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# Electric Power Annual 1999

## Volume I

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Technical information regarding the sources and quality of the data in this report is available in the *Electric Power Monthly*, DOE/EIA-0226, Technical Notes, which is accessible via the Internet at: http://www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html.

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# Preface

Section 205(A)(2) of the Department of Energy Organization Act of 1977 (Public Law 95-91) requires the Administrator of the Energy Information Administration (EIA) to carry out a central, comprehensive, and unified energy data information program. Under this program, EIA collects, evaluates, assembles, analyzes, and disseminates data and information relevant to energy resources, reserves, production, demand, technology, and related economic and statistical information.

The legislation that created EIA vested the organization with an element of statutory independence. EIA does not take positions on policy questions. The agency's responsibility is to provide timely, high-quality information and to perform objective, credible analyses in support of deliberations by both public and private decisionmakers. Accordingly, this report does not purport to represent the policy positions of the U.S. Department of Energy or the Administration.

The *Electric Power Annual 1999 Volume I* is intended for a wide audience, including Congress, Federal and State agencies, the electric power industry, and the general public. The primary purpose of this report is to provide an interpretative analysis of the domestic electric power industry's data collected by the EIA for the most recent year. Statistical information contained in this report include industry capability, generation, fossil-fuel consumption and stocks. Data on utility fossil-fuel receipts cost are also included.

Data on retail sales of electricity and average revenue per kilowatthour are also presented, as well as information on activities in the wholesale market by the electric power industry. (Information pertaining to wholesale trade was obtained from secondary sources.) In addition, developments designed to foster nondiscriminatory usage of transmission facilities (by proposing the formation of regional transmission organizations) and events related to industry restructuring are discussed.

Some discussions, tables, and figures may address utilities only, some nonutilities only, and others the electric power industry as a whole. The combination of utility and nonutility are referred to as "industry." Industry data are presented wherever possible to provide the most complete picture.

The *Electric Power Annual Volume II,* to be released later in the year, will provide additional annual summary statistics for the electric power industry, including information for both electric utilities and nonutilities. Volume II includes data on electric utility retail sales of electricity, associated revenue, and average revenue per kilowatthour of electricity sold; financial statistics; environmental statistics; power transactions; and demand-side management. Also included in the report are data on installed capacity, gross generation, emissions, and supply and disposition of energy for nonutilities.

The *Electric Power Annual Volume 1* can be accessed from EIA's Web Site on the Internet at: http://www.eia.doe.gov/cneaf/electricity/epav1/epav1_sum.html. Technical information regarding the sources and quality of the data in this report is available in the *Electric Power Monthly*, DOE/EIA-0226, via the Internet at: http://www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html.

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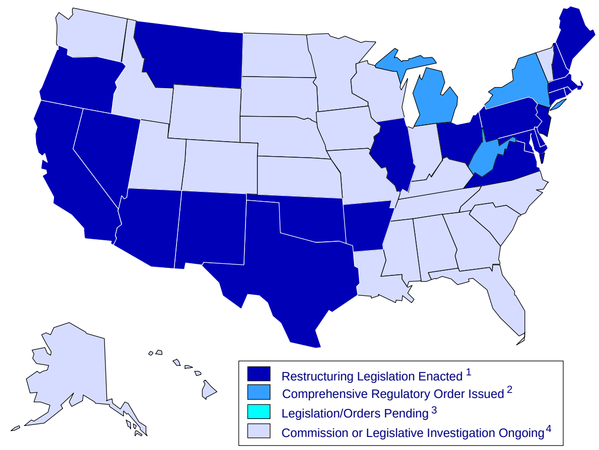
# Electric Power Industry: 1999

Restructuring of the electric power industry (referred to as "industry" in this report) in the United States is continuing with electricity generation markets being opened to competition. The passage of the Energy Policy Act of 1992 and the subsequent issuance of Order Nos. 888 and 889 by the Federal Energy Regulatory Commission (FERC) in 1996 created an environment for competition to emerge in wholesale electricity trade transactions.[1] Since the issuance of the FERC Orders, State-level activity in electricity markets at the retail level has also increased significantly. By the end of 1999, 24 States and the District of Columbia had either enacted restructuring legislation or issued comprehensive regulatory orders on restructuring that enable customers to choose their electricity supplier either immediately or in a phased manner over the next few years (Figure 1).[2]

During 1999, ongoing structural changes within the industry were coupled with continuing growth in the generation of electricity. Electricity generation by the industry reached 3,691 billion kilowatthours (kWh), compared with 3,618 billion kWh in 1998, reflecting an increase of 2.0 percent (Table 1). Utilities generated 86.0 percent (3,174 billion kWh) of that output and nonutilities contributed the balance of 14.0 percent (517 billion kWh).[3] In comparison with generation levels of 1998, utility generation declined by 1.2 percent. In contrast, nonutility generation increased by 27.5 percent to 517 billion kWh in 1999, compared with 406 kWh in 1998. These developments are attributable to the acquisition by nonutilities of generating assets divested by the investor-owned utilities as a part of the ongoing restructuring process. Nonutilities also added 6,769

**Figure 1. Status of State Electric Utility Deregulation Activity, as of January 2000**




[1]Arizona, Arkansas, California, Connecticut, Delaware, District of Columbia, Illinois, Maine, Maryland, Massachusetts, Montana, Nevada, New Hampshire, New Jersey, New Mexico, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Texas, and Virginia.

[2]Michigan, New York, and West Virginia.

[3]None.

[4]Alabama, Alaska, Colorado, Florida, Georgia, Hawaii, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, South Carolina, South Dakota, Tennessee, Utah, Vermont, Washington, Wisconsin, and Wyoming.

Note: The most current status of State restructuring activity is available on the Internet at:

http://www.eia.doe.gov/cneaf/electricity/chg_str/regmap.html.

Source: Energy Information Administration.

[1] For more detailed information on the changing electric power industry see the Energy Information Administration, *Changing Structure of the Electric Power Industry: An Update*, DOE/EIA-0562(96) (Washington, DC, December 1996) and *The Changing Structure of the Electric Power Industry: Selected Issues, 1998*, DOE/EIA-0562(98) (Washington, DC, July 1998).

[2] The 24 States are Arizona, Arkansas, California, Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, Michigan, Montana, Nevada, New Hampshire, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Texas, Virginia, and West Virginia. For further details on State deregulation activities see the EIA Web Site at: www.eia.doe.gov/gov/fuelelectric.html.

[3] Utilities generally consist of investor-owned utilities, Federally owned utilities, other publicly owned utilities, and cooperatively owned utilities); nonutilities consist of cogenerators, small power producers, exempt wholesale generators, other cogenerators and noncogenerators not qualified under the Public Utility Policies Act of 1978. This classification is used throughout our discussion in this publication.

