	2,153.0	117,852	17,258.9	2,094.9	121,380	3.0
TRSY	5,776.9	615.0	106,463	10,356.0	1,749.1	168,896	58.6
EPA	1,455.0	452.8	311,227	1,786.7	578.3	323,650	4.0
DOC	5,611.5	540.3	96,292	4,974.3	531.0	106,742	10.9
TVA	4,886.6	402.4	82,357	5,307.5	425.6	80,189	-2.6
ST	2,597.0	232.1	89,390	2,597.0	273.8	105,412	17.9
FEMA	606.0	96.1	158,579	1,488.4	204.1	137,101	-13.5
HUD	1,432.0	114.4	79,878	1,432.0	123.3	86,115	7.8
OPM	853.9	54.3	63,609	853.9	78.8	92,263	45.0
PCC	492.5	26.6	54,079	529.8	30.1	56,787	5.0
FCC	121.0	11.2	92,182	124.8	12.4	99,151	7.6
OTHER*	1,098.6	218.6	198,982	2,157.0	235.5	109,172	-45.1
CIVILIAN AGENCIES							
TOTAL	793,324.6	120,117.4	151,410	856,191.2	116,849.5	136,476	-9.9
DOD	2,578,984.0	349,076.7	135,354	2,340,145.8	295,719.8	126,368	-6.6
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TOTAL	3,372,308.6	469,194.1	139,131	3,196,337.0	412,569.3	129,076	-7.2

DATA AS OF 08/18/93

*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: 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 Quarterly Energy Use Reports, DOE Form 6200.2.

DOT reported actual energy consumption for all of its buildings except for the U.S. Coast Guard (USCG), which had actual data for only 48 percent of its buildings. Therefore, approximately half of DOT's total building consumption is actual. The remainder is estimated at the same rate per square foot. The USCG is working to establish a system that will accurately capture all energy consumption in future years.

Table 5 shows total buildings net energy use in Btu rather than on a Btu/GSF basis. The table shows that agencies have decreased overall buildings energy use by 12.1 percent, from 469.2 trillion Btu in FY 1985 to 412.6 trillion Btu in FY 1992. A comparison to FY 1991 shows an increase of 2.3 percent in total buildings energy use.

Of the 27 agencies represented on the table for FY 1992, 11, including DoD, consume over 98 percent of the reported buildings energy. Energy used in buildings accounts for approximately 31.9 percent of the total 1.29 quads used by the Federal Government. The mix of Federal buildings energy for Defense and civilian agencies is depicted in Figure 5. Electricity constitutes 36.1 percent of Federal buildings energy; 30.9 percent is accounted for by natural gas, and 17.8 percent by fuel oil. 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 15.2 percent.

Figure 6 illustrates the proportion of energy consumption in buildings and facilities that is attributable to electricity for the fiscal years 1985 through 1992. 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 1992, electricity consumption, including energy used at the source of generation, accounted for approximately 65.2 percent of the total gross Btu consumed in buildings and facilities. Of this amount, approximately 29.4 percent or 148.9 trillion Btu reached the site of use. The remaining 70.6 percent, 357.4 trillion Btu, was lost during the generation and transmission processes.

Decreases in consumption relative to FY 1991 were evident in most types of energy used in buildings and facilities during FY 1992. Natural gas consumption was reduced by 3.3 percent in FY 1992 from the previous year, and electricity consumption fell by 2.4 percent. Purchased steam consumption, however, increased 41.1 percent from FY 1991.

As shown in Table 6, fuel switching and conservation of fuel oil and LPG/propane in buildings contributed to a 31.2 percent decrease in consumption compared to FY 1985. These reductions are partially attributable to efforts by DoD to utilize natural gas as a cost-effective substitute for petroleum-based fuels in buildings. DoD's reallocation in FY 1988 of energy to process operations that was previously reported in buildings operations also contributed to the reductions beginning in that year. Petroleum fuel consumption in buildings during FY 1992 represented only 18.6 percent of all energy consumed in Federal buildings. Of this amount, 96.2 percent is attributed to fuel oil and the remaining 3.8 percent to LPG/propane.

The energy used in buildings in FY 1992 accounted for approximately 42.2 percent of the total Federal energy bill. Tables 7-A and 7-B show that the Federal Government spent approximately \$3,650.5 million for buildings energy during the fiscal year, a decrease of

TABLE 5
FEDERAL ENERGY USE 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	% CHANGE 85-92	% CHANGE 91-92
DOE	32,146.7	31,763.7	30,510.1	31,795.4	28,875.0	29,186.2	27,875.9	28,859.8	-10.2	3.5
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	0.3	-0.5
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	19.8	4.4
GSA	16,887.2	13,869.1	12,971.1	12,267.8	12,550.1	13,937.3	13,116.3	13,061.4	-22.7	-0.4
HHS	6,610.2	5,888.0	6,200.9	6,180.3	6,525.0	7,957.0	7,107.1	7,954.7	20.3	11.9
DOT	4,112.1	5,368.4	3,928.4	3,951.8	3,368.5	3,750.4	3,297.6	3,918.0	-4.7	18.8
DOJ	6,112.0	6,450.9	5,928.1	7,455.7	5,597.0	4,863.8	5,894.3	3,869.2	-36.7	-34.4
NASA	3,039.8	3,222.8	3,269.2	3,247.8	3,451.6	3,480.1	3,258.7	3,455.7	13.7	6.0
DOI	3,405.9	3,752.5	3,664.6	3,878.5	4,073.2	4,039.4	3,886.2	3,173.4	-6.8	-18.3
USDA	2,096.3	1,900.0	1,439.1	1,826.5	828.0	2,765.6	1,901.1	2,151.6	2.6	13.2
DOL	2,153.0	2,179.3	2,153.2	2,230.7	2,191.1	2,137.1	2,044.1	2,094.9	-2.7	2.5
TRSY	615.0	647.0	1,486.1	4,196.9	2,529.2	1,918.4	1,494.7	1,749.1	184.4	17.0
EPA	452.8	1,240.1	452.8	401.7	399.8	411.5	426.4	578.3	27.7	35.6
DOC	540.3	1,214.9	1,136.3	1,294.2	1,325.1	1,376.0	1,406.9	531.0	-1.7	-62.3
TVA	402.4	462.0	466.8	452.5	417.2	427.8	426.6	425.6	5.8	-0.2
ST	232.1	248.7	275.3	263.9	264.2	267.7	274.2	273.8	17.9	-0.2
FEMA	96.1	151.9	157.9	171.5	192.5	215.1	198.4	204.1	112.3	2.9
HUD	114.4	117.4	119.4	123.8	139.1	140.3	129.6	123.3	7.8	-4.9
OPM	54.3	54.5	54.5	67.3	72.1	70.8	74.6	78.8	45.0	5.6
PCC	26.6	26.7	27.2	28.4	28.2	28.6	32.4	30.1	13.0	-7.2
FCC	11.2	11.8	12.6	13.1	12.1	14.8	14.9	12.4	10.9	-16.8
OTHER*	218.6	290.8	362.7	391.1	437.0	412.6	230.8	235.5	7.7	2.0
CIVILIAN AGENCIES TOTAL										
	120,117.4	119,734.2	115,585.6	123,488.8	117,121.2	120,260.6	116,444.6	116,849.5	-2.7	0.3
DOD	349,076.7	327,583.1	351,882.9	319,876.4	322,205.6	321,101.6	286,885.7	295,719.8	-15.3	3.1
ALL AGENCIES TOTAL										
BBTU	469,194.1	447,317.2	467,468.5	443,365.2	439,326.8	441,362.2	403,330.3	412,569.3	-12.1	2.3
MBOE	80.5	76.8	80.3	76.1	75.4	75.8	69.2	70.8		
Petajoules	495.0	471.9	493.2	467.7	463.5	465.6	425.5	435.2		
ANNUAL CHANGE FROM 1985										
BBTU		-21,876.9	-1,725.6	-25,828.9	-29,867.3	-27,831.9	-65,863.8	-56,624.8		
MBOE		-3.8	-0.3	-4.4	-5.1	-4.8	-11.3	-9.7		
Petajoules		-23.1	-1.8	-27.2	-31.5	-29.4	-69.5	-59.7		
CUMULATIVE SAVINGS FROM 1985										
BBTU		21,876.9	23,602.5	49,431.4	79,298.8	107,130.7	172,994.5	229,619.3		
MBOE		3.8	4.1	8.5	13.6	18.4	29.7	39.4		
Petajoules		23.1	24.9	52.1	83.7	113.0	182.5	242.2		

DATA AS OF 08/18/93

*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: 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 Quarterly Energy Use Reports, DOE Form, 6200.2.

FIGURE 5
FEDERAL ENERGY USE IN BUILDINGS AND FACILITIES,
FY 1992

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

NOTE: Figure uses a conversion factor for electricity of 3,412 Btu per kilowatt hour.

Source: Federal Agency Quarterly Energy Use Reports, DOE Form 6200.2.

FIGURE 6
CONSUMPTION OF ELECTRICITY AND OTHER FUELS
IN BUILDINGS AND FACILITIES,
FY 1985 through FY 1992

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 Quarterly Energy Use Reports, DOE Form 6200.2.

TABLE 6
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	% CHANGE 85-92	% CHANGE 91-92
DOD	6,817.3	85,607.3	90,403.2	78,345.1	70,701.8	69,030.1	59,451.5	65,654.1	-32.2	10.4
HHS	2,199.6	2,680.8	2,643.8	2,008.1	2,059.8	2,138.7	1,545.9	2,144.2	-2.5	38.7
DOE	1,627.6	1,257.1	1,488.8	1,547.1	1,757.1	1,953.8	1,978.2	2,034.7	25.0	2.9
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	-30.8	7.2
DOT	2,363.4	3,564.0	2,107.2	2,100.0	1,534.8	1,524.1	1,308.4	1,426.0	-39.7	9.0
USPS	1,673.2	1,591.6	1,556.3	1,602.6	1,555.7	1,502.2	1,219.4	1,195.8	-28.5	-1.9
DOI	1,557.7	1,430.7	1,272.1	1,364.7	1,376.7	1,273.9	1,141.1	919.1	-41.0	-19.5
GSA	1,048.9	667.8	530.3	561.8	544.0	668.1	443.1	418.2	-60.1	-5.6
DOJ	381.7	363.4	467.3	970.3	310.8	371.6	503.7	383.8	0.5	-23.8
DOL	437.8	414.5	427.0	387.3	394.5	331.2	258.3	263.6	-39.8	2.1
NASA	279.7	273.0	250.3	260.6	281.0	265.6	169.4	194.5	-30.5	14.8
USDA	414.2	260.7	191.0	206.4	229.1	260.0	291.3	242.9	-41.4	-16.6
TRSY	22.5	25.4	172.9	294.2	319.3	281.3	127.7	84.2	274.7	-34.1
FEMA	56.7	62.8	73.2	77.0	77.8	72.3	59.1	66.9	17.9	13.2
DOC	130.3	95.5	78.9	85.1	36.8	77.6	13.1	9.8	-92.4	-24.5
EPA	36.9	25.5	14.8	0.0	0.0	0.0	0.0	1.9	-94.8	N/A
FCC	1.7	1.6	1.4	1.7	1.5	1.9	1.0	1.3	-27.2	27.4
TVA	4.2	2.9	1.6	3.0	1.2	3.2	0.1	1.3	-69.4	1,028.7
EEOC	0.0	0.0	0.0	0.0	2.3	1.9	0.0	0.0	N/A	N/A
NSF	19.4	22.3	9.5	9.5	9.5	9.5	0.0	0.0	-100.0	N/A
USIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	N/A	N/A
TOTAL	111,249.7	100,465.5	103,950.9	92,312.8	83,522.6	81,986.4	69,916.0	76,548.5	-31.2	9.5

DATA AS OF 08/18/93

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

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

Source: Federal Agency Quarterly Energy Use Reports, DOE Form 6200.2.

TABLE 7-A
FEDERAL COSTS FOR BUILDINGS ENERGY IN FY 1992
(IN MILLIONS OF NOMINAL DOLLARS)

	ELECTRICITY	FUEL OIL	NATURAL GAS	LPG/ PROPANE	COAL	PURCHASED STEAM	OTHER	TOTAL
DEFENSE	1,545.182	237.972	281.601	13.830	113.374	190.244	1.123	2,383.328
CIVILIAN	996.983	43.479	148.512	6.303	15.287	55.266	1.374	1,267.205
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	2,542.164	281.452	430.113	20.134	128.662	245.511	2.498	3,650.533

AVERAGE COST PER UNIT, BASED ON REPORTS FROM AGENCIES

ELECTRICITY	=	58.24	/ MWH
FUEL OIL	=	0.53	/ GALLON
NATURAL GAS	=	3.48	/ THOUSAND CUBIC FEET
LPG/PROPANE	=	0.66	/ GALLON
COAL	=	77.31	/ SHORT TON
PURCHASED STEAM	=	13.75	/ MILLION BTU
OTHER	=	2.64	/ MILLION BTU

DATA AS OF 08/18/93

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

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

TABLE 7-B
CONSUMPTION AND COSTS OF FEDERAL BUILDINGS ENERGY
IN FY 1992, FY 1991, AND FY 1985 (NOMINAL DOLLARS)

FY 1992				
ENERGY TYPE	BILLIONS OF BTU'S	COST PER MILLION BTU'S	COST (IN MILLIONS OF DOLLARS)	
ELECTRICITY	148,925.8	17.0700	2,542.164	
FUEL OIL	73,616.1	3.8232	281.452	
NATURAL GAS	127,382.4	3.3765	430.113	
LPG/PROPANE	2,932.4	6.8659	20.134	
COAL	40,905.5	3.1453	128.662	
PURCHASED STEAM	17,861.5	13.7452	245.511	
OTHER	945.5	2.6415	2.498	
	-----		-----	
TOTAL	412,569.3		3,650.533	

AVERAGE COST PER MBTU = \$ 8.848

FY 1991				
ENERGY TYPE	BILLIONS OF BTU'S	COST PER MILLION BTU'S	COST (IN MILLIONS OF DOLLARS)	
ELECTRICITY	152,633.6	17.0808	2,607.107	
FUEL OIL	67,066.5	6.7423	452.184	
NATURAL GAS	131,719.0	3.5111	462.485	
LPG/PROPANE	2,849.4	6.9541	19.815	
COAL	35,390.6	1.7495	61.918	
PURCHASED STEAM	12,655.2	11.0429	139.750	
OTHER	1,015.9	2.3427	2.380	
	-----		-----	
TOTAL	403,330.3		3,745.639	

AVERAGE COST PER MBTU = \$ 9.287

FY 1985				
ENERGY TYPE	BILLIONS OF BTU'S	COST PER MILLION BTU'S	COST (IN MILLIONS OF DOLLARS)	
ELECTRICITY	143,908.7	16.6437	2,395.177	
FUEL OIL	107,601.7	5.8722	631.858	
NATURAL GAS	143,322.5	4.6536	666.960	
LPG/PROPANE	3,648.0	6.9194	25.242	
COAL	58,068.7	2.3472	136.296	
PURCHASED STEAM	7,969.2	8.3356	66.428	
OTHER	4,675.4	4.7042	21.994	
	-----		-----	
TOTAL	469,194.1		3,943.954	

AVERAGE COST PER MBTU = \$ 8.406

DATA AS OF 08/18/93

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 Quarterly Energy Use Reports and annual energy cost data submitted to DOE by Federal agencies.

approximately \$95.1 million from FY 1991 expenditures. The average cost for buildings energy in FY 1992 was \$8.85 per million Btu, down 4.7 percent from the average cost of \$9.29 reported in FY 1991 (see Appendix E).

Figure 7-A illustrates energy expenditures for buildings and facilities in current year dollars for FY 1985 through FY 1992. Figure 7-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 27.7 percent from \$4,177.9 million in FY 1985 to \$3,019.5 million in FY 1992. The average cost for buildings energy in constant dollars in FY 1992 was \$7.32 per million Btu, down 17.8 percent from \$8.91 per million Btu in FY 1985.

Electricity costs of \$2,542.2 million represent approximately 69.6 percent of the total expenditures of \$3,650.5 million for buildings energy in FY 1992. Natural gas costs account for approximately 11.8 percent of the total, expenditures for fuel oil account for 7.7 percent, with the remaining 10.9 percent attributable to expenditures for LPG/propane, coal, purchased steam, and "other." It should be noted that interyear comparisons between FY 1985 and FY 1992 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.

C. 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.

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 1992, the 1992 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.

FIGURE 7-A
ENERGY EXPENDITURES (NOMINAL DOLLARS) IN BUILDINGS AND FACILITIES,
FY 1985 through FY 1992

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

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

FIGURE 7-B
ENERGY EXPENDITURES (CONSTANT DOLLARS*)
IN BUILDINGS AND FACILITIES,
FY 1985 through FY 1992

*In 1987 dollars, calculated using implicit Gross Domestic Product price deflators. DOE/EIA-0384(92), *Annual Energy Review 1992*, Appendix C, June 1993

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

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

D. New 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.

E. Procurement Policy

Mandatory standards for energy conservation in Government procurement have been established by the Office of Federal Procurement Policy (OFPP) within the Office of Management and Budget (OMB). These standards have been incorporated into the Federal Acquisition Regulations (FAR) requiring Federal agencies to take the necessary steps to apply energy conservation and energy efficiency criteria for determining the requirements for source selection decisions in the procurement of consumer products.¹¹ Such criteria would be applied when meaningful, practical, and consistent with agency programs and operational needs. In addition, Federal agencies are required to use life-cycle costing (LCC) as a decision criterion for implementing major procurement actions.¹²

Three agencies continue to lead the Federal Government's efforts to develop and implement procurement-related energy conservation and efficiency standards required by section 381 of EPCA. OFPP has developed Government-wide procurement policies that consider the economic benefits of energy conservation in the procurement process.¹³ As a primary purchaser of goods and commodities used in Federal non-military operations, the GSA has the major responsibility for implementing OFPP policies. The DoD, the largest Federal purchaser of goods and services, has responsibility for military procurement operations.

Both GSA and DoD consider life-cycle cost (LCC) aspects of energy in the purchase of products. In FY 1976, the GSA instituted a policy of using LCC in the purchase of nine energy consuming household appliances and considers the program to be highly successful. This program has expanded to use LCC in the purchase of energy consuming office equipment.

Executive Order 12759, Section 5, Procurement of Energy Efficient Goods and Products, states that each agency shall select for procurement those energy consuming goods or products which are the most life-cycle cost-effective, pursuant to the requirements of the FAR. It also calls on each agency to require vendors of goods, to the extent practicable, to provide appropriate data that can be used to assess the life-cycle costs of each good or

¹¹Federal Procurement Regulations (Second Edition, FPR Amendment 191, March 1978).

¹²OFPP Policy letter 76-1, Office of Management and Budget Circular A-109, Major Systems Acquisition: and 10 CFR, Part 436, Subpart A "Methodology and Procedures for Life-Cycle Costing Analyses."

¹³OMB Policy Letter No. 76-1, August 6, 1976, and Supplement No. 1, July 2, 1980.

product, including building energy system components, lighting systems, office equipment, and other energy using equipment.

In cooperation with the Defense Logistics Agency (DLA), GSA, through its Public Buildings Service (PBS), continued to support efforts to assist Federal managers in lighting products. GSA's collaboration with the DLA resulted in the publication of a second volume of the "Energy Saver Bulb" catalog in the spring of FY 1992. The second edition catalog (May 1992) has added energy efficient-ballasts and fixtures. Over 30,000 copies were distributed in FY 1992 to Federal civilian and military agencies.

Also, a consortium of representatives from DOE, GSA, EPA, and other Federal agencies, manufacturers, technical laboratories, professional associations, and other special interest groups is identifying energy saving opportunities with improved office equipment technologies, such as desktop personal computers. This consortium is researching potential savings associated with systems having features which reduce the power requirements of desktop computers similar to features available in laptop models. The goal of this group is to identify cost saving features and use the buying power of the Federal Government to achieve voluntary changes by manufacturers.

GSA's FY 1992 activities to procure and use energy-efficient products involves the Federal Supply Service (FSS), Information Resources Management Service (IRMS), and PBS.

The FSS used life-cycle costing methods to procure appliances (e.g. refrigerators, heaters, washers, clothes dryers, and ranges) and bought them on Single Award Schedule contracts. FSS purchases air conditioners for GSA through the Special Order Program using LCC factors also. The FSS procures 900 paper products with high percentages of recycled content. Their requirements meet or exceed the Environmental Protection Agency recommended percentages of recycled content. Retreaded tires for trucks and buses are available to Government agencies through a Federal Supply Schedule. Sizes and styles have risen from 70 to over 200 during the past two years. Testing for passenger vehicle retreads for schedule coverage continues. New energy related technologies are encouraged through the New Item Introduction Schedule program, which allow new energy saving items to be marketed within the Federal System. The FSS solicits ideas from the GSA Commodity Centers for identifying and promoting energy-efficient products and highlights energy-efficient products in the FSS Supply Catalog.

III. ENERGY MANAGEMENT IN GENERAL OPERATIONS

A. Introduction

General operations include two categories of energy use: vehicles and equipment; and energy, including process energy, used in buildings exempted under section 543 of NECPA.

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.

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

Executive Order 12759 expands the scope of Federal energy management activities beyond the NECPA mandates by establishing goals for industrial operations. Section 2 requires 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. The Executive Order goal applies to certain buildings currently exempt under NECPA where industrial operations are performed. In FY 1992 agencies which use industrial energy began to take steps to implement Section 2 of the Executive Order by developing appropriate indicators of energy efficiency for their industrial facilities in order to measure progress toward the 20 percent reduction goal.

B. Energy Consumption Trends

In FY 1992, the Federal Government used 880.3 trillion Btu of energy in general operations, approximately 68.1 percent of the total 1.29 quads consumed. Total energy use in general operations decreased 9.7 percent relative to FY 1985 and 16.4 percent relative to FY 1991. The Department of Defense consumed 808.3 trillion Btu or 91.8 percent of all general operations energy used by the Federal Government. From FY 1985 to FY 1992, DoD reported a decrease of 10.3 percent in consumption of operations energy. DoD's consumption of operations energy decreased by 17.7 percent from FY 1991 to FY 1992.

Fuels consumed by vehicles and equipment represent 88.8 percent of the energy used in general operations; the remaining 11.2 percent is attributed to exempted/process energy.

C. General Operations Fuel Mix and Energy Costs

Figure 8 depicts the operations fuel mix within DoD and civilian agencies. Jet fuel accounts for 71.2 percent of the total energy usage in general operations, with 12.8 percent attributed to diesel and distillate fuel, 4.0 percent to auto gasoline, and 2.1 percent to aviation gasoline,

FIGURE 8
FEDERAL ENERGY USE IN GENERAL OPERATIONS,
FY 1992

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

NOTE: Figure uses a conversion factor for electricity of 3,412 Btu per kilowatt hour.

Source: Federal Agency Quarterly Energy Use Reports, DOE Form 6200.2.

fuel oil, and LPG/propane, combined. These petroleum-based fuels represent approximately 90.2 percent of the energy consumed in general operations. The remaining 9.8 percent is the electricity, natural gas, purchased steam, coal, and "other" reported largely as exempted/process energy.

As shown in Tables 8-A and 8-B, the Federal Government spent \$5,006.4 million on operations energy in FY 1992, 33.6 percent less than the FY 1991 expenditure of \$7,535.3 million in nominal dollars. In constant 1987 dollars, the cost of operations energy decreased 39.6 percent in FY 1992 to \$4,140.9 million from \$6,859.1 million in FY 1985. In FY 1992, the average price for all types of operations energy was \$5.69 per million Btu, down 20.5 percent from the \$7.15 reported in FY 1991. Vehicle and equipment fuel costs in FY 1992 represent 82.1 percent of the total energy cost of general operations; the remaining 11.2 percent is attributed to exempted/process energy cost.

D. Vehicles and Equipment

Table 9 shows that in FY 1992, the Federal Government used 781.9 trillion Btu of energy for vehicles and equipment, a decrease of 16.3 percent relative to FY 1985. DoD's vehicle and equipment energy consumption decreased 16.9 percent during that time, while the civilian agencies decreased consumption by 5.3 percent. Overall, vehicle and equipment consumption decreased 19.4 percent from FY 1991.

Jet fuel consumption accounted for 80.2 percent of all vehicle and equipment energy in FY 1992. In FY 1992 compared to the previous year, jet fuel consumption decreased 19.0 percent from 774.5 trillion Btu to 627.0 trillion Btu.

The cost of the energy used for vehicles and equipment as shown in Tables 8-A and 8-B was \$4,110.9 million in FY 1992, a decrease of 39.0 percent relative to FY 1991. This decrease resulted primarily from the significant decrease in consumption. When compared to FY 1985 using constant dollars, energy costs for vehicles and equipment decreased 47.2 percent from \$6,436.6 million to \$3,400.2 million in FY 1992. During that same period, the Government's average cost for vehicles and equipment energy, in constant dollars, fell 36.9 percent from \$6.89 per million Btu to \$4.35 per million 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 69.3 percent in FY 1992 from FY 1990.

TABLE 8-A
FEDERAL COSTS FOR GENERAL OPERATIONS ENERGY IN FY 1992
(IN MILLIONS OF NOMINAL DOLLARS)

VEHICLES & EQUIPMENT

	AUTO GAS	DIESEL	LPG/ PROPANE	AVIATION GAS	JET FUEL	NAVY SPECIAL	OTHER	TOTAL
DEFENSE	39.919	227.703	0.000	0.297	3,508.428	0.157	17.300	3,793.803
CIVILIAN	196.828	58.396	0.095	10.127	47.709	0.000	3.923	317.077
	-----	-----	-----	-----	-----	-----	-----	-----
	236.746	286.099	0.095	10.424	3,556.136	0.157	21.222	4,110.881

PROCESS & PRODUCTION

	ELECTRICITY	FUEL OIL	NATURAL GAS	LPG/ PROPANE	COAL	PURCHASED STEAM	OTHER	TOTAL
DEFENSE ¹	380.244	57.075	51.261	0.227	34.005	49.554	0.012	572.378
CIVILIAN ²	282.411	8.945	24.271	0.497	1.782	4.930	0.301	323.138
	-----	-----	-----	-----	-----	-----	-----	-----
	662.655	66.020	75.533	0.724	35.787	54.484	0.312	895.516

GENERAL OPERATIONS TOTAL

5,006.396

AVERAGE COST PER UNIT, BASED ON REPORTS FROM AGENCIES

VEHICLES AND EQUIPMENT

AUTO GAS =	0.83	/ GALLON
DIST/DIESEL =	0.35	/ GALLON
LPG/PROPANE =	0.69	/ GALLON
AVIATION GAS =	1.34	/ GALLON
JET FUEL =	0.74	/ GALLON
NAVY SPECIAL =	0.37	/ GALLON
OTHER =	4.19	/ MILLION BTU

PROCESS AND PRODUCTION

ELECTRICITY =	53.06	/ MWH
FUEL OIL =	0.54	/ GALLON
NATURAL GAS =	3.26	/ THOUSAND CUBIC FEET
LPG/PROPANE =	0.71	/ GALLON
COAL =	81.07	/ SHORT TON
PURCHASED STEAM =	13.89	/ MILLION BTU
OTHER =	6.49	/ MILLION BTU

DATA AS OF 08/18/93

¹Includes DoD costs for process and cold iron energy.

²Includes DOE costs for metered process energy and energy costs for buildings exempted from performance measurement by DOC, DOT, GSA, NASA, PCC, TRSY, 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.

TABLE 8-B
CONSUMPTION AND COSTS OF GENERAL OPERATIONS
ENERGY IN FY 1992, FY 1991, AND FY 1985 (NOMINAL DOLLARS)

FY 1992				
ENERGY TYPE	BILLIONS OF BTU'S	COST PER MILLION BTU'S	COST (IN MILLIONS OF DOLLARS)	
AUTO GASOLINE	35,630.3	6.6445	236.746	
DIST/DIESEL	113,116.1	2.5293	286.099	
LPG/PROPANE	13.1	7.2555	0.095	
AVIATION GASOLINE	974.0	10.7022	10.424	
JET FUEL	627,026.5	5.6714	3,556.136	
NAVY SPECIAL	59.1	2.6532	0.157	
OTHER	5,065.0	4.1900	21.222	
PROCESS & PRODUCTION ¹	98,416.4	9.0993	895.516	
	-----		-----	
TOTAL	880,300.5		5,006.396	

AVERAGE COST PER MBTU = \$ 5.687

FY 1991				
ENERGY TYPE	BILLIONS OF BTU'S	COST PER MILLION BTU'S	COST (IN MILLIONS OF DOLLARS)	
AUTO GASOLINE	34,698.4	8.3689	290.388	
DIST/DIESEL	159,711.6	6.8406	1,092.516	
LPG/PROPANE	20.3	7.2692	0.148	
AVIATION GASOLINE	436.8	16.9601	7.408	
JET FUEL	774,464.3	6.9034	5,346.460	
NAVY SPECIAL	0.0	N/A	0.000	
OTHER	681.4	5.8991	4.020	
PROCESS & PRODUCTION ¹	83,503.9	9.5127	794.351	
	-----		-----	
TOTAL	1,053,516.8		7,535.290	

AVERAGE COST PER MBTU = \$ 7.153

FY 1985				
ENERGY TYPE	BILLIONS OF BTU'S	COST PER MILLION BTU'S	COST (IN MILLIONS OF DOLLARS)	
AUTO GASOLINE	50,484.7	7.9171	399.694	
DIST/DIESEL	169,412.1	6.0247	1,020.653	
LPG/PROPANE	149.4	7.0060	1.047	
AVIATION GASOLINE	1,882.3	11.9482	22.490	
JET FUEL	705,675.5	6.5095	4,593.588	
NAVY SPECIAL	6,695.9	5.5884	37.419	
OTHER	236.6	5.3946	1.276	
PROCESS & PRODUCTION ¹	40,245.8	9.9097	398.824	
	-----		-----	
TOTAL	974,782.3		6,474.993	

AVERAGE COST PER MBTU = \$ 6.643

DATA AS OF 08/18/93

¹Includes DoD costs for process and "cold iron" (powers Navy ships docked in port) energy, DOE costs for metered process energy, and energy costs for buildings exempted from performance measurement by DOC, DOT, GSA, NASA, PCC, TRSY, USDA, and USIA.

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

Source: Federal Agency Quarterly Energy Use Reports and annual energy cost data submitted to DOE by Federal agencies.

TABLE 9
FEDERAL ENERGY USE 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	% CHANGE 85-92	% CHANGE 91-92
USPS	11,524.2	11,588.2	11,722.9	11,993.3	12,081.4	12,136.2	12,196.2	12,225.0	6.1	0.2
DOT	12,162.5	10,706.6	11,457.7	11,036.6	11,414.2	12,150.8	12,151.2	7,453.0	-38.7	-38.7
USDA	4,319.6	3,242.7	3,648.3	4,300.1	4,783.4	4,952.3	5,123.8	4,982.7	15.4	-2.8
DOI	3,051.9	3,105.4	2,967.3	3,097.8	3,075.5	3,352.5	2,968.1	3,819.1	25.1	28.7
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	78.1	73.0
DOE	2,946.7	2,887.6	2,761.3	2,761.3	2,706.1	2,512.1	2,367.4	2,078.2	-29.5	-12.2
TRSY	2,155.0	2,055.1	2,193.3	2,921.9	2,713.2	1,473.2	1,655.7	2,065.2	-4.2	24.7
NASA	1,972.7	1,828.1	1,510.8	1,550.1	1,649.9	1,736.7	1,871.3	1,886.5	-4.4	0.8
DOC	1,010.2	1,059.8	1,008.2	1,228.7	1,534.1	3,100.3	1,315.2	952.5	-5.7	-27.6
PCC	530.4	600.0	686.2	629.5	700.3	653.7	578.6	699.6	31.9	20.9
VA	592.8	595.5	660.0	630.1	629.4	518.3	529.2	634.9	7.1	20.0
TVA	578.5	440.6	493.8	480.4	400.8	476.6	534.7	408.8	-29.3	-23.5
DOL	232.2	236.7	250.1	270.4	239.0	239.0	401.9	388.7	67.4	-3.3
GSA	144.1	134.0	110.7	117.6	109.8	128.1	94.5	102.9	-28.6	8.9
FCC	12.4	9.6	11.7	9.3	8.6	9.1	7.2	7.5	-39.9	3.7
EPA	132.2	33.0	32.5	37.7	29.4	0.0	0.0	0.0	N/A	N/A
FEMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N/A	N/A
HHS	373.3	331.9	358.4	206.2	204.3	0.0	0.0	0.0	N/A	N/A
ST	14.8	16.0	29.7	37.4	38.8	34.9	0.0	0.0	N/A	N/A
OTHER*	39.2	51.8	42.3	42.5	67.9	69.6	60.3	147.1	275.0	143.9
CIVILIAN AGENCIES TOTAL	43,856.6	41,064.3	42,140.3	43,334.0	44,538.1	45,641.4	43,979.3	41,526.9	-5.3	-5.6
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	-16.9	-20.1
TOTAL	934,536.5	924,832.9	958,906.3	846,928.1	959,983.2	926,986.5	970,012.8	781,884.1	-16.3	-19.4
BBTU	160.4	158.8	164.6	145.4	164.8	159.1	166.5	134.2		
MBOE	985.9	975.7	1,011.6	893.5	1,012.7	977.9	1,023.3	824.9		
Petajoules										
ANNUAL CHANGE FROM 1985										
BBTU		-9,703.6	24,369.9	-87,608.3	25,446.7	-7,550.0	35,476.4	-152,652.4		
MBOE		-1.7	4.2	-15.0	4.4	-1.3	6.1	-26.2		
Petajoules		-10.2	25.7	-92.4	26.8	-8.0	37.4	-161.0		
CUMULATIVE SAVINGS FROM 1985										
BBTU		9,703.6	-14,666.3	72,942.0	47,495.3	55,045.3	19,568.9	172,221.2		
MBOE		1.7	-2.5	12.5	8.2	9.4	3.4	29.6		
Petajoules		10.2	-15.5	77.0	50.1	58.1	20.6	181.7		

DATA AS OF 08/18/93

*Other includes for certain years the Commodity Futures Trading Commission, National Science Foundation, Nuclear Regulatory Commission, and the U.S. Information Agency.

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

Source: Federal Agency Quarterly Energy Use Reports, DOE Form 6200.2.

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. DOT's 38.7 percent reduction in FY 1992 is due to a change in reporting procedures. DOT reports that FY 1992 auto gasoline data include only gasoline used in motor pool vehicles and privately-owned vehicles used for official travel. Prior year usage was overstated due to inclusion of other miscellaneous fuels. This change is also reflected in DOT's 56.1 percent reduction in auto gasoline from FY 1991.

Section 10 of Executive Order 12759 extends the energy-efficiency goal to 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. The Administrator of General Services, in consultation with the Secretary of Energy, issued guidance on October 14, 1992, to assist agencies in meeting this goal.

Table 10 shows Federal agency progress in FY 1992 in meeting the goals of Section 10. Of the agencies reporting gasoline consumption, the level of consumption overall increased 2.7 percent from 277.6 million gallons in FY 1991 to 285.0 million gallons in FY 1992.

Of the agencies reporting consumption of diesel fuel, the overall level of consumption decreased 29.2 percent from 1,151.5 million gallons in FY 1991 to 815.5 million gallons in FY 1992. The Defense Department's 30.0 percent decrease in diesel consumption is the main contributing factor in this significant decrease. The high level of diesel consumption during FY 1991 is attributed to Desert Shield/Desert Storm operations. It should be noted that the 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 will receive credit toward meeting the vehicle energy efficiency goal. Information on Federal Government activities related to alternative fuel vehicles is included in Section I(E) of this report.

E. 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 1992 was 27.5 mpg. For nonpassenger vehicles acquired in FY 1992, the standard for light trucks was 20.2 mpg. The General Services Administration reports that passenger vehicles acquired by the Federal Government in FY 1992 achieved an average of 27.3 mpg, while light trucks achieved an average of 21.5 mpg for light trucks.

TABLE 10
FEDERAL AGENCY PROGRESS TOWARD THE GOALS OF SECTION 10 OF
EXECUTIVE ORDER 12759
FY 1991 and FY 1992

GASOLINE CONSUMPTION BY AGENCY (THOU. OF GALLONS)			
AGENCY	1991	1992	% CHANGE
DOD	95,958.0	97,936.0	2.1
USPS	72,152.0	74,330.0	3.0
USDA	37,949.6	36,802.2	-3.0
DOJ	14,260.1	23,155.0	62.4
DOI	14,499.0	14,401.0	-0.7
DOE	8,594.9	9,094.6	5.8
TRSY	5,666.7	6,985.8	23.3
DOT	12,856.6	5,638.1	-56.1
VA	3,504.7	4,364.1	24.5
DOL	3,215.0	3,109.6	-3.3
NASA	2,634.0	2,619.0	-0.6
TVA	2,234.0	2,305.0	3.2
DOC	2,525.0	2,092.6	-17.1
GSA	756.2	823.4	8.9
USIA	90.1	660.7	633.3
HUD	261.5	268.4	2.6
PCC	335.9	260.9	-22.3
OPM	0.0	100.8	N/A
FCC	55.8	57.7	3.4
NRC	35.5	37.3	5.1
CFTC	2.4	0.0	N/A
TOTAL	277,587.0	285,042.2	2.7

DIESEL CONSUMPTION BY AGENCY (THOU. OF GALLONS)			
AGENCY	1991	1992	% CHANGE
DOD	1,073,084.0	751,246.6	-30.0
DOT	30,390.7	23,695.0	-22.0
USPS	22,907.0	21,152.0	-7.7
PCC	3,869.0	4,808.7	24.3
DOC	6,637.1	4,486.1	-32.4
DOE	5,601.3	2,804.9	-49.9
DOI	2,786.0	2,637.0	-5.3
USDA	2,201.7	2,076.8	-5.7
TVA	1,791.0	789.2	-55.9
NASA	644.0	666.0	3.4
VA	656.7	644.6	-1.8
DOJ	775.2	408.0	-47.4
USIA	81.5	95.2	16.8
TRSY	61.8	31.4	-49.2
FCC	1.7	1.9	11.8
NRC	1.2	1.5	25.0
TOTAL	1,151,489.9	815,544.9	-29.2

DATA AS OF 08/18/93

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

Source: Federal Agency Quarterly Energy Use Reports, DOE Form 6200.2.

Vehicles designed for use in law enforcement, emergency rescue, and combat related missions are exempt from the fuel efficiency requirements.

F. Exempted Buildings Energy Including Process Energy

NECPA allows agencies to exempt from the buildings goal facilities which house energy intensive activities. The energy consumed in these facilities is reported under exempted/process energy. The reporting of energy used in exempted buildings assures that total Federal energy consumption is monitored.

The designation of exempted buildings is at the discretion of each agency. Currently, 10 agencies are exempting specific facilities from the NECPA goal: the Departments of Agriculture, Commerce, Defense, Energy, Transportation, and the Treasury, the General Services Administration, the National Aeronautics and Space Administration, the Panama Canal Commission, and the U.S. Information Agency. Lists of the exempted buildings that have been identified by the agencies are included in Appendix G.

Exempted/process energy reported by these agencies represents 98.4 trillion Btu or 11.2 percent of the energy used in general operations in FY 1992. Table 11 shows that fuels consumed by exempted/process energy have increased 144.5 percent compared to FY 1985 and increased 19.3 percent over FY 1991. Some of the fluctuations in consumption of exempted/process energy resulted from agencies changing data collection and reporting procedures. The large increase in the FY 1992 consumption of exempted/process energy compared to FY 1985 is 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 1992. 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 process energy in FY 1990 and has backed out process energy from its FY 1985 buildings data. The Departments of Agriculture and Commerce both began exempting 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 the National Institute of Standards and Technology.

The Department of Defense consumed 67.9 trillion Btu of exempted/process energy, 69.0 percent of all exempted/process energy used by the Federal Government, followed by the Department of Energy with 13.6 percent of the exempted/process energy consumption.

The Department of Defense exempts 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 exempted/process.

The Department of Energy reports its use of metered energy in extensive experimental research and production processes under exempted/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. Exempted/process energy totaled 13.4 trillion Btu in FY 1992, which represents 86.6 percent of operations energy used by DOE and 30.3 percent of all energy consumed by DOE. The use of exempted process energy by DOE in FY 1992 was 21.7 percent less than in FY 1985, but 16.4 percent more than FY 1991.

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

Within the Department of Transportation, the Federal Aviation Administration exempts 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 exempted 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 exempts 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 exempted/process energy is comprised mainly of industrial energy consumption by the Bureau of Engraving and Printing and the Mint.

