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  Updated the 2nd week of the month.
- Oxygenate data
  Updated approximately the 25th of the month.
- *Weekly Petroleum Status Report*
  Updated on Wednesdays (Thursdays in the event of a holiday) at 9 a.m.
- *Petroleum Supply Monthly*
  Updated between the 23rd and 26th of the month.
- *Petroleum Marketing Monthly*
  Updated on the 20th of the month.
- *Natural Gas Monthly*
  Updated on the 20th of the month.
- *Weekly Coal Production*
  Updated on Fridays by noon.
- *Quarterly Coal Report*
  Updated 40 days after the end of the quarter.
- *Electric Power Monthly*
  Updated during the first week of the month.
- *Monthly Energy Review*
  Updated the last week of the month.
- *Short-Term Energy Outlook*
  Updated 60 days after the end of the quarter.
- *Electric Power Annual*
  Updated annually.

Office of Coal, Nuclear, Electric and Alternate Fuels
Electric Power Industry Related Data: Available in Electronic Form

(as of August 1997)

	Internet			CD-ROM	EPUB	Diskette
	Portable Document Format (PDF)	Executable Data Files	Hypertext Markup Language (HTML)			
Surveys:						
Form EIA-412: Annual Report of Public Electric Utilities		X				X
Form EIA-759: Monthly Power Plant Report		X		X		X
Form EIA-767: Steam-Electric Operation and Design Report		X				X
Form EIA-826: Monthly Electric Utility Sales and Revenue Report with State Distributions		X		X		X
Form EIA-860: Annual Electric Generator Report		X		X		X
Form EIA-861: Annual Electric Utility Report		X		X		X
FERC Form 1: Annual Report of Major Electric Utilities, Licensees, and Others		X				X
FERC Form 423: Monthly Report of Cost and Quality of Fuels for Electric Plants		X				X
Publications:						
Electric Power Monthly	X			X	X	
Electric Power Annual Volume I	X		X	X	X	
Electric Power Annual Volume II	X		X	X	X	
Inventory of Power Plants in the United States	X			X		
Electric Sales and Revenue	X		X	X	X	
Financial Statistics of Major U.S. Investor Owned Electric Utilities	X			X	X	
Financial Statistics of Major U.S. Publicly Owned Electric Utilities	X			X	X	

Note: If you have any questions and/or need additional information, please contact the National Energy Information Center at (202) 586-8800.

Preface

The *Electric Power Annual* presents a summary of electric power industry statistics at national, regional, and State levels. The objective of the publication is to provide industry decisionmakers, government policy-makers, analysts, and the general public with data that may be used in understanding U.S. electricity markets. The *Electric Power Annual* is prepared by the Coal and Electric Data and Renewables Division; Office of Coal, Nuclear, Electric and Alternate Fuels; Energy Information Administration (EIA); U.S. Department of Energy.

In the private sector, the majority of the users of the *Electric Power Annual.* are researchers and analysts and, ultimately, individuals with policy- and decisionmaking responsibilities in electric utility companies. Financial and investment institutions, economic development organizations interested in new power plant construction, special interest groups, lobbyists, electric power associations, and the news media will find data in the *Electric Power Annual* useful.

In the public sector, users include analysts, researchers, statisticians, and other professionals with regulatory, policy, and program responsibilities for Federal, State, and local governments. The Congress and other legislative bodies may also be interested in general trends related to electricity at State and national levels. Much of the data in these reports can be used in analytic studies to evaluate new legislation. Public service commissions and other special government groups share an interest in State-level statistics. These groups can also compare the statistics for their States with those of other jurisdictions.

Volume 1—with a focus on U.S. electric utilities—contains final 1996 data on net generation and fossil fuel consumption, stocks, receipts, and cost; preliminary 1996 data on generating unit capability, and retail sales of electricity, associated revenue, and the average revenue per kilowatthour of electricity sold (based on a **monthly sample**: Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions"). Additionally, information on net generation from renewable energy sources and on the associated generating capability is included in Volume 1 of the EPA. Data published in the *Electric Power Annual Volume 1* are compiled from three statistical forms filed monthly and two forms filed annually by electric utilities. These forms are described in detail in the Technical Notes.

Volume 2—expected to be available in November 1997—will present other annual data. The second volume will present annual 1996 summary statistics for the electric power industry, including information on nonutility power producers. Included in the latter volume will be preliminary data for electric utility retail sales of electricity, associated revenue, and average revenue per kilowatthour of electricity sold (based on the **annual census**—Form EIA-861, "Annual Electric Utility Report") and statistics on electric utility financial and environmental aspects, power transactions, and demand-side management. Preliminary 1996 data for U.S. nonutility power producers on installed capacity and gross generation, as well as supply and disposition information, will also be provided in Volume 2 of the EPA.

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Nonutility Power Producers

Electric power produced by nonutility power producers re-emerged as an increasing part of U.S. electricity generation over the past decade. In the 1970's, the energy crisis, inflation, and the high cost of nuclear power resulted in increased electricity rates and reduced investment in new capacity. These factors led to a re-examination of alternative sources of power, such as nonutility electric power, which stimulated the passage of the Public Utility Regulatory Policies Act (PURPA) of 1978 and other legislation— encouraging growth in the nonutility industry.

For nonutilities (with a nameplate rating of 1 megawatt and greater), the final 1995 and estimated 1996 for year-end nameplate capacity, gross generation, and sales to electric utilities are:

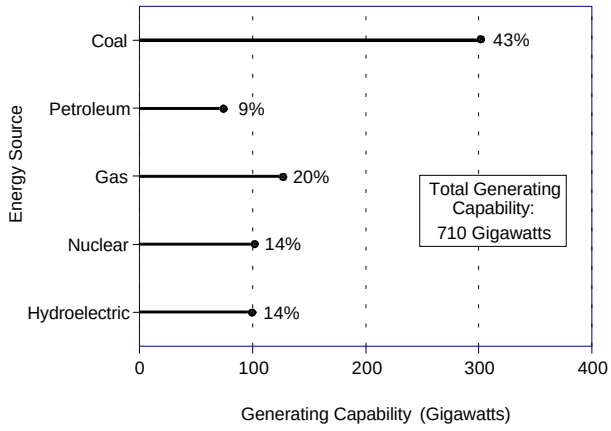
Nonutility Power Producers	Final 1995	Estimated 1996
Nameplate Capacity (gigawatts)	71	73
Gross Generation (gigawatthours)	376,475	380,008
Sales to Electric Utilities (gigawatthours)	219,653	223,202

Source: Form EIA-867, "Annual Nonutility Power Producer Report." Estimates were derived using the following procedure. For facilities that have filed for 1996 and 1995, a growth factor for each data element was calculated [Growth Factor equals (current year's data divided by last year's data)]. Estimates are based on information from respondents who make up 86 percent of total nameplate capacity in 1995. For facilities that have not filed to date, their last year's data were multiplied by the growth factor of the corresponding data element to derive estimates for the current year. More information concerning nonutility power producers will be provided in the *Electric Power Annual Volume II* (DOE/EIA-348), scheduled for release in November 1997. For more information, contact Ms. Betty Williams at (202)426-1269 or E-mail BWilliam@EIA.DOE.GOV..

Generating Capability at Electric Utilities

Electric utility generating capability in the United States totaled 709,612 megawatts in 1996.[1] Based on primary energy source, coal-fired capability totaled 302,167 megawatts; gas-fired, 143,208 megawatts; nuclear, 100,685 megawatts; renewables, 77,439 megawatts; petroleum, 65,009 megawatts; and hydroelectric (pumped storage only), 21,104 megawatts. Total capability included 4,394 megawatts of newly added capability. Of that added capability, 35 percent was coal-fired while both gas and nuclear units represented 27 percent.

Figure 1. Generating Capability at U.S. Electric Utilities by Energy Source, 1996



Notes: ●The total generating capability value includes renewable generating capability (excluding hydroelectric) that is less than 1 percent of the total. ●Preliminary 1996 data are based on final 1995 data and changes (including additions, retirements, and modifications) that occurred in 1996 that were followed up and verified by telephone using the respondents' proposed ten-year changes reported as of January 1, 1996. No updates from responses submitted on Form EIA-860 with data as of January 1, 1997 are included. ●Totals may not equal sum of components because of independent rounding.

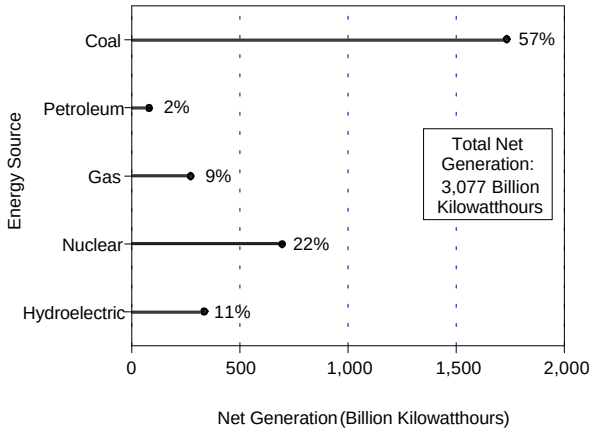
Source: Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

[1] Data on capability for 1996 are preliminary; does not include the estimated 73,000 megawatts of capacity at nonutility facilities.

Net Generation at Electric Utilities

In 1996, a record level of net generation was set, when 3,077 billion kilowatthours of electricity were produced—an increase of 3 percent from last year. Generation from nuclear power and coal were also at record levels. Although a record was set when 675 billion kilowatthours of electricity were produced from nuclear power in 1996, this level was only slightly higher (less than 1 percent) from the level during the previous year. Nuclear power supplied 21.9 percent of the total U.S. electricity production in 1996. Coal-fired generation continued to be the largest contributor to the supply of electricity, providing 56.5 percent of total utility generation. During 1996, coal-fired plants produced 1,737 billion kilowatthours of electricity, 5 percent above the level during 1995.

Figure 2. U.S. Electric Utility Net Generation by Energy Source, 1996



Notes: ●The total net generation value includes renewable energy sources (excluding hydroelectric), which represent less than 1 percent of total generation. ●Data are final. ●Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Conventional hydroelectric generation increased to 331 billion kilowatthours, 12 percent above the level reported during 1995, partly due to improved water conditions in the Pacific Northwest. Hydroelectric plants in the Pacific Contiguous Census Division, which provided 56 percent of total U.S. hydroelectric generation during the year, reported 9 percent more production than during 1995. Gas-fired generation, however, declined by 15 percent from the level reported in 1995. This decrease was due in part to a substantial increase in the cost of gas in 1996.

Fossil Fuel Receipts and Costs at Electric Utilities

In 1996, electric utilities received 863 million short tons of coal, 107 million barrels of petroleum, and 2,605 billion cubic feet (Bcf) of gas at a total delivered cost of approximately 32 billion dollars.[2]

Coal accounted for 84 percent of the total Btu content of fossil fuels delivered in 1996, while gas and petroleum accounted for 13 and 3 percent, respectively.

Coal. Electric utilities received a record 863 million short tons of coal in 1996, up from 827 million short tons received in 1995. This increase in receipts of coal was due primarily to an increase in coal-fired generation that was required to meet a higher demand for electricity. Even with record coal receipts, end-of-year coal stocks fell by 12 million short tons to the 115 million short ton level.

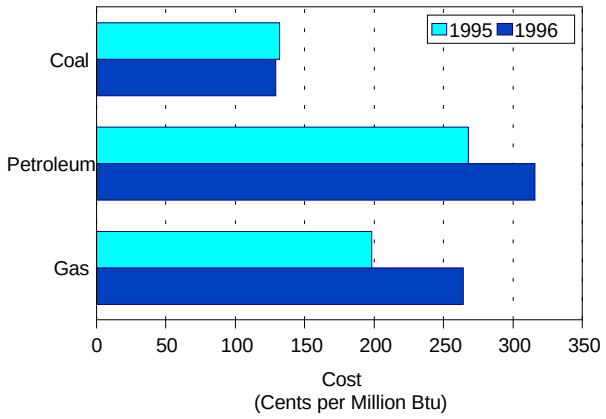
Receipts of coal were indirectly affected by a substantial decrease in the use of gas that was caused primarily by high gas prices. During 1995 the opposite was true when the low-cost of gas edged out coal at some electric utilities as the least cost fuel for electric generation. Near record hydroelectric generation limited coal use, especially in the western United States where coal-fired generation rose but not to the same extent as in other parts of the country. Receipts of coal actually decreased in the Mountain and Pacific Contiguous Census Divisions from 1995 levels. Record nuclear-fired generation in 1996 also limited coal-fired generation; however, on a year-to-year basis, it was up only slightly from 1995 levels.

Continuing the downward trend of the last 11 years, the average delivered cost of coal decreased to $1.29 per million Btu, down from the $1.32 per million Btu reported for 1995.[3] Contributing to this lower cost of coal were an increase in receipts of low-cost subbituminous coal from Wyoming; the continuing expiration, renegotiation, and buyouts of older high-priced contracts; improved efficiency in coal production and transportation; and excess production capacity.

[2] Federal Energy Regulatory Commission (FERC) Form 423, "Monthly Report of Cost and Quality of Fuels for Electric Plants." This survey covers over 99 percent of the coal and approximately 95 percent of the petroleum and gas delivered to electric utilities.

[3] The delivered cost of fossil fuels includes all costs (i.e., transportation, taxes, etc.) incurred by the electric utility for delivery of the fuel to the plant. It does not include unloading charges.

Figure 3. Average Cost of Fossil Fuels at U.S. Electric Utilities, 1995 and 1996



Notes: ●Data are final. ●Data are for electric generating plants with a total steam-electric and combined-cycle nameplate capacity of 50 or more megawatts. ●Totals may not equal sum of components because of independent rounding. ● Data do not include petroleum coke.

Source: Federal Energy Regulatory Commission, FERC Form 423, "Monthly Report of Cost and Quality of Fuels for Electric Plants."

The average cost of coal delivered under contract in 1996 was $1.31 per million Btu, down from $1.36 per million Btu in 1995. On a per short ton basis the average delivered cost of contract coal was $26.33 as compared to $27.51 in 1995. However, coal purchased on the spot-market and delivered in 1996 increased in cost. On a dollars per million Btu basis, spot-market coal delivered to electric utilities increased to $1.20 per million Btu, up 4 percent from the $1.15 per million Btu reported in 1995. On a per-short-ton-basis, the increase in cost of spot-market coal was even more pronounced. The average delivered cost rose 8 percent to $26.97 per short ton from the $24.89 per short ton reported in 1995.

This increase in cost was due to a combination of higher receipts of spot-market coal from the Appalachian and Interior Regions and a substantial decline in receipts of western spot-market subbituminous coal.[4] It is also important to note that the cost of coal on a per-short-ton basis does not fully account for the difference in Btu content of coal from different geographic regions. Subbituminous coal on a per short ton basis is usually lower in cost than bituminous coal because it has a lower heat content, approximately 8,800 Btu per pound as compared to 10,000 to 13,000 per pound for eastern coal.

Since 1990, the average sulfur content (measured as percent sulfur by weight) of coal delivered to electric utilities fell each year due to greater use of low-sulfur western coal and to implementation of the Clean Air Act Amendments of 1990 (CAAA90).[5] However, in 1996, the average sulfur content of coal delivered was 1.10 percent, up from 1.08 in 1995. The surprising increase in sulfur content was due primarily to an increase in receipts of high-sulfur coal from Indiana, Ohio, and Pennsylvania. Consumption of coal rose in each of these States. In addition, receipts of low-sulfur coal from Kentucky fell while deliveries of high-sulfur coal rose.

The average Btu content of coal received in 1996 was 10,263 per pound, up from 10,248 per pound in 1995. Like sulfur, the average Btu content of coal was affected by an increase in receipts of Appalachian and Interior Region coal. Coal from these two regions typically contain 10,000 and 13,000 Btu per pound, respectively, well above the national average.

Petroleum. Receipts of petroleum delivered to electric utilities totaled 107 million barrels, up from the 84 million barrels reported in 1995. This is opposite the trend of the past several years of lower receipts of petroleum that has resulted from electric utilities turning away from petroleum as a baseload fuel. However, the level of receipts in 1995 was unusually low due to competition from abundant supplies of low-cost natural gas. In 1996, higher gas prices accompanied by a reduction in supplies of gas available to electric utilities resulted in a rebound in receipts of petroleum from 1995 levels. Connecticut, Massachusetts, New York, Florida, and Hawaii reported the highest receipts of petroleum. Combined, these States accounted for 76 percent of all petroleum received at electric utilities.

In 1996, the average cost of petroleum was $3.16 per million Btu compared with $2.68 per million Btu in 1995. Typically, the cost of petroleum delivered to electric utilities closely tracks the cost of crude oil. Number 6 fuel oil represented 93 percent of all petroleum products delivered to electric utilities in 1996. Based on a weighted average, fuel oil was the most expensive fossil fuel delivered to electric utilities in 1996.

[4] Typically, western subbituminous coal has a lower average delivered cost than either Appalachian or Interior Region bituminous coal. Therefore, a decrease in receipts of low-cost spot-market subbituminous coal or an increase in receipts of eastern spot-market bituminous coal will contribute to an increase in the national average cost of spot-market coal.

[5] Title IV of the Clean Air Act Amendments of 1990 established an Acid Rain Program designed to reduce emissions from utility boilers in a two-phase approach. Starting on January 1, 1995, Phase I set emission restrictions on 110 mostly coal-burning plants in the eastern and midwestern United States. Phase II begins in the year 2000 and places additional emission restrictions on approximately 1,000 electric plants. To comply with Phase I, many electric utilities have increased purchases of low-sulfur coal while reducing purchases of high-sulfur coal.

Gas. Receipts of gas totaled 2,605 Bcf in 1996, down from 3,023 Bcf reported in 1995. This nationwide decrease in receipts of gas was due in part to a substantial increase in the cost of gas in 1996. Gas became less competitive with other fuels as a fuel source for electric generation. Also, for the second consecutive year, high levels of hydroelectric generation greatly reduced the use of gas by electric utilities in California. On the other hand, increases in pipeline capacity and the enactment of the CAAA90 which promotes clean-burning gas as a means of reducing emissions, have increased the use of gas by some electric utilities.

On a dollars-per-million-Btu basis, the average cost of gas was $2.64 per million Btu, compared with $1.98 per million Btu in 1995. While the average cost of gas delivered to electric utilities in 1995 was the lowest since 1979, the average cost in 1996 was the highest since 1985. Uncertainties concerning the availability of gas, stock levels, and weather were the primary factors influencing changes in the price of gas.

Nuclear Generation Affect on Receipts. In 1996, nuclear-powered plants generated a record 675 billion kilowatthours of electricity, up 0.2 percent from 1995. At the Census division and State level, however, nuclear-fired generation posted substantial year-to-year changes that affected demand for fossil-fuels.[6] The New England, East North Central, and the South Atlantic Census Divisions each posted large decreases in nuclear generation. States with substantial decreases in nuclear generation include Connecticut, New Jersey, Illinois, Ohio, Kansas, Florida, and South Carolina, In contrast, the East South Central Census Division posted a 39-percent gain due to a return to service of Tennessee Valley Authority's Watts Bar (Tennessee) and Browns Ferry (Alabama) nuclear plants. Other States with a 20-percent or more increase in nuclear generation included Maine, New York, and Nebraska.

Weather Conditions Affecting Receipts. Weather that affected the level and timing of fossil fuels received during 1996 included severe cold and snow in the East during January and February, above normal winter precipitation in the western United States, and a relatively mild summer.[7]

January and February 1996 were cold and wet throughout much of the eastern United States. Demand for electricity during this period was up considerably from 1995 levels. Stocks of coal at electric utilities fell to the 116-million-short-ton level but were replenished during the spring. The summer of 1996 was mild, especially when compared to the intense heat wave which prevailed over much of the Nation during the summer months of 1995. The heavily populated Northeast and North Central parts of the Nation were especially mild. Total generation by electric utilities for the June through August period fell by 5 billion kilowatthours from 1995 levels which in-turn negatively affected receipts of fuel.

Heavy precipitation fell in the western United States (in particular California and the Pacific Northwest) during the winter months of December 1995 through March 1996. The area usually receives most of its precipitation during this period at which time a deep snowpack accumulates in the mountains. The subsequent melting during the spring and summer helps maintain reservoir levels throughout the year and is then the source of hydro-electric generation. The result was the highest level of hydroelectric generation in the Pacific Contiguous Census Division since 1983. For the year, hydroelectric generation in this Census division rose 10 percent from 1995's high level.[8]

The affect of higher levels of hydroelectric generation on fossil fuel receipts was two-fold. First, receipts of gas to California fell 19 percent to 315 Bcf as hydroelectric plants ran at nearly full capacity reducing the need for gas-fired generation. Second, receipts of coal to the Mountain and Pacific Contiguous Census Divisions fell as California required less coal-by-wire (coal-fired generation produced in neighboring States and sold over the transmission grid to electric utilities located in California.)

Retail Sales at Electric Utilities

Total retail sales of electricity to all ultimate consumers in the United States in 1996 reached 3,085 billion kilowatt-hours, an increase of 71 billion kilowatthours, or 2 percent, compared with 1995 (Table 1). In 1996, sales increased in all major end-use sectors. The residential sector led with an increase of 36 billion kilowatthours (3 percent). The commercial sector followed, increasing by 29 billion kilowatthours (3 percent). Lastly, the industrial sector increased by 2 billion kilowatthours, less than 1 percent.

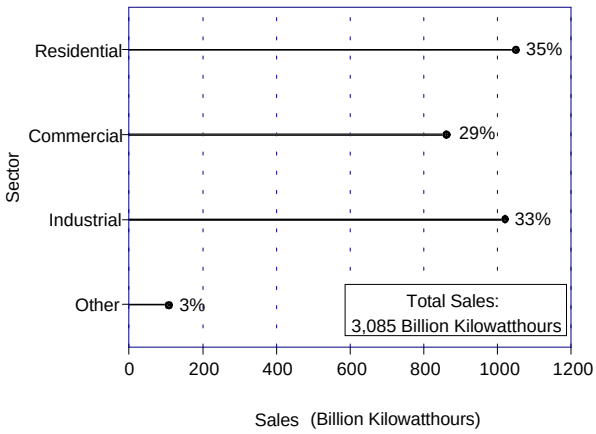
Revenue from the sale of electricity to all ultimate consumers in the United States in 1996 reached $212 billion, an increase of 4 billion dollars (2 percent),

[6] Due to their relatively lower operating cost, nuclear plants are baseload plants that are usually dispatched to meet electric system load ahead of fossil fuel plants. Changes in nuclear generation require fossil fuel plants to adjust their output to meet electric demand.

[7] U.S. Department of Agriculture, *Weekly Weather and Crop Bulletin*, Vol. 84, No. 2, January 14, 1997.

[8] Energy Information Administration, *Electric Power Monthly (EPM)*, DOE/EIA-0226(97/03), Table 11.

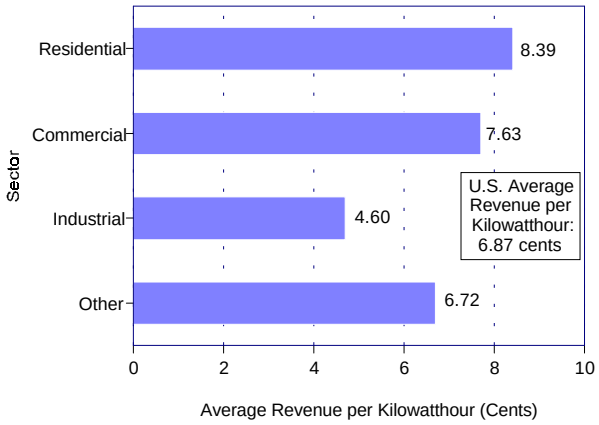
Figure 4. U.S. Electric Utility Retail Sales to Ultimate Consumers by Sector, 1996



Notes: ●Other includes public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales. ●Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions."

Figure 5. U.S. Electric Utility Average Revenue per Kilowatthour by Sector, 1996



Notes: ●Other includes sales to public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales. ●Values are weighted and are calculated by dividing total revenue by total sales.

Source: Energy Information Administration, Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions."

compared with the level in 1995. Electricity revenue in the residential and commercial sectors increased by 3 billion and 2 billion dollars, respectively. Revenue from sales of electricity in the industrial sector decreased slightly.

Average Revenue per Kilowatthour[9] of electricity sold to ultimate consumers in 1996 was 6.87 cents, a decrease of 0.02 cents from 1995. In both the commercial and industrial sectors, average revenue per kilowatthour decreased by 0.06 cents. Average revenue per kilowatthour in the residential sector decreased by 0.01 cents.

In 1996, estimated U.S. total retail sales of electricity (3,085 billion kilowatthours) exceeded total net generation by U.S. electric utilities by 7 billion kilowatthours (less than 1 percent). The major factor contributing to this difference was net import of electricity totaling 38 billion kilowatthours (EIA estimate based on preliminary data from the National Energy Board of Canada and U.S. Department of Energy, Fossil Energy).

[9] Average revenue per kilowatthour is the ratio of revenue to retail sales.

Table 1. U.S. Electric Utility Summary Statistics, 1995 and 1996

Item	1995	1996	Percent Change
Generating Capability (megawatts)[1]	**706,111**	**709,612**	**0.5**
Coal	300,610	302,167	.5
Petroleum	64,464	65,009	.8
Gas	142,536	143,208	.5
Nuclear	99,515	100,685	1.2
Hydroelectric Pumped Storage	21,387	21,104	–1.3
Renewable			
Hydroelectric (conventional)	75,274	75,238	.0
Geothermal	1,747	1,622	–7.2
Biomass[2]	567	567	.0
Wind	8	8	.0
Solar Thermal	0	0	.0
Photovoltaic	4	4	.0
Net Generation (million kilowatthours) R	**2,994,529**	**3,077,442**	**2.8**
Coal	1,652,914	1,737,453	5.1
Petroleum[3]	60,844	67,346	10.7
Gas	307,306	262,730	–14.5
Nuclear	673,402	674,729	.2
Hydroelectric Pumped Storage[4]	–2,725	–3,088	13.3
Renewable			
Hydroelectric (conventional)	296,378	331,058	11.7
Geothermal	4,745	5,234	10.3
Biomass[2]	1,649	1,967	19.3
Wind	11	10	–9.1
Solar Thermal	0	0	.0
Photovoltaic	4	3	–25.0
Consumption R			
Coal (million short tons)	829	875	5.5
Petroleum (million barrels)[5]	102	113	10.8
Gas (billion cubic feet)	3,197	2,732	–14.5
Stocks (Year End) R			
Coal (million short tons)	126	115	–8.7
Petroleum (million barrels)[6]	50	48	–4.0
Receipts			
Coal (million short tons)	827	863	4.4
Petroleum (million barrels)[7]	84	107	27.4
Gas (billion cubic feet)[8]	3,023	2,605	–13.8
Cost (cents per million Btu)[9]			
Coal	131.8	128.9	–2.2
Petroleum[10]	267.9	315.7	17.8
Gas	198.4	264.1	33.1
Retail Sales			
(million kilowatthours)	**3,013,287**	**3,084,664**	**2.4**
Residential	1,042,501	1,078,512	3.5
Commercial	862,685	891,588	3.4
Industrial	1,012,693	1,014,347	.2
Other[11]	95,407	100,217	5.0
Revenue from Retail Sales			
(billion dollars)	**208**	**212**	**1.9**
Residential	88	90	2.3
Commercial	66	68	3.0
Industrial	47	47	.0
Other[11]	7	7	.0
Average Revenue per Kilowatthour (cents)	**6.89**	**6.87**	**–.3**
Residential	8.40	8.39	–.1
Commercial	7.69	7.63	–.8
Industrial	4.66	4.60	–1.3
Other[11]	6.88	6.72	–2.3

1 Based on primary energy source; waste heat, waste gases, and waste steam are included in the original primary energy source (i.e., coal, petroleum, or gas). Preliminary 1996 data are based on final 1995 data and respondent's proposed 1996 changes (additions,retirements, and modifications) reported as of January 1, 1996, and verified by telephone. The Form EIA-860 was revised during 1995 to collect data as of January 1 of the reporting year, where ''reporting year'' is the calendar year in which the report is required to be filed with the Energy Information Administration. No updates from responses submitted on Form EIA-860 with data as of January 1, 1997 are included.

2 Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural waste, straw, tires, landfill gases, fish oils, and/or other waste.

3 Includes petroleum coke.

4 Represents total pumped storage facility production minus energy used for pumping. Negative generation denotes that electric power consumed for plant use exceeds gross generation.

5 Does not include petroleum coke consumption of 761 thousand short tons in 1995 and 681 thousand short tons in 1996.

6 Does not include petroleum coke stocks of 65 thousand short tons at year end 1995 and 91 thousand shorts tons at year end 1996.