**Table 1. Summary of U.S. Electric Power Statistics, 1999 and 1998**

| Item | 1999 | 1998[a] |
|---|---|---|
| **Capability**[b] (megawatts) | **785,990** | **775,885** |
| Utility | 639,143 | 686,692 |
| Nonutility | 146,846 | 89,193 |
| **Net Generation**[c] (billion kilowatthours) | **3,691** | **3,618** |
| Utility | 3,174 | 3,212 |
| Nonutility | 517 | 406 |
| **Utility Retail Sales**[b d] (billion kilowatthours) | **3,296** | **3,240** |
| **Utility Retail Prices**[b] (cents per kilowatthour) | **6.60** | **6.74** |
| **Stocks** | | |
| **Coal** (million short tons) | **143** | **121** |
| Utility[c] | 128 | 121 |
| Nonutility[b] | 14 | NA |
| **Petroleum** (million barrels) | **53** | **54** |
| Utility[c] | 44 | 54 |
| Nonutility[b] | 9 | NA |
| **Utility Fossil Fuel Consumption**[c] | | |
| Coal (million short tons) | 894 | 911 |
| Petroleum (million barrels) | 144 | 179 |
| Gas (billion cubic feet) | 3,113 | 3,258 |
| **Nonutility Fossil Fuel Consumption**[b] | | |
| Coal (million short tons) | 62 | 57 |
| Petroleum (million barrels) | 43 | 54 |
| Gas (billion cubic feet) | 3,752 | 3,547 |
| **Utility Fossil Fuel Cost**[a] (dollars per million Btu) | | |
| Coal | 1.22 | 1.25 |
| Petroleum | 2.53 | 2.14 |
| Gas | 2.57 | 2.38 |
| **Utility Fossil Fuel Receipts**[a] | | |
| Coal (million short tons) | 908 | 929 |
| Petroleum (million barrels) | 131 | 165 |
| Gas (billion cubic feet) | 2,809 | 2,923 |

[a]Data are final.
[b]Data for 1999 are preliminary.
[c]Data for 1999 are final.
[d]Does not include retail sales by all energy service providers (power marketers). Those sales are estimated to total 49 billion kilowatthours in 1999. In 1998, power marketer sales were 24 billion kilowatthours.
NA = Not available.
Btu = British Thermal Unit.
Notes: Except for generation, data exclude petroleum coke. Petroleum coke stocks (thousand short tons) at the end of the year were: **utility** – 355 (1999), 559 (1998) and **nonutility** – 143 (1999). Petroleum coke consumption (thousand short tons) was: **utility** – 1,608 (1999), 1,769 (1998) and **nonutility** – 3,082 (1999), 4,447 (1998). **Utility** petroleum coke cost (on a per-million-Btu basis) was 65.4 cents in 1999 (preliminary) and 71.2 cents in 1998 (final). •**Utility** petroleum coke receipts were 2,906 thousand short tons in 1999 and 3,217 thousand short tons in 1998. •Nonutility data for 1998 represent fuels consumed to produce both electricity and steam. •Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels, Electric Power Division.

megawatts (MW) to their capability by bringing 67 new plants on line.[4]

Electricity generation is geared to meeting customer demands instantaneously. Therefore, a positive correlation exists between changes in the level of generation and the level of retail sales. Accordingly, compared with 1998, retail sales increased to 3,296 billion kWh (1.7 percent) in tandem with the 1999 increase in generation.[5]

In 1999, wholesale prices spiked in certain areas of the country (as in 1998), reaching $6,000 per megawatthour (MWh) in the Midwest. Price surges (or spikes) have been observed in various parts of the country each year since 1998. A recent report released by the FERC[6] shows that similar surges in prices were evident for ancillary services.[7] According to FERC, factors contributing to these price spikes include:

- Weather (1999 was the second warmest year of this century for the United States)
- Capacity
- Deliverability
- Market manipulation.[8]

The price volatility in the wholesale electricity market during 1999 was not observed in the retail market. Generally, retail rates for electricity are regulated by State utility commissions; and as a consequence, utilities cannot automatically recoup higher costs incurred in the wholesale market through increased retail rates.[9] Average retail prices in 1999 were 6.60 cents per kWh, as compared to an average of 6.74 cents per kWh in 1998.

# Electricity Production

## Generating Capability

By the end of 1999, preliminary estimates indicate that the industry, comprised of two segments—utilities (approximately 3,200) and nonutilities (more than 2,100)—had 785,990 megawatts (MW) of capability to supply the Nation's demand for electricity (Table 2). Of this total, utilities own 639,143 MW (81.3 percent) and nonutilities own 146,846 MW (18.7 percent). Industry capability included 10,266 MW of newly added capability and 161 MW of capability retired (Table 3). Utilities accounted for 3,497 MW of the new capability and all retirements. Most of the new petroleum-fired plants (123 MW) that utilities brought on line consisted of small units (less than 10 MW). Of the gas-fired plants (3,141 MW) that utilities brought into service during the year, 15 were larger than 100 megawatts. Nonutilities added 67 new plants (6,769 MW) to their capability in 1999.

Nonutility capability includes a total of 50,884 MW of capability divested by investor-owned utilities and acquired by nonutilities. Note that divestiture has become a common feature in States that have already begun implementing retail competition. Some States

At the completion of a sale by an investor-owned utility to a nonutility, data on generation, consumption, and stocks for that plant are no longer collected on EIA Form-759, "Monthly Power Plant Report." However, these data are collected on the Form EIA-900, "Monthly Nonutility Power Plant Report." Subsequent to this change in ownership, data on fossil fuel receipts, costs, and quality are no longer collected on the Federal Energy Regulatory Commission (FERC) Form 423, "Monthly Report of Cost and Quality of Fuels for Electric Plants." These changes affect comparisons between 1999 and prior-year data for generation, consumption, stocks, fossil fuel receipts, costs, and quality at the State, Census Division, and U.S. levels.

[4] All capability values shown in this report are net summer and all capacity is installed nameplate. Capability values for 1999 are estimated; final values are to be released in the *Inventory of Electric Utility Power Plants in the United States 2000*, DOE/EIA-0095 and *Inventory of Nonutility Power Plants in the United States 1999*, DOE/EIA-0095.

[5] As a result of deregulation occurring in several States, total sales in the retail market by all energy service providers have not been captured. Consequently, the growth in sales is underestimated, in particular for the commercial and industrial sectors. For detailed data on electric utility retail sales, see Appendix A.

