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Resources, Community, and
Economic Development Division

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March 21, 1997

The Honorable Thomas J. Bliley, Jr.
Chairman, Committee on Commerce
House of Representatives

The Honorable Dan Schaefer
Chairman, Subcommittee on Energy and Power
Committee on Commerce
House of Representatives

Subject: Energy Consumption: Federal Agencies' Electricity Use and Cost

Changes to the electricity industry are being considered at the federal and state levels that could affect federal agencies' costs for electricity. Currently, electricity constitutes about 45 percent of the energy used and about 80 percent of energy costs.¹ To assist the Committee in its deliberations on changes in the electricity market, you asked us to provide information on (1) the amount of electricity used in federal buildings and facilities and (2) the costs of this electricity from fiscal year 1986 through fiscal year 1995. As agreed with your offices, we plan, in a subsequent review, to examine the estimated savings to the federal government if legislation were enacted authorizing the purchase of electricity competitively on the open market.

¹Electricity data are a subset of the energy data. Energy includes electricity and other fuels, such as natural gas, coal, and fuel oil.

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In summary, the federal government used about 61 billion kilowatt-hours² of electricity in fiscal year 1995—the latest year for which data were available—in its buildings and facilities. Electricity use in the federal government is highly concentrated in a few agencies: The Department of Defense (DOD) used about 50 percent of the total in fiscal year 1995, and the five next largest consuming agencies—the Tennessee Valley Authority (TVA), the United States Postal Service, the Department of Energy (DOE), the General Services Administration (GSA),³ and the Department of Veterans Affairs—accounted for about another 34 percent.

Electricity costs in federal buildings and facilities in fiscal year 1995 totaled about \$3.5 billion. Electricity costs were similarly concentrated, with DOD and the five other agencies accounting for about 87 percent of the total cost.

BACKGROUND

DOE's Office of Federal Energy Management Programs (FEMP) coordinates federal energy efficiency efforts and reports annually to the Congress on federal energy consumption and conservation activities by executive branch agencies.⁴ FEMP gathers these data from agencies under three categories: buildings and

²A watt is the basic unit used to measure electric power. A kilowatt is 1,000 watts. A kilowatt-hour (kWh) is equal to 1 kilowatt of power applied for 1 hour. The average household in the United States uses about 10,000 kWh of electricity per year, according to the Department of Energy's Energy Information Administration.

³GSA reports energy consumption data for buildings that it controls including data for buildings leased to tenant agencies to whom GSA has not delegated the responsibility for operation and maintenance.

⁴For fiscal year 1995, FEMP's data were for 28 executive branch agencies and did not include the judicial and legislative branch agencies. Enclosure I is a listing of the agencies that report data to FEMP.

facilities, energy-intensive operations,⁵ and vehicles and equipment.⁶ In fiscal year 1995, federal agencies used about 1.9 percent of the energy consumed in the nation, according to FEMP.⁷ Because our primary focus for this report is electricity use and costs, we combined the buildings and facilities and energy-intensive operations categories for our discussion of federal buildings and facilities.

The few agencies that have facilities outside the United States differ as to how they report to FEMP electricity consumption at such facilities. FEMP officials said that they do not attempt to isolate these data. A DOD official told us DOD's total use reported to FEMP includes nondomestic use—about 24 percent of DOD's preliminary total use for fiscal year 1996, costing about \$420 million. Electricity use at facilities outside the United States would not be affected by restructuring the electricity industry in the United States.

ELECTRICITY USE IN FEDERAL BUILDINGS AND FACILITIES

Over the 10-year period fiscal years 1986-95, the use of electricity measured at federal buildings and facilities increased from 0.16 quadrillion British thermal units (Btu)⁸ in fiscal year 1986 to 0.21 quadrillion Btu in fiscal year 1995. Figure 1 shows electricity's portion of energy use in quadrillions of Btu for the 28 agencies reporting to FEMP.