TABLE 11
FEDERAL ENERGY USE IN EXEMPTED 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	% CHANGE 85-92	% CHANGE 91-92
DOE	17,148.4	15,279.1	14,967.0	15,235.0	12,301.3	11,691.6	11,536.6	13,433.2	-21.7	16.4
NASA	5,844.5	6,128.1	6,319.9	6,418.7	7,005.4	7,112.1	7,318.2	7,206.3	23.3	-1.5
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	35.2	32.6
USDA	1,942.8	1,655.3	1,530.5	1,657.5	2,026.0	2,204.2	2,133.3	1,966.3	1.2	-7.8
DOC	938.6	0.0	0.0	0.0	0.0	0.0	0.0	976.6	4.1	N/A
USIA	0.0	0.0	0.0	0.0	1,354.4	1,406.9	850.6	828.5	N/A	-2.6
TRSY	0.0	0.0	0.0	0.0	0.0	0.0	1,026.8	814.1	N/A	-20.7
GSA	86.8	0.0	0.0	0.0	0.0	160.6	746.2	677.6	680.4	-9.2
PCC	167.2	179.2	185.7	190.0	187.6	190.8	197.1	193.9	16.0	-1.6
CIVILIAN AGENCIES										
TOTAL	29,388.6	26,560.6	26,618.9	27,228.5	26,599.3	25,830.1	26,105.0	30,503.3	3.8	16.8
DOD	10,857.2	11,449.9	11,890.3	42,284.8	36,792.9	39,209.1	56,372.1	67,913.1	525.5	20.5
TOTAL	40,245.8	38,010.5	38,509.2	69,513.3	63,392.2	65,039.2	82,477.1	98,416.4	144.5	19.3
BBTU	40,245.8	38,010.5	38,509.2	69,513.3	63,392.2	65,039.2	82,477.1	98,416.4		
MBOE	6.9	6.5	6.6	11.9	10.9	11.2	14.2	16.9		
Petajoules	42.5	40.1	40.6	73.3	66.9	68.6	87.0	103.8		
ANNUAL CHANGE FROM 1985										
BBTU		-2,235.3	-1,736.7	29,267.5	23,146.3	24,793.4	42,231.3	58,170.6		
MBOE		-0.4	-0.3	5.0	4.0	4.3	7.3	10.0		
Petajoules		-2.4	-1.8	30.9	24.4	26.2	44.6	61.4		
CUMULATIVE SAVINGS FROM 1985										
BBTU		2,235.3	3,972.0	-25,295.4	-48,441.8	-73,235.2	-115,466.5	-173,637.0		
MBOE		0.4	0.7	-4.3	-8.3	-12.6	-19.8	-29.8		
Petajoules		2.4	4.2	-26.7	-51.1	-77.3	-121.9	-183.3		

DATA AS OF 08/18/93

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

Source: Federal Agency Quarterly Energy Use Reports, DOE Form 6200.2.

IV. FEDERAL AGENCY IMPLEMENTING ACTIVITIES RELATED TO NECPA AND EXECUTIVE ORDER 12759

A. United States Department of Agriculture (USDA)

Performance and Conservation Activities

In FY 1992, the United States Department of Agriculture reported a decrease of 11.5 percent in Btu per gross square foot compared to FY 1985.

Examples of energy-efficiency projects funded and accomplished in FY 1992 include the following:

- replacement of laboratory roof and greenhouse glazing in St. Paul, MN (\$125,000);
- replacement of air conditioning unit and boiler in West Haven, CT (\$280,000);
- installation of heat pumps to replace electric baseboard heat in the Chippewa National Forest (\$110,000);
- installation of energy-efficient lights in the corridors of the Agriculture Administration Building, Washington, DC (\$52,709);
- restoration of windows in Court 3 of the Agriculture South Building, Washington, DC (\$1,261,000); and
- implementation of numerous low-cost actions, such as insulating roofs and walls, converting furnaces to natural gas, installing high efficiency fluorescent tubes and solid state ballasts, caulking, repairing steam systems, installing motion sensor light switches, and repairing HVAC equipment and systems.

Implementation Plans

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. The implementation strategy can be summarized as follows:

- Institute and/or emphasize energy conservation awareness programs among facility managers and building occupants. Provide training as necessary.
- Ensure that the building envelope and building systems are properly maintained to promote efficient energy use.
- Review and modify building operation plans to ensure compliance with temperature guidelines and utilization of appropriate energy conservation techniques.
- Implement no-cost and low-cost energy conservation actions such as turning lights off, reducing office equipment use, and managing load curtailment.
- Implement changes in agency operational policies, such as reduction of overtime use of facilities, where feasible.
- Carefully monitor energy usage at each facility, utilizing the Energy Reporting System at the National Finance Center. Analyze consumption data to evaluate trends and identify problem areas. The Department will upgrade and modernize the Energy Reporting System as necessary.

- Perform surveys to identify building-specific energy conservation opportunities. Target buildings exceeding 10,000 GSF. Prioritize projects based on life-cycle cost procedures of NIST Handbook 135 (*Life-Cycle Costing Manual for the Federal Energy Management Program*) and on savings-to-investment ratios.
- Allocate funds for energy conservation actions within approved agency budget totals, and implement the most life-cycle cost-effective projects.
- Take advantage of alternative methods of funding energy conservation projects, including shared energy savings contracts, demand side management programs, and utility rebates.
- Allocate agency resources to the Energy Management Program within each agency as needed to accomplish the goals of Sections 1, 2, and 3 of Executive Order 12759.
- Review Federal, Departmental, and agency policies, regulations, laws, and procedures to identify impediments to implementing Executive Order 12759. Promulgate changes needed to facilitate or enhance its implementation.
- Provide incentive awards to facility managers and other individuals who contribute to the energy efficiency of the Department.

Agencies were advised to prepare their own internal plan before September 30, 1992, for implementation in FY 1993. Further revision of the plan is now underway as a result of EPACT.

Funding

USDA agencies and the Office of Operations expended about \$7.3 million on energy conservation-related improvements in FY 1992. Current energy conservation funding is obtained from existing operation, maintenance, repair, and construction budgets of the USDA sub-agencies to the extent such funding is available. In FY 1993, energy conservation-related actions total about \$8 million of current planned expenditures. Included is a \$600,000 lighting retrofit for the entire Agriculture Administration Building.

Agency resources to conduct energy surveys at all USDA facilities (over 20,000) are extremely limited. Due to funding limitations, agency decisions to implement an energy conservation action must be based on an evaluation of both the program needs of the agency and the life-cycle cost of the action and its savings-to-investment ratio. However, energy activities presently compete with other needs of USDA agencies, including priorities such as health and safety, accessibility, mission-related needs, and normal operations and maintenance.

Shared Energy Savings

The USDA Energy Management Plan established the Office of Operations to be responsible for implementing a program to enter into shared energy savings contracts, with individual USDA agencies responsible for implementing projects in their facilities.

USDA has not yet entered into a shared energy savings contract. The first effort to institute an SES contract was initiated by the U.S. Forest Service in 1991. The Forest Products Laboratory in Madison, WI, was identified as a potential candidate, and an agreement was reached between the Forest Service and DOE to have a survey done by Battelle Pacific Northwest Laboratories to develop a detailed energy usage baseline and to identify possible

life-cycle cost-effective retrofits. The most promising project is a complete lighting retrofit of the four major buildings of the Forest Products Laboratory at an estimated cost of \$335,000. Annual savings are projected between \$40,000-\$50,000. The local electric utility appears to be willing to finance the project. It will be determined whether the retrofits will be accomplished as an SES project or as a custom demand side management program with Madison Gas and Electric Company.

Under the USDA SES Program, the amount of funds equal to the savings realized from SES contracts will remain available to undertake additional energy conservation measures. Energy and cost savings will be estimated based on standard engineering practice and GSA and DOE guidance. Actual cost savings will be based on verifiable meter readings of actual usage, along with utility billings.

Demand Side Management

Legal and regulatory aspects of obtaining demand side management services are being reviewed to facilitate use of such services. Rebates have been obtained from the Potomac Electric Power Company for lighting retrofits in the South Agriculture and Administration Buildings in Washington, DC. The simplest method of receiving rebates has been found to be as a credit on utility bills. The use of demand side management is being pursued at the Forest Products Laboratory in Madison, WI, with the assistance of DOE, Office of Federal Energy Management Programs. The USDA Plan encourages all USDA agencies to utilize DSM services, SES contracts, and rebates and incentives offered by utilities and other private sector energy service providers.

Vehicles

USDA has a mandatory requirement to use alcohol-blended fuels in all owned and leased motor vehicles. Several USDA agencies are participating in the use of alternative fuel vehicles within GSA's Interagency Fleet Management System, and one agency has converted a number of vehicles to CNG and LPG for use in its fleet of owned vehicles. As more vehicle types become available and a fuel infrastructure is in place, USDA will progress in its use of alternative fuels and vehicles.

USDA uses a variety of fuels, including gasoline, diesel, blended fuel, E-85, M-85, CNG, and LPG. All efforts are made to acquire blended fuels when available.

USDA anticipates the following changes in its current fleet size/makeup:

- replacement of some full-sized vehicles with smaller, more fuel-efficient vehicles without impacting mission requirements;
- continued use of AFVs;
- reduction of unnecessary commercial leases and GSA rentals; and
- the Food Safety and Inspection Service may significantly increase its fleet size as more inspectors are employed to meet the nationwide concerns of meat and poultry inspection procedures.

USDA developed the following steps to reach the reduction goal:

- analyzed, program by program, the use of each vehicle owned, assigned, or leased;
- eliminated identified marginal use vehicle requirements;

- participated in carpooling/ridesharing programs and combining trips when feasible;
- replaced on-site inspections and reporting with telecommunications technology;
- paid more attention to personally-owned vehicle fleet composition as to type of vehicles used and average fuel economy achieved;
- used alcohol-blended fuels when available and where the U.S. Government National Credit Card is accepted;
- worked with GSA's Interagency Fleet Management System to incorporate more AFVs into the fleet;
- adhered to manufacturer's vehicle maintenance standards;
- conducted awareness training/outreach programs on energy conservation;
- replaced full-size vehicles with smaller, more fuel-efficient vehicles as appropriate;
- eliminated unnecessary weight in vehicles; and
- published energy-saving tips in various publications.

Environmental Benefits

During FY 1992, USDA made significant progress in the procurement of environmentally sound energy-efficient products and products that contain a high percentage of recovered materials. For example, items purchased in large quantities by the Forest Service include recycled paper and paper products, plastic lumber, garbage can liners, retreaded tires, concrete/cement with fly ash, remanufactured printer/copier toner cartridges, and carpeting made from recycled soda bottles. The Forest Products Laboratory has developed many energy-efficient materials and products from recycled materials which are now industry standards in building construction.

B. Department of Commerce (DOC)

Performance and Conservation Activities

At the Department of Commerce in FY 1992, energy consumption in buildings measured in Btu per gross square foot has increased by 10.9 percent from the 1985 base year.

The Commerce Department reports that during FY 1992, the Patent and Trademark Office (PTO) has finished a lighting retrofit project that was started in FY 1991. In three PTO office buildings, each of 9,000 standard four-lamp fluorescent fixtures were retrofitted with two energy-efficient lamps, one energy-efficient ballast, a polished reflector, and a new acrylic lens. This project will reduce energy used by 50 percent from the old lighting system. Two other lighting retrofit projects are planned for FY 1993 and FY 1994. The first project is to install motion detectors in all restrooms and corridors. The second project is to replace two hundred 250-watt quartz lamps located in the public search room with 50-watt high pressure sodium lamps. PTO had a lighting energy survey performed on Crystal Plaza buildings 3 and 4. Several recommendations were made for upgrades and these projects will be implemented in FY 1993, or as funds allow.

At the Bureau of Economic Analysis (BEA), the Potomac Electric Power Company conducted an energy survey of the Tower Building, which is a GSA-leased office building. The survey developed a number of recommendations. However, since BEA is moving from the building in August 1993, replacement of the light fixtures would not be cost-effective. BEA also

requested that the lessor initiate a comprehensive preventive maintenance program on the 350 individual wall/window HVAC units, and repair five inoperable air handlers. This has been completed by the lessor and has resulted in additional efficiency in HVAC operations.

At the Bureau of the Census in the Jeffersonville Federal Center, IN, a central air conditioning system was installed to replace window units in one of the buildings. Accustats and programmable thermostats were installed in various buildings. Lamps and light fixtures were replaced to improve energy efficiency. Mercury vapor, 100-watt, exterior light fixtures were replaced with 70-watt, high-pressure sodium fixtures. A steam condensate station was removed from Building 75, and two new electric heat pump systems with steam-coil back-ups were installed. An automated preventive maintenance program has been implemented.

The National Oceanic and Atmospheric Administration (NOAA) is presently involved in a major building construction program, Next Generation Radar Stations. These are new advanced weather stations being built throughout the United States. The integration of sound energy conservation and design is being implemented in all new buildings. Specific areas such as lighting, HVAC, building envelope, and equipment configuration, are being analyzed as part of the design process, and the compliance with Title 10 of the Code of Federal Regulations (CFR) for all major construction projects. NOAA is presently working on an Administrative Order for the Procurement of Energy Efficient Goods and Services.

NOAA is continuing consolidation of its headquarters at Silver Spring, MD. At the end of the fiscal year, Silver Spring Metro Center buildings III and IV were 30 to 40 percent completed. These two buildings have a high-performance building design to greatly reduce the need for extensive cooling in the summer. Occupancy sensors to automatically dim and turn off the lighting will be installed in private offices, conference rooms, and other walled areas. The lighting system will use high efficiency T-8 lamps and electronic ballasts.

The NOAA Western Regional Center (WRC) in Seattle, WA, completed an energy audit of all buildings under phase one of its conservation program. Phase two is partially underway and involves the replacement of all lighting with more energy-efficient lighting. Phase three is awaiting funding and will add variable speed drives to all air handlers and fan motors. Pneumatic HVAC controls will be converted to direct digital controls for more efficient operation. WRC is also undertaking minor projects such as daylighting and adding or replacing insulation as funding allows. WRC participates in the "Smart Design" program promoted by the local power company; it was the first Federal facility in the area to participate in this program. WRC is involved in research to remove harmonics problems in variable speed drives, problems with harmonically sensitive breakers, and problems created by high efficiency electronic ballasts.

The Office of the Secretary at the Commerce Department is presently working on a complete lighting retrofit of the Herbert C. Hoover Building, where old fluorescent four-lamp light fixtures will be replaced by T-8 three-lamp fixtures with electronic ballasts and motion detectors. A study on a complete retrofit of all the windows at the building has been completed. Work is still in progress to have this project funded and scheduled for implementation. Plans are underway to automate the maintenance program at the Hoover

Building. Extensive efforts have already been made in the elevator repair and maintenance part of the program.

The Bureau of the Census has in place vanpooling, carpooling, and preferential parking for carpool and vanpool vehicles. NOAA, during FY 1992, had approximately 400 employees participate in a subsidy program through which all transportation fare equivalents were sold to employees at a reduced price on a monthly basis through the Buildings Management Branch. In the near future, NOAA will relocate approximately 2,900 employees to the Silver Spring campus. A decision has been made to extend the six-month subsidy program to each employee who uses public transportation for the next two years. Employee awareness outreach was accomplished through seminars, visual displays, and newsletters. Transit, Congressional, and Federal representatives were instrumental in coordinating ridesharing programs. For the fifth consecutive year, NOAA was the recipient of an award from the Montgomery County Government for promoting transportation alternatives.

Implementation Plans

DOC has developed the following list to implement and administer its Energy Conservation Program:

- Establish a program to insure that all designated facility energy supervisors/operating officials are trained to a sufficient level that they can effectively coordinate the implementation of DOC and Government-wide energy programs and initiatives.
- Ensure that all new DOC-constructed buildings are designed and built in accordance with energy performance standards as applicable.
- Use LCC 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.
- Participate, to the maximum extent possible, in all demand side management services, including utility rebates offered by electric and gas utilities and other private sector energy service providers.
- Perform energy surveys on all buildings as funds and programs will allow.
- Promote energy conservation through training, employee awareness, and outreach programs.
- Maintain complete and accurate records on energy consumption and energy cost for all Federal buildings under DOC control where the Government is responsible for paying the utility bills.

Funding

The Commerce Department provided funds of \$871,873, and GSA provided \$1,215,000, during FY 1992 for the following energy efficiency projects:

- The Bureau of the Census at the Jeffersonville Federal Center implemented projects totaling \$487,000. A window retrofit project for \$785,000 in Building 66 was funded with GSA's energy conservation money. This contract was awarded in the end of FY 1992 and work will start in FY 1993.

- At the Office of the Secretary, Herbert C. Hoover Building, several projects were funded for \$23,000, and one project for a 900-ton energy-efficient chiller was funded by GSA at a cost of \$430,000.
- NOAA, at Silver Spring, MD, funded projects totalling \$278,360. NOAA used GSA Building Delegation Funds to retrofit the lighting in Silver Spring, MD.
- The Western Regional Center of NOAA funded projects totalling \$106,513.
- Funding for projects in FY 1993 will be paid out of Delegations Funds, Operations and Maintenance Funds, and GSA funds as available.

Shared Energy Savings

The Office of the Secretary began work to implement an SES contract to retrofit all the lighting fixtures in the Herbert C. Hoover building. Once this is done, the information will be used to assist other bureaus to implement SES contracts. There are presently no other SES contracts pending. DOC is encouraging energy coordinators and contracts personnel to take training courses which GSA and DOE are offering on energy savings performance contracting.

Demand Side Management

Analysis of demand side management opportunities is underway in several DOC facilities. Additional work in this area is planned for FY 1993. Guidance has been issued to bureaus in the field about investigating conservation programs and services offered through local utilities. The Department is taking advantage of rebates and DSM programs as follows:

- The Herbert C. Hoover Building of the Office of the Secretary received a \$9,460 rebate on a lighting project.
- NOAA received \$56,308 in rebates on two projects at its WRC facility.
- It is estimated that NOAA will receive a lighting project rebate of \$69,000 for its Silver Spring, MD, facility for FY 1992.
- At the Bureau of the Census, Jeffersonville Federal Center, a power distributor's architect and engineering firm is performing four comprehensive building energy audits. Other services are forthcoming in FY 1993.

Vehicles

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

The Commerce Department plans to take the following actions to reduce the overall use of gasoline and diesel fuel:

- Conduct a Departmental review on the utilization of all commercially-leased and GSA Interagency Fleet Management System (IFMS) motor vehicles assigned to operating units, and turn in all motor vehicles with poor utilization.
- Develop a program to acquire AFVs. This plan will include working with GSA IFMS to replace DOC present gasoline-fueled vehicles with AFVs as they become available for assignment, and to purchase AFVs to replace existing owned motor vehicles.

- **Develop a vehicle fuel efficiency outreach program.** This program will focus on actions that employees can take when operating Government motor vehicles and personally-owned vehicles used on official travel. DOC also plans to issue information on actions that operating units can take to promote ridesharing and use of mass transit by Commerce employees.

To date, the Department has only a few AFVs in its fleet of 2,087 vehicles. The Commerce Department is working with its bureaus to initiate a comprehensive alternative fuel vehicle program. There are four M-85 sedans located at NOAA in Silver Spring, MD. NOAA and the National Institute of Standards and Technology, which own the majority of DOC's domestic vehicles, plan to replace owned vehicles with AFVs through GSA's Automotive Commodity Center as they become available and as refueling locations and service locations for AFVs are established throughout the United States. The Patent and Trademark Office (PTO) emphasizes carpool and vanpool opportunities through periodic employee notices. This information is also furnished in orientation packages for new employees. PTO also issues subway fare cards to employees on official business in the Washington, DC metropolitan area to preclude, where possible, the use of Government or personally-owned vehicles.

Environmental Benefits

DOC is participating in a recycling program for aluminum cans, cardboard, glass bottles, newsprint, paper, toner cartridges, and photo finishing projects where silver is recovered from the waste. The Department's procurement division is working on different programs to procure energy-efficient goods and services.

C. The Department of Defense (DoD)

Performance and Conservation Activities

In FY 1992, the Department of Defense decreased Btu per gross square foot energy consumption by 6.6 percent when compared to FY 1985. All parts of the DoD have taken an active role in implementing, planning, and funding of energy efficient programs. Strong continuing action will be required to maintain this accomplishment because of on-going major base realignment, significant modification to program emphasis resulting from the establishment of an industrial process energy use reduction goal, and major internal management and organizational changes occurring in the DoD.

Improvements in energy efficiency continue to be met primarily through improved energy systems operations and better maintenance, energy management seminars, increased training, and increased engineering assistance provided to DoD installations. Installation supply managers routinely purchase energy-efficient products through GSA, the Defense Logistics Agency (DLA), and Federal supply contracts, and maintain stocks of energy-efficient replacement equipment. Installation utility managers have increased their involvement in planning, contracting, and maintenance and operation procedures to ensure that cost-effective energy conservation measures are taken wherever possible.

DoD has arranged for each facility and base to receive a copy of the Federal Relighting Initiative package being developed by DOE as well as a copy of the DLA current lighting catalog, *Energy Saver Bulbs*. This work is continuing to be extended to other energy-consuming items. For example, ballasts and complete fixtures are being included in the bulb catalog, and new initiatives with electric motors have commenced.

DoD installations have implemented training programs to familiarize personnel with the energy efficiency and cost-effectiveness requirements. Covered personnel include those responsible for the planning, design, estimating, equipment specification and purchasing, contracting, supply management and maintenance of facilities. Energy surveys and seminars were conducted at nine installations during FY 1992. In FY 1993, 24 installations have been scheduled for these seminars.

DoD continues to survey facilities and to implement plans to develop dual fuel capabilities in its facilities. Some of the dual fuel projects in FY 1992 include the following activities:

- the Department of the Navy converted seven power systems to natural gas with petroleum back-up systems as a cost effective alternative to petroleum power systems;
- the Marine Corps used as standard criteria dual fuel capability for plants producing over 50 million Btu per hour;
- the Defense Mapping Agency (DMA) converted all of the boiler plants at the Aerospace Center and the Hydrographic Topographic Center to natural gas with oil backup;
- The Defense Commissary Agency (DeCA) issued a memorandum directing each commissary in the continental U.S. to develop and retrofit dual fuel capability where practicable; and
- DLA began design of a construction project for replacement of the coal-fired central heating plant at the Defense Electronic Supply Center, Dayton, OH, with decentralized natural gas boilers. Cogeneration capability at the Defense Personnel Support Center, Philadelphia, PA, is being surveyed in conjunction with replacement of the central heating plant. Under study at the Defense Construction Supply Center, Columbus, OH, is the downsizing and conversion of one central heating plant coal-fired generator to natural gas.

The Washington Headquarters Services (WHS) initiated a construction project to replace a 50-year-old plant with a modern chilled water and steam producing facility. In the fall of 1994, renovation of the Pentagon building is scheduled to begin with completion scheduled in 2002. The Federal Facilities Division (FFD) has been contributing energy conservation measures into the various planning stages.

A new agency in DoD, the Defense Commissary Agency, achieved a 4.1 percent decrease in energy consumption in FY 1992. Reduction can be attributed to the opening of new commissaries constructed to DeCA design standards, implementation of DeCA refrigeration and HVAC design maintenance contracts (\$8.1 million), distribution of a DeCA Commissary Energy Management Manual, completion and publication of the DeCA Energy Plan, energy awareness and energy reporting training to Region Engineers, and the hiring of a Headquarters level energy management engineer.

Energy performance standards applicable to Federal residential and commercial buildings as set forth in 10 CFR Part 435 are employed by each DoD agency. The certification procedures initiated in FY 1991 have assured that quality assurance checks by Service representatives at the installation level will be performed during the design and construction phase to ensure the design incorporates the standards and the building is constructed in accordance with the drawings and specifications. DoD agencies purchase design and construction services through the Naval Facilities Engineering Command or the Army Corps of Engineers and depend on the servicing command to ensure the applicable regulations are incorporated in each new construction project.

Implementation Plans

The Defense Energy Program Policy Memorandum (DEPPM) 91-2 and the Deputy Secretary of Defense Memorandum, "Defense Facilities Energy Management," contain implementation

language to reduce energy consumption in buildings by 20 percent and increase energy efficiency in industrial facilities by 20 percent by FY 2000, as compared to FY 1985. DEPPM 91-2 provides DoD agencies with policy implementation guidance required to meet the goals. Specific technical program areas were assigned to lead agencies for the development of a coordinated DoD strategy for action in each area of high potential benefit. These program areas include:

- personnel awareness;
- improved operation and maintenance;
- capital funding of facility improvement projects;
- demand side management;
- SES contracting;
- use of energy monitoring and control systems;
- alternative, renewable, and clean energy applications;
- lighting systems; and
- environmental benefits of energy conservation.

Implementation plans were revised in most DoD agencies to include requirements under Executive Order 12759. For example, the Department of the Army updated The Energy Resource Management Plan, FY 1985 to FY 2000, during FY 1992 to incorporate the requirements of Executive Order 12759, DEPPM 91-2, and the Deputy Secretary of Defense Memorandum. The key components in the updated plan are the Energy Engineering Analysis Program, an OMA-funded program for energy conservation project feasibility studies, discussion of alternative financing strategies for energy project funding, and the Building Load Analysis and System Thermodynamics program offered by the Army's Construction Engineering Research Labs. The Department of the Army is also working with DoD Energy Policy Office to develop an Energy Managers Handbook and plan to distribute this handbook in April 1993, to all major commands (MACOMs) and bases.

The Architectural and Engineering Instructions (AEI) design criteria is the basic design manual. This document was updated to disseminate design guidance that has been mandated by Federal Statute, regulation, and DEPPM 91-2. The AEI is used by Corps of Engineer Offices, MACOMs, and installations. The AEI is accessible through the Design Criteria Information System, which is a module of the PAX electronic system. The Army will be an active participant in DLA-sponsored electric energy-efficient equipment and refrigeration demonstration projects during FY 1993.

In November 1991, The Marine Corps promulgated Marine Corps Order P11000.9C, Real Property Facilities Manual, Volume VI, Energy and Utilities Management. This order implemented the energy savings goals extending through the year FY 2000 and applies to all Marine Corps installations. In addition, Marine Corps Headquarters initiated work on the Energy Conservation Campaign Plan that focuses on long-term and short-term energy conservation strategies.

The Air Force Energy Plan was re-written as an Air Force Energy Program Procedural Memorandum (AFEPPM). All other AFEPPM and Engineering Technical Letters (ETL) are being reviewed and updated as required. An Air Force Policy Directive (AFPD) is being

developed to replace Air Force Regulation (AFR) 18-1, Air Force Energy Management, dated 28 August 1987.

DeCA issued the DeCA Handbook (October 1992) detailing the limits of building space temperatures, humidity and domestic hot water temperatures. DeCA criteria also includes the requirement for architect and engineering certification of mandatory compliance with Section 435.112 of Title 10 CFR relating to performance standards for new commercial buildings. Energy-efficient design criteria incorporated in the DeCA Design Handbook, effective October 1992, includes energy-efficient lighting, heat reclamation, desiccant dehumidification, energy and refrigeration monitoring and control systems, and the requirement to use life-cycle cost analysis methods.

The Navy has been successful in meeting the required energy reduction goals by assigning energy conservation responsibilities to individual activities and providing policy, oversight, and guidance from the Naval Facilities Engineering Command and engineering support at the EFD level.

A revision of the consolidated DLA Energy Resource Management Program guidance is expected in FY 1993.

WHS provides guidance and assistance for the purchase of energy-efficient goods. For instance, all requests for electrical motor replacements are specified for minimum motor efficiencies, purchasing agents are given direction to procure only fluorescent fixtures with electronic ballasts and T8 lamps, and all purchases of chilled water coils or air handling units are sized based on sound engineering practices and selected for a minimum temperature differential of 12 degrees Fahrenheit. WHS's Service Federal Facility Division's Energy Resources Management Plan was developed in 1991 as a reference guide for facility managers involved in the support of DoD energy policy.

Funding

During FY 1992, the primary source of large project capital investment funds for energy conservation measures for DoD is the Energy Conservation Investment Program (ECIP), which is part of the Military Construction (MILCON) program, specifically authorized and appropriated by Congress. In FY 1992, DoD funded approximately \$30 million in ECIP projects: the Department of the Army funded projects with a value of \$7.7 million, the Navy funded over \$11.7 million, the Air Force invested \$8.9 million, and the Marine Corps funded \$1.8 million. In addition to ECIP funding, DoD agencies used other funding vehicles for energy-efficient projects. Estimated funding for energy projects from operation and maintenance budgets included \$2.4 million for the Navy, \$3.5 million for the Marine Corps, and \$2.5 million for the Air Force. In addition, the DeCA spent \$11.2 million in commissary surcharge funds for maintenance contracts and refrigeration retrofitting.

Shared Energy Savings

At the end of FY 1992, the DoD had awarded or was in the process of awarding 14 SES contracts since the initiation of the program. Another contract was awarded but terminated for contractor non-performance within the first contract year. A description of each, by administering Services, follows:

The Department of the Army has awarded four SES contracts, two of which were awarded in FY 1992.

Corpus Christi Army Depot, TX (FY 1988). This project involved the replacement of a steam absorption chiller with an electrical driven system resulting in average annual energy savings of 16,820 MBtu. Cumulative energy savings through the end of FY 1991 were 71,911 MBtu with maintenance cost savings of \$284,238. Resultant cost savings were reprogrammed to fund critical OMA maintenance and repair requirements.

Aliamanu Housing Reservation, Fort Shafter, HI (FY 1991). Energy conservation actions undertaken include the installation of high efficiency AC units, EMCS controls, lighting retrofit, shower head replacement, water heater insulation, and other measures. These measures saved 7,690 MBtu in FY 1992 with energy cost savings of \$28,466 and maintenance cost savings of \$1,601,373.

Fort Stewart, GA (FY 1992). This project plans will upgrade and expand a propane-air mixing plant to provide backup capability for natural gas system. Cost savings will be reported in FY 1993.

Fort McPherson/Gillem, GA (FY 1992) A propane-air mixing plant will be installed to supplement the natural gas system. The propane-air mixing plant permits Fort McPherson to buy interruptible rate natural gas during peak demand periods. The plant was under construction during FY 1992, and cost savings will be reported beginning in FY 1993.

In addition to the four projects under contract, there are 15 other SES projects under study or out for proposal solicitation.

The Department of the Navy awarded four SES contracts, two initiated in FY 1992 (a third contract was awarded and terminated for default for non-performance within the first contract year).

Building 3400, Naval Training Center, Great Lakes, IL. Energy conservation activities include a lighting system retrofits and installation of an energy management and control system (EMCS) for air handling, boiler, and chiller systems. Cumulative energy savings through 1992 are approximately \$250,000 and 96,395 MWh since installation was completed in November 1990.

Naval Air Warfare Center, Aircraft Division, (NAWC-AD) Patuxent River, MD. Energy conservation activities include lighting system retrofits in 52 administrative and community buildings. Cumulative energy savings \$87,000 and 837 MBtu.

Southern California Commissary Stores, CA. Energy conservation projects include lighting system retrofits to retail, office, and storage spaces in four San Diego area commissary stores and stores in El Centro, Long Beach, Point Mugu, Port Hueneme, and China Lake. Annual savings are estimated at \$109,959 with a projected energy cost savings of nearly \$1.7 million over the life of the contracts. These projects were transferred to DeCA in March, 1992.

Naval Surface Warfare Center, Indian Head, MD. Energy conservation activities are on schedule to award an SES contract with demand side management incentives in FY 1993.

The Department of the Air Force issued six requests for proposals for the following projects expected to be undertaken in FY 1993.

Tyndall Air Force Base, FL. Energy conservation activities include lighting system retrofits of 3,500 fixtures in 15 administrative buildings and aircraft hangars. Estimated annual energy and cost saving are 2,220 MBtu and \$22,000, respectively. Cumulative energy cost savings is estimated at \$164,000.

Randolph Air Force Base, TX. Energy conservation actions include lighting system retrofit of approximately 20,000 fixtures in 40 buildings and hangars. Projected annual energy savings is estimated at 170,650 MBtu with cost savings estimated at \$1.3 million.

Dover Air Force Base, DE. Energy conservation actions include central heat plant boiler retrofits. Cumulative energy savings is estimated at 240,000 Btu at a cumulative cost savings of \$6 million.

USAF Medical Center, Wright-Patterson Air Force Base, OH. Energy conservation actions include lighting system retrofits of 8,600 fixtures in the medical center complex. Projected annual energy savings are 10,650 at a cost savings of \$100,000.

Nellis Air Force Base, NE. Energy conservation activities include replacement of equipment with high efficiency AC units, motors, and lights. Estimated energy and cost savings have not been calculated.

US Air Force Academy, CO. Energy conservation projects include lighting system retrofits for various dormitory, classroom, and administrative facilities. Estimated energy and cost savings have not been calculated.

DEPPM 91-2 directs each Defense agency to establish a centralized program to administer its shared energy savings contracting program. The U.S. Army Engineering and Housing Support Center (USAEHSC) is the Department of the Army's functional proponent for SES contracting, responsible for overall management, planning, programming, budgeting, and direction of the program. The Corps of Engineers U.S. Army Engineer Division-Huntsville (CEHND) provides technical expertise for SES programming/projects as requested by USAEHSC. The Navy's Headquarters, Naval Facilities Engineering Command (NAVFAC) provides program policy and guidance, including close coordination with the other services, civilian Federal agencies, and Office of the Secretary of Defense (OSD). Southwest Division, NAVFAC is the executive agent for SES contracting and is a resource of technical and contractual expertise serving activities Navy-wide in all phases of contract development.

The Marine Corps maintains a Program Manager in its Installations and Logistics Department to coordinate efforts relating to implementation of these contracts. In FY 1992, this department continued development of a pilot project developing a base-wide, open-scope SES contract at MCB Camp Pendleton for a planned FY 1993 award. This department

maintains close coordination with NAVFAC Headquarters and its Engineering Field Divisions that have been assigned implementation responsibility. In addition, this department works directly with Marine Corps installations to encourage SES contract development, provide technical support, and contract development funding assistance.

The Air Force Facility Energy program is a three-tiered operation, with the Air Force Civil Engineer (HQ USAF/CE) responsible for overall program management. The Air Force Civil Engineering Support Agency (HQ AFCESA) provides technical assistance to HQ USAF/CE concerning technical engineering and contracting issues. Personnel from HQ AFCESA perform program management, policy development, and represent the Air Force on SES matters with other DoD agencies, and DOE. Installation personnel are responsible for identification and implementation of specific SES projects.

DoD continues to encounter some problems associated with SES contracts. The lack of funding and resources inhibit the transition of the SES program from developing into a full scale DoD energy conservation program. Because of current budget constraints, DoD installations and agencies are reluctant to provide the funding necessary to develop an SES contract. The Department of the Army recommends that the DoD move toward centrally funding the up-front costs for the Services to conduct feasibility studies to identify the SES opportunities on installations, focusing the SES program on specific segments of the energy conservation program.

Another difficulty is retaining a stable SES team throughout the lengthy solicitation and award process. Difficulties such as personnel reductions, lack of experience with SES, and no implementing guidance in the Federal Acquisition Regulations make SES a hard sell. In addition, the uncertainty of future base closure and realignments make long-term business ventures very risky for the Navy and its contractors.

Another factor is that SES contracts are not mission critical, yet to award one takes considerable time and effort, both of which must be taken from mission critical work. Manpower and funding shortages inhibit allocation of resources for non-mission critical projects.

While SES uses the developer's funds to retrofit existing facilities, the developer recovers his investment from savings generated by the retrofits. Comptroller personnel at the installation level have not been briefed/trained on making those savings monies available for payment. Thus any reduction in this year's utility costs results in budget reductions for next year, deleting the money intended for the contractor's return on investment.

The Air Force recommends that DoD include a request for monies in the budget to be used for energy project identification. The money would be used to identify energy efficiency/conservation projects and to develop submittal documentation for ECIP, SES, and other programs that offer a funding mechanism.

Demand Side Management

The Department of the Army, as the lead service in the DoD DSM program, initiated numerous actions during FY 1992. Guidance was provided to installations on how to take

advantage of DSM opportunities, and meetings have been held with installation personnel. Three DSM workshops have been held at select sites in FY 1992 with at least one more workshop scheduled for FY 1993. Sessions covering the DSM program were added to the Energy Coordinator Course and the Energy Awareness Seminar program. Also, the second edition of a DSM newsletter was published. A customized DSM program between Fort Lewis and Tacoma Public Utilities became a signed agreement. DSM opportunities are currently under study at Forts Stewart, Drum, Bliss, McNair, Hood, and Dugway Proving Ground, and other sites.

The Department of the Navy participated in the source supply natural gas program conducted by DLA. The DLA program consolidates installations' requirements for interruptible natural gas supplies and contracts for delivery to the local distribution company. The Navy has saved approximately \$2 million by utilizing source supply natural gas in FY 1992.

Several Naval installations in the San Diego, CA area have installed high efficiency lighting systems and qualified for rebates from San Diego Gas and Electric of 50 to 60 percent of the installed cost. Rebates were applied as credits on utility bills. Trident Submarine Base, Kings Bay, GA, negotiated two special riders to their electrical service contract that provide for interruptible service and standby generation. Estimated savings from these two peak load reduction initiatives are expected to earn a rebate of \$1.4 million in FY 1993 and to increase to \$1.7 million in FY 1999.

Commitments were made for FY 1993 to replace an electric chiller in the central chilled water plant at the National Naval Medical Center, Bethesda, MD, at a cost of \$700,000 with the local gas distributor supplementing the costs with a \$400,000 rebate. Approximately \$2.5 million will be spent to replace existing gas-fired boilers in the heating plant of the Washington Navy Yard, and the local gas distribution company will rebate \$125,000 for installing a high efficiency boiler.

The Marine Corps also took advantage of DSM programs. Some California installations reported taking advantage of incentives for hardware installation and rebates for lighting retrofits. The Marine Corps Air Station El Toro participated in Southern California Edison Company's air-conditioning cycling device program and received cash incentives for installing energy-saving equipment. The Marine Corps Barstow facility received lighting installation rebates. At the Marine Corps Air Station, Yuma, AZ, 1,200 T-8, 32-watt, fluorescent lamps and 350 electronic ballasts replaced old equipment under a contract with the local utility. The Marine Corps Base at Camp Pendleton continued to pursue a base-wide, open-scope SES/DSM contract, in which the utility will conduct detailed energy audits to establish baselines and pay for project installation. The Marine Corps facility at Albany participated in the Department of Defense Partnership Program with Georgia Power and Light Company.

Air Force installations actively participated with local utilities in no-cost audit programs and rebate incentives. Customized incentive programs have been proposed to 17 utilities that offer a 100 percent up-front funding, facility energy audits and life-cycle-cost analysis of proposed projects, design and installation of approved projects, construction management, and savings verification. Pilot project audit and analysis are currently underway with three companies (Southern California Edison Company, Utah Power and Light Company, and Gulf

Power Company). The Air Force expects to have contracts for pilot projects with five other companies (Florida Power and Light Company, Montana Power Company, Niagara Power Company, Sacramento Municipal Utility District, and Texas Utilities Electric Company) signed in FY 1993.

The Air Force targeted eight other utilities to approach during FY 1993 (City of San Antonio, Dayton Power and Light Company, Oklahoma Gas and Electric Company, Georgia Power Company, Public Service Company of New Mexico, Mississippi Power Company, New York State Electric and Gas, and Arizona Public Service Company).

DeCA Region Engineers surveyed DSM opportunities in their respective geographical areas and recommended commissary locations which should be candidates for DSM programs. All continental U.S. Region Engineers were furnished with a floppy disk version of the Edison Electric Institute's "Customer Assistance Programs" to assist them in locating utilities in their areas which offer various DSM programs and technologies for their use. DeCA agreed to participate in a pilot test project evaluation of the Refrigeration Improvement by Liquid Pressure Amplification Project proposed by Niagara Mohawk. One project in cooperation with Central Maine Power Company is under consideration for the Brunswick Maine commissary. An initial utility metering survey was completed which will be used to develop metering projects to increase energy reporting accuracy.

Vehicles

The Under Secretary of Defense (Acquisition & Technology) (OUSD(A&T)) is finalizing motor vehicle energy and environmental policy guidance implementing Section 10 of Executive Order 12759. The policy guidance promotes the use of oxygenated and reformulated gasoline, gasohol and alternative fuels, e.g., natural gas, alcohol, liquefied petroleum gas, hydrogen, coal derived fuels, fuels (other than alcohol) derived from biological materials and electricity; and energy efficiency in the management, acquisition and use of motor vehicles. The guidance is to be published as a DoD Manual implementing DoD Instruction 4170.10, "Energy Management Policy" and a DoD Regulation delineating authorities and responsibilities concerning DoD-owned or leased motor vehicles in DoD Directive 4500.36, "Management, Acquisition and Use of Motor Vehicles." These issuances will be consistent with the Federal Property Management Regulation Temporary Regulation G-56, "Federal Energy Management for Motor Vehicles," GSA, Federal Register, Volume 57, Number 199, October 22, 1992, which is GSA's guidance to Federal agencies responsible to implement Section 10 of Executive Order 12759.

OUSD(A&T) forwarded DoD's FY 1993-1997 AFV requirements to DOE on June 11, 1992, in accordance with DOE's draft guidance implementing Section 11 of Executive Order 12759. In its submission to DoE, OUSD(A&T) estimated DoD's AFV requirements, as follows:

DoD Alternative Fueled Vehicle Requirements

FY 1993	FY 1994	FY 1995	FY 1996	FY 1997
2,005	1,809	2,304	2,776	3,849

This projection of DoD's AFV requirements reflected the following considerations:

- Acquisition of motor vehicles assumes funding levels reflected in the President's FY 1993 Budget;
- Acquisition of AFVs is subject to the availability of appropriations for that purpose; and
- Projections reflect acquisition of AFVs from original automotive equipment manufacturers as well as conversions of conventionally fueled vehicles to AFVS.

Ridesharing and related programs are underway or being developed for most major DoD installations. Army Ridesharing and employee outreach programs were promoted in the Energy Coordinator course taught at the Army Logistics Management College, Fort Lee, VA, as well as various Army publications, such as the Army Energy Planning Guide. Army Energy Awareness Seminars also provide information on the benefits to the environment as potential energy savings. The revised AR 11-27 (Army Energy Program) outlines the procedures for implementing a ride sharing program.

The Navy policy on ridesharing and employee awareness outreach programs to reduce petroleum fuel usage by Federal employees is contained in OPNAV Instruction 5560.11A. Marine Corps Order (MCO) P11000.9C, promulgated in November 1991, addresses ridesharing and ride-matching. It requires Marine Corps installations to promote ridesharing programs to include appointment of employee coordinators and recognition for accomplishments. WHS established a ridesharing program which is periodically described in various Building Circulars, informing employees of the program and encouraging them to participate. Ridesharing was promoted at Headquarters DeCA by providing parking priority to van and car pool vehicles and through host installation awareness programs. The DLA actively promotes ridesharing and employee outreach programs. Policy guidance is contained in DLAR 4165.14, Personnel Parking Program. Both DMA Centers have ridesharing programs in place. Additionally, there are reserved parking spaces located close to DMA buildings for carpools, however, carpooling is hindered at many locations due to extensive use of flextime and compressed work schedules.