[6] Federal Energy Regulatory Commission, *State of the Markets 2000–Measuring Performance in Energy Market Regulation* (March 2000).

[7] Ancillary services are those services necessary to support the transmission of electric power from seller to purchaser. These services range from actions taken to effect the transaction (such as scheduling and dispatching services) to services that are necessary to maintain the integrity of the transmission system (such as load following, reactive power support, and system protection services). Ancillary services are also needed to offset effects associated with undertaking a transaction (such as loss compensation and energy imbalance service).

[8] Network industries, like the electric power industry, are interconnected and are subject to constraints on the physical capability to deliver power. These characteristics significantly influence formation of different price categories. The present volatility, as witnessed in 1998 and 1999, stems from conditions prevailing in a market that is still in rudimentary stages of development.

[9] Franchised territory of San Diego Gas and Electric (SDG&E) in Southern California constitutes an exception to this statement. SDG&E's rates are currently based on market rates for the power it buys in the wholesale market.

**Table 2. Industry Capability by Fuel Source and Industry Sector, 1999 and 1998**
(Megawatts)

| Item | 1999 | 1998 |
|---|---|---|
| **Total Industry** | **785,990** | **775,885** |
| **Utility** | **639,143** | **686,692** |
| Coal-fired | 285,798 | 299,739 |
| Petroleum-fired [a] | 43,114 | 62,959 |
| Gas-fired [b] | 121,479 | 130,204 |
| Nuclear-powered | 94,689 | 97,070 |
| Hydroelectric | 92,999 | 94,423 |
| Other [c] | 1,064 | 2,297 |
| **Nonutility** | **146,846** | **89,193** |
| Coal-fired | 26,746 | 12,830 |
| Petroleum-fired [d] | 43,214 | 23,267 |
| Gas-fired [e] | 49,711 | 33,104 |
| Nuclear-powered | 2,381 | -- |
| Hydroelectric | 5,662 | 4,048 |
| Other [f] | 19,131 | 15,944 |

[a]Includes fuel oil Nos. 2, 4, 5, and 6, crude oil, kerosene, and petroleum coke.
[b]Includes gas-fueled fuel cell units and waste heat.
[c]Includes geothermal, wind, solar (photovoltaic), and biomass (wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural byproducts, straw, tires, landfill gases, fish oils).
[d]Includes petroleum coke, liquid butane, diesel, light oil, kerosene, methanol, oil waste, sludge oil, tar oil, and liquid propane.
[e]Includes natural gas, waste heat, waste gas, butane, methane, propane, other gas, and digester gas.
[f] Includes geothermal, wind, solar (photovoltaic/thermal), multifuel, biomass (wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural byproducts, straw, tires, landfill gases, fish oils), hydrogen, sulfur, batteries, chemicals, and purchased steam.
Notes: •Data for 1999 are preliminary; 1998 data are final.•Totals may not equal sum of components due to independent rounding.
Sources: Energy Information Administration, Form EIA-860A, "Annual Electric Generator Report – Utility," and Form EIA-860B, "Annual Electric Generator Report – Nonutility."

require incumbent utilities to divest their generating assets to minimize their market dominance or to arrive at a determination of potential stranded costs.[10] In other cases, divestiture is voluntary as utilities attempt to focus on regulated activities (that is, transmission and distribution) that confer cost-of-service-based returns and the absence of competition.[11] Acquisition of generating assets by nonutilities from utilities is expected to foster competition at the retail level and to diminish the degree of market power that the incumbent utilities can exercise in their franchised territories.

As other States decide to open their markets to competition, it is likely that purchases of generating assets by nonutilities will increase in the future. In addition, as incumbent utilities exit the generation market and divest their assets, the share of generation owned by nonutilities will continue increasing, perhaps exponentially. However, generating capability by ownership in the utility sector is still dominated by investor-owned utilities (IOUs) (Figure 2).

Of the aggregate divestitures in 1999, 54.0 percent took place on the East Coast. In the New England Census Division, 3,179 MW of capability was sold in Connecticut, 1,160 MW in Massachusetts, and 1,402 MW in Maine (Table 4).[12] Capability sales of 12,241 MW were reported in New York, 1,319 MW in New Jersey, and 8,563 MW in Pennsylvania (Middle Atlantic Census Division). During the year, 18 MW were sold in Maryland (South Atlantic Census Division) and 14,177 MW were sold in Illinois (East North Central Census Division). In Montana (Mountain Census Division), utilities reported divesting 1,951 MW of capability, while in the Pacific Contiguous Census Division, utilities in California divested 6,265 MW.

**Capability by Energy Source**. The largest share (39.8 percent) of the Nation's generating capability was represented by coal-fired plants in 1999 (Figure 3). Gas-fired plants represented 21.8 percent of the total U.S. generating capability and are, generally, the preferred plant type for new capacity.[13] Gas turbines are frequently used to serve peak load (periods of most demand) since they are generally small (less than 100 MW) and, therefore, can be installed at various sites and have a quick startup time. Gas turbines are also suitable for emergency and reserve-power requirements. Nuclear power plants provided 12.4 percent (97,070 MW) of capability in 1999, 65,303 MW of which is located in the eastern half of the country. Of the 104 nuclear-powered plants, 32 plants, with a capability totaling 31,767 MW,

[10] Most States have authorized the recovery of stranded costs (in some form or another and subject to various conforming requirements to be met by incumbent utilities) as part of the restructuring process. Determination of stranded costs of non-economic generating assets is a complex task defying a consensus computational approach. Divestiture is less complex for the States since it results in an immediate valuation of marketable assets in question and renders recovery more straightforward.
[11] Introducing competition in transmission and distribution has not been attempted in view of the inherent difficulties that do not lend themselves to a ready solution at this time. In both cases, however, efforts continue to reduce the influences of monopoly ownership control.
[12] For a map of the Census divisions, see Figure A1 in the Appendix.
[13] Energy Information Administration, *The Challenges of Electric Power Industry Restructuring for Fuel Suppliers*, DOE/EIA-0623 (Washington, DC, September 1998), p. 43.