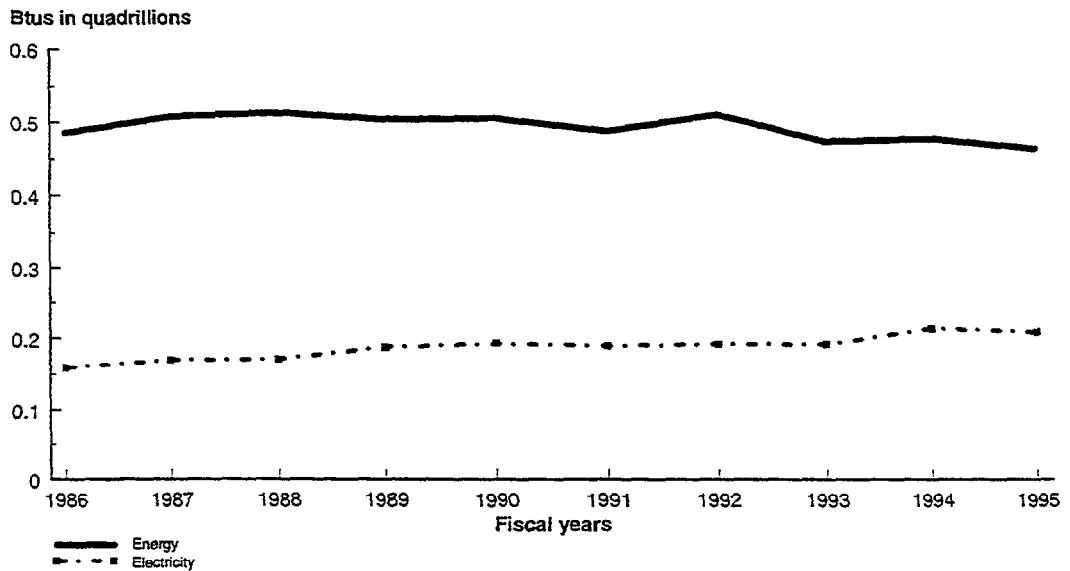
⁵This category includes the energy consumed in industrial operations, certain research and development activities, and in electronic-intensive facilities, such as air traffic control towers.

⁶For fiscal year 1995, 28 agencies reported that buildings and facilities used about 32 percent of the energy at a cost of about \$3.6 billion, energy-intensive facilities used about 9 percent at a cost of about \$0.9 billion, and vehicles and equipment used the remaining 59 percent at a cost of about \$3.4 billion.

⁷Annual Report to Congress on Federal Government Energy Management and Conservation Programs, Fiscal Year 1995, DOE, Washington, D.C.: Draft. According to FEMP officials, the draft, which is expected to be published in April 1997, contains final consumption totals for fiscal year 1995, which we used.

⁸A Btu, the quantity of heat required to raise the temperature of 1 pound of water 1 degree Fahrenheit, is a standard unit for measuring the energy used in operating buildings and facilities.

Figure 1: Electricity's Portion of Energy Use in Federal Buildings and Facilities, in British Thermal Units