7 Does not include petroleum coke receipts of 1,123 thousand short tons in 1995 and 1,410 thousand short tons in 1996.

8 Includes small amounts of coke-oven, refinery, and blast furnace gas.

9 Average cost of fuel delivered to electric generating plants with a total steam-electric nameplate capacity of 50 or more megawatts; average cost values are weighted by Btu.

10 Does not include petroleum coke cost of 65.2 cents per million Btu in 1995 and 78.2 cents per million Btu in 1996.

11 Includes public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

R = Revised; final 1996 monthly estimates provided in the April 1997 issue of the ''Electric Power Monthly'' DOE/EIA-0226 (97\04) have been adjusted to reflect the annual census.

Notes: •Net summer capability values are preliminary for 1996 and final for 1995. •Values for net generation, consumption, and stocks are final. •Values for sales, revenue, and average revenue per kilowatthour for 1995 are final but preliminary for 1996 (that is, the monthly estimates based on a cutoff model sample have been revised --see technical notes for a discussion of the sample design for the Form EIA-826). •Preliminary 1996 values in the commercial and industrial sectors for Maryland, South Atlantic Census Division, and the U.S. total reflect an electric utility's reclassification for this information by Standard Industrial Classification Code (SIC). •Values are based on unrounded values. •Totals may not equal sum of components because of independent rounding. •Percent change is calculated before rounding.

Sources: •Energy Information Administration, Form EIA-860, ''Annual Electric Generator Report''; monthly and annual Form EIA-759, ''Monthly Power Plant Report''; Form EIA-826, ''Monthly Electric Utility Sales Report with State Distributions''; and Form EIA-861, ''Annual Electric Utility Report.'' Report with State Distributions''; and •Federal Energy Regulatory Commission FERC Form 423, ''Monthly Report of Cost and Quality of Fuels for Electric Plants.''

Generating Capability at U.S. Electric Utilities

More than one-third of the primary energy in the Nation is used to generate electricity.[10] Consumers expect electricity to be instantly available; that is, at the flick of a switch. In fact, electricity is so important to the functioning of our society that its unavailability is newsworthy. The U.S. electric power industry is organized to ensure that an adequate supply of electricity is available to meet all demand requirements at any given instant, both now and in the future. This chapter provides an inventory of the capability of various methods for converting energy into electricity, and information regarding industry plans for building additional capability in the future.

The generating units operated by an electric utility vary by intended usage; that is, by the three major types of load (generally categorized as base, intermediate, and peak) requirements the utility must meet. A *baseload generating unit* is normally used to satisfy all or part of the minimum or base load of the system and, as a consequence, produces electricity at an essentially constant rate and runs continuously. Baseload units are generally the newest, largest, and most efficient[11] of the three types of units. A *peakload generating unit*, normally the least efficient of the three unit types, is used to meet requirements during the periods of greatest or peak load on the system. *Intermediate-load generating units* meet system requirements that are greater than base load but less than peak load. Intermediate-load units are used during the transition between baseload and peak load requirements. Utilities also have reserve or standby generating units, which are available to the system in the event of an unexpected increase in load or an unexpected outage within the system. Consequently, an inventory of net capability must account for reserve or standby capability, as well as generating units that are not available to the system for various reasons (such as routine maintenance).

Net capability in this report, unless otherwise stated, refers to that which is *operable* and includes both active and inactive capability. Once a new generator has been declared available to generate power to the electrical grid, it is considered a part of the operable capability of the utility until it is retired from service. Generating units that are used for standby service, cold standby, and generators that are out of service for an extended period (exceeding 1 year) comprise the inactive operable capability.[12] Active operable capability includes generators that are generating or available to generate; this includes generators that may be down for scheduled maintenance, refueling, or forced outages.

An electric utility plant (station) contains generating units and auxiliary equipment that are used to convert various types of energy into electric energy. A fossil-fueled generating unit may be designed to use (burn) one or more fossil fuels to produce electricity. A generating unit capable of burning more than one fossil fuel is referred to as a dual-fired unit. Some dual-fired units can only burn one fuel at a time (that is, the fuels are fired sequentially), while others can burn more than one fuel simultaneously (concurrent firing of different fuels). A sequentially fired unit generally uses one fossil fuel as its primary energy source, but can switch to a second fossil fuel as an alternate energy source. Unless stated otherwise, information regarding generating capability in this report is based on the primary energy source.

Prime Movers

Electric utilities use a variety of prime movers based on the loads, availability of fuels, and energy requirements of the utility. The most common prime movers are the steam turbine, internal-combustion engine, gas combustion turbine, water turbine, and wind turbine.[13] Most prime movers used to produce electricity today are turbines. The energy sources most often used with prime movers are the fossil fuels—coal, petroleum, and natural gas.

Steam-Turbine Generating Units. Most of the electricity in the United States is produced in steam turbines. In a

[10] Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(96/04) (Washington, DC, April 1996), pp. 7 and 33.

[11] The *operating efficiency* of a generating unit is a function of the amount of net heat that it can extract from the energy source for use in the production of electricity.

[12] As of January 1, 1996, about 2 percent of the operable capability was inactive, based on preliminary data from the Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

[13] A turbine converts the kinetic energy of a moving fluid (liquid or gas) to mechanical energy. Turbines have a series of blades mounted on a shaft against which fluids are forced, thus rotating the shaft connected to the generator. The fluids most commonly used in turbines are steam, hot air, or combustion products, and water.

fossil-fueled steam turbine, the fuel is burned in a boiler to produce steam. The resulting steam then turns the turbine blades that turn the shaft of the generator to produce electricity. In a *nuclear-powered* steam turbine, the boiler is replaced by a reactor containing a core of nuclear fuel (primarily enriched uranium). Heat produced in the reactor by fission of the uranium is used to make steam. The steam is then passed through the turbine generator to produce electricity, as in the fossil-fueled steam turbine. Steam-turbine generating units are used primarily to serve the base load of electric utilities. Fossil-fueled steam-turbine generating units range in size (nameplate capacity) from 1 megawatt to more than 1,000 megawatts. The size of nuclear-powered steam-turbine generating units in operation today ranges from 75 megawatts to more than 1,400 megawatts.

Gas Turbine Generating Units. In a gas turbine (combustion-turbine) unit, hot gases produced from the combustion of natural gas and distillate oil in a high-pressure combustion chamber are passed directly through the turbine, which spins the generator to produce electricity. Gas turbines are commonly used to serve the peak loads of the electric utility. Gas-turbine units can be installed at a variety of site locations, because their size is generally less than 100 megawatts. Gas-turbine units also have a quick startup time, compared with steam-turbine units. As a result, gas-turbine units are suitable for peaking, emergency, and reserve-power requirements.

The gas turbine, as is typical with peaking units, has a lower efficiency than the steam turbine used for baseload power. The efficiency of the gas turbine is increased when coupled with a steam turbine in a *combined-cycle* operation. In this operation, hot gases (which have already been used to spin one turbine generator) are moved to a waste-heat recovery steam boiler where the water is heated to produce steam that, in turn, produces electricity by running a second steam-turbine generator. In this way, two generators produce electricity from one initial fuel input. All or part of the heat required to produce steam may come from the exhaust of the gas turbine. Thus, the steam-turbine generator may be supplementarily fired in addition to the waste heat. Combined-cycle generating units generally serve intermediate loads.

Internal-Combustion Engines. These prime movers have one or more cylinders in which the combustion of fuel takes place. The engine, which is connected to the shaft of the generator, provides the mechanical energy to drive the generator to produce electricity. Internal-combustion (or diesel) generators can be easily transported, can be installed upon short notice, and can begin producing electricity nearly at the moment they start. Thus, like gas turbines, they are usually operated during periods of high demand for electricity. They are generally about 5 megawatts in size.

Hydroelectric Generating Units. Hydroelectric power is the result of a process in which flowing water is used to spin a turbine connected to a generator. The two basic types of hydroelectric systems are those based on *falling water* and those based on *natural river current*. In the first system, water accumulates in reservoirs created by the use of dams. This water then falls through conduits (penstocks) and applies pressure against the turbine blades to drive the generator to produce electricity. In the second system, called a *run-of-the-river* system, the force of the river current (rather than falling water) applies pressure to the turbine blades to produce electricity. Since run-of-the-river systems do not usually have reservoirs and cannot store substantial quantities of water, power production from this type of system depends on seasonal changes and stream flow. These conventional hydroelectric generating units range in size from less than 1 megawatt to 700 megawatts. Because of their ability to start quickly and make rapid changes in power output, hydroelectric generating units are suitable for serving peak loads and providing spinning reserve power, as well as serving baseload requirements.

Another kind of hydroelectric power generation is the *pumped storage* hydroelectric system. Pumped storage hydroelectric plants use the same principle for generation of power as the conventional hydroelectric operations based on falling water and river current. However, in a pumped storage operation, low-cost off-peak energy is used to pump water to an upper reservoir where it is stored as potential energy. The water is then released to flow back down through the turbine generator to produce electricity during periods of high demand for electricity.

Other Generating Units. Other methods of electric power generation, which presently contribute only small amounts to total power production, have potential for expansion. These include *geothermal, solar, wind,* and *biomass* (wood, municipal solid waste, agricultural waste, etc.). *Geothermal* power comes from heat energy buried beneath the surface of the earth. Although most of this heat is at depths beyond current drilling methods, in some areas of the country, magma[14] flows close enough to the surface of the earth to produce steam. That steam can then be harnessed for use in conventional steam-turbine plants. *Solar power* is derived from the energy (both light and heat) of the sun. *Photovoltaic conversion* generates electric power directly from the light of the sun; whereas,

[14] Magma is the molten matter under the earth's crust from which igneous rock is formed by cooling.

solar-thermal electric generators use the heat from the sun to produce steam to drive turbines. *Wind power* is derived from the conversion of the energy contained in wind into electricity. A wind turbine is similar to a typical wind mill. However, because of the intermittent nature of sunlight and wind, high capacity utilization factors cannot be achieved for these plants. Several electric utilities have incorporated *wood* and *waste* (for example, municipal waste, corn cobs, and oats) as energy sources for producing electricity at their power plants. These sources replace fossil fuels in the boiler. The combustion of wood and waste creates steam that is typically used in conventional steam-electric plants.

Generator Rating

The rating of a generator is a measure of its ability to produce electricity. Generators are rated by nameplate capacity. The *nameplate capacity* is the full-load continuous rating of the generator under specified conditions, as designated by the manufacturer, and is usually indicated on a metal plate attached to the generator. *Net capability* is the steady hourly output that the generating unit is expected to supply to the system load, as demonstrated by test procedures. The capability of the generating unit in the summer is generally less than in the winter due to high ambient-air and cooling-water temperatures, which cause generating units to be less efficient. The measure used in this publication for electric utilities is net summer capability. The nameplate capacity of a generator is generally greater than its net capability.

Data Sources

The following tables contain a summary of the number of electric generators and the amount of electric generating capability in the United States at national, regional, and State levels for the period 1992 through 1996. During the past year, several updates were made for these data. These changes include the installation of new generators; the retirement of existing generators; the use of a primary energy source for dual-fired units different from that which has been reported in the past; and the modification of generators, such as the rewinding of stators or the retrofitting of associated generator equipment. Respondents that did not meet the reporting requirements of Form EIA-860 were deleted. The capacity of generators sold to nonutilities was also deleted. The inclusion of new respondents also resulted in data changes.

Estimates of net summer capability and net winter capability are made for operable nonnuclear electric generating units with no reported capability. These estimates are calculated using a statistical relationship that exists between the capability (summer and winter) and installed generator nameplate capacity for units that were in commercial operation as of the end of 1992. For a description of the estimation formula, see the technical notes.

Data in the tables were obtained from the Form EIA-860, "Annual Electric Generator Report." Data are reported annually on the Form EIA-860 by approximately 900 electric utilities in the United States that operate power plants. The Form EIA-860 was revised during 1995 to collect data as of January 1 of the reporting year, where "reporting year" is the calendar year in which the report is required to be filed with the Energy Information Administration.

Data from the Form EIA-860 for 1996 are preliminary, based on final 1995 data and respondents' proposed 1996 changes (additions, retirements, and modifications) reported as of January 1, 1996, and verified by telephone. Data prior to 1995 are as of December 31 of the reporting year. Final data, as well as more detailed statistics on operable capacity and planned capability additions, are published in the *Inventory of Power Plants in the United States*.[15]

[15] Energy Information Administration, *Inventory of Power Plants in the United States*, DOE/EIA-0095.

Table 2. Generating Capability at U.S. Electric Utilities by Prime Mover and Primary Energy Source, 1992 Through 1996

(Megawatts)

Prime Mover/Primary Energy Source	1992	1993	1994	1995	1996[2]
Fossil Steam	**446,201**	**446,315**	**445,234**	**446,076**	**447,296**
Coal-Fired	300,547	300,795	301,098	300,610	302,167
Petroleum-Fired	44,472	41,905	41,151	36,669	36,736
Gas-Fired	101,182	103,614	102,985	108,798	108,393
Gas Turbine/Internal Combustion	**54,291**	**56,494**	**59,577**	**61,533**	**63,087**
Petroleum-Fired	27,381	27,614	28,768	27,795	28,273
Gas-Fired	26,910	28,881	30,809	33,738	34,814
Nuclear	**98,985**	**99,041**	**99,148**	**99,515**	**100,685**
Hydroelectric Pumped Storage	**21,190**	**21,146**	**21,208**	**21,387**	**21,104**
Renewable					
Hydroelectric (conventional)	**72,185**	**74,763**	**74,787**	**75,274**	**75,238**
Geothermal	1,739	1,747	1,747	1,747	1,622
Biomass[1]	464	459	515	567	567
Wind	*	1	8	8	8
Solar Thermal	0	0	0	0	0
Photovoltaic	3	4	4	4	4
U.S. Total	**695,059**	**699,971**	**702,229**	**706,111**	**709,612**

1 Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural waste, straw, tires, landfill gases, fish oils, and/or other waste.

2 Preliminary 1996 data are based on final 1995 data and respondent's proposed 1996 changes (additions,retirements, and modifications) reported as of January 1, 1996, and verified by telephone. The Form EIA-860 was revised during 1995 to collect data as of January 1 of the reporting year, where ''reporting year'' is the calendar year in which the report is required to be filed with the Energy Information Administration. No updates from responses submitted on Form EIA-860 with data as of January 1, 1997 are included.

* =Value less than 0.5.

Notes: •Waste heat, waste gases, and waste steam are included in the original primary energy source category (i.e., coal, petroleum, or gas). •Data for 1996 are preliminary; prior-year data are final. •Totals may not equal sum of components because of independent rounding. •Generating capability is net summer capability. Data prior to 1995 are as of December 31 of the reporting year.

Source: Energy Information Administration, Form EIA-860, ''Annual Electric Generator Report.''

Table 3. Summary of Capability Additions, Retirements, and Total Operable Capability at U.S. Electric Utilities by Energy Source, 1996

Primary Energy Source	Added		Retired		Operable	
	Number of Generators	Capability[1] (megawatts)	Number of Generators	Capability[1] (megawatts)	Number of Generators	Capability[1] (megawatts)
Coal	**6**	**1,558**	**0**	**0**	**1,218**	**302,167**
Petroleum	**24**	**472**	**4**	**59**	**3,304**	**65,009**
Gas	**24**	**1,188**	**0**	**0**	**2,259**	**143,208**
Nuclear	**1**	**1,170**	**0**	**0**	**110**	**100,685**
Hydroelectric Pumped Storage	**0**	**0**	**0**	**0**	**139**	**21,104**
Renewable						
Hydroelectric (conventional)	4	7	0	0	3342	75,238
Geothermal	0	0	2	126	27	1,622
Biomass[2]	0	0	0	0	27	567
Wind	0	0	0	0	18	8
Solar Thermal	0	0	0	0	0	0
Photovoltaic	0	0	0	0	9	4
U.S. Total	**59**	**4,394**	**6**	**185**	**10,453**	**709,612**

1 Net summer capability.

2 Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural waste, straw, tires, landfill gases, fish oils, and/or other waste.

Notes: •Data are preliminary. •Preliminary 1996 data are based on final 1995 data and respondent's proposed 1996 changes (additions,retirements, and modifications) reported as of January 1, 1996, and verified by telephone. The Form EIA-860 was revised during 1995 to collect data as of January 1 of the reporting year, where ''reporting year'' is the calendar year in which the report is required to be filed with the Energy Information Administration. No updates from responses submitted on Form EIA-860 with data as of January 1, 1997 are included. Data prior to 1995 are as of December 31 of the reporting year. •Totals may not equal sum of components because of independent rounding. •Total capability cannot be calculated from the prior year's capability by adjusting for retirements and newly added capability because capability ratings for independent generators change each year and generators are purchased from or sold to nonutilities. •Waste heat, waste gases, and waste steam are included in the original primary energy source category (i.e., coal, petroleum, or gas).

Source: Energy Information Administration, Form EIA-860, ''Annual Electric Generator Report.''

Table 4. Generating Capability at U.S. Electric Utilities by Census Division and State, 1995 and 1996

Census Division State	1995		1996[1]	
	Number of Generators	Capability[2] (megawatts)	Number of Generators	Capability[2] (megawatts)
New England	**663**	**22,480**	**663**	**22,185**
Connecticut	81	6,722	81	6,722
Maine	189	2,432	189	2,432
Massachusetts	196	9,288	196	9,288
New Hampshire	44	2,506	44	2,506
Rhode Island	18	442	18	147
Vermont	135	1,090	135	1,090
Middle Atlantic	**902**	**79,662**	**901**	**79,710**
New Jersey	112	13,817	112	13,900
New York	556	32,147	555	32,112
Pennsylvania	234	33,698	234	33,698
East North Central	**1,685**	**114,733**	**1,699**	**114,833**
Illinois	328	33,139	333	33,151
Indiana	161	20,712	161	20,712
Michigan	557	21,981	558	21,983
Ohio	245	27,365	248	27,369
Wisconsin	394	11,536	399	11,618
West North Central	**1,858**	**55,524**	**1,874**	**55,743**
Iowa	401	8,237	405	8,246
Kansas	408	9,675	413	9,686
Minnesota	336	8,923	338	8,929
Missouri	352	15,724	356	15,808
Nebraska	250	5,529	251	5,639
North Dakota	46	4,485	46	4,485
South Dakota	65	2,950	65	2,950
South Atlantic	**1,367**	**138,239**	**1,376**	**139,943**
Delaware	30	2,239	30	2,239
District of Columbia	4	806	4	806
Florida	371	35,857	375	36,769
Georgia	207	22,290	206	22,007
Maryland	104	10,957	104	10,957
North Carolina	190	20,597	194	20,896
South Carolina	226	16,701	227	17,086
Virginia	188	14,342	189	14,733
West Virginia	47	14,451	47	14,451
East South Central	**478**	**59,202**	**485**	**60,912**
Alabama	152	20,463	157	20,893
Kentucky	112	15,425	113	15,535
Mississippi	53	7,170	53	7,170
Tennessee	161	16,144	162	17,314
West South Central	**804**	**104,010**	**805**	**104,029**
Arkansas	105	9,639	105	9,639
Louisiana	109	17,019	109	17,019
Oklahoma	155	12,928	156	12,947
Texas	435	64,424	435	64,424
Mountain	**829**	**50,903**	**832**	**50,995**
Arizona	129	15,221	129	15,221
Colorado	161	6,647	161	6,647
Idaho	111	2,559	111	2,559
Montana	96	4,943	96	4,943
Nevada	70	5,556	71	5,646
New Mexico	55	5,078	55	5,078
Utah	149	4,927	151	4,930
Wyoming	58	5,970	58	5,970
Pacific Contiguous	**1,154**	**78,025**	**1,155**	**77,912**
California	678	43,302	681	43,342
Oregon	195	10,446	194	10,310
Washington	281	24,277	280	24,260
Pacific Noncontiguous	**656**	**3,334**	**663**	**3,349**
Alaska	559	1,732	561	1,738
Hawaii	97	1,602	102	1,612
U.S. Total	**10,396**	**706,111**	**10,453**	**709,612**

1 Preliminary 1996 data are based on final 1995 data and respondent's proposed 1996 changes (additions,retirements, and modifications) reported as of January 1, 1996, and verified by telephone. The Form EIA-860 was revised during 1995 to collect data as of January 1 of the reporting year, where ''reporting year'' is the calendar year in which the report is required to be filed with the Energy Information Administration. No updates from responses submitted on Form EIA-860 with data as of January 1, 1997 are included.

2 Net summer capability.

Notes: •Data for 1996 are preliminary; prior-year data are final. •Totals in this table include two gas-fired fuel cells totaling 0.4 megawatts. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-860, ''Annual Electric Generator Report.''

Table 5. Coal-Fired, Nuclear, Hydroelectric, and Renewable Generating Capability at U.S. Electric Utilities by Census Division and State, 1996

Census Division State	Coal		Nuclear		Hydroelectric		Renewable[1]	
	Number of Generators	Capability[2] (megawatts)	Number of Generators	Capability[2] (megawatts)	Number of Generators	Capability[2] (megawatts)	Number of Generators	Capability[2] (megawatts)
New England	**15**	**2,670**	**8**	**6,383**	**376**	**3,129**	**14**	**147**
Connecticut	1	385	4	3,194	34	137	2	64
Maine	0	0	1	870	141	421	1	32
Massachusetts	9	1,707	1	669	63	1,860	8	*
New Hampshire	5	578	1	1,155	32	284	0	0
Rhode Island	0	0	0	0	1	1	0	0
Vermont	0	0	1	496	105	426	3	50
Middle Atlantic	**98**	**23,002**	**19**	**17,642**	**344**	**9,623**	**0**	**0**
New Jersey	7	1,629	4	3,862	3	380	0	0
New York	32	3,870	6	4,824	296	7,311	0	0
Pennsylvania	59	17,503	9	8,956	45	1,932	0	0
East North Central	**382**	**75,887**	**23**	**20,093**	**479**	**2,760**	**9**	**196**
Illinois	56	14,916	13	12,609	12	13	0	0
Indiana	80	18,850	0	0	21	68	0	0
Michigan	75	11,794	5	3,989	232	2,134	0	0
Ohio	122	23,123	2	2,042	9	119	3	90
Wisconsin	49	7,204	3	1,453	205	427	6	106
West North Central	**191**	**34,896**	**8**	**5,645**	**164**	**3,918**	**11**	**82**
Iowa	52	5,995	1	528	30	134	1	*
Kansas	19	5,244	1	1,167	0	0	0	0
Minnesota	45	5,634	3	1,571	54	142	10	82
Missouri	45	10,575	1	1,125	29	1,110	0	0
Nebraska	15	3,112	2	1,254	20	167	0	0
North Dakota	12	3,862	0	0	5	545	0	0
South Dakota	3	475	0	0	26	1,820	0	0
South Atlantic	**222**	**67,254**	**27**	**23,792**	**433**	**11,786**	**3**	*****
Delaware	5	910	0	0	0	0	0	0
District of Columbia	0	0	0	0	0	0	0	0
Florida	31	10,757	5	3,822	6	41	0	0
Georgia	39	12,551	4	3,900	108	3,051	0	0
Maryland	15	4,636	2	1,675	13	530	0	0
North Carolina	45	12,440	5	4,639	82	1,528	0	0
South Carolina	26	5,737	7	6,364	133	3,449	0	0
Virginia	27	5,842	4	3,392	79	3,131	3	*
West Virginia	34	14,381	0	0	12	58	0	0
East South Central	**140**	**36,550**	**9**	**9,395**	**201**	**7,495**	**0**	**0**
Alabama	39	11,669	5	4,835	89	2,962	0	0
Kentucky	58	14,011	0	0	30	789	0	0
Mississippi	6	2,255	1	1,173	0	0	0	0
Tennessee	37	8,615	3	3,387	82	3,744	0	0
West South Central	**57**	**30,890**	**8**	**8,507**	**131**	**3,041**	**1**	*****
Arkansas	5	3,817	2	1,694	43	1,325	0	0
Louisiana	6	2,843	2	2,011	0	0	0	0
Oklahoma	10	4,831	0	0	38	1,035	0	0
Texas	36	19,399	4	4,802	50	680	1	*
Mountain	**105**	**29,116**	**3**	**3,810**	**427**	**10,627**	**9**	**48**
Arizona	14	5,159	3	3,810	47	2,884	0	0
Colorado	31	4,953	0	0	47	1,114	0	0
Idaho	0	0	0	0	107	2,418	0	0
Montana	6	2,260	0	0	85	2,551	2	13
Nevada	9	2,807	0	0	17	1,046	0	0
New Mexico	13	3,901	0	0	6	58	0	0
Utah	12	4,374	0	0	88	262	7	35
Wyoming	20	5,662	0	0	30	294	0	0
Pacific Contiguous	**3**	**1,848**	**5**	**5,417**	**868**	**43,607**	**31**	**1,728**
California	0	0	4	4,310	432	13,538	26	1,597
Oregon	1	508	0	0	177	9,031	2	35
Washington	2	1,340	1	1,107	259	21,038	3	97
Pacific Noncontiguous	**5**	**54**	**0**	**0**	**58**	**356**	**3**	*****
Alaska	5	54	0	0	54	353	3	*
Hawaii	0	0	0	0	4	3	0	0
U.S. Total	**1,218**	**302,167**	**110**	**100,685**	**3,481**	**96,342**	**81**	**2,201**

1 Includes geothermal, biomass, wind, solar thermal, and photovoltaic (excludes hydroelectric).
2 Net summer capability.
* =Value less than 0.5.

Notes: •Data are preliminary. •Preliminary 1996 data are based on final 1995 data and respondent's proposed 1996 changes (additions,retirements, and modifications) reported as of January 1, 1996, and verified by telephone. The Form EIA-860 was revised during 1995 to collect data as of January 1 of the reporting year, where ''reporting year'' is the calendar year in which the report is required to be filed with the Energy Information Administration. No updates from responses submitted on Form EIA-860 with data as of January 1, 1997 are included. •Totals may not equal sum of components because of independent rounding. •Waste heat, waste gases, and waste steam are included in the original primary energy source category (i.e., coal, petroleum, or gas).

Source: Energy Information Administration, Form EIA-860, ''Annual Electric Generator Report.''

Table 6. Petroleum-, Gas-, and Dual-Fired Steam Generating Capability at U.S. Electric Utilities by Census Division and State, 1996

Census Division State	Petroleum		Gas		Dual-Fired Petroleum/Gas		Total Petroleum and Gas	
	Number of Generators	Capability[1] (megawatts)	Number of Generators	Capability[1] (megawatts)	Number of Generators	Capability[1] (megawatts)	Number of Generators	Capability[1] (megawatts)
New England	**35**	**4,943**	**6**	**1,079**	**16**	**2,243**	**57**	**8,265**
Connecticut	13	1,840	2	214	2	528	17	2,582
Maine	13	1,041	0	0	0	0	13	1,041
Massachusetts	8	2,021	4	865	11	1,225	23	4,111
New Hampshire	0	0	0	0	1	406	1	406
Rhode Island	1	41	0	0	2	84	3	125
Vermont	0	0	0	0	0	0	0	0
Middle Atlantic	**36**	**7,072**	**37**	**8,814**	**12**	**2,924**	**85**	**18,810**
New Jersey	13	1,139	12	1,802	1	72	26	3,013
New York	11	2,797	24	6,811	10	2,770	45	12,378
Pennsylvania	12	3,136	1	201	1	82	14	3,419
East North Central	**20**	**3,622**	**30**	**3,445**	**7**	**489**	**57**	**7,556**
Illinois	9	1,468	14	2,011	6	429	29	3,908
Indiana	5	188	5	473	0	0	10	661
Michigan	6	1,966	5	694	1	60	12	2,720
Ohio	0	0	3	211	0	0	3	211
Wisconsin	0	0	3	57	0	0	3	57
West North Central	**4**	**363**	**67**	**2,466**	**6**	**44**	**77**	**2,873**
Iowa	0	0	4	77	3	22	7	98
Kansas	0	0	32	1,763	3	22	35	1,785
Minnesota	2	50	13	198	0	0	15	248
Missouri	2	313	6	111	0	0	8	424
Nebraska	0	0	11	257	0	0	11	257
North Dakota	0	0	0	0	0	0	0	0
South Dakota	0	0	1	61	0	0	1	61
South Atlantic	**32**	**6,347**	**72**	**8,382**	**29**	**6,580**	**133**	**21,310**
Delaware	0	0	1	175	5	655	6	830
District of Columbia	2	550	0	0	0	0	2	550
Florida	20	3,990	55	6,264	24	5,925	99	16,178
Georgia	2	122	9	408	0	0	11	530
Maryland	3	665	4	1,439	0	0	7	2,104
North Carolina	0	0	3	96	0	0	3	96
South Carolina	2	92	0	0	0	0	2	92
Virginia	3	929	0	0	0	0	3	929
West Virginia	0	0	0	0	0	0	0	0
East South Central	**2**	**58**	**36**	**3,519**	**0**	**0**	**38**	**3,577**
Alabama	0	0	4	92	0	0	4	92
Kentucky	2	58	0	0	0	0	2	58
Mississippi	0	0	32	3,427	0	0	32	3,427
Tennessee	0	0	0	0	0	0	0	0
West South Central	**0**	**0**	**317**	**56,751**	**0**	**0**	**317**	**56,751**
Arkansas	0	0	15	2,480	0	0	15	2,480
Louisiana	0	0	75	11,877	0	0	75	11,877
Oklahoma	0	0	33	6,116	0	0	33	6,116
Texas	0	0	194	36,279	0	0	194	36,279
Mountain	**0**	**0**	**70**	**3,832**	**0**	**0**	**70**	**3,832**
Arizona	0	0	21	1,500	0	0	21	1,500
Colorado	0	0	11	234	0	0	11	234
Idaho	0	0	0	0	0	0	0	0
Montana	0	0	1	70	0	0	1	70
Nevada	0	0	11	904	0	0	11	904
New Mexico	0	0	24	964	0	0	24	964
Utah	0	0	2	160	0	0	2	160
Wyoming	0	0	0	0	0	0	0	0
Pacific Contiguous	**0**	**0**	**108**	**20,018**	**6**	**880**	**114**	**20,898**
California	0	0	106	19,732	6	880	112	20,612
Oregon	0	0	2	286	0	0	2	286
Washington	0	0	0	0	0	0	0	0
Pacific Noncontiguous	**26**	**1,170**	**2**	**85**	**0**	**0**	**28**	**1,255**
Alaska	0	0	2	85	0	0	2	85
Hawaii	26	1,170	0	0	0	0	26	1,170
U.S. Total	**155**	**23,576**	**745**	**108,393**	**76**	**13,159**	**976**	**145,129**

[1] Net summer capability.