Environmental Benefits

The Marine Corps has taken positive steps to address the environmental impact of energy use. One benefit is greater environmental awareness on the part of energy management and operating and maintenance personnel. This resulted from a focus on improved disposal of environmentally harmful products, improved fuel management leading to decreased emissions, and efforts to achieve greater capture of CFC refrigerant gases. Improved fuel management, such as switching to more environmentally friendly natural gas from fuel oil and coal, has also produced greater heating plant operating efficiencies and reduced the cost of operation.

Managers now incorporate the costs of environmental compliance in the required life-cycle cost analysis for energy conservation design decisions. Additional costs are being reported due to the lower efficiency of replacement refrigerants now being introduced in air-conditioning equipment.

DeCA developed plans to reclaim, recycle, reuse, and maintain CFC stockpiles. Presently, DeCA's maintenance contractors recover and reclaim CFCs when commissaries close. Systems using Class I (CFC-12 and R-502) refrigerants will be retrofitted to eliminate the

CFC requirement no later than December 31, 1996. Class II (HCFC-22) refrigerants will be phased out by 2005. DECA proposes continued use of commercial firms to recover Class I and II refrigerants. If the proposal is approved, the DECA vendor will pick up, reclaim and recycle, and bank the refrigerants for future use. All new DECA refrigeration systems will use R-134a for medium temperature systems and HCFC-22 for low temperature systems. All new refrigeration systems installed after October 1, 1992, will have non-mineral oil lubricants, as recommended by the compressor manufacturers for use with R-134a and HCFC-22. (HCFC-22 will continue to be used until SUVA HP62 is economically available.) During 1993 through 1995, all R-12 used in medium temperature applications in existing stores will be replaced with R-134a. By the end of 1995, the remaining R-12 and all R-502 systems will be replaced by HCFC-22 or SUVA HP62. The R-502 and R-12 released by the program will be recovered, reclaimed, and banked for future use or resale. DECA proposed procedures would have emergency supplies of refrigerant strategically located and secured at commissaries throughout the continental U.S. Refrigerants would be used when regional maintenance contractors were unable to obtain refrigerants on a reimbursable basis only. The same procedure would apply overseas, except that the refrigerant would be made available to installations only when not locally available or reasonably priced.

D. Department of Energy (DOE)

Performance and Conservation Activities

During FY 1992, the Department of Energy reported a 20.6 percent reduction in buildings consumption in Btu per gross square foot compared to FY 1985.

Measures to improve operations and maintenance procedures throughout DOE have been implemented primarily through the publication and use of energy conservation guidelines, how-to manuals, training programs for operating and administrative personnel, and employee awareness programs. Procedures include improved preventive maintenance and routine maintenance techniques for maximum energy efficiency. Efforts such as steam trap maintenance programs, energy-conscious thermostat settings, and delamping and relamping of lighting fixtures continued to produce energy savings. Also, the installation of a number of

Energy Monitoring and Control Systems at major DOE complexes have improved building operations. These systems automatically monitor and control building energy use patterns.

The DOE Headquarters In-House Energy Management (IHEM) Program conducted boiler efficiency improvement training at three sites in FY 1992. The program consists of 4 days of both classroom and in-plant, hands-on training in boiler tuneup procedures, and the efficient operation of central heating plants. Steam trap training is also included in the program scope. This portion of the program provides training in the latest steam trap technology and design, physical inspection of the site steam traps and an analysis of savings obtainable from correction of deficiencies, and an evaluation of site steam and maintenance programs. The anticipated annual savings from this program, if all recommendations in FY 1992 are implemented, is \$1.1 million.

The IHEM Program also conducted training at seven sites during FY 1992 as part of its Heating, Ventilating, and Air-Conditioning Efficiency Improvement Program. The program consists of 10 hours of classroom training and 10 hours of in-plant, hands-on training in testing system operation and making adjustments to improve efficiency. A report was prepared which identifies retrofits to improve operating efficiency. The anticipated annual savings from this program, if all recommendations in FY 1992 are implemented, is almost \$4.5 million. Of this total, \$3.7 million is from refrigerant savings at the Portsmouth Gaseous Diffusion Plant in Piketon, OH.

DOE funded studies at some of its sites to develop specifications to ensure the purchase of the most life-cycle cost-effective (LCC) products being used for replacement items. DOE requires, through its General Design Criteria, the selection of energy-consuming equipment to be based on LCC procedures.

DOE Notice 4330.3, Energy Efficiency, requires that program secretarial officers ensure that their sites implement ridesharing and employee awareness programs. Employee awareness and ridesharing have long been a part of DOE's IHEM Program at most, if not all, sites.

Implementation Plans

The existing energy efficiency goals stated in the October 1985 *DOE Ten-Year In-House Energy Management Plan* were modified to include the new goals stated in Executive Order 12759, and those listed in DOE Notice 4330.3 Energy Efficiency, dated September 16, 1991. DOE Order 4330.2D, In-House Energy Management, of May 18, 1992, is being revised to reflect those changes.

Program secretarial officers shall, in accordance with DOE Notice 4330.3, ensure that DOE sites and facilities under their cognizance develop plans under which overall energy use is reduced in buildings through FY 2000 in accordance with Section 1 of Executive Order 12759. It is also required under Section 2 of the Executive Order that plans are developed so that metered process facilities in the aggregate increase energy efficiency by at least 20 percent in FY 2000, in comparison to FY 1985. Program secretarial offices shall also ensure that DOE sites and facilities establish appropriate indicators of energy efficiency to comply with this section (e.g., energy used per hour of accelerator operation).

The updated In-House Energy Management Program is structured to include the following 13 program elements, which collectively contribute to the achievement of energy conservation goals:

- development of energy efficiency criteria;
- review of site master plans for energy management;
- energy-efficiency survey and evaluation activities for existing DOE buildings and processes;
- retrofit activities for DOE facilities;
- development and evaluation of new buildings design criteria;
- activities undertaken to make existing and new central heating and cooling plants more energy-efficient;
- energy awareness programs;
- driver energy conservation awareness training, ridesharing programs, alternative fuel vehicle programs, and energy-efficient vehicle acquisition assistance;
- third-party financing activities;
- review and improvement of utility contracts;
- metering efforts in major DOE buildings and facilities;
- reporting and program assessment; and
- contingency plans for reducing individual fuel sources by 10, 15, and 20 percent.

In order to meet the goals of Executive Order 12759, energy efficiency surveys and central plant studies will be necessary to identify retrofit projects for existing facilities. Funds are available through the In-House Energy Management Program for these surveys and studies.

Each DOE site has developed and implemented a comprehensive energy conservation program and a Ten-Year Plan modeled on the In-House Energy Management Program to achieve the 10 and 20 percent reduction goals for buildings energy, metered process energy, and vehicles and equipment energy consumption. DOE Notice 4330.3, instructs all DOE sites to update energy management plans and submit them with their annual report on In-House Energy Management. Each site must annually submit energy conservation retrofit projects with a payback of 10 years or less to the In-House Energy Management Branch. Also, DOE sites must reduce motor vehicle gasoline and diesel consumption by at least 10 percent by FY 1995 in comparison with FY 1991. Each site electing to use alternative fuel vehicles shall receive credit for such use under the present DOE reporting system.

Newly constructed DOE buildings, for which design was initiated after July 31, 1989, are required to comply with Title 10, Code of Federal Regulations Part 435, Performance Standards for New Commercial and Multi-Family High Rise Residential Buildings. DOE is preparing an energy conservation manual to assist designers in complying with these requirements.

Funding

At DOE, funding for energy surveys in DOE buildings and processes amounted to \$3.6 million in FY 1992, with a total expenditure of \$36.8 million since FY 1978. Also during FY 1992, DOE invested \$17.7 million in 68 retrofit projects in building and metered process facilities. The anticipated savings in DOE facilities from the FY 1992 IHEM-funded retrofit

program is 325 billion Btus. Since the beginning of the retrofit program in FY 1977, 934 projects costing \$245.8 million were funded to reduce energy consumption and costs in buildings and metered process. The funded projects have a projected annual savings of 35.4 trillion Btus and \$91.8 million. These savings represent a 2 to 3-year payback. DOE's building retrofit projects have generally involved the installation of energy monitoring and control systems, mechanical equipment, and boilers; improvements in electric lighting and power systems; and the addition of building insulation and storm windows. The proposed budgeted level of expenditures for retrofits for FY 1993, is approximately \$17.0 million.

Shared Energy Savings

DOE's first shared energy savings contract was signed at Lawrence Berkeley Laboratory during FY 1992. For this contract, extensive submetering was conducted within the building to characterize the energy consumption of major components. This submetering will be continued throughout the contract term to verify the energy and cost savings.

By the end of FY 1992, no savings had yet been achieved under shared energy savings contracts. DOE polled its sites and has determined that no specific procedures should be established to set aside the cost savings from SES contracts. The best incentive is that the savings be used to conduct further energy savings opportunities and research at the site.

Demand Side Management

Electric service rebates were received by DOE sites as incentives to undertake energy conservation projects. These DOE sites received rebate checks from their respective utilities and returned these funds back to the accounts from which the original payments were made.

DOE forwarded a memorandum to all sites initiating a DOE Demand-Side Management Program providing information concerning utility company programs and encouraging DSM activities. DOE has been integrating DSM into its In-House Energy Management and Public Utilities Programs. Actions include the review of utility contracts and possible rate interventions. DSM activities through FY 1992 saved 30 million kWh of electricity and approximately \$1.3 million.

Vehicles

To meet the energy conservation goals under Section 10 of Executive Order 12759 for minimizing the use of petroleum products and decreasing gasoline and diesel fuel consumption by 10 percent by FY 1995, DOE implemented a transportation program at its sites that includes acquiring more energy-efficient vehicles and alternative fuel vehicles, using alternative fuels where cost-effective, and providing driver awareness training and employee outreach.

Fleet vehicles in a number of locations were, or will soon be, converted from gasoline to gasohol-powered engines. Liquefied petroleum gas, compressed natural gas, and electric vehicles are some of the possible alternative fuels being used by DOE sites. Vehicle conversions are being implemented at 17 DOE sites.

DOE actively promotes the acquisition of AFVs. In FY 1992, DOE acquired a total of 125 AFVs. This total consists of 61 trucks, 35 utility vehicles, 26 vans, and 3 sedans. DOE

Notice 4330.3, Energy Efficiency, states that the maximum practicable number of AFVs, produced by original equipment vehicle manufacturers, be acquired by the end of model year 1995. The goal is to have AFVs comprise 30 percent, 40 percent, and 50 percent of new light duty vehicle acquisitions for FY 1996, FY 1997, and FY 1998, respectively. The availability of alternative fuels and their cost will be limiting factors controlling the acquisition of AFVs.

E. Department of Health and Human Services (HHS)

Performance and Conservation Activities

The Department of Health and Human Services reported an 11.6 percent reduction in buildings consumption in Btu per gross square foot in FY 1992 when compared to FY 1985.

During FY 1992, the Department of Health and Human Services 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. Significant energy reduction for buildings in these categories is difficult because the energy consumed is more for process load and less building/environmental load. During FY 1992, HHS continued the successful implementation of many no-cost and low-cost energy conservation measures. All facilities will be surveyed to identify buildings that can be converted to dual fuel or alternative fuel facilities. Where possible, buildings will be converted from petroleum fuel products. Obsolete PCB-containing fluorescent ballasts are being removed from the Hubert H. Humphrey Building in large quantities and are being shipped to an approved dump site.

In FY 1992, the Social Security Administration (SSA) installed motion sensors, energy-efficient motors, revolving doors, and compact fluorescent lamps in various buildings to reduce energy consumption. Also, SSA saved an estimated \$43,600 in electric and gas expenditures at its Main Complex by closing an unnecessary electric vault exhaust fan. At the SSA Headquarters Complex, an employee energy efficiency campaign is underway. The campaign includes articles in a monthly bulletin to explain SSA's energy conservation strategies and examples of how employees can participate. SSA has an outreach team which periodically visits delegated buildings to assist on-site personnel with energy conservation measures. Furthermore, SSA continues to maintain 10-foot candles in non-work areas, maintain hot water at 105 degrees at the first faucet from the source, and turn off equipment during non-work hours.

The SSA Mid-Atlantic Program Service Center performed retrofits which installed new lamps, electronic ballasts, and reflectors into existing fixtures; and an energy management control system, a small boiler, and fixed solar screens were installed. The Albuquerque Data Operations Center installed motion sensors and adjusted refrigeration and air-conditioning compressors for timed start-up to prevent compressors from starting at the same time, thus avoiding peak electrical demand charges. Also, energy-efficient lamps were purchased and will be used with the purchase of electronic ballasts in FY 1993. The Western Program Service Center began the process of installing motion sensors in various locations throughout

the building, which will continue as lighting circuits are separated and more areas become available for retrofit.

In FY 1992, the Public Health Service (PHS) conducted the following activities:

- replaced existing chillers and other building service equipment with more energy-efficient models as part of regular upgrading;
- replaced older buildings with new ones that have a strong design emphasis on energy efficiency;
- installed thermal energy storage facilities and cogeneration equipment as part of major infrastructure renovations;
- upgraded building control systems for more efficient operation;
- insulated attics and crawl spaces and used insulation-type roofing material when possible;
- shut down air-conditioning during unoccupied hours;
- reduced hot water temperature; and
- installed storm windows and doors in several buildings.

At the Office of the Secretary of Health and Human Services, the following energy conservation activities have taken place in FY 1992:

- Began installation of a sprinkler system in the Hubert H. Humphrey (HHH) Building, which has provided the opportunity to reduce the volume of conditioned air by replacing the original pyramid style ceiling with a flat, drop-in style.
- New lighting systems have been installed which use electronic versus PCB ballasts and 32-watt versus 40-watt fluorescent tubes.
- New, energy-efficient, water flow valves were installed in the HHH Building.
- "Free cooling" is used whenever outside air temperatures permit to avoid the need for chiller operations when indoor air temperature is high.

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 (FPMR) for heating, cooling, and lighting. Recommended measures to lessors include maintaining building temperatures in accordance with FPMR, insulating bare heating and hot water pipes, replacing worn boiler controls, installing or replacing steam traps, installing energy recovery equipment, replacing inefficient air-conditioners and reducing lighting levels. Additionally, HCFA has an Employee Transportation Coordinator to handle ridesharing, mass transit, and other commuter service programs.

HHS has an active ridesharing program. Ridesharing activities are reported separately under requirements of the Federal Property Management Regulations.

Implementation Plans

HHS has had an energy conservation plan in effect since 1980. Under the provisions of this plan, all components of the Department are required to develop an annual report which reflects their efforts toward compliance with the National Energy Conservation Policy Act. HHS is currently working with its Operating Divisions—Social Security Administration, Public Health Service, Health Care Financing Administration, and Office of the Secretary—to

establish a viable implementation plan consistent with the provisions of E.O. 12759. Strategies include the procurement of energy-efficient goods, inclusion of energy guidelines in new construction, participation in shared energy savings and demand side management services, and a common sense approach to energy conservation.

Funding

HHS components are developing plans for funding energy conservation projects. For example, SSA received nearly \$2.8 million from the GSA fund for financing energy reduction projects, which was been used to fund many FY 1992 projects. A decision was made to direct all components to prioritize energy-efficient investments according to their savings-to-investment ratios.

Shared Energy Savings

SSA initiated efforts to establish a shared energy savings project that will allow for lighting upgrades at its headquarters office. The local utility company, Baltimore Gas and Electric (BG&E), made an offer to finance the entire lighting retrofit at SSA Headquarters without interest. Negotiations for this project are at the initial stages.

Public Health Service reported that a significant percentage of its facilities are possibly facing major changes in function (e.g., from offices to laboratories) due to evolving agency missions. Many of the remaining facilities are scheduled or proposed for renovation or replacement due to age or increasing demand on the facilities. As a result, energy conservation planning was included with retrofit or renovation projects and is not considered as a long term SES activity.

Demand Side Management

All of the HHS Operating Divisions review programs available to them through their local utility companies and are developing procedures to participate in these programs where feasible. Both PHS and SSA are participating or are in the planning stages of taking advantage of DSM programs.

Even though no tabulation was compiled in FY 1992, for many years PHS's larger installations such as the National Institutes of Health and the Centers for Disease Control continue to work 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 electric rate.

As reported last year, SSA Headquarters is continuing to work with the local utility company, BG&E, to receive credits on its utility bills when SSA generates its own power. BG&E intends to install the necessary cable and switch gear to allow SSA to power the Main Complex from SSA's National Computer Center, which generates its own power. This program is designed to reduce the load on BG&E's power grid during summer peak demand periods. The costs associated with this program will be borne by BG&E, and SSA will receive credits in the form of rebates for the life of the contract.

SSA installed water meters on all cooling towers make up lines at its Headquarters buildings. SSA receives a credit at the end of the year on its sewer bill for water used in the cooling towers. To date in FY 1993, SSA has earned a \$44,983 savings credit on the sewer bill.

F. Department of Housing and Urban Development (HUD)

Performance and Conservation Activities

During FY 1992, the Department of Housing and Urban Development reported a 7.8 percent increase in buildings consumption in Btu per gross square foot compared to FY 1985.

In an effort to meet the goals and objectives of Executive Order 12759 in FY 1992, HUD has implemented the following energy efficiency initiatives:

- installed energy-efficient overhead lighting fixtures in the remaining 40 percent of office space, corridors, and elevator lobbies throughout the building (funded by GSA as part of the Sprinkler Installation Project);
- installed motion sensors in all elevator freight lobbies to turn lights on and off as necessary (funded by HUD);
- installed LED lights in all exit signs throughout the building (funded by HUD);
- installing variable speed motors and frequency inverters on all major air handling units, a project which will be completed in FY 1993 (funded by GSA);
- installing separate second floor fan coil unit heating system, separating it from the main building heating system, a project which will also be completed in FY 1993 (funded by GSA); and
- relocated 70 percent of its Computer Center to an off-site facility.

Energy savings initiatives to be implemented at the HUD headquarters building during FY 1993 include overhead lighting replacement in the penthouse, basement, and sub-basement with T-8 fixtures (funded by GSA).

Implementation Plans

HUD developed an energy management plan to promote energy efficiency and to achieve the Executive Order 12759 goal for FY 2000. HUD follows the operations and maintenance procedures as outlined in GSA's Building Maintenance Management Handbook, PBS P 5850.1B, and Energy Management Handbook, PBS P 5800.35. The handbooks are used to implement the rules and regulations for Federal energy and property management.

Funding

HUD uses a 3-year planning cycle to ensure sound engineering and budgeting for energy conservation projects. HUD participated in GSA's energy conservation program. Other energy projects not funded by GSA are funded through HUD's Building Delegation Repair and Alteration Fund.

Demand Side Management

HUD continues to participate in demand side management programs with Potomac Electric Power Company. HUD took part in Potomac Electric Power Company's Electrical Load Curtailment Program in order to maintain building demand at a predetermined level.

Vehicles

HUD has submitted its Fuel Reduction Plan to DOE. HUD began its efforts to meet the 10 percent reduction goals by downsizing the Headquarters motor fleet by 50 percent. Additionally, HUD plans the following steps to meet the 1995 fuel usage goal:

- issue GSA's 12-point fuel reduction tips, including following the manufacturer's recommended schedule for tune-ups;
- implement a system to monitor the monthly status of vehicles to ensure that energy conservation methods are being used at HUD headquarters;
- switch to methanol-fueled vehicles as follows: 5 in 1993; 30 in 1994; 30 in 1995;
- streamline HUD's vehicle fleet to reduce quantity and possibly engine size; and
- coordinate field activities so that directional trips and/or travelers go at the same time.

Currently, the Department's fleet consists entirely of gasoline-operated vehicles.

G. Department of the Interior (DOI)**Performance and Conservation Activities**

During FY 1992, the Department of the Interior reported a 5.3 percent reduction in buildings consumption in Btu per gross square foot compared to FY 1985.

The Interior Department's energy management strategy has been to heighten the awareness of energy conservation management. DOI's Executive Energy Conservation Council (EECC), meeting as a group and one-on-one with the Director, Office of Acquisition and Property Management, demonstrated the emphasis that DOI has placed on energy management. The group meeting allowed for the dissemination of relevant information and emphasis on increased management awareness of the energy management program. The bureaus were reintroduced to computer programs, training courses, and other tools available on energy management. Additional bureau strategies included continuation of contacts with local utilities for demand side management assistance, contact with DOE for technical assistance, increased energy awareness programs, and surveying buildings for identification of energy conservation measures and fuel switching potential.

Examples of Interior Department facilities which have reduced consumption, costs, and petroleum use include the Bureau of Mines Rolla Research Center, which has insulated buildings, installed a new boiler in one building and incorporated propane to heat various areas of the center. The research center is one of only three Bureau of Mines facilities that uses fuel oil. At the Bureau's Alaska Field Operations Center, new steam lines insulated with non-asbestos insulation, replacement of leaking zone valves and gaskets, and splitting one building into two heating zones reduced fuel oil consumption by one-third since FY 1985. The Bureau of Mines Twin Cities Research Center has dual fuel capability—interruptible natural gas and fuel oil. In FY 1992, the gas company required the center to use fuel oil for a short period of time. Dual fuel capability (natural gas and coal) at the Bureau's Pittsburgh Research Center has allowed for reduction in the use of natural gas by switching to coal for the steam boilers. Dual fuel capability also exists at the Salt Lake Research Center (solar and fuel oil).

Factors causing increased use of petroleum fuels include the demand for buildings to be open for longer periods during the day and night, including weekends, and the increased use of electrical devices. DOI land acquisitions may include buildings that are not energy-efficient.

The Bureau of Reclamation focused on lighting retrofits and installed an energy management control system at Lake Mead, NV.

Previously instituted awareness programs were continued. Through an energy-notice program, which involves random surveys and scheduled inspections, building occupants receive written notification when energy-consuming equipment such as lights, radios, and fans have not been turned off.

The Department began establishing procedures to assure compliance with energy performance standards and a certification process to assure an energy review of all major new construction. Bureaus were notified in meetings and through memoranda that the current regulations need to be upheld for management of buildings and facilities.

Recycling programs are in effect in many bureaus. Recycling has proven to be an effective way to reduce energy use, though quantifying the savings directly attributable to Federal buildings is difficult. DOI also has a computerized ridesharing program.

Implementation Plans

In July 1992, the Department submitted to DOE an Energy Management Plan for Buildings and Facilities. The goals of the plan include more efficient use of energy in Federal buildings and facilities by FY 2000, minimization of petroleum use, and procurement of energy-efficient goods.

The EECC, consisting of bureau management representatives, was extensively involved in the development of the Plan. The EECC heightened awareness of energy management, ensured an overall effort for energy management in the bureaus, and worked in concert with the previously-established Departmental Energy Conservation Committee.

Funding

The Department reinforced the requirement for funding for energy conservation management by working with the bureau budget offices and energy management offices to ascertain full time employee and budget estimates for specific requirements in Executive Order 12759. In FY 1992, \$9.8 million was spent for energy conservation management.

Shared Energy Savings

DOI's procurement offices, architect and engineering divisions, and facility managers are the management structure for implementing shared energy savings contracts. They are expected to assist each other in specifying the requirements of projects, qualifying contractors, and awarding contracts. Presently, there are no SES contracts in place, so procedures for utilizing cost savings have not been developed.

Problems identified at the Interior Department in implementing SES contracts include a 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. Such buildings, obviously, have low potential for SES contracts.

Demand Side Management

Participation in demand side management programs, initiated in previous years, continued in FY 1992. The Bureau of Mines Pittsburgh Research Center negotiated a DSM contract for the purchase of natural gas directly from the supplier instead of through the gas utility company.

At North Cascades National Park, WA, the Seattle City Light Company offered \$7,000 for lighting retrofit projects, and an unspecified amount of rebates have been offered by the Clallam County Public Utilities District and Port Angeles City Light Company for facility retrofit projects at Olympic National Park, WA. Additionally, DOI distributed literature on rebate programs and other services offered by utility companies.

Vehicles

In FY 1991, the Secretary of the Interior issued a policy statement requiring the use of blended gasoline (ethanol and methyl tertiary butyl ether) when such fuels are available and reasonably priced. In FY 1992, DOI continued to direct and oversee the implementation of the AFV program. Interior's Department-wide initiatives in conjunction with the Alternative Fuels Task Force and interagency INTERFUEL working group include the following:

- coordinated with other Federal agencies, utilities, auto manufacturers, and bureaus to place AFVs, address infrastructure support, and minimize the impact of range and mechanical problems with vehicles received from the original equipment manufacturers;
- provided guidance to bureaus on setting goals for compressed natural gas (CNG) vehicles, placing CNG vehicles, and preparing vehicle energy reduction plans and 5-year AFV acquisition plans;
- obtained a commitment by GSA to provide CNG vehicles to the DOI fleet, enabling DOI to surpass the Secretary of the Interior's FY 1992 goal of placing 100 CNG vehicles in the fleet;
- arranged delivery of the first of DOI's CNG vans and helped coordinate and plan the resulting ceremony involving the Secretary of the Interior, the Secretary of Energy, and the GSA Administrator;
- negotiated agreements with Washington Gas and Light Company to provide DOI with CNG fueling facilities in Washington, DC, and Reston, VA; and
- initiated planning for introducing several thousand AFVs into DOI's fleet by the year 2000.

H. Department of Justice (DOJ)

Performance and Conservation Activities

During FY 1992, the Department of Justice reported a 53.8 percent reduction in buildings consumption in Btu per gross square foot compared to FY 1985.

Within the Justice Department during FY 1992, the Drug Enforcement Administration (DEA) reinforced a strict prohibition of all portable heaters and fans as required by existing energy management guidelines. Plans were developed for FY 1993 and FY 1994 activities. In FY 1993, DEA plans to survey and remedy the existing problem relative to positive air pressure in the main lobbies of both Lincoln Place buildings in Arlington, VA. DEA will also repair and enhance the automated energy management system at the Lincoln Place facilities. The DEA expects that upon completion of these two energy management initiatives, energy savings goals for FY 1993 will be easily achievable. Moreover, the commercial facilities management contractor at Lincoln Place will be requested to explore the feasibility of implementing shared energy management initiatives during FY 1993 and FY 1994.

In FY 1992, the Federal Bureau of Investigation (FBI) replaced all standard fluorescent lighting ballasts that failed with more efficient hybrid-type ballasts. Compact fluorescent lamps were used to replace less efficient incandescent lamps. Current limiters were installed on 110 hallway fluorescent fixtures, resulting in an annual reduction of 57,250 kWh in energy consumption. The cafeteria incandescent lighting system was replaced with fluorescent lighting, which will save 19,000 kWh annually.

The FBI is working closely with an architect and engineering firm to design the new Identification Division facility in West Virginia. Many energy-efficient concepts have been included in the design of this facility. The design of the new Washington Field Office will be undertaken with a similar emphasis on energy efficiency. Additionally, this project will be included in Potomac Electric Power Company's efficient new building program.

Upgrades and retrofits planned for FY 1993 at the FBI include the following:

- Occupancy sensors will be installed in private offices and break rooms to turn off lights when not in use.
- The remaining 20 percent of standard exit signs will be replaced with high efficiency LED type signs.
- Plans are being developed to install an automated building management system which will allow more efficient cycling of equipment and load shedding during peak electric use periods. This project is dependent upon availability of GSA funds.
- Interior perimeter building lighting that is centrally controlled will be curtailed beyond normal working hours. This will result in an annual reduction in energy consumption of 1,500 mWh.
- Fluorescent lighting in the underground parking garage will be replaced with high pressure sodium lighting. This will result in an annual reduction in energy consumption of 700 mWh. This project also is dependent on GSA funding.
- The bureau will participate in demand side management services.

As funds become available, facilities using coal and oil are converting to natural gas.

DOJ procures goods and products in accordance with current Federal Acquisition Regulations and General Services Administration (GSA) supply/service regulations, policies and guidelines. DOJ regularly receives GSA and commercial vendor literature and product catalogs which contain energy-efficient goods and products.

DOJ has a computerized program which provides ridesharing information to assist personnel in obtaining a carpool/vanpool and has joined the Washington Metropolitan Council of Governments network to expand and enhance the ridesharing effort. DOJ provides a number of subsidized parking spaces to qualifying carpools and vanpools to promote ridesharing.

Implementation Plans

DOJ is revising its energy management and conservation plan required by Section 543 (b)(1) of NECPA to include the requirements of the Energy Policy Act of 1992. Each bureau will be required to update its energy management plan.

Funding

Funding requests for energy conservation retrofits and capital equipment requirements are included in DOJ's budget process. Projects are prioritized in order of emergency, life and fire safety, mission, operational or maintenance necessity, and other factors. Consideration is given to life-cycle cost effectiveness, equipment condition, savings-to-investment ratio, and initial costs.

During FY 1992, DEA expended \$24,471 on 10 energy savings projects. Nine of these projects were for energy-efficient light fixtures and/or lamps that replaced incandescent bulbs in public spaces such as restrooms, lobbies, and perimeter exterior lighting. The tenth project involved the replacement of three backdraft dampers, which are an integral part of the buildings' supply air systems. The expenditure of \$24,471 represented 21 percent of funds that were allocated by GSA during FY 1991 for repairs at the Lincoln Place facilities. Total funds transferred by GSA for repairs totalled \$116,190 during FY 1992.

The DOJ Headquarters received funding for lighting retrofit projects from GSA for FY 1993 for public space efficiency upgrades in the Main Justice and Home Owners Loan Corporation buildings. These projects are prioritized by the savings-to-investment ratio.

Shared Energy Savings

In FY 1992, the Bureau of Prisons planned to implement two SES contracts; however, in both cases the contractors elected not to proceed with the contracts and they were not awarded.

Demand Side Management

The FBI Headquarters and the Main Justice Building currently participate in PEPCO's load curtailment program, and both are actively involved in PEPCO's rebate program. DOJ Headquarters has actively pursued PEPCO's rebate program in the National Capitol Region. Energy savings initiatives in the Main Justice Building have included:

- Replacement of thirty-two 75-watt incandescent lamps with 17-watt fluorescent bulbs, realizing an electrical savings of \$560 per year and a PEPCO rebate of \$336;
- Replacement of 486 100-watt incandescent lamps with 27-watt fluorescent bulbs: it is estimated that an electrical savings of \$14,349 per year will be realized with a PEPCO rebate of \$5,928; and
- Establishment of a pilot program to test the operations of infrared automatic light switches in selected locations. To date, this program has been a success, and these devices will now be installed throughout both the Main Justice and Home Owners

Loan Corporation Buildings. A PEPCO rebate will pay for nearly 100 percent of the purchase and installation costs, and substantial energy savings will begin immediately.

Vehicles

The DOJ vehicle fleet is exempt from the requirements of Section 10 of Executive Order 12759. A separate annual plan related to this section will not be provided by DOJ. DOJ will, however, continue to collect and report quarterly and annual vehicle fuel consumption data as in the past. In addition, DOJ will continue to promote energy-efficient vehicle usage and the use of alternative fuels such as gasohol, when and where available.

The FBI also has integrated, through normal passenger-carrying vehicle replacement cycles, the use of front wheel drive vehicles for the last five years. Approximately 80 percent of the fleet is now front wheel drive. These vehicles have provided the FBI with the required response capabilities while improving fuel efficiency.

The DOJ vehicle fleet is also exempt from Section 11 of Executive Order 12759. Nevertheless, the FBI has completed a pilot program to test vehicles fueled with a propane gasoline mixture; however, the four test vehicles converted have produced unsatisfactory results. In FY 1993, the FBI will work with DOE to convert approximately 10 vehicles to compressed natural gas.

I. Department of Labor (DOL)

Performance and Conservation Activities

In FY 1992, the Department of Labor reported a 3.0 percent increase in buildings consumption in Btu per gross square foot compared to FY 1985.

The component agencies within the DOL 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, WV, and the Approval and Certification Center in Triadelphia, WV.

Job Corps holdings include 108 complexes located in 42 states, the District of Columbia, and Puerto Rico. Thirty of these are Civilian Conservation Centers (CCCs) which are operated for DOL by the Departments of the Interior and Agriculture. The CCCs are included in the energy management programs of the Interior and Agriculture. Approximately 49 percent of the units were constructed before the end of World War II, and another 34 percent were built during or before the energy crisis of 1974. More than 80 percent of all JCC facilities did not include energy-efficient construction techniques in the building design.

Recognizing the need to improve energy efficiency, JCC completed several energy consumption retrofits. A partial list of these retrofits includes: roof insulation upgrades; window replacement, upgrade, and/or repair; and heating, ventilation, and air conditioning replacements with energy-efficient models. These types of upgrades are completed routinely as a part of improved facility maintenance.

The savings produced by energy-efficient retrofits, however, are often negated by the addition of quality of life amenities and mission-related equipment. These include "energy-hogs" such as air conditioning and the addition of computer-based learning equipment. The scope and composition of JCC facilities will soon change significantly because JCC is embarking on a sizeable replacement and expansion program. Twelve new centers are now in the design or construction phase, and a solicitation for four additional centers is in progress. Furthermore, recent legislation calls for 50 additional JCCs. These newly-constructed facilities will meet the energy savings standards specified in ASHRAE Standard 90.1-1989. Consequently, increasing the quantity of energy-efficient structures will necessarily reduce the overall energy consumption of JCCs per gross square foot.

The energy management program for FPB is implemented by a team composed of the Departmental Energy Manager, Chief Engineer, Building Manager, and the Director of Facilities Management. The Energy Management Team jointly develops and implements the energy conservation strategy for the building. Since 1983, the Team has implemented a wide variety of energy conservation retrofits, which include the installation of solar film, isolation and vestibule doors, motion sensors in all corridors and restrooms, replacement of antiquated auxiliary air conditioning units with glycol-based models, and tenant awareness programs. The Team estimates that, without adjusting for operational or rate changes over time, the actual energy consumed at FPB was reduced by approximately 10 billion Btu since FY 1985, as a result of energy reduction retrofits. Even so, FY 1992 consumption is up 28.2 percent as compared with FY 1985. However, without an active energy reduction program, energy consumption at FPB would be even higher.

The increase of energy consumption overall in FPB between FY 1985 and 1989 is partially attributable to: the installation of auxiliary air conditioning for computer rooms; the increased use of computer equipment; and the increased HVAC loads resulting from the addition of 786 employees to the building. Future energy conservation retrofits include relamping all office, corridor, and lobby areas to energy-efficient lamps, ballasts, and reflectors; and installing motion sensors in areas such as conference rooms and the library stacks. These projects are currently scheduled to begin in FY 1993, even though they are still in the design stage.

MSHA's Training Academy complex in Beckley, WV, is comprised of seven buildings which total 350,000 gross square feet and are used as offices, classrooms, laboratories, dormitories, a cafeteria, resource learning center, auditorium, and gymnasium. Since 1985, the energy reduction program at Beckley has reaped an estimated annual savings of 2,567 million Btu of electricity (the only energy source at the Academy) for an annual cost savings of \$40,800.

The Academy completed a number of retrofits which include: energy-efficient lighting, occupancy sensors, and lighting timers; resized (smaller) transformers; and a thermal blanket to cover the swimming pool during the off-hours. The heart of the Beckley energy reduction strategy is the installation of a new energy management system, which includes five 30-kilowatt thermal storage units. The equipment is leased from a local vendor for an annual fixed fee; MSHA keeps all utility savings resulting from the system. MSHA currently plans to renew the option year for the current lease agreement (FY 1994) and will consider purchasing the system thereafter.

The Triadelphia energy reduction plan highlights an operations and maintenance contract for the facility. For a fixed annual fee, the contractor provides all routine, preventive, and emergency maintenance services and replaces the equipment with energy-efficient models (except chillers), as required, to reduce overall energy consumption. The focus of this program is on preventive and predictable maintenance to provide maximum operating efficiency. Twice yearly the condenser coils are cleaned and oil samples are drawn from the air condition compressors for computer analysis of performance. The Approval Center estimates that the building maintenance contract saved \$27,882 in electricity and \$3,828 in natural gas during FY 1992, and reduced overall energy consumption by 1,699.1 million Btu.

Additionally, Triadelphia has installed power factor correction capacitors in Buildings I and II to reduce the surcharge for low-power factors, and replaced a single, four-inch water meter with two, two-inch water meters to accurately record the quantity of water actually used. These retrofits save the Approval Center an additional 237.6 million Btu every year.

In accordance 41 C.F.R. Chapter 101-20.104, *et seq.*, as well as Section 9 of Executive Order 12759, the DOL Fuel Efficiency Outreach Program encompasses two ridesharing activities: the carpool locator and parking program. The carpool locator is found in the Employee Information Center in the FPB Cafeteria. The carpool locator is a large map of the Metropolitan region which is divided into smaller commuter zones. Advertisements soliciting riders for existing carpools are posted on the locator bulletin board; employees seeking to join a carpool can leave their name, office address, and work schedule information in the cubby hole provided for each commuter zone. Information for applying for a carpool parking permit in FPB is also available at the carpool locator.

The Office of Facilities Management (OFM), within the Directorate of Administrative and Procurement Programs, of the Office of the Assistant Secretary for Administration and Management, administers the parking program for the FPB garages. Parking permits are issued to employees according to GSA regulations, including those who are severely disabled, executive personnel working unusual hours, and carpools or vanpools. Carpool and vanpool permits are issued to employees in the vicinity of the headquarters building including the Departments of Labor and Justice, the Federal Trade Commission, and the U.S. Courts. Each year, OFM issues approximately 590 parking permits to carpools and vanpools.

Funding

DOL completed four retrofits during FY 1992, at a total cost of \$93,666. Of this total, 80 percent of all retrofits (\$75,336) was paid by Federal Government accounts, and 20 percent (\$18,330) was paid by the private sector. Since annual energy expenditures are expected to drop by \$104,400 as a result of these retrofit activities, these measures are cost beneficial. DOL will continue to fund energy conservation projects by using a combination of agency appropriations, GSA monies (for FPB only), and utility rebate programs.

Demand Side Management

An incandescent lighting retrofit for FPB was funded with both GSA monies and a rebate of \$18,330, from the Potomac Electric Power Company (PEPCO) as part of its DSM program. Seventy-five and 150-watt incandescent lamps were replaced with 13-watt compact fluorescent units in the elevator lobbies, Mezzanine, and Great Hall low ceiling areas. This

project also retrofitted 400-watt mercury vapor fixtures in the Third Street Underpass with 250-watt high pressure sodium units. A photo cell was also installed to reduce the burn-time of lighting units from 24 to 10 hours per day, depending upon the level of daylight. The project cost \$37,165, and annual energy savings are expected to reach \$45,000 annually. When the annual maintenance savings of \$31,700 is added, the cost benefit analysis produces a savings-to-investment ratio of 47.3, and the retrofit will save 2,007 kilowatts of electricity annually.

Vehicles

Overall, DOL's vehicle fuel consumption is down 3.3 percent as compared to base year 1991. The DOL vehicle fleet consists of 4,017 GSA Interagency Fleet Management System (IFMS) vehicles, an undetermined number of privately-owned vehicles, 161 agency-owned vehicles, 18 commercially-leased vehicles, and one alternative fuel vehicle. The quantity of vehicles in the DOL vehicle fleet has not significantly increased or decreased since FY 1991. DOL did not acquire or convert additional vehicles to alternative fuels during 1992.

The reduced consumption of gasoline is a result of GSA providing the Department with vehicles which get more miles-per-gallon of gasoline, as well as the Department's emphasis on the importance of employing the fuel-efficient driving techniques recommended by GSA in Temporary Regulation G-56. If these continue, DOL should meet the 10 percent reduction goal of Executive Order 12759.

In April 1991, DOL received an AFV which uses a combination of methanol and unleaded gasoline to test as a replacement for the existing fleet, as required by Section 11 of Executive Order 12759. This vehicle (a Ford Taurus) is part of the DOL Motor Pool, and as such, is driven by many different employees.

The optimum mixture of fuels recommended by Ford is 85 percent methanol and 15 percent gasoline, however, during 1991 and 1992, the AFV fuel mixture was about 65 percent methanol and 35 percent gasoline. In the Washington metropolitan area, there is only one methanol fueling site. While drivers from the Motor Pool refilled the vehicle with methanol routinely, other users did not, primarily because they were not in the vicinity of the methanol fueling site. During FY 1992, the AFV was driven 3,677 miles and actually consumed 217 gallons of methanol and 61 gallons of gasoline. Since DOL only had the AFV for 7 months in 1991, a comparison of usage between FY 1992 and the base year is not reasonable. Further, as instructed by 41 CFR Part 101-38, the reported consumption level (32.6 gallons or 4.1 million Btu) for the quantity of methanol consumed reflects the alternative fuel credit.

The Department expects to have considerably more experience with AFVs in future years as it obtains a greater number from the GSA Motor Pools.

J. Department of Transportation (DOT)

Performance and Conservation Activities

During FY 1992, the Department of Transportation reported a 9.7 percent reduction in buildings consumption in Btu per gross square foot compared to FY 1985.