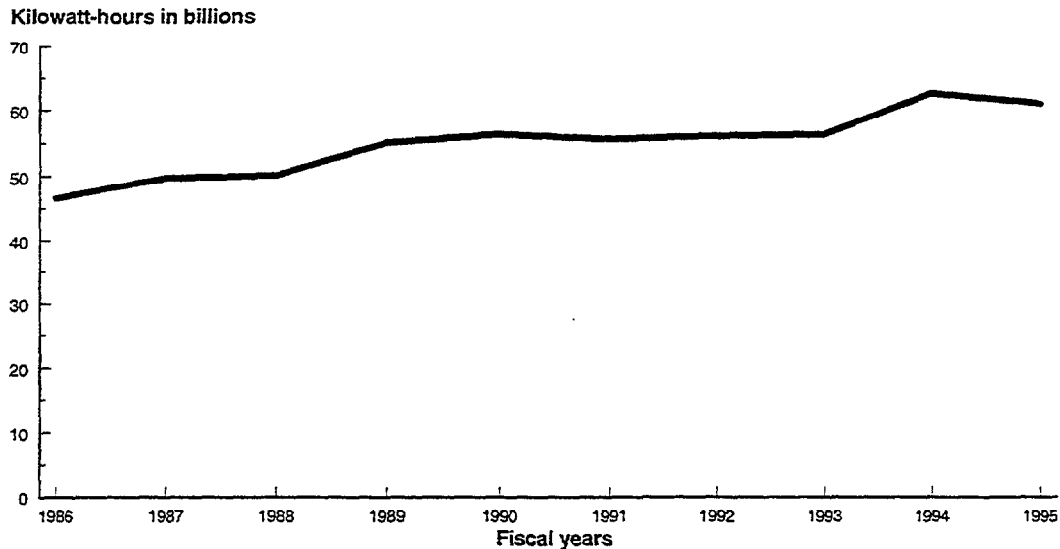


Notes: The increases in fiscal years 1994 and 1995 are largely attributable to TVA. They result from a revised management accounting method at TVA, designed to reflect requirements of the Energy Policy Act of 1992, which captures the costs of electricity use in its plants (most of which is electricity used for the generation of electricity). According to FEMP and TVA officials, comparable data are not available for previous years. FEMP and TVA officials agree that this methodology provides additional management information, but to be consistent with other agencies that produce electricity, the fiscal year 1996 FEMP report will likely not reflect this energy use.

Energy includes electricity and other fuels, such as natural gas, coal, and fuel oil.

Source: Developed by GAO from data provided by FEMP.

Figure 2 presents the same information on electricity use expressed in kilowatt-hours rather than Btu.

Figure 2: Electricity Use in Federal Buildings and Facilities, in Kilowatt-Hours

Note: The conversion factor for electricity is 3,142 Btu per kilowatt-hour.

Source: Developed by GAO from data provided by FEMP.

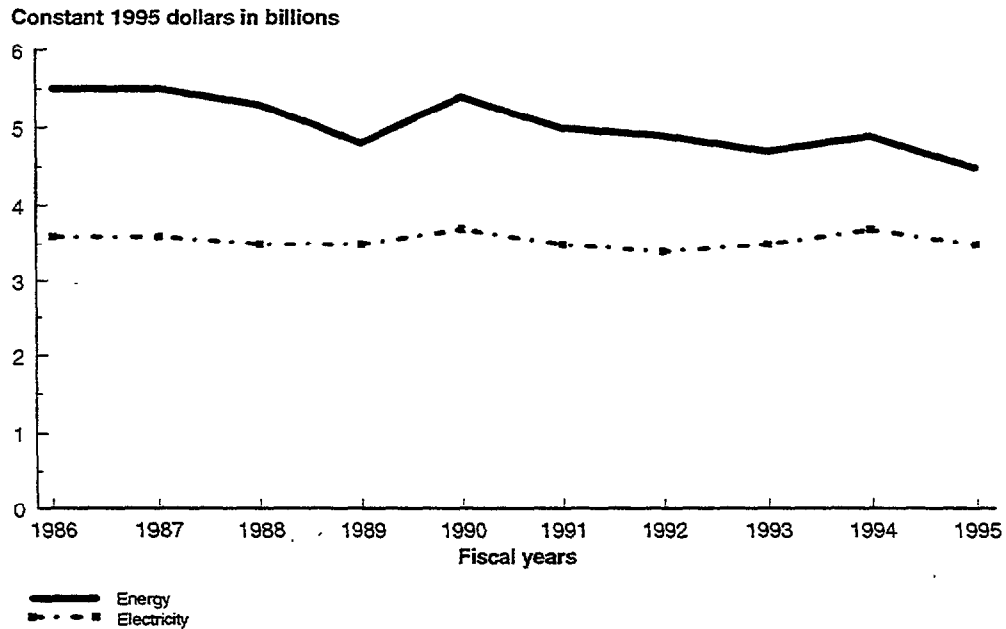
Officials at DOE's Energy Information Administration, DOD, and FEMP were unable to provide independent estimates of federal agencies' future electricity consumption. Whether the agencies' future rate of growth in electricity consumption can be extrapolated from the historic patterns is very uncertain. However, if one assumes that the growth rate for the near future would generally follow the trend of the recent past, the rate could range from an increase of 1 percent annually to a decrease of 1.6 percent. We calculated this range using electricity consumption by federal agencies, as reported to FEMP for the last 11 years. We estimated the growth rate for three recent time periods—the last 10 years, 5 years, and 3 years—which resulted in average annual growth rates of positive 1 percent, and negative 1 and 1.6 percent, respectively.