Notes: •Data are preliminary. •Preliminary 1996 data are based on final 1995 data and respondent's proposed 1996 changes (additions,retirements, and modifications) reported as of January 1, 1996, and verified by telephone. The Form EIA-860 was revised during 1995 to collect data as of January 1 of the reporting year, where ''reporting year'' is the calendar year in which the report is required to be filed with the Energy Information Administration. No updates from responses submitted on Form EIA-860 with data as of January 1, 1997 are included. •Totals may not equal sum of components because of independent rounding. •Waste heat, waste gases, and waste steam are included in the original primary energy source category (i.e., coal, petroleum, or gas).

Source: Energy Information Administration, Form EIA-860, ''Annual Electric Generator Report.''

Table 7. Petroleum-, Gas-, and Dual-Fired Gas Turbine/Internal Combustion Generating Capability at U.S. Electric Utilities by Census Division and State, 1996

Census Division State	Petroleum		Gas		Dual-Fired Petroleum/Gas		Total Petroleum and Gas	
	Number of Generators	Capability[1] (megawatts)	Number of Generators	Capability[1] (megawatts)	Number of Generators	Capability[1] (megawatts)	Number of Generators	Capability[1] (megawatts)
New England	**170**	**1,110**	**10**	**128**	**13**	**352**	**193**	**1,590**
Connecticut	23	360	0	0	0	0	23	360
Maine	33	68	0	0	0	0	33	68
Massachusetts	70	478	10	128	12	335	92	940
New Hampshire	4	66	0	0	1	17	5	83
Rhode Island	14	20	0	0	0	0	14	20
Vermont	26	118	0	0	0	0	26	118
Middle Atlantic	**223**	**5,199**	**121**	**5,299**	**11**	**134**	**355**	**10,632**
New Jersey	25	1,543	46	3,395	1	78	72	5,016
New York	104	2,014	62	1,658	10	56	176	3,728
Pennsylvania	94	1,642	13	246	0	0	107	1,888
East North Central	**403**	**3,070**	**273**	**4,858**	**73**	**412**	**749**	**8,340**
Illinois	84	650	114	952	25	104	223	1,706
Indiana	30	292	20	842	0	0	50	1,134
Michigan	139	526	72	751	23	68	234	1,345
Ohio	60	797	37	931	12	56	109	1,784
Wisconsin	90	806	30	1,382	13	184	133	2,372
West North Central	**614**	**3,562**	**443**	**3,940**	**366**	**828**	**1,423**	**8,330**
Iowa	162	497	55	749	97	245	314	1,491
Kansas	52	289	149	933	157	268	358	1,490
Minnesota	128	861	47	256	36	135	211	1,252
Missouri	147	1,281	78	1,173	48	121	273	2,575
Nebraska	75	307	102	517	26	25	203	849
North Dakota	27	69	2	10	0	0	29	79
South Dakota	23	257	10	302	2	34	35	593
South Atlantic	**275**	**6,123**	**188**	**6,315**	**95**	**3,362**	**558**	**15,800**
Delaware	15	124	3	336	1	39	19	499
District of Columbia	2	256	0	0	0	0	2	256
Florida	110	3,180	114	2,272	10	518	234	5,970
Georgia	22	942	16	866	6	167	44	1,975
Maryland	43	722	22	1,283	2	7	67	2,012
North Carolina	22	414	8	218	29	1,561	59	2,193
South Carolina	10	195	11	345	38	905	59	1,444
Virginia	50	279	14	995	9	166	73	1,440
West Virginia	1	12	0	0	0	0	1	12
East South Central	**31**	**1,221**	**61**	**2,623**	**5**	**52**	**97**	**3,895**
Alabama	1	18	19	1,318	0	0	20	1,336
Kentucky	8	76	10	549	5	52	23	677
Mississippi	2	31	12	283	0	0	14	314
Tennessee	20	1,096	20	472	0	0	40	1,568
West South Central	**59**	**290**	**200**	**4,480**	**32**	**69**	**291**	**4,839**
Arkansas	20	206	9	105	11	11	40	322
Louisiana	1	16	24	253	1	19	26	288
Oklahoma	11	30	48	907	16	28	75	965
Texas	27	38	119	3,215	4	11	150	3,264
Mountain	**95**	**352**	**105**	**3,105**	**18**	**105**	**218**	**3,563**
Arizona	3	92	37	1,773	4	3	44	1,868
Colorado	40	141	20	125	12	80	72	346
Idaho	2	6	2	136	0	0	4	142
Montana	0	0	2	50	0	0	2	50
Nevada	20	48	13	839	1	2	34	889
New Mexico	6	24	5	112	1	20	12	155
Utah	16	27	26	71	0	0	42	98
Wyoming	8	15	0	0	0	0	8	15
Pacific Contiguous	**45**	**648**	**82**	**3,410**	**5**	**355**	**132**	**4,413**
California	37	560	65	2,472	3	252	105	3,284
Oregon	0	0	10	348	2	103	12	451
Washington	8	88	7	590	0	0	15	678
Pacific Noncontiguous	**538**	**973**	**30**	**674**	**1**	**38**	**569**	**1,684**
Alaska	466	535	30	674	1	38	497	1,246
Hawaii	72	438	0	0	0	0	72	438
U.S. Total	**2,453**	**22,547**	**1,513**	**34,833**	**619**	**5,708**	**4,585**	**63,087**

[1] Net summer capability.

Notes: •Data are preliminary. •Preliminary 1996 data are based on final 1995 data and respondent's proposed 1996 changes (additions,retirements, and modifications) reported as of January 1, 1996, and verified by telephone. The Form EIA-860 was revised during 1995 to collect data as of January 1 of the reporting year, where ''reporting year'' is the calendar year in which the report is required to be filed with the Energy Information Administration. No updates from responses submitted on Form EIA-860 with data as of January 1, 1997 are included. •Totals may not equal sum of components because of independent rounding. •Waste heat, waste gases, and waste steam are included in the original primary energy source category (i.e., coal, petroleum, or gas).

Source: Energy Information Administration, Form EIA-860, ''Annual Electric Generator Report.''

Net Generation from U.S. Electric Utilities

This chapter provides summary statistics on the amount of electricity produced by electric utilities in the United States. The different energy sources used by electric utilities to produce electric power are also discussed in this chapter.

The production of electricity is generally referred to as generation and is measured in kilowatthours. Gross generation is the amount of power produced by an electric power plant (station), measured at the terminals of the plant (that is, prior to the point at which the power leaves the station and is available to the system). Some of the electric power generated at a power plant is used to operate equipment at the plant. Power used at the plant generally ranges between 1 percent (for hydroelectric units) and 7 percent (for steam-electric units). Net generation is the power available to the system (gross generation less use at the plant); however, it is greater than that available to consumers due to losses during transmission and distribution (approximately 8 percent to 9 percent). Net generation is the measure used for electric power production by electric utilities in this report.

Generation from Fossil Fuels

Coal. Historically, most generation of electricity in the United States has been from coal. Coal-fired generation became even more important following the Arab oil embargo of 1973 due to concerns over the availability of petroleum imports, increasing petroleum costs, and curtailments of natural gas. In 1978, the passage of the Powerplant and Industrial Fuel Use Act and the Natural Gas Policy Act encouraged further use of coal by electric utilities. Although both Federal and State environmental laws and regulations existed during the 1970's, renewed interest in environmental issues raised concerns about electric power plant emissions, particularly from those plants burning coal. The Clean Air Act Amendments of 1990 established a goal of a 10-million-ton reduction in sulfur dioxide emissions and a 2-million-ton reduction in nitrogen oxide emissions by 2000 from 1980 levels. Coal-fired generation continues to provide more than one-half the total net generation of electricity by electric utilities in the Nation. Most of the electricity production from coal by electric utilities occurs in the East North Central and South Atlantic Census Divisions where substantial amounts of coal are mined.

Petroleum. During the early 1970's, electric utilities used petroleum extensively to generate electricity. However, after the 1973 embargo by the Organization of Petroleum Exporting Countries (OPEC) on petroleum exports to the United States, petroleum prices rose sharply. Further price increases occurred in 1979 and 1980 following the Iranian revolution and subsequent reductions in Iranian petroleum exports. Consequently during the past decade, utilities have not built large, petroleum-fired steam units. In addition, many utilities have either converted steam units to coal or switched fuels where dual-fired capability exists. Most of the utilities that still rely heavily on petroleum to generate electricity are located along the eastern seaboard.

Gas. The demand for gas (primarily natural gas) to heat homes and serve business and industry has historically taken priority over demand from electric utilities under both Federal and State regulations. In the 1970's, many utilities were on occasion denied gas when available pipelines reached capacity in serving heating demand during the months from November to March (the peak heating season). By the middle 1970's, curtailments to electric utilities also occasionally occurred during the non-heating season as producers conserved supply in preparation for heating season demand. In the face of an attractive interstate price structure, but deprived of supplies during many months of the year, utilities in the 1970's used relatively less expensive gas when it was available, then switched to other more expensive fuels when gas supplies were curtailed. Gas became more available to utilities with the passage of the Natural Gas Policy Act of 1978 and more frequent exemptions from the gas-use restrictions of the Powerplant and Industrial Fuel Use Act (Fuel Use Act) of 1978. Amendments to the Fuel Use Act in 1987 created potential for additional use of gas. These amendments eased restrictions on the use of gas by removing a legal requirement to obtain an exemption for the construction of new gas-fired generating capability. The West South Central Census Division, where most of the gas production in the Nation occurs, supplies more than half of the gas-fired generation in the country.

Nuclear-Powered Generation

Generation from nuclear power has generally increased since the 1950's, and this trend continues. Since 1984, nuclear plants have provided the second largest share of total U.S. generation of electricity, after coal-fired plants. Although no new nuclear units have been ordered since 1978 and units ordered after 1974 were not built, many units that were under construction have either been

completed and entered service or will enter service in the near future. Licensing delays, questions about radioactive waste disposal, and concern about nuclear plant safety have slowed these units from entering service and are still major obstacles to additional growth in the use of this energy source for generating electricity. Most of the nuclear-powered generation comes from the Middle Atlantic, East North Central, and South Atlantic Census Divisions (where over 60 percent of the nuclear units in the country are located).

Generation from Renewable Fuels

Hydroelectric. Water is currently the leading renewable energy source used by electric utilities to generate electric power. Hydroelectric plants operate where suitable waterways are available; many of the best of these sites have already been developed. Generating electricity using water has several advantages. The major advantage is that water, a renewable resource, is a source of cheap power. In addition, because there is no fuel combustion, there is little air pollution in comparison with fossil fuel plants and limited thermal pollution compared with nuclear plants. Like other energy sources, the use of water for generation has limitations, including environmental impacts caused by damming rivers and streams, which affects the habitats of the local plant, fish, and animal life. Seventy percent of the hydroelectric power in the United States is generated in the Pacific and Rocky Mountain States.

Other Sources. Other renewable resources—geothermal (heat energy beneath the surface of the earth), wood, waste, wind, and the sun (solar)—are energy sources that are constantly replenished. These energy sources have received increased attention in recent years, but a limited number of such generating facilities are in use today. Currently, renewable resources (other than water) supply less than 1 percent of the electricity generated by electric utilities. Most of the electricity produced from this category is from geothermal power. Electric utilities currently operate geothermal plants in two States (California and Utah). The Geysers, operated by the Pacific Gas and Electric Company, is the largest geothermal plant in the Nation. Only a few utilities operate units that produce electricity from wind and solar energy. Wood and waste resources can be used to replace fossil fuels in utility boilers. To date, just a few electric generating units have been built that use wood or waste products as a primary fuel.

Data Sources

The data in the following tables are aggregated at national, regional, and State levels for the period 1992 through 1996. Data in the tables were obtained from the Form EIA-759, "Monthly Power Plant Report," which is used to collect monthly data from all operators of electric utilities (approximately 700) in the United States. More detailed statistics from the Form EIA-759 are published in the *Electric Power Monthly*.[16]

Table 8. Net Generation from U.S. Electric Utilities by Energy Source, 1992 Through 1996
(Million Kilowatthours)

Energy Source	1992	1993	1994	1995	1996 R
Coal	**1,575,895**	**1,639,151**	**1,635,493**	**1,652,914**	**1,737,453**
Petroleum[1]	**88,916**	**99,539**	**91,039**	**60,844**	**67,346**
Steam	86,046	96,070	86,469	56,265	62,271
Gas Turbine/Internal Combustion	2,871	3,469	4,570	4,579	5,075
Gas	**263,872**	**258,915**	**291,115**	**307,306**	**262,730**
Steam	245,612	237,345	259,554	267,686	218,781
Gas Turbine/Internal Combustion	18,260	21,570	31,560	39,260	43,949
Hydroelectric Pumped Storage[2]	**-4,177**	**-4,036**	**-3,378**	**-2,725**	**-3,088**
Nuclear	**618,776**	**610,291**	**640,440**	**673,402**	**674,729**
Renewable					
Hydroelectric (conventional)	243,736	269,098	247,071	296,378	331,058
Geothermal	8,104	7,571	6,941	4,745	5,234
Wind	*	*	*	11	10
Biomass[3]	2,093	1,990	1,988	1,649	1,967
Solar Thermal	--	--	--	--	--
Photovoltaic	3	4	3	4	3
U.S. Total	**2,797,219**	**2,882,525**	**2,910,712**	**2,994,529**	**3,077,442**

[1] Includes petroleum coke.
[2] Negative generation denotes that electric power consumed for plant use exceeds gross generation.
[3] Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural waste, straw, tires, landfill gases, fish oils, and/or other waste.
* =Value less than 0.5.
R = Revised; final 1996 monthly estimates provided in the April 1997 issue of the ''Electric Power Monthly'' DOE/EIA-0226 (97\04) have been adjusted to reflect the annual census.
Notes: • Data are final. • Totals may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

[16] Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0226.

Table 9. Net Generation from U.S. Electric Utilities by Selected Prime Mover, Census Division, and State, 1995 and 1996

(Million Kilowatthours)

Census Division State	Total		Fossil Steam		Gas Turbine/Internal Combustion	
	1995	1996 R	1995	1996 R	1995	1996 R
New England	**76,001**	**75,057**	**35,267**	**34,795**	**919**	**4,033**
Connecticut	26,932	15,774	7,454	8,396	32	185
Maine	2,668	7,800	806	622	6	*
Massachusetts	26,972	27,759	21,791	21,629	851	543
New Hampshire	13,936	15,419	4,568	4,148	4	*
Rhode Island	653	3,301	640	0	13	3,301
Vermont	4,840	5,004	7	*	13	3
Middle Atlantic	**297,190**	**299,173**	**159,906**	**154,063**	**3,699**	**2,649**
New Jersey	27,088	19,791	8,759	7,917	1,618	960
New York	101,161	104,360	49,490	41,763	1,702	1,362
Pennsylvania	168,942	175,022	101,658	104,384	379	327
East North Central	**531,705**	**539,380**	**395,667**	**413,324**	**1,424**	**854**
Illinois	145,165	144,116	66,418	74,045	151	141
Indiana	105,189	105,557	104,543	105,008	179	100
Michigan	92,479	95,155	67,077	67,387	199	99
Ohio	137,860	142,900	120,459	128,425	405	164
Wisconsin	51,012	51,651	37,170	38,459	490	351
West North Central	**242,569**	**251,039**	**184,682**	**191,301**	**1,074**	**955**
Iowa	33,502	33,387	28,652	28,466	109	56
Kansas	38,230	39,875	27,746	31,302	422	367
Minnesota	42,503	41,792	27,933	28,291	75	146
Missouri	65,400	67,827	54,991	57,431	289	235
Nebraska	25,279	27,323	16,245	16,156	107	97
North Dakota	28,842	30,770	26,384	27,618	1	1
South Dakota	8,812	10,066	2,731	2,036	71	53
South Atlantic	**606,944**	**616,105**	**395,315**	**411,156**	**15,422**	**18,521**
Delaware	8,324	8,122	6,059	5,920	2,265	2,202
District of Columbia	189	110	174	102	15	8
Florida	147,157	145,140	108,618	105,424	9,568	14,031
Georgia	102,016	98,729	66,193	63,518	479	350
Maryland	44,659	44,381	29,504	29,365	775	465
North Carolina	96,110	102,787	55,844	64,245	341	307
South Carolina	78,440	76,326	26,389	30,438	143	85
Virginia	52,727	56,533	25,606	28,663	1,837	1,074
West Virginia	77,322	83,978	76,928	83,481	*	*
East South Central	**294,424**	**321,017**	**226,876**	**232,810**	**1,962**	**1,871**
Alabama	99,589	115,093	68,920	73,886	416	418
Kentucky	86,162	88,438	82,671	84,815	67	127
Mississippi	26,395	28,838	17,210	18,499	1,171	1,114
Tennessee	82,278	88,647	58,075	55,610	307	213
West South Central	**414,746**	**422,148**	**334,794**	**342,299**	**8,821**	**9,132**
Arkansas	39,527	43,678	24,643	27,518	8	6
Louisiana	65,555	58,643	49,134	42,305	735	573
Oklahoma	47,955	47,545	41,637	41,878	3,603	3,589
Texas	261,709	272,283	219,380	230,598	4,474	4,964
Mountain	**258,329**	**266,925**	**193,145**	**193,139**	**2,808**	**3,113**
Arizona	68,967	70,877	32,664	31,795	840	763
Colorado	32,674	33,972	30,568	32,280	5	107
Idaho	10,063	12,231	—	—	*	*
Montana	25,411	26,039	14,693	12,275	20	23
Nevada	19,997	21,362	16,382	17,322	1,693	1,897
New Mexico	29,432	29,364	29,022	28,968	146	185
Utah	32,101	32,229	30,931	30,879	104	139
Wyoming	39,684	40,852	38,885	39,620	0	0
Pacific Contiguous	**261,584**	**275,196**	**45,528**	**39,777**	**4,107**	**3,616**
California	121,881	114,706	38,112	29,868	1,466	1,575
Oregon	44,031	47,884	1,531	1,861	2,086	1,510
Washington	95,671	112,606	5,885	8,048	555	532
Pacific Noncontiguous	**11,038**	**11,402**	**5,686**	**5,841**	**3,963**	**4,278**
Alaska	4,847	4,982	736	724	2,739	2,993
Hawaii	6,191	6,420	4,950	5,117	1,224	1,285
U.S. Total	**2,994,529**	**3,077,442**	**1,976,865**	**2,018,505**	**44,199**	**49,024**

* =Value less than 0.5 million kilowatthours.

R = Revised; final 1996 monthly estimates provided in the April 1997 issue of the ''Electric Power Monthly'' DOE/EIA-0226 (97\04) have been adjusted to reflect the annual census.

Notes: •Data are final. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.''

Table 10. Net Generation from U.S. Electric Utilities by Energy Source, Census Division, and State, 1995 and 1996

(Million Kilowatthours)

Census Division State	Coal		Petroleum[1]		Gas	
	1995	1996[R]	1995	1996[R]	1995	1996[R]
New England	**16,223**	**17,178**	**11,126**	**13,002**	**8,837**	**8,648**
Connecticut	2,269	2,368	3,397	5,255	1,820	959
Maine	—	—	812	622	—	—
Massachusetts	10,587	11,501	5,849	6,221	6,206	4,450
New Hampshire	3,367	3,310	1,004	838	201	*
Rhode Island	—	—	50	62	603	3,239
Vermont	—	—	13	3	7	*
Middle Atlantic	**121,848**	**127,128**	**11,792**	**13,149**	**29,965**	**16,436**
New Jersey	5,105	5,826	885	611	4,386	2,439
New York	19,943	20,444	7,835	9,325	23,414	13,355
Pennsylvania	96,800	100,858	3,072	3,213	2,165	641
East North Central	**388,842**	**408,296**	**2,234**	**2,160**	**6,014**	**3,723**
Illinois	62,736	71,515	888	796	2,944	1,875
Indiana	103,775	104,414	213	321	734	374
Michigan	65,425	66,097	687	652	1,163	737
Ohio	120,043	128,125	298	267	523	196
Wisconsin	36,864	38,145	147	124	649	540
West North Central	**179,863**	**188,131**	**1,392**	**1,064**	**4,500**	**3,061**
Iowa	28,426	28,283	58	51	277	189
Kansas	25,897	29,743	74	158	2,198	1,768
Minnesota	26,821	27,329	485	640	703	468
Missouri	53,582	57,176	682	96	1,015	395
Nebraska	16,080	16,041	27	20	245	192
North Dakota	26,336	27,530	49	89	–1	*
South Dakota	2,721	2,030	17	9	63	50
South Atlantic	**341,974**	**366,611**	**25,996**	**27,154**	**42,767**	**35,913**
Delaware	4,227	4,225	917	1,188	3,180	2,708
District of Columbia	—	—	189	110	—	—
Florida	61,864	65,782	21,583	22,891	34,738	30,781
Georgia	65,880	63,231	219	292	573	345
Maryland	27,370	27,780	1,408	1,401	1,501	649
North Carolina	55,698	64,098	234	259	253	195
South Carolina	25,802	30,307	130	126	600	90
Virginia	24,443	27,930	1,120	683	1,881	1,124
West Virginia	76,690	83,257	197	204	40	20
East South Central	**218,325**	**225,773**	**509**	**1,722**	**10,005**	**7,186**
Alabama	68,553	73,599	102	156	680	549
Kentucky	82,539	84,660	131	135	68	146
Mississippi	9,260	12,010	24	1,174	9,098	6,430
Tennessee	57,972	55,504	253	258	158	61
West South Central	**192,324**	**208,104**	**383**	**1,055**	**150,908**	**142,272**
Arkansas	21,506	24,339	53	98	3,092	3,087
Louisiana	18,954	18,633	49	273	30,867	23,972
Oklahoma	29,714	31,877	78	125	15,448	13,465
Texas	122,149	133,255	203	559	101,501	101,748
Mountain	**185,800**	**186,234**	**250**	**306**	**9,903**	**9,713**
Arizona	31,710	30,781	64	65	1,729	1,712
Colorado	30,276	31,952	10	16	287	419
Idaho	—	—	*	*	—	—
Montana	14,656	12,242	25	18	32	38
Nevada	13,972	14,657	27	94	4,077	4,468
New Mexico	26,121	26,357	23	22	3,023	2,773
Utah	30,260	30,693	34	31	741	293
Wyoming	38,805	39,552	68	59	13	9
Pacific Contiguous	**7,405**	**9,770**	**502**	**690**	**41,728**	**32,934**
California	—	—	489	675	39,090	30,768
Oregon	1,528	1,728	4	7	2,084	1,637
Washington	5,877	8,042	9	8	554	529
Pacific Noncontiguous	**309**	**229**	**6,661**	**7,046**	**2,679**	**2,844**
Alaska	309	229	487	643	2,679	2,844
Hawaii	—	—	6,175	6,402	—	—
U.S. Total	**1,652,914**	**1,737,453**	**60,844**	**67,346**	**307,306**	**262,730**

See notes and footnotes at end of table.

Table 10. Net Generation from U.S. Electric Utilities by Energy Source, Census Division, and State, 1995 and 1996 (Continued)

(Million Kilowatthours)

Census Division State	Nuclear		Hydroelectric[2]		Renewable[3]	
	1995	1996[R]	1995	1996[R]	1995	1996[R]
New England	**35,670**	**30,255**	**3,614**	**5,401**	**531**	**572**
Connecticut	18,749	6,225	293	530	404	437
Maine	198	5,062	1,658	2,116	*	1
Massachusetts	4,486	5,324	−156	263	—	—
New Hampshire	8,379	9,845	984	1,426	—	—
Rhode Island	—	—	0	0	—	—
Vermont	3,859	3,799	834	1,067	127	135
Middle Atlantic	**109,603**	**114,926**	**23,969**	**27,495**	**12**	**40**
New Jersey	16,806	11,028	−95	−114	—	—
New York	26,336	35,226	23,620	25,970	12	40
Pennsylvania	66,462	68,672	444	1,639	—	—
East North Central	**130,667**	**120,644**	**3,594**	**4,105**	**353**	**452**
Illinois	78,481	69,774	48	22	68	134
Indiana	—	—	467	448	—	—
Michigan	24,448	26,829	755	840	—	—
Ohio	16,768	13,919	227	392	—	—
Wisconsin	10,970	10,121	2,097	2,402	285	319
West North Central	**42,763**	**42,571**	**13,561**	**15,725**	**490**	**488**
Iowa	3,730	3,924	991	918	20	23
Kansas	10,062	8,205	—	—	*	—
Minnesota	13,243	12,095	823	837	429	422
Missouri	8,242	8,890	1,854	1,239	25	31
Nebraska	7,485	9,457	1,426	1,602	16	12
North Dakota	—	—	2,457	3,151	—	—
South Dakota	—	—	6,010	7,978	—	—
South Atlantic	**182,558**	**171,064**	**13,649**	**15,364**	*****	**0**
Delaware	—	—	—	—	—	—
District of Columbia	—	—	—	—	—	—
Florida	28,741	25,470	231	216	—	—
Georgia	30,661	29,925	4,684	4,936	—	—
Maryland	12,938	12,093	1,442	2,457	—	—
North Carolina	35,910	33,718	4,014	4,517	—	—
South Carolina	49,173	43,571	2,734	2,231	—	—
Virginia	25,135	26,286	149	510	*	0
West Virginia	—	—	394	497	—	—
East South Central	**44,474**	**61,856**	**21,111**	**24,479**	**—**	**—**
Alabama	20,752	29,708	9,502	11,082	—	—
Kentucky	—	—	3,423	3,497	—	—
Mississippi	8,013	9,225	—	—	—	—
Tennessee	15,708	22,924	8,186	9,900	—	—
West South Central	**63,495**	**64,888**	**7,636**	**5,829**	*****	*****
Arkansas	11,658	13,357	3,218	2,797	—	—
Louisiana	15,686	15,765	—	—	—	—
Oklahoma	—	—	2,715	2,078	—	—
Texas	36,151	35,767	1,703	954	*	*
Mountain	**26,985**	**28,840**	**35,252**	**41,641**	**140**	**192**
Arizona	26,985	28,840	8,478	9,480	—	—
Colorado	—	—	2,101	1,585	0	0
Idaho	—	—	10,063	12,231	—	—
Montana	—	—	10,698	13,741	0	—
Nevada	—	—	1,922	2,143	—	—
New Mexico	—	—	264	211	—	—
Utah	—	—	926	1,019	140	192
Wyoming	—	—	799	1,232	—	—
Pacific Contiguous	**37,188**	**39,685**	**169,879**	**186,648**	**4,883**	**5,470**
California	30,246	34,097	47,436	44,057	4,622	5,110
Oregon	—	—	40,415	44,513	0	0
Washington	6,942	5,588	82,028	98,079	261	360
Pacific Noncontiguous	**—**	**—**	**1,388**	**1,284**	**—**	**—**
Alaska	—	—	1,372	1,266	—	—
Hawaii	—	—	16	18	—	—
U.S. Total	**673,402**	**674,729**	**293,653**	**327,970**	**6,409**	**7,214**

1 Includes petroleum coke.

2 Station losses include energy used for pumped storage. Energy used in 1996 for pumping was 28,611 million kilowatthours and in 1995 was 26,230 million kilowatthours.