Energy surveys and energy conservation measures which were identified and completed in FY 1992 are listed below:

- The United States Coast Guard (USCG) completed energy surveys on 483,458 square feet of space in FY 1992. An energy audit was also completed by the Research and Special Programs Administration at the 384,600 square foot Volpe National Transportation Systems Center.
- USCG installed 107 new gas and electric meters. Seven retrofit projects were completed by USCG at a cost of \$88,000, with an estimated annual savings of \$8,500.
- The Office of the Secretary (OST) replaced recessed incandescent lights in the elevator lobbies of the DOT Headquarters Nassif Building with compact fluorescent fixtures. OST also replaced all incandescent exit lights with LED lights. These two projects cost \$55,000, and will save \$35,000 annually. Also, with utility rebates, these projects have a payback of less than 1 year.
- OST has acquired FY 1993 funding through GSA to retrofit 13,500 existing fluorescent fixtures with T-8 lamps, electronic ballasts, and reflectors.
- The Federal Highway Administration has funded \$741,000, for energy-related building improvements during FY 1993.

Where practicable, facilities with access to natural gas are converting from fuel oil to gas or to dual fuel capability. Two major USCG facilities, the Support Center in Governor's Island, NY, and the Reserve Training Center in Yorktown, VA, are pursuing projects to convert from oil to natural gas. The Support Center in New York, has negotiated with Consolidated Edison and Brooklyn Union Gas Company to install a gas service main and distribution piping with an installation cost of \$3.5 million. The Support Center is converting 163 boilers to natural gas at a cost of \$1.5 million. The estimated annual reduction in fuel oil use is 2.1 million gallons. The Reserve Center in Yorktown will convert to natural gas use as soon as historical considerations are resolved. It appears that a new gas line will need to cross an historic battlefield.

A revised Transportation Acquisition Manual chapter has been drafted which requires the operating administrations within the Department to procure energy-efficient goods or products that are the most life-cycle cost effective.

DOT has an ongoing ridesharing program with a minimum occupancy requirement for a parking permit at Headquarters buildings. The Department also has an active transit benefit program with over 4,000 people participating at the three Headquarters buildings and 1,000 people at field locations. Over 100 parking permits have been terminated at Headquarters as a result of this program.

Implementation Plans

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 administration and consolidated for submission to the DOE. These plans were originally developed in compliance with Section 543(b)(1) of NECPA. DOT provided DOE with a revised Federal Energy Management Implementation Plan in July 1992, to incorporate the goals of Executive Order 12759. The plan addresses all elements of energy management. The Office of the Secretary is in the process of issuing a new energy policy document to be followed by a policy manual that will provide detailed guidance for implementing the Department's program.

DOT has already exceeded the FY 1995 goal of a 10 percent reduction in energy use as compared to the FY 1985 base year. Also, substantial progress has been made toward meeting the FY 2000 goal of a 20 percent reduction in energy use as compared to the FY 1985 base year.

Funding

An accurate identification of the total funding specifically dedicated to energy conservation measures is unavailable at this time. 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. Increased emphasis has been placed on the need to have energy conservation projects identified in the budget process for future years.

Shared Energy Savings

The implementation of SES contracts is decentralized within DOT. It is the responsibility of the individual operating administrations to develop and award SES contracts, and the management structure is the same as that for the energy conservation program. At the present, DOT does not have any SES contracts in place. The USCG is currently developing the following three SES projects:

- upgrading the heating system, replacing windows and doors, and insulating walls and ceilings of building #26 at their Support Center in Kodiak, AK;
- installing an energy management and control system for Dawson Hall at the Information System center in Alexandria, VA; and
- installing solar-powered exterior lights and motion-activated lighting at the Training Center in Petaluma, CA.

The major problems encountered with SES contracts at DOT are attributed to the large up-front investment in time and training costs for procurement and technical personnel. DOT recommends the continuation of efforts to offer low-cost training for both procurement and technical personnel to provide the expertise for future SES contracts.

Demand Side Management

The use of demand side management incentives is strongly encouraged throughout the Department. Two demand side management projects were completed at the Headquarters Nassif Building during FY 1992, with rebates of over \$41,000 from the Potomac Electric Power Company for the installation of compact fluorescent lights and LED lights. These two projects cost \$55,000, and will save \$35,000 annually. Also, the Department developed a solicitation for the retrofit of 13,500 fluorescent fixtures with T-8 tubes, electronic ballasts, and reflectors at the Headquarters Nassif Building for FY 1993.

Vehicles

The Department developed a plan to meet the 10 percent reduction in consumption of gasoline and diesel fuel by FY 1995. Although the Department's requirements for motor vehicles will increase by FY 1995, the goal should be met by acquiring more efficient vehicles, driver awareness training, close examination of vehicle utilization, and greater use of alternative fuel vehicles.

DOT relies on GSA's Interagency Fleet Management System (IFMS) for vehicle support rather than on agency-owned fleets. DOT's efforts have been focused on being in the forefront of agencies obtaining IFMS alternative fuel vehicles (AFVs). DOT has been working closely with GSA to maximize the number of AFVs both at Headquarters and in the field. DOT now has 14 compressed natural gas vehicles and 42 methanol-powered vehicles from GSA, and these numbers will increase as more vehicles become available. Also, DOT commercially leases a methanol-powered sedan which is used for executive transportation.

K. Department of the Treasury (TRSY)**Performance and Conservation Activities**

During FY 1992, the Department of the Treasury reported a 58.6 percent increase in buildings consumption in Btu per gross square foot compared to FY 1985.

Within the Treasury Department during FY 1992, the Office of Thrift Supervision completed several energy conservation projects which are expected to save \$10,000 and 169,672 kWh annually. The bureau is currently conducting a complete building energy audit which includes replacement/retrofit of existing CFC chillers with the most energy-efficient chillers on the market. Additionally, the Office of Thrift Supervision has a comprehensive preventive maintenance program to ensure efficient operation of heating, cooling, plumbing, and electrical systems. The program is scheduled over 52 weekly increments to support a balanced workload. The Secret Service is replacing the HVAC system in its Beltsville, Maryland Training Center at a cost of \$200,000. In addition, the U.S. Customs Service is replacing HVAC systems in several of its Customs houses, border stations, and canine training centers. The U.S. Mint, Bureau of Public Debt, the Bureau of Engraving and Printing, and Law Enforcement Training Center have completed or scheduled work on wastewater treatment additions, replacement of transformers, new chiller systems, room upgrades, boiler system replacements, energy-efficient windows, and siding replacements.

The demand for energy remains high at the Treasury's industrial facilities within the Bureau of Engraving and Printing and the U.S. Mint. Energy usage data for the new Bureau of Engraving and Printing facility in Fort Worth, TX, became available in FY 1991. This new facility has an up-to-date energy management system to control and measure energy usage.

The Internal Revenue Service (IRS) is revamping its tax information system under its Tax System Modernization Program. Despite emphasis on energy efficiency and conservation, the IRS finds that this effort will have a negative impact on the Treasury's overall energy efficiency. These enhanced program operations will increase energy consumption in IRS Service Centers and pose problems for the IRS in its efforts to achieve the FY 1995 and FY 2000 energy reduction goals.

Efforts have been made to counter the negative impact of the Tax System Modernization Program through other conservation measures. The IRS's architectural and engineering firm has conducted surveys and made recommendations to reduce energy usage. Using a computer model of the IRS Andover Center, the firm made recommendations for energy improvements covering lighting, high efficiency motors, modified exterior walls and windows, conversion of air handling units, energy monitoring systems, and efficient transformers. Taking into account these possible energy reductions, energy usage at Andover may still increase 77 percent over targeted levels. Some of the Service Center operations will move into new, more energy-efficient, GSA buildings in the next five years. This should have a positive impact on the IRS's energy consumption.

In addition to regular energy surveys, all IRS delegated sites have incorporated Energy Management and Conservation Guidelines into their Buildings Operations Plan. The IRS is also requiring contractors to perform energy surveys on renovation and new construction projects. Where feasible, all projects will be required to comply with the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) Standard 90A.

Employee awareness plays an integral part of the Treasury energy management program. The Department and individual bureaus seek to make employees aware of the positive aspects of energy conservation. For example, the Chief Financial Officer at IRS sent a memorandum to all IRS Assistant Commissioners encouraging compliance with Executive Order 12759 and stressing the importance of energy conservation. At the operations level, bureaus have taken steps to involve all concerned parties in energy conservation efforts. All IRS facilities have Energy Conservation Committees, consisting of employees from Operations, Maintenance, Repair and Alterations, and Lease Management, who work together on energy efficiency projects.

There are several employee incentive programs at the Treasury Department which promote energy-efficient transportation. Treasury requires several facilities to have an active ridesharing program and encourages alternative programs to reduce energy usage. Most Treasury bureaus provide some form of a Public Transportation Incentive Program to encourage the use of public transportation by its employees. In Southern California, IRS is offering a \$30 monthly stipend to employees as a commuting subsidy. In Washington, DC, a majority of Treasury bureaus offer such programs. IRS is also developing a national

Flexiplace program to allow employees to work at home or at a satellite office rather than commuting long distances to work.

Implementation Plans

Following the recommendation in a recent survey of energy management programs in the Department, Treasury is strengthening its Departmental policy directives, clarifying energy management goals and objectives, and assuring program and facilities managers cooperate more closely in developing and carrying out the new directives. Treasury will monitor, on a regular basis, bureau and office progress in meeting Secretarial goals and objectives.

The Treasury and its bureaus have issued guidance and policies to ensure energy management goals and objectives are being met. These instructions are found in policy directives and procedures manuals and cover the following:

- overall energy responsibilities of organizations and facilities, including statements on the necessary achievement of the 10 percent and 20 percent energy reductions goals;
- instruction on the operation and maintenance of facilities;
- contracting for energy-efficient operations, energy-efficient goods and services, and maintenance of facilities;
- shared energy savings contracting;
- conduct of energy audits and surveys and identification of low-cost energy opportunities;
- maintenance of equipment and systems to promote energy efficiency; and
- implementation of employee awareness programs.

The Department of the Treasury has issued a formal policy directive on the procurement of energy-efficient goods and services and has informed the Office of Federal Procurement Policy of its action. Bureau procurement practices must adhere to these policies.

Funding

Commitments were made by the Internal Revenue Service to perform lighting retrofit projects in FY 1993 at the following facilities: Martinsburg Computing Center (\$94,000), Fresno Service Center (\$795,000), Austin Service Center (\$147,365), and Cincinnati Service Center (\$319,297).

The Office of Thrift Supervision combines funding for energy conservation retrofits, capital equipment, energy surveys, and other energy efficiency projects in the building operations budget.

GSA is a significant funding source for energy projects at delegated facilities operated by Treasury. It has funded several major retrofit projects at IRS facilities and a major retrofit project at the Public Debt facility at Parkersburg, WV.

Shared Energy Savings

There were no shared energy savings projects undertaken in the Treasury Department during FY 1992. Thus far, efforts to implement SES projects at delegated facilities under IRS control have been unsuccessful. As the largest bureau within the Treasury, the IRS is the most likely candidate for SES programs. Due to the major Tax System Modernization Program, many

facilities which could be candidates for SES contracts are not being actively pursued by the Service or GSA at this time. Many of the facilities being examined could be scheduled for substantial renovation before the cost of the retrofits would be recouped.

Demand Side Management

Treasury bureaus continue to work with local utilities to take advantage of demand side management programs. In the Washington, DC area, the Financial Management Service, Office of the Secretary, and the Office of Thrift Supervision have received rebates from Potomac Electric Power Company for conservation of electrical energy. Nationally, the IRS has taken advantage of demand side management programs and received rebates for load management. At Brookhaven, NY, the IRS receives a \$200,000 rebate annually from Long Island Lighting Company for agreeing to switch to an IRS generator for power, if required.

The Treasury's Financial Management Service received a \$4,000 rebate for the installation of occupancy sensors. It expects to gain additional benefits from PEPCO's rebate program as a result of a survey which will be conducted in FY 1993 at its Washington facility, the Liberty Center.

Vehicles

Treasury submitted plans for the acquisition of AFVs to the Department of Energy. Bureaus have indicated a willingness to acquire these vehicles when they become available. Not all Treasury vehicles, however, are eligible to be replaced by AFV's, because the bulk of the Treasury fleet consists of law enforcement vehicles, which are exempt under the Executive Order 12759.

The U.S. Customs Service is taking its own steps to reach fuel reduction goals. The Bureau has requested that vehicles currently leased from GSA be replaced with dual fuel vehicles. In addition, the U.S. Customs Service is developing an enhancement to their automated property system that will provide offices with reminders if a vehicle has not had its scheduled maintenance.

Approximately 95 percent of the IRS-owned fleet consists of law enforcement vehicles, which are exempt from Executive Order 12759. But within the non-law enforcement fleet, the IRS has begun to procure AFVs and expects to reach 20 percent by 1995. The IRS's detailed 5-year energy plan for acquiring alternative fueled vehicles was submitted in March 1992. The plan was developed around the non-attainment areas which were specified in the DOE guidance document. In accordance with this year's directions, the vehicles have been concentrated around large metropolitan areas where it is most likely that oil companies have constructed or will construct re-fueling stations. In FY 1992, GSA leased an additional AFV to the IRS fleet. IRS now has two AFVs, one in Washington, DC, and one in Seattle, Washington. Treasury is willing to accept AFVs in any region in the country. IRS's AFVs run on M85 fuel.

In FY 1993, the IRS expects to lease additional AFVs from GSA. The IRS also hopes to establish ways of detecting and reporting the savings which would be achieved through the use of gasohol. With the exception of one flexible fuel vehicle leased from GSA and several special purpose diesel-powered vehicles operated by Law Enforcement, all vehicles operated

by the Bureau of Alcohol, Tobacco and Firearms (ATF) are gasoline-powered. ATF's current fleet contains 2,784 Bureau-owned vehicles, 152 GSA-leased vehicles, and 23 commercially-leased vehicles. Additionally, 367 compliance employees receive mileage reimbursement for operating their own privately-owned vehicles on official business. For future acquisitions, those leased from GSA will consist of fuel-efficient vehicles to meet mission requirements. Whenever possible, these will include alternative fuel vehicles.

L. Department of Veterans Affairs (VA)

Performance and Conservation Activities

During FY 1992, the Department of Veterans Affairs reported a 11.5 percent reduction in buildings consumption in Btu per gross square foot compared to FY 1985.

During FY 1992, 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 approximately 13.5 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.

Furthermore, the VA has one cogeneration plant that it owns, operates, and maintains, and the VA is currently evaluating the cost-effectiveness of 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.

Implementation Plans

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

Funding

Funding for energy conservation retrofits and capital improvements was approximately \$10 million for FY 1992. Plans call for expenditures of \$12 million for projects that have been approved by the Central Office for accomplishment at the medical centers in FY 1993. The VA is actively participating in the utility rebate programs and has funded many projects during FY 1992.

Shared Energy Savings

During FY 1992, the West Haven VA Medical Center (VAMC) became the first Veteran's Hospital to award an SES contract. This \$2.4 million project, awarded to EUA Cogenex Corporation, is a 15-year contract and will provide an estimated annual savings of \$600,000. 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 VAMC West Haven replaced two 800-ton centrifugal chillers installed in 1963, with a new 800-ton electric chiller and a 1,000-ton steam absorption chiller.

Under the SES contract, EUA Cogenex will perform a facility-wide lighting retrofit to replace over 7,000 fixtures with more energy-efficient fixtures. There are 58 different applications as part of this lighting retrofit, which include the use of reflectors, T-8 lamps, and energy-saving electronic ballasts. This retrofit will result in an annual savings of \$220,000.

The terms of the SES contract allow the contractor to receive 90 percent of the savings and the medical center 10 percent for chilled water use up to 1.8 million ton hours per year. Once this baseline level is exceeded, the contractor receives 25 percent of the savings and the remainder goes to the medical center.

A total of \$317,582 in rebates from the local electric company (United Illuminating) and gas company (Southern Connecticut Gas) contributed to this project.

Demand Side Management

The Department of Veterans Affairs has designated \$3 million in FY 1993 for projects at the medical centers where utility companies will contribute rebates. These projects will be identified by the medical centers and sent to the Central Office for approval and funding.

Vehicles

A 5-year plan was developed last year which outlined how the VA would reduce gasoline/diesel consumption by at least 10 percent by FY 1995 in comparison to FY 1991. VA is planning to convert half of its fleet to AFVs, which would result in exceeding the goal. The Department worked closely with both the GSA Fleet Management Division and DOE in order to facilitate the conversion at each field site. The remaining gasoline and diesel fuel vehicles will use slightly less fuel each year as GSA procures more fuel-efficient vehicles for the VA. The plan will be revised on a yearly basis. Furthermore, the Department will recommend the use of AFVs to facility Chief Engineers at the VA's national engineering conference in FY 1993 and in future years by distributing a nationwide directory of AFV refueling locations and presenting the methods to convert fleets to AFVs, including:

- list of AFVs to be provided by GSA;
- types of fuel each vehicle uses;
- characteristics of vehicles running on different alternative fuels;
- how to order the vehicles from GSA;
- special maintenance requirements; and
- what to do if there is not an alternative fueling facility nearby.

M. Commodity Futures Trading Commission (CFTC)

Performance and Conservation Activities

The Commodity Futures Trading Commission does not occupy space in Federal buildings nor does it operate a large fleet of Federal vehicles. However, the CFTC is required to develop a plan to implement Section 5, Procurement of Energy Efficient Goods and Products, and Section 9, Vehicle Fuel Efficiency Outreach Programs of Executive Order 12759.

To implement Section 5 of the Executive Order, CFTC developed the following guidelines:

- When preparing solicitations for the acquisition of products that consume energy, the specification or statement of work is to clearly indicate that energy efficiency is a critical requirement.
- When acquiring any energy-consuming products for the Commission, energy consumption shall be a mandatory technical evaluation criterion. Energy consumption data will have to be provided in bid/offer packages in sufficient detail to assess life-cycle energy costs.
- As the Secretary of Energy provides estimates of the degree of relative energy efficiency of products, other factors being equal, preference will be given to the acquisition of those products estimated to be the most energy-efficient.

To comply with Executive Order, Section 9, the CFTC performed the following activities:

- Continued to designate a coordinator to inform employees of the availability of ridesharing opportunities and assist them in finding ridesharing partners.

- Provided subsidized parking for car pools, subject to the availability of funds. In FY 1992, funds were not available.
- Participated in state and local government programs, such as the Federal MetroPool and Van Pool Programs in Washington, DC, New York City, Chicago, and Los Angeles, designed to encourage the use of public transportation by providing reduced cost incentive to employees, subject to availability of funds. In FY 1992, funds were not available.

Implementation Plans

The Chairman has designated the Office of the Executive Director to be responsible for the planning, implementation and oversight of the Commission's Energy Management Plan. The Director of the Office of Administrative Services will be responsible for developing the Commission's internal operating instructions for implementing compliance with Executive Order 12759, consistent with the plan.

N. Environmental Protection Agency (EPA)

Performance and Conservation Activities

During FY 1992, the Environmental Protection Agency reported a 4.0 percent increase in buildings consumption in Btu per gross square foot compared to FY 1985.

The energy coordinator for the Environmental Protection Agency has developed a database containing each facility's energy use on a square foot basis. During FY 1992, the energy coordinator worked with EPA's facilities managers to ensure accurate and current reporting and to research past reporting for inconsistencies or errors.

Many activities are planned or are underway that will expand and help implement EPA's compliance with the Energy Policy Act of 1992. An awareness program is in place which contains an Energy Conservation Clearinghouse, an awards program, energy updates, and train-the-trainer sessions for disseminating information and expertise throughout the Agency. Additionally, lighting retrofits and other energy conservation projects are occurring throughout EPA's facilities. To date, energy conservation projects have been completed at the following sites:

- Annapolis, MD;
- Cincinnati, OH;
- Ada, OK;
- Houston, TX; and
- Manchester, WA.

Energy conservation projects are being planned at the following sites:

- Narragansett, RI;
- Edison, NJ;
- Montgomery, AL;
- Gulf Breeze, FL; and
- Duluth, MN.

Small-scale pilot energy conservation projects are also being implemented at EPA's Corvallis and Newport, OR, facilities.

Requirements for new facilities now being planned (e.g., Annapolis, MD; Research Triangle Park, NC; and Bay City, MI) require that "building construction features, materials and methods, as well as mechanical and electrical equipment, shall provide concepts that will reflect safety and efficiency as well as reduce energy consumption."

Implementation Plans

EPA's Facilities Management and Services Division has revised the Agency Energy Conservation Manual and will issue this document as a final policy document in FY 1993. The following guidance documents have been completed, as well as initial training of EPA facilities managers:

- Energy Conservation Plan Handbook—provides guidance for establishing conservation priorities, developing facility 10-year plans, ensuring internal auditing and reporting. Distribution of this document and training were completed in FY 1992.
- Green Lights Pollution Prevention Strategy—outlines EPA's approach to implementing energy conservation and quantifying pollution prevention through energy efficient lighting. EPA became a Green Lights partner in FY 1992.
- Recycling Program Policy—an internal policy document on pollution prevention responsibilities at EPA facilities. Completion of this policy document is expected in FY 1993.

O. Federal Communications Commission (FCC)

Performance and Conservation Activities

During FY 1992, the Federal Communications Commission reported a 7.6 percent increase in building energy consumption in Btu per gross square foot compared to FY 1985.

Although the Federal Communications Commission is not a delegated agency as defined by Executive Order 12759 and is exempt from Sections 1, 2, 3, 6, 7, 8, 10, and 11, it is still required to develop, implement, and submit programs that comply with Section 5, Procurement of Energy Efficient Goods and Products, and Section 9, Vehicle Fuel Efficiency Outreach Programs.

Regarding Section 5 of Executive Order 12759, it is the policy of the FCC to procure supplies and equipment from GSA Federal Supply Schedules when practicable. When the acquisition of items exceeds the ordering limits of Schedules, it is the policy of the FCC to procure items in accordance with the requirements of the Federal Acquisition Regulations and Federal Information Resources Management Regulations, and all appropriate clauses in reference to energy conservation life-cycle costing are inserted in FCC's Requests for Proposals.

Regarding Section 9 of Executive Order 12759, the FCC is about to initiate a campaign to educate its employees about the importance and implications of energy conservation. This campaign will make available copies of Executive Order 12759, post and distribute literature and pamphlets on energy conservation, encourage employees to attend workshops and seminars discussing wise usage of resources, and encourage employees to utilize ridesharing, carpools, and public transportation whenever possible.

Vehicles

Currently, vehicles leased by the FCC through GSA are used only when other forms of transportation are unavailable or impractical. In order to conserve energy and cost, drivers are directed to maintain vehicles for proper operation, to use self-service pumps to refuel, and to use regular unleaded gasoline. Prior to expiration of its current vehicle leasing agreements, the FCC will explore other vehicle lease options which will be more energy-efficient, such as alternative fuel vehicles.

P. Federal Emergency Management Agency (FEMA)

Performance and Conservation Activities

During FY 1992, the Federal Emergency Management Agency (FEMA) reported a 13.5 percent decrease in building energy consumption in Btu per gross square foot compared to FY 1985.

Activities undertaken at all FEMA facilities include the following:

- promoted employee awareness measures to reduce energy consumption;
- included energy conservation devices and systems in new leased or purchased space acquisitions, or if existing space is remodeled;
- issued an internal directive setting policy and procedures for promoting the Federal Facility Ridesharing Program and designated an agency Ridesharing Coordinator. Ridesharing information is included in orientation packages for new employees;
- implemented a transit subsidy program to encourage employees to use public transportation systems; and
- continued participation in a recycling program for aluminum cans glass bottles, newsprint, and paper.

In addition to these activities, each of the FEMA facilities has undertaken projects to reduce energy consumption. The Berryville, VA, facility installed an electric heat pump to provide heat and hot water to several buildings, and it is estimated that the overall energy savings will pay for the project in less than three years. Most projects are not undertaken for their energy conservation aspects, but because they are necessary maintenance activities, and as such, they are based upon the condition of the existing systems and their expected useful life. The Denton, TX, facility is initiating a Vehicle Storage Administration Building project that will upgrade energy monitoring and control systems, which should allow for better control of energy consumption.

The Bothell, WA, facility is using FY 1992 funds to upgrade the building's heating, ventilation, and air conditioning system's electro-pneumatic controls with a programmable,

computer operated control system. Total cost of the upgrade is \$71,868, with the local utility providing a \$50,307 reimbursement. If funds are available, additional energy conservation measures would include time set switching of lighting, as well as new energy-efficient lighting system. The Olney, MD, facility has cut back operations from 24 to 16 hours a day and has added computerized systems to two chillers that cool and heat the building.

The National Emergency Training Center in Emmitsburg, MD, established an Energy Conservation Committee to evaluate and approve future heating and air conditioning modifications, created and distributed an Energy Gram newsletter that lists energy conservation suggestions, installed heat pumps in dormitory and classroom buildings, and installed a new heating and air conditioning system in an office building to replace steam radiators and window air conditioners. Future energy conservation activities include submetering of electricity in buildings to establish baseline and future energy consumption data, installation of a condensate recovery system to use energy remaining in the steam distribution system, and implementation of an energy management system to include demand monitoring, occupancy sensors and cycling of mechanical systems.

Implementation Plans

In February 1993, personnel responsible for FEMA energy conservation activities met with DOE, Office of Federal Energy Management Programs to obtain guidance for developing a program that complies with legislation. In March 1993, the staff met with personnel from a FEMA field office to seek advice and suggestions based on their engineering expertise and experience in energy management activities. As a result of these discussions, FEMA plans to:

- develop agency-wide policies and procedures for energy conservation and a tracking system to monitor energy consumption in order to ensure the accuracy and reliability of usage and cost data;
- develop explicit instructions to ensure that future FEMA annual reports on energy management and conservation comply with DOE reporting requirements; and
- implement an equipment maintenance program to ensure the efficient operation of all building equipment and systems and ensure the purchase of energy-efficient equipment.

In accordance with the Energy Policy Act of 1992, FEMA has identified individuals who qualify as trained energy managers at facilities under its control.

Vehicles

FEMA has a small fleet of 183 vehicles and, therefore, is exempted from developing a plan to reduce motor vehicle fuel consumption by 10 percent by 1995.

Q. Federal Energy Regulatory Commission (FERC)

Performance and Conservation Activities

During FY 1992, the Federal Energy Regulatory Commission (FERC) reported a 10.3 percent increase in building energy consumption in Btu per gross square foot compared to FY 1985. FERC energy consumption is included in DOE energy consumption data for reporting purposes. This increase was attributable to the installation of additional mechanical and

office equipment throughout the agency to help meet the office demands and improve office standards.

Since FY 1985, FERC has installed Mini Mate Coolers, four heat pumps, eight fan coil units, seven air conditioning units, two hot water heaters, and two glycol pumps. In addition to general office space, this equipment supports conference and meeting rooms, as well as the Child Care Center and Employee Fitness Center. Furthermore, over 1,000 personal computers have been installed, which add to agency energy consumption.

FERC is now doing the following:

- issuing employees energy awareness bulletins;
- operating economizer cycle to achieve free cooling;
- installing time clocks on mechanical equipment;
- surveying for further delamping in corridors;
- tracking and reporting energy usage; and
- operating equipment and systems based on outside air temperatures.

FERC implemented a transit subsidy program to encourage its employees to use public transportation and 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.

Implementation Plans

FERC is revising its energy management program to meet the energy goals of both NECPA and Executive Order 12759. These revisions will establish general energy performance objectives for building operations now and in the future. The building operation plan is being updated by engineering and facilities personnel. Investment in energy-efficient equipment is not planned for the 825 North Capitol Street building due to near expiration of the building leases and planned consolidation into a new location.

Demand Side Management

Demand side management programs are not planned due to the near expiration of the FERC building lease and planned relocation. FERC is working with the General Services Administration and prospective building owners to procure an energy efficient building that will fully comply with EPACT of 1992. Offerors of new or substantially renovated buildings must comply with the Potomac Electric Power Company's New Building Design Program. The projected total energy consumption will be between 17 to 18 kWh per gross square foot annually, and 60,000-70,000 Btu per gross square foot annually. Several energy-efficient features to be installed in the new building include:

- automatic lighting controls (motion sensors);
- building automation system (BAS) capable of regulating and monitoring all environmental conditioning equipment. The BAS will provide economizer control, event-initiated programs, start/stop time optimization, temperature resets, equipment status, time-of-day scheduling, and night setback;
- electric energy management control system consisting of demand lighting, load cycling, load rotation, time-of-day scheduling, and night setback;
- emergency generators to electrically peak shave to control electric demand;
- gas fired heating system with possible gas fired absorption chiller;

- HVAC system that will meet or exceed ASHRAE Standard 90.1-1989;
- light color paint wall finishes; and
- parabolic type, recessed, 75 percent energy-efficient, rapid-start fluorescent T-8 lamps and electronic ballasts.

Vehicles

It is FERC's intention to replace gasoline vehicles with alternative fuel vehicles, and FERC has leased two vehicles fueled by compressed natural gas. The Commission also intends to reduce the number of executive motor vehicles by one-half by the end of FY 1993.

R. General Services Administration (GSA)

Performance and Conservation Activities

In FY 1992, GSA reported a 7.8 percent decrease in energy consumed in owned and leased buildings compared to FY 1985 in Btu per gross square foot.

GSA has reaffirmed the value of operations and maintenance in a new Seven Point Plan for energy management. Point #3 of the Plan is devoted entirely to improving building operations and includes the following actions as a partial list of tactics addressing improved operations/maintenance:

- Develop training programs for energy-efficient operation of major building systems, including boiler and chiller operations, operation of energy management control systems and other control systems, water treatment, economizer cycles, air and water system balancing, and environmental and indoor air quality.
- Explore the following opportunities for improved procedures: maintenance work inspection guide and training, building operating plans and procedures, steam traps and strainers, eddy current testing, guide cards for control system maintenance, and defined hours of work.
- Explore opportunities for water conservation with efficient operation of major building systems and improved procedures.

Generally, GSA's application of life-cycle costing to project development and new buildings design/construction, as well as dual fuel, multi-fuel capabilities, has helped the agency to reduce actual petroleum usage in buildings. Public Buildings Service (PBS) advised all its regions in September 1990, that all heating systems designed to utilize fuel oil should have the capability of utilizing an alternative fuel where practical, and that alternative fuels should be used when they can be purchased at lower cost than fuel oil. The advisory further instructed verification of dual fuel capability in fuel-burning installations where natural gas is available, and where these installations are not dual fuel capable, regions were advised to expedite dual fuel retrofits where cost-effective.

GSA activities to procure, utilize, and foster the use of energy-efficient products involve the Federal Supply Service (FSS), Information Resources Management Service, and PBS. Life-cycle cost (LCC) analysis is used in the procurement of appliances, which are bought on Single Award Schedule contracts. Air-conditioners are purchased, using LCC factors, through the Special Order Program. New energy-related technologies are encouraged through the New Item Introduction Schedule program, which allows new energy-saving items to be marketed within the Federal system. Initiatives and ideas on energy-efficient products are being solicited from FSS Commodity Centers as to how energy-efficient products can be identified and promoted. FSS is also committed to increasing the visibility of energy-efficient products by highlighting them in the Supply Catalog.

GSA is actively participating in a consortium with the EPA and DOE, as well as commercial manufacturers, in promoting the development of energy-efficient office technologies, such as desktop computers, monitors, printers, facsimile machines, and peripherals. GSA has developed draft guidelines for the procurement of energy-efficient computers, i.e., those which use less energy when operating at full capacity, as well as computers which offer features such as screen savers, power management, and sleep modes. GSA has also committed its "buying power" to help promote this program and get industry interested in meeting these standards.

In FY 1992, GSA continued to support the Defense Logistics Agency (DLA) in its efforts to assist Federal managers in their selection and procurement of energy-efficient lighting products. GSA's collaboration with DLA resulted in the publication of a second volume of the *Energy Saver Bulb* catalog in the spring of FY 1992. Over 30,000 copies of the second edition have been distributed to Federal civilian and military agencies. The second edition catalog contains energy-efficient ballasts and fixtures.

In FY 1992, GSA continued an annual training seminar for its nationwide/regional energy coordinators. In addition to developing a strategy and solving problems, these sessions are used to familiarize energy coordinators with the latest commercial technologies in buildings energy management. These include areas such as efficient belt drive systems, energy management and control systems, chiller systems, lighting technology, and energy-efficient motors. This direct exposure to the most recent technologies better prepares energy managers in project selection and development. GSA is planning to add commercially available water conservation and renewable energy technologies to future energy coordinator training seminars.

To promote the Federal Ridesharing Program, the GSA regions worked closely with city, state, and county ridesharing units, and commuter transportation associations. The GSA regions conducted training, participated in ridesharing fairs, and may publish employment transportation newsletters. In addition to providing its annual report to the President on the Federal Ridesharing Program, GSA Central Office participated in the Washington Metropolitan Council of Government meetings designed to encourage closer cooperation among public transportation providers in the Washington-Baltimore Metropolitan Area.

Implementation Plans

To achieve the goals required by the Federal Energy Management Improvement Act of 1988, GSA established an energy coordinator's position in each of its 10 Regions. These coordinators prepared GSA's Five Point Energy Reduction Plan (Five Point Plan), which has been the cornerstone of GSA's program since its implementation in FY 1990. The Five Point Plan was formulated to address five broad areas, including energy planning and monitoring, identifying and implementing energy conservation projects, improving building operations, fostering energy awareness, and providing incentives for conservation in leased space. Following the passage of the Energy Policy Act of 1992, the GSA Energy Coordinator revised and expanded the Five Point Plan into the Seven Point Energy and Water Reduction Plan. The new plan updates some areas and further emphasizes other areas by adding two additional points. These include procurement of energy-efficient products and services and training.

In 1989, GSA established interim goals through FY 1995 in order to achieve the 10 percent reduction goals in the Federal Energy Management Improvement Act of 1988, and the 20 percent reduction goal required in Executive Order 12759. In addition, GSA requires each of its 10 regions to achieve these interim goals. A biannual survey of each region includes an in-depth evaluation of its energy conservation program. These biannual evaluations ensure the following:

- Building equipment and systems are operated in an energy-efficient and economic manner.
- A building action plan has been developed and is being implemented with energy conservation projects and other actions designated for future years.
- Appropriate documentation has been developed and is on file.
- Provisions of the Federal Property Management Regulations, Executive Orders, and National Energy Acts are complied with by regions.

The GSA-issued Federal Property Management Regulations (FPMR) 101-20.107, Energy Management, continues to be the basis for Federal Executive agency operating standards for energy conservation in buildings. Its provisions include conserving heating and cooling levels in Federal facilities. In February 1992, GSA issued the revised Facilities Standards for the Public Buildings Service, which stipulates that renewable energy sources must be evaluated and compared to conventional sources for each new Federal project. On April 27, 1992, GSA issued an FPMR bulletin entitled Federal Energy Management. This bulletin announced the Executive Order 12759, delineating the 10 percent reduction goal in FY 1995 versus 1985, and the 20 percent reduction goal in FY 2000 versus 1985.

Funding

GSA invests approximately \$600 million annually in building repairs and alterations. Of this amount, \$37 million was identified in FY 1992 specifically for energy conservation projects. The remainder represents investments that are evaluated on the life-cycle cost within the project budget, rather than on an individual basis. The energy conservation components of these projects are not tracked separately. Of the \$37 million spent for energy conservation projects in FY 1992, \$5.4 million was funding for projects at buildings delegated to agencies for control. Of the \$30 million planned for FY 1993, \$5.9 million is planned for delegated agency projects. In FY 1992, more than 280 projects were funded nationwide. Projects are selected based on evaluations of life-cycle costs, savings-to-investment ratio, total energy saved, demand side management, and other considerations. Types of projects included the following: retrofitting existing lighting systems, installing energy management and control systems, upgrading HVAC boiler, and chiller control systems, improving building envelope, and increasing insulation.

Shared Energy Savings

At GSA, the agency management structure responsible for implementing a program to enter into SES contracts is as follows:

- **Central Office**—The PBS Office of Procurement is currently a member of the DOE Government-wide task force chartered to develop a generic SES contract. The contract format will be made available to all Government agencies to utilize, as appropriate. Applicable Federal Acquisition Regulations policy changes are also ongoing in GSA to provide appropriate contracting authorization.
- **Regions**—Regional Offices of GSA, Real Property Management and Safety Divisions, and Contracts Divisions are responsible for the identification and implementation of SES contracts.

Since FY 1990, GSA has set aside funds specifically for energy conservation projects. The funding level for FY 1992 was \$37 million. GSA's position on funding energy conservation projects continues to be to utilize its limited human resources to administer projects that are funded from this set-aside amount. Several SES opportunities have been considered; however, GSA has always found it to be advantageous to fund those projects internally, since all savings generated from GSA projects remain in the Federal Buildings Fund and can be utilized for other property management functions.

In FY 1992, GSA made funding available to delegated agencies for energy conservation projects in delegated buildings that had a passing score in the most recent operational evaluation of delegations. GSA also informed all delegated agencies that SES contracts are a viable option to accomplishing energy conservation projects in buildings that did not pass the most recent operational evaluation of delegations, or where funds are unavailable. GSA will work with the delegated agencies to identify and implement SES contracts.

Demand Side Management

GSA actively participates in public utility company DSM programs. In FY 1992, GSA received rebates of approximately \$1.2 million for energy conservation projects. Most of these projects were in the Northeast and on the West Coast. Rebates are typically offered within a geographic area, and, hence, certain regions may have a limited opportunity to

participate in these programs. Rebates received by GSA are generally returned to the regions for additional energy project funding. GSA estimates that approximately \$7 million in rebates will be received in FY 1993.

GSA, Office of Procurement initiated a pilot program with three major California utility companies to provide energy surveys for approximately eight million square feet of Government property at no cost to GSA. These energy audits represent a significant cost avoidance to GSA and have expedited the schedule for initiating energy surveys, which will ultimately become lead reference documents to review energy conservation projects. This pilot, initiated in January 1993, represents the GSA initial approach to extending its authority to deal with utility companies on a nationwide basis.

GSA, Office of Procurement is continuing work with GSA legal, budgeting, and acquisition policy offices to facilitate Government participation in DSM programs offered by utilities. Current efforts include review and development of proposed language for use under GSA area-wide utility service contracts. Also, GSA reviews DSM programs proposed in proceedings before state utility regulatory bodies and testifies as necessary to the appropriateness of these programs to the Federal Government.

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 AFV's for its own use:

FY 1993	FY 1994	FY 1995	FY 1996	FY 1997
54	67	89	183	251

Environmental Benefits

The FSS procures paper and paper products with high percentages of recycled content for approximately 900 items. FSS requirements meet or exceed the EPA recommended percentages of recycled content.

Retread tires for trucks and buses are available to Government agencies via a Federal Supply Schedule. Sizes and styles offered in the past 2 years have risen from 70 to over 200, and testing for passenger vehicle retreads for schedule coverage continues.

In September 1992, GSA issued the nationwide Refrigerant Management Plan for GSA facilities. The plan provides the framework for implementing requirements of the Clean Air Act and any EPA regulations. With this plan, GSA takes a proactive approach to reduce the impact of ozone-depleting substances on the environment.

S. National Aeronautics and Space Administration (NASA)

Performance and Conservation Activities

During FY 1992, the National Aeronautics and Space Administration reported a 5.5 percent reduction in buildings energy consumption in Btu per gross square foot compared to FY 1985.

Most NASA Centers monitor and control building HVAC systems and some electrical systems with central Utility Control Systems which are continually being upgraded to modern direct digital control technology. Many NASA Centers are expanding their Utility Control Systems to a greater number of buildings to tighten control over building operations. The Stennis Space Center Utility Control System office made after-hours run time adjustments of HVAC systems in several large buildings, which resulted in annual energy cost savings of \$52,700. Most NASA Centers have begun to install high efficiency electrical products such as fluorescent lamps, electronic ballasts, compact fluorescent bulbs as replacements for incandescent bulbs, LED and other low power consumption exit lights, and occupancy sensors.

The Lewis Research Center in Cleveland, OH, reduced energy consumption in its Technical Library by more than 60 percent by controlling the operation of fan coil units with a central Utility Control System, replacing interior fluorescent lighting with high efficiency lamps and electronic ballasts, and installing motion-detecting lighting controls. This pilot project will be extended to other facilities of the Center through locally funded projects. The Center is also investigating potential sources of supplemental funding for these projects, such as utility demand side management incentives.

A general survey of energy reduction opportunities at the Goddard Space Flight Center in Greenbelt, MD, was conducted by Battelle Pacific Northwest Laboratories through DOE. The Center completed a steam trap survey which identified potential energy cost savings of \$94,000 annually.

Langley Research Center in Hampton, VA, uses a radio control system to shut down all major hot water heaters during night and weekend periods. The Center completed a survey of all non-mission variable facilities. The survey identified opportunities to reduce lighting levels,

expand use of steam from the waste-to-energy facility for space heating, connect additional building system components to the Utility Control System, and turn off all unneeded equipment, especially at night.

A survey is being performed at the Deep Space Network complex in Goldstone, CA, by a team of energy conservation specialists to determine what cost effective improvements might be made to the facilities, equipment, and operating procedures.

During the Christmas holidays, Kennedy Space Center shut down all non-essential facilities and equipment saving an estimated 2,217,000 kWh of electricity in December 1991. In order to improve energy awareness and technical energy engineering knowledge of design engineers, operating engineers, and operations and maintenance mechanics, a week of comprehensive training was sponsored by the Kennedy Space Center and conducted by the University of Wisconsin. Supply system personnel must now order 34-watt replacement lamps instead of standard 40-watt fluorescent lamps. Personnel must order more efficient lamps for outdoor application, such as high pressure sodium or metal halide instead of mercury vapor lighting products. Setback electronic thermostats were installed in various facilities throughout the Center.

Defense Fuel Supply Center Energy-Efficient Lighting catalogs have been distributed to all NASA field installations.

The Jet Propulsion Laboratory installed electronic variable speed drives on electric motors totaling 260 horsepower. The drives are expected to save about 500,000 kWh annually. Automatic tube cleaners installed in two chiller condensers are expected to save 180,000 kWh annually.

NASA has implemented various outreach programs to reduce the use of vehicle petroleum fuels. Ridesharing and use of public transportation are emphasized. At NASA Headquarters, all 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.