ELECTRICITY COSTS IN FEDERAL BUILDINGS AND FACILITIES

The cost of electricity in federal buildings and facilities in fiscal year 1995 for the 28 federal agencies was about \$3.5 billion. Figure 3 shows electricity's

portion of energy costs for the period fiscal years 1986-95 in constant 1995 dollars.⁹

Figure 3: Electricity's Portion of Energy Costs in Federal Buildings and Facilities, Fiscal Years 1986-95



Notes: These data are also presented in a bar chart in enc. III.

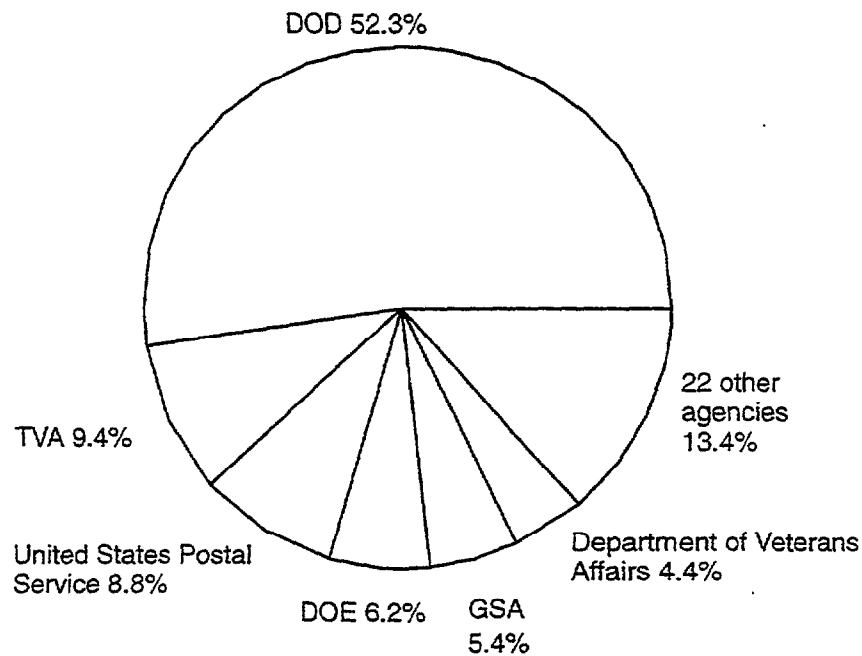
According to TVA's Internal Energy Management Program Coordinator, because of the nature of TVA's business, TVA's cost is based on a benchmark rate and does not reflect the actual cost for electricity used in station service.

Source: Developed by GAO from data provided by FEMP.

Six agencies accounted for about 87 percent of the federal agencies' total electricity costs in fiscal year 1995 (see fig. 4).

⁹Enclosure II shows each agency's electricity costs for buildings and facilities in constant 1995 dollars for fiscal years 1986-95.

Figure 4: Agencies' Share of Federal Electricity Costs, Fiscal Year 1995



Note: GSA reports energy consumption data for buildings that it controls, including data for buildings leased to tenant agencies to whom GSA has not delegated the responsibility for operation and maintenance.

Source: Developed by GAO from data provided by FEMP.