3 Includes geothermal, biomass, wind, solar thermal, and photovoltaic (excludes hydroelectric).

* =Value less than 0.5 million kilowatthours.

R = Revised; final 1996 monthly estimates provided in the April 1997 issue of the ''Electric Power Monthly'' DOE/EIA-0226 (97\04) have been adjusted to reflect the annual census.

Notes: •Data are final. •Negative generation denotes that electric power consumed for plant use exceeds gross generation. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.''

Table 11. Petroleum-Fired Net Generation from U.S. Electric Utilities by Selected Prime Mover, Census Division, and State, 1995 and 1996

(Million Kilowatthours)

Census Division State	Total[1]		Steam		Gas Turbine/Internal Combustion	
	1995	1996 R	1995	1996 R	1995	1996 R
New England	**11,126**	**13,002**	**10,770**	**12,706**	**355**	**295**
Connecticut	3,397	5,255	3,365	5,240	32	15
Maine	812	622	806	622	6	*
Massachusetts	5,849	6,221	5,561	6,006	288	215
New Hampshire	1,004	838	1,000	838	4	*
Rhode Island	50	62	38	0	13	62
Vermont	13	3	*	*	13	3
Middle Atlantic	**11,792**	**13,149**	**11,008**	**12,331**	**784**	**818**
New Jersey	885	611	758	464	126	147
New York	7,835	9,325	7,422	8,906	413	418
Pennsylvania	3,072	3,213	2,827	2,960	245	252
East North Central	**2,234**	**2,160**	**2,004**	**1,983**	**231**	**177**
Illinois	888	796	844	730	44	66
Indiana	213	321	201	309	12	11
Michigan	687	652	651	642	36	10
Ohio	298	267	210	218	88	49
Wisconsin	147	124	97	83	50	41
West North Central	**1,392**	**1,064**	**1,198**	**921**	**194**	**143**
Iowa	58	51	28	27	30	24
Kansas	74	158	42	124	32	34
Minnesota	485	640	457	612	27	28
Missouri	682	96	612	57	70	39
Nebraska	27	20	8	7	19	13
North Dakota	49	89	48	88	1	1
South Dakota	17	9	3	6	15	3
South Atlantic	**25,996**	**27,154**	**24,952**	**25,820**	**1,044**	**1,334**
Delaware	917	1,188	870	1,167	48	22
District of Columbia	189	110	174	102	15	8
Florida	21,583	22,891	21,108	22,249	476	641
Georgia	219	292	98	102	121	190
Maryland	1,408	1,401	1,230	1,189	178	212
North Carolina	234	259	124	127	110	132
South Carolina	130	126	101	89	29	36
Virginia	1,120	683	1,051	590	69	93
West Virginia	197	204	197	204	*	*
East South Central	**509**	**1,722**	**317**	**1,461**	**192**	**261**
Alabama	102	156	96	92	6	64
Kentucky	131	135	94	97	37	39
Mississippi	24	1,174	23	1,167	*	7
Tennessee	253	258	103	106	149	152
West South Central	**383**	**1,055**	**363**	**1,022**	**19**	**34**
Arkansas	53	98	45	92	8	6
Louisiana	49	273	48	271	*	3
Oklahoma	78	125	77	118	1	7
Texas	203	559	193	541	10	18
Mountain	**250**	**306**	**246**	**286**	**4**	**20**
Arizona	64	65	64	56	*	9
Colorado	10	16	11	10	–1	5
Idaho	*	*	—	—	*	*
Montana	25	18	24	18	1	1
Nevada	27	94	25	92	1	1
New Mexico	23	22	22	22	1	1
Utah	34	31	33	28	1	3
Wyoming	68	59	68	59	0	0
Pacific Contiguous	**502**	**690**	**456**	**620**	**46**	**70**
California	489	675	446	612	43	63
Oregon	4	7	3	3	2	3
Washington	9	8	7	5	1	3
Pacific Noncontiguous	**6,661**	**7,046**	**4,952**	**5,121**	**1,710**	**1,924**
Alaska	487	643	1	4	485	639
Hawaii	6,175	6,402	4,950	5,117	1,224	1,285
U.S. Total	**60,844**	**67,346**	**56,265**	**62,271**	**4,579**	**5,075**

1 Includes petroleum coke.

* =Value less than 0.5 million kilowatthours.

R = Revised; final 1996 monthly estimates provided in the April 1997 issue of the ''Electric Power Monthly'' DOE/EIA-0226 (97\04) have been adjusted to reflect the annual census.

Notes: •Data are final. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.''

Table 12. Gas-Fired Net Generation from U.S. Electric Utilities by Selected Prime Mover, Census Division, and State, 1995 and 1996

(Million Kilowatthours)

Census Division State	Total		Steam		Gas Turbine/Internal Combustion	
	1995	1996 R	1995	1996 R	1995	1996 R
New England	**8,837**	**8,648**	**8,273**	**4,911**	**564**	**3,737**
Connecticut	1,820	959	1,820	789	—	170
Maine	—	—	—	—	—	—
Massachusetts	6,206	4,450	5,643	4,122	563	328
New Hampshire	201	*	201	0	1	*
Rhode Island	603	3,239	603	0	—	3,239
Vermont	7	*	7	*	—	—
Middle Atlantic	**29,965**	**16,436**	**27,051**	**14,604**	**2,915**	**1,831**
New Jersey	4,386	2,439	2,895	1,626	1,491	813
New York	23,414	13,355	22,124	12,412	1,290	943
Pennsylvania	2,165	641	2,031	566	134	75
East North Central	**6,014**	**3,723**	**4,821**	**3,046**	**1,193**	**677**
Illinois	2,944	1,875	2,838	1,800	106	75
Indiana	734	374	567	285	167	89
Michigan	1,163	737	1,001	648	163	89
Ohio	523	196	206	81	318	115
Wisconsin	649	540	210	231	439	310
West North Central	**4,500**	**3,061**	**3,621**	**2,249**	**880**	**813**
Iowa	277	189	198	157	79	32
Kansas	2,198	1,768	1,807	1,435	390	333
Minnesota	703	468	655	350	47	117
Missouri	1,015	395	797	199	219	196
Nebraska	245	192	157	108	88	84
North Dakota	–1	*	–1	*	*	*
South Dakota	63	50	7	*	56	50
South Atlantic	**42,767**	**35,913**	**28,389**	**18,725**	**14,378**	**17,187**
Delaware	3,180	2,708	963	528	2,217	2,180
District of Columbia	—	—	—	—	—	—
Florida	34,738	30,781	25,645	17,392	9,092	13,390
Georgia	573	345	215	184	358	161
Maryland	1,501	649	904	396	597	252
North Carolina	253	195	21	20	231	175
South Carolina	600	90	487	42	114	49
Virginia	1,881	1,124	113	143	1,768	981
West Virginia	40	20	40	20	—	—
East South Central	**10,005**	**7,186**	**8,235**	**5,576**	**1,770**	**1,610**
Alabama	680	549	271	195	410	354
Kentucky	68	146	37	58	31	88
Mississippi	9,098	6,430	7,927	5,323	1,171	1,107
Tennessee	158	61	0	0	158	61
West South Central	**150,908**	**142,272**	**142,106**	**133,174**	**8,802**	**9,098**
Arkansas	3,092	3,087	3,092	3,087	*	0
Louisiana	30,867	23,972	30,132	23,402	735	571
Oklahoma	15,448	13,465	11,846	9,883	3,602	3,582
Texas	101,501	101,748	97,037	96,802	4,465	4,946
Mountain	**9,903**	**9,713**	**7,098**	**6,619**	**2,804**	**3,093**
Arizona	1,729	1,712	890	958	840	754
Colorado	287	419	281	318	6	101
Idaho	—	—	—	—	—	—
Montana	32	38	13	16	19	23
Nevada	4,077	4,468	2,385	2,573	1,691	1,896
New Mexico	3,023	2,773	2,879	2,590	145	184
Utah	741	293	638	157	103	137
Wyoming	13	9	13	9	—	—
Pacific Contiguous	**41,728**	**32,934**	**37,667**	**29,387**	**4,061**	**3,547**
California	39,090	30,768	37,666	29,257	1,423	1,512
Oregon	2,084	1,637	0	130	2,084	1,507
Washington	554	529	1	1	554	528
Pacific Noncontiguous	**2,679**	**2,844**	**425**	**490**	**2,254**	**2,354**
Alaska	2,679	2,844	425	490	2,254	2,354
Hawaii	—	—	—	—	—	—
U.S. Total	**307,306**	**262,730**	**267,686**	**218,781**	**39,620**	**43,949**

* =Value less than 0.5 million kilowatthours.

R = Revised; final 1996 monthly estimates provided in the April 1997 issue of the ''Electric Power Monthly'' DOE/EIA-0226 (97\04) have been adjusted to reflect the annual census.

Notes: •Data are final. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.''

U.S. Electric Utility Fossil Fuel Statistics

This chapter contains statistics on consumption of fossil fuels by U.S. electric utilities to generate electricity, and end-of-year fossil fuel stocks for all U.S. electric utility plants. Statistics are also included for receipts and costs of fossil fuels at power plants with a steam-electric and combined-cycle nameplate capacity of 50 or more megawatts, approximately 86 percent of the total capability at U.S. electric utilities. These data are aggregated to national, Census division, and State levels.

Various sources of energy are used by electric utilities to produce electricity; however, fossil fuels supply about 70 percent of the energy sources for the generation requirements of the Nation. Coal, petroleum, and gas are currently the dominant fossil fuels used by the industry.[17] Statistics on consumption, purchases (receipts), and stocks of fossil fuels at electric utilities are interdependent. That is, the stocks on site at the utility at the end of the current year result from the stocks that were available at the end of the prior year, the amount of fuel purchased during the current year, and the amount of fuel consumed during the year.

Fossil Fuel Consumption and Stocks

Coal, the energy source used by electric utilities to generate more than one-half of the electricity needed in the Nation, is consumed extensively throughout the United States (particularly in the East North Central, West North Central, West South Central, and the South Atlantic Census Divisions). The use of petroleum for generation is not as common on a national level as during the early 1970's; however, some areas of the country (such as in the New England, Middle Atlantic, and South Atlantic Census Divisions) continue to use it extensively. Consumption of gas occurs mostly in areas of the country where it is readily accessible, particularly in the West South Central Census Division, and in dual-fired generator units, which use gas and petroleum as substitute fuels.

The purposes of on-site storage are to provide an uninterrupted supply, to allow bulk shipments, and to take advantage of favorable market conditions. Electric utilities maintain stockpiles of coal and petroleum to minimize the effect of an interruption or curtailment in fuel availability (for example, railroad strikes, coal-mine strikes, or oil embargoes). Since gas is generally not stored, there are no stocks of gas.

Fossil Fuel Receipts and Costs

Statistics on electric utility receipts provide information regarding the delivery of fossil fuels to steam-electric plants. The costs include all costs incurred by an electric utility in the purchase and delivery of fuel to the plant. The type of contract under which a fuel is purchased has a significant effect on the cost of the fuel delivered and can be used as a good indicator of market conditions. Transactions where petroleum and coal are obtained by the utility under purchase orders or contracts with a duration of 1 year or more are referred to as *contract purchases*. Shipments of petroleum and coal under purchase orders or contracts of less than 1-year duration are considered *spot purchases*. Transactions that are conducted under a contract with uninterrupted delivery to secure gas are identified as *firm purchases*. *Interruptible purchases* are those in which the gas is received under a contract that permits curtailment of service under certain circumstances. For example, under both Federal and State regulations, requirements for gas to heat homes and serve industry have priority over requirements of the electric power industry. Consequently, a contract under which gas is purchased is most generally one that allows for an interruption in its accessibility.

Coal. Coal is obtained from three major coal-producing areas in the United States. *Appalachian coal* is mined in both surface and underground mines located in Pennsylvania, Maryland, Virginia, West Virginia, eastern Kentucky, Tennessee, Alabama, and Ohio. This coal is bituminous in rank and of low-to-medium sulfur content. Its heat content in British Thermal Units (Btu) averages over 12,000 Btu per pound. The coal is transported primarily by train, barge, and truck to electric utility plants throughout the Eastern United States. *Interior coal* is mined in both surface and underground mines located primarily in Illinois, Indiana and western Kentucky. It is bituminous coal with a high percentage of sulfur and contains approximately 11,000 Btu per pound. Most of this coal is delivered to plants in the Central and Southeastern United States. *Western coal* is mined in

[17] Other fossil fuels include petroleum coke, refinery gas, coke oven gas, blast furnace gas, and liquefied petroleum gas.

Montana, Wyoming, Colorado, Utah, North Dakota, Arizona, and New Mexico. It is delivered to plants throughout the Western and Central United States. Over one-half of the coal in this region is subbituminous coal that is low in sulfur content (less than 0.5 percent) and contains approximately 9,000 Btu per pound. Most of this coal originates in the Powder River basin of northeast Wyoming and southeast Montana. Coal from this region is delivered by unit train to plants as far east as Indiana and Georgia.

The cost of coal delivered to electric utilities can vary significantly from State to State. Coal delivered to the New England Census Division from the Appalachian coal fields may cost as much as $60 per short ton due to transportation costs and the higher cost of producing eastern coal (generally in underground mines). Environmental restrictions within a State may require electric utilities to burn only the more expensive, low-sulfur coal resulting in a higher delivered cost. In the West, especially in the Mountain Census Division, coal-burning plants are often built close to the mine thus reducing transportation costs. In addition, the cost of mining coal from large surface mines located in the Western United States is significantly less than that of underground eastern mines, resulting in a delivered cost of under $15 per short ton for States such as Montana and Wyoming. The cost of coal delivered to electric utilities in States such as North Dakota, South Dakota, and Texas is well below the national average because of the lower cost of low-grade lignite.

Petroleum. Although nationwide receipts at electric utilities are less than one-half the volume of the 1970's, several electric utilities in the New England area, New York, Florida, and Hawaii still depend on petroleum for a significant portion of their fossil fuel requirements. Receipts can vary widely from year to year at electric utilities due to changes in the cost of petroleum. Fuel oil numbers 4, 5, and 6 (heavy oil) constitute the majority of all petroleum receipts at electric utilities. Smaller amounts of fuel oil number 2 (light oil) are also used by electric utilities primarily for start-up and flame stabilization of the boilers.

The cost of petroleum delivered to electric utilities varies considerably from State to State. The most important factor in determining cost is the type of fuel oil that is being delivered. States receiving only low-grade heavy oil will show a delivered cost much lower than a State receiving only light oil. Most of the petroleum delivered to the New England, Middle Atlantic, and South Atlantic Census Divisions, California, and Hawaii for use by electric utilities is the number 6 fuel oil. The cost of fuel oil can also vary because of its sulfur content. Electric utilities that are required to meet stringent environmental standards must purchase low-sulfur fuel oil at premium prices.

Gas. Gas is used extensively as a primary fuel throughout areas of the country where it is readily accessible (for example, the West South Central Census Division and in California). Large volumes of gas are also transported by pipeline to the Middle Atlantic and South Atlantic Census Divisions. Gas receipts in these Census divisions and in California can vary considerably from year to year because some electric utilities switch between use of petroleum and gas in dual-fired generating units. The highest volume of gas receipts at electric utilities occurs during the summer months when demand for electricity peaks and when there is a greater amount available to electric utilities because of lower demands from residential and commercial consumers. In some northern parts of the United States, receipts of gas at electric utilities are limited during the winter months due to the priority for residential heating and industry needs. Many electric utilities have the capability of burning either petroleum or gas. The cost of the fuel is usually the determining factor. One major advantage of gas over all other fossil fuels is that it is a clean burning fuel. Therefore, some electric utilities use gas in order to comply with environmental regulations.

Data Sources

Data in the following tables were obtained from two sources. The first is the Form EIA-759, "Monthly Power Plant Report," which is used to collect monthly data from all operators of power plants (approximately 700) in the United States. More detailed statistics on stocks and consumption are published in the *Electric Power Monthly*.[18] The second source is the Federal Energy Regulatory Commission (FERC) Form 423, "Monthly Report of Cost and Quality of Fuels for Electric Plants," which is a restricted census used to collect data from approximately 230 electric utilities.

[18] Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0226.

Caution should be used in comparing stocks, receipts, and consumption data since all operators of power plants are surveyed by the Form EIA-759, while the FERC Form 423 is limited to operators of power plants with a fossil-fueled steam-electric and combined-cycle nameplate capacity of 50 or more megawatts.

Table 13. Consumption of Fossil Fuels and Year-End Stocks of Coal and Petroleum at U.S. Electric Utilities, 1992 Through 1996

Item	1992	1993	1994	1995	1996
Consumption					
Coal (thousand short tons)	779,860	813,508	817,270	829,007	874,681
Petroleum (thousand barrels)[1]	147,335	162,454	151,004	102,150	113,274
Gas (million cubic feet)	2,765,608	2,682,440	2,987,146	3,196,507	2,732,107
Stocks					
Coal (thousand short tons)	154,130	111,341	126,897	126,304	114,623
Petroleum (thousand barrels)[1]	71,849	62,443	62,986	50,495	47,690

1 Does not include petroleum coke.

R = Revised; final 1996 monthly estimates provided in the April 1997 issue of the ''Electric Power Monthly'' DOE/EIA-0226 (97\04) have been adjusted to reflect the annual census.

Notes: •Data are final. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.''

Table 14. Receipts and Average Delivered Cost of Fossil Fuels at U.S. Electric Utilities, 1992 Through 1996

Item	1992	1993	1994	1995	1996
Receipts					
Coal (thousand short tons)	775,963	769,152	831,929	826,860	862,701
Petroleum (thousand barrels)	144,390	147,902	142,940	84,292	106,629
Gas (million cubic feet)	2,637,678	2,574,523	2,863,904	3,023,327	2,604,663
Cost (dollars)					
Coal (per short ton)	**29.36**	**28.58**	**28.03**	**27.01**	**26.45**
Contract	29.89	28.93	28.53	27.51	26.33
Spot	26.64	27.19	26.26	24.89	26.97
Petroleum (per barrel)[1]	**16.15**	**15.42**	**15.70**	**16.93**	**19.95**
Contract	16.17	15.74	15.86	16.94	20.18
Spot	16.07	14.89	15.48	16.90	19.57
Gas (per thousand cubic feet)	**2.38**	**2.62**	**2.28**	**2.02**	**2.69**
Firm	2.37	2.59	2.33	2.10	2.77
Interruptible[2]	2.40	2.66	2.25	1.96	2.61

1 Does not include petroleum coke.

2 Includes spot-market purchases.

Notes: •Data are final. •Data are for electric generating plants with a total steam-electric and combined-cycle nameplate capacity of 50 or more megawatts. •Totals may not equal sum of components because of independent rounding.

Source: Federal Energy Regulatory Commission, FERC Form 423, ''Monthly Report of Cost and Quality of Fuels for Electric Plants.''

Table 15. Consumption of Fossil Fuels at U.S. Electric Utilities by Census Division and State, 1995 and 1996

Census Division State	Coal (thousand short tons)		Petroleum[1] (thousand barrels)		Gas (million cubic feet)	
	1995	1996	1995	1996	1995	1996
New England	**6,272**	**6,701**	**18,903**	**21,508**	**91,321**	**80,644**
Connecticut	881	925	5,720	9,028	19,310	10,455
Maine	—	—	1,490	1,154	—	—
Massachusetts	4,044	4,406	9,755	9,727	64,623	45,091
New Hampshire	1,346	1,369	1,816	1,508	2,248	3
Rhode Island	0	0	83	75	5,002	25,071
Vermont	—	—	39	16	138	24
Middle Atlantic	**49,357**	**51,718**	**20,128**	**22,581**	**316,859**	**175,740**
New Jersey	2,054	2,387	1,704	1,182	45,897	25,824
New York	8,051	8,254	13,398	15,998	246,265	142,677
Pennsylvania	39,252	41,076	5,026	5,401	24,697	7,238
East North Central	**187,490**	**198,900**	**4,238**	**4,354**	**100,024**	**72,482**
Illinois	33,463	38,091	1,552	1,732	39,143	25,729
Indiana	52,089	52,855	342	353	8,349	4,355
Michigan	31,165	32,175	1,509	1,524	35,784	32,172
Ohio	49,785	53,543	642	584	7,459	2,897
Wisconsin	20,987	22,236	194	161	9,289	7,328
West North Central	**116,720**	**122,418**	**936**	**1,096**	**56,671**	**40,013**
Iowa	17,785	17,864	148	134	3,614	3,367
Kansas	16,345	18,852	151	331	27,945	23,110
Minnesota	17,282	17,459	133	141	8,292	5,296
Missouri	30,440	33,059	296	256	12,830	5,202
Nebraska	10,048	10,091	61	47	3,059	2,311
North Dakota	22,680	23,640	99	155	1	3
South Dakota	2,137	1,453	48	33	931	725
South Atlantic	**138,134**	**149,353**	**43,340**	**45,064**	**399,117**	**334,164**
Delaware	1,816	1,787	1,495	1,969	27,010	23,370
District of Columbia	—	—	477	290	—	—
Florida	25,200	27,172	35,071	36,871	318,854	283,539
Georgia	29,280	29,170	494	640	7,834	4,734
Maryland	10,141	10,540	2,789	2,903	18,833	8,454
North Carolina	21,424	25,083	505	569	3,146	2,381
South Carolina	10,074	11,832	268	306	6,615	1,206
Virginia	9,543	10,994	1,903	1,163	16,414	10,276
West Virginia	30,657	32,774	338	353	410	205
East South Central	**92,262**	**96,808**	**966**	**2,860**	**121,527**	**91,799**
Alabama	28,759	31,216	181	299	7,377	6,145
Kentucky	35,707	37,071	282	308	866	1,836
Mississippi	4,319	5,558	48	1,792	111,229	83,246
Tennessee	23,477	22,963	455	460	2,055	572
West South Central	**132,633**	**140,493**	**723**	**1,909**	**1,557,062**	**1,461,373**
Arkansas	13,216	14,467	109	179	32,750	33,998
Louisiana	12,930	12,450	91	507	322,923	252,132
Oklahoma	18,130	19,386	129	217	154,114	136,071
Texas	88,358	94,190	393	1,006	1,047,274	1,039,172
Mountain	**101,013**	**101,510**	**490**	**601**	**103,926**	**106,110**
Arizona	16,021	16,118	119	124	18,846	19,247
Colorado	16,222	16,841	30	51	3,798	5,488
Idaho	—	—	1	*	—	—
Montana	9,373	7,897	53	41	388	470
Nevada	7,084	7,424	54	177	40,134	46,764
New Mexico	15,137	15,215	44	43	31,924	29,968
Utah	13,325	13,585	61	55	8,707	4,087
Wyoming	23,850	24,430	128	110	128	87
Pacific Contiguous	**4,834**	**6,551**	**865**	**1,148**	**420,191**	**338,628**
California	—	—	835	1,122	394,698	318,025
Oregon	977	1,044	12	10	19,136	14,013
Washington	3,857	5,507	18	16	6,356	6,589
Pacific Noncontiguous	**293**	**229**	**11,561**	**12,151**	**29,809**	**31,154**
Alaska	293	229	849	1,171	29,809	31,154
Hawaii	—	—	10,713	10,980	—	—
U.S. Total	**829,007**	**874,681**	**102,150**	**113,274**	**3,196,507**	**2,732,107**

[1] Does not include petroleum coke. Petroleum coke consumption in 1996 was 681 thousand short tons and in 1995 was 761 thousand short tons.

* =Value less than 0.5 thousand barrels or 0.5 million cubic feet.

R = Revised; final 1996 monthly estimates provided in the April 1997 issue of the ''Electric Power Monthly'' DOE/EIA-0226 (97\04) have been adjusted to reflect the annual census.

Notes: •Data are final. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.''

Table 16. Petroleum Consumption at U.S. Electric Utilities by Selected Prime Mover, Census Division, and State, 1995 and 1996

(Thousand Barrels)

Census Division State	Total		Steam		Gas Turbine/Internal Combustion	
	1995	1996	1995	1996	1995	1996
New England	**18,903**	**21,508**	**18,144**	**20,945**	**759**	**563**
Connecticut	5,720	9,028	5,634	8,983	86	45
Maine	1,490	1,154	1,475	1,152	15	2
Massachusetts	9,755	9,727	9,166	9,299	589	428
New Hampshire	1,816	1,508	1,804	1,507	12	2
Rhode Island	83	75	63	0	20	75
Vermont	39	16	1	5	37	11
Middle Atlantic	**20,128**	**22,581**	**18,084**	**20,437**	**2,044**	**2,145**
New Jersey	1,704	1,182	1,359	774	345	408
New York	13,398	15,998	12,347	15,004	1,051	994
Pennsylvania	5,026	5,401	4,378	4,658	648	743
East North Central	**4,238**	**4,354**	**3,559**	**3,800**	**680**	**555**
Illinois	1,552	1,732	1,414	1,537	138	195
Indiana	342	353	300	322	41	32
Michigan	1,509	1,524	1,392	1,472	117	51
Ohio	642	584	402	419	240	165
Wisconsin	194	161	51	49	143	111
West North Central	**936**	**1,096**	**386**	**666**	**549**	**430**
Iowa	148	134	52	56	96	77
Kansas	151	331	80	248	71	82
Minnesota	133	141	43	52	90	89
Missouri	296	256	101	127	195	129
Nebraska	61	47	16	14	45	34
North Dakota	99	155	88	151	11	4
South Dakota	48	33	5	18	42	15
South Atlantic	**43,340**	**45,064**	**40,822**	**41,934**	**2,518**	**3,130**
Delaware	1,495	1,969	1,388	1,915	107	54
District of Columbia	477	290	424	260	52	31
Florida	35,071	36,871	33,971	35,475	1,100	1,397
Georgia	494	640	206	228	288	412
Maryland	2,789	2,903	2,347	2,354	442	549
North Carolina	505	569	209	214	296	355
South Carolina	268	306	175	156	93	150
Virginia	1,903	1,163	1,763	981	141	182
West Virginia	338	353	338	353	*	*
East South Central	**966**	**2,860**	**626**	**2,335**	**340**	**525**
Alabama	181	299	168	162	13	138
Kentucky	282	308	228	218	54	91
Mississippi	48	1,792	47	1,775	1	17
Tennessee	455	460	183	181	272	279
West South Central	**723**	**1,909**	**673**	**1,830**	**49**	**80**
Arkansas	109	179	86	160	23	19
Louisiana	91	507	89	496	2	11
Oklahoma	129	217	128	205	2	12
Texas	393	1,006	370	968	23	38
Mountain	**490**	**601**	**470**	**555**	**20**	**46**
Arizona	119	124	117	106	2	17
Colorado	30	51	27	37	3	13
Idaho	1	*	—	—	1	*
Montana	53	41	52	39	2	2
Nevada	54	177	48	171	6	7
New Mexico	44	43	41	41	3	2
Utah	61	55	57	50	4	5
Wyoming	128	110	128	110	0	0
Pacific Contiguous	**865**	**1,148**	**757**	**1,000**	**108**	**148**
California	835	1,122	735	984	100	138
Oregon	12	10	9	8	3	3
Washington	18	16	13	9	5	7
Pacific Noncontiguous	**11,561**	**12,151**	**8,610**	**8,769**	**2,951**	**3,382**
Alaska	849	1,171	4	17	844	1,154
Hawaii	10,713	10,980	8,606	8,752	2,107	2,228
U.S. Total	**102,150**	**113,274**	**92,131**	**102,270**	**10,019**	**11,003**

* =Value less than 0.5.

R = Revised; final 1996 monthly estimates provided in the April 1997 issue of the ''Electric Power Monthly'' DOE/EIA-0226 (97\04) have been adjusted to reflect the annual census.

Notes: •Data are final. •Totals may not equal sum of components because of independent rounding. •Does not include petroleum coke. Petroleum coke consumption in 1996 was 681 thousand short tons and in 1995 was 761 thousand short tons.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.''