Implementation Plans

NASA centers have submitted 15-year energy conservation plans to meet the energy reduction goals of NECPA and Executive Order 12759. NASA Headquarters consolidated these Center plans into the Agency Energy Conservation and Management Implementation Plan, which was submitted to DOE in October 1992. The Energy Conservation and Management Implementation Plan format, which is structured to address the 12 sections of Executive Order 12759, has been adopted by the Centers in preparing annual plan updates. The plan contains the following key components:

- policy formulation;
- field installation energy management;
- intra-agency energy conservation team;
- metering;
- energy surveys;
- improved facilities operation and maintenance;

- energy conservation investments;
- employee involvement initiatives;
- shared energy savings/third-party financing contracts; and
- retention of savings.

NASA Management Instruction 8832.1, "Energy Management through FY 2000", was drafted and submitted for concurrence review by the Associate Administrators. It establishes NASA policy to comply with the Federal energy management requirements of Executive Order 12759 and associated Public Laws. It sets goals and assigns organizational responsibilities for managing and reducing energy consumption at NASA installations. It requires the Centers to revise their 15-year energy conservation plans by February 15, each year.

Funding

NASA-funded facilities energy conservation projects are divided into two categories. The first consists of minor capital improvement projects (under \$200,000) that can be achieved with Center funds; the second consists of major capital improvement projects (over \$200,000) requiring Construction of Facilities program funding. At the present time, energy conservation projects must compete with all other construction projects for Construction of Facilities funding. A long-term goal is to identify, describe, and request funding for all potentially high payoff energy conservation efforts to be funded from the Construction of Facilities appropriation.

In FY 1992, approximately \$1.3 million were expended for energy conservation projects, and \$5.8 million were expended for Construction of Facilities repair, rehabilitation, and modernization projects with substantial energy-savings features. It is projected that \$1.7 million for energy conservation projects and \$12.5 million in energy-related Construction of Facilities projects will be funded in FY 1993.

There were no Construction of Facilities projects accomplished in FY 1992, and none are planned for FY 1993, for the sole purpose of energy conservation. However, many Construction of Facilities projects do contain features which will conserve energy and reduce costs, such as:

- HVAC system modernization, including replacement of inefficient chillers, installation of variable air volume systems, and removal of constant volume, terminal reheat systems;
- upgrade and expansion of utility control systems used to monitor and control heating and cooling apparatus startup and shutdown, fluid temperatures and pumping rates, use of outside air for cooling and ventilation, electrical demand limiting, and optimization of equipment operation; and
- lighting system efficiency improvements, including lighting upgrade and relamping projects.

Shared Energy Savings

NASA has only limited experience with SES contracts to date. Although there has been considerable interest expressed by Center personnel, no SES initiatives have been put in place, with the exception of the Energy Cost Reduction Program at Michoud Assembly Facility (MAF). This facility is a Government-owned, contractor-operated facility, which

implemented an Energy Cost Reduction Program with Martin Marietta Space Systems (MMSS) in 1988. Under this program, the MMSS 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 usage at MAF by providing 8 to 14 percent of energy savings achieved as an additional award fee. The program also includes provisions for sharing savings achieved through energy conservation projects proposed by MMSS. The share of savings are determined by whether NASA or MMSS funds the capital investment. The manner of determining who gets the savings has worked well and may serve as a model for other Centers to use.

Under the MAF Energy Cost Reduction Program, MMSS achieved a 22.6 percent reduction in energy usage below the negotiated baseline in FY 1992. Energy cost savings for FY 1992 totaled \$1.9 million, of which MMSS received 14 percent as an additional contract award fee. Cumulative savings since FY 1988 total nearly \$4.4 million, of which 13.3 percent was awarded to MMSS.

Goddard Space Flight Center is planning an SES project for a Center-wide steam trap replacement and a lighting retrofit for its Administration Building. The contract will utilize a small, disadvantaged business as the SES contractor and will include a rebate of over \$50,000 from the Potomac Electric Power Company. Johnson Space Center is preparing a Request for Proposals for a potential SES contract to replace T-12 fluorescent lamps and magnetic ballasts with T-8 lamps, reflectors, and electronic ballasts. White Sands Test Facility is preparing a Request for Information for an SES contract to retrofit fluorescent lighting fixtures with electronic ballasts and T-8 lamps.

NASA Management Instruction 8832.1, assigns joint responsibility to the Associate Administrator for Procurement and the Director of NASA Headquarters Facilities Engineering Division to develop Agency policy and innovative contracting procedures for SES projects, and for incorporating SES clauses in existing facilities and other support contracts. Candidate SES projects would be developed, implemented and managed by individual NASA Centers. NASA Headquarters Procurement, Institutional Program Office, and a Facilities Engineering representative would provide guidance and oversight as needed and would ensure that lessons learned in SES contracting are shared with all NASA Centers.

Current legislation allows use of savings from energy initiatives to be reinvested at the installation level for new energy initiatives. Policy requires the NASA Chief Financial Officer/Comptroller, in conjunction with the Director, Facilities Engineering Division, to promulgate procedures to allow field installations to retain all cost savings that accrue over a period of 3 years, as a result of improved efficiency, SES agreements, rebates, or other energy conservation measures. Future SES contracts at NASA Centers will require the use of meters to validate actual savings, or will be limited to measures such as lighting retrofits, for which savings may be determined with a high level of confidence using commonly accepted energy engineering calculations.

Demand Side Management

The Goldstone Deep Space Network complex utilizes on-site generation facilities to reduce the amount of power taken from the grid during the summer and winter peak and mid-peak

periods. It is estimated that the Goldstone site saves approximately \$500,000 per year by operating diesel generators during the peak and mid-peak periods.

Goddard Space Flight Center (GSFC) has participated in a load curtailment program with the Potomac Electric Power Company since 1986. During peak summer demands, GSFC reduces its load to 20,000 kilowatts or lower when requested by the power company. The Center has achieved estimated savings of \$265,000 a year. Wallops Flight Facility has had a load shedding agreement during peak summer demand periods with Delmarva Power Company since 1991. During the past two summers, the Facility has operated its generators 10 times and has saved \$60,000.

Langley Research Center has a unique power contract with Virginia Power. The demand level is fixed at 40 megawatts, which means that the Center pays for this demand regardless of actual consumption. In practice, the Center always exceeds this level, and thus saves funds. The concession that Langley Research Center gives for this agreement is that they will reduce power below 40 megawatts within 10 minutes of notification from Virginia Power. The penalty for not shedding load is a significant charge above the 40 megawatt level. The Center has a well-defined and structured load shedding operation, and no penalties have ever been imposed.

Ames Research Center participates in the Western Area Power Administration Diversity Plan. This requires wind tunnel operations and other high electrical consumption processes to be curtailed during high demand condition in return for annual rebates which totaled \$3 million in FY 1992.

High efficiency chillers were specified in several Construction of Facilities projects, including the Space Station Freedom Processing Facility at Kennedy Space Center, in order to qualify for rebates under the local utility DSM programs. Rebates approaching \$600,000 are expected after qualifying tests on the chillers are completed.

The Jet Propulsion Laboratory received rebates totaling \$38,000 in FY 1992 from the local electric utility. The Laboratory utilized the expertise of the local gas utility to select energy-efficient, low nitrogen oxide-emitting boilers to meet Air Quality Management District regulations. The gas utility will provide rebates of \$1.50 per Btu/hour reduction in rated output. Despite these successes, the Laboratory reported some impediments to taking advantage of utility rebate programs. Utility companies generally allocate funds for DSM programs on an as-available basis and usually require the planning, design, and completion of projects in the calendar year the funds have been allocated. No carryover is allowed. Many Construction of Facilities projects which would qualify for rebates cannot be serviced due to the extended schedule of the projects and the uncertainty as to whether the utility company will have rebate funds available in the year of implementation. Center-funded projects are more likely to obtain rebates, but even in these cases, the difference between Federal and utility company fiscal years can create a mismatch in project implementation schedules and utility rebate availability.

Vehicles

No alternative fueled vehicles were purchased by the NASA during FY 1992, however, a feasibility study was completed for establishing a compressed natural gas vehicle fleet at Lewis Research Center. Although vehicle conversions are economically feasible, lack of funding for the construction of a dedicated refueling station was identified as an obstacle. Starting in FY 1993, GSA will provide dual fuel vehicles which can use either unleaded gasoline or methanol-blended fuels at the Goldstone Deep Space Network complex. At the present time, Goldstone has no facilities capable of handling blended fuels, which are highly corrosive to conventional tanks and piping. An investigation will be made as to the cost-effectiveness of installing new tanks and facilities for handling the blended fuels. A pilot program is planned for GSA to purchase two compressed natural gas vehicles in April 1993, for use at the Kennedy Space Center. By April 1994, plans call for 50 compressed natural gas vehicles to be in service at the Kennedy Space Center.

T. Nuclear Regulatory Commission (NRC)

Performance and Conservation Activities

The Nuclear Regulatory Commission did not have any buildings under its management authority in base year 1985, therefore, energy consumption comparison between FY 1985 and FY 1992 cannot be reported.

The NRC is responsible for conservation activities at its one Federally-owned building at One White Flint North (OWFN) and one of its leased buildings. While NRC is responsible for paying utility bills for all of the leased buildings, the authority for facility operations, including the development and implementation of an energy program, is restricted to the Phillips Building in Bethesda, MD. Therefore, the conservation activities presented address only the efforts at these two facilities.

In FY 1992, energy consumption at the One White Flint North Building was reduced by 6.4 percent in comparison to base year FY 1989. Since the base year, NRC has expanded its operation and services at the building, which has required additional energy consuming equipment. In FY 1990, the "New Reg Cafe" cafeteria increased the energy consumption by 669 MBtu, and in FY 1991, a conference center was constructed, which also resulted in additional energy consumption. During FY 1992, several conservation activities were initiated. A preventive maintenance program ensured that all domestic water systems, heating and air conditioning, and ventilation systems were operating at optimum performance levels. Heat exchangers were utilized during the transitional seasons to provide free cooling for the building. An ongoing employee awareness program provided information to employees regarding their responsibilities and contributions in achieving the energy reduction goals.

In FY 1992, energy consumption at the NRC leased buildings increased by 1.2 percent compared to FY 1991. Approximately 40 percent of the increase is attributable to additional computer equipment and air conditioning systems in the Phillips Building. The lessor at 5650 Nicholson Lane, after converting the heating system from oil to gas, paid the gas bills to offset the amount of oil recovered from the tank (previously paid for by the Government). Therefore, in FY 1991, there were no gas bills to be reported for the building. The rest of the

increase is attributable to increases in energy consumption in the leased building operated by the lessor and to an increase in the Phillips Building in support of agency meetings conducted in the evenings and on weekends. Several energy-saving devices were installed in the Phillips Building. Time clocks were programmed to start mechanical equipment as late as possible and stop the equipment as early as possible. The new programming reduced run times but also increased the risk of frozen water lines during the winter. To safeguard against a problem, thermostats were installed to override the time clocks during severe weather. Building engineers provided information on how to conserve energy to building occupants. Signs were posted on bulletin boards throughout the building advising against opening windows, and encouraging employees to turn out unnecessary lighting. A program was implemented to replace failed light ballasts with electronic upgrades.

Implementation Plans

The NRC's energy management plan was developed in 1989 and is updated on an annual basis to include initiatives, programs, and strategies to meet the goals of Executive Order 12759. In FY 1992, the following strategies were used at the OWFN building:

- development of operational strategies for the automatic energy management system;
- initiation of a program to use energy-efficient cafeteria equipment and optimize equipment shutdowns;
- modification of the central cooling chiller operation to allow for a one-chiller operation during seasonal changes; and
- upgrade of condenser and chilled water systems to optimize energy-efficient heat transfer.

The NRC continues to implement the following initiatives reported during previous years:

- utilize heat exchangers;
- conduct building energy audits;
- implement a voluntary load curtailment program;
- operate equipment and systems based on outside air temperatures;
- ensure that thermostats are maintained within Federal guidelines; and
- incorporate the requirements of applicable Federal energy policies into the Commercial Facility Management contract to operate and maintain the OWFN building.

Funding

GSA funded a \$400,000 energy management system at the OWFN building. A contract was awarded and construction initiated for the installation of this automatic energy management system, which will provide optimum digital control of the central chillers, air handler units, exhaust fans, and other miscellaneous equipment.

In FY 1992, the NRC identified several energy retrofit projects for GSA funding. As a result, GSA has approved the replacement of incandescent exit signs with fluorescent ones. The estimated cost is \$10,000, with a payback period of 1.2 years. The project will be funded and performed in FY 1993.

Shared Energy Savings

The NRC did not award any shared energy savings contracts during FY 1992 for the OWFN building. However, NRC plans to explore shared energy savings contracts in FY 1993 and

FY 1994 to retrofit the OWFN building. This includes plans to install solar film on the southern side of the OWFN building, to replace light ballasts with electronic ballasts, and to replace task lights with energy-efficient units.

Demand Side Management

The NRC continues to participate in demand side management programs with Potomac Electric Power Company (PEPCO). As funding becomes available, the Commission will request rebates for lighting and equipment retrofit. The NRC energy coordinator is in constant contact with PEPCO representatives to further pursue penalty-free load curtailment programs. In addition, the NRC receives pulse reports from PEPCO which are used to analyze equipment operation and develop operating strategies to further enhance energy efficiency.

Vehicles

The NRC has less than 300 vehicles in its fleet and is therefore not subject to the fuel consumption reduction goal. Nevertheless, the NRC did take steps in FY 1992 to increase vehicle fuel efficiency by replacing four midsize cars, leased commercially, with compact sedans. In addition, reductions in the number of vehicles at the Headquarters location were identified when consolidation of Headquarters employees is completed in FY 1994. Although acquisition of alternative fueled vehicles is voluntary for the NRC, the Commission intends to participate in the program by replacing GSA-assigned vehicles with alternative fueled vehicles as they become available through GSA. In the 5-year plan which the Commission has submitted to DOE, NRC plans to acquire, subject to availability, six of these vehicles in FY 1993; eight in FY 1994; five in FY 1995; two in FY 1996; and two in FY 1997.

U. Office of Personnel Management (OPM)

Performance and Conservation Activities

During FY 1992, the Office of Personnel Management reported a 45.0 percent increase in buildings consumption in Btu per gross square foot compared to FY 1985.

Presently, the Building Operations Branch of OPM purchases only reduced wattage, energy-saving lamps and electric ballasts for the Theodore Roosevelt Building in Washington, DC. For each ballast and lamp replacement, approximately 28 watts per fixture is saved. A formal proposal has been made to GSA to fund a building-wide lamp retrofit using T-8 technology, which will reduce electrical demand by approximately 471 kilowatts. The dollar savings will equal approximately \$111,500 per year in electrical costs, with a reduced heat load of 1.6 million Btu per year. Fixtures in the Theodore Roosevelt Building parking garage are being retrofitted, which will save approximately \$900 per year. Both of these projects have payback periods of less than 3 years and will provide the widest range of energy reductions.

OPM maintains an active ridesharing program, which provides carpool/vanpool information via a bulletin board maintained on the first floor of the main OPM headquarters building. This board is useful to all employees interested in participating in existing as well as forming new carpools/vanpools. In addition, OPM has produced a pamphlet promoting ridesharing for agency employees.

As another means of reducing overall energy consumption and cost, OPM actively participates in a transit subsidies program. This program has resulted in a decrease in single occupancy vehicles, and at the same time promoted public transportation and shared riding concepts. After the initial implementation of the OPM Fare Subsidy Program, a decrease in carpool/vanpool applicants was realized.

OPM has a vigorous preventive maintenance program to ensure efficient operation of all building equipment and systems. OPM operation and maintenance procedures include adoption of operating standards for building equipment and daily tours of the building by the engineer to ensure efficient operation. OPM has completed a number of energy-efficient measures such as installation of an energy management control system and low energy lighting systems, reduction and replacement of overall lighting by task lighting, addition of new valves in the air handlers, new air dampers, new chill water coils, electronic chiller controls, and new booster coils and installation of motion detectors.

Implementation Plans

OPM has established an organization, within its Administration Group, that is designed to promulgate and carry out its internal energy reduction policies. Functions represented in this organization include motor pool management, building operations/management, and space renovation. Each function within the Group has an understanding of both the Department of Energy and General Services Administration regulations and develops its internal program to implement the regulations.

OPM has developed a plan designed to meet the objectives of PL 100-615, the Federal Energy Management Improvement Act of 1988 and Executive Order 12759. The OPM energy management program implements actions to support eight key elements:

- implementation of life-cycle costing capital investments;
- contracting for shared energy savings;
- identification of funds to be devoted to energy conservation measures;
- contracting for the energy-efficient operations and maintenance of the building;
- development of energy-efficient designs for renovations;
- promotion of employee energy awareness programs;
- accomplishment of low cost and no cost energy opportunities; and
- ensuring energy-efficient day-to-day operations and maintenance of building systems and equipment.

Funding

Delegated by GSA to manage and operate its headquarters building, OPM uses 15 to 20 percent of its repair and alterations funds provided by GSA for energy-efficient improvements. Typically, these funds have been directed towards improving building operations such as upgrading motors and pumps, installing motion detectors, and installing energy-efficient lighting systems. In FY 1993, OPM will make a formal proposal to GSA to fund a project to completely replace all existing fluorescent tubes and conventional ballasts with energy-efficient tubes and electronic ballasts. OPM funded the survey/proposal for this project at a cost of over \$5,000.

Demand Side Management

The Building Operations Branch (BOB) participated in Potomac Electric Power Company's (PEPCO's) load curtailment program. When PEPCO sends the BOB a signal via a control box in the Building Managers Office, the BOB performs several energy reducing functions. In exchange for reducing electric consumption, BOB receives rebates which appear as credits against the monthly electric bill. OPM also participates in PEPCO's "custom rebate program". This program pays back for energy reduction projects such as lighting retrofits. These rebates also appear as credits against the monthly electric bill. Curtailment load credits and Custom Rebate Program credits for last year were approximately \$8,500, and \$8,000, respectively.

Vehicles

OPM will issue an agency-wide letter articulating various ways to reduce petroleum fuel usage for all employees using GSA vehicles, private vehicles in support of official duties, and contractor-operated vehicles in support of official agency functions. Specifically, OPM will provide guidance on use of alternative fuels, leasing alternative fuel vehicles, and the steps one can take to reduce overall fuel consumption. These efforts are intended to serve as a "first step" in establishing an employee outreach program to educate personnel on fuel efficiency goals and to suggest ways to help to achieve these reductions.

Although OPM is exempt from E.O. 12759 AFV requirements, where applicable, the agency will attempt to lease alternative fueled vehicles. A concerted effort will be made, dependent upon GSA's ability to secure vehicles equipped to accommodate OPM requirements, and alternative fuels. Filling stations must also be readily available to service alternative fuel vehicles. As commercial vendors secure the necessary means to equip their vehicles for alternative fuels, OPM will proceed aggressively to lease vehicles with this capability.

V. Panama Canal Commission (PCC)

Performance and Conservation Activities

During FY 1992, the Panama Canal Commission reported a 5.0 percent increase in buildings energy consumption in Btu per gross square foot compared to FY 1985. The electrical consumption burden was slightly higher than the FY 1985 baseline but decreased from 63,139 Btu per gross square foot in FY 1991 to 56,787 Btu per gross square foot in FY 1992.

The Commission furnishes agency-wide, Bureau, or operating level information sheets, directives, and memoranda, and prints articles 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 Program has further stimulated employee awareness and participation, and will continue to contribute in the overall Federal effort.

Recurring maintenance includes mass relamping and light fixture cleaning every three years or as lamp problems appear. This effort was established in coordination with surveys to help

determine specific requirements for reflectors, new ballasts, lenses, and changes from incandescent, fluorescent, or mercury vapor to high pressure sodium or metal halide lights. A related buildings electrical usage reduction retrofit project underway since FY 1988, involved installation of new solid state thermostats and timers on air handling units for better controls over temperature and use periods.

Over the years, PCC has significantly improved fuel conservation in its dredges, major energy consumers, by replacing or converting old heavy fuel oil steam-powered plants to diesel units and by intense renovation and modernization—including the agency large class hydraulic-cutterhead dredge MINDI. MINDI energy efficiency upgrades have resulted in a decrease in the amount of fuel used for the last six fiscal years, which averaged .45 gallons per cubic yard excavated annually, compared to 1.29 gallons per cubic yard in 1986.

The Commission considers conservation and efficiency criteria in acquisition decisions and has purchased recycled items consistent with maintaining a satisfactory level of competition. Close coordination is maintained with operating units to ensure that effective products are obtained for PCC buildings retrofits, replacements, and other energy improvement work. Among recycling projects is the sale of paper by lot, including recovery of computer paper for offer locally at fair market value, while scrap iron, used oil, and surplus and excess items are collected for resale and recycling as part of conservation and waste minimization operations.

Implementation Plans

The Office of Canal Improvements oversees agency-wide actions to implement energy plans and achieve projected goals through its Environmental/Energy Control Unit, and prepares guidance for PCC staff and operations on procedures, policies, and other matters governing Federal energy management. Energy performance liaison personnel within the respective Offices and Bureaus assist in data collection and coordination needed to achieve maximum energy efficiency at the subprogram level. Technical and engineering expertise, representing major and specialized energy-consuming areas of the organization, are of key importance for maintaining PCC's energy conservation commitments. To most effectively monitor consumption trends, unit level usage reports on electrical power, gasoline, diesel, and distillate fuel are submitted monthly to the Environmental/Energy Unit.

The PCC's existing approved 10-Year Buildings Energy Plan prepared by the Engineering & Construction Bureau serves as the basis for its ongoing buildings maintenance, monitoring, and improvement programs. The Commission is responsive to technical advances in the industry that enhance energy efficiency, and state-of-the-art energy conservation measures are incorporated where practical into buildings and their facilities under construction or renovation. Engineering & Construction reviews electrical power demand reduction alternatives to ensure feasibility and cost-effectiveness, and upon management approval, recommended modifications are installed. The largest, heaviest, consuming buildings normally receive first priority, irrespective of their classification (standard buildings or facilities or process/industrial).

As a Federal agency abroad, PCC is not bound by the Executive Order 12759 requirements for reductions of electrical power energy use in buildings and their facilities, reductions of

fuel use in vehicles, and increased procurement of alternative fuel vehicles. Nevertheless, PCC operates consistent with these Federal efforts to the extent feasible and will strive to meet long-range goals until termination of United States operation of the Canal in December 1999.

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 buildings energy conservation for ballasts, Canal lighting upgrades, air conditioner timers, chilled water improvements, insulation, and other modifications totalled \$249,000 in FY 1992, and are expected to be near \$245,000 in FY 1993.

Shared Energy Savings

The Commission did not enter into any shared energy savings contracts during FY 1992. The PCC believes that there is insufficient economic opportunity for SES initiatives, given its self-financing basis, location overseas, and terminal status, as well as 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; thus discounts or other benefits from these types of 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 distributes electrical power from the plants to other Canal area consumers, primarily the U.S. Military.

Vehicles

PCC's gasoline-operated transportation and miscellaneous equipment is converted or replaced for diesel power where feasible. Vehicle replacement has been an aggressive part of the program, especially concerning heavy duty units assigned to relatively long distance runs cross-Isthmus; those sedans are subjected to severe driving conditions and average 60,000-80,000 miles per year while committed to Canal pilot transportation. Seven diesel vehicles replaced gasoline utility units in FY 1992, concluding this phase of the program.

PCC vehicles have been combined under a single motor pool for optimal administrative control and consistent preventive maintenance, review of fuel usage/repair rates and evaluation for replacement. PCC policy further supports vehicle fuel savings by ensuring trip consolidation and similar measures. Gasoline and diesel consumption for FY 1992 totaled 260,900 gallons and approximately 4.8 million gallons, respectively.

W. Railroad Retirement Board (RRB)

Performance and Conservation Activities

The RRB Headquarters building in Chicago, IL, is the only building over which RRB has operational control. RRB operates and maintains the building under a delegation of authority agreement with GSA. Under this agreement, GSA is responsible for energy retrofits, improvements, and building repairs valued at more than \$50,000 per item.

RRB is working with GSA to conduct an energy audit in FY 1993. The following operation and maintenance procedures are being utilized to increase energy efficiency:

- reducing the operating time and conditions of various air handling units and fans without adversely affecting employees or program equipment;
- reducing lighting usage by manually shutting off lights when not needed, installing automatic sensors in all washrooms and some offices, and installing energy-saving lights in all mechanical areas and in certain public areas and office spaces;
- replacing exit lights with LED signs (funded by GSA). These will result in savings of approximately 40,000 kWh annually; and
- advising employees of energy savings steps to assist in conservation efforts.

GSA funded and contracted for replacement of all windows above the first floor, resulting in an estimated energy savings of 3 million Btu per hour per day. RRB has invested in energy-efficient equipment, such as lighting products, motors, light sensors, and air controllers, which has helped to reduce energy consumption. Also, operating procedures have been refined to achieve maximum energy savings.

Implementation Plans

RRB updated its energy conservation plan in March 1993, to incorporate the requirements of NECPA, Executive Order 12759, and the Energy Policy Act of 1992. The plan lists some of the conditions and equipment additions which have hindered energy reduction efforts. It also lists initiatives that RRB and GSA have taken or have planned in order to meet the energy reduction goals of FY 1995 and FY 2000.

Funding

Between \$10,000 and \$20,000 of building operating funds are utilized 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 and has planned future projects which will significantly reduce energy consumption.

Shared Energy Savings

RRB has not entered into any SES contracts. The comparatively small size of potential contracts available to RRB—at a \$50,000 repair limit—is not practical for this type of procurement.

Demand Side Management

While RRB has not participated in DSM services, the agency has received rebates for high efficiency motors. No DSM services are available from the local electric utility.

X. Tennessee Valley Authority (TVA)

Performance and Conservation Activities

During FY 1992, the Tennessee Valley Authority reported a 2.6 percent decrease in energy consumption in Btu per gross square foot compared to FY 1985.

In FY 1992, projects were performed under Fossil and Hydro's Heat Rate Improvement Program, which primarily attempts to maintain plant availability and to reduce energy consumption requirements. Project benefits other than improved heat rate will result from most of these projects, such as lower maintenance costs or improved availability.

Building energy conservation activities for FY 1992 are summarized below for owned and leased existing buildings:

- A technical survey was completed on the Edney Building. A survey is in progress for Warehouse Row. Surveys are also in progress for nine buildings in Muscle Shoals.
- In the Chattanooga Office Complex (COC) the 12.8 KV service transformers/distribution boards were loaded at less than 30 percent for all 10 boards. The boards, which were arranged in pairs on the low voltage side, were cross-tied and fed from one transformer. This reduced the energy consumption at the transformers during both peak and off peak usage. Also nine variable frequency drives and energy-efficient motors were installed in the COC to replace old maintenance-intensive machinery.
- In the Knoxville Office Complex, one hundred and eighty-five 150-watt floodlights were replaced with 60-watt halogen floodlights, and one floor was retrofitted with motion sensor lighting controls to operate lights only when employees are at work. Motion sensor installations are planned for other floors of the building. Also, an energy management and control system is being installed to control air handling unit start/stop operation and zone temperature control. Currently, two floors of the building are being controlled, but as renovation of the Knoxville Office Complex continues, other floors will be added.
- In various buildings, 500 incandescent lights were replaced with compact fluorescent lights.

In FY 1992, TVA continued to reduce and consolidate building square footage, thus reducing energy consumption. An automated database has been implemented which will plot trends of all utilities and allow feedback to operations and engineering personnel on building energy consumption, contributing to reporting accuracy. An energy management control system for the Summer Place Building is in the design phase. TVA has installed additional insulation in the Natural Resources Building attic. Additionally, TVA is installing programmable thermostats on all HVAC units in Norris facilities. Prior to this installation, the units ran 24 hours a day on the occupied temperature. TVA estimates that all thermostats will be replaced by the end of FY 1993. Also, blinds were installed on the south-facing clerestory windows on the top floor of the Natural Resources Building to correct a heating problem caused by afternoon sunlight.

At TVA, a continuing maintenance program is followed for all major energy-consuming systems and equipment. When minor pieces of equipment are repaired or replaced, the load

factor and efficiency are checked to see if a smaller piece of equipment can be used. Gasoline and diesel powered equipment are being replaced by electrical powered equipment or are being modified to use synthetic fuels derived from coal or biomass whenever feasible. The following operations and maintenance programs were implemented during FY 1992:

- Install night setback thermostats.
- Continue a high efficiency relamping program.
- Replace inefficient building space with more energy-efficient space.
- Use outside air for cooling where possible.
- Extend the lighting maintenance management to all facilities.
- Survey each building to determine if it is economically feasible to install an energy management control system (EMCS).
- Implement requirements of the newly amended/extended 10-year energy plan through FY 1995.
- Review maintenance procedures and make identified repairs to reduce energy use.
- Disseminate energy awareness information.
- Verify that all newly designed and renovated buildings have the proper interface installed for an EMCS.
- Use the turnkey concept of space renovation to address the engineering-related facility systems that affect energy usage.
- Install a network of EMCS in Facilities Services' larger use buildings to allow centralized monitoring and control of building energy consumption.

Implementation Plans

TVA's revised 10-Year Plan for Reduction of Building Energy Use was approved by DOE in FY 1982, and updated in FY 1989. Responsible TVA managers have been informed of the legal requirements of Executive Order 12759 and EPACT, and coordination and reporting responsibility has been assigned. A representative from each responsible TVA office has been selected to serve on an energy conservation and management committee (ECC), which has initiated a process to determine the legal requirements and to develop an energy conservation plan that will meet or exceed the energy reduction goals required under the law. The ECC has proposed the following schedule for developing facility-specific plans:

- Develop a TVA Board-approved energy policy statement by June 30, 1993.
- Inventory or update the inventory of all facilities covered by the law and prepare a facilities report by October 31, 1993.
- Determine the facility-specific energy reduction opportunities, and develop a TVA energy conservation plan by December 31, 1993.

While none of the above plans have been finalized for presentation to TVA higher management for review and approval, the TVA Board has already taken a strongly supportive position regarding compliance with Executive Order 12759 and EPACT.

Demand Side Management

The production and sale of electric power is part of TVA's resource development program. TVA supplies power at wholesale to 110 municipal and 50 cooperative distributors which distribute power to about 3.3 million customers in parts of seven states. TVA also supplies power to 55 commercial and industrial customers and 11 Federal agencies. As a service

provider of electric power, TVA offers several end-user conservation and reduction programs to its customers. These programs are listed as follows:

- **Dispersed Power Production Program**—makes price schedule arrangements available to qualified producers who may desire to sell all or part of their electrical production, based upon TVA's avoided energy costs. Since TVA has an ample supply of capacity for the near-term, any facilities being proposed to provide for the future power needs of the Tennessee Valley region would be included for consideration in TVA's integrated resource planning being carried out consistent with the Energy Policy Act of 1992 (EPACT). Those proposing projects that ultimately may be determined as the best for meeting TVA's capacity needs would have an opportunity to enter into purchase arrangements with TVA reflecting avoided capacity, as well as energy costs for the TVA system.
- **Residential Energy Services Program - Heat Pump Program**—encourages the installation of energy-efficient heat pumps in existing residential dwellings. Distributors may offer incentives such as cash payments, electric bill credits, or low-interest loans. The maximum loan amount is \$7,500, and it may be used for the heat pump and related improvements. There is no down payment, and customers may take up to 10 years to repay the loan. The program has found wide acceptance across the Valley, with over 13,500 installations in FY 1992. In addition to the Heat Pump Program, the Residential Energy Services Program offers a New Construction Program, which encourages the installation of energy-efficient heat pumps and water heating systems in new homes. The plan includes an on-site inspection to ensure that the minimum prescribed standards are met. During FY 1992, over 1,700 homes were inspected.
- **Residential Load Management Program (Cycle & Save)**—enables customers to reduce system demand during peak hours of electrical usage. Under this program, a cycling device (switch) is installed on central air-conditioners, heat pumps, or electric water heaters of customers volunteering to take part in the program. Cycling occurs via a radio signal transmitted to the switch, causing an interruption in power. At the end of FY 1992, approximately 40,000 air-conditioners and 60,000 water heaters were equipped with cycling devices.
- **Energy Education in the Schools Program**—provides students in elementary, secondary, and vocational schools with energy information to help them make better energy use decisions in the future. Highlights of this program include teacher workshops, student materials in the form of "Energy Sourcebooks," and a series of meetings held across the Valley for superintendents and curriculum supervisors to provide information about the programs, products, and services available to their schools free of charge. The Energy Sourcebook Series received an Administrator's Award for its effort in pollution prevention from EPA Region IV, and a national award from Renew America for excellence in environmental achievement.
- **Industrial and Large Commercial Programs**—offers various energy services to business and industry to help them become more competitive and productive.

Vehicles

During FY 1992, TVA replaced most of its sedan fleet with 1992 Plymouth Acclaims. At the end of FY 1992, the sedan fleet consisted of 1,170 compacts, 58 mid-size vehicles, and one full-size sedan. TVA plans to replace its sedan fleet on an annual basis, if cost-effective.

Since 1975, TVA has been emphasizing fuel conservation in fleet management operations. Specific actions taken since 1975 include replacement of intermediate size sedans with more fuel-efficient compact vehicles, replacement of full-size pickup trucks with compact trucks, and replacement of gasoline-powered trucks with diesels. TVA will continue to replace sedans with fuel-efficient models and will replace full-size pickup trucks with compact pickups where applicable.

Y. United States Postal Service (USPS)

Performance and Conservation Activities

In FY 1992, energy use in Postal Service facilities decreased by 1.3 percent in Btu per gross square foot compared to FY 1985.

Several energy conservation activities were undertaken by the Postal Service in FY 1992, including the following:

- USPS participated in several utility demand reduction and rebate programs.
- The controlled expansion of the Shared Energy Savings Program was completed.
- A training program was completed for over 200 energy coordinators and building managers for all large facilities and for each former field division. Training covered energy surveys, financial evaluations, design criteria, support systems, and methods of financing retrofits.
- New facilities continue to be designed in accordance with strict, cost-effective, energy design targets and criteria. This criteria is at least 45 percent more efficient than similar buildings from 1975. The criteria includes optimized envelope performance; daylighting controls; high efficiency lamps and ballasts; automatic lighting controls; high efficiency heating, ventilating, and air-conditioning systems; and energy management control systems.

- The envelope performance of small post offices was improved by lowering the required U values by climatic zone. The "Kit of Parts" program was analyzed, and the efficiency of the lighting system was increased.
- The Postal Service received three Federal Energy Efficiency Awards from the Department of Energy. Two were given to individuals and the other to the Shared Energy Savings Steering Committee. The Postal Service gave 22 Superior Management Awards and five Exemplary Performance Awards to recognize energy accomplishments of employees.

The fact that the Postal Service is the only Federal agency that is not bound by the provisions of the Federal Acquisition Regulations has allowed it the flexibility to adopt the best purchasing principles of both the private and public sectors. The Postal Service overall "best value" buying philosophy is a perfect fit with the procurement of energy-efficient goods and products. Under this philosophy, price and price-related factors are not the key elements in a buy decision. Other factors, such as energy consumption, energy efficiency, and other life-cycle costing factors relating to energy conservation should carry as much or more weight in determining contract awards.

The "best value" policy and procedures are continually developed for the Postal Service Purchasing Manual to provide USPS contracting officers with the tools necessary to place this philosophy into reality. More day-to-day guidance is under development and should be published in the Purchasing Manual during FY 1993.

New energy-efficient technology is utilized in lighting retrofit projects and building system renovations. The design criteria for new facilities incorporates new energy-efficient technology in the areas of building envelope, lighting, and HVAC systems and equipment.

Dual fuel capability exists at some Postal Service facilities. Alternative fuel sources are investigated as part of the energy surveys conducted by field personnel. The Postal Service is also responsive to the initiatives of local utility companies in the area of dual fuel and alternative fuel sources. An analysis of fuel sources is part of the design process for new Postal facilities.

FY 1992 is the second 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. Additionally, the Postal Service will begin trip reduction programs in eight additional non-attainment areas as defined by the Clean Air Act.

Implementation Plans

The development, implementation, and update of the energy management plan is the responsibility of Maintenance Policies and Programs (MPP) within the Engineering Research and Development Department. Plan strategies include demand side management, shared energy savings, energy conservation training, improved building operation and maintenance, and increased energy awareness. The existing plans are being revised to encompass all aspects of energy conservation and incorporate financial, procurement, and operating

strategies, as well as an increased emphasis on demand side management, alternative fuels, and the environment.

The Postal Service's energy management plans establish energy performance goals by each region. As a result of restructuring, the energy plans will be revised in FY 1993 to establish performance goals consistent with the new Area structure. Each of the 10 Areas will be assigned a Btu-per-gross-square-foot goal.

Energy management responsibilities at the facility level remain with the facility head and the maintenance manager. The support activities are being realigned to the new Area management structure. The alternative fuel vehicle program is continuing as an energy conservation and environmental strategy.

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. Funds for implementation of energy retrofit projects may be provided by the local office budget or Headquarters.

Projects submitted for Headquarters funding are coordinated by Headquarters MPP. During FY 1992, nearly \$2.3 million was expended on energy retrofit projects. Several of the projects involved rebates from the local utility company. Two million dollars has been budgeted for FY 1993.

Shared Energy Savings

The Postal Service has established a national Shared Energy Savings Steering Committee that is responsible for the implementation of shared energy savings initiatives. Facilities, Purchasing; Finance and Planning; and Engineering, Research and Development are the functional groups represented on the committee, which is chaired by MPP.

During FY 1992 in three SES contracts were awarded. Each contract is for a five-year period, involves retrofitting existing lighting systems, includes total maintenance of the lighting system, and was implemented using contractor funds in exchange for a share of the associated energy savings.

Currently, The Postal Service has shared energy savings contracts in place at four locations: San Diego General Mail Facility (GMF), CA; Oklahoma City GMF, OK; New Orleans GMF, LA; and Southern Maryland GMF, MD.

The solicitations allow the offerors to propose the lighting retrofit methods. Savings are calculated based upon the baseline and kilowatt hours established in the solicitation. Lighting maintenance, including lamp and ballast replacements and group relamping, is part of the project scope.

Demand Side Management

Demand side management services are one of the central strategies of the Postal Service energy management program. Several energy projects have been accomplished in cooperation with local utility programs. In FY 1992, the Postal Service participated in several utility rebate programs. Projects were completed using a combination of internal funds and rebates offered by such utility companies as Long Island Lighting, Niagara Mohawk Power, Sacramento Municipal, Consolidated Edison, and Potomac Electric Power Company.

An example of a successful utility rebate program is the lighting retrofit project implemented at Morgan General Mail Facility in New York, NY. The project replaced mercury vapor lights with state-of-the-art high pressure sodium lamps. With the rebate program, the purchase and installation of 1,453 fixtures were done at no cost to the Postal Service. The first year retrofit cost savings are \$827,000, and annual energy cost savings exceed \$625,000. The annual electricity savings are approximately 6.8 MWh.

Another noteworthy project involved the combination of shared energy savings and rebates. The lighting retrofit project at the Southern Maryland General Mail Facility was implemented using shared energy savings methodology. Upon completion of the project, the Postal Service received a rebate in excess of \$100,000. This project, estimated to cost \$237,000, was completed at no cost to the Postal Service and is expected to save \$71,000 over 5 years.

Vehicles

The Postal Service continues to operate the largest CNG fleet in the country. During FY 1992, a total of 837 vehicles were converted to CNG. The vehicles were deployed at eight different sites throughout the country. FY 1993 plans are to convert an additional 1,400 vehicles at 12 new locations. Of the 300 older vehicles converted and previously reported, less than 100 remain in service. These older vehicles are being phased out and replaced with long-life vehicles.

Due to expanding delivery network, the number of miles traveled in FY 1992 increased by 3.4 percent. However, fuel consumption rose only 1.3 percent due to increased use of more fuel-efficient vehicles. The postal-owned fleet increased from 177,719 in FY 1991 to 178,308 in FY 1992. An additional 19,793 long-life vehicles were placed into service in FY 1992, which brings the total deployed since 1987 to 98,669.

AFV procurement/conversions are funded by Headquarters. During FY 1992, over \$1.5 million was spent on AFV conversions. The budget for this program in FY 1993 is \$3.9 million.

V. PUBLIC EDUCATION AND EMPLOYEE AWARENESS

A. Public Education Programs

Section 549(b) of National Energy Conservation Policy Act (NECPA) requires the Secretary 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 Energy Policy and Conservation Act (EPCA).

While the primary emphasis of this Section is directed at controlling and managing energy use in the Federal Government, there are also activities which affect the general public. 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 1992, through its Federal Highway Administration, DOT obligated about \$70 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 over \$400 million in Federal-aid highway funds has been spent on such projects in an effort to establish self-sufficient programs across the Nation.

In 1992, approximately 2,000 copies of a report developed by DOT, entitled "Evaluation of Travel Demand Management - Measures to Relieve Congestion" (FHWA-SA-90-005) were distributed by the Technology Sharing Program. In addition, a course entitled "Effective Travel Demand Management Actions - Measures to Relieve Congestion" was conducted by the National Highway Institute five times during the year. New research on Travel Demand Management, conducted in FY 1992/93, will be published in FY 1993 and will be incorporated into a new version of the training course in FY 1994.

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.

The general public is served by the Conservation and Renewable Energy Inquiry and Referral Service (CAREIRS) which provides information in the form of fact sheets, bibliographies, books, and brochures. CAREIRS also offers tailored responses to technical inquiries and referrals to over 400 public and private organizations which specialize in highly technical or regionally-specific information. In FY 1992, CAREIRS answered over 44,000 public inquiries received through its toll-free telephone service and post office box.