## Table 3. Retired and Added Capability by Energy Source, State, and Sector, 1999
(Megawatts)

| State | Coal | Gas[a] | Petroleum[b] | Nuclear | Hydroelectric | Other[c] | Total |
|---|---|---|---|---|---|---|---|
| | **Retirements[d]** | | | | | | |
| Alaska | -- | -- | 2 | -- | -- | -- | 2 |
| Colorado | -- | 4 | -- | -- | -- | -- | 4 |
| Florida | -- | 46 | -- | -- | -- | -- | 46 |
| Iowa | -- | -- | 1 | -- | -- | -- | 1 |
| Maryland | -- | -- | 1 | -- | -- | -- | 1 |
| Massachusetts | -- | -- | 24 | -- | -- | -- | 24 |
| Missouri | -- | -- | 1 | -- | -- | -- | 1 |
| New York | 80 | -- | -- | -- | -- | -- | 80 |
| Wisconsin | -- | -- | 2 | -- | -- | -- | 2 |
| **Total** | **80** | **50** | **31** | **--** | **--** | **--** | **161** |
| | **Capability Additions: Utilities** | | | | | | |
| Alaska | -- | -- | -- | -- | 6 | -- | 6 |
| Alabama | -- | 423 | -- | -- | -- | -- | 423 |
| Arkansas | -- | -- | -- | -- | 108 | -- | 108 |
| Arizona | -- | -- | -- | -- | -- | * | * |
| Colorado | -- | 191 | 6 | -- | -- | -- | 197 |
| Florida | -- | 470 | -- | -- | -- | -- | 470 |
| Iowa | -- | -- | 24 | -- | -- | -- | 24 |
| Illinois | -- | 276 | 3 | -- | -- | -- | 279 |
| Kansas | -- | 1 | 25 | -- | -- | -- | 26 |
| Kentucky | -- | 658 | -- | -- | -- | -- | 658 |
| Maryland | -- | -- | 4 | -- | -- | -- | 4 |
| Michigan | -- | 625 | 2 | -- | -- | -- | 627 |
| Minnesota | -- | -- | 5 | -- | -- | -- | 5 |
| Missouri | -- | 248 | 5 | -- | -- | -- | 253 |
| North Carolina | -- | 165 | -- | -- | -- | -- | 165 |
| Nebraska | -- | -- | 1 | -- | -- | -- | 1 |
| New York | -- | 67 | -- | -- | -- | -- | 67 |
| Ohio | -- | -- | 31 | -- | 42 | -- | 73 |
| South Carolina | 55 | -- | 2 | -- | -- | -- | 57 |
| Utah | -- | -- | 11 | -- | -- | -- | 11 |
| Washington | -- | -- | -- | -- | -- | 8 | 8 |
| Wisconsin | -- | 17 | 6 | -- | -- | 9 | 32 |
| Wyoming | -- | -- | -- | -- | -- | 3 | 3 |
| **Total** | **55** | **3,141** | **123** | **--** | **156** | **21** | **3,497** |
| | **Capability Additions: Nonutilities** | | | | | | |
| Alaska | -- | -- | 9 | -- | -- | -- | 9 |
| Alabama | -- | 88 | -- | -- | -- | 40 | 128 |
| California | -- | 238 | -- | -- | -- | 82 | 320 |
| Colorado | -- | 60 | -- | -- | -- | -- | 60 |
| Connecticut | -- | 169 | -- | -- | -- | -- | 169 |
| Florida | -- | -- | -- | -- | -- | 47 | 47 |
| Georgia | -- | 5 | -- | -- | -- | -- | 5 |
| Iowa | -- | -- | -- | -- | -- | 194 | 194 |
| Illinois | -- | 907 | -- | -- | -- | 2 | 909 |
| Indiana | -- | -- | -- | -- | -- | 8 | 8 |
| Louisiana | -- | 359 | -- | -- | -- | 34 | 393 |
| Massachusett | -- | 172 | -- | -- | 3 | 248 | 422 |
| Maryland | -- | -- | -- | -- | -- | 187 | 187 |
| Maine | -- | -- | -- | -- | -- | 93 | 93 |
| Michigan | -- | 342 | -- | -- | -- | 23 | 365 |
| Minnesota | -- | 14 | -- | -- | -- | 137 | 150 |
| Missouri | -- | 886 | -- | -- | -- | -- | 886 |

**Table 3. Retired and Added Capability by Energy Source, State, and Sector, 1999 (Continued)**
(Megawatts)

| State | Energy Source | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Coal | Gas[a] | Petroleum[b] | Nuclear | Hydroelectric | Other[c] | |
| | Capability Additions: Nonutilities (continued) | | | | | | |
| North Carolina | -- | 4 | 1 | -- | -- | 1 | 6 |
| New Hampshire | -- | 5 | -- | -- | -- | -- | 5 |
| New Jersey | -- | -- | -- | -- | -- | 4 | 4 |
| Nevada | -- | 216 | -- | -- | -- | -- | 216 |
| New York | -- | 0 | -- | -- | 31 | 55 | 86 |
| Pennsylvania | -- | 75 | -- | -- | -- | -- | 75 |
| Tenneessee | -- | 500 | -- | -- | -- | -- | 500 |
| Texas | -- | 754 | -- | -- | -- | 620 | 1,374 |
| Wisconsin | -- | -- | -- | -- | -- | 159 | 159 |
| **Total** | **--** | **4,791** | **10** | **--** | **34** | **1,933** | **6,769** |
| **Total Additions** | **55** | **7,932** | **133** | **--** | **190** | **1,954** | **10,266** |

* = Absolute value is less than 0.5.

[a]Includes **utilities** – gas-fueled fuel cell units and waste heat; **nonutilities** – natural gas, waste heat, waste gas, butane, methane, propane, other gas, and digester gas.

[b]Includes **utility** – fuel oil Nos. 2, 4, 5, and 6, crude oil, kerosene, and petroleum coke; **nonutility** – liquid butane, diesel, light oil, kerosene, methanol, oil waste, sludge oil, tar oil, and liquid propane.

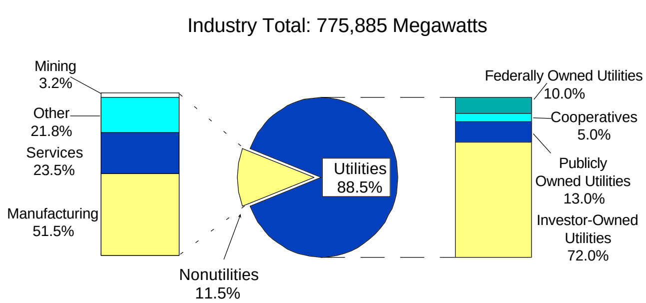
[c]Includes **utilities** – geothermal, wind, solar (photovoltaic), and biomass (wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural byproducts, straw, tires, landfill gases, fish oils); **nonutilities** – geothermal, wind, solar (photovoltaic/thermal), multifuel, biomass (wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural byproducts, straw, tires, landfill gases, fish oils), hydrogen, sulfur, batteries, chemicals, and purchased steam.

[d]All retirements were by utilities.

Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding. • For detailed data, see Table A26 (for capability additions) and Table A27 (retirements) in Appendix A.

Sources: Energy Information Administration, Form EIA-860A, "Annual Electric Generator Report-Utility," and Form EIA-860B, "Annual Electric Generator Report – Nonutility."

**Figure 2. Share of Total Industry Capability by Industry Sector and Ownership, as of January 1, 1999**




Notes: • Totals may not equal sum of components due to independent rounding. • Data are final. • "Other" includes agriculture, transportation, and other services.

Sources: Energy Information Administration, Form EIA-860A, "Annual Electric Generator Report – Utility," and Form EIA-860B, "Annual Electric Generator Report – Nonutility."

are located west of the Mississippi. Illinois -had the most nuclear-powered capability of any State with more than 9,000 MW. Hydroelectric plants provided 12.6 percent of the Nation's total capability. Petroleum plants and others (consisting primarily of renewables) comprise the remaining capability.

## Generation

### *Industry*

Net generation in 1999 increased from 3,618 billion kWh in 1998 to 3,691 billion kWh, reflecting an increase of 2.0 percent in demand for electricity[14] (Table 5). Coal provided 51.0 percent of total generation (1,882 billion kWh), followed by nuclear at 19.7 percent or 728 billion kWh (Figure 4). Nuclear-powered generation increased by 8.1 percent (compared to 1998), due to a significant improvement in the capacity factors (up to 85.5 percent, from 78.2 percent in 1998) [15] for these plants during the

[14] Generation values in this report are "net" generation; that is, the total amount of electric energy produced by the generating units at a generating station (measured at the generator terminals) less the electric energy consumed at the generating station for station use.

[15] A capacity factor is the ratio of the amount of electricity produced by a generating unit for the period of time considered to the electrical energy that could have been produced at continuous full-power operation during the same period.

**Table 4. Generating Capability Sold by Utilities to Nonutilities by Energy Source and State, 1999**
(Megawatts)

| State | Energy Source | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Coal | Gas[a] | Petroleum[b] | Nuclear | Hydroelectric | Other[c] | |
| California | -- | 5,025 | 16 | -- | -- | 1,224 | 6,265 |
| Connecticut | -- | 358 | 2,821 | -- | -- | -- | 3,179 |
| Florida | -- | 608 | -- | -- | -- | -- | 608 |
| Illinois | 8,236 | 3,945 | 1,066 | 930 | -- | -- | 14,177 |
| Maine | -- | – | 942 | -- | 430 | 30 | 1,402 |
| Maryland | -- | -- | -- | -- | 18 | -- | 18 |
| Massachusetts | 221 | -- | 261 | 665 | 13 | -- | 1,160 |
| Montana | 1,510 | -- | -- | -- | 441 | -- | 1,951 |
| New Jersey | -- | -- | 1,319 | -- | -- | -- | 1,319 |
| New York | 1,869 | 1,291 | 8,450 | -- | 631 | -- | 12,241 |
| Pennsylvania | 2,080 | 589 | 5,062 | 786 | 46 | -- | 8,563 |
| Washington | -- | -- | -- | -- | 1 | -- | 1 |
| **Total** | **13,916** | **11,816** | **19,937** | **2,381** | **1,580** | **1,254** | **50,884** |

[a]Includes: **utilities** – gas-fueled fuel cell units and waste heat; **nonutilities** – natural gas, waste heat, waste gas, butane, methane, propane, other gas, and digester gas.
[b]Includes: **utility** – fuel oil Nos. 2, 4, 5, and 6, crude oil, kerosene, and petroleum coke; **nonutility** – liquid butane, diesel, light oil, kerosene, methanol, oil waste, sludge oil, tar oil, and liquid propane.
[c]Includes: **utilities** – geothermal, wind, solar (photovoltaic), and biomass (wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural byproducts, straw, tires, landfill gases, fish oils); **nonutilities** – geothermal, wind, solar (photovoltaic/thermal), multifuel, biomass (wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural byproducts, straw, tires, landfill gases, fish oils), hydrogen, sulfur, batteries, chemicals, and purchased steam.
Note: • Values are preliminary. • Totals may not equal sum of components due to independent rounding. • For detailed data, see Table A25 in Appendix A.
Source: Energy Information Administration, Form EIA-860A, "Annual Electric Generator Report – Utility."

year.[16] Fewer maintenance outages and a return to service of three nuclear plants also contributed to an increased generation from nuclear plants. Gas-fired units provided 15.3 percent or 565 billion kWh of total generation in 1999, increasing its output 2.9 percent from 1998. Hydroelectric facilities supplied another 8.3 percent (a decline of about 3.6 percent from the previous year) of the total generation in 1999. Energy sources in the "Other" category (which include biomass, wind, photovoltaic, geothermal, and solar thermal) contributed 2.4 percent of total generation.

The following explanation may help to interpret the impact of a higher nuclear plant capacity factor on fossil-fuel requirements at electric utilities. First, assume a 1-percent increase in the annual nuclear plant capacity factor with a net summer nuclear capability of 97,155 MW. Multiply the capability by the number of hours in a year (8,760), yielding 851,078 billion kWh. Next, multiply the result by 1 percent (0.01) to determine the additional output from these plants (8,510 billion kWh). That additional production may translate into a reduction in annual consumption of coal (4.3 million short tons), petroleum (14 million barrels), gas (92 billion cubic feet), or more likely, a combination of each.

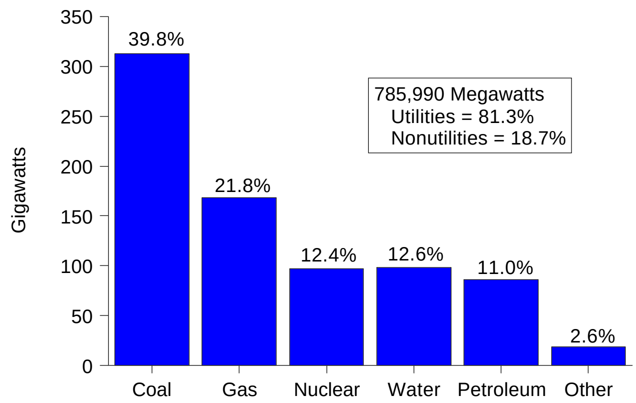
## *Nonutility*[17]

Nonutilities generated 517 billion kWh of electricity in 1999, an increase of 27.3 percent from 1998. Gas-fired generation represented the largest share of the nonutilities' total output at 52.0 percent, with coal providing another 22.1 percent. The "Other" energy source category accounted for 16.6 percent of the total output of electricity in this segment, a 26.5-percent increase over 1998 generation. Petroleum, hydroelectric, and nuclear power plants accounted for the remaining output.