Table 17. Gas Consumption at U.S. Electric Utilities by Selected Prime Mover, Census Division, and State, 1995 and 1996

(Million Cubic Feet)

Census Division State	Total		Steam		Gas Turbine/Internal Combustion	
	1995	1996	1995	1996	1995	1996
New England	**91,321**	**80,644**	**85,931**	**50,476**	**5,390**	**30,168**
Connecticut	19,310	10,455	19,310	8,526	—	1,929
Maine	—	—	—	—	—	—
Massachusetts	64,623	45,091	59,241	41,926	5,382	3,165
New Hampshire	2,248	3	2,240	0	8	3
Rhode Island	5,002	25,071	5,002	0	—	25,071
Vermont	138	24	138	24	—	—
Middle Atlantic	**316,859**	**175,740**	**284,087**	**154,660**	**32,772**	**21,079**
New Jersey	45,897	25,824	28,119	15,531	17,778	10,293
New York	246,265	142,677	232,809	132,776	13,456	9,902
Pennsylvania	24,697	7,238	23,159	6,354	1,538	885
East North Central	**100,024**	**72,482**	**82,270**	**62,531**	**17,754**	**9,951**
Illinois	39,143	25,729	37,006	24,351	2,138	1,378
Indiana	8,349	4,355	6,097	3,180	2,252	1,175
Michigan	35,784	32,172	33,766	31,123	2,018	1,049
Ohio	7,459	2,897	2,599	1,092	4,860	1,806
Wisconsin	9,289	7,328	2,803	2,785	6,486	4,543
West North Central	**56,671**	**40,013**	**44,027**	**28,928**	**12,645**	**11,086**
Iowa	3,614	3,367	2,389	2,808	1,225	559
Kansas	27,945	23,110	22,463	18,560	5,481	4,550
Minnesota	8,292	5,296	7,574	3,975	718	1,321
Missouri	12,830	5,202	9,540	2,318	3,290	2,884
Nebraska	3,059	2,311	1,915	1,240	1,144	1,070
North Dakota	1	3	1	1	*	2
South Dakota	931	725	145	26	786	698
South Atlantic	**399,117**	**334,164**	**275,419**	**191,684**	**123,697**	**142,480**
Delaware	27,010	23,370	10,362	5,864	16,649	17,506
District of Columbia	—	—	—	—	—	—
Florida	318,854	283,539	243,950	176,122	74,904	107,417
Georgia	7,834	4,734	3,152	2,538	4,682	2,196
Maryland	18,833	8,454	11,470	5,260	7,363	3,194
North Carolina	3,146	2,381	0	0	3,146	2,381
South Carolina	6,615	1,206	4,972	399	1,644	807
Virginia	16,414	10,276	1,104	1,296	15,310	8,980
West Virginia	410	205	410	205	—	—
East South Central	**121,527**	**91,799**	**85,975**	**59,111**	**35,553**	**32,688**
Alabama	7,377	6,145	2,817	2,188	4,560	3,957
Kentucky	866	1,836	400	611	466	1,224
Mississippi	111,229	83,246	82,758	56,311	28,471	26,935
Tennessee	2,055	572	0	0	2,055	572
West South Central	**1,557,062**	**1,461,373**	**1,459,446**	**1,360,507**	**97,615**	**100,866**
Arkansas	32,750	33,998	32,750	33,998	*	0
Louisiana	322,923	252,132	313,427	244,782	9,496	7,351
Oklahoma	154,114	136,071	121,879	104,026	32,235	32,045
Texas	1,047,274	1,039,172	991,390	977,702	55,885	61,470
Mountain	**103,926**	**106,110**	**75,996**	**72,759**	**27,930**	**33,351**
Arizona	18,846	19,247	10,246	11,170	8,600	8,076
Colorado	3,798	5,488	3,682	4,181	115	1,307
Idaho	—	—	—	—	—	—
Montana	388	470	127	165	262	305
Nevada	40,134	46,764	24,517	27,423	15,617	19,341
New Mexico	31,924	29,968	30,156	27,724	1,768	2,244
Utah	8,707	4,087	7,140	2,008	1,568	2,078
Wyoming	128	87	128	87	—	—
Pacific Contiguous	**420,191**	**338,628**	**379,742**	**301,500**	**40,450**	**37,128**
California	394,698	318,025	379,733	300,641	14,966	17,384
Oregon	19,136	14,013	0	852	19,136	13,161
Washington	6,356	6,589	9	7	6,347	6,582
Pacific Noncontiguous	**29,809**	**31,154**	**0**	**0**	**29,809**	**31,154**
Alaska	29,809	31,154	0	0	29,809	31,154
Hawaii	—	—	—	—	—	—
U.S. Total	**3,196,507**	**2,732,107**	**2,772,893**	**2,282,155**	**423,614**	**449,952**

* =Value less than 0.5.

R = Revised; final 1996 monthly estimates provided in the April 1997 issue of the ''Electric Power Monthly'' DOE/EIA-0226 (97\04) have been adjusted to reflect the annual census.

Notes: •Data are final. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.''

Table 18. Coal and Petroleum Stocks at U.S. Electric Utilities by Census Division and State, as of December 31, 1995 and 1996

Census Division State	Coal (thousand short tons)		Petroleum[1] (thousand barrels)	
	1995	1996	1995	1996
New England	**908**	**1,236**	**3,757**	**4,618**
Connecticut	164	173	1,153	1,756
Maine	—	—	323	592
Massachusetts	425	704	1,712	1,660
New Hampshire	319	359	513	476
Rhode Island	0	0	24	25
Vermont	—	—	33	110
Middle Atlantic	**11,064**	**9,606**	**9,965**	**10,855**
New Jersey	804	824	2,082	1,780
New York	1,015	905	6,031	7,117
Pennsylvania	9,244	7,878	1,852	1,958
East North Central	**30,505**	**27,618**	**2,617**	**2,257**
Illinois	5,331	4,578	1,109	964
Indiana	8,435	7,103	123	111
Michigan	7,708	6,530	786	642
Ohio	5,661	5,229	379	326
Wisconsin	3,371	4,178	220	214
West North Central	**17,732**	**17,107**	**1,405**	**1,361**
Iowa	3,923	4,042	165	143
Kansas	3,850	2,968	542	515
Minnesota	1,898	1,461	110	129
Missouri	4,641	5,159	334	317
Nebraska	1,409	1,691	136	135
North Dakota	1,858	1,642	41	34
South Dakota	153	143	76	89
South Atlantic	**18,851**	**18,662**	**11,817**	**11,846**
Delaware	363	322	437	429
District of Columbia	—	—	119	106
Florida	3,204	3,349	6,318	7,236
Georgia	3,657	3,727	515	619
Maryland	1,038	1,346	2,119	1,345
North Carolina	2,715	2,559	399	369
South Carolina	2,033	1,979	311	260
Virginia	1,098	1,010	1,454	1,353
West Virginia	4,744	4,370	145	128
East South Central	**10,148**	**8,514**	**1,955**	**1,925**
Alabama	3,282	2,526	236	225
Kentucky	4,472	4,119	214	195
Mississippi	724	602	1,026	995
Tennessee	1,670	1,266	480	510
West South Central	**20,195**	**19,525**	**7,307**	**6,053**
Arkansas	2,790	2,701	236	243
Louisiana	2,659	2,470	1,340	1,125
Oklahoma	4,118	4,067	509	368
Texas	10,628	10,287	5,222	4,317
Mountain	**14,562**	**11,304**	**1,126**	**934**
Arizona	2,998	1,992	448	431
Colorado	3,622	3,027	168	127
Idaho	—	—	*	*
Montana	511	508	12	14
Nevada	1,356	1,239	380	239
New Mexico	967	815	76	79
Utah	2,250	1,526	20	22
Wyoming	2,857	2,197	21	23
Pacific Contiguous	**2,340**	**1,051**	**9,725**	**6,518**
California	—	—	9,157	6,101
Oregon	399	203	230	221
Washington	1,941	848	338	196
Pacific Noncontiguous	**1**	**1**	**820**	**1,322**
Alaska	1	1	212	284
Hawaii	—	—	608	1,038
U.S. Total	**126,304**	**114,623**	**50,495**	**47,690**

[1] Does not include petroleum coke. Petroleum coke stocks at the end of 1996 were 91 thousand short tons and in 1995 were 65 thousand short tons.

* =Value less than 0.5.

R = Revised; final 1996 monthly estimates provided in the April 1997 issue of the ''Electric Power Monthly'' DOE/EIA-0226 (97\04) have been adjusted to reflect the annual census.

Notes: •Data are final. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.''

Table 19. Fossil Fuel Receipts at U.S. Electric Utilities by Census Division and State, 1995 and 1996

Census Division State	Coal (thousand short tons)		Petroleum[1] (thousand barrels)		Gas (million cubic feet)	
	1995	1996	1995	1996	1995	1996
New England	**6,072**	**6,947**	**17,881**	**22,070**	**92,244**	**92,757**
Connecticut	841	931	4,970	9,562	19,277	10,327
Maine	—	—	1,414	1,423	—	—
Massachusetts	3,859	4,693	9,299	9,782	64,350	48,011
New Hampshire	1,372	1,324	2,104	1,215	2,564	—
Rhode Island	—	—	92	81	5,914	34,396
Vermont	—	—	2	6	138	24
Middle Atlantic	**48,188**	**51,066**	**18,110**	**24,113**	**300,502**	**168,075**
New Jersey	2,160	2,412	2,154	2,662	37,601	21,698
New York	7,575	7,896	12,372	16,662	239,247	139,848
Pennsylvania	38,453	40,759	3,584	4,789	23,654	6,529
East North Central	**184,018**	**194,371**	**3,578**	**3,526**	**79,583**	**56,337**
Illinois	33,905	37,441	1,333	1,272	38,666	24,354
Indiana	49,676	51,680	440	431	6,134	3,213
Michigan	31,214	30,177	1,295	1,362	28,540	25,972
Ohio	47,768	52,268	420	403	3,394	848
Wisconsin	21,456	22,804	90	59	2,848	1,951
West North Central	**117,821**	**121,696**	**424**	**632**	**41,390**	**27,345**
Iowa	18,095	18,116	50	57	2,484	2,751
Kansas	17,812	17,950	58	131	21,093	17,621
Minnesota	16,862	16,744	41	63	5,283	2,707
Missouri	30,819	33,718	176	207	10,650	3,128
Nebraska	10,063	10,275	14	14	1,752	1,135
North Dakota	22,294	23,586	85	153	1	2
South Dakota	1,877	1,307	—	6	127	2
South Atlantic	**132,902**	**146,322**	**36,261**	**43,443**	**369,271**	**314,620**
Delaware	1,720	1,745	1,028	1,926	27,012	23,165
District of Columbia	—	—	422	295	—	—
Florida	24,202	26,700	31,059	36,449	305,896	272,616
Georgia	28,490	28,870	240	485	3,196	2,619
Maryland	9,901	10,949	2,008	2,492	11,659	5,258
North Carolina	19,792	24,646	195	209	1,020	800
South Carolina	9,771	10,951	68	72	5,325	193
Virginia	8,624	11,024	937	1,186	14,656	9,543
West Virginia	30,402	31,438	305	329	506	426
East South Central	**93,394**	**96,969**	**601**	**2,465**	**89,399**	**63,790**
Alabama	28,131	29,510	176	178	2,412	1,443
Kentucky	36,891	38,383	234	205	428	616
Mississippi	4,271	5,428	28	1,726	86,559	61,732
Tennessee	24,100	23,649	163	355	—	—
West South Central	**136,806**	**141,043**	**362**	**943**	**1,524,483**	**1,441,962**
Arkansas	14,082	14,736	70	86	29,696	32,443
Louisiana	13,409	12,504	82	299	313,325	243,098
Oklahoma	19,713	19,571	10	73	150,892	133,520
Texas	89,602	94,232	200	486	1,030,570	1,032,900
Mountain	**101,149**	**98,869**	**387**	**396**	**96,760**	**91,680**
Arizona	15,762	15,027	113	158	17,954	17,685
Colorado	16,503	16,416	4	—	1,478	2,328
Idaho	—	—	—	—	—	—
Montana	9,313	7,877	34	22	123	155
Nevada	7,422	7,304	29	31	39,118	41,221
New Mexico	14,671	15,003	47	48	30,833	28,218
Utah	13,524	13,695	31	31	7,126	1,985
Wyoming	23,955	23,547	129	106	128	88
Pacific Contiguous	**6,510**	**5,418**	**33**	**16**	**411,515**	**329,657**
California	—	—	—	—	390,482	314,789
Oregon	1,200	838	13	—	21,026	14,832
Washington	5,310	4,580	20	16	8	36
Pacific Noncontiguous	**—**	**—**	**6,654**	**9,024**	**18,180**	**18,439**
Alaska	—	—	—	—	18,180	18,439
Hawaii	—	—	6,654	9,024	—	—
U. S. Total	**826,860**	**862,701**	**84,292**	**106,629**	**3,023,327**	**2,604,663**

[1] Does not include petroleum coke. Petroleum coke receipts in 1996 were 1.140 million short tons and in 1995 were 1.123 million short tons.

Notes: •Data are final. •Data are for electric generating plants with a total steam-electric and combined-cycle nameplate capacity of 50 or more megawatts. •Totals may not equal sum of components because of independent rounding.

Source: Federal Energy Regulatory Commission, FERC Form 423, ''Monthly Report of Cost and Quality of Fuels for Electric Plants.''

Table 20. Average Delivered Cost of Fossil Fuel Receipts at U.S. Electric Utilities by Census Division and State, 1995 and 1996

Census Division State	Coal			Petroleum[1]			Gas		
	1995	1996		1995	1996		1995	1996	
	(cents per 10^6 Btu)	(cents per 10^6 Btu)	($ per short ton)	(cents per 10^6 Btu)	(cents per 10^6 Btu)	($ per barrel)	(cents per 10^6 Btu)	(cents per 10^6 Btu)	($ per Mcf)
New England	**168.7**	**170.2**	**43.55**	**258.0**	**307.9**	**19.71**	**198.5**	**266.2**	**2.75**
Connecticut	188.1	191.0	50.05	264.0	324.1	20.83	197.8	270.7	2.76
Maine	—	—	—	260.6	293.6	18.54	—	—	—
Massachusetts	167.9	168.8	42.64	258.7	299.2	19.10	200.6	296.2	3.07
New Hampshire	158.9	160.6	42.23	232.6	254.4	16.51	182.6	—	—
Rhode Island	—	—	—	412.5	478.7	28.23	184.9	222.6	2.29
Vermont	—	—	—	411.7	523.8	29.34	195.3	317.5	3.22
Middle Atlantic	**138.8**	**140.8**	**35.08**	**270.2**	**328.7**	**20.62**	**207.7**	**287.7**	**2.96**
New Jersey	177.6	175.2	45.53	286.2	358.7	22.20	211.8	289.8	2.96
New York	141.2	142.8	37.15	265.5	319.2	20.07	208.0	287.9	2.96
Pennsylvania	135.9	138.2	34.06	276.8	345.2	21.69	198.1	276.9	2.85
East North Central	**139.0**	**133.3**	**28.29**	**321.5**	**385.8**	**23.60**	**186.7**	**270.7**	**1.83**
Illinois	163.4	162.7	32.14	301.4	368.1	23.06	168.0	257.2	2.62
Indiana	125.5	119.1	24.67	401.1	486.9	28.08	244.1	341.2	3.48
Michigan	144.9	139.7	29.34	292.1	340.2	21.08	199.5	269.3	.74
Ohio	142.0	134.0	32.31	390.9	489.6	28.33	227.7	335.0	3.44
Wisconsin	113.5	106.0	19.55	385.0	481.6	28.26	220.7	300.6	3.04
West North Central	**95.7**	**92.1**	**15.53**	**364.6**	**434.8**	**25.59**	**171.7**	**241.2**	**2.38**
Iowa	98.7	94.1	16.30	409.0	507.5	29.52	271.0	322.4	3.23
Kansas	102.1	99.2	17.51	369.1	412.2	24.57	161.0	231.8	2.26
Minnesota	114.0	106.6	18.99	406.7	487.4	28.42	176.1	216.9	2.18
Missouri	98.4	95.5	17.31	313.0	352.2	20.82	168.1	255.2	2.58
Nebraska	74.8	71.9	12.37	415.0	511.4	29.56	165.8	206.1	2.07
North Dakota	73.3	73.7	9.72	417.5	505.1	29.56	349.4	276.6	2.93
South Dakota	102.9	93.7	16.94	—	597.9	35.16	157.8	233.0	2.36
South Atlantic	**155.2**	**149.3**	**36.68**	**255.0**	**294.7**	**18.72**	**224.8**	**307.9**	**3.12**
Delaware	161.5	159.4	41.51	260.9	321.2	20.49	227.2	302.5	3.13
District of Columbia	—	—	—	309.5	378.2	22.75	—	—	—
Florida	178.6	173.9	42.40	249.5	285.4	18.21	223.6	309.7	3.12
Georgia	166.8	157.8	36.54	378.1	430.5	25.44	272.1	281.3	2.88
Maryland	150.4	149.4	38.49	274.7	331.6	20.91	215.7	298.6	3.11
North Carolina	162.8	148.4	36.87	381.5	468.2	27.20	232.8	300.5	3.11
South Carolina	151.2	147.1	37.54	411.1	496.5	28.86	160.3	445.4	4.56
Virginia	144.8	141.8	35.73	250.9	290.0	17.90	259.1	281.6	2.98
West Virginia	127.3	124.9	30.93	438.9	528.7	30.79	357.6	299.0	2.99
East South Central	**127.4**	**125.3**	**29.35**	**401.9**	**296.1**	**18.64**	**172.3**	**269.0**	**2.79**
Alabama	156.0	154.3	36.39	375.6	445.7	26.09	197.7	287.6	2.95
Kentucky	110.6	105.9	24.43	428.1	515.4	30.07	294.1	341.3	3.49
Mississippi	153.3	151.1	33.31	374.3	223.6	14.50	171.0	267.9	2.78
Tennessee	115.2	114.6	27.64	397.4	484.6	28.46	—	—	—
West South Central	**133.6**	**129.1**	**20.13**	**373.1**	**417.9**	**24.81**	**190.5**	**255.9**	**2.63**
Arkansas	161.1	150.3	26.15	417.5	452.5	26.43	169.7	246.6	2.52
Louisiana	154.9	151.4	24.74	348.1	326.8	20.20	180.6	281.6	2.94
Oklahoma	99.4	97.6	16.79	252.9	406.7	23.86	226.5	290.1	2.98
Texas	133.7	129.5	19.26	374.4	473.2	27.50	188.9	245.6	2.51
Mountain	**110.4**	**112.0**	**21.82**	**470.0**	**551.7**	**32.44**	**168.5**	**231.0**	**2.36**
Arizona	139.4	144.4	29.55	510.2	538.6	32.19	172.9	298.2	3.03
Colorado	104.8	102.6	20.24	477.2	—	—	173.0	209.8	2.09
Idaho	—	—	—	—	—	—	—	—	—
Montana	67.3	70.5	11.90	490.7	564.9	33.45	358.1	269.3	2.90
Nevada	131.0	136.6	30.44	337.2	551.5	31.71	165.8	206.0	2.12
New Mexico	141.7	142.8	26.04	490.4	586.8	33.52	154.5	227.9	2.31
Utah	109.4	107.1	24.66	504.6	579.2	33.95	214.5	179.0	1.83
Wyoming	81.8	82.0	14.30	444.6	545.6	31.89	797.8	1211.2	12.59
Pacific Contiguous	**136.2**	**148.5**	**23.96**	**462.3**	**508.5**	**29.89**	**217.7**	**261.9**	**2.68**
California	—	—	—	—	—	—	222.3	267.9	2.75
Oregon	105.8	107.1	18.81	426.7	—	—	129.8	132.2	1.33
Washington	143.6	156.9	24.91	484.9	508.5	29.89	438.2	474.7	4.98
Pacific Noncontiguous	**—**	**—**	**—**	**298.0**	**353.5**	**22.10**	**128.6**	**144.6**	**1.45**
Alaska	—	—	—	—	—	—	128.6	144.6	1.45
Hawaii	—	—	—	298.0	353.5	22.10	—	—	—
U. S. Total	**131.8**	**128.9**	**26.45**	**267.9**	**315.7**	**19.95**	**198.4**	**264.1**	**2.69**

[1] Does not include petroleum coke. Petroleum coke cost in 1996 was 78.2 cents per million Btu and in 1995 was 65.2 cents per million Btu.
Mcf = thousand cubic feet.

Notes: •Data are final. •Data are for electric generating plants with a total steam-electric and combined-cycle nameplate capacity of 50 or more megawatts. •Totals may not equal sum of components because of independent rounding.

Source: Federal Energy Regulatory Commission, FERC Form 423, ''Monthly Report of Cost and Quality of Fuels for Electric Plants.''

U.S. Electric Utility Retail Sales, Revenue, and Average Revenue per Kilowatthour

This chapter provides estimates on the sale of electricity to ultimate consumers by U.S. electric utilities, its associated revenue, and the average revenue per kilowatthour sold[19] at the national, Census, and State levels for 1996 and final data for 1992 through 1995.

Because electricity cannot be stored, it must be generated, transmitted to the consumer, and consumed instantaneously. Electric utility companies were formed to provide these services. U.S. electric utilities are high-investment businesses and historically have been treated as monopolies because duplicate facilities, particularly transmission and distribution lines, would be inefficient. Thus, franchises are granted to electric utilities for given geographical areas by regulatory officials. To obtain a franchise, electric utilities must provide service to all consumers in their territories at a reasonable cost. The service territory of an electric utility is usually composed of many combinations of consumers. Electric utilities classify their consumers within end-use sector based on factors such as demand, rate schedule, and Standard Industrial Classification (SIC) code.

Private households and apartment buildings, where energy is consumed primarily for space heating, water heating, air conditioning, lighting, refrigeration, cooking, and clothes drying are classified as residential consumers. Nonmanufacturing business establishments (including hotels, motels, restaurants, wholesale businesses, retail stores, health, social, and educational institutions) are generally classified as commercial. However, demand or annual usage may be the determining factor used by the electric utility to classify a consumer as commercial. Manufacturing, construction, mining, agriculture, fishing, and forestry establishments (SIC codes 1-39) are included as industrial consumers. Again, electric utilities may instead classify industrial service based on demand or annual usage. Public street and highway lighting, railroads and railways, municipalities, divisions or agencies of State and Federal governments under special contracts or agreements, and other utility departments as defined by the pertinent regulatory agency and / or electric utility within this report are classified as other sales.

The average revenue per kilowatthour of electricity sold by electric utilities is calculated by dividing total annual revenue by total annual retail sales for each sector and State. The resulting measurement is the cost (per kilowatthour of electricity sold) for providing service to a sector, given the rate schedule of the electric utility for that particular sector. The average revenue per kilowatthour is calculated for all consumers and for each sector (residential, commercial, industrial, and other sales). Utilities typically employ a number of rate schedules within a single sector. These alternative rate schedules reflect the varying consumption levels and patterns of these customers and their associated impact on the cost to the electric utility for providing electrical service. The average revenue per kilowatthour by sector reported in this publication represents a weighted average of revenue and sales within and across sectors for all consumers.

To derive the average revenue per kilowatthour, the operating revenue[20] reported by the electric utility is used. Utility operating revenues cover—among other costs of service—State and federal income taxes and taxes other than income taxes paid by the utility. The federal component of these taxes are, for the most part, *payroll* taxes. State and local authorities will tax the value of plant (property taxes), the amount of revenues (gross receipts taxes), purchases of materials and services (sales and use taxes), and a potentially long list of other taxes that vary extensively by taxing authority. Taxes deducted from an employee's pay, such as federal income taxes and the employee's share of social security taxes, are not a part of the utility's "tax costs," but are paid to the taxing authorities in the name of the employees. These taxes are included in the utility's cost of service (for example, revenue requirements) and are included in the amounts recovered from the customer in rates and reported in operating revenues.

Electric utilities, like many other business enterprises, are required by various taxing authorities to collect and remit taxes assessed on its customers. In this regard, the utility serves as an agent for the taxing authority. Taxes assessed on the consumer, such as a gross receipts tax or sales tax,

[19] Average revenue per kilowatthour is the ratio of revenue to retail sales.
[20] Includes energy charges, demand charges, consumer service charges, environmental surcharges, fuel adjustments, and other miscellaneous charges.

are referred to as *pass through* taxes. These taxes do not represent a cost of the utility and are not recorded in the operating revenues of the utility. However, taxing authorities differ regarding whether a specific tax is assessed on the utility or on the consumer. That decision, in turn, determines whether or not the tax is included in the electric utility's operating revenue.

Average revenue per kilowatthour from residential consumers is generally higher than for any other sector, in part due to the higher costs associated with serving many consumers who use relatively small amounts of electricity. These higher costs include direct-load costs (such as those for distribution lines) in addition to consumer or administrative costs. The industrial sector, which generally has the highest use of electricity, has the lowest average revenue per kilowatthour.

Data Sources

Preliminary values for 1996 are derived from data collected on the Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions." Respondents to the Form EIA-826 are based on a statistically chosen sample and include 252 U.S. electric utilities from a universe of approximately 3,250 utilities. The sample was designed to obtain estimates of electricity sales, average revenue, and revenue per kilowatthour for all U.S. electric utilities by end-use sector. Estimates of coefficients of variation, which indicate possible error caused by sampling, are also published at each level.

Historical census-based statistics on retail sales of electricity, associated revenue, and average revenue per kilowatthour are based on information collected on the Form EIA-861, "Annual Electric Utility Report." **Final** census-based statistics for retail sales of electricity, associated revenue, and average revenue per kilowatthour based on information collected on the Form EIA-861 will be published in the *Electric Sales and Revenue*, DOE / EIA-0540.

Table 21. Retail Sales by U.S. Electric Utilities to Ultimate Consumers and Associated Revenue by Sector, 1992 Through 1996

Item	1992	1993	1994	1995	1996
Retail Sales (million kilowatthours)					
Residential	935,939	994,781	1,008,482	1,042,501	1,078,512
Commercial	761,271	794,573	820,269	862,685	891,588
Industrial	972,714	977,164	1,007,981	1,012,693	1,014,347
Other[1]	93,442	94,944	97,830	95,407	100,217
U.S. Total	**2,763,365**	**2,861,462**	**2,934,563**	**3,013,287**	**3,084,664**
Revenue (million dollars)					
Residential	76,848	82,814	84,552	87,610	90,498
Commercial	58,343	61,521	63,396	66,365	68,073
Industrial	46,993	47,357	48,069	47,175	46,646
Other[1]	6,296	6,528	6,689	6,567	6,738
U.S. Total	**188,480**	**198,220**	**202,706**	**207,717**	**211,955**

[1] Includes public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Notes: •Values for 1996 are preliminary, based on revised Form EIA-826 estimates. Values for 1992-1995 are final. •Revenue and average revenue per kilowatthour do not include taxes such as sales and excise taxes that are assessed on the consumer and collected through the utility. •Weather-related phenomena, reclassification of retail sales, changes in number of customers, prior period adjustments, and changes in billing procedures may contribute to substantial year-to-year changes in the data in this table. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-826, ''Monthly Electric Utility Sales and Revenue Report with State Distributions,'' and Form EIA-861, ''Annual Electric Utility Report.''

Table 22. Average Revenue per Kilowatthour for U.S. Electric Utilities by Sector, 1992 Through 1996

(Cents)

Sector	1992	1993	1994	1995	1996
Residential	8.21	8.32	8.38	8.40	8.39
Commercial	7.66	7.74	7.73	7.69	7.63
Industrial	4.83	4.85	4.77	4.66	4.60
Other[1]	6.74	6.88	6.84	6.88	6.72
All Sectors	**6.82**	**6.93**	**6.91**	**6.89**	**6.87**

[1] Includes public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Notes: •Values for 1996 are preliminary, based on revised Form EIA-826 estimates. Values for 1992-1995 are final. •Revenue and average revenue per kilowatthour do not include taxes such as sales and excise taxes that are assessed on the consumer and collected through the utility. •Weather-related phenomena, reclassification of retail sales, changes in number of customers, prior period adjustments, and changes in billing procedures may contribute to substantial year-to-year changes in the data in this table. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-826, ''Monthly Electric Utility Sales and Revenue Report with State Distributions,'' and Form EIA-861, ''Annual Electric Utility Report.''