The National Appropriate Technology Assistance Service (NATAS) offers specialized responses to technical inquiries from the public concerning the application of energy

conservation and renewable technologies. NATAS has also developed a program to assist businesses and innovators in the commercialization of energy technologies and services. During the fiscal year, NATAS responded to approximately 9,000 requests for technical information and assistance. Over 75 percent of information inquiries to NATAS are by telephone.

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, statistical data, microfiche, and data tapes produced by the DOE Energy Information Administration. During FY 1992, NEIC initiated an on-line bulletin board service (202) 586-2557 that permits access by Federal employees and the public. The bulletin board service allows for electronic inquiries and ordering of publications. In 1992, NEIC staff responded to 41,000 inquiries and sold or distributed approximately 471,000 publications.

The DOE Office of Scientific and Technical Information (OSTI) develops and provides access to bibliographic data bases and technical reports on energy-related research and development. The majority of its users are Government officials, contractors, libraries, research institutions, and the public. OSTI served the public directly or indirectly through agreements with the National Technical Information Service, Government Printing Office, Depository libraries, and commercial vendors. 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. A comprehensive collection of over 3.2 million STI records, dating from 1974, is made available to the public through commercial vendors. Other services include providing DOE-sponsored scientific and technical computer software to public and Departmental customers through the Energy Science and Technology Software Center.

In FY 1992, OSTI added over 184,000 worldwide research summaries to its data base and provided 24,000 full-text documents to other government agencies for public availability. Other services offered by OSTI include assistance to Departmental elements in the planning, development, and implementation of public outreach/education activities and programs, which promote the utilization of scientific and technical information.

The Solar Technical Information Program, operated by the National Renewable Energy Laboratory, provides information on solar energy technology to scientific and industrial professionals. During FY 1992, this service responded to over 3,000 technical inquiries and referred 1,000 nontechnical inquiries to other DOE information sources. The program staff has also produced many technical reports and contributed numerous articles to professional journals.

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, 17,112

schools, 1,802 hospitals, and 1,204 colleges have participated in ICP programs. In FY 1992, funding for state grants exceeded \$30 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;
- the Office of Federal Energy Management Programs (FEMP), which promotes interagency information sharing and technology transfer of effective energy management practices, coordinates policy development, and provides technical assistance on shared energy savings financing for Federal sector energy projects;
- the Energy Extension Service (EES), through which the States offer tailored information, specialized training, and technical assistance to small scale energy users such as local governments, small businesses, and homeowners. In FY 1992, funding for programs exceeded \$4.5 million; and
- the Pre-Freshman Enrichment Program (PREP), which provides funding for summer seminars in math and science-based subjects at colleges and universities nationwide.

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

B. Employee 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 include the following:

- At the Department of Commerce, employee awareness outreach for transportation alternatives was accomplished through seminars, visual displays, and newsletters, and for the fifth consecutive year, the National Oceanic and Atmospheric Administration received an award from the Montgomery County Government for promoting transportation alternatives.
- 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.
- At the Department of the Interior, an energy-notice program involves random surveys and scheduled inspections, after which building occupants receive written notification when energy-consuming equipment such as lights, radios, and fans have not been turned off.
- Employee awareness plays an integral part of the Treasury Department energy management program. The Department and individual bureaus seek to make employees aware of the positive aspects of energy conservation. For example, the Chief Financial Officer at IRS sent a memorandum to all IRS Assistant

Commissioners encouraging compliance with Executive Order 12759 and stressing the importance of energy conservation. At the operations level, bureaus have taken steps to involve all concerned parties in energy conservation efforts. All IRS facilities have Energy Conservation Committees, consisting of employees from Operations, Maintenance, Repair and Alterations, and Lease Management, who work together on energy efficiency projects.

- The Federal Emergency Management Agency, National Emergency Training Center distributed an Energy Gram newsletter that lists energy conservation suggestions.
- The Federal Energy Regulatory Commission issues energy awareness bulletins.
- The Nuclear Regulatory Commission, One White Flint North Building, has an ongoing employee awareness program which provides information to employees regarding their responsibilities and contributions in achieving energy reduction goals. At the Phillips Building, building engineers provided information on reducing energy use to building occupants. Signs were posted on bulletin boards throughout the building advising against opening windows and encouraging employees to turn out unnecessary lighting.
- The Panama Canal Commission furnishes agency-wide, Bureau, or operating level information sheets, directives, and memoranda, and prints articles 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 Program has further stimulated employee awareness and participation, and will continue to contribute in the overall Federal effort.
- The Postal Service ridesharing program includes a newsletter, educational activities, flexible work hours, and recognition awards.

The Department of Energy, the Department of Labor, the National Aeronautics and Space Administration, the Office of Personnel Management, and the Railroad Retirement Board offer employee energy awareness programs.

Energy Awareness Month, celebrated in October 1992, promoted energy awareness with the theme "Energy Technology for a Competitive America". DOE designed and distributed posters and a camera-ready logo for use in publications.

APPENDIX A REPORTING REQUIREMENTS

This report and documented activities described herein are required by Title V, Part 3, of the National Energy Conservation Policy Act, as amended (NECPA), 42 U.S.C. 8251-8261; and Title VIII of NECPA, 42 U.S.C. 8287, and section 381 of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6361.

Among the provisions of these authorities are the following requirements:

Energy Policy and Conservation Act (EPCA) of 1975.

Sec. 381. (a)(1) The President shall, to the extent of his authority under the law, establish or coordinate Federal agency actions to develop mandatory standards with respect to energy conservation and energy efficiency to govern the procurement policies and decisions of the Federal Government and all Federal agencies and shall take such steps as are necessary to cause such standards to be implemented.

(b)(1) The Secretary shall establish and carry out a responsible public education program-

- (A) to encourage energy conservation and energy efficiency; or
- (B) to promote vanpooling and carpooling arrangements.

(2) For purposes of this subsection:

(a) The term "van" means any automobile which the Secretary determines is manufactured primarily for use in the transportation of not less than 8 individuals and not more than 15 individuals.

(b) The term "vanpooling arrangement" means an arrangement for the transportation of employees between their residences or other designated locations and their place of employment on a nonprofit basis in which the operating costs of such arrangement are paid for by the employees utilizing such arrangement.

(c) Amended by PL 100-615, the Secretary shall include in the report under section 8258(b) of this title, steps taken under subsections (a) and (b) of this section.

Part 3, Title V of the National Energy Conservation Policy Act, November 1978, as amended by the Energy Security Act (ESA), June 1980, the Omnibus Budget Reconciliation Act of 1986, April 7, 1986, and the Federal Energy Management Improvement Act of 1988, November 1988. The following paragraphs describe provisions of NECPA as it existed during the reporting period. As noted in the text of this report, some of these provisions were amended by the Energy Policy Act of 1992.

Section 543(a)(1) establishes new energy performance goals for Federal buildings so that, "energy consumption per gross square foot of its Federal buildings in use during the fiscal year 1995 is at least 10 percent less than the energy consumption per gross square foot of its Federal buildings in use during the fiscal year 1985."

Section 543(a)(2) states that, "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."

Section 543(b) requires each agency to, "prepare or update. . .a plan describing how the agency intends to meet such goal". It also requires each agency to, "perform energy surveys of its Federal buildings to the extent necessary" and to use those surveys to, "apply energy conservation measures in a manner which will attain the goal. . .in the most cost-effective manner practicable."

Section 544(a)(1) indicates that, "the Secretary. . .shall establish practical and effective methods for estimating and comparing life cycle costs for Federal buildings, using the sum of all capital and operating expenses associated with the energy system. . .over the expected life of such system or during a period of 25 years. . .and using average fuel costs and a discount rate determined by the Secretary."

Section 544(a)(2) states that the Secretary, "shall develop and prescribe the procedures to be followed in applying and implementing the methods so established."

Section 544(b) states that life cycle cost methods and procedures should be used in, "the design of new Federal buildings, and the application of energy conservation measures to existing Federal buildings". It also requires agencies leasing buildings to, "give appropriate preference to buildings which minimize life cycle costs."

Section 545 requires each agency to, "specifically set forth and identify funds requested for energy conservation measures."

Section 546 requires each agency to "establish a program of incentives for conserving. . .energy as a result of entering into [shared energy savings] contracts", and to, "implement procedures for entering into such contracts and for identifying, verifying and utilizing. . .the cost savings resulting from such contracts."

Section 546 also provides that, "the portion of the funds appropriated to an agency for energy expenses for a fiscal year that is equal to the amount of cost savings realized by such agency for such year from contracts entered into under title VIII shall remain available for obligation, without further appropriation, to undertake additional energy conservation measures."

Section 547 establishes the "Interagency Energy Management Task Force" for the purpose of coordinating "the activities of the Federal Government in promoting energy conservation and the efficient use of energy and in informing non-Federal entities of the Federal experience in energy conservation."

Section 548 provides that, "each agency shall transmit a report to the Secretary. . .with complete information on its activities", and that the Secretary shall "report annually. . .to the Congress. . .on all activities. . .on the progress made toward achievement of the objective", and on the "extent and nature of interagency exchange of information. . ."

Section 801 provides that, "the head of a Federal agency may enter into contracts under this title solely for the purpose of achieving energy savings and benefits ancillary to that purpose. Each such contract may, notwithstanding any other provision of law, be for a period not to exceed 25 years. Such contract shall provide that the contractor shall incur costs of implementing energy savings measures, including at least the costs (if any) incurred in making energy audits, acquiring and installing equipment, and training personnel, in exchange for a share of any energy savings directly resulting from implementation of such measures during the term of the contract."

Section 802 provides that, "any amount paid by a Federal agency pursuant to any contract entered into under this title may be paid only from funds appropriated or otherwise made available to the agency for fiscal year 1986 or any fiscal year thereafter for the payment of energy expenses (and related operation and maintenance expenses)."

Section 803 provides that, "each Federal agency shall periodically furnish the Secretary of Energy with full and complete information on its activities under this title, and the Secretary shall include in the report submitted to Congress under Section 550 a description of the progress made by each Federal agency in—

- (1) including the authority provided by this title in its contracting practices;
and
- (2) achieving energy savings under contracts entered into under this title."

Federal Energy Management Improvement Act of 1988

Section 2(b) amends Section 381(c) of the Energy Policy and Conservation Act (EPCA) and requires the Secretary to include in NECPA reports "the steps taken under subsections (a) and (b)" of that EPCA section, which are the subsections on Federal coordination and public education programs.

APPENDIX B LIST OF AUTHORITIES

ENERGY POLICY ACT (Public Law 102-486), October 1992

**FEDERAL ENERGY MANAGEMENT IMPROVEMENT ACT (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 C

EXECUTIVE ORDER 12759 ON FEDERAL ENERGY MANAGEMENT

Executive Order 12759 of April 17, 1991

Federal Energy Management

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the Energy Policy and Conservation Act, as amended (Public Law 94-163, 89 Stat. 871, 42 U.S.C. 6201 *et seq.*), the Motor Vehicle Information and Cost Savings Act, as amended (15 U.S.C. 1901 *et seq.*), section 205(a) of the Federal Property and Administrative Services Act, as amended (40 U.S.C. 486(a)), and section 301 of title 3 of the United States Code, it is hereby ordered as follows:

Section 1. Federal Energy Efficiency Goals For Buildings. Each agency shall develop and implement a plan to meet the 1995 energy management goals of the National Energy Conservation Policy Act, as amended, 42 U.S.C. 8251 *et seq.*, and by the year 2000 reduce overall energy use of Btu per gross square foot of the Federal buildings it operates, taking into account utilization, by 20 percent from 1985 energy use levels, to the extent that these measures minimize life cycle costs and are cost-effective in accordance with 10 CFR Part 436.

Section 2. Federal Energy Efficiency Goals For Other Facilities. Each agency will prescribe policies under which its industrial facilities in the aggregate increase energy efficiency by at least 20 percent in fiscal year 2000 in comparison to fiscal year 1985, to the extent that these measures minimize life cycle costs and are cost-effective in accordance with 10 CFR Part 436. Each agency shall establish appropriate indicators of energy efficiency to comply with this section.

Section 3. Minimization of Petroleum Use in Federal Facilities. Each agency using petroleum products for facilities operations or building purposes shall seek to minimize such use 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. In addition, each agency shall survey its buildings and facilities to determine where the potential for a dual fuel capability exists and shall provide dual fuel capability where practicable.

Section 4. Implementation Strategies. (a) Except as provided by paragraph (b) and (c) of this section, each agency shall adopt an implementation strategy, consistent with the provisions of this order, to achieve the goals established in sections 1, 2, and 3. That strategy should include, but not be limited to, changes in procurement practices, acquisition of real property, participation in demand side management services and shared savings agreements offered by private firms, and investment in energy efficiency measures. The mix and balance among such measures shall be established in a manner most suitable to the available resources and particular circumstances in each agency.

(b) The Secretary of Defense may, if he determines it to be in the national interest, issue regulations exempting from compliance with the requirements of this order, any weapons, equipment, aircraft, vehicles, or other classes or categories of real or personal property which are owned or operated by the Armed Forces of the United States (including the Coast Guard) or by the National Guard of any State and which are uniquely military in nature.

(c) The Secretary of the Treasury and the Attorney General, consistent with their protective and law enforcement responsibilities, shall determine the extent to which the requirements of this order shall apply to the protective and law enforcement activities of their respective agencies.

Section 5. Procurement of Energy Efficient Goods and Products. In order to assure the purchase of energy-efficient goods and products, each agency shall select for procurement those energy consuming goods or products which are the most life cycle cost-effective, pursuant to the requirements of the Federal Acquisition Regulation. To the extent practicable, each agency shall require vendors of goods to provide appropriate data that can be used to assess the life cycle costs of each good or product, including building energy system components, lighting systems, office equipment, and other energy using equipment.

Section 6. Participation in Demand Side Management Services. Each agency shall review its procedures used to acquire utility and other related services, and to the extent practicable and consistent with its strategy established pursuant to section 4, remove any impediments to receiving, utilizing, and taking demand side management services, incentives, and rebates offered by utilities and other private sector energy service providers.

Section 7. Energy Efficiency Requirement for Current Federal Building Space. Each agency occupying space in Federal buildings shall implement the applicable rules and regulations regarding Federal property and energy management.

Section 8. Energy Efficiency Requirements for Newly Constructed Federal Buildings. Each agency responsible for the construction of a new Federal building shall ensure that the building is designed and constructed to comply with the energy performance standards applicable to Federal residential and commercial buildings as set forth in 10 CFR Part 435. Each agency shall establish certification procedures to implement this requirement.

Section 9. Vehicle Fuel Efficiency Outreach Programs. Each agency shall implement outreach programs including, but not limited to, ride sharing and employee awareness programs to reduce the petroleum fuel usage by Federal employees and by contractor employees at Government-owned, contractor-operated facilities.

Section 10. Federal Vehicle Fuel Efficiency. Consistent with its mission requirements, each agency operating 300 or more commercially designed motor vehicles domestically shall develop a plan to reduce motor vehicle gasoline and diesel consumptions by at least 10 percent by 1995 in comparison with fiscal year 1991. The Administrator of General Services, in consultation with the Secretary of Energy, shall issue appropriate guidance to assist agencies in meeting this goal. This guidance shall include guidance concerning vehicles to be covered, the use of alternative/blended fuels, initiatives to improve fuel efficiency of the existing fleet, the use of modified energy life cycle costing consistent with life cycle costing methods in 10 CFR 436, and limitations on vehicle type and engine size to be acquired. Each agency electing to use alternative fuel motor vehicles shall receive credit for such use.

Section 11. Procurement of Alternative Fueled Vehicles. The Secretary of Energy, with the cooperation of other appropriate agencies, and consistent with other Federal law, shall ensure that the maximum number practicable of vehicles acquired annually are alternative fuel vehicles as required by the Alternative Motor Fuels Act of 1988 (42 U.S.C. 6374.) Subject to availability of appropriations for this purpose, the maximum number practicable of alternative fuel vehicles produced by original equipment vehicle manufacturers shall be acquired by the end of model year 1995.

Section 12. Federal Funding. Within approved agency budget totals, each agency head shall work to achieve the goals set forth in this order. To the extent that available resources fall short of requirements, agency heads shall rank energy efficiency investments in descending order of the savings-to-investment ratios, or their adjusted internal rate of return to establish priority.

Section 13. Annual Reports. The head of each agency shall report annually to the Secretary of Energy, in a format specified by the Secretary after consultation with the heads of affected agencies on progress in achieving the goals of this Executive order with respect to Federal buildings, facilities, and vehicles subject to this order. The Secretary of Energy will prepare a consolidated report to the President annually on the implementation of this order.

Section 14. Definitions. For the purpose of this order—

(a) the term "energy use" means the energy that is used at a building or facility and measured in terms of energy delivered to the building or facility;

(b) the term "Federal building" means any building in the United States which is controlled by the Federal Government for its use.

APPENDIX D DATA COLLECTION

Buildings and Facilities

The Federal agencies that own or control buildings are required to report the energy consumption in these buildings to FEMP 45 days after the end of each fiscal quarter. 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 quarterly reports on DOE Form 6200.2, 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.

General Operations

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 quarter, using DOE Form 6200.2.

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

The general operations category also includes the exempted/process energy reported by eight agencies. This operations energy is reported quarterly to FEMP on DOE Form 6200.2 expressed in units corresponding to those under buildings and facilities.

Missing data and anomalies are addressed in the same fashion as those described in the Buildings and Facilities section of this appendix.

APPENDIX E
FEDERAL ENERGY EXPENDITURES AND COST AVOIDANCE,
FY 1985 THROUGH FY 1992

TABLE E
FEDERAL ENERGY EXPENDITURES AND COST AVOIDANCE,
FY 1985 THROUGH FY 1992 (NOMINAL DOLLARS)

YEAR	ANNUAL ENERGY USE (BBTU)	ANNUAL ENERGY COST (\$ MILLION)	ANNUAL ENERGY USE REDUCTION REL. TO FY 1985 (BBTU)	AVERAGE ANNUAL ENERGY COST (\$/MMBTU)	ANNUAL ENERGY COST AVOIDANCE (\$ MILLION)
Buildings and Facilities					
1985	469,194.1	3,943.954	0.0	8.406	0.000
1986	447,317.2	3,706.501	21,876.9	8.286	181.273
1987	467,468.5	3,814.807	1,725.6	8.161	14.082
1988	443,365.2	3,593.319	25,828.9	8.105	209.334
1989	439,326.8	3,406.326	29,867.3	7.754	231.577
1990	441,362.2	3,996.421	27,831.9	9.055	252.011
1991	403,330.3	3,745.639	65,863.8	9.287	611.662
1992	412,569.3	3,650.533	56,624.8	8.848	501.033
B&F Total					2,000.973
Vehicles & Equipment					
1985	934,536.5	6,076.168	0.0	6.502	0.000
1986	924,832.9	3,757.063	9,703.6	4.062	39.420
1987	958,906.3	4,098.704	-24,369.9	4.274	-104.165
1988	846,928.1	4,018.368	87,608.3	4.745	415.670
1989	959,983.2	4,688.368	-25,446.7	4.884	-124.277
1990	926,986.5	5,268.958	7,550.0	5.684	42.914
1991	970,012.8	6,740.939	-35,476.4	6.949	-246.537
1992	781,884.1	4,110.881	152,652.3	5.258	802.594
V&E Total					825.618
Process and Production					
1985	40,245.8	398.824	0.0	9.910	0.000
1986	38,010.5	396.643	2,235.3	10.435	23.326
1987	38,509.2	389.267	1,736.7	10.108	17.555
1988	69,513.3	667.618	-29,267.5	9.604	-281.090
1989	63,392.2	578.935	-23,146.3	9.133	-211.386
1990	65,039.2	633.489	-24,793.4	9.740	-241.490
1991	83,503.9	794.351	-43,258.1	9.513	-411.503
1992	98,416.4	895.516	-58,170.6	9.099	-529.309
P&P Total					-1,633.897
Total All Energy					1,192.694

DATA AS OF 08/18/93

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 Quarterly Energy Use Reports and annual energy cost data submitted to DOE by Federal agencies.

FIGURE E
FEDERAL GOVERNMENT
AVERAGE ANNUAL ENERGY UNIT COSTS,
FY 1985 THROUGH FY 1992 (NOMINAL DOLLARS)

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

APPENDIX F FEDERAL PERFORMANCE UTILIZING "SOURCE" CONVERSION FACTORS

Appendix F 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 5, but expresses electricity and steam use in terms of source Btu instead of site Btu.

TABLE F-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	% CHANGE 85-92	% CHANGE 91-92
DOE	97,507.9	92,001.4	93,184.9	96,732.8	89,891.0	89,341.8	85,703.8	89,286.5	-8.4	4.2
USPS	50,965.1	51,457.3	53,327.2	55,794.7	57,865.1	59,097.8	60,543.2	62,372.2	22.4	3.0
VA	42,926.5	42,135.4	42,363.5	44,838.5	45,267.5	44,337.2	45,483.4	45,394.6	5.7	-0.2
GSA	42,388.5	34,082.8	32,374.8	30,431.7	31,026.2	36,590.2	36,852.7	36,282.5	-14.4	-1.5
HHS	12,978.7	10,654.3	11,227.6	12,136.6	12,880.3	16,191.3	14,353.7	15,857.0	22.2	10.5
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	17.5	-8.5
NASA	23,397.1	24,660.7	25,179.4	25,350.5	27,525.1	28,196.5	29,129.4	29,457.2	25.9	1.1
DOT	28,560.2	28,525.2	28,721.5	28,533.7	28,129.2	28,379.3	28,830.2	29,463.5	3.2	2.2
DOI	9,817.0	9,955.3	9,659.7	10,464.3	10,820.5	10,864.3	10,715.0	10,643.5	8.4	-0.7
USDA	12,152.0	10,761.5	10,802.2	12,005.7	9,449.4	14,800.2	14,149.4	14,039.6	15.5	-0.8
TRSY	3,606.0	3,479.0	5,681.8	9,613.4	8,370.1	6,477.3	7,960.4	8,699.7	141.3	9.3
DOL	3,920.0	3,988.4	4,035.1	4,185.3	4,119.4	4,103.2	4,186.7	4,241.1	8.2	1.3
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	11.6	42.9
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	8.3	-3.6
TVA	1,899.5	1,966.8	2,045.0	1,980.6	1,784.5	1,887.1	1,958.1	1,830.8	-3.6	-6.5
ST	704.0	740.5	832.8	818.4	835.1	852.2	845.4	829.4	17.8	-1.9
FEMA	190.5	295.6	312.1	351.8	395.3	459.6	442.7	453.6	138.1	2.5
HUD	340.6	350.1	355.7	373.0	417.0	426.5	446.0	418.0	22.7	-6.3
OPM	168.1	174.6	175.1	200.6	214.0	218.2	227.1	239.2	42.3	5.3
PCC	1,189.4	1,300.1	1,409.8	1,372.2	1,434.0	1,399.5	1,358.9	1,461.0	22.8	7.5
FCC	42.0	41.6	46.2	44.5	41.0	50.1	50.9	41.3	-1.5	-18.8
OTHER*	628.1	838.7	981.3	1,039.8	4,154.5	3,390.4	2,409.5	2,443.1	289.0	1.4
CIVILIAN AGENCIES TOTAL	349,788.3	334,853.5	338,777.8	354,331.9	352,303.2	365,868.9	365,392.6	372,284.4	6.4	1.9
DOD	1,494,704.2	1,460,487.5	1,537,276.3	1,424,872.8	1,564,051.2	1,536,176.1	1,554,075.0	1,388,726.4	-7.1	-10.6
ALL AGENCIES TOTAL	1,844,492.5	1,795,341.0	1,876,054.1	1,779,206.7	1,916,354.4	1,902,045.0	1,919,467.5	1,761,010.7	-4.5	-8.3
BBTU	316.7	308.2	322.1	305.4	329.0	326.5	329.5	302.3		
MBOE	1,945.9	1,894.0	1,979.2	1,877.0	2,021.7	2,006.6	2,025.0	1,857.8		
Petajoules										
ANNUAL CHANGE FROM 1985										
BBTU		-49,151.5	31,561.5	-65,287.9	71,861.9	57,552.5	74,975.0	-83,481.8		
MBOE		-8.4	5.4	-11.2	12.3	9.9	12.9	-14.3		
Petajoules		-51.9	33.3	-68.9	75.8	60.7	79.1	-88.1		
CUMULATIVE SAVINGS FROM 1985										
BBTU		49,151.5	17,590.0	82,877.9	11,016.0	-46,536.5	-121,510.5	-38,029.7		
MBOE		8.4	3.0	14.2	1.9	-8.0	-20.9	-6.5		
Petajoules		51.9	18.6	87.4	11.6	-49.1	-128.2	-40.1		

DATA AS OF 08/18/93

*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.

¹National Science Foundation's data for FY 1988, FY 1989, and FY 1990 are estimated.

Note: This table uses a conversion factor for electricity of 11,600 Btu per kilowatt hour.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Quarterly Energy Use Reports

TABLE F-2
FEDERAL BUILDINGS AND FACILITIES USE PER GROSS SQUARE FOOT - SOURCE CONVERSION
FOR FY 1985 AND FY 1992
(WHEN ELECTRICITY EQUALS 11,600 BTU/KWH)

	FISCAL YEAR 1985			FISCAL YEAR 1992			% CHANGE
	GSF x 10 ³	BTU x 10 ⁹	BTU/GSF	GSF x 10 ³	BTU x 10 ⁹	BTU/GSF	1985-1992
DOE	70,739.4	55,021.5	777,806	79,964.6	53,745.2	672,113	-13.6
USPS	189,400.0	39,441.0	208,242	229,734.8	50,147.1	218,283	4.8
VA	123,650.0	42,333.7	342,367	140,126.0	44,759.7	319,424	-6.7
GSA	202,020.1	41,978.7	207,795	169,555.1	34,300.3	202,296	-2.6
HHS	22,611.3	12,605.4	557,484	30,797.3	15,857.0	514,883	-7.6
DOJ	20,768.8	8,962.7	431,545	28,460.0	9,285.9	326,278	-24.4
NASA	11,518.0	6,706.9	582,301	13,852.0	8,459.9	610,736	4.9
DOT	29,477.7	7,360.8	249,706	31,093.4	8,355.1	268,710	7.6
DOI	50,959.5	6,765.1	132,754	50,123.3	6,824.4	136,152	2.6
USDA	28,980.5	4,347.2	150,004	33,618.4	5,339.6	158,829	5.9
TRSY	5,776.9	1,451.0	251,178	10,356.0	4,805.4	464,019	84.7
DOL	18,268.3	3,687.8	201,871	17,258.9	3,852.4	223,212	10.6
EPA	1,455.0	1,209.6	831,313	1,786.7	1,496.8	837,748	0.8
DOC	5,611.5	1,189.1	211,905	4,974.3	1,483.1	298,157	40.7
TVA	4,886.6	1,321.0	270,333	5,307.5	1,422.0	267,920	-0.9
ST	2,597.0	689.2	265,377	2,597.0	829.4	319,353	20.3
FEMA	606.0	190.5	314,426	1,488.4	453.6	304,784	-3.1
HUD	1,432.0	340.6	237,862	1,432.0	384.4	268,453	12.9
OPM	853.9	168.1	196,822	853.9	226.6	265,354	34.8
PCC	492.5	90.5	183,854	529.8	102.3	193,063	5.0
FCC	121.0	29.5	244,132	124.8	33.9	271,370	11.2
OTHER*	1,098.6	588.9	536,037	2,157.0	593.5	275,144	-48.7
CIVILIAN AGENCIES							
TOTAL	793,324.6	236,478.9	298,086	856,191.2	252,757.6	295,212	-1.0
DOD	2,578,984.0	581,170.2	225,349	2,340,145.8	524,164.8	223,988	-0.6
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TOTAL	3,372,308.6	817,649.1	242,460	3,196,337.0	776,922.3	243,066	0.3

DATA AS OF 08/18/93

*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, and the U.S. Information Agency.

²National Science Foundation's data for FY 1988, FY 1989, and FY 1990 are estimated.

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

Source: Federal Agency Quarterly Energy Use Reports

TABLE F-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	% CHANGE 85-92	% CHANGE 92-91
DOE	55,021.5	55,158.4	54,354.4	56,601.2	53,934.8	54,650.2	52,657.6	53,745.2	-2.3	2.1
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	27.1	3.7
VA	42,333.7	41,539.9	41,703.6	44,208.4	44,638.1	43,818.9	44,954.2	44,759.7	5.7	-0.4
GSA	41,978.7	33,948.9	32,264.2	30,314.2	30,916.4	35,985.0	34,685.4	34,300.3	-18.3	-1.1
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	25.8	10.5
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	3.6	-22.9
NASA	6,706.9	7,222.9	7,518.3	7,552.1	8,098.5	8,347.2	8,080.6	8,459.9	26.1	4.7
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	13.5	26.4
DOI	6,765.1	6,849.9	6,692.3	7,366.5	7,745.0	7,511.8	7,746.9	6,824.4	0.9	-11.9
USDA	4,347.2	4,210.0	4,042.9	4,366.4	899.1	5,800.4	5,163.5	5,339.6	22.8	3.4
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	231.2	9.9
DOL	3,687.8	3,751.7	3,785.1	3,914.9	3,880.5	3,864.3	3,784.8	3,852.4	4.5	1.8
EPA	1,209.6	2,098.5	1,049.8	970.6	975.7	1,004.6	1,047.3	1,496.8	23.7	42.9
DOC	1,189.1	2,571.4	2,485.7	2,683.6	3,062.9	3,227.4	3,220.7	1,483.1	24.7	-54.0
TVA	1,321.0	1,526.2	1,551.2	1,500.1	1,383.8	1,410.5	1,423.4	1,422.0	7.6	-0.1
ST	689.2	724.5	803.1	781.1	796.4	817.3	845.4	829.4	20.3	-1.9
FEMA	190.5	295.6	312.1	351.8	395.3	459.6	442.7	453.6	138.1	2.5
HUD	340.6	350.1	355.7	373.0	417.0	426.5	413.4	384.4	12.9	-7.0
OPM	168.1	174.6	175.1	200.6	214.0	218.2	227.1	226.6	34.8	-0.2
PCC	90.5	90.8	92.4	96.6	95.8	97.2	110.2	102.3	13.0	-7.2
FCC	29.5	31.9	34.5	35.2	32.4	41.0	43.7	33.9	14.6	-22.5
OTHER*	588.9	786.9	939.0	997.3	1,147.8	1,070.0	611.3	593.5	0.8	-2.9
CIVILIAN AGENCIES TOTAL	236,478.9	231,181.4	230,789.2	243,212.4	239,372.2	253,398.0	251,180.0	252,757.6	6.9	0.6
DOD	581,170.2	552,598.8	595,765.7	546,127.6	576,994.6	580,184.6	523,370.8	524,164.8	-9.8	0.2
ALL AGENCIES TOTAL										
BBTU	817,649.1	783,780.2	826,554.9	789,340.0	816,366.9	833,582.6	774,550.8	776,922.3	-5.0	0.3
MBOE	140.4	134.6	141.9	135.5	140.1	143.1	133.0	133.4		
Petajoules	862.6	826.9	872.0	832.7	861.2	879.4	817.1	819.6		
ANNUAL CHANGE FROM 1985										
BBTU		-33,869.0	8,905.8	-28,309.2	-1,282.3	15,933.5	-43,098.3	-40,726.8		
MBOE		-5.8	1.5	-4.9	-0.2	2.7	-7.4	-7.0		
Petajoules		-35.7	9.4	-29.9	-1.4	16.8	-45.5	-43.0		
CUMULATIVE SAVINGS FROM 1985										
BBTU		33,869.0	24,963.2	53,272.3	54,554.6	38,621.1	81,719.4	122,446.2		
MBOE		5.8	4.3	9.1	9.4	6.6	14.0	21.0		
Petajoules		35.7	26.3	56.2	57.6	40.7	86.2	129.2		

DATA AS OF 08/18/93

*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.

¹Environmental Protection Agency's data for FY 1990 are estimated.

²National Science Foundation's data for FY 1988, FY 1989, and FY 1990 are estimated.

Note: This table uses a conversion factor for electricity of 11,600 Btu per kilowatt hour.
Sum of components may not equal total due to independent rounding.

Source: Federal Agency Quarterly Energy Use Reports

APPENDIX G

BUILDINGS EXEMPTED FROM NECPA'S PERFORMANCE GOAL IN FY 1992

NECPA, as amended by the Federal Energy Management Improvement Act of 1988 (Public Law 100-615) 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 exempted/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 exempted/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 Pln.
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

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

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 10 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, Laurence, 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

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

12-21/Gas Lab/Nondestructive Evaluation
12-91/Data Collection Building
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)

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

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
OB1 Office Building
Expanded Environmental Laboratory
7-24 to 7-26 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 Pump House
 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
 S1W 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
 Field Operations Office
 Environmental, Safety, and Health Office
 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

Lawrence Berkely Laboratory

Advanced Light Source (under construction)
Electronics Engineering, Research Medicine,
Radiation Biophysics Office
Utilities Service
Compressor Building
Accelerator Development, ALS, RTSS
Physics, Telephone Services, TID, ICSD, Computer
Center
Bevatron/Bevatron
Bevatron Experimental Area
External Particle Beam Hall
2 Accelerator and Fusion Research Buildings

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
 88-Inch Cyclotron
 Blackberry Canyon Gatehouse
 Bevatron Plumbers Storage
 Bevatron Electricians Shop
 Bevatron Electrical Storage
 3 HISS Buildings
 VAX Trailer, User Facility
 Bevatron Trailer
 Bevalec Patient Facility
 Office Trailer
 Bevatron Riggers
 6 Office Trailers

Energy Technology Engineering Center

MG Building, B/461
 SPTF, B/462
 TTF, B/013
 LLTR, B/059
 SCTI, B/356
 LMDL-1, B/032
 LMDL-2, B/057
 SCTL, B/026
 HTF, B/863
 CHCF, B/463

Department of Transportation--Federal Aviation Administration

62 Automated Flight Service Stations
 Airport Information Desk
 Automated International Flight Service Station
 119 Approach Light Systems
 Airway Beacon
 127 Air Route Surveillance Radar -
 FAA and Military
 Air Route Traffic Control Center
 189 Automated Radar Terminal Systems
 23 Airport Surface Detection Equipment
 647 Altimeter Setting Indicators
 263 Airport Surveillance Radar -
 FAA and Military
 568 Airway/Terminal Building Maintenance
 23 Air Traffic Control Beacon Interrogator
 331 Air Traffic Control Radar Beacons
 464 Airport Traffic Control Towers
 398 Automatic Terminal Information Systems
 356 Automated Weather Observing Systems
 Aerial Tramway
 597 BRITE Radar Indicator Terminal Equipment
 294 Backup Emergency Communications
 116 Computer Based Instruction
 2 Central Computer Complexes
 120 Closed Circuit Tvs
 229 Common Digitizers

10 Cloud Height Indicators
 Computer Display Channel
 Combined Center/RAPCO
 11 Control Circuit Equipment
 407 Control Line Maintenance
 17 Communications Microwave Link Terminals
 23 Command Communications Outlets
 Center Building Maintenance
 23 Direct Access Radar Channels
 Display Channel Complex
 337 Direction Finders - VHF
 226 Direction Finder Indicators
 584 Distance Measuring Equipment
 51 Distance Measuring Equipment Remaining
 558 Data Multiplexors
 811 Data Terminal Equipment
 En Route Automated Radar
 Tracking System
 5 Electronic Data Processing Systems
 468 Electrical Distribution Systems
 12 Emergency Operating Facilities
 50 Flight Data Entry and Printout
 23 Flight Data Input/Output Centers
 391 Flight Data Input/Output Remotes
 Flight Data Remoting System Intermediate
 Fields and Landing Areas

39 Fan Markers
 20 Flight Service Data Processing Systems
 189 Flight Service Stations
 46 Ground/Air Transmitter Receivers
 Guidance Light Facility
 Gap Filler Radar
 85 Geostationary Operational
 Environmental Satellite Systems
 864 Glide Slopes
 1143 Homing Radio Beacons
 5 Central Heating Facilities - Per Unit
 22 Heliports
 Homing Radio Beacon - High Power
 1 International Aeronautical
 Telecommunications Switching Center
 260 Integrated Communications
 Switching Systems
 26 Identification, Friend or Foe
 International Flight Service Station
 International Flight Service
 Transmitter Station
 81 Inner Markers
 136 VHF/UHF Link Terminals
 23 Localizer Type Directional Aids
 20 Lead-in Light Facilities
 37 Living Quarters
 114 Low Level Wind Shear Alert
 Systems
 Compass Locator at the ILS
 Middle Marker
 4 Link Repeaters
 1053 ILS Localizers
 473 Compass Locators at the ILS
 Outer Marker
 94 Medium-Intensity Approach
 Lighting Systems
 633 Medium-Intensity ALS (MALS)
 with Runway Alignment
 Indicator Lights (RAIL)
 4 Meteorological and Aeronautical
 Presentation Systems
 9 Marine Equipment Boats and Docks
 625 Multichannel Recorders
 17 Military Height Finder Radar
 33 Military Interface Groups
 Military Interface Modification
 272 Microwave Landing Systems
 Azimuth
 160 Microwave Landing Systems
 Back Azimuth
 271 Microwave Landing System Distance
 Measuring Equipment Precision
 276 Microwave Landing System Elevation
 1 Microwave Landing System Flare

828 Middle Markers
 14 Mobile Laboratories
 105 Mode S/Data Links
 46 Maintenance Processing Systems
 400 Mobile Engines or Generator Plants
 28 National Data Interchange Networks
 1282 National Radio Communications Systems
 39 Next Generation Weather Radar
 65 Off Airways Weather Stations
 50 Omnidirectional Airport Lighting Systems
 Oceanic Display and Planning System
 325 Heavy Equipment and Off-Road Vehicles
 831 Outer Markers
 General Oil Distribution System
 180 Precision Approach Path Indicators
 2 Precision Approach Radar
 707 Power Conditioning Systems
 19 Primary Power Engines or Generator Plants
 68 Quarters Building - Other than
 Living Quarters
 8 Radar Approach Control - Air Force
 111 Rotating Beam Ceilometers
 11 Radar Bright Display Equipment
 22 Radar Beacon Data Processor Equipment
 277 Remote Beacon Performance Monitor
 685 Remote Center Air/Ground
 Communications Facilities
 99 Remote Control Interface Units
 752 Radio Communications Link Repeat
 233 Radio Communications Link Terminals
 1837 Remote Communications Outlets
 692 Runway End Identification Lights
 215 Remote Monitor Control Facilities
 214 Radar Microwave Link Repeaters
 138 Radar Microwave Link Terminals
 189 Remote Readout Hygrothermometers
 95 Radar Remote Weather Display Indicators
 135 Radar Remote Weather Display Systems
 12 Remote Tower Communications
 Control Systems
 1222 Remote Transmitter Receivers
 537 Runway Visual Range
 Shortened Approach Light System
 Sanitation System
 661 Storage Buildings
 Systems Command Center
 Sensor, Receiver, and Processor
 72 Simplified Short Approach Lighting
 Systems with Runaway Alignment
 Indicator Lights (RAIL)
 Simplified Short Approach Lighting System
 Self Sustained Outlet
 49 Sewerage Systems
 666 Tactical Air Navigation

8 Tower Cab Digital Displays
 144 Terminal Data Display Systems
 496 Telephone Exchanges
 589 TELC Interface Maintenance
 19 Terminal Information Processing Systems
 125 Television Microwave Link Indicators
 110 Television Microwave Link Repeaters
 138 Television Microwave Link Transmitters
 414 Tower Buildings
 529 Trails and Roads
 25 Terminal Radar Approach Controls
 17 Teletypewriter Facilities
 137 Transcribed Weather Broadcast
 743 Utility Buildings
 1387 Visual Approach Slope Indicators
 769 Vehicle Maintenance
 1025 VHF Omnidirectional Range
 95 VHF Omnidirectional Range Test
 Weather Message Switching Center
 Water System Maintenance

General Services Administration **EXCLUDED GSA OWNED AND OPERATED BUILDINGS**

GSA CD Depot 234, Watertown, MA
 Parking Facility, Portland, ME
 GSA Reg. FSS MP, Concord, NH
 Fairgrounds Dist. Ctr., Richmond, VA
 FB PO, Port Gibson, MS
 77 W. Jackson, Chicago, IL
 Bldg. 209, Fort Snelling, MN
 Federal Parking Facility, Dayton, OH
 Open Land - FDA Site, New Orleans, LA
 Federal Building, Austin, TX
 U.S. Appraisers Stores, Houston, TX
 Border Station, El Paso, TX
 Alliance Tower, Houston, TX
 Columbia-Laredo Sol, Laredo, TX
 FB-CU, Denver, CO
 FB PO, Denver, CO
 GSA Parking Lot, Denver, CO
 Chief Mtn. Base & Qtrs., Babb, MT
 GSA Storage Bldg., Bismarck, ND
 New Parking Lot, Bismarck, ND
 Sunbeam Appliance Svc., Salt Lake City, UT
 Fed. Ctr. Bldg. 1, Alameda, CA
 U.S. Court of Appeals & PO, San Francisco, CA
 Phillip Burton FB Ct., San Francisco, CA
 John F. Shea Fed. Bldg., Santa Rosa, CA
 Parking Garage, Los Angeles, CA