Nonutility generation in 1999 contrasts significantly with generation levels for each fuel source in 1998, with the exception of hydroelectric production, which remained

[16] Energy Information Administration, *Monthly Energy Review* (MER), DOE/EIA-0035(00/04) (Washington, DC, April 2000), Table 8.1, p. 111.
[17] In 1996, EIA began collecting monthly nonutility data, which were confidential. However, as of 1999, data for nonutilities on capability, generation, and consumption by fuel type are no longer confidential. Annual data for prior years will continue to be withheld. A detailed description of EIA's treatment of confidentiality is available on EIA's Web site at: http://www.eia.doe.gov/cneaf/electricity/forms/sselecpower98.html.

**Figure 3. Share of U.S. Net Summer Capability by Energy Source, Year-End 1999**




Note: ●Gas includes gas-fueled fuel cell units, waste heat, natural gas, waste gas, butane, methane, propane, other gas, and digester gas. ●Petroleum includes petroleum coke, liquid butane, diesel, light oil, kersone, methanol, oil waste, sludge oil, tar oil, and liquid propane. ●Other includes geothermal, wind, solar (photovoltaic/thermal), multifuel, biomass (wood, wood waste, peat wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural byproducts, straw, tires, landfill gases, fish oils), hydrogen, sulfur, batteries, chemicals, and purchased steam. ●Data are preliminary. ●Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, Form EIA-860A, "Annual Electric Generator Report – Utility," and Form EIA-860B, "Annual Electric Generator Report – Nonutility."

unchanged. The increased nonutility generation reflects the impact of acquisition of assets divested by incumbent IOUs. Capability additions by nonutilities accounted for a small portion of their increased generation in 1999.

### *Utility*

Generation by utilities in 1999 declined from 1998 by 38 billion kWh. With the exception of nuclear power generation, generation from all other major energy sources declined during the year under review in comparison with 1998.[18] A decline of 47,549 MW in utility capability during the year and adverse conditions affecting hydroelectric power generation are among the critical factors contributing to the decline in generation in this segment of the industry. Significant improvements in the performance of nuclear power plants during the same period, however, moderated the decline in generation.

**Coal.** In 1999, coal-fired generation at utilities totaled 1,768 billion kWh, down 2.2 percent from 1998. Two Census divisions (East North Central and South Atlantic) represented 45.5 percent of the Nation's output by utilities from this energy source.[19] Divestiture of coal plants by utilities to nonutilities partially explains the downturn in coal-fired generation within the utility segment. A significant decline (86.8 percent) in coal-fired generation occurred in Massachusetts as a result of the sale by Montaup Electric Company of the Somerset Plant, which accounted for 67.4 percent of coal capability within the State, to NRG Energy (a nonutility).[20] New York, where 1,869 megawatts of coal-fired capability were divested by utilities and acquired by nonutilities, experienced a 53.4-percent decline in utility generation from coal. More than 2,080 MW of coal-fired capability were transferred to the nonutility sector in Pennsylvania, which experienced a 19.7-percent decrease in coal-fired generation from 1998.

**Nuclear.** Nuclear plants generated a record 725 billion kWh, 7.6 percent higher than in 1998 and 7.4 percent higher than the previous record set in 1996 (675 billion kWh).[21] The New England Census Division had a 32.2-percent (7 billion kWh) increase in nuclear-powered generation, followed by the East North Central Census Division with a 31.8-percent increase (30 billion kWh).

Among States reporting increases of more than 5 billion kWh in nuclear generation were Connecticut, New York, Pennsylvania, and Illinois. Illinois reported the largest volume increase in nuclear-powered generation at 26 billion kWh. This was due to a substantial increase in generation from the Clinton Plant (owned by the Illinois Power Company) and the LaSalle 2 Plant (owned by the Commonwealth Edison Company). Pennsylvania experienced a 15.9-percent or 10-billion-kWh increase in nuclear-powered generation. As indicated previously,

[18] Nuclear-powered plants in the utility sector increased generation by 51 billion kWh during the year. One contributing factor to the increased production from these plants was the return to service of the Clinton Plant (930 MW) owned by the Illinois Power Company, and the LaSalle 2 Plant (1,048 MW) owned by Commonwealth Edison Company—both located in Illinois, and the Millstone 2 Plant in Connecticut (871 MW) owned by Northeast Nuclear Energy Company. (Note: the Clinton Plant was sold on December 15, 1999, to a nonutility, Amergen.)

[19] For a map of the Census divisions, see Figure A1 in Appendix A.

[20] Energy Information Administration, *Inventory of Electric Utility Power Plants in the United States 1999,* DOE / EIA-0095(99)(Washington, DC, November 1999), Table 17, p.30.

[21] Energy Information Administration, *Monthly Energy Review*, DOE / EIA-0035(2000 / 04)(Washington, DC, April 2000), Table 8.1, p. 111.

**Table 5. Net Generation by Energy Source and Sector, 1999 and 1998**
(Billion Kilowatthours)

| Energy Source | 1999 Industry | 1999 Utility | 1999 Nonutility | 1998 Industry | 1998 Utility | 1998 Nonutility |
|---|---|---|---|---|---|---|
| Coal[a] | 1,882 | 1,768 | 114 | 1,874 | 1,807 | 66 |
| Petroleum[b] | 119 | 87 | 32 | 127 | 110 | 17 |
| Gas[c] | 565 | 296 | 269 | 549 | 309 | 240 |
| Nuclear | 728 | 725 | 3 | 674 | 674 | -- |
| Hydroelectric | 307 | 294 | 14 | 319 | 304 | 14 |
| Other[d] | 89 | 4 | 86 | 75 | 7 | 68 |
| **Total** | **3,691** | **3,174** | **517** | **3,618** | **3,212** | **406** |

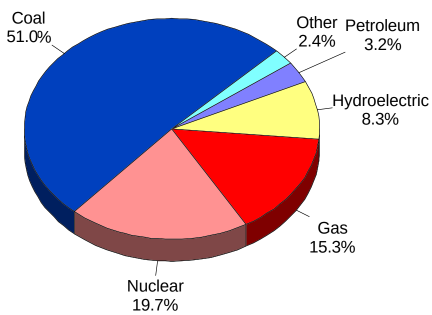
[a]Includes coal, anthracite, culm, coke breeze, fine coal, waste coal, bituminous gob, and lignite waste.
[b]Includes petroleum, petroleum coke, diesel, kerosene, liquid butane, liquid propane, oil waste, and tar oil.
[c]Includes natural gas, waste heat, waste gas, butane, methane, propane, and other gas.
[d]Includes **utilities**–geothermal, biomass (wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural byproducts, straw, tires, landfill gases, and fish oils), wind, solar, and photovoltaic; **nonutilities** – multifuel, hydrogen, sulfur, batteries, chemicals, and purchased steam.