AGENCY COMMENTS

We provided copies of a draft of this report to DOE and DOD, the largest single federal electricity consumer, for review and comment. We met with officials of DOE, including the Deputy Director, FEMP, who fully concurred with the information presented in the draft report. FEMP also provided some clarifying comments that have been incorporated in the report as appropriate. For example, FEMP noted that we should more fully explain the extent to which agencies differ in reporting nondomestic electricity use. We revised our discussion to address these concerns. In addition, DOD fully concurred with the facts contained in the draft.

SCOPE AND METHODOLOGY

We conducted our review primarily at DOE's FEMP in Washington, D.C. We interviewed officials and obtained data on electricity and energy use and costs at FEMP and its contractor, which performs data analysis and provides information for FEMP's reports. The electricity data are a subset of the energy data that FEMP includes in DOE's annual report to the Congress. We contacted officials at the Department of State, DOD, GSA, the National Aeronautics and Space Administration, and the Panama Canal Commission to identify how much of those agencies' reported electricity use was in the United States. We contacted officials at the Department of State, DOD, DOE, GSA, and TVA to discuss consumption reporting concerning energy-intensive facilities. We discussed projected electricity use from 1995 through 2000 with officials of DOE's Energy Information Administration. We contacted officials of the Architect of the Capital, our own office, and the Government Printing Office to obtain electricity consumption data for the judicial and legislative branches.¹⁰

We did not verify the data obtained from FEMP, but we did discuss FEMP's procedures for validating the data submitted by the agencies. A FEMP official told us that the office identifies significant variances, defined as 2 to 5 percent depending on the type of information, from prior reports and asks agencies to either explain those variances and/or provide narratives for inclusion in FEMP's annual report. FEMP provides, with its annual reporting guidance, an electronic worksheet to allow agencies to self-check their consumption and cost data.

We conducted our work from January 1997 to March 21, 1997, in accordance with generally accepted government auditing standards. As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send a copy to the Secretary of Defense and the Secretary of Energy. We will also make copies available to others upon request. If you or

¹⁰According to data provided by legislative branch officials, the legislative and judicial branches' use is less than 1 percent of the government's electricity use.

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your staff have any questions concerning this report, please contact me at (202) 512-3841. Major contributors to this report were Peg Reese, Jim Kennedy, and Charles Hessler.

A handwritten signature in black ink, appearing to read "Victor S. Rezendes". The signature is fluid and cursive, with a large, sweeping flourish at the end.

Victor S. Rezendes
Director, Energy, Resources,
and Science Issues

Enclosures - 3

AGENCIES WHOSE ELECTRICITY USE HAS BEEN REPORTED BY THE OFFICE
OF FEDERAL ENERGY MANAGEMENT PROGRAMS

<u>Agency</u>	<u>Abbreviation</u>
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

Source: Office of Federal Energy Management Programs (FEMP).

ELECTRICITY COSTS IN FEDERAL BUILDINGS
AND FACILITIES, FISCAL YEARS 1986-95

Constant 1995 dollars in millions

Agency ^a	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
DOD ^b	\$2,191.4	\$2,246.8	\$2,188.7	\$2,085.4	\$2,275.1	\$2,129.9	\$2,071.7	\$2,098.0	\$1,918.3	\$1,831.9
TVA ^b	8.7	8.6	8.0	7.8	6.9	6.7	6.7	6.6	372.2	330.6
USPS	264.3	267.6	270.5	273.9	275.0	286.9	288.1	300.7	305.6	307.3
DOE ^b	308.5	302.9	302.3	292.5	284.2	267.9	269.2	228.8	239.7	217.7
GSA ^b	228.5	193.1	166.0	175.9	198.8	215.1	199.7	201.5	193.7	190.2
VA	160.9	153.3	152.5	150.6	153.7	154.9	151.8	151.0	150.9	153.1
DOT ^b	90.8	99.9	102.2	104.0	99.7	99.0	96.3	100.1	98.9	100.2
NASA ^b	108.6	113.6	106.9	112.6	111.7	116.1	109.6	105.6	104.1	94.8
DOJ ^b	25.0	29.2	31.9	33.9	36.0	47.1	35.9	42.6	43.1	52.9
HHS	40.6	37.0	45.5	53.0	57.0	60.0	59.4	58.9	61.5	43.9
USDA ^b	32.3	38.0	39.5	38.6	38.5	36.7	36.9	39.6	38.6	37.4
DOI	32.7	31.3	34.4	32.9	32.4	33.2	33.6	33.0	39.9	36.1
TRSY ^b	10.1	20.3	26.0	29.7	30.0	32.1	29.1	28.2	24.1	31.1
DOC ^b	11.5	10.7	10.6	12.7	15.5	12.5	14.9	17.4	18.7	17.1