Table 23. Retail Sales of Electricity by U.S. Electric Utilities to Ultimate Consumers by Sector, Census Division, and State, 1996

(Million Kilowatthours)

Census Division and State	All Sectors	Residential	Commercial	Industrial	Other[1]
New England	**108,269**	**38,599**	**42,636**	**25,552**	**1,481**
Connecticut	28,391	10,941	11,161	5,902	387
Maine	11,609	3,681	3,221	4,646	61
Massachusetts	47,382	16,111	20,782	9,803	685
New Hampshire	9,111	3,399	3,232	2,330	150
Rhode Island	6,567	2,465	2,591	1,345	165
Vermont	5,209	2,002	1,649	1,525	33
Middle Atlantic	**324,896**	**106,461**	**119,286**	**84,910**	**14,238**
New Jersey	66,974	22,670	29,863	13,940	502
New York	130,925	40,149	54,074	24,344	12,358
Pennsylvania	126,997	43,642	35,350	46,627	1,378
East North Central	**526,254**	**155,975**	**139,084**	**215,903**	**15,292**
Illinois	125,109	37,380	37,241	41,819	8,669
Indiana	88,652	26,702	18,118	43,269	562
Michigan	96,421	28,893	32,316	34,333	878
Ohio	157,649	44,410	35,971	72,729	4,539
Wisconsin	58,423	18,589	15,437	23,753	644
West North Central	**222,979**	**80,436**	**60,163**	**76,721**	**5,660**
Iowa	34,877	11,538	7,046	14,982	1,310
Kansas	31,227	10,712	10,697	9,462	356
Minnesota	54,692	17,086	9,823	27,047	736
Missouri	64,482	26,328	22,195	15,005	954
Nebraska	21,716	7,765	6,222	6,323	1,406
North Dakota	8,345	3,609	2,089	2,089	558
South Dakota	7,640	3,398	2,091	1,813	339
South Atlantic	**636,872**	**261,437**	**199,540**	**155,968**	**19,928**
Delaware	9,749	3,326	2,928	3,436	60
District of Columbia	10,137	1,614	7,905	252	366
Florida	170,481	87,417	60,429	17,341	5,295
Georgia	100,242	37,525	29,196	32,241	1,279
Maryland	57,734	23,417	23,261	10,306	749
North Carolina	108,255	41,730	30,606	34,016	1,902
South Carolina	66,689	22,436	14,761	28,661	831
Virginia	87,460	34,697	24,518	18,891	9,353
West Virginia	26,126	9,275	5,935	10,824	92
East South Central	**274,519**	**96,308**	**43,807**	**128,858**	**5,547**
Alabama	72,571	25,437	13,664	32,794	675
Kentucky	75,926	21,296	10,672	40,890	3,068
Mississippi	39,260	14,886	8,083	15,625	666
Tennessee	86,763	34,688	11,388	39,549	1,138
West South Central	**429,461**	**153,339**	**105,498**	**152,612**	**18,012**
Arkansas	35,487	12,844	7,349	14,677	617
Louisiana	75,055	24,124	15,901	32,592	2,438
Oklahoma	43,115	17,241	11,652	11,977	2,246
Texas	275,804	99,130	70,597	93,367	12,711
Mountain	**193,428**	**61,397**	**59,961**	**64,411**	**7,660**
Arizona	51,719	19,755	17,218	12,349	2,397
Colorado	37,400	11,915	14,544	9,803	1,138
Idaho	21,121	6,501	5,867	8,374	379
Montana	12,413	3,878	3,322	4,920	293
Nevada	22,502	7,486	5,136	9,010	870
New Mexico	16,824	4,354	5,306	5,778	1,385
Utah	19,824	5,484	6,047	7,423	870
Wyoming	11,624	2,023	2,520	6,753	328
Pacific Contiguous	**353,854**	**120,122**	**116,604**	**104,942**	**12,186**
California	219,802	71,465	82,279	58,350	7,709
Oregon	47,391	17,300	13,267	16,151	673
Washington	86,661	31,358	21,059	30,442	3,803
Pacific Noncontiguous	**14,130**	**4,439**	**5,008**	**4,470**	**213**
Alaska	4,767	1,763	2,246	602	156
Hawaii	9,363	2,676	2,762	3,868	58
U.S. Total	**3,084,664**	**1,078,512**	**891,588**	**1,014,347**	**100,217**

[1] Includes public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Notes: •Values for 1996 are preliminary, based on revised Form EIA-826 estimates. •Revenue and average revenue per kilowatthour do not include taxes such as sales and excise taxes that are assessed on the consumer and collected through the utility. •Weather-related phenomena, reclassification of retail sales, changes in number of customers, prior period adjustments, and changes in billing procedures may contribute to substantial year-to-year changes in the data in this table. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-826, ''Monthly Electric Utility Sales and Revenue Report with State Distributions.''

Table 24. Estimated Coefficients of Variation for U.S. Electric Utility Retail Sales of Electricity by Census Division and State, 1996

(Percent)

Census Division and State	All Sectors	Residential	Commercial	Industrial	Other[1]
New England	**0.2**	**0.2**	**0.7**	**0.3**	**0.9**
Connecticut	.1	.1	.1	.2	.5
Maine	.1	.1	1.0	.6	3.3
Massachusetts	.4	.5	1.5	.6	1.8
New Hampshire	.3	.3	.1	.8	.4
Rhode Island	—	.1	—	.1	.2
Vermont	.2	.4	.2	.6	1.4
Middle Atlantic	**.2**	**.5**	**.2**	**.4**	**.3**
New Jersey	.1	.2	.1	.2	.1
New York	.3	.7	.3	.4	.2
Pennsylvania	.5	1.0	.4	.7	2.3
East North Central	**.2**	**.3**	**.2**	**.5**	**.5**
Illinois	.3	.5	.3	.3	.4
Indiana	.4	.9	.5	.6	1.4
Michigan	.4	.2	.9	2.5	1.4
Ohio	.6	.6	.2	.6	1.4
Wisconsin	.2	.6	.3	.3	1.3
West North Central	**.2**	**.3**	**.2**	**.2**	**1.8**
Iowa	.4	.6	1.4	.6	1.2
Kansas	.2	.4	.3	.3	1.2
Minnesota	.5	.7	.7	.4	2.1
Missouri	.2	.6	.2	.3	1.3
Nebraska	.5	.9	.4	.5	6.9
North Dakota	.6	.8	.7	.6	1.4
South Dakota	.4	.8	.4	.5	2.2
South Atlantic	**.2**	**.2**	**.1**	**.2**	**.3**
Delaware	.2	.1	.1	.5	.6
District of Columbia	—	—	—	—	—
Florida	.4	.5	.3	1.0	.8
Georgia	.4	.8	.3	.2	1.9
Maryland	.2	.4	.3	.4	.9
North Carolina	.4	.6	.5	.3	1.2
South Carolina	.3	.6	.4	.3	.6
Virginia	.3	.6	.2	.2	.2
West Virginia	.1	.3	.1	.1	.9
East South Central	**.5**	**.6**	**.5**	**.7**	**1.0**
Alabama	.5	1.3	1.1	.4	.7
Kentucky	1.7	1.2	.4	2.0	.3
Mississippi	.6	.6	.6	.5	1.1
Tennessee	.6	1.1	1.1	.5	4.8
West South Central	**.2**	**.6**	**.2**	**.3**	**.5**
Arkansas	.6	.5	.4	.4	1.4
Louisiana	.3	.6	.2	.3	1.4
Oklahoma	.4	1.1	.6	.7	.3
Texas	.4	.8	.3	.4	.6
Mountain	**.2**	**.2**	**.2**	**.2**	**1.2**
Arizona	.2	.2	.2	.6	1.1
Colorado	.3	.5	.3	.5	4.4
Idaho	.4	.6	1.1	.7	4.9
Montana	1.2	.8	.5	.7	2.1
Nevada	.6	1.0	.3	.3	1.0
New Mexico	.5	.4	.5	.9	3.4
Utah	.3	.3	.5	.2	1.2
Wyoming	.7	.6	.5	.7	16.5
Pacific Contiguous	**.3**	**.3**	**.5**	**.9**	**2.5**
California	.2	.4	.7	1.0	3.9
Oregon	.6	.7	.7	1.5	5.2
Washington	1.0	.5	.3	2.0	.5
Pacific Noncontiguous	**.1**	**.1**	**.1**	**.3**	**2.8**
Alaska	.4	.2	.3	1.7	3.9
Hawaii	.1	.1	.1	.2	.2
U.S. Total	**.1**	**.1**	**.1**	**.2**	**.4**

[1] Includes public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Notes: •See technical notes for CV estimation methodology. It should be noted that such things as large changes in retail sales, reclassification of retail sales, or changes in billing procedures can contribute unusually high coefficients of variation.

Sources: Energy Information Administration, Form EIA-826, ''Monthly Electric Utility Sales and Revenue Report with State Distributions.''

Table 25. Revenue from Retail Sales by U.S. Electric Utilities to Ultimate Consumers by Sector, Census Division, and State, 1996

(Million Dollars)

Census Division and State	All Sectors	Residential	Commercial	Industrial	Other[1]
New England	**11,221**	**4,590**	**4,369**	**2,046**	**216**
Connecticut	2,986	1,319	1,149	465	54
Maine	1,110	465	334	296	15
Massachusetts	4,852	1,828	2,086	839	99
New Hampshire	1,069	463	368	215	23
Rhode Island	692	293	265	115	19
Vermont	512	223	168	116	6
Middle Atlantic	**31,745**	**12,631**	**12,554**	**5,190**	**1,370**
New Jersey	7,054	2,728	3,092	1,143	92
New York	14,627	5,664	6,539	1,301	1,124
Pennsylvania	10,063	4,240	2,923	2,746	154
East North Central	**34,349**	**13,325**	**10,318**	**9,632**	**1,074**
Illinois	9,699	3,904	2,998	2,203	594
Indiana	4,700	1,851	1,089	1,709	52
Michigan	6,924	2,470	2,586	1,771	96
Ohio	9,944	3,817	2,770	3,069	287
Wisconsin	3,083	1,283	876	879	45
West North Central	**13,196**	**5,838**	**3,730**	**3,272**	**357**
Iowa	2,071	943	463	587	79
Kansas	2,040	838	713	447	43
Minnesota	3,050	1,239	606	1,152	53
Missouri	3,959	1,869	1,344	678	68
Nebraska	1,133	487	337	232	77
North Dakota	466	222	128	94	21
South Dakota	478	240	140	82	16
South Atlantic	**41,944**	**20,618**	**13,248**	**6,823**	**1,255**
Delaware	669	296	204	162	7
District of Columbia	745	125	585	11	23
Florida	12,457	7,087	4,090	908	372
Georgia	6,494	2,907	2,088	1,391	107
Maryland	4,044	1,942	1,596	437	69
North Carolina	7,047	3,340	1,952	1,627	128
South Carolina	3,790	1,690	940	1,110	50
Virginia	5,338	2,639	1,454	754	490
West Virginia	1,361	591	339	423	8
East South Central	**13,812**	**5,987**	**2,708**	**4,795**	**323**
Alabama	3,858	1,687	880	1,252	39
Kentucky	3,076	1,208	558	1,167	143
Mississippi	2,356	1,052	571	677	57
Tennessee	4,522	2,040	700	1,699	84
West South Central	**25,920**	**11,586**	**6,947**	**6,245**	**1,141**
Arkansas	2,212	1,008	499	664	41
Louisiana	4,597	1,856	1,137	1,412	192
Oklahoma	2,377	1,148	670	446	113
Texas	16,735	7,574	4,642	3,723	795
Mountain	**11,670**	**4,663**	**3,904**	**2,682**	**421**
Arizona	3,907	1,763	1,367	655	122
Colorado	2,289	901	863	439	86
Idaho	834	344	250	223	17
Montana	626	244	185	179	19
Nevada	1,330	518	338	435	39
New Mexico	1,140	390	417	250	84
Utah	1,048	381	356	271	40
Wyoming	496	123	128	231	14
Pacific Contiguous	**26,482**	**10,681**	**9,724**	**5,528**	**549**
California	20,551	8,089	7,996	4,096	370
Oregon	2,275	1,001	689	546	39
Washington	3,656	1,591	1,040	886	139
Pacific Noncontiguous	**1,616**	**578**	**570**	**435**	**33**
Alaska	486	198	213	50	26
Hawaii	1,129	380	357	385	7
U.S. Total	**211,955**	**90,498**	**68,073**	**46,646**	**6,738**

[1] Includes public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Notes: •Values for 1996 are preliminary, based on revised Form EIA-826 estimates. •Revenue and average revenue per kilowatthour do not include taxes such as sales and excise taxes that are assessed on the consumer and collected through the utility. •Weather-related phenomena, reclassification of retail sales, changes in number of customers, prior period adjustments, and changes in billing procedures may contribute to substantial year-to-year changes in the data in this table. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-826, ''Monthly Electric Utility Sales and Revenue Report with State Distributions,''

Table 26. Estimated Coefficients of Variation of Revenue from Retail Sales by U.S. Electric Utilities by Census Division and State, 1996

(Percent)

Census Division and State	All Sectors	Residential	Commercial	Industrial	Other[1]
New England	**0.3**	**0.3**	**0.9**	**0.5**	**0.9**
Connecticut	.2	.2	.2	.2	.2
Maine	.1	.1	.9	.5	1.9
Massachusetts	.7	.7	1.8	1.1	1.8
New Hampshire	.5	.6	.3	.9	2.3
Rhode Island	.1	.1	.1	.2	.3
Vermont	.6	.5	.5	1.1	1.0
Middle Atlantic	**.3**	**.5**	**.3**	**.3**	**.5**
New Jersey	.1	.2	.1	.2	—
New York	.5	.6	.5	.5	.5
Pennsylvania	.7	1.2	.6	.6	1.2
East North Central	**.2**	**.3**	**.3**	**.5**	**.2**
Illinois	.4	.6	.2	.4	.3
Indiana	.6	1.0	.6	.8	.8
Michigan	.6	.3	.9	2.4	.8
Ohio	.3	.6	.3	.4	.5
Wisconsin	.3	.6	.3	.3	1.5
West North Central	**.3**	**.3**	**.3**	**.3**	**1.2**
Iowa	.4	.5	.8	.7	.8
Kansas	.3	.5	.4	.5	2.3
Minnesota	.6	.7	.7	.4	1.0
Missouri	.7	.8	.6	1.0	1.2
Nebraska	.8	1.1	.7	1.4	5.1
North Dakota	.5	.6	.6	.5	1.0
South Dakota	.6	.9	.5	.5	1.9
South Atlantic	**.2**	**.3**	**.2**	**.2**	**.3**
Delaware	.1	.1	.2	.6	.4
District of Columbia	—	—	—	—	—
Florida	.4	.5	.4	1.0	.7
Georgia	.6	1.2	.3	.2	1.3
Maryland	.5	.7	.6	.9	.4
North Carolina	.5	.7	.6	.5	1.3
South Carolina	.5	1.0	.4	.4	.6
Virginia	.4	.7	.3	.2	.3
West Virginia	.1	.2	.2	.1	.9
East South Central	**.4**	**.6**	**.5**	**.4**	**.9**
Alabama	.7	1.3	1.1	.5	2.4
Kentucky	1.1	1.6	.6	1.0	.4
Mississippi	.7	.8	.6	.7	1.4
Tennessee	.6	1.0	1.1	.6	3.3
West South Central	**.3**	**.5**	**.3**	**.4**	**.5**
Arkansas	.3	.5	.4	.6	1.8
Louisiana	.4	.6	.5	.2	.8
Oklahoma	.9	1.4	1.3	.8	.4
Texas	.5	.8	.4	.6	.7
Mountain	**.2**	**.2**	**.2**	**.3**	**.9**
Arizona	.3	.4	.3	.6	1.3
Colorado	.3	.4	.2	.5	1.3
Idaho	.6	.5	1.2	1.3	3.4
Montana	1.0	.6	.7	.9	2.4
Nevada	.8	1.0	.3	1.0	.7
New Mexico	.5	.6	.5	1.0	3.4
Utah	.3	.3	.6	.2	1.5
Wyoming	.7	.6	.5	.8	7.3
Pacific Contiguous	**.5**	**.4**	**1.1**	**1.3**	**1.5**
California	.6	.5	1.3	1.7	2.1
Oregon	.7	.9	.5	1.8	2.1
Washington	.9	.5	.6	2.3	1.0
Pacific Noncontiguous	**.2**	**.1**	**.2**	**.4**	**2.8**
Alaska	.6	.4	.5	2.3	3.6
Hawaii	.1	.1	.1	.3	.3
U.S. Total	**.1**	**.1**	**.2**	**.2**	**.2**

[1] Includes public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Notes: •See technical notes for CV estimation methodology. It should be noted that such things as large changes in retail sales, reclassification of retail sales, or changes in billing procedures can contribute unusually high coefficients of variation.

Sources: Energy Information Administration, Form EIA-826, ''Monthly Electric Utility Sales and Revenue Report with State Distributions.''

Table 27. Average Revenue per Kilowatthour for U.S. Electric Utilities by Sector, Census Division, and State, 1996

(Cents)

Census Division and State	All Sectors	Residential	Commercial	Industrial	Other[1]
New England	**10.4**	**11.9**	**10.2**	**8.0**	**14.6**
Connecticut	10.5	12.1	10.3	7.9	13.9
Maine	9.6	12.6	10.4	6.4	23.8
Massachusetts	10.2	11.3	10.0	8.6	14.4
New Hampshire	11.7	13.6	11.4	9.2	15.6
Rhode Island	10.5	11.9	10.2	8.6	11.8
Vermont	9.8	11.1	10.2	7.6	17.0
Middle Atlantic	**9.8**	**11.9**	**10.5**	**6.1**	**9.6**
New Jersey	10.5	12.0	10.4	8.2	18.3
New York	11.2	14.1	12.1	5.3	9.1
Pennsylvania	7.9	9.7	8.3	5.9	11.2
East North Central	**6.5**	**8.5**	**7.4**	**4.5**	**7.0**
Illinois	7.8	10.4	8.0	5.3	6.8
Indiana	5.3	6.9	6.0	3.9	9.2
Michigan	7.2	8.5	8.0	5.2	11.0
Ohio	6.3	8.6	7.7	4.2	6.3
Wisconsin	5.3	6.9	5.7	3.7	7.0
West North Central	**5.9**	**7.3**	**6.2**	**4.3**	**6.3**
Iowa	5.9	8.2	6.6	3.9	6.0
Kansas	6.5	7.8	6.7	4.7	12.2
Minnesota	5.6	7.3	6.2	4.3	7.2
Missouri	6.1	7.1	6.1	4.5	7.2
Nebraska	5.2	6.3	5.4	3.7	5.4
North Dakota	5.6	6.1	6.1	4.5	3.8
South Dakota	6.3	7.1	6.7	4.5	4.7
South Atlantic	**6.6**	**7.9**	**6.6**	**4.4**	**6.3**
Delaware	6.9	8.9	7.0	4.7	11.9
District of Columbia	7.3	7.8	7.4	4.4	6.4
Florida	7.3	8.1	6.8	5.2	7.0
Georgia	6.5	7.7	7.2	4.3	8.4
Maryland	7.0	8.3	6.9	4.2	9.2
North Carolina	6.5	8.0	6.4	4.8	6.7
South Carolina	5.7	7.5	6.4	3.9	6.0
Virginia	6.1	7.6	5.9	4.0	5.2
West Virginia	5.2	6.4	5.7	3.9	8.9
East South Central	**5.0**	**6.2**	**6.2**	**3.7**	**5.8**
Alabama	5.3	6.6	6.4	3.8	5.8
Kentucky	4.1	5.7	5.2	2.9	4.6
Mississippi	6.0	7.1	7.1	4.3	8.5
Tennessee	5.2	5.9	6.1	4.3	7.4
West South Central	**6.0**	**7.6**	**6.6**	**4.1**	**6.3**
Arkansas	6.2	7.8	6.8	4.5	6.7
Louisiana	6.1	7.7	7.1	4.3	7.9
Oklahoma	5.5	6.7	5.7	3.7	5.0
Texas	6.1	7.6	6.6	4.0	6.3
Mountain	**6.0**	**7.6**	**6.5**	**4.2**	**5.5**
Arizona	7.6	8.9	7.9	5.3	5.1
Colorado	6.1	7.6	5.9	4.5	7.5
Idaho	4.0	5.3	4.3	2.7	4.5
Montana	5.0	6.3	5.6	3.6	6.4
Nevada	5.9	6.9	6.6	4.8	4.5
New Mexico	6.8	8.9	7.9	4.3	6.1
Utah	5.3	6.9	5.9	3.6	4.6
Wyoming	4.3	6.1	5.1	3.4	4.2
Pacific Contiguous	**7.5**	**8.9**	**8.3**	**5.3**	**4.5**
California	9.3	11.3	9.7	7.0	4.8
Oregon	4.8	5.8	5.2	3.4	5.8
Washington	4.2	5.1	4.9	2.9	3.7
Pacific Noncontiguous	**11.4**	**13.0**	**11.4**	**9.7**	**15.5**
Alaska	10.2	11.2	9.5	8.3	16.5
Hawaii	12.1	14.2	12.9	10.0	12.8
U.S. Average	**6.87**	**8.39**	**7.63**	**4.60**	**6.72**

[1] Includes public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Notes: •Values for 1996 are preliminary, based on revised Form EIA-826 estimates. •Revenue and average revenue per kilowatthour do not include taxes such as sales and excise taxes that are assessed on the consumer and collected through the utility. •Weather-related phenomena, reclassification of retail sales, changes in number of customers, prior period adjustments, and changes in billing procedures may contribute to substantial year-to-year changes in the data in this table. •Totals may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-826, ''Monthly Electric Utility Sales and Revenue Report with State Distributions,''

Table 28. Estimated Coefficients of Variation for Average Revenue per Kilowatthour for U.S. Electric Utilities by Sector, Census Division, and State, 1996

(Percent)

Census Division and State	All Sectors	Residential	Commercial	Industrial	Other[1]
New England	**0.2**	**0.3**	**0.4**	**0.3**	**0.7**
Connecticut	.1	.1	.1	.2	.4
Maine	.1	—	.2	.2	1.2
Massachusetts	.5	.8	.9	.7	1.4
New Hampshire	.3	.4	.4	.4	2.3
Rhode Island	.1	.2	.1	.2	.3
Vermont	.5	.7	.5	.6	1.5
Middle Atlantic	**.1**	**.2**	**.2**	**.2**	**.3**
New Jersey	—	.1	—	.1	.2
New York	.2	.3	.3	.4	.4
Pennsylvania	.3	.4	.3	.2	1.2
East North Central	**.2**	**.2**	**.1**	**.2**	**.5**
Illinois	.3	.4	.3	.2	.2
Indiana	.4	.5	.3	.4	1.4
Michigan	.3	.2	.1	.4	.7
Ohio	.6	.3	.2	.3	1.8
Wisconsin	.2	.2	.1	.3	1.5
West North Central	**.3**	**.3**	**.2**	**.3**	**1.0**
Iowa	.4	.5	.8	.5	.7
Kansas	.2	.4	.2	.3	2.9
Minnesota	.5	.4	.3	.6	1.2
Missouri	.7	.7	.6	.9	.8
Nebraska	.6	.7	.5	1.3	2.7
North Dakota	.3	.4	.3	.4	.9
South Dakota	.4	.4	.5	.4	1.3
South Atlantic	**.2**	**.2**	**.2**	**.1**	**.1**
Delaware	.1	.1	.1	.3	.3
District of Columbia	—	—	—	—	—
Florida	.4	.4	.5	.5	.3
Georgia	.4	.8	.3	.2	.9
Maryland	.3	.4	.4	.5	.8
North Carolina	.3	.4	.3	.4	.5
South Carolina	.4	.5	.5	.3	.3
Virginia	.2	.2	.3	.2	.3
West Virginia	.1	.1	.1	—	1.4
East South Central	**.4**	**.1**	**.1**	**.6**	**.4**
Alabama	.3	.2	.2	.5	2.4
Kentucky	1.4	.5	.4	1.7	.3
Mississippi	.3	.4	.2	.4	1.0
Tennessee	.2	.1	.3	.3	1.5
West South Central	**.2**	**.3**	**.3**	**.2**	**.4**
Arkansas	.6	.5	.5	.5	1.0
Louisiana	.2	.3	.4	.2	1.9
Oklahoma	.6	.4	.7	1.0	.2
Texas	.3	.4	.4	.4	.5
Mountain	**.1**	**.1**	**.2**	**.2**	**.8**
Arizona	.4	.3	.3	.7	.9
Colorado	.2	.1	.2	.3	3.7
Idaho	.2	.3	.2	.6	2.7
Montana	.7	.6	.8	.4	1.8
Nevada	.3	.1	.1	.7	1.2
New Mexico	.5	.4	.5	1.1	.9
Utah	.2	.1	.4	.1	.7
Wyoming	.4	.2	.4	.2	4.3
Pacific Contiguous	**.5**	**.3**	**.9**	**1.0**	**1.6**
California	.6	.4	1.1	1.2	2.4
Oregon	.6	.7	.7	1.0	3.9
Washington	.5	.4	.5	.5	1.1
Pacific Noncontiguous	**.1**	**.1**	**.2**	**.2**	**3.8**
Alaska	.4	.3	.4	.9	5.3
Hawaii	.1	.1	.1	.1	.2
U.S. Average	**.1**	**.1**	**.1**	**.1**	**.3**

[1] Includes public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Notes: •See technical notes for CV estimation methodology. It should be noted that such things as large changes in retail sales, reclassification of retail sales, or changes in billing procedures can contribute unusually high coefficients of variation.

Sources: Energy Information Administration, Form EIA-826, ''Monthly Electric Utility Sales and Revenue Report with State Distributions.''

Appendix A

Technical Notes

Data Sources

The *Electric Power Annual* is prepared by the Coal and Electric Data and Renewables Division; Office of Coal, Nuclear, Electric and Alternate Fuels; Energy Information Administration (EIA); U.S. Department of Energy (DOE). Data published in the *Electric Power Annual Volume 1* (EPA) are compiled from three statistical forms filed monthly and two forms filed annually by electric utilities. Those forms are: the Form EIA-759, "Monthly Power Plant Report"; the Federal Energy Regulatory Commission (FERC) Form 423, "Monthly Report of Cost and Quality of Fuels for Electric Plants"; the Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions"; the Form EIA-861, "Annual Electric Utility Report"; and the Form EIA-860, "Annual Electric Generator Report." Each form is summarized below.

Form EIA-759

The Form EIA-759 is a mandatory survey of operators of electric utility plants producing electric power for public use. The Form EIA-759 is used to collect monthly data on net generation, consumption of coal, petroleum, and natural gas; and end-of-the-month stocks of coal and petroleum for a sample of plants by fuel-type and State. Remaining plants are surveyed annually to form an annual census of all plants. Summary data from the Form EIA-759 are also published in the *Electric Power Monthly (EPM)*, the *Monthly Energy Review (MER)*, and the *Annual Energy Review (AER)*. These reports present aggregated data for electric utilities at the U.S., Census division, and North American Electric Reliability Council Region (NERC) levels.

Instrument and Design History. Prior to 1936, the Bureau of the Census and the U.S. Geological Survey collected, compiled, and published data on the electric power industry. In 1936, the Federal Power Commission (FPC) assumed all data collection and publication responsibilities for the electric power industry and implemented the FPC Form 4. The Federal Power Act, Sections 311 and 312, and FPC Order 141 define the legislative authority to collect power production data. The Form EIA-759 replaced the FPC Form 4 in January 1982.

Data Processing. The Form EIA-759, along with a return envelope, is mailed to respondents approximately 4 working days before the end of the month. The respondents names are obtained from a computerized mailing address file. The completed forms are to be returned to the EIA by the 10th working day after the end of the reporting month. After receipt, data from the completed forms are manually logged in and edited before being keypunched for automatic data processing. An edit program checks the data for errors not found during manual editing. The electric utility companies are telephoned to obtain data in cases of missing reports and to verify data when questions arise during editing. Following EIA approval, the data are made available for public use.

FERC Form 423

The FERC Form 423, a restricted census, is a monthly record of delivered-fuel purchases, submitted by approximately 230 electric utilities for each plant with a total steam-electric and combined-cycle nameplate capacity of 50 or more megawatts. Summary data from the FERC Form 423 are also published in the *EPM* and the *MER*. These reports present aggregated data on electric utilities at the U.S. and Census division level.

Instrument and Design History. On July 7, 1972, the FPC issued Order Number 453 enacting the New Code of Federal Regulations, Section 141.61, legally creating the Form 423. Originally, the form was used to collect data only on fossil-steam plants, but was amended in 1974 to include data on internal combustion and combustion turbines. The FERC Form 423 replaced the FPC Form 423 in January 1983. Peaking units were eliminated from the FERC Form 423. In addition, the nameplate capacity threshold was changed from 25 megawatts to 50 megawatts. This reduction in coverage eliminated approximately 50 utilities and 250 plants.

In 1991, the FERC Form 423 was amended to include combined-cycle generating units. This increase in coverage added 5 electric utilities and approximately 15 additional electric plants. Several plants, already reporting on the FERC Form 423, began including fuel receipts for combined-cycle units starting with 1991 data.

Data Processing. Starting with the January 1993 data, the FERC began collection of the data directly from the respondents. The FERC processes the data through edits and each month provides the EIA with a diskette containing the data. The EIA reviews the data for accuracy. Following EIA approval, the data are made available for public use.

Form EIA-826

The Form EIA-826 is a monthly collection of data from 252 U.S. electric utilities, which generally account for the largest share of retail sales within the State for which they report.

Instrument and Design History. The collection of electric power sales, revenue, and income data began in the early 1940's and was established as FPC Form 5 by FPC Order 141 in 1947. In 1980, the report was revised with only selected income items remaining and became the FERC Form 5. The Form EIA-826 replaced the FERC Form 5 in January 1983. In January 1987, the Form EIA-826 was changed to the "Monthly Electric Utility Sales and Revenue Report with State Distributions;" it was formerly titled, "Electric Utility Company Monthly Statement." The Form EIA-826 was revised in January 1990, and some data elements were eliminated.