Notes: • Utility data are final; nonutility values for 1998 are final and for 1999 are preliminary. • Totals may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, Form EIA-759, "Monthly Power Plant Report," Form EIA-900, "Monthly Nonutility Power Plant Report," and Form EIA-860B, "Annual Electric Generator Report – Nonutility."

**Figure 4. Share of Net Generation by Energy Source and Industry Sector, 1999**

Industry Total = 3,691 Billion Kilowatthours




| Energy Source | Share (Percent) Utility | Share (Percent) Nonutility |
|---|---|---|
| Coal | 93.9 | 6.1 |
| Petroleum | 73.1 | 26.9 |
| Gas | 52.4 | 47.6 |
| Nuclear | 99.6 | 0.4 |
| Hydro | 95.6 | 4.4 |
| Other | 4.2 | 95.8 |

Notes: • Utility total – 3,174 billion kilowatthours and nonutility total – 517 billion kilowatthours. • Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, Form EIA-759, "Monthly Power Plant Report" and Form EIA-900, "Monthly Nonutility Power Plant Report."

increased nuclear power generation during the year resulted from improvements in performance during 1999.

**Gas.** The utility segment of the industry accounted for 52.4 percent of the gas-fired production of the total industry in 1999. Gas-fired generation by utilities totaled 296 billion kWh, down 4.2 percent from the prior year. Divestiture of slightly more than 5,025 MW of gas-fired capability by the utilities in the Pacific Contiguous Census Division contributed to a 44.2-percent drop in gas-fired generation for the division. This capability represented roughly one-half of the gas-fired capability in California. As a result, the division provided only 5.8 percent of the Nation's total gas-fired production by utilities in 1999, compared with 10.0 percent in 1998.[22]

[22] Energy Information Administration, *Inventory of Electric Utility Power Plants in the United States 1999,* DOE/EIA-0095(99) (Washington, DC, November 1999), Table 17, p. 27.

The West South Central Census Division, providing 56.3 percent of total utility generation, generated 167 billion kWh, a slight decrease (1.4 percent) from the prior year. Texas generated 69.7 percent of the division's gas-fired production. Gas-fired generation in the South Atlantic Census Division rose by 14.0 percent from 1998 to 45 billion kWh. The majority of this increase was attributed to a 13.1-percent surge in production in Florida, which provided 79.8 percent of the division's gas-fired generation. The increase in gas-fired generation in Florida occurred partly in response to the greater increase in the cost of petroleum. In 1999, the cost per million Btu for gas in Florida was $2.97 (an increase of 7.6 percent from 1998), whereas the cost per million Btu for petroleum was $2.46 (a 19.3-percent increase from 1998).

**Petroleum.** Petroleum-fired generation totaled 87 billion kWh in 1999, down 21.1 percent from the prior year. The decrease may be due to a substantial increase in the cost of crude oil and related products, as well as the divestiture of utility plants to the nonutility segment of the industry. The effect of the decline in petroleum-fired output was most notable in the New England Census Division, where utility output fell to 8 billion kWh from the 1998 level of 22 billion kWh. The division's share of the utility petroleum-fired generation plunged to 9.5 percent, down from 19.8 percent in 1998.

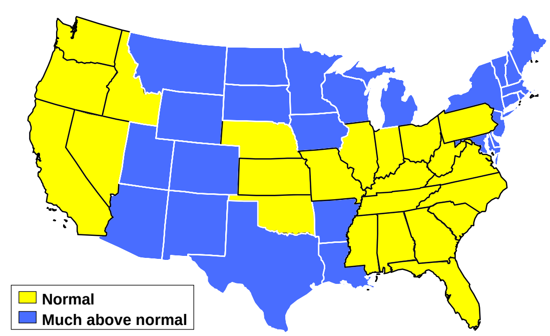
**Hydroelectric.** Hydroelectric generation declined by 3.4 percent from the 1998 level of 304 billion kWh. Contrary to the country-wide drop, hydroelectric production rose by 7.7 percent from the 1998 level in the Pacific Contiguous Census Division, reaching 181 billion kWh, primarily due to locally heavy precipitation. The division accounted for 61.4 percent of the Nation's total hydroelectric generation and largely offset the decline from this energy source in the other Census divisions. Oregon and Washington together provided 78.5 percent of the division's hydroelectric generation in 1999, compared with 71.0 percent in 1998. The two States increased their hydroelectric generation from the prior year—Washington by 21.5 percent and Oregon by 14.5 percent. Locations in western Washington reported their wettest February and wettest water-year on record. In addition, cold temperatures led to a record-setting snow pack in the northern Cascades with Mt. Baker, Washington, setting a U.S. record for the most snowfall in a snow season (1,140 inches).[23]

Electric utilities provided **95.6 percent** of the Nation's hydroelectric generation of electricity in 1999.

Most other Census divisions experienced a decline in hydroelectric generation from 1998 as a result of at least two factors. First, utilities divested 1,580 MW of hydroelectric capability to nonutilities. Second, the United States experienced a heat wave (Figure 5) and drought (Figure 6) according to the National Oceanic and Atmospheric Administration (NOAA).[24] The drought mostly affected the East Coast with short-term precipitation deficits of record and near-record levels. During the year, drought emergencies were declared in Delaware, Georgia, Maryland, New Jersey, Pennsylvania, and South Carolina. As a result of those drought conditions, hydroelectric production of electricity fell in several Census divisions:

- New England Census Division (dropped 57.9 percent to 2 billion kWh)
- South Atlantic Census Division (declined by 49.1 percent to 7 billion kWh)
- Pacific Noncontiguous Census Division (fell by 25.9 percent to 1 billion kWh)
- East South Central Census Division (fell by 27.1 percent to 17 billion kWh)
- Middle Atlantic Census Division (experienced a 24.5-percent decline to 21 billion kWh)
- West South Central Census Division (decreased by 13.5 percent to 7 billion kWh).