Agency ^a	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
DOL	15.6	15.1	14.9	14.2	14.2	14.0	14.0	14.3	14.7	14.4
USIA	0	0	0	11.1	7.4	8.3	9.3	8.6	12.9	11.5
EPA	7.4	6.6	7.0	6.3	7.0	7.6	7.4	6.9	7.1	7.9
ST ^b	4.8	4.7	4.3	4.1	4.2	4.3	4.3	6.1	6.7	6.8
NARA	0	0	0	0	0	0	0	1.9	4.7	5.4
PCC ^b	3.9	4.3	4.1	3.7	4.0	4.0	3.7	3.7	3.8	3.8
HUD	2.4	2.2	2.1	2.0	2.2	2.1	2.2	1.9	1.8	1.8
FEMA	1.1	1.2	1.3	1.4	1.6	1.5	1.5	1.7	1.5	1.4
OPM	1.4	1.3	1.3	1.2	1.3	1.3	1.3	1.1	1.1	1.1
FCC	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Other ^c	4.3	5.0	5.2	5.8	5.5	3.1	2.9	1.9	2.1	2.4
Total	\$3,555.1	\$3,592.7	\$3,525.5	\$3,453.3	\$3,662.1	\$3,544.5	\$3,449.7	\$3,460.3	\$3,666.1	\$3,501.5

^aAbbreviations for agency names are contained in enc. I.

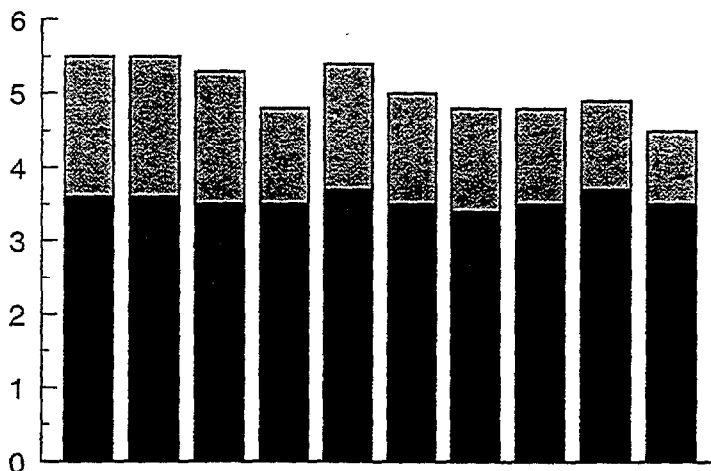
^bFor this agency, the costs include those for energy-intensive operations, which FEMP tracked separately.

^c"Other" includes, for certain years, CFTC, EEOC, FERC, FTC, NARA, NRC, NSF, RRB, and USIA.

Source: Developed by GAO from data provided by FEMP.