Frame. The current sample for the Form EIA-826, which was designed to obtain estimates of electricity sales and revenue per kilowatthour at the State level by end-use sector, was chosen to be in effect for the January 1993 data. The frame for the Form EIA-826 was originally based on the 1989 submission of the Form EIA-861, which consisted of approximately 3,250 electric utilities selling retail and/or sales for resale. Note that for the Form EIA-826, we are only interested in retail sales and revenue. Updates have been made to the frame to reflect mergers that affect data processing. Some electric utilities serve in more than one State. Thus, the State-service area is actually the sampling unit. For each State served by each utility, there is a utility State-part, or "State-service area." This approach allows for an explicit calculation of estimates for State, Census division, and U.S. level sales, revenue and revenue per kilowatthour by end-use sector (residential, commercial, industrial and other). A model-based cutoff sample is used currently. Regressor data came from the Form EIA-861. (Note that estimates at the "State level" are for sales for the entire State, and similarly for "Census division" and "U.S." levels.)

The preponderance of electric power sales to ultimate consumers in each State are made by a few large utilities. Ranking of electric utilities by retail sales on a State-by-State basis revealed a consistent pattern of dominance by a few electric utilities in nearly all 50 States and the District of Columbia. These dominant electric utilities were selected as a model sample. These electric utilities constitute about 8 percent of the population of U.S. electric utilities, but provide three-quarters of the total U.S. retail electricity sales. The procedures used to derive electricity sales, revenue, average revenue per kilowatthour, and associated coefficient of variation (CV) estimates are provided in the Formulas and Calculations section of this Appendix.

Data Processing. The forms are mailed each year to the electric utilities with State-parts selected in the sample. The completed form is to be returned to the EIA by the last calendar day of the month following the reporting month. Nonrespondents are telephoned to obtain the data. Imputation, in model sampling, is an implicit part of the estimation. That is, data that are not available either because they were not part of the sample or because the data are missing are estimated using a model. The data are edited and entered into the computer where additional checks are completed. After all forms have been received from the respondents, the final automated edit is submitted. After EIA approval, the data are made available for public use.

Form EIA-861

Data for the Form EIA-861 are collected at the utility level from all electric utilities in the United States, its territories, and Puerto Rico. Form EIA-861 data in this publication are for the United States only. These data are then aggregated to provide geographic totals at the State, NERC region, Census division, and national level. Sources and disposition of data are also provided by utility class of ownership and retail consumer class of service. Average revenue (nominal dollars) per kilowatthour of electricity sold is calculated by dividing total annual retail revenue (nominal dollars) by the total annual retail sales of electricity.

Average revenue per kilowatthour is defined as the cost per unit of electricity sold and is calculated by dividing retail electric revenue by the corresponding sales of electricity. The average revenue per kilowatthour is calculated for all consumers and for each sector (residential, commercial, industrial, and other sales).

Electric utilities typically employ a number of rate schedules within a single sector. These alternative rate schedules reflect the varying consumption levels and patterns of consumers and their associated impact on the costs to the electric utility for providing electrical service. The average revenue per kilowatthour reported in this publication by sector represents a weighted average of

consumer revenue and sales within that sector and across sectors for all consumers.

The electric revenue used to derive the average revenue per kilowatthour is the operating revenue reported by the electric utility. Operating revenue includes energy charges, demand charges, consumer service charges, environmental surcharges, fuel adjustments, and other miscellaneous charges.

Electric utility operating revenues cover, among other costs of service, State and Federal income taxes and taxes other than income taxes paid by the utility. The Federal component of these taxes are, for the most part, "payroll" taxes. State and local authorities tax the value of plant (property taxes), the amount of revenues (gross receipts taxes), purchases of materials and services (sales and use taxes), and a potentially long list of other items that vary extensively by taxing authority. Taxes deducted from employees' pay (such as Federal income taxes and employees' share of social security taxes) are not a part of the utility's "tax costs," but are paid to the taxing authorities in the name of the employees. These taxes are included in the utility's cost of service (for example, revenue requirements) and are included in the amounts recovered from consumers in rates and reported in operating revenues.

Electric utilities, like many other business enterprises, are required by various taxing authorities to collect and remit taxes assessed on their consumers. In this regard, the electric utility serves as an agent for the taxing authority. Taxes assessed on the consumer, such as a gross receipts tax or sales tax, are called "pass through" taxes. These taxes do not represent a cost to the utility and are not recorded in the operating revenues of the utility. However, taxing authorities differ as to whether a specific tax is assessed on the utility or the consumer—which, in turn, determines whether or not the tax is included in the operating revenue of the electric utility.

Form EIA-860

The Form EIA-860 is a mandatory census of electric utilities in the United States that operate power plants or plan to operate a power plant within 10 years of the reporting year. The survey is used to collect data on existing power plants from the electric utilities and their 10-year plans for constructing new plants, and modifying and retiring existing plants. Data on the survey are collected at the generating unit level. These data are then aggregated by energy source, geographic area, and prime mover. Final data from the Form EIA-860 are also summarized in the *Inventory of Power Plants in the United States.*

Instrument and Design History. The Form EIA-860 was implemented in January 1985 to collect data as of year-end 1984. The Federal Energy Administration Act of 1974 (Public Law 93-275) defines the legislative authority to collect these data.

Data Processing. The Form EIA-860 is mailed to approximately 900 respondents in December of the reporting year and the completed forms are to be returned to the EIA by February 15 containing data as of January 1 of the following year. Effective with the 1996 reporting, respondents have the option of filing Form EIA-860 directly with the EIA or through an agent—such as the respondent's regional electric reliability council. Data reported through the regional electric reliability councils are submitted to the EIA electronically from the North American Electric Reliability Council (NERC). Data for each respondent are preprinted from the applicable data base. Respondents are instructed to verify all preprinted data and to supply missing data. The data are manually edited before being keyed for automatic data processing. Computer programs containing additional edit checks are run. Respondents are telephoned to obtain correction or clarification of reported data and to obtain missing data, as a result of the manual and automatic editing process. After EIA approval, the data are made available for public use.

Quality of Data

The Office of Coal, Nuclear, Electric and Alternate Fuels (CNEAF) is responsible for routine data improvement and quality assurance activities. All operations in this office are done in accordance with formal standards established by the EIA. These standards are the measuring rod necessary for quality statistics. Data improvement efforts include verification of data-keyed input by automatic computerized methods, editing by subject matter specialists, and follow up on nonrespondents. The CNEAF office supports the quality assurance efforts of the data collectors by providing advisory reviews of the structure of information requirements, and of proposed designs for new and revised data collection forms and systems. Once implemented, the actual performance of working data collection systems is also validated. Computerized respondent data files are checked to identify those who fail to respond to the survey. By law, nonrespondents may be fined or otherwise penalized for not filing a mandatory EIA data form. Before invoking the law, the EIA tries to obtain the required information by encouraging cooperation of nonrespondents.

Completed forms received by the CNEAF office are sorted, screened for completeness of reported information, and keyed onto computer tapes for storage and transfer to

random access data bases for computer processing. The information coded on the computer tapes is manually spot-checked against the forms to certify accuracy of the tapes. To ensure the quality standards established by the EIA, formulas that use the past history of data values in the data base have been designed and implemented to check data input for errors automatically. Data values that fall outside the ranges prescribed in the formulas are verified by telephoning respondents to resolve any discrepancies. It is very important, however, to concentrate on accuracy in the earliest stages of data collection. The data quality community now recognizes that editing can only be used to find the largest errors. Trying to "correct" smaller errors can lead to substantial bias. (Please consult http://www.dataquality.com and other data quality resource references.)

Conceptual problems affecting the quality of data are discussed in the report, *An Assessment of the Quality of Selected EIA Data Series*:[21]

Data Editing System

Data from the form surveys are edited using automated systems. The edit includes both deterministic checks, in which records are checked for the presence of required fields and their validity; and statistical checks, in which estimation techniques are used to validate data according to their behavior in the past and in comparison to other current fields.

Rounding Rules for Data

Given a number with r digits to the left of the decimal and d+t digits in the fraction part, with d being the place to which the number is to be rounded and t being the remaining digits which will be truncated, this number is rounded to r+d digits by adding 5 to the (r+d+1)th digit when the number is positive or by subtracting 5 when the number is negative. The t digits are then truncated at the (r+d+1)th digit. The symbol for a rounded number truncated to zero is (*).

CNEAF Data Revision and Policy

The Office of Coal, Nuclear, Electric and Alternate Fuels has adopted the following policy with respect to the revision and correction of recurrent data in energy publications:

1. Annual survey data collected by this office are published either as preliminary or final when first appearing in a data report. Data initially released as preliminary will be so noted in the report. These data will be revised, if necessary, and declared final in the next publication of the data.

2. All monthly and quarterly survey data collected by this office are published as preliminary. These data are revised only after the completion of the 12-month cycle of the data. No revisions are made to the published data before this unless approved by the Office Director.

3. The magnitude of changes due to revisions experienced in the past will be included in the data reports, so that the reader can assess the accuracy of the data.

4. After data are published as final, corrections may be made in the event of a greater than one percent difference at the national level. Corrections for differences that are less than the before-mentioned threshold are left to the discretion of the Office Director.

This report presents the most current annual data available to the EIA. The statistics may differ from those published previously in EIA publications due to corrections, revisions, or other adjustments to the data subsequent to its original release.

On a chapter basis, the status of the data contained in this report is:

- **Generating Capability at U.S. Electric Utilities**
  Total net summer capability data from the Form EIA-860 are preliminary in this publication. Final data will be reported in the *Inventory of Power Plants in the United States.*

- **Net Generation at U.S. Electric Utilities**
  The Form EIA-759 data are supplemented annually to become a census, and are final in this report. A comparison of preliminary versus final data is provided in the Technical Notes of the *Electric Power Monthly* (EPM), when available.

- **U.S. Electric Utility Fossil-Fuel Statistics**
  All FERC Form 423 data are final. A comparison of preliminary versus final data is provided in the Technical Notes of the EPM, when available.

- **U.S. Electric Utility Retail Sales, Revenue, and Average Revenue per Kilowatthour**
  Values for sales, revenue, and average revenue per kilowatthour from the Form EIA-826 are

[21] Energy Information Administration, Office of Statistical Standards, *An Assessment of the Quality of Selected EIA Data Series: Electric Power Data*, DOE/EIA-0292(87) (Washington, DC, 1989).

preliminary. Historical annual data from the Form EIA-861, "Annual Electric Utility Report," are final.

Formulas and Calculations

Average Heat Content. In order to determine the Btu value per unit of consumption for each of the fossil fuels collected on the Form EIA-759, the heat content values contained on the FERC Form 423 were used. Data on the FERC Form 423 represent approximately 85 percent of the total generator nameplate capacity for all electric utilities.

Percent Difference. The following formula is used to calculate percent differences.

$$\text{Percent Difference} = \left(\frac{x(t_2) - x(t_1)}{x(t_1)} \right) \times 100,$$

where $x(t_1)$ and $x(t_2)$ denote the quantity at year t_1 and subsequent year t_2.

Form EIA-759

Data for the Form EIA-759 are collected at the plant level. These data are then aggregated to provide geographic totals at the State, Census division, and U.S. level, or totals by type of plant. Consumption of fuel(s) is converted from quantities (in short tons, barrels, or thousand cubic feet) to Btu at the plant level. End-of-month fuel stocks for a single generating plant may not equal beginning-of-the-month stocks, plus receipts, less consumption, for many reasons, including the fact that several plants may share the same fuel stock.

FERC Form 423

Data for the FERC Form 423 are collected at the plant level. These data are then used in the following formulas to produce aggregates and averages for each fuel type at the State, Census division, and U.S. level. For these formulas, receipts and average heat content are at the plant level. For each geographic region, the summation, Σ, represents the sum of all plants in that geographic region. Additionally,

- For coal, units for receipts *(R)* are in tons, units for average heat content *(A)* are in Btu per pound, and the unit conversion *(U)* is 2,000 pounds per ton;
- For petroleum, units for receipts *(R)* are in barrels, units for average heat content *(A)* are in Btu per gallon, and the unit conversion *(U)* is 42 gallons per barrel;
- For gas, units for receipts *(R)* are in thousand cubic feet (Mcf), average heat content *(A)* are in Btu per cubic foot, and the unit conversion *(U)* is 1,000 cubic feet per Mcf.

Where i denotes a plant; R_i = receipts for plant i; A_i = average heat content for receipts at plant i; and, U = unit conversion:

$$\text{Total Btu} = \sum_i (R_i \times A_i \times U),$$

and

$$\text{Weighted Average Heat Content} = \frac{\sum_i (R_i \times A_i)}{\sum_i R_i},$$

for a given fuel type.

Where i denotes a plant; R_i = receipts for plant i; A_i = average heat content for receipts at plant i; and, C_i = cost at plant i in cents per million Btu;

Weighted Average Cost (cents per million Btu) =

$$\frac{\sum_i (R_i \times A_i \times C_i)}{\sum_i (R_i \times A_i)},$$

and

Weighted Average Cost (dollars per unit) =

$$\frac{U \sum_i (R_i \times A_i \times C_i)}{(10)^8 \sum_i R_i}.$$

Form EIA-826

The Form EIA-826 data are collected at the utility level by end use sector and State. When a utility has sales in more than one State, the data that may be required are dependent upon the sample selection that was done for each State. Data from the Form EIA-826 are used to determine estimates by sector at the State, Census division, and national level for the entire corresponding State, Census division, or national category. Form EIA-861 data were used as the frame from which the sample was selected, and also as regressor data.

A cutoff model sample is used, so that only utilities that have relatively large sales in one or more end use sectors in a given State were selected. The sample consists of 252 electric utilities. This includes a somewhat larger number of State-service areas for electric utilities. Estimation procedures include imputation to account for non-response. State-level sales-and-revenue estimates are calculated. Also, a ratio estimation procedure is used for

estimation of average revenue per kilowatthour at the State level. These estimates are accumulated separately to produce estimates for Census division and U.S. levels.

The coefficient of variation (CV) statistic, usually given as a percent, is an estimate that describes the magnitude of sampling error that might reasonably be incurred. The CV, sometimes referred to as the relative standard error, is the square root of the estimated relative variance of the variable of interest. The variable of interest may be a single variable (for example, sales) or it may be the ratio of two variables (for example, revenue to sales).

CV's were not specifically designed to account for nonsampling errors, such as errors of misclassification or transposed digits. They are, however, affected by nonsampling errors. Using the Central Limit Theorem, which applies to sums and means, there is an approximate 68-percent chance that the true sampling error is less than the corresponding CV, when there is no nonsampling error. In reality, a large CV often is caused by a large nonsampling error that the system has failed, up to that point, to correct. Several large nonsampling errors have been found this way.

As an example of an ordinary application of CVs, suppose that a revenue-per-kilowatthour value is estimated to be 5.13 cents per kilowatthour with an estimated CV of 1.6 percent. This means that, ignoring any nonsampling error, there is approximately a 68-percent chance that the true average revenue per kilowatthour is within approximately 1.6 percent of 5.13 cents per kilowatthour (that is, between 5.05 and 5.21 cents per kilowatthour). There is approximately a 95-percent chance of a true sampling error being 2 CV's or less.

For sales or revenue in any sector at the State level, if we let x represent an observation from the Form EIA-861, y represents an observation from the Form EIA-826, and $\hat{y}$ represents an estimated value for data not collected, then

$$y_i = b x_i + x_i^{\gamma} e_{o_i},$$

$$\hat{y}_i = \hat{b} x_i,$$

$$\hat{b}(\gamma) = \left[\sum_{k=1}^{n} x_k^{1-2\gamma} y_k\right] / \left[\sum_{k=1}^{n} x_k^{2-2\gamma}\right]$$

Here, n is the Form EIA-826 sample size for that State, and b is the factor ('slope') relating x to y in the linear regression. γ is taken to be 1/2 although more research could refine this. For the Form EIA-826, $\gamma = 1/2$ has been shown to be robust.

CV estimates may also be provided for **annualized estimates** of sales and revenue. These CV estimates may be biased to larger than actual values, in general, because covariances between the various months of data are ignored. Even so, many of these estimates are less than one percent, and the national level estimates are quite small. Also, note that experience with past test data indicates that when CV estimates are only a few tenths of a percent, they may often be biased high even before aggregation. (However, the opposite may be true for somewhat larger CVs.) Thus, these CV estimates, especially at the national level, are likely to be over estimated. Further, CV estimates, although designed to measure sampling error, are impacted by nonsampling error. This along with information given in the *Electric Power Monthly* (EPM) Table B2, "Comparison of Preliminary Versus Final Published Data at the U.S. Level," and Table B4, "Comparison of Sample Versus Census Published Data at the U.S. Level by End-Use Sector," give a fairly good indication of overall data accuracy.

Sales and revenue data are expected, generally, to be highly positively correlated, and when estimating CV's for average revenue per kilowatthour, that covariance should not be ignored.[22] A covariance formula to handle this was developed by Professor Poduri S.R.S. Rao.

(For additional technical information, see the EPM, April 1995, page 254).

Form EIA-860

Data for the Form EIA-860 are submitted at the generating unit level and then aggregated by energy source, prime mover, and geographic area. Estimated values for net summer and net winter capability for nonnuclear electric generating units were developed by use of a regression formula, using year-end 1992 data on net summer capability, net winter capability, and generator nameplate capacity of units in commercial operation during three intervals of time: 1940 or earlier, 1941 through 1980, and 1981 to present.[23]

[22] This model is discussed in Knaub, J.R., Jr. (1994), "Relative Standard Error for a Ratio of Variables at an Aggregate Level Under Model Sampling," *Proceedings of the Section on Survey Research Methods*, pp. 310-312, American Statistical Association.

[23] Respondents report summer and winter capability and nameplate for all nuclear units.

A heterogeneous, zero-intercept linear regression model with generator nameplate capacity (expressed in kilowatts) as the regressor data was used since examination of the data shows that the intercepts are generally near zero.[24] [25]

In all formulas, the symbol, *, is an operator meaning multiplied by.

For nonnuclear units,

Net Capability = b*(Nameplate Capacity),

where

b, represents the slope or factor by which nameplate capacity has to be multiplied to obtain a capability estimate.

Using this model in the following,

δ represents the standard error for b.

Net Summer Capability

b = .90, δ = .04, 1940 or earlier; b = .927, δ = .002, 1941-1980; b = .937, δ = .004, 1981 through present, for coal steam units (Unit Types, ST, AB, PB)

b = 1.00, δ = .03, 1940 or earlier; b = .961, δ = .002, 1941 - 1980; b = .93, δ = .01, 1981 through present, for noncoal steam units (Unit Types, ST, AB, PB)

b = .856, δ = .003, 1980 or earlier; b = .85, δ = .01, 1981 through present, for gas-turbine units (Unit Types, GT, JE).

b = .94, δ = .01, 1940 or earlier; b = .84, δ = .01, 1941 - 1980; b = .86, δ = .02, 1981 through present, for combined-cycle units (Unit Types, CA, CS, CW, CT, IG)

b = .884, δ = .009, 1940 or earlier; b = .925, δ = .002, 1941 - 1980; b = .976, δ = .003, 1981 through present, for internal combustion units (Unit Type, IC)

b = .975, δ = .005, 1940 or earlier; b = 1.034, δ = .004, 1941 - 1980; b = .950, δ = .008, 1981 through present, for conventional and pipeline hydroelectric units (Unit Types, HC, HL)

b = .93, δ = .03, 1940 or earlier; b = 1.03, δ = .01, 1941 - 1980; b = 1.01, δ = .006, 1981 through present, for pumped-storage hydroelectric units (Unit Type, HR)

b = 1, for all other units (Including Unit Types, CG, FC, GE, OC, SP, SS, WT), where limited data are available.

Net Winter Capability

b = .88, δ = .05, 1940 or earlier; b = .934, δ = .002, 1941 - 1980; b = .940, δ = .004, 1981 through present, for coal steam units (Unit Types, ST, AB, PB)

b = 1.02, δ = .03, 1940 or earlier; b = .965, δ = .002, 1941 - 1980; b = .94, δ = .01, 1981 through present, for noncoal steam units (Unit Types, ST, AB, PB)

b = 1.023, δ = .004, 1980 or earlier; b = .98, δ = .01, 1981 through present, for gas-turbine units (Unit Types, GT, JE)

b = 1.02, δ = .03, 1940 or earlier; b = .96, δ = .01, 1941 - 1980; b = .94, δ = .02, 1981 through present, for combined-cycle units (Unit Types, CA, CS, CW, CT, IG)

b = .893, δ = .008, 1940 or earlier; b = .940, δ = .002, 1941 - 1980; b = .987, δ = .002, 1981 through present, for internal combustion units (Unit Type, IC)

b = .979, δ = .005, 1940 or earlier; b = 1.026, δ = .004, 1941 - 1980; b = .92, δ = .01, 1981 through present, for conventional and pipeline hydroelectric units (Unit Types, HC, HL)

b = .96, δ = .05, 1940 or earlier; b = 1.02, δ = .01, 1941 - 1980; b = 1.03, δ = .01, 1981 through present, for pumped-storage hydroelectric units (Unit Type, HR)

b = 1, for all other units (Unit Types, FC, GE, OC, SP, SS, WT, CG), where limited data are available.

General Information

Use of the Glossary

The terms in the glossary have been defined for general use. Restrictions on the definitions as used in these data collection systems are included in each definition when necessary to define the terms as they are used in this report.

[24] See model 4.1 in Knaub, J.R., Jr. (1997), "Weighting in Regression for Use in Survey Methodology," April 1997, *Interstat*, on the Internet, http://interstat.stat.vt.edu/Interstat, shown here under Form EIA-826.

[25] For a more general formula for the related estimate of the total, "T," see section 4 of "Weighted Multiple Regression Estimation for Survey Model Sampling," May 1996, *Interstat*, on the Internet, http://interstat.stat.vt.edu/Interstat.

Table A1. Unit-of-Measure Equivalents

Unit	Equivalent		
Kilowatt (kW)	1,000	(One Thousand)	Watts
Megawatt (MW)	1,000,000	(One Million)	Watts
Gigawatt (GW)	1,000,000,000	(One Billion)	Watts
Terawatt (TW)	1,000,000,000,000	(One Trillion)	Watts
Gigawatt	1,000,000	(One Million)	Kilowatts
Thousand Gigwatts	1,000,000,000	(One Billion)	Kilowatts
Kilowatthours (kWh)	1,000	(One Thousand)	Watthours
Megawatthours (Mwh)	1,000,000	(One Million)	Watthours
Gigawatthours (Gwh)	1,000,000,000	(One Billion)	Watthours
Terawatthours (Twh)	1,000,000,000,000	(One Trillion)	Watthours
Gigawatthours	1,000,000	(One Million)	Kilowatthours
Thousand Gigawatthours	1,000,000,000	(One Billion)	Kilowatthours
U.S. Dollar	1,000	(One Thousand)	Mills
U.S. Cent	10	(Ten)	Mills

Source: Energy Information Administration, Coal and Electric Data and Renewables Division.

Table A2. Metric Conversion

Type of Unit	U.S. Unit	*multiplied by*	Conversion Factor	*equals*	Metric Unit
Mass	short tons (2,000 lb)	x	0.907 184 7	=	metric tons (t)
	pounds (lb)	x	0.453 592 37[a]	=	kilograms (kg)
Volume	barrels of oil (bbl)	x	0.158 987 3	=	cubic meters (m^3)
	cubic feet (ft^3)	x	0.028 316 85	=	cubic meters (m^3)
	U.S. gallons (gal)	x	3.785 412	=	liters (L)
Energy	British thermal units (Btu)	x	1,055.055 852 62[ab]	=	joules (J)

[a]Exact conversion.
[b]The Btu used in this table is the International Table Btu adopted by the Fifth International Conference on Properties of Steam, London, 1956.

Notes: ●Spaces have been inserted after every third digit to the right of the decimal for ease of reading. ●Most metric units belong to the International System of Units (SI), and the liter and metric ton are acceptable for use with the SI units.

Sources: ●General Services Administration, Federal Standard 376B, *Preferred Metric Units for General Use by the Federal Government* (Washington, DC, January 27, 1993), pp. 9-11, 13, and 16. ●National Institute of Standards and Technology, Special Publications 330, 811, and 814. ●American National Standards Institute/Institute of Electrical and Electronic Engineers, SVIEEE Std 268-1992, pp. 28 and 29.

Glossary

Acid Rain: Also called acid precipitation or acid deposition, acid rain is precipitation containing harmful amounts of nitric and sulfuric acids formed primarily by nitrogen oxides and sulfur oxides released into the atmosphere when fossil fuels are burned. It can be wet precipitation (rain, snow, or fog) or dry precipitation (absorbed gaseous and particulate matter, aerosol particles or dust). Acid rain has a pH below 5.6. Normal rain has a pH of about 5.6, which is slightly acidic. The term pH is a measure of acidity or alkalinity and ranges from 0 to 14. A pH measurement of 7 is regarded as neutral. Measurements below 7 indicate increased acidity, while those above indicate increased alkalinity.

Ampere: The unit of measurement of electrical current produced in a circuit by 1 volt acting through a resistance of 1 ohm.

Anthracite: A hard, black lustrous coal, often referred to as hard coal, containing a high percentage of fixed carbon and a low percentage of volatile matter. Comprises three groups classified according to the following ASTM Specification D388-84, on a dry mineral-matter-free basis:

	Fixed Carbon Limits		Volatile Matter	
	GE	LT	GT	LE
Meta-Anthracite	98	-	-	2
Anthracite	92	98	2	8
Semianthracite	86	92	8	14

Ash: Impurities consisting of silica, iron, alumina, and other noncombustible matter that are contained in coal. Ash increases the weight of coal, adds to the cost of handling, and can affect its burning characteristics. Ash content is measured as a percent by weight of coal on an :q.as received:eq. or a "dry" (moisture-free, usually part of a laboratory analysis) basis.

Available but not Needed Capability: Net capability of main generating units that are operable but not considered necessary to carry load, and cannot be connected to load within 30 minutes.

Average Revenue per Kilowatthour: The average revenue per kilowatthour of electricity sold by sector (residential, commercial, industrial, or other) and geographic area (State, Census division, and national), is calculated by dividing the total monthly revenue by the corresponding total monthly sales for each sector and geographic area.

Barrel: A volumetric unit of measure for crude oil and petroleum products equivalent to 42 U.S. gallons.

Base Bill: A charge calculated through multiplication of the rate from the appropriate electric rate schedule by the level of consumption.

Baseload: The minimum amount of electric power delivered or required over a given period of time at a steady rate.

Baseload Capacity: The generating equipment normally operated to serve loads on an around-the-clock basis.

Baseload Plant: A plant, usually housing high-efficiency steam-electric units, which is normally operated to take all or part of the minimum load of a system, and which consequently produces electricity at an essentially constant rate and runs continuously. These units are operated to maximize system mechanical and thermal efficiency and minimize system operating costs.

Bbl: The abbreviation for barrel.

Bcf: The abbreviation for 1 billion cubic feet.

Bituminous Coal: The most common coal. It is dense and black (often with well-defined bands of bright and dull material). Its moisture content usually is less than 20 percent. It is used for generating electricity, making coke, and space heating. Comprises five groups classified according to the following ASTM Specification D388-84, on a dry mineral-matter-free (mmf) basis for fixed-carbon and volatile matter and a moist mmf basis for calorific value.

	Fixed Carbon Limits		Volatile Matter Limits		Calorific Value Limits Btu / lb	
	GE	LT	GT	LT	GE	LE
LV	78	86	14	22	-	-
MV	69	78	22	31	-	-
HVA	-	69	31	-	14000	-
HVB	-	-	-	-	13000	14000
HVC	-	-	-	-	10500	13000

LV = Low-volatile bituminous coal
MV = Medium-volatile bituminous coal
HVA = High-volatile A bituminous coal
HVB = High-volatile B bituminous coal
HVC = High-volatile C bituminous coal

Boiler: A device for generating steam for power, processing, or heating purposes or for producing hot water for heating purposes or hot water supply. Heat from an external combustion source is transmitted to a fluid contained within the tubes in the boiler shell. This fluid is delivered to an end-use at a desired pressure, temperature, and quality.

Btu (British Thermal Unit): A standard unit for measuring the quantity of heat energy equal to the quantity of heat required to raise the temperature of 1 pound of water by 1 degree Fahrenheit.

Capability: The maximum load that a generating unit, generating station, or other electrical apparatus can carry under specified conditions for a given period of time without exceeding approved limits of temperature and stress.

Capacity: The amount of electric power delivered or required for which a generator, turbine, transformer, transmission circuit, station, or system is rated by the manufacturer.

Capacity (Purchased): The amount of energy and capacity available for purchase from outside the system.