Long Beach Fed. Bldg., Long Beach, CA
 Int. Ag. Motor Pool, Anchorage, AK
 Danville Border Station, Danville, WA
 Fed. Bldg. U.S. Post Office, Spokane, WA
 White House, Washington, DC
 Delasalle, Avondale, MD
 Techwood VI, Hanover, MD
 Savoy Plaza, Randallstown, MD
 Building No. 1, Belle-Mead, NJ
 Federal Supply Depot, Chicago, IL
 Federal Parking Facility, Detroit, MI
 Border Station, International Falls, MN
 USBS, Santa Teresa, NM
 Garage, Cheyenne, WY
 BS Office Building, Nogales, AZ
 BS Main Building, Douglas, AZ
 BS Main Building, San Luis, AZ
 BS Old Customs Building, Calexico, CA
 BS Exist Main Building, San Diego, CA
 BS Main Building, Tecate, CA
 Federal Building, Los Angeles, CA
 BF SISK FB and US Courthouse, Fresno, CA
 US Border Patrol Station, Calexico, CA
 US Courthouse, Los Angeles, CA
 Federal Office Building, Seattle, WA

GSA EXCLUDED LEASED BUILDINGS

Hobart Prof. Bldg., North Adams, MA
 Building 80, New York (Queens), NY
 5 Washington Sq., Albany, NY
 Greenway Plaza, Melville, NY
 Wise County Plaza, Wise, VA
 Congress Ave. Off. Park, West Palm Beach, FL
 Altamonte Commerce, Altamonte Springs, FL
 Ridgefield Business, Asheville, NC
 Barefoot Jackson, Wilmington, NC
 Airline Business Center, Nashville, TN
 Rockwell Bldg., Cleveland, OH
 Tennyson Guyer FB, Lima, OH
 Park-West Bldg., Rocky River, OH
 Commerce Place, Middleburgh Hts., OH
 Sanning Apartments, Cincinnati, OH
 Lakewood Ctr. West, Lakewood, OH
 113 Saint Clair Ave., Cleveland, OH
 4411 Montgomery Rd., Norwood, OH
 Old Bayfield Cthse., Bayfield, WI
 Vander Heyden II, West Bend, WI
 1519-23 Tower Avenue, Superior, WI
 575 Lester Street, Onalaska, WI
 Glen Hill Office Park, Glen Ellyn, IL
 Park Ridge Office Ctr., Park Ridge, IL
 O'Hare Lake Office Plaza, Des Plaines, IL
 Mid-Continental Plaza, Chicago, IL
 Plaza Tower Office, Evergreen Park, IL
 2100 N. California, Chicago, IL
 Wash. Bicentennial Bldg., Springfield, IL
 2444 W. Lawrence Bldg., Chicago, IL
 County Bank Plaza, Urbana, IL
 Trans Union Bldg., Chicago, IL
 10 West Jackson Blvd., Chicago, IL
 547 West Jackson, Chicago, IL
 Lincolnwood Corp. Ctr., Lincolnwood, IL
 Farnsworth Center, Aurora, IL
 O'Hare Lake Office Plaza, Des Plaines, IL
 State National Bank Bldg., Evanston, IL
 One Congress Center, Chicago, IL
 E. Empire & Eastport, Bloomington, IL
 Burrell Building, Chicago, IL
 1455 Golf Mill Road, Des Plaines, IL
 901 Warrenville Road, Lisle, IL
 1700 South Wolf Road, Des Plaines, IL
 175 East Hawthorn Park, Vernon Hills, IL
 Quails Ridge Office Center, Westmont, IL
 626 W. Jackson, Chicago, IL
 IL Business Ctr., Springfield, IL
 River Center, Chicago, IL
 Northwest Center, Chicago, IL
 Governors' Off. Park, Olympia Fields, IL
 One Oak Brook Ter., Oak Brook, IL

Lakeside Office Bldg., Indianapolis, IN
 595 East 16th Street, Holland, MI
 Clean America Bldg., Benton Harbor, MI
 The Furniture Company, Grand Rapids, MI
 23580 Orchard Lake Rd., Farmington Hills, MI
 5015 South Cedar St., Lansing, MI
 605 N. Saginaw, Flint, MI
 15 Ionia SW, Grand Rapids, MI
 Atrium Office Plaza, Cleveland, OH
 14-15 St. Cass-Chicago, Omaha, NE
 Parking Lot, Little Rock, AR
 Unnamed Building, Fort Smith, AR
 Bldg. 27, Houma, LA
 Sandia Office Bldg, Bernalillo, NM
 Sun Belt Bus. Ctr., Albuquerque, NM
 SSA District Office, Poteau, OK
 King Building, Corsicana, TX
 3223 Briarpark Bldg., Houston, TX
 Unnamed Building, Houston, TX
 Regency Building, San Antonio, TX
 T & P Building, Fort Worth, TX
 Tatum Parking Lot, Helena, MT
 GSA Motor Pool Shop, Cheyenne, WY
 352 East Ave., K/4, Lancaster, CA
 Storage Bldg., Pasco, WA
 Mariner Court Bldg., Coupeville, WA
 Springfield Park Pl., Springfield, NJ
 1578 E 233 Street, New York-Bronx, NY
 100 Church Street, New York-Manhattan, NY
 408 Jay Street, New York-Kings, NY
 76 Eleventh Ave., New York-Manhattan, NY
 Amherst Air Space MV, Amherst, NY
 Mercantil Plaza Building, Hato Rey, San Juan, PR
 2432 Loiza Street, Santurce, San Juan, PR
 Miglori Building, Yauco, Mayaguez, PR
 A.D.R. Building, Guayama, Guayama, PR
 Garrido Morales, Fajardo, Humacao, PR
 715 Building, Wilmington, DE
 823 Hammonds Ferry, Linthicum Hghts, MD
 Food and Drug Admin, Baltimore, MD
 Belmont, Woodlawn, MD
 Snowden Office Park, Fredericksburg, VA
 Thimble Shoals B Ctr, Newport News, VA
 10th and Market Streets, Parkersburg, WV
 FB, Camden, AL
 915 Weinacker Ave, Mobile, AL
 Tampa Commerce Mall, Tampa, FL
 H K Enerprises, Savannah, GA
 324 North 19th Bldg, Middlesboro, KY
 Old Hillsboro School, Franklin, TN
 Fed Hwy Adm Reg Ofc, Homewood, IL
 O'Hare Office Building 2, Rosemont, IL

Clyde Savings Building, North Riverside, IL
 Smoke Tree Bus Park, North Aurora, IL
 Glen Hill North BG A, Glen Ellyn, IL
 14475 John Humphrey, Orland Park, IL
 OT Johnson Building, Galesburg, IL
 900 Oakmont Lane, Westmont, IL
 1279 North Milwaukee, Chicago, IL
 Bank of America, Chicago, IL
 121 South Wilke, Arlington Hts, IL
 Elm Plaza So. Tower, Hinsdale, IL
 Soc. SFC. Office, Chicago, IL
 125 Fairfield Way, Bloomingdale, IL
 2360 E. Devon Ave. Des Plaines, IL
 923-25 Dillon, Wood Dale, IL
 First & North Center, Melrose Park, IL
 Glen Hill North B, Glen Ellyn, IL
 Schaumburg Atrium, Schaumburg, IL
 600 Joliet RD, Willowbrook, IL
 508 So. 8th Street, Springfield, IL
 2350 E. Devon, Des Plaines, IL
 300 S. Riverside, Chicago, IL
 29 North Wacker Drive, Chicago, IL
 5619-21 West 115th S, Alsip, IL
 635 Butterfield Rd, Oakbrook Terrace, IL
 5353 S. Laramie, Chicago, IL
 Illini fin Center, Springfield, IL
 M/Grove Exec Center, Tinley Park, IL
 Governors Off Pk IV, Olympia Fields, IL
 Glenwood Plaza, Glenwood, IL
 215 W 83rd St, Burr Ridge, IL
 Business Centre Building, Oakbrook Terrace, IL
 401 Medical Plaza, Michigan city, IN
 Tremonti Building, Detroit, MI
 Campau-Holbrook Building, Hamtramck, MI
 17410 Mack AVE, Grosse Pointe, MI
 Uptown Mall, Big Rapids, MI
 Trust Building, Grand Rapids, MI
 Ambassador Bridge, Detroit, MI
 Trestlebridge Centr, Kalamazoo, MI
 125 Arlington Srtree, Sault Ste Marie, MI
 Good Speed Building, Grand Rapids, MI
 123 S. Westnedge Ave, Kalamazoo, MI
 Giant Plaza, Ludington, MI
 US Customs & Immig, International Falls, MN
 Plymouth Building, Minneapolis, MN

Mounds View Park, Mounds View, MN
 None, Mansfield, OH
 Bancohio Building, Cleveland, OH
 Keith Building, Cleveland, OH
 Maylee Building, Cleveland Hts, OH
 Plaza South II, Middleburg Heights, OH
 75 Public Sqaure Building, Cleveland, OH
 Brass Office Center, Mansfield, OH
 Social Security Administration, Kenosha, WI
 110 Plaza Circle, Waterloo, IA
 625 Cheyenne, Kansas City, KS
 11510 West 80th, Lenexa, KS
 3150 Dodge Road, Kansas City, KS
 Ozark Terminal Whse, Neosho, MO
 401 E. Union, Vandalia, MO
 Brooklyn Building, Kansas City, MO
 Portion Lots 8 to 12, Little Rock, AR
 Unnamed Building, Farmington, NM
 Old Dr. Pepper Wrhse, Galveston, TX
 1-35 Business Center, San Antonio, TX
 Unnamed Building, Dallas, TX
 Romero Building, Lakewood, CO
 115 Inverness, Englewood, CO
 Motor Pool, San Francisco, CA
 21200 Roscoe Blvd, Los Angeles, CA
 321 Castro Stree, Mountain View, CA
 9168 De Soto Ave, Los Angeles, CA
 2216 West Beverly Bl, Montebello, CA
 Civic Ctr Complex, Palm Desert, CA
 777 Kapiolani Blvd, Honolulu, HI
 350 South Rock, Reno, NV
 Blg 60 Banfield Ind, Portland, OR
 Postal Sqaure, Washington, DC
 1990 K Street NW, Washington, DC
 Vanguard, Washington, DC
 1020 11th St NW, Washington, DC
 SS Metro Center 3, Silver Spring, MD
 River. Col. PK Metro, Riverdale, MD
 8745 Darcy Road, Forestville, MD
 Forestville Bus Prk, Forestville, MD
 EDS Building, Springfield, VA
 7401 Fullerton Rd, Springfield, VA
 6437 General Green W, Alexandria, VA
 1411 South Fern Street, Arlington, VA
 Crystal Plaza 6, Arlington, VA

National Aeronautics and Space Administration

Johnson Space Center

Flight Operations Facility
 Mission Simulation & Training Facility
 Crew Systems Laboratory

Photo. Tech. Laboratory
 Central Data Office
 Avionics Systems Laboratory
 Central Heating & Cooling Plant
 Mission Control Center Facilities

Planetary & Earth Sciences Lab.
Space Environment Simulation Lab.
Mission Simulator Development Facility
Life Sciences Laboratory
Central Computer Facility
Vibration/Acoustic Test Facility
ARMSEF
Radiant Heat Facility
Thermochemical Test Area
Auxiliary Chiller Facility
Emergency Power Building

Downey Facility

Entire Facility

White Sands Test Facility

Entire Facility

Kennedy Space Center

Vehicle Assembly Building (K6-848)
Orbiter Processing Facility
Launch Control Center
Utility Annex
Repeater Station
Converter/Compressor Building
Launch Equipment Test Facility
Hypergol Module-N
Hypergol Support Building
Hypergol Module-S
Hypergol Module-W
Hypergol Module-E
Hypergol Module-F
Unified "S" Band System Facility
Hanger AF, SRB Recovery Building
Parachute Refurbishment Facility
SRB Paint Shop
High Energy Radiography Fac. (HERF)
Comm. Distribution & Switching Center

Launch Complex 39 A & B
Spacecraft Landing Facility
Operations & Checkout Building
Vertical Processing Facility
Spacecraft Assembly & Encapsulation Fac.
Payload Hazardous Service Facility
Hanger S, Automated Payload Facility
Hanger L, Life Sciences Support Fac.

Hangar AM, Spacecraft Building #1
Hangar AE, Missile Assembly Building
ESA 60

Payload Support Facility
Spin Test Building
Hangar AO, Spacecraft Building #2
Rotating/Processing Building
Engineering and Administration Building

Marshall Space Flight Center

Microwave Anechoic Chamber
Communications System Facility
Hardware Simulation Lab.
Space Science Lab.
Laboratory
Prop. System & Acoustic Model Facility
Structural Test Facility
Pump & Boiler House
Test & Data Recording Facility
Space Environmental Effects Lab.
Materials & Processes Lab.
Structures & Mechanics Lab.
Cryogenic Testing Facility
Compressor Building
LH2 Vaporization Facility
HP GN2 Facility
2 Boiler Plants
Computer Facility
Prop. Tech. Test Facility
Helium Compressor Building
Non-Destructive Evaluation Lab.
Shops and Neutral Buoyancy Simulator
Productivity Enhancement Facility
Engineering and Development Lab.
Development Processes Lab.
Wind Tunnel Facility
Compressed Air Facility
Air Compressor Building
Multi-Purpose High Bay Facility
Surface Treatment Facility
High Reynolds Number Facility
Eng. Dynamic Fluid Flow Facility
Photographic Laboratory
Celestial and Optical Sensors Facility
Power Systems Laboratory
Test Support Building
Test Facility Terminal Building
Hot Gas Test Control/Support Building
TPTA Refurbishment Facility
Propulsion and Structural Test Facility
Atmospheric Research Facility
Heat Treatment Facility
High Pressure Test Facility
Hydraulic Equipment Development Facility
Pump House
Test Facility Support Building

Block House
X-Ray Calibration Facility
High Bay Shop Building
Multi-Purpose High Bay Facility
Low Density Flow Facility

Michoud Assembly Facility

Entire facility

Santa Susana Facility

Entire facility

Slidell Computer Complex

Entire facility

Ames Research Center

Computational Fluid Dynamics Facility
Model Development Facility
12 Ft. Pressure Wind Tunnel
12 Ft. Wind Tunnel Auxiliaries
Propulsion Sims Calibration Fac.
Flight System Research Lab.
Flight Support Facility
7 x 10 Ft. Wind Tunnel #1
7 x 10 Ft. Wind Tunnel #2
Model Preparation Facility
14 Ft. Transonic Wind Tunnel
Technical Services Shop
40 x 80 x 120 Ft. Wind Tunnel
20-G Centrifuge
2 x 2 Ft. Transonic Wind Tunnel
6 x 6 Ft. Supersonic Wind Tunnel
Unitary Plan Wind Tunnel System
3.5 Ft. Hypersonic Wind Tunnel
Hypersonic Wind Tunnel Auxiliaries
Fluid Dynamics Laboratory
Central Computation Facility
Thermal Protection Facility
Bioscience Laboratory
Hypervelocity Free Flight Facility
Arc Jet Facility
Life Sciences Research Facility
Airborne Missions Facility
Vestibular Research Facility
Flight & Guidance Simulation Lab.
Space Projects Facility
Space Sciences Research Lab.
Model Construction Facility

Kulper C-141 Hangar
Static Test Stand (OARF)
High Pressure Air Housing
Telecommunications Gateway Fac.
Moffet Range Systems Research Fac.
Man-Vehicle Systems Research Facility
Numerical Aero. Simulator
High Altitude Aircraft Support Fac.
Fluid Mechanics Laboratory
Biomedical Research Laboratory
Human Performance Research Lab.
Digital Comms. Systems Facility
Automated Sciences Research Fac.

NASA Tracking Stations

Consists of four sites in the United States, and is entirely Mission Variable

Dryden Flight Research Facility

Entire Facility

Langley Research Center

High Intensity Noise Research Lab
Low Turb. Tunnel & Compressor Station
Transonic Tunnel
6 x 19 Ft. Transonic Tunnel
8 Ft. Transonic Tunnel & Supply Bldg.
30 x 60 Ft. Tunnel
12 Ft. Low Speed Tunnel
20 Ft. Vert. Spin Tunnel
Engineering Lab./Compressor Facility
General Rotor Aerolasticity Lab.
Transonic Dynamic Tunnel
Hydrodynamics Research Facility
Basic Aerodynamics Tunnel
Vortex Research Facility
Space Environmental Effects Lab.
16 Ft. Transonic Tunnel
Structures & Material Research Lab.
Pyrotechnics System - Enviro. Test
Flight Electronics Lab.
Subsonic Tunnel Offices
High Speed 7 x 10 Tunnel
Subsonic 14 x 22 Tunnels
Steam Generation Plant
Anechoic Noise Facility
Adv. Machine Development Lab.
Structural Mechanics & Dynamics Research Lab.
Instrument Research Lab.
Space Technology Lab.
Jet Exit Test Facility

Frequency Converter Building
 National Transonic Facility
 NTF Tunnel Model Facility
 Foundry & Glass Blowing Shop
 Electronics Technology Lab.
 Drive Control Facility
 0.3 Meter Transonic Cryo. Tunnel
 Hanger & Flight Research Center
 Hangar Support
 Hangar Support/Shop - Aircraft
 Hypersonic Facilities Complex - West Wing
 High Pressure Air Facility
 Environmental & Space Science Lab.
 Unitary Wind Tunnel
 Con. Flow Hypersonic Wind Tunnel
 Aircraft Landing Dynamics Facility
 Aircraft Landing Dynamics Shop
 HPB Ceramic Heated Comb. Facility
 8 Ft. High-Temperature Structures
 High Temp. Materials Lab. & Processing
 TSL Cooling System Facility
 Chemical Treatment Facility
 Radiation Re-Entry Research
 Engineering & Fabrication Lab.
 Component Verification Facility
 Impact Dynamics Support Building
 Flight Management Research Facility
 Advanced Technology Research Laboratory
 Materials Research Laboratory
 Acoustics Research Laboratory
 Applied Acoustics Branch Offices
 Basic Aerodynamics Research Tunnel
 Conference Center
 Information Systems Research Facility
 Hyper Propulsion Facility/Operations Support Shop
 High Intensity Noise Research Laboratory
 Hazard Material Metallurgy Laboratory
 Gas Flow Calibration Laboratory
 Nondestructive Evaluation laboratory
 Metals Technology Development Laboratory
 AFGE Union Building Local 2755
 Research Support Facility/Models Coating Lab
 Electronics Technology/Microelectronics Developm
 Composites & Model Development Laboratory
 Flight Research/Space Station Freedom Office
 Hypersonic Facilities Complex Offices
 Hypersonic Facilities Complex - East Wing
 Atmospheric Sciences/Systems Development Lab
 Atmospheric Sciences Laboratory Annex
 Thermal Structures Laboratory
 Materials Processing and Development Shop
 Central Scientific Computing Facility
 Flight Simulation Laboratory
 Central Scientific Computing Facility

Printed Circuit & Encapsulation Laboratory
 Composite Storage & Preparation Buildings
 Storage Facility
 Cloud Chemistry Laboratory
 Composite Material Laboratory
 Spacecraft Dynamics Laboratory
 Materials Properties & Nondestructive Testing Lab
 Aircraft Crashworthiness Preparations Facility
 Impact Dynamics Support Facility
 Guidance & Control Research Laboratory
 Flight Electronics/Electromagnetics Laboratory

Lewis Research Center

Engine Research Bldg. (also 23/37/38/81/82)
 Chemistry Laboratory
 Icing Research Tunnel
 Special Projects Lab.
 Materials Research Lab.
 Materials & Structures Lab.
 Central Air Equip. Bldg. (also 70/74/95/126)
 Instrument Research Lab.
 ERB Comb. Air Heater
 Engine Components Research Lab.
 Materials Processing Lab.
 Basic Materials Lab.
 Electric Power Lab.
 Energy Conversion Lab.
 Space Power Research Lab.
 8 x 6 Ft. Supersonic Wind Tunnel
 10 x 10 Ft. Supersonic Wind Tunnel
 PSL Heater Building

Plum Brook Station

Entire facility

Goddard Space Flight Center

Research Projects Lab.
 Flight Control Range Operations
 Instrument Development Lab.
 Payload Testing Facility
 Environmental Testing Lab.
 Network Control Center
 Spacecraft Operations Facility
 High Capacity Centrifuge Facility
 Space & Terrestrial Applications Facility
 Data Interpretation Lab.
 Technical Processing Facility
 Spacecraft Systems Development/Integration
 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 Ft. Space Simulator
Spacecraft Assembly Facility
Space Flight Operations Facility
10 Ft. Space Simulator
Space Flight Support
Frequency Standards Laboratory
Microdevices Laboratory
Earth & Space Sciences 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

167 Barns
2 Bus Stations
31 Chemical Storage Buildings
8 Engineering Facilities
2 Filling Stations
4 Fire Stations
294 Greenhouses
43 Garages
69 Headhouses
106 Housing Buildings
2 Incinerator Buildings
440 Laboratory Buildings

47 Office Buildings
86 Office/ Laboratory Buildings
Chapel
4 Restroom Buildings
157 Sheds
141 Shops
426 Storage Buildings
20 Trailers
Weather Station
3 Waste Treatment Buildings
64 Other Building Types

APPENDIX H

FEDERAL ENERGY EFFICIENCY AWARDS

Special Recognition Awards

Garyl D. Smith
Naval Weapons Center
United States Navy
China Lake, California

Through his technical expertise, leadership, and ability to get things done, Mr. Smith has come to be considered by the DoD as the foremost expert in the field of solar and photovoltaic (PV) technologies. Close to 2,000 PV systems have been installed for the Navy under Mr. Smith's direction. He has developed technical manuals, design workshops, and a descriptive video used by the military, government agencies, and the private sector and provides direct input to the DoD, Navy, and national policy-making process.

Fred Bloom
Gordon Cates
David Killebrew
Tonto National Forest Project
Forest Service, Region 3
U.S. Department of Agriculture
Phoenix, Arizona
Hal Post
Photovoltaic Design Assistance Center
Tonto National Forest Project
Sandia National Laboratory
U.S. Department of Energy
Albuquerque, New Mexico

This team has implemented model projects at the Cholla Recreation Site that maximize the use of photovoltaic (PV) technology, solar thermal exchange, passive infrared sensing, and compost toilet technology. These projects are a result of the National Recreation Policy strategy to incorporate viable water and energy saving technologies in the Roosevelt Lake Recreation Area. The total cost of the system was \$240,000, which is much less than the estimated \$750,000 it would have cost to extend commercial grid power to the site.

Energy Management Program
Electric Utilities and Utilities Divisions
Lawrence Livermore National Laboratory
U.S. Department of Energy
Livermore, California

The Electric Utilities and Utilities Divisions, Lawrence Livermore National Laboratory (LLNL), implemented integrated resource planning to structure its source of utility supply in the most reliable, cost effective, and energy efficient manner; to reduce energy and water consumption; and to reduce negative impacts to the environment. In-House Energy Management Program retrofit projects are estimated to reduce energy costs by \$603,000, and operation and maintenance costs by \$167,000 annually.

Real Property Management and Safety Division
Region 2
General Services Administration
New York, New York

The Division demonstrated integrated resource planning by the negotiation and implementation of a Memorandum of Understanding (MOU) between GSA, the Department of Energy, and Consolidated Edison, in a commitment by all three parties to cooperate in a joint effort to ensure that the most energy efficient concepts and practices are applied to the modernization of the Federal Plaza complex and that demand side management practices are fully utilized.

Individual Awards

George A. Ames
U.S. Department of Energy
Lawrence Berkeley Laboratory
University of California
Berkeley, California

Mr. Ames developed and implemented a nationally acclaimed direct digital control system and was responsible for the development of a model energy management program. The annual energy cost savings for approved retrofit projects are anticipated to exceed \$2.1 million by the mid-1990s.

Newell G. Flood
Headquarters, I Corps
United States Army
Fort Lewis, Washington

Mr. Flood submitted \$1.6 million in energy projects for funding of boiler and control changeouts, competed for and obtained Army funds for the projects, and reviewed contract design and construction to ensure energy savings were realized. These projects will save approximately 32,037 MBtu per year over the 30-year project life. He negotiated a demand side management (DSM) program with Tacoma Public Utilities (TPU) which will result in 86,000 MBtu per year savings in electrical energy for a cost reduction of over \$600,000 per year.

Ronald F. Grady
United States Postal Service
Providence, Rhode Island

Mr. Grady focused his energy conservation efforts primarily on lighting retrofits. He coordinated the identification of specific projects, energy audits, and the retrofit installations. Yearly energy savings for all projects completed through FY 1991 were projected to be 4,105 MBtu with corresponding utility incentives valued at \$634,003.

Grant R. Keath
Logistics Evaluation Agency
United States Army
New Cumberland, Pennsylvania

Mr. Keath was instrumental in the development and execution of energy conservation policy for the Army Energy Program and for the development of the Army Energy Resources Management Plan. FY 1991 facility energy consumption was 17.3 percent below FY 1985, while mobility energy consumption was reduced by 31.6 percent. The Army's facility energy conservation efforts alone have produced a cost avoidance of \$517 million over the past five years.

Frederick Lerch
Pittsburgh Division
United States Postal Service
Pittsburgh, Pennsylvania

Mr. Lerch conceived and initiated a major lighting retrofit at the Pittsburgh General Mail Facility that involved replacement of 1,265 metal halide and mercury vapor lamps with 784 high and low pressure sodium lamps in the 400,000 square foot area. First

year savings are projected at \$200,000, based on actual consumption for the first two full months after contract completion.

Mark K. Orton, P.E.
U.S. Fish and Wildlife Service
U.S. Department of the Interior
Madison, Wisconsin

Mr. Orton established an energy management system as an integral part of the operations of the National Wildlife Health Research Center and has implemented over 42 energy conservation measures. Comparing FY 1991 to FY 1985, the energy efficiency projects and off peak energy rates obtained by Mr. Orton have saved the Center approximately 2.2 billion Btu and \$24,000 per year.

Paul L. Scalf
Naval Aviation Depot
United States Navy
Jacksonville, Florida

Under the leadership of Mr. Scalf, energy consumption was reduced by 317 billion Btu, 53.5 percent in FY 1991 in comparison to the FY 1985 baseline. He was instrumental in the development and implementation of a computerized energy management control system, major improvements to the high voltage power distribution system, installation of new energy efficient process equipment, improvements to the steam distribution system, implementation of a metering program, relamping and installation of motion sensors, and optimization of HVAC operations which saved 116.5 billion Btu and \$775,812 in FY 1991.

Harold C. Schramm
United States Army
Fort McNair, Washington, D.C.

Mr. Schramm provided the impetus for a program that has given Fort McNair the most consistent year-to-year savings. He has successfully implemented low technology, innovative energy conservation measures that have reduced facility energy use by 2,389 MBtu in FY 1991 as compared to FY 1990, for an energy cost avoidance of \$26,351.

Linda D. Scott
General Services Administration
Kansas City, Missouri

Ms. Scott served as the project coordinator for a major cafeteria kitchen renovation at the Federal Building in Kansas City, Missouri. Aging, inefficient kitchen equipment was replaced with new, state-of-the-art equipment. The project saved 608 MBtu in FY 1991 and reduced the building energy consumption by nearly 50 percent from the previous fiscal year. Ms. Scott is highly respected nationwide and her actions are being adapted by others in similar projects as opportunities arise.

Mark A. Trimarchi
General Services Administration
Fort Worth, Texas

Mr. Trimarchi was solely responsible for the development and implementation of the energy conservation program for FY 1991. He developed and administered a contract for comprehensive energy conservation surveys in 46 buildings in Region 7, reviewed the survey reports, and used the recommendations to generate energy projects. During FY 1991, 28 projects were awarded which should save approximately 45,789 MBtu each year over the next 25 years.

Small Groups Awards

Tharon L. Jack, Manager
Sean O. Kelly, Maintenance Supervisor
Mark G. Phares, Maintenance Worker
Elkins Office
General Services Administration
Elkins, West Virginia

These three employees initiated energy saving projects that, compared to FY 1990, reduced energy consumption by 16.33 percent at the Jennings Randolph Federal Center and by 28.58 percent at the U.S. Forest Service Building in Elkins, West Virginia. Utilization of existing technology and a vigorous, enthusiastic approach to energy conservation were the key ingredients to the decrease in energy consumption which resulted in annual savings of approximately \$16,000.

Paul M. Coleman
Walter E. Bay
Energy Management Control System (EMCS)
Optimization Team
Brookhaven National Laboratory
U.S. Department of Energy
Upton, New York

This Team was formed at Brookhaven National Laboratory in fiscal year 1990 to coordinate all EMCS related activities from construction through operation and maintenance. During FY 1991, efforts of the Team produced annual savings of over \$300,000 in energy costs based on estimated energy savings of 71,000 MBtu. Mr. Coleman is responsible for EMCS engineering and programming. Mr. Bay oversees operation and maintenance.

Walter E. Parks, Energy Coordinator
Thomas W. Arceneaux, Project Manager
Samuel D. McCarty, Technical Manager
Jerome G. Misch, Contracts Specialist
John C. Stennis Space Center
National Aeronautics and Space Administration
Stennis Space Center, Mississippi

The John C. Stennis Space Center (SSC) in Mississippi saved 7,308 MBtu of natural gas, for a 3.4 percent reduction in consumption during FY 1991 relative to FY 1990. The team achieved this reduction by replacing the SSC central heating boiler plant system with a distributed system of individual packaged boiler units in various buildings. The team implemented a spot gas contracting program. Now in its third year SSC's average cost for natural gas decreased from \$3.33 per thousand cubic feet (MCF) in FY 1989 to \$2.15/MCF in FY 1991 and most recently to only \$1.56/MCF. These two efforts represent a 10.5 percent reduction in cost based on FY 1989 energy usage and savings of over \$300,000 in FY 1991.

Richard Helmlich, Springfield Office
Eduardo A. Libunao
Eli J. Armstrong
Peter Dal Corobbo
Quincy, Illinois Social Security Administration
Building Project
General Services Administration
Chicago, Illinois

During FY 1991, the technical efforts and hardware modifications initiated by this team reduced energy consumption in the Social Security Administration Building by 64.2 percent from FY 1990, an energy

saving of 226 MBtu. The team replaced an aging package rooftop HVAC unit with a state-of-the-art unit that incorporates high efficiency compressors with solid state controls which optimize loading and unloading of the compressors. The team approach resulted in a new energy efficient HVAC system which should save 4,516 MBtu over the expected 20-year life of the project.

Richard Koelsch, Manager,
Facilities Operations Engineering
Norman R. Michal, Jr.,
Facilities Electrical Engineer
TVA Engineering Team
Tennessee Valley Authority
Chattanooga, Tennessee

While studying ways to reduce energy consumption, Mr. Koelsch found the 12.8 kV service transformer/distribution boards loaded at less than 30 percent for all ten boards. The boards were arranged in pairs, and on the low voltage side they could be crosstied and fed from one transformer. Mr. Koelsch and Mr. Michal decided to crosstie all pairs of distribution boards from a single transformer. Their efforts made it possible to manipulate the loading according to peak and non-peak hours. The estimated annual savings for 40 plus years is 750 MBtu equal to \$15,400 per year in FY 1991 dollars.

Organizational Awards

Austin Service Center
Internal Revenue Service
U.S. Department of the Treasury
Austin, Texas

Several energy-related projects were implemented at the Austin Service Center in FY 1991 to reduce the overall consumption of energy at its main office building. The primary initiative was the replacement of old fluorescent light fixtures with high efficiency parabolic light fixtures and high efficiency ballasts. This saved 3,176 MBtu.

Engineering Service
Edith Nourse Rogers Memorial Hospital
Department of Veterans Affairs
Bedford, Massachusetts

By fine tuning the steam distribution system at the Edith Nourse Rogers Memorial Hospital, the Engineering Service was able to save 42 MBtu for a 17.7 percent decrease in energy consumption in fiscal year

1991 from the previous year. The primary conservation initiative was the resizing and replacement of a pressure regulating valve to allow better control of the steam pressure. Also, a steam condensate return system was installed to replace a condensate tank, a deaerator tank, feed pumps and associated piping in the steam plant. These initiatives provide more precise control of the facility's steam pressure and allow a single plant operator to put the plant on-line.

Engineering Service
Veterans Affairs Medical Center
East Orange, New Jersey

Energy consumption was reduced by more than 14 percent during FY 1991 from FY 1990. A boiler plant project in which three out of four existing boilers and auxiliaries were replaced with high efficiency equipment contributed to this decrease. Motor speed controllers were installed to reduce airflow in areas that are unoccupied or have low occupancy rates. Lighting reflectors were installed to replace four existing lamp fixtures with an aluminum reflective surface and higher color rendering lamps. These projects are projected to produce annual savings of \$130,000.

Golden Gate Field Office
General Services Administration
San Francisco, California

Energy consumption was reduced by roughly one-third when the eight major dual-duct constant-volume HVAC systems were modified to a dual duct variable air volume system incorporating variable frequency drives. This effort resulted in savings of 7.2 MBtu. Lighting modifications were implemented on three floors and installation of motion detectors in all bathroom and conference rooms played pivotal roles in the installation and operational troubleshooting.

Heidelberg Community Energy Team
Headquarters, Base Support Battalion
United States Army
Heidelberg, Germany

Through the coordinated efforts of this team, fixed facility energy consumption was reduced by 33 percent and mobility fuel consumption was reduced by 31 percent in FY 1991 from the 1985 base year. To achieve these savings, technical innovations, facility upgrades, mobility fuel management, and awareness campaigns were implemented. The total energy consumption for Heidelberg is 7.4 percent

below the goal established for FY 1991 by the U.S. Army, Europe.

Keesler Training Center
United States Air Force
Keesler Air Force Base, Mississippi

Keesler Training Center saved \$328,883 in facility energy costs in FY 1991, and reduced energy consumption by 44,809 MBtu from FY 1990, a 4 percent reduction in energy use. Ground and aviation fuel consumption was decreased by 1.6 million gallons during the same time. The single, most important tool used to achieve the facility reduction was the Energy Management Control System (EMCS). The EMCS monitors and controls approximately 7,000 data collection and control points in 103 buildings.

Marine Corps Air Station, El Toro
United States Marine Corps
Santa Ana, California

Personnel implemented major retrofit programs during FY 1991 which reduced energy consumption by 6,200 MBtu, more than a 10 percent decrease from the FY 1985 level, and a dollar saving of over \$1.6 million for 1991. Air Station employees reviewed lighting systems in over 25 structures and 2,500 lighting fixtures were retrofit with electronic ballasts, silver optical reflectors, and low wattage fluorescent tubes, for annual electric energy cost savings of approximately \$32,000. Installation of a training pool cover provided an additional savings of \$41,000 per year.

Milwaukee Field Office
General Services Administration
Milwaukee, Wisconsin

Energy management systems were installed in the Social Security Administration Buildings in Janesville, Oshkosh, Racine, and Sheboygan, Wisconsin. The Field Office personnel control the operation of their HVAC equipment via the energy management systems located in the Federal Building and U.S. Courthouse in Milwaukee. The energy management systems control air handling units, roof top heating and cooling units, and the office space temperatures during occupied and unoccupied hours. Actions taken in FY 1991 by the Milwaukee Field Office saved 1,214 MBtu compared to FY 1990, and are estimated to save a total of 18,210 MBtu over an estimated 15-year life of the projects.

Shared Energy Savings Steering Committee
United States Postal Service Headquarters
Washington, D.C.

The United States Postal Service, in fiscal year 1991, initiated lighting retrofit projects which saved 3,604,669 kWh annually through the implementation of two shared energy savings (SES) contracts. This equates to approximately 12,300 MBtu. The retrofits will reduce overall consumption by 10 to 15 percent at the facilities. The General Mail Facilities (GMF) at New Orleans and Oklahoma City were the sites where the SES projects were awarded. The effects of these projects will be organization-wide and will be shared with other Federal agencies.

Trident Training Facility
United States Navy
Kings Bay, Georgia

The Facility reduced energy consumption by 35,000 Btu per square foot in fiscal year 1991, which represents a 16.5 percent reduction from fiscal year 1990. Efforts were concentrated in two areas: energy awareness and technical enhancement of existing utility systems. The Facility concentrated efforts on the use of automated monitoring and control systems to maximize efficiency. Among the energy saving projects implemented were the rewiring of lighting fixtures and the installation of photoelectric lighting controls. These and other projects resulted in savings of 377,200 Btu for each dollar spent.

Twin Cities Field Office
General Services Administration
Fort Snelling, Minnesota

Energy conservation efforts resulted in annual savings of 3,781 MBtu in FY 1991 compared to FY 1990. This was accomplished through a variety of actions including the installation of energy management systems in buildings throughout the state. Numerous lighting projects were undertaken including the installation of automatic lighting controls, incandescent lamp replacement with high pressure sodium lamps, and the use of T8 lighting technology. These projects are estimated to result in savings of 445,652 Btu per dollar spent throughout the lifetime of the projects.

**U.S. Army Yuma Proving Ground
United States Army
Yuma, Arizona**

Facility energy consumption was reduced by 2,674 MBtu from FY 1990 with a cost avoidance of \$20,000 in FY 1991. Energy management programs included an active Energy Advisory Council, the Energy Conservation Working Group, which promotes energy awareness and education; the Energy Awards Working Group, responsible for judging energy contests, evaluating suggestions, and recognizing individual achievements; and the Energy Engineering Working Group, composed of engineers and technicians who review and analyze energy conservation suggestions and propose projects to reduce energy usage.

**U.S. Department of Energy
Lawrence Berkeley Laboratory
University of California
Berkeley, California**

Energy conservation projects were implemented in numerous buildings to reduce energy consumption at the Lawrence Berkeley Laboratory during fiscal year 1991. The total saving for funded projects was 1,181,500 MBtu (source) at a cost of \$9,680,300, or approximately 43,100 Btu saved per dollar spent per year. The projects completed in FY 1991 include installation of energy management and control systems (EMCS), a small part-load chiller for process cooling, and retrofit of a high efficiency cooling tower.

**U.S. Naval Facility Argentia
United States Navy
Newfoundland, Canada**

Argentia reduced energy consumption by 24,611 MBtu in FY 1991 as compared to FY 1990, for savings of over 18 percent in Btu per square foot since FY 1985. A new underground steam distribution system has produced a 40 percent decrease in make-up water used and will save approximately 125,000 MBtu over its 15-year life. A new high efficiency burner unit, installed on an industrial area boiler, will save approximately 48,000 MBtu in its 15-year lifetime.

**Westinghouse Hanford Company
Richland Field Office
U.S. Department of Energy
Richland, Washington**

A variety of actions taken during FY 1991 produced a reduction in energy use of 576,000 MBtu when compared to FY 1990, and a 39 percent decrease from the 1985 base year. The design of new energy efficient buildings with various energy saving features, including double-pane windows with solar glazing and high efficiency heat pumps, has contributed significantly to this reduction. Other conservation efforts include energy conservation training, incentive awards, employee awareness, and programs on efficiency in vehicles, equipment and transportation, and ridesharing.

APPENDIX I
DEPARTMENT OF ENERGY: EDUCATION, EXTENSION,
AND INFORMATION SERVICES

Conservation and Renewable Energy Inquiry and Referral Service (CAREIRS)

Contact: Mary Corrigan, (202) 586-1265

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 Extension Service (EES)

Contact: Jim Demetrops (202) 586-9187

Energy-Related Inventions Program (ERIP)

Contact: Terry Levinson, (202) 586-1478

Gas Mileage Guide

Contact: Shellia Perez, (202) 586-6723

Institutional Conservation Program (ICP)

Contact: Robert K. Volk, Jr., (202) 586-8034

National Appropriate Technology Assistance Service (NATAS)

Contact: Mary Corrigan, (202) 586-1265

National Energy Information Center, Energy Information Administration (NEIC/EIA)

Contact: Nancy Nicoletti, (202) 586-8800

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 Ortman, (202) 586-1634

Solar Technical Information Program, National Renewable Energy Laboratory (STIP/NREL)

Contact: Nancy Reece, (303) 231-1488

State Energy Conservation Program (SECP)

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Technical Information and Communication Program

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Weatherization Assistance Program

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Source: *Fourteenth Report to Congress. Comprehensive Program and Plan for Federal Energy Education, Extension and Information Activities: Annual Revisions; DOE/CE-0355P; November 1992.*

APPENDIX J
FEDERAL AGENCY ENERGY MANAGEMENT CONTACTS

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APPENDIX K
PERSONNEL OF THE DEPARTMENT OF ENERGY'S
FEDERAL ENERGY MANAGEMENT PROGRAM

FY 1992 Personnel

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APPENDIX L
EQUIVALENT FEDERAL ENERGY DATA TABLES
USING METRIC UNITS OF MEASURE

TABLE 1
TOTAL ENERGY USE BY FEDERAL AGENCIES
(In Terajoules [Joule x 10¹²] and Millions of Barrels of Oil Equivalent [MBOE])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	% CHANGE 85-92	% CHANGE 91-92
DOE	55,115.1	52,676.7	50,891.5	52,530.3	46,295.8	45,776.3	44,077.7	46,811.5	-15.1	6.2
USPS	29,289.5	29,578.6	30,040.8	31,247.2	31,973.5	32,300.1	32,511.9	33,416.3	14.1	2.8
VA	26,527.7	26,397.0	26,245.7	27,699.2	27,693.0	26,267.8	26,651.6	26,643.9	0.4	0.0
DOT	20,609.3	20,460.7	20,046.9	19,745.0	19,525.1	20,008.3	19,804.3	16,645.5	-19.2	-16.0
GSA	18,059.6	14,773.2	13,801.3	13,066.5	13,356.1	15,008.5	14,724.6	14,603.3	-19.1	-0.8
NASA	11,454.1	11,793.8	11,710.5	11,833.5	12,772.7	13,007.0	13,132.9	13,238.7	15.6	0.8
USDA	8,818.4	7,171.7	6,981.9	9,212.2	8,057.4	10,467.9	9,662.0	9,601.1	8.9	-0.6
HHS	7,367.5	6,562.0	6,920.1	6,737.7	7,099.4	8,394.7	7,498.0	8,392.2	13.9	11.9
DOJ	8,625.7	9,065.3	8,570.3	9,958.1	8,175.6	7,344.5	8,459.3	7,959.2	-7.7	-5.9
DOI	6,813.0	7,235.1	6,996.7	7,360.0	7,541.9	7,798.5	7,231.2	7,377.0	8.3	2.0
TRSY	2,922.4	2,850.7	3,881.7	7,510.3	5,530.8	3,578.1	4,406.9	4,883.0	67.1	10.8
DOL	2,516.3	2,548.9	2,535.5	2,638.6	2,563.7	2,506.7	2,580.5	2,620.2	4.1	1.5
DOC	2,626.0	2,399.8	2,262.5	2,661.7	3,016.5	4,722.5	2,871.9	2,595.4	-1.2	-9.6
PCC	764.1	850.3	948.5	894.6	966.5	921.1	852.6	974.3	27.5	14.3
TVA	1,034.9	952.2	1,013.4	984.2	862.9	954.2	1,014.1	880.3	-14.9	-13.2
EPA	617.2	1,343.1	511.9	463.6	452.8	434.1	449.8	610.1	-1.2	35.6
ST	260.5	279.3	321.7	317.8	319.6	289.3	289.3	288.8	10.9	-0.2
FEMA	101.4	160.2	166.6	181.0	203.1	226.9	209.3	215.3	112.3	2.9
HUD	120.7	123.8	126.0	130.6	146.7	148.0	171.3	165.5	37.1	-3.4
OPM	57.3	57.5	57.5	71.0	76.1	74.7	78.7	96.4	68.2	22.5
FCC	24.9	22.6	25.7	23.7	21.8	25.2	23.3	20.9	-15.9	-10.1
OTHER*	272.0	361.4	427.3	457.5	1,961.6	1,993.0	1,169.9	1,229.0	351.8	5.1
CIVILIAN AGENCIES TOTAL	203,997.6	197,663.9	194,483.7	204,724.1	198,612.8	202,277.3	197,871.2	199,268.1	-2.3	0.7
DOD	1,319,397.6	1,290,055.6	1,350,968.9	1,229,871.8	1,344,538.0	1,309,946.9	1,339,102.5	1,164,709.6	-11.7	-13.0
ALL AGENCIES TOTAL										
Bjoule	1,523,395.1	1,487,719.5	1,545,452.6	1,434,596.0	1,543,150.7	1,512,224.3	1,536,973.7	1,363,977.7	-10.5	-11.3
MBOE	261.5	255.4	265.3	246.3	264.9	259.6	263.9	234.2		
Petajoules	1,607.1	1,569.5	1,630.4	1,513.4	1,628.0	1,595.3	1,621.5	1,438.9		
ANNUAL CHANGE FROM 1985										
TJoule		-35,675.7	22,057.5	-88,799.1	19,755.6	-11,170.9	13,578.6	-159,417.5		
MBOE	-6.1	3.8	-15.2	3.4	-1.9	2.3	-27.4			
CUMULATIVE SAVINGS FROM 1985										
TJoule		35,675.7	13,618.2	102,417.3	82,661.7	93,832.6	80,254.0	239,671.4		
MBOE		6.1	2.3	17.6	14.2	16.1	13.8	41.1		

DATA AS OF 08/18/93

*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.