ELECTRICITY'S PORTION OF ENERGY COSTS IN FEDERAL BUILDINGS
AND FACILITIES, FISCAL YEARS 1986-95

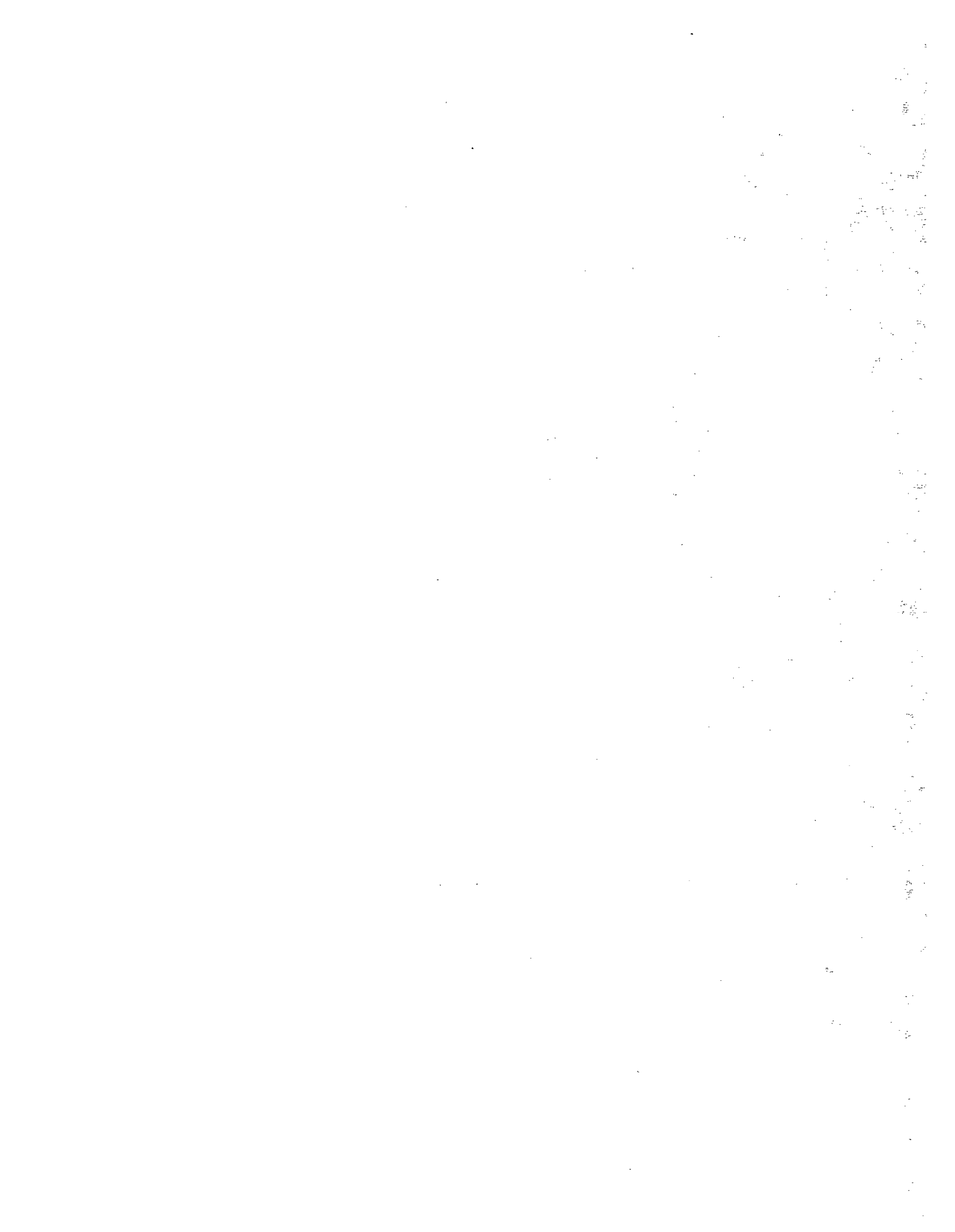
Constant 1995 dollars in billions



Fiscal years	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Electricity 	3.6	3.6	3.5	3.5	3.7	3.5	3.4	3.5	3.7	3.5
Nonelectricity 	1.9	1.9	1.8	1.3	1.7	1.5	1.4	1.3	1.2	1.0
Total energy	5.5	5.5	5.3	4.8	5.4	5.0	4.8	4.8	4.9	4.5

Source: Developed by GAO from data provided by FEMP.

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