Capacity Charge: An element in a two-part pricing method used in capacity transactions (energy charge is the other element). The capacity charge, sometimes called Demand Charge, is assessed on the amount of capacity being purchased.

Census Divisions: The nine geographic divisions of the United States established by the Bureau of the Census, U.S. Department of Commerce, for the purpose of statistical analysis. The boundaries of Census divisions coincide with State boundaries. The Pacific Division is subdivided into the Pacific Contiguous and Pacific Noncontiguous areas.

Circuit: A conductor or a system of conductors through which electric current flows.

Coal: A black or brownish-black solid combustible substance formed by the partial decomposition of vegetable matter without access to air. The rank of coal, which includes anthracite, bituminous coal, subbituminous coal, and lignite, is based on fixed carbon, volatile matter, and heating value. Coal rank indicates the progressive alteration from lignite to anthracite. Lignite contains approximately 9 to 17 million Btu per ton. The contents of subbituminous and bituminous coal range from 16 to 24 million Btu per ton and from 19 to 30 million Btu per ton, respectively. Anthracite contains approximately 22 to 28 million Btu per ton.

Cogenerator: A generating facility that produces electricity and another form of useful thermal energy (such as heat or steam), used for industrial, commercial, heating, or cooling purposes. To receive status as a qualifying facility (QF) under the Public Utility Regulatory Policies Act (PURPA), the facility must produce electric energy and :q.another form of useful thermal energy through the sequential use of energy,:eq. and meet certain ownership, operating, and efficiency criteria established by the Federal Energy Regulatory Commission (FERC). (See the Code of Federal Regulations, Title 18, Part 292.)

Coincidental Demand: The sum of two or more demands that occur in the same time interval.

Coincidental Peak Load: The sum of two or more peakloads that occur in the same time interval.

Coke (Petroleum): A residue high in carbon content and low in hydrogen that is the final product of thermal decomposition in the condensation process in cracking. This product is reported as marketable coke or catalyst coke. The conversion factor is 5 barrels (42 U.S. gallons each) per short ton.

Combined Cycle: An electric generating technology in which electricity is produced from otherwise lost waste heat exiting from one or more gas (combustion) turbines. The exiting heat is routed to a conventional boiler or to a heat recovery steam generator for utilization by a steam turbine in the production of electricity. This process increases the efficiency of the electric generating unit.

Combined Cycle Unit: An electric generating unit that consists of one or more combustion turbines and one or more boilers with a portion of the required energy input to the boiler(s) provided by the exhaust gas of the combustion turbine(s).

Combined Pumped-Storage Plant: A pumped-storage hydroelectric power plant that uses both pumped water and natural streamflow to produce electricity.

Commercial: The commercial sector is generally defined as nonmanufacturing business establishments, including hotels, motels, restaurants, wholesale businesses, retail stores, and health, social, and educational institutions. The utility may classify commercial service as all consumers whose demand or annual use exceeds some specified limit. The limit may be set by the utility based on the rate schedule of the utility.

Commercial Operation: Commercial operation begins when control of the loading of the generator is turned over to the system dispatcher.

Consumption (Fuel): The amount of fuel used for gross generation, providing standby service, start-up and/or flame stabilization.

Contract Price: Price of fuels marketed on a contract basis covering a period of 1 or more years. Contract prices reflect market conditions at the time the contract was negotiated and therefore remain constant throughout the life of the contract or are adjusted through escalation clauses. Generally, contract prices do not fluctuate widely.

Contract Receipts: Purchases based on a negotiated agreement that generally covers a period of 1 or more years.

Cooperative Electric Utility: An electric utility legally established to be owned by and operated for the benefit of those using its service. The utility company will generate, transmit, and/or distribute supplies of electric energy to a specified area not being serviced by another utility. Such ventures are generally exempt from Federal income tax laws. Most electric cooperatives have been initially financed by the Rural Electrification Administration, U.S. Department of Agriculture.

Cost: The amount paid to acquire resources, such as plant and equipment, fuel, or labor services.

Current (Electric): A flow of electrons in an electrical conductor. The strength or rate of movement of the electricity is measured in amperes.

Demand (Electric): The rate at which electric energy is delivered to or by a system, part of a system, or piece of equipment, at a given instant or averaged over any designated period of time.

Demand-Side Management: The planning, implementation, and monitoring of utility activities designed to encourage consumers to modify patterns of electricity usage, including the timing and level of electricity demand. It refers only to energy and load-shape modifying activities that are undertaken in response to utility-administered programs. It does not refer to energy and load-shape changes arising from the normal operation of the marketplace or from government-mandated energy-efficiency standards. Demand-Side Management (DSM) covers the complete range of load-shape objectives, including strategic conservation and load management, as well as strategic load growth.

Distillate Fuel Oil: A general classification for one of the petroleum fractions produced in conventional distillation operations. It is used primarily for space heating, on-and-off-highway diesel engine fuel (including railroad engine fuel and fuel for agriculture machinery), and electric power generation. Included are Fuel Oils No. 1, No. 2, and No. 4; and Diesel Fuels No. 1, No. 2, and No. 4.

Distribution System: The portion of an electric system that is dedicated to delivering electric energy to an end user.

Electric Plant (Physical): A facility containing prime movers, electric generators, and auxiliary equipment for converting mechanical, chemical, and/or fission energy into electric energy.

Electric Rate Schedule: A statement of the electric rate and the terms and conditions governing its application, including attendant contract terms and conditions that have been accepted by a regulatory body with appropriate oversite authority.

Electric Utility: A corporation, person, agency, authority, or other legal entity or instrumentality that owns and/or operates facilities within the United States, its territories, or Puerto Rico for the generation, transmission, distribution, or sale of electric energy primarily for use by the public and files forms listed in the Code of Federal Regulations, Title 18, Part 141. Facilities that qualify as cogenerators or small power producers under the Public Utility Regulatory Policies Act (PURPA) are not considered electric utilities.

Energy: The capacity for doing work as measured by the capability of doing work (potential energy) or the conversion of this capability to motion (kinetic energy). Energy has several forms, some of which are easily convertible and can be changed to another form useful for work. Most of the world's convertible energy comes from fossil fuels that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. Electrical energy is usually measured in kilowatthours, while heat energy is usually measured in British thermal units.

Energy Charge: That portion of the charge for electric service based upon the electric energy (kWh) consumed or billed.

Energy Deliveries: Energy generated by one electric utility system and delivered to another system through one or more transmission lines.

Energy Efficiency: Refers to programs that are aimed at reducing the energy used by specific end-use devices and systems, typically without affecting the services provided. These programs reduce overall electricity consumption (reported in megawatthours), often without explicit consideration for the timing of program-induced savings. Such savings are generally achieved by substituting technically more advanced equipment to produce the same level of end-use services (e.g. lighting, heating, motor drive) with less electricity. Examples include high-efficiency appliances, efficient lighting programs, high-efficiency heating, ventilating and air conditioning (HVAC) systems or control modifications, efficient building design, advanced electric motor drives, and heat recovery systems.

Energy Receipts: Energy generated by one electric utility system and received by another system through one or more transmission lines.

Energy Source: The primary source that provides the power that is converted to electricity through chemical, mechanical, or other means. Energy sources include coal, petroleum and petroleum products, gas, water, uranium, wind, sunlight, geothermal, and other sources.

Facility: An existing or planned location or site at which prime movers, electric generators, and / or equipment for converting mechanical, chemical, and / or nuclear energy into electric energy are situated, or will be situated. A facility may contain more than one generator of either the same or different prime mover type. For a cogenerator, the facility includes the industrial or commercial process.

Federal Energy Regulatory Commission (FERC): A quasi-independent regulatory agency within the Department of Energy having jurisdiction over interstate electricity sales, wholesale electric rates, hydroelectric licensing, natural gas pricing, oil pipeline rates, and gas pipeline certification.

Federal Power Act: Enacted in 1920, and amended in 1935, the Act consists of three parts. The first part incorporated the Federal Water Power Act administered by the former Federal Power Commission, whose activities were confined almost entirely to licensing non-Federal hydroelectric projects. Parts II and III were added with the passage of the Public Utility Act. These parts extended the Act's jurisdiction to include regulating the interstate transmission of electrical energy and rates for its sale as wholesale in interstate commerce. The Federal Energy Regulatory Commission is now charged with the administration of this law.

Federal Power Commission: The predecessor agency of the Federal Energy Regulatory Commission. The Federal Power Commission (FPC) was created by an Act of Congress under the Federal Water Power Act on June 10, 1920. It was charged originally with regulating the electric power and natural gas industries. The FPC was abolished on September 20, 1977, when the Department of Energy was created. The functions of the FPC were divided between the Department of Energy and the Federal Energy Regulatory Commission.

FERC: The Federal Energy Regulatory Commission.

Firm Gas: Gas sold on a continuous and generally long-term contract.

Firm Power: Power or power-producing capacity intended to be available at all times during the period covered by a guaranteed commitment to deliver, even under adverse conditions.

Flue Gas Desulfurization Unit (Scrubber): Equipment used to remove sulfur oxides from the combustion gases of a boiler plant before discharge to the atmosphere. Chemicals, such as lime, are used as the scrubbing media.

Flue Gas Particulate Collectors: Equipment used to remove fly ash from the combustion gases of a boiler plant before discharge to the atmosphere. Particulate collectors include electrostatic precipitators, mechanical collectors (cyclones), fabric filters (baghouses), and wet scrubbers.

Fly Ash: Particule matter from coal ash in which the particle diameter is less than 1×10^{-4} meter. This is removed from the flue gas using flue gas particulate collectors such as fabric filters and electrostatic precipitators.

Forced Outage: The shutdown of a generating unit, transmission line or other facility, for emergency reasons or a condition in which the generating equipment is unavailable for load due to unanticipated breakdown.

Fossil Fuel: Any naturally occurring organic fuel, such as petroleum, coal, and natural gas.

Fossil-Fuel Plant: A plant using coal, petroleum, or gas as its source of energy.

Fuel: Any substance that can be burned to produce heat; also, materials that can be fissioned in a chain reaction to produce heat.

Fuel Expenses: These costs include the fuel used in the production of steam or driving another prime mover for the generation of electricity. Other associated expenses include unloading the shipped fuel and all handling of

the fuel up to the point where it enters the first bunker, hopper, bucket, tank, or holder in the boiler-house structure.

Full-Forced Outage: The net capability of main generating units that is unavailable for load for emergency reasons.

Gas: A fuel burned under boilers and by internal combustion engines for electric generation. These include natural, manufactured and waste gas.

Gas Turbine Plant: A plant in which the prime mover is a gas turbine. A gas turbine consists typically of an axial-flow air compressor, one or more combustion chambers, where liquid or gaseous fuel is burned and the hot gases are passed to the turbine and where the hot gases expand to drive the generator and are then used to run the compressor.

Generating Unit: Any combination of physically connected generator(s), reactor(s), boiler(s), combustion turbine(s), or other prime mover(s) operated together to produce electric power.

Generation (Electricity): The process of producing electric energy by transforming other forms of energy; also, the amount of electric energy produced, expressed in watthours (Wh).

Gross Generation: The total amount of electric energy produced by the generating units at a generating station or stations, measured at the generator terminals.

Net Generation: Gross generation less the electric energy consumed at the generating station for station use.

Generator: A machine that converts mechanical energy into electrical energy.

Generator Nameplate Capacity: The full-load continuous rating of a generator, prime mover, or other electric power production equipment under specific conditions as designated by the manufacturer. Installed generator nameplate rating is usually indicated on a nameplate physically attached to the generator.

Geothermal Plant: A plant in which the prime mover is a steam turbine. The turbine is driven either by steam produced from hot water or by natural steam that derives its energy from heat found in rocks or fluids at various depths beneath the surface of the earth. The energy is extracted by drilling and/or pumping.

Gigawatt (GW): One billion watts.

Gigawatthour (GWh): One billion watthours.

Greenhouse Effect: The increasing mean global surface temperature of the earth caused by gases in the atmosphere (including carbon dioxide, methane, nitrous oxide, ozone, and chlorofluorocarbon). The greenhouse effect allows solar radiation to penetrate but absorbs the infrared radiation returning to space.

Grid: The layout of an electrical distribution system.

Gross Generation: The total amount of electric energy produced by a generating facility, as measured at the generator terminals.

Heavy Oil: The fuel oils remaining after the lighter oils have been distilled off during the refining process. Except for start-up and flame stabilization, virtually all petroleum used in steam plants is heavy oil.

Hydroelectric Plant: A plant in which the turbine generators are driven by falling water.

Industrial: The industrial sector is generally defined as manufacturing, construction, mining agriculture, fishing and forestry establishments Standard Industrial Classification (SIC) codes 01-39. The utility may classify industrial service using the SIC codes, or based on demand or annual usage exceeding some specified limit. The limit may be set by the utility based on the rate schedule of the utility.

Intermediate Load (Electric System): The range from base load to a point between base load and peak. This point may be the midpoint, a percent of the peakload, or the load over a specified time period.

Internal Combustion Plant: A plant in which the prime mover is an internal combustion engine. An internal combustion engine has one or more cylinders in which the process of combustion takes place, converting energy released from the rapid burning of a fuel-air mixture into mechanical energy. Diesel or gas-fired engines are the principal types used in electric plants. The plant is usually operated during periods of high demand for electricity.

Interruptible Gas: Gas sold to customers with a provision that permits curtailment or cessation of service at the discretion of the distributing company under certain circumstances, as specified in the service contract.

Interruptible Load: Refers to program activities that, in accordance with contractual arrangements, can interrupt consumer load at times of seasonal peak load by direct control of the utility system operator or by action of the consumer at the direct request of the system operator. It usually involves commercial and industrial consumers. In some instances the load reduction may be affected by direct action of the system operator (remote tripping) after

notice to the consumer in accordance with contractual provisions. For example, loads that can be interrupted to fulfill planning or operation reserve requirements should be reported as Interruptible Load. Interruptible Load as defined here excludes Direct Load Control and Other Load Management. (Interruptible Load, as reported here, is synonymous with Interruptible Demand reported to the North American Electric Reliability Council on the voluntary Office of Energy Emergency Operations Form OE-411, "Coordinated Regional Bulk Power Supply Program Report," with the exception that annual peakload effects are reported on the Form EIA-861 and seasonal (i.e., summer and winter) peakload effects are reported on the OE-411).

Kilowatt (kW): One thousand watts.

Kilowatthour (kWh): One thousand watthours.

Light Oil: Lighter fuel oils distilled off during the refining process. Virtually all petroleum used in internal combustion and gas-turbine engines is light oil.

Lignite: A brownish-black coal of low rank with high inherent moisture and volatile matter (used almost exclusively for electric power generation). It is also referred to as brown coal. Comprises two groups classified according to the following ASTM Specification D388-84 for calorific values on a moist material-matter-free basis

	Limits Btu / lb.	
	GE	LT
Lignite A	6300	8300
Lignite B	-	6300

Load (Electric): The amount of electric power delivered or required at any specific point or points on a system. The requirement originates at the energy-consuming equipment of the consumers.

Maximum Demand: The greatest of all demands of the load that has occurred within a specified period of time.

Mcf: One thousand cubic feet.

Megawatt (MW): One million watts.

Megawatthour (MWh): One million watthours.

MMcf: One million cubic feet.

Natural Gas: A naturally occurring mixture of hydrocarbon and nonhydrocarbon gases found in porous geological formations beneath the earth's surface, often in association with petroleum. The principal constituent is methane.

Net Capability: The maximum load-carrying ability of the equipment, exclusive of station use, under specified conditions for a given time interval, independent of the characteristics of the load. (Capability is determined by design characteristics, physical conditions, adequacy of prime mover, energy supply, and operating limitations such as cooling and circulating water supply and temperature, headwater and tailwater elevations, and electrical use.)

Net Generation: Gross generation minus plant use from all electric utility owned plants. The energy required for pumping at a pumped-storage plant is regarded as plant use and must be deducted from the gross generation.

Net Summer Capability: The steady hourly output, which generating equipment is expected to supply to system load exclusive of auxiliary power, as demonstrated by tests at the time of summer peak demand.

Net Winter Capability: The steady hourly output which generating equipment is expected to supply to system load exclusive of auxiliary power, as demonstrated by tests at the time of winter peak demand.

Noncoincidental Peak Load: The sum of two or more peakloads on individual systems that do not occur in the same time interval. Meaningful only when considering loads within a limited period of time, such as a day, week, month, a heating or cooling season, and usually for not more than 1 year.

Non-Firm Power: Power or power-producing capacity supplied or available under a commitment having limited or no assured availability.

Nonutility Power Producer: A corporation, person, agency, authority, or other legal entity or instrumentality that owns electric generating capacity and is not an electric utility. Nonutility power producers include qualifying cogenerators, qualifying small power producers, and other nonutility generators (including independent power producers) without a designated franchised service area, and which do not file forms listed in the Code of Federal Regulations, Title 18, Part 141.

Nuclear Fuel: Fissionable materials that have been enriched to such a composition that, when placed in a nuclear reactor, will support a self-sustaining fission chain reaction, producing heat in a controlled manner for process use.

Nuclear Power Plant: A facility in which heat produced in a reactor by the fissioning of nuclear fuel is used to drive a steam turbine.

Off-Peak Gas: Gas that is to be delivered and taken on demand when demand is not at its peak.

Ohm: The unit of measurement of electrical resistance. The resistance of a circuit in which a potential difference of 1 volt produces a current of 1 ampere.

Operable Nuclear Unit: A nuclear unit is :q.operable:eq. after it completes low-power testing and is granted authorization to operate at full power. This occurs when it receives its full power amendment to its operating license from the Nuclear Regulatory Commission.

Outage: The period during which a generating unit, transmission line, or other facility is out of service.

Peak Demand: The maximum load during a specified period of time.

Peak Load Plant: A plant usually housing old, low-efficiency steam units; gas turbines; diesels; or pumped-storage hydroelectric equipment normally used during the peak-load periods.

Peaking Capacity: Capacity of generating equipment normally reserved for operation during the hours of highest daily, weekly, or seasonal loads. Some generating equipment may be operated at certain times as peaking capacity and at other times to serve loads on an around-the-clock basis.

Percent Difference: The relative change in a quantity over a specified time period. It is calculated as follows: the current value has the previous value subtracted from it; this new number is divided by the absolute value of the previous value; then this new number is multiplied by 100.

Petroleum: A mixture of hydrocarbons existing in the liquid state found in natural underground reservoirs, often associated with gas. Petroleum includes fuel oil No. 2, No. 4, No. 5, No. 6; topped crude; Kerosene; and jet fuel.

Petroleum Coke: See Coke (Petroleum).

Petroleum (Crude Oil): A naturally occurring, oily, flammable liquid composed principally of hydrocarbons. Crude oil is occasionally found in springs or pools but usually is drilled from wells beneath the earth's surface.

Planned Generator: A proposal by a company to install electric generating equipment at an existing or planned facility or site. The proposal is based on the owner having obtained (1) all environmental and regulatory approvals, (2) a signed contract for the electric energy, or (3) financial closure for the facility.

Plant: A facility at which are located prime movers, electric generators, and auxiliary equipment for converting mechanical, chemical, and/or nuclear energy into electric energy. A plant may contain more than one type of prime mover. Electric utility plants exclude facilities that satisfy the definition of a qualifying facility under the Public Utility Regulatory Policies Act of 1978.

Plant Use: The electric energy used in the operation of a plant. Included in this definition is the energy required for pumping at pumped-storage plants.

Plant-Use Electricity: The electric energy used in the operation of a plant. This energy total is subtracted from the gross energy production of the plant; for reporting purposes the plant energy production is then reported as a net figure. The energy required for pumping at pumped-storage plants is, by definition, subtracted, and the energy production for these plants is then reported as a net figure.

Power: The rate at which energy is transferred. Electrical energy is usually measured in watts. Also used for a measurement of capacity.

Power Pool: An association of two or more interconnected electric systems having an agreement to coordinate operations and planning for improved reliability and efficiencies.

Price: The amount of money or consideration-in-kind for which a service is bought, sold, or offered for sale.

Prime Mover: The engine, turbine, water wheel, or similar machine that drives an electric generator; or, for reporting purposes, a device that converts energy to electricity directly (e.g., photovoltaic solar and fuel cell(s)).

Profit: The income remaining after all business expenses are paid.

Public Authority Service to Public Authorities: Public authority service includes electricity supplied and services rendered to municipalities or divisions or agencies of State or Federal governments, under special contracts or agreements or service classifications applicable only to public authorities.

Public Street and Highway Lighting: Public street and highway lighting includes electricity supplied and services rendered for the purposes of lighting streets, highways, parks, and other public places; or for traffic or other signal system service, for municipalities, or other divisions or agencies of State or Federal governments.

Pumped-Storage Hydroelectric Plant: A plant that usually generates electric energy during peak-load periods by using water previously pumped into an elevated storage reservoir during off-peak periods when excess generating capacity is available to do so. When additional generating capacity is needed, the water can be released from the reservoir through a conduit to turbine generators located in a power plant at a lower level.

Purchased Power Adjustment: A clause in a rate schedule that provides for adjustments to the bill when energy from another electric system is acquired and it varies from a specified unit base amount.

Pure Pumped-Storage Hydroelectric Plant: A plant that produces power only from water that has previously been pumped to an upper reservoir.

Qualifying Facility (QF): A cogeneration or small power production facility that meets certain ownership, operating, and efficiency criteria established by the Federal Energy Regulatory Commission (FERC) pursuant to the Public Utility Regulatory Policies Act (PURPA). (See the Code of Federal Regulations, Title 18, Part 292.) Part 292.

Railroad and Railway Services: Railroad and railway services include electricity supplied and services rendered to railroads and interurban and street railways, for general railroad use, including the propulsion of cars or locomotives, where such electricity is supplied under separate and distinct rate schedules.

Rate Base: The value of property upon which a utility is permitted to earn a specified rate of return as established by a regulatory authority. The rate base generally represents the value of property used by the utility in providing service and may be calculated by any one or a combination of the following accounting methods: fair value, prudent investment, reproduction cost, or original cost. Depending on which method is used, the rate base includes cash, working capital, materials and supplies, and deductions for accumulated provisions for depreciation, contributions in aid of construction, customer advances for construction, accumulated deferred income taxes, and accumulated deferred investment tax credits.

Ratemaking Authority: A utility commission's legal authority to fix, modify, approve, or disapprove rates, as determined by the powers given the commission by a State or Federal legislature.

Receipts: Purchases of fuel.

Regulation: The governmental function of controlling or directing economic entities through the process of rulemaking and adjudication.

Reserve Margin (Operating): The amount of unused available capability of an electric power system at peakload for a utility system as a percentage of total capability.

Residential: The residential sector is defined as private household establishments which consume energy primarily for space heating, water heating, air conditioning, lighting, refrigeration, cooking and clothes drying. The classification of an individual consumer's account, where the use is both residential and commercial, is based on principal use. For the residential class, do not duplicate consumer accounts due to multiple metering for special services (water, heating, etc.). Apartment houses are also included.

Residual Fuel Oil: The topped crude of refinery operation, includes No. 5 and No. 6 fuel oils as defined in ASTM Specification D396 and Federal Specification VV-F-815C; Navy Special fuel oil as defined in Military Specification MIL-F-859E including Amendment 2 (NATO Symbol F-77); and Bunker C fuel oil. Residual fuel oil is used for the production of electric power, space heating, vessel bunkering, and various industrial purposes. Imports of residual fuel oil include imported crude oil burned as fuel.

Restricted-Universe Census: This is the complete enumeration of data from a specifically defined subset of entities including, for example, those that exceed a given level of sales or generator nameplate capacity.

Retail: Sales covering electrical energy supplied for residential, commercial, and industrial end-use purposes. Other small classes, such as agriculture and street lighting, also are included in this category.

Revenue: The total amount of money received by a firm from sales of its products and/or services, gains from the sales or exchange of assets, interest and dividends earned on investments, and other increases in the owner's equity except those arising from capital adjustments.

Running and Quick-Start Capability: The net capability of generating units that carry load or have quick-start capability. In general, quick-start capability refers to generating units that can be available for load within a 30-minute period.

Sales: The amount of kilowatthours sold in a given period of time; usually grouped by classes of service, such as residential, commercial, industrial, and other. Other sales include public street and highway lighting, other sales to public authorities and railways, and interdepartmental sales.

Sales for Resale: Energy supplied to other electric utilities, cooperatives, municipalities, and Federal and State electric agencies for resale to ultimate consumers.

Scheduled Outage: The shutdown of a generating unit, transmission line, or other facility, for inspection or maintenance, in accordance with an advance schedule.

Short Ton: A unit of weight equal to 2,000 pounds.

Small Power Producer (SPP): Under the Public Utility Regulatory Policies Act (PURPA), a small power production facility (or small power producer) generates electricity using waste, renewable (water, wind and solar), or geothermal energy as a primary energy source. Fossil fuels can be used, but renewable resource must provide at least 75 percent of the total energy input. (See Code of Federal Regulations, Title 18, Part 292.)

Spinning Reserve: That reserve generating capacity running at a zero load and synchronized to the electric system.

Spot Purchases: A single shipment of fuel or volumes of fuel, purchased for delivery within 1 year. Spot purchases are often made by a user to fulfill a certain portion of energy requirements, to meet unanticipated energy needs, or to take advantage of low-fuel prices.

Stability: The property of a system or element by virtue of which its output will ultimately attain a steady state. The amount of power that can be transferred from one machine to another following a disturbance. The stability of a power system is its ability to develop restoring forces equal to or greater than the disturbing forces so as to maintain a state of equilibrium.

Standard Industrial Classification (SIC): A set of codes developed by the Office of Management and Budget, which categorizes business into groups with similar economic activities.

Standby Facility: A facility that supports a utility system and is generally running under no-load. It is available to replace or supplement a facility normally in service.

Standby Service: Support service that is available, as needed, to supplement a consumer, a utility system, or to another utility if a schedule or an agreement authorizes the transaction. The service is not regularly used.

Steam-Electric Plant (Conventional): A plant in which the prime mover is a steam turbine. The steam used to drive the turbine is produced in a boiler where fossil fuels are burned.

Stocks: A supply of fuel accumulated for future use. This includes coal and fuel oil stocks at the plant site, in coal cars, tanks, or barges at the plant site, or at separate storage sites.

Subbituminous Coal: Subbituminous coal, or black lignite, is dull black and generally contains 20 to 30 percent moisture. The heat content of subbituminous coal ranges from 16 to 24 million Btu per ton as received and averages about 18 million Btu per ton. Subbituminous coal, mined in the western coal fields, is used for generating electricity and space heating.

Substation: Facility equipment that switches, changes, or regulates electric voltage.

Sulfur: One of the elements present in varying quantities in coal which contributes to environmental degradation when coal is burned. In terms of sulfur content by weight, coal is generally classified as low (less than or equal to 1 percent), medium (greater than 1 percent and less than or equal to 3 percent), and high (greater than 3 percent). Sulfur content is measured as a percent by weight of coal on an "as received" or a "dry" (moisture-free, usually part of a laboratory analysis) basis.

Switching Station: Facility equipment used to tie together two or more electric circuits through switches. The switches are selectively arranged to permit a circuit to be disconnected, or to change the electric connection between the circuits.

System (Electric): Physically connected generation, transmission, and distribution facilities operated as an integrated unit under one central management, or operating supervision.

Transformer: An electrical device for changing the voltage of alternating current.

Transmission: The movement or transfer of electric energy over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers, or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer.

Transmission System (Electric): An interconnected group of electric transmission lines and associated equipment for moving or transferring electric energy in bulk between points of supply and points at which it is transformed for delivery over the distribution system lines to consumers, or is delivered to other electric systems.

Turbine: A machine for generating rotary mechanical power from the energy of a stream of fluid (such as water, steam, or hot gas). Turbines convert the kinetic energy of fluids to mechanical energy through the principles of impulse and reaction, or a mixture of the two.

Uniform System of Accounts: Prescribed financial rules and regulations established by the Federal Energy Regulatory Commission for utilities subject to its jurisdiction under the authority granted by the Federal Power Act.

Useful Thermal Output: The thermal energy made available for use in any industrial or commercial process, or used in any heating or cooling application, i.e., total thermal energy made available for processes and applications other than electrical generation.

Voltage Reduction: Any intentional reduction of system voltage by 3 percent or greater for reasons of maintaining the continuity of service of the bulk electric power supply system.

Watt: The electrical unit of power. The rate of energy transfer equivalent to 1 ampere flowing under a pressure of 1 volt at unity power factor.

Watthour (Wh): An electrical energy unit of measure equal to 1 watt of power supplied to, or taken from, an electric circuit steadily for 1 hour.

Wheeling Service: The movement of electricity from one system to another over transmission facilities of intervening systems. Wheeling service contracts can be established between two or more systems.

Wholesale Sales: Energy supplied to other electric utilities, cooperatives, municipals, and Federal and State electric agencies for resale to ultimate consumers.