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 Quarterly Energy Use Reports, DOE Form 6200.2.

TABLE 4
FEDERAL BUILDINGS AND FACILITIES USE PER GROSS SQUARE METERS (GSM),
FY 1985 AND FY 1992

	FISCAL YEAR 1985		MEGAJoule/GSM	FISCAL YEAR 1992		%CHANGE 1985-1992
	GSM x 10 ³	JOULE x 10 ¹² (TERAJOULES)		GSM x 10 ³	JOULE x 10 ¹² (TERAJOULES)	
DOE	6,575,271.4	33,914.7	5,158	7,432,759.5	30,447.0	-20.6
VA	11,493,344.7	25,902.3	2,254	13,024,799.2	25,974.1	-11.5
USPS	17,604,848.3	17,131.4	973	21,353,993.1	20,518.9	-1.3
GSA	18,777,894.4	17,815.9	949	15,760,252.4	13,779.8	-7.8
HHS	2,101,734.4	6,973.8	3,318	2,862,628.2	8,392.2	-11.6
DOT	2,739,970.6	4,338.2	1,583	2,890,150.9	4,133.4	-9.7
DOJ	1,930,472.9	6,448.2	3,340	2,645,374.7	4,082.0	-53.8
NASA	1,070,605.2	3,207.0	2,996	1,287,552.0	3,645.8	-5.5
DOI	4,736,717.3	3,593.2	759	4,658,992.0	3,347.9	-5.3
USDA	2,693,755.5	2,211.6	821	3,124,851.2	2,269.9	-11.5
DOL	1,698,049.8	2,271.4	1,338	1,604,225.5	2,210.1	3.0
TRSY	536,966.4	648.9	1,208	962,596.6	1,845.3	58.6
EPA	135,243.1	477.7	3,532	166,074.8	610.1	4.0
DOC	521,592.4	570.1	1,093	462,364.2	560.2	10.9
TVA	454,212.5	424.6	935	493,335.4	449.0	-2.6
ST	241,392.7	244.9	1,015	241,392.7	288.8	17.9
FEMA	56,328.0	101.4	1,800	138,347.7	215.3	-13.5
HUD	133,105.2	120.7	907	133,105.2	130.1	7.8
OPM	79,370.5	57.3	722	79,370.5	83.1	45.0
PCC	45,778.1	28.1	614	49,245.2	31.7	5.0
FCC	11,247.0	11.8	1,046	11,600.2	13.1	7.6
OTHER*	102,115.5	230.6	2,258	200,494.4	248.4	-45.1
CIVILIAN AGENCIES						
TOTAL	73,740,017.1	126,723.9	1,719	79,583,506.8	123,276.3	-9.9
DOD	239,718,173.7	368,275.9	1,536	217,518,013.8	311,984.4	-6.6
TOTAL	313,458,190.8	494,999.8	1,579	297,101,520.7	435,260.6	-7.2

DATA AS OF 08/18/93

*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: 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 Quarterly Energy Use Reports, DOE Form 6200.2.

TABLE 5
FEDERAL ENERGY USE IN BUILDINGS AND FACILITIES
(In Terajoules [Joules x 10¹²] and Millions of Barrels of Oil Equivalent [MBOE])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	% CHANGE 85-92	% CHANGE 91-92
DOE	33,914.7	33,510.7	32,188.2	33,544.2	30,463.1	30,791.5	29,409.0	30,447.0	-10.2	3.5
VA	25,902.3	25,768.7	25,549.5	27,034.4	27,029.0	25,721.0	26,093.4	25,974.1	0.3	-0.5
USPS	17,131.4	17,353.0	17,673.1	18,594.3	19,227.7	19,496.4	19,644.9	20,518.9	19.8	4.4
GSA	17,815.9	14,631.9	13,684.5	12,942.5	13,240.4	14,703.8	13,837.7	13,779.8	-22.7	-0.4
HHS	6,973.8	6,211.9	6,542.0	6,520.2	6,883.9	8,394.7	7,498.0	8,392.2	20.3	11.9
DOT	4,338.2	5,663.7	4,144.4	4,169.2	3,553.7	3,956.7	3,479.0	4,133.4	-4.7	18.8
DOJ	6,448.2	6,805.7	6,254.2	7,865.8	5,904.9	5,131.3	6,218.5	4,082.0	-36.7	-34.4
NASA	3,207.0	3,400.1	3,449.1	3,426.4	3,641.4	3,671.5	3,437.9	3,645.8	13.7	6.0
DOI	3,593.2	3,958.9	3,866.2	4,091.8	4,297.3	4,261.6	4,099.9	3,347.9	-6.8	-18.3
USDA	2,211.6	2,004.5	1,518.2	1,926.9	873.5	2,917.7	2,005.7	2,269.9	2.6	13.2
DOL	2,271.4	2,299.2	2,271.7	2,353.4	2,311.6	2,254.6	2,156.5	2,210.1	-2.7	2.5
TRSY	648.9	682.6	1,567.8	4,427.7	2,668.3	2,023.9	1,576.9	1,845.3	184.4	17.0
EPA	477.7	1,308.3	477.7	423.8	421.8	434.1	449.8	610.1	27.7	35.6
DOC	570.1	1,281.7	1,198.8	1,365.4	1,398.0	1,451.7	1,484.3	560.2	-1.7	-62.3
TVA	424.6	487.4	492.5	477.3	440.1	451.4	450.0	449.0	5.8	-0.2
ST	244.9	262.4	290.4	278.4	278.7	282.5	289.3	288.8	17.9	-0.2
HUD	120.7	123.8	126.0	130.6	146.7	148.0	136.8	130.1	7.8	-4.9
OPM	57.3	57.5	57.5	71.0	76.1	74.7	78.7	83.1	45.0	5.6
PCC	28.1	28.2	28.7	30.0	29.7	30.2	34.2	31.7	13.0	-7.2
FCC	11.8	12.4	13.3	13.8	12.7	15.6	15.7	13.1	10.9	-16.8
OTHER*	332.0	467.0	549.2	593.6	664.2	662.2	452.8	463.7	39.7	2.4
CIVILIAN AGENCIES TOTAL										
	126,723.9	126,319.5	121,942.8	130,280.7	123,562.8	126,874.9	122,849.0	123,276.3	-2.7	0.3
DOD										
	368,275.9	345,600.1	371,236.5	337,469.6	339,926.9	338,762.2	302,664.5	311,984.4	-15.3	3.1
ALL AGENCIES TOTAL										
JOULES	494,999.8	471,919.7	493,179.2	467,750.3	463,489.7	465,637.1	425,513.5	435,260.6	-12.1	2.3
MBOE	80.5	76.8	80.3	76.1	75.4	75.8	69.2	70.8		
ANNUAL CHANGE FROM 1985										
JOULES		-23,080.1	-1,820.5	-27,249.5	-31,510.0	-29,362.7	-69,486.3	-59,739.2		
MBOE		-3.8	-0.3	-4.4	-5.1	-4.8	-11.3	-9.7		
CUMULATIVE SAVINGS FROM 1985										
JOULES		23,080.1	24,900.7	52,150.2	83,660.2	113,022.9	182,509.2	242,248.4		
MBOE		3.8	4.1	8.5	13.6	18.4	29.7	39.4		

DATA AS OF 08/18/93

*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: 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 Quarterly Energy Use Reports, DOE Form, 6200.2.

TABLE 6
PETROLEUM-BASED FUEL* CONSUMPTION IN BUILDINGS AND FACILITIES
(In Terajoules [Joules x 10¹²])

AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	% CHANGE 85-92	% CHANGE 91-92
DOD	102,142.3	90,315.7	95,375.4	82,654.1	74,590.5	72,826.8	62,721.4	69,265.1	-32.2	10.4
HHS	2,320.6	2,828.3	2,789.2	2,118.5	2,173.0	2,256.4	1,630.9	2,262.2	-2.5	38.7
DOE	1,717.1	1,326.2	1,570.7	1,632.2	1,853.7	2,061.2	2,087.0	2,146.6	25.0	2.9
VA	2,296.4	2,235.0	2,385.7	2,625.1	2,456.9	2,341.3	1,482.2	1,588.8	-30.8	7.2
DOT	2,493.4	3,760.0	2,223.1	2,215.5	1,619.2	1,607.9	1,380.3	1,504.5	-39.7	9.0
USPS	1,765.3	1,679.2	1,641.9	1,690.7	1,641.3	1,584.8	1,286.4	1,261.6	-28.5	-1.9
DOI	1,643.4	1,509.4	1,342.1	1,439.8	1,452.5	1,344.0	1,203.8	969.6	-41.0	-19.5
GSA	1,106.6	704.6	559.5	592.7	573.9	704.9	467.5	441.2	-60.1	-5.6
DOJ	402.7	383.4	493.0	1,023.7	327.9	392.1	531.4	404.9	0.5	-23.8
EPA	461.8	437.2	450.5	408.6	416.2	349.4	272.5	278.1	-39.8	2.1
NASA	295.0	288.0	264.1	274.9	296.4	280.3	178.7	205.2	-30.5	14.8
USDA	437.0	275.1	201.5	217.7	241.7	274.3	307.3	256.2	-41.4	-16.6
TRSY	23.7	26.8	182.4	310.4	336.9	296.7	134.7	88.8	274.7	-34.1
FEMA	59.9	66.3	77.2	81.2	82.1	76.3	62.3	70.6	17.9	13.2
DOC	137.5	100.8	83.2	89.8	38.9	81.9	13.8	10.4	-92.4	-24.5
EPA	38.9	26.9	15.6	0.0	0.0	0.0	0.0	2.0	-94.8	N/A
FCC	1.8	1.7	1.5	1.8	1.5	2.0	1.0	1.3	-27.2	27.4
TVA	4.5	3.0	1.7	3.2	1.2	3.3	0.1	1.4	-69.4	1,031.4
EEOC	0.0	0.0	0.0	0.0	2.5	2.0	0.0	0.0	N/A	N/A
NSF	20.5	23.5	10.0	10.0	10.0	10.0	0.0	0.0	-100.0	N/A
USIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	N/A	N/A
TOTAL	117,368.4	105,991.1	109,668.2	97,390.0	88,116.4	86,495.6	73,761.4	80,758.7	-31.2	9.5

DATA AS OF 08/18/93

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

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

Source: Federal Agency Quarterly Energy Use Reports

TABLE 7-B
CONSUMPTION AND COSTS OF FEDERAL BUILDINGS ENERGY IN FY 1992,
FY 1991, AND FY 1985 (NOMINAL DOLLARS)

ENERGY TYPE	TERAJOULES	COST PER (JOULE x 10 ⁹) GIGAJOULE'S	COST (IN MILLIONS OF DOLLARS)
FY 1992			
ELECTRICITY	157,116.7	16.1801	2,542.164
FUEL OIL	77,665.0	3.6239	281.452
NATURAL GAS	134,388.5	3.2005	430.113
LPG/PROPANE	3,093.7	6.5080	20.134
COAL	43,155.3	2.9814	128.662
PURCHASED STEAM	18,843.9	13.0287	245.511
OTHER	997.5	2.5038	2.498
	-----		-----
TOTAL	435,260.6		3,650.533
AVERAGE COST PER JOULE = \$ 8.387			
FY 1991			
ELECTRICITY	161,028.5	16.1903	2,607.107
FUEL OIL	70,755.2	6.3908	452.184
NATURAL GAS	138,963.6	3.3281	462.485
LPG/PROPANE	3,006.2	6.5916	19.815
COAL	37,337.1	1.6583	61.918
PURCHASED STEAM	13,351.2	10.4672	139.750
OTHER	1,071.8	2.2206	2.380
	-----		-----
TOTAL	425,513.5		3,745.639
AVERAGE COST PER JOULE = \$ 8.803			
FY 1985			
ELECTRICITY	151,823.6	15.7760	2,395.177
FUEL OIL	113,519.8	5.5661	631.858
NATURAL GAS	151,205.2	4.4110	666.960
LPG/PROPANE	3,848.6	6.5587	25.242
COAL	61,262.5	2.2248	136.296
PURCHASED STEAM	8,407.5	7.9011	66.428
OTHER	4,932.5	4.4589	21.994
	-----		-----
TOTAL	494,999.8		3,943.954
AVERAGE COST PER JOULE = \$ 7.968			

DATA AS OF 08/18/93

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 Quarterly Energy Use Reports and annual energy cost data submitted to DOE by Federal agencies.

TABLE 8-B
CONSUMPTION AND COSTS OF GENERAL OPERATIONS ENERGY IN FY 1992,
FY 1991, AND FY 1985 (NOMINAL DOLLARS)

ENERGY TYPE	TERA JOULE'S	COST PER MILLION JOULE'S	COST (IN MILLIONS OF DOLLARS)
FY 1992			
AUTO GASOLINE	37,589.9	6.2981	236.746
DIST/DIESEL	119,337.5	2.3974	286.099
LPG/PROPANE	13.9	6.8772	0.095
AVIATION GASOLINE	1,027.6	10.1443	10.424
JET FUEL	661,513.0	5.3758	3,556.136
NAVY SPECIAL	62.3	2.5149	0.157
OTHER	5,343.6	3.9716	21.222
PROCESS & PRODUCTION ¹	103,829.3	8.6249	895.516
	-----		-----
TOTAL	928,717.1		5,006.396
AVERAGE COST PER MJOULE = \$ 5.391			
FY 1991			
AUTO GASOLINE	36,606.8	7.9326	290.388
DIST/DIESEL	168,495.8	6.4839	1,092.516
LPG/PROPANE	21.4	6.8903	0.148
AVIATION GASOLINE	460.8	16.0759	7.408
JET FUEL	817,059.9	6.5435	5,346.460
NAVY SPECIAL	0.0	N/A	0.000
OTHER	718.9	5.5916	4.020
PROCESS & PRODUCTION ¹	88,096.7	9.0168	794.351
	-----		-----
TOTAL	1,111,460.2		7,535.290
AVERAGE COST PER MJOULE = \$ 6.780			
FY 1985			
AUTO GASOLINE	53,261.3	7.5044	399.694
DIST/DIESEL	178,729.8	5.7106	1,020.653
LPG/PROPANE	157.6	6.6407	1.047
AVIATION GASOLINE	1,985.8	11.3253	22.490
JET FUEL	744,487.7	6.1701	4,593.588
NAVY SPECIAL	7,064.2	5.2971	37.419
OTHER	249.6	5.1134	1.276
PROCESS & PRODUCTION ¹	42,459.4	9.3931	398.824
	-----		-----
TOTAL	1,028,395.3		6,474.993
AVERAGE COST PER MJOULE = \$ 6.296			

DATA AS OF 08/18/93

¹Includes DoD costs for process and "cold iron" (powers Navy ships docked in port) energy, DOE costs for metered process energy, and energy costs for buildings exempted from performance measurement by DOC, DOT, GSA, NASA, PCC, TRSY, USDA, and USIA.

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

Source: Federal Agency Quarterly Energy Use Reports and annual energy cost data submitted to DOE by Federal agencies.

TABLE 9
FEDERAL ENERGY USE IN VEHICLE AND EQUIPMENT OPERATIONS
(In Terajoules [Joule x 10¹²] and Millions of Barrels of Oil Equivalent [MBOE])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	% CHANGE 85-92	% CHANGE 91-92
USPS	12,158.0	12,225.6	12,367.7	12,652.9	12,745.9	12,803.7	12,867.0	12,897.4	6.1	0.2
DOT	12,831.4	11,295.5	12,087.8	11,643.6	12,042.0	12,819.1	12,819.6	7,862.9	-38.7	-38.7
USDA	4,557.2	3,421.0	3,849.0	4,536.6	5,046.4	5,224.7	5,405.6	5,256.8	15.4	-2.8
DOI	3,219.8	3,276.2	3,130.5	3,268.2	3,244.7	3,536.9	3,131.3	4,029.1	25.1	28.7
DOJ	2,177.5	2,259.6	2,316.1	2,092.4	2,270.7	2,213.3	2,240.8	3,877.3	78.1	73.0
DOE	3,108.7	3,046.5	2,913.1	2,913.2	2,854.9	2,650.3	2,497.6	2,192.5	-29.5	-12.2
TRSY	2,273.5	2,168.1	2,313.9	3,082.6	2,862.4	1,554.2	1,746.7	2,178.8	-4.2	24.7
NASA	2,081.2	1,928.7	1,593.9	1,635.3	1,740.6	1,832.3	1,974.2	1,990.2	-4.4	0.8
DOC	1,065.8	1,118.1	1,063.7	1,296.3	1,618.5	3,270.8	1,387.6	1,004.9	-5.7	-27.6
PCC	559.6	633.0	723.9	664.1	738.8	689.7	610.4	738.1	31.9	20.9
VA	625.4	628.3	696.3	664.7	664.0	546.8	558.3	669.8	7.1	20.0
TVA	610.3	464.8	520.9	506.8	422.8	502.9	564.1	431.3	-29.3	-23.5
DOL	245.0	249.7	263.8	285.3	252.1	252.1	424.0	410.1	67.4	-3.3
GSA	152.1	141.3	116.7	124.0	115.8	135.2	99.7	108.6	-28.6	8.9
FCC	13.1	10.2	12.4	9.8	9.0	9.6	7.6	7.9	-39.9	3.7
EPA	139.5	34.8	34.3	39.8	31.0	0.0	0.0	0.0	N/A	N/A
FEMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N/A	N/A
HHS	393.8	350.2	378.1	217.5	215.5	0.0	0.0	0.0	N/A	N/A
ST	15.6	16.9	31.3	39.4	40.9	36.8	0.0	0.0	N/A	N/A
OTHER*	41.4	54.6	44.6	44.9	71.6	73.4	63.6	155.2	275.0	143.9
CIVILIAN AGENCIES										
TOTAL	46,268.7	43,322.9	44,458.0	45,717.3	46,987.7	48,151.7	46,398.1	43,810.9	-5.3	-5.6
DOD	939,667.3	932,375.9	967,188.2	847,791.8	965,794.5	929,819.1	976,965.4	781,076.9	-16.9	-20.1

TOTAL TJOULE	985,936.0	975,698.7	1,011,646.2	893,509.2	1,012,782.3	977,970.8	1,023,363.6	824,887.8	-16.3	-19.4
MBOE	169.3	167.5	173.7	153.4	173.9	167.9	175.7	141.6		
ANNUAL CHANGE FROM 1985										
TJOULE		-10,237.3	25,710.2	-92,426.8	26,846.3	-7,965.2	37,427.6	-161,048.2		
MBOE		-1.8	4.4	-15.9	4.6	-1.4	6.4	-27.6		
CUMULATIVE SAVINGS FROM 1985										
TJOULE		10,237.3	-15,473.0	76,953.8	50,107.6	58,072.8	20,645.2	181,693.4		
MBOE		1.8	-2.7	13.2	8.6	10.0	3.5	31.2		

DATA AS OF 08/18/93

*Other includes for certain years the Commodity Futures Trading Commission, National Science Foundation, Nuclear Regulatory Commission, and the U.S. Information Agency.

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

Source: Federal Agency Quarterly Energy Use Reports, DOE Form 6200.2.

TABLE 10
FEDERAL AGENCY PROGRESS TOWARD THE GOALS OF SECTION 10 OF
EXECUTIVE ORDER 12759
FY 1991 and FY 1992

GASOLINE CONSUMPTION BY AGENCY (KILOLITERS)

AGENCY	1991	1992	% CHANGE
DOD	363,240.4	370,727.9	2.1
USPS	273,124.9	281,369.5	3.0
USDA	143,654.8	139,311.4	-3.0
DOJ	53,980.3	87,651.2	62.4
DOI	54,884.7	54,513.7	-0.7
DOE	32,535.2	34,426.8	5.8
TRSY	21,450.8	26,444.1	23.3
DOT	48,667.5	21,342.5	-56.1
VA	13,266.7	16,519.9	24.5
DOL	12,170.1	11,771.1	-3.3
NASA	9,970.8	9,914.0	-0.6
TVA	8,456.6	8,725.4	3.2
DOC	9,558.2	7,921.3	-17.1
GSA	2,862.5	3,116.9	8.9
USIA	341.1	2,501.0	633.3
HUD	989.9	1,016.0	2.6
PCC	1,271.5	987.6	-22.3
OPM	0.0	381.6	N/A
FCC	211.2	218.4	3.4
NRC	134.4	141.2	5.1
CFTC	9.1	0.0	N/A
TOTAL	1,050,780.6	1,079,001.6	2.7

DIESEL CONSUMPTION BY AGENCY (KILOLITERS)

AGENCY	1991	1992	% CHANGE
DOD	4,062,062.9	2,843,776.4	-30.0
DOT	115,041.3	89,695.3	-22.0
USPS	86,712.4	80,069.0	-7.7
PCC	14,645.8	18,202.9	24.3
DOC	25,124.1	16,981.7	-32.4
DOE	21,203.2	10,617.7	-49.9
DOI	10,546.2	9,982.1	-5.3
USDA	8,334.3	7,861.5	-5.7
TVA	6,779.7	2,987.4	-55.9
NASA	2,437.8	2,521.1	3.4
VA	2,485.9	2,440.1	-1.8
DOJ	2,934.4	1,544.4	-47.4
USIA	308.5	360.4	16.8
TRSY	233.9	118.9	-49.2
FCC	6.4	7.2	11.8
NRC	4.5	5.7	25.0
TOTAL	4,358,861.4	3,087,171.8	-29.2

DATA AS OF 08/18/93

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

Source: Federal Agency Quarterly Energy Use Reports, DOE Form 6200.2.

TABLE 11
FEDERAL ENERGY USE IN EXEMPTED BUILDINGS/PROCESS OPERATIONS
(In Terajoules [Joule x 10¹²] and Millions of Barrels of Oil Equivalent [MBOE])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	% CHANGE 85-92	% CHANGE 91-92
DOE	18,091.6	16,119.5	15,790.2	16,072.9	12,977.8	12,334.6	12,171.2	14,172.0	-21.7	16.4
NASA	6,165.9	6,465.1	6,667.5	6,771.8	7,390.7	7,503.3	7,720.7	7,602.6	23.3	-1.5
DOT	3,439.7	3,501.5	3,814.7	3,932.3	3,929.4	3,232.5	3,505.8	4,649.2	35.2	32.6
USDA	2,049.6	1,746.3	1,614.7	1,748.7	2,137.4	2,325.5	2,250.7	2,074.4	1.2	-7.8
DOC	990.2	0.0	0.0	0.0	0.0	0.0	0.0	1,030.3	4.1	N/A
USIA	0.0	0.0	0.0	0.0	1,428.9	1,484.2	897.3	874.1	N/A	-2.6
TRSY	0.0	0.0	0.0	0.0	0.0	0.0	1,083.3	858.9	N/A	-20.7
GSA	91.6	0.0	0.0	0.0	0.0	169.5	787.2	714.9	680.4	.2
PCC	176.4	189.1	195.9	200.5	197.9	201.2	207.9	204.5	16.0	.6
CIVILIAN AGENCIES TOTAL	31,005.0	28,021.5	28,082.9	28,726.1	28,062.2	27,250.8	27,540.8	32,181.0	3.8	16.8
DOD	11,454.4	12,079.6	12,544.3	44,610.4	38,816.5	41,365.6	59,472.6	71,648.4	525.5	20.5
TOTAL TJoule	42,459.4	40,101.1	40,627.2	73,336.5	66,878.7	68,616.4	87,013.4	103,829.3	144.5	19.3
MBOE	7.3	6.9	7.0	12.6	11.5	11.8	14.9	17.8		
ANNUAL CHANGE FROM 1985 TJoule		-2,358.3	-1,832.2	30,877.2	24,419.4	26,157.0	44,554.0	61,369.9		
MBOE		-0.4	-0.3	5.3	4.2	4.5	7.6	10.5		
CUMULATIVE SAVINGS FROM 1985 TJoule		2,358.3	4,190.5	-26,686.7	-51,106.1	-77,263.1	-121,817.1	-183,187.1		
MBOE		0.4	0.7	-4.6	-8.8	-13.3	-20.9	-31.4		

DATA AS OF 08/18/93

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

Source: Federal Agency Quarterly Energy Use Reports, DOE Form 6200.2.

TABLE E
FEDERAL ENERGY EXPENDITURES AND COST AVOIDANCE,
FY 1985 TO FY 1991 (NOMINAL DOLLARS)

YEAR	ANNUAL ENERGY USE (TJOULES)	ANNUAL ENERGY COST (\$ MILLION)	ANNUAL ENERGY USE REDUCTION REL. TO FY 1985 (TJOULES)	AVERAGE ANNUAL ENERGY COST (\$/TJOULE)	ANNUAL ENERGY COST AVOIDANCE (\$ MILLION)
Buildings and Facilities					
1985	494,999.8	3,943.954	0.0	7.968	0.000
1986	471,919.7	3,706.501	23,080.1	7.854	181.273
1987	493,179.2	3,814.807	1,820.5	7.735	14.082
1988	467,750.3	3,593.319	27,249.5	7.682	209.334
1989	463,489.7	3,406.326	31,510.0	7.349	231.577
1990	465,637.1	3,996.421	29,362.7	8.583	252.011
1991	425,513.5	3,745.639	69,486.3	8.803	611.662
1992	435,260.6	3,650.533	59,739.2	8.387	501.033
B&F Total					2,000.972
Vehicles & Equipment					
1985	985,936.0	6,076.168	0.0	6.163	0.000
1986	975,698.7	3,757.063	10,237.3	3.851	39.420
1987	1,011,646.2	4,098.704	-25,710.2	4.052	-104.165
1988	893,509.2	4,018.368	92,426.8	4.497	415.670
1989	1,012,782.3	4,688.368	-26,846.3	4.629	-124.277
1990	977,970.8	5,268.958	7,965.2	5.388	42.914
1991	1,023,363.6	6,740.939	-37,427.6	6.587	-246.537
1992	824,887.8	4,110.881	161,048.2	4.984	802.594
V&E Total					825.619
Process and Production					
1985	42,459.4	398.824	0.0	9.393	0.000
1986	40,101.1	396.643	2,358.3	9.891	23.326
1987	40,627.2	389.267	1,832.2	9.581	17.555
1988	73,336.5	667.618	-30,877.2	9.103	-281.090
1989	66,878.7	578.935	-24,419.4	8.656	-211.386
1990	68,616.4	633.489	-26,157.0	9.232	-241.490
1991	88,096.7	794.351	-45,637.3	9.017	-411.503
1992	103,829.3	895.516	-61,369.9	8.625	-529.309
P&P Total					-1,633.897
Total All Energy					1,192.694

DATA AS OF 08/18/93

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 Quarterly Energy Use Reports and annual energy cost data submitted to DOE by Federal agencies.

TABLE F-1
TOTAL ENERGY USE BY FEDERAL AGENCIES - SOURCE CONVERSION
(In Terajoules [Joule x 10¹²] and 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	% CHANGE 85-92	% CHANGE 91-92
DOE	102,870.8	97,061.5	98,310.1	102,053.1	94,835.0	94,255.6	90,417.5	94,197.2	-9.4	4.7
USPS	53,768.2	54,287.4	56,260.2	58,863.4	61,047.7	62,348.2	63,873.1	65,802.6	24.9	3.4
VA	45,287.4	44,452.9	44,693.5	47,304.6	47,757.2	46,775.8	47,984.9	47,891.3	6.4	-0.2
GSA	44,719.9	35,957.4	34,155.4	32,105.4	32,732.6	38,602.6	38,879.6	38,278.0	-16.0	-1.7
HHS	13,692.5	11,240.3	11,845.1	12,804.1	13,588.8	17,081.9	15,143.1	16,729.1	24.7	11.7
DOJ	11,633.1	12,324.1	12,117.5	13,866.1	12,746.3	12,105.0	14,941.8	13,673.9	19.5	-9.4
NASA	24,683.9	26,017.0	26,564.3	26,744.8	29,039.0	29,747.3	30,731.5	31,077.4	28.8	1.3
DOT	30,131.0	30,094.1	30,301.2	30,103.1	29,676.3	29,940.2	30,415.8	31,084.0	3.5	2.4
DOI	10,356.9	10,502.8	10,191.0	11,039.8	11,415.6	11,461.9	11,304.3	11,228.9	9.4	-0.7
USDA	12,820.3	11,353.4	11,396.4	12,666.1	9,969.1	15,614.2	14,927.6	14,811.8	17.3	-0.9
TRSY	3,804.3	3,670.3	5,994.3	10,142.1	8,830.4	6,833.5	8,398.3	9,178.2	157.2	10.3
DOL	4,135.6	4,207.7	4,257.1	4,415.5	4,346.0	4,328.9	4,416.9	4,474.4	9.1	1.4
EPA	1,415.6	2,248.7	1,141.8	1,063.8	1,060.3	1,059.8	1,104.9	1,579.1	12.9	47.8
DOC	4,260.9	3,830.9	3,686.1	4,127.6	4,849.9	6,675.7	4,785.4	4,613.3	9.2	-4.0
TVA	2,004.0	2,075.0	2,157.5	2,089.5	1,882.7	1,990.9	2,065.8	1,931.5	-4.0	-7.2
ST	742.7	781.2	878.6	863.4	881.1	899.0	891.9	875.0	19.8	-2.1
FEMA	201.0	311.9	329.2	371.2	417.1	484.9	467.0	478.6	153.7	2.8
HUD	359.4	369.3	375.3	393.5	440.0	450.0	470.6	441.0	25.3	-7.0
OPM	177.3	184.2	184.7	211.7	225.8	230.2	239.6	252.3	47.1	5.9
PCC	1,254.8	1,371.6	1,487.4	1,447.6	1,512.8	1,476.4	1,433.7	1,541.4	25.4	8.4
FCC	44.3	43.8	48.8	46.9	43.3	52.8	53.7	43.6	-1.7	-20.9
OTHER*	662.7	884.8	1,035.3	1,097.0	4,383.0	3,576.9	2,542.0	2,577.5	289.0	1.4
CIVILIAN AGENCIES TOTAL	369,026.7	353,270.4	357,410.6	373,820.2	371,679.9	385,991.7	385,489.2	392,760.0	6.4	1.9
DOD	1,576,913.0	1,540,814.3	1,621,826.5	1,503,240.8	1,650,074.0	1,620,665.8	1,639,549.1	1,465,106.3	-7.1	-10.6
ALL AGENCIES TOTAL										
TJoule	1,945,939.6	1,894,084.7	1,979,237.0	1,877,060.9	2,021,753.9	2,006,657.5	2,025,038.2	1,857,866.3	-4.5	-8.3
MBOE	334.1	325.2	339.8	322.2	347.1	344.5	347.6	318.9		
ANNUAL CHANGE FROM 1985										
TJoule		-51,854.9	33,297.4	-68,878.7	75,814.3	60,717.9	79,098.6	-88,073.3		
MBOE		-8.9	5.7	-11.8	13.0	10.4	13.6	-15.1		
CUMULATIVE SAVINGS FROM 1985										
TJoule		51,854.9	18,557.5	87,436.2	11,621.9	-49,096.0	-128,194.6	-40,121.3		
MBOE		8.9	3.2	15.0	2.0	-8.4	-22.0	-6.9		

DATA AS OF 08/18/93

*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.

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 Quarterly Energy Use Reports, DOE Form 6200.2.

TABLE F-2
FEDERAL BUILDINGS AND FACILITIES USE PER GROSS SQUARE METER
FOR FY 1985 AND FY 1990
(WHEN ELECTRICITY EQUALS 11,600 BTU/KWH)

	GSM	FISCAL YEAR 1985 TERAJOULES	TJ/GSM	GSM	FISCAL YEAR 1992 TERAJOULES	TJ/GSM	%CHANGE 1985-1992
DOE	6,575,271.4	58,047.7	8,828	7,432,759.5	56,701.2	7,629	-13.6
USPS	17,604,848.3	41,610.2	2,364	21,353,993.1	52,905.2	2,478	4.8
VA	11,493,344.7	44,662.1	3,886	13,024,799.2	47,221.4	3,626	-6.7
GSA	18,777,894.4	44,287.5	2,358	15,760,252.4	36,186.9	2,296	-2.6
HHS	2,101,734.4	13,298.7	6,328	2,862,628.2	16,729.1	5,844	-7.6
DOJ	1,930,472.9	9,455.6	4,898	2,645,374.7	9,796.6	3,703	-24.4
NASA	1,070,605.2	7,075.8	6,609	1,287,552.0	8,925.2	6,932	4.9
DOT	2,739,970.6	7,765.6	2,834	2,890,150.9	8,814.6	3,050	7.6
DOI	4,736,717.3	7,137.1	1,507	4,658,992.0	7,199.8	1,545	2.6
USDA	2,693,755.5	4,586.3	1,703	3,124,851.2	5,633.2	1,803	5.9
TRSY	536,966.4	1,530.8	2,851	962,596.6	5,069.7	5,267	84.7
DOL	1,698,049.8	3,890.7	2,291	1,604,225.5	4,064.3	2,533	10.6
EPA	135,243.1	1,276.1	9,435	166,074.8	1,579.1	9,509	0.8
DOC	521,592.4	1,254.5	2,405	462,364.2	1,564.7	3,384	40.7
TVA	454,212.5	1,393.7	3,068	493,335.4	1,500.2	3,041	-0.9
ST	241,392.7	727.1	3,012	241,392.7	875.0	3,625	20.3
FEMA	56,328.0	201.0	3,569	138,347.7	478.6	3,459	-3.1
HUD	133,105.2	359.4	2,700	133,105.2	405.6	3,047	12.9
OPM	79,370.5	177.3	2,234	79,370.5	239.0	3,012	34.8
PCC	45,778.1	95.5	2,087	49,245.2	107.9	2,191	5.0
FCC	11,247.0	31.2	2,771	11,600.2	35.7	3,080	11.2
OTHER*	102,115.5	621.3	6,084	200,494.4	626.1	3,123	-48.7
CIVILIAN AGENCIES							
TOTAL	73,740,017.1	249,485.2	3,383	79,583,506.8	266,659.2	3,351	-1.0
DOD	239,718,173.7	613,134.6	2,558	217,518,013.8	552,993.8	2,542	-0.6
TOTAL	313,458,190.8	862,619.8	2,752	297,101,520.6	819,653.1	2,759	0.3

DATA AS OF 08/18/93

*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: 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 Quarterly Energy Use Reports, DOE Form 6200.2.

TABLE F-3
FEDERAL ENERGY USE IN BUILDINGS AND FACILITIES - SOURCE CONVERSION
(In Terajoules [Joule x 10¹²] and Millions of Barrels of Oil Equivalent [MBOE])

CIVILIAN AGENCY	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	% CHANGE 85-92	% CHANGE 92-91
DOE	58,047.7	58,192.1	57,343.9	59,714.3	56,901.2	57,655.9	55,553.8	56,701.2	-2.6	2.3
USPS	41,610.2	42,061.8	43,892.5	46,210.5	48,301.9	49,544.5	51,006.1	52,905.2	30.2	4.1
VA	44,662.1	43,824.6	43,997.3	46,639.9	47,093.2	46,229.0	47,426.7	47,221.4	6.4	-0.5
GSA	44,287.5	35,816.1	34,038.7	31,981.4	32,616.8	37,964.2	36,593.1	36,186.9	-20.4	-1.2
HHS	13,298.7	10,890.1	11,467.0	12,586.6	13,373.2	17,081.9	15,143.1	16,729.1	28.7	11.7
DOJ	9,455.6	10,064.5	9,801.5	11,773.8	10,475.6	9,891.8	12,700.9	9,796.6	4.0	-25.5
NASA	7,075.8	7,620.2	7,931.8	7,967.5	8,543.9	8,806.3	8,525.1	8,925.2	29.1	5.2
DOT	7,765.6	9,172.2	7,783.1	7,717.8	7,060.8	7,506.1	6,973.5	8,814.6	15.0	29.4
DOI	7,137.1	7,226.6	7,060.4	7,771.6	8,170.9	7,925.0	8,173.0	7,199.8	1.0	-13.3
USDA	4,586.3	4,441.5	4,265.3	4,606.5	948.5	6,119.5	5,447.5	5,633.2	25.4	3.8
TRSY	1,530.8	1,502.2	3,680.4	7,059.5	5,968.0	5,279.3	4,612.7	5,069.7	257.3	11.0
DOL	3,890.7	3,958.1	3,993.3	4,130.2	4,093.9	4,076.8	3,992.9	4,064.3	5.0	2.0
EPA	1,276.1	2,213.9	1,107.5	1,024.0	1,029.3	1,059.8	1,104.9	1,579.1	26.4	47.8
DOC	1,254.5	2,712.8	2,622.4	2,831.2	3,231.3	3,404.9	3,397.9	1,564.7	27.5	-60.0
TVA	1,393.7	1,610.2	1,636.6	1,582.6	1,459.9	1,488.0	1,501.7	1,500.2	8.5	-0.1
ST	727.1	764.3	847.3	824.0	840.2	862.2	891.9	875.0	22.6	-2.1
FEMA	201.0	311.9	329.2	371.2	417.1	484.9	467.0	478.6	153.7	2.8
HUD	359.4	369.3	375.3	393.5	440.0	450.0	436.1	405.6	14.3	-7.8
OPM	177.3	184.2	184.7	211.7	225.8	230.2	239.6	239.0	38.8	-0.3
PCC	95.5	95.8	97.4	102.0	101.0	102.6	116.3	107.9	14.4	-8.0
FCC	31.2	33.7	36.4	37.1	34.2	43.2	46.1	35.7	16.3	-25.0
OTHER*	621.3	830.2	990.6	1,052.1	1,211.0	1,128.9	645.0	626.1	0.8	-2.9
CIVILIAN AGENCIES TOTAL										
TOTAL	249,485.2	243,896.4	243,482.6	256,589.1	252,537.7	267,334.9	264,994.9	266,659.2	6.9	0.6
DOD	613,134.6	582,991.7	628,532.8	576,164.6	608,729.3	612,094.8	552,156.2	552,993.8	-9.8	0.2
ALL AGENCIES TOTAL										
JOULES	862,619.8	826,888.1	872,015.4	832,753.7	861,267.1	879,429.7	817,151.1	819,653.1	-5.0	0.3
MBOE	140.4	134.6	141.9	135.5	140.1	143.1	133.0	133.4		
ANNUAL CHANGE FROM 1985										
JOULES		-35,731.8	9,395.6	-29,866.2	-1,352.8	16,809.9	-45,468.8	-42,966.8		
MBOE		-5.8	1.5	-4.9	-0.2	2.7	-7.4	-7.0		
CUMULATIVE SAVINGS FROM 1985										
JOULES		35,731.8	26,336.1	56,202.3	57,555.1	40,745.2	86,214.0	129,180.7		
MBOE		5.8	4.3	9.1	9.4	6.6	14.0	21.0		

DATA AS OF 08/18/93

*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: 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 Quarterly Energy Use Reports, DOE Form, 6200.2.

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