**Figure 5. Above Normal Temperatures in the United States, 1999**

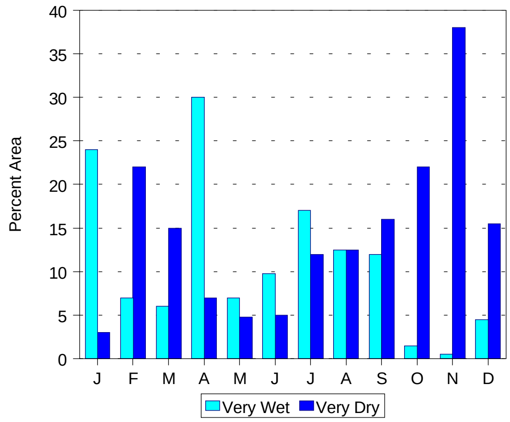



Source: National Climatic Data Center, National Oceanic and Atmospheric Administration.

[23] National Oceanic and Atmospheric Administration, extracted from the Internet at www.ncdc.noaa.gov/ol/climate/research/1999/ann/preann99.html#usprecip.

[24] National Oceanic and Atmospheric Administration, extracted from the Internet at http://www.ncdc.noaa.gov/ol/climate/research/1999/sum/us_drought.html.

**Figure 6. National Precipitation, 1999**




Source: National Climatic Data Center, National Oceanic and Atmospheric Administration.

States with significant hydroelectric generating capacity that reported decreases in hydroelectric generation from the prior year included Alabama (26.5 percent), California (20.2 percent), and New York (24.3 percent).

## Consumption, Stocks, Receipts, and Costs of Fossil Fuels

Industry wide, consumption of fossil fuels in 1999 was affected by several factors, which include:

- Record nuclear generation
- Weather
- Higher demand for electricity
- Fuel prices.

Gas consumption increased (up 0.9 percent), but consumption of petroleum and coal decreased by 19.9 percent and 1.2 percent, respectively, from 1998. For the year 1999, industry gas consumption increased to 6,865 billion cubic feet (Bcf) from the 6,806 Bcf consumed in 1998. Conversely, petroleum consumption was down to 186 million barrels (compared to 233 million barrels in 1998) and 957 million short tons of coal were consumed (11 million tons less than in 1998).

In 1999, consumption of all three fossil fuels was lower in the utility segment of the industry than in 1998, largely as a result of divestiture of capability by utilities and acquisition of that capability by nonutilities.[25] In 1999, coal consumption in the utility segment (which represented 93.5 percent of the industry coal consumption, compared to 94.1 percent in 1998) fell by 1.8 percent (17 million short tons) from 1998. In 1999, gas consumption in the utility segment dropped 4.4 percent from the prior year. Petroleum consumption by utilities was down 19.5 percent from 1998. At the end of 1999, coal stocks at electric utilities were 128 million short tons—8 million tons more than the tonnage reported in 1998. Petroleum stocks totaled 44 million barrels at the end of 1999, 9 million barrels less than at year end 1998. Nonutility year-end stocks for 1999 amounted to 14 million short tons of coal and 9 million barrels of petroleum.[26]

**Coal**. The 11-million short ton decrease in industry coal consumption was most evident in four Census divisions—the East North Central, the Middle Atlantic, the South Atlantic, and the East South Central. In the East North Central Census Division, utility coal consumption fell by 2.2 percent, primarily as the result of the divestiture of 8,236 MW of coal-fired capability by utilities to nonutilities in Illinois. In the Middle Atlantic Census Division, where industry coal consumption was down by 4.9 percent from 1998, utilities divested 3,949 MW of coal-fired capability in New York and Pennsylvania. As a result, utility consumption of coal dropped by 24.1 percent in 1999 from 1998.

Other than in the Pacific Noncontiguous Census Division (down by 47.1 percent), where less than 1 percent of the Nation's coal was consumed, the largest change (up 11.1 percent) from the previous year for the industry occurred in the New England Census Division. Although overall coal consumption in the New England Census Division rose, consumption of coal by the utility segment fell (the utility share of total coal consumption in the division fell to 19.6 percent in 1999, from a 63.7-percent share in 1998). Two factors contributed to the decline in the utility segment: (1) the return to service of the Millstone nuclear plant, and (2) the divestiture of the 221-MW coal-fired plant (owned by the Montaup Electric Company) located in Massachusetts, to NRG Energy. The share of coal consumption in the division represented by utilities in Massachusetts dropped dramatically to 24.2 percent in 1999, from 60.4 percent in 1998.

Utilities received 908 million short tons of coal in 1999, a 21-million short ton decrease from the record amount received in 1998. Factors contributing to this decrease included declining coal capability at the disposal of

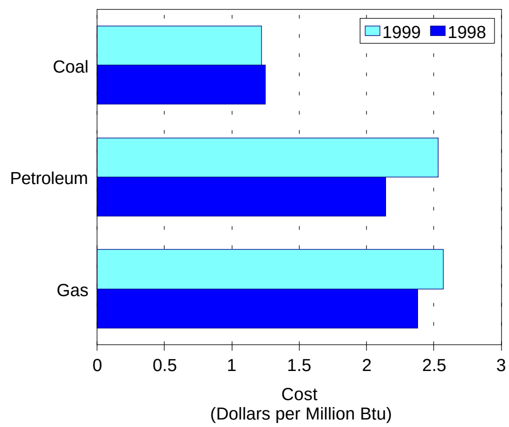
[25] A year-to-year comparison of nonutility fossil fuel consumption is not appropriate since data for 1998 and prior years are for fuels consumed to produce both steam and electricity.
[26] Data collection of fuel stocks in the nonutility sector began in 1999.

utilities (as a result of ongoing divestitures) and a significant increase in generation associated with nuclear power plants.

In 1999, the average cost of coal delivered to utilities decreased to $1.22 per million Btu, a drop from the $1.25-per-million-Btu level in 1998 (Figure 7).[27] Several factors continued to lead toward this lower cost of coal for utilities:

- The continued expiration, renegotiation, and buy-outs of older, high-priced contracts
- Improved efficiency in coal production and transportation
- Increased use of low-cost western coal
- To some extent, excess production capacity.

**Figure 7. Average Cost of Fossil Fuels at U.S. Electric Utilities, 1999 and 1998**




Notes: •Data are final. •Data are for electric generating plants with a total steam-electric and combined cycle nameplate capacity of 50 or more MW. •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.”

**Petroleum**. In response to higher prices and changing ownership patterns, industry consumption levels in 1999 decreased by 46 million barrels (or 19.9 percent) from 1998. This decline occurred in all Census divisions but the Mountain Census Division, where less than 1 percent of the Nation’s petroleum is consumed. The largest quantitative decrease (21 million barrels) in 1999 from 1998 occurred in the South Atlantic Census Division, followed by the New England Census Division (10 million barrels). The South Atlantic Census Division provided the largest share (42.2 percent) of the Nation’s petroleum consumption at 79 million barrels in 1999. Petroleum consumption in the New England Census Division fell by 10 million barrels from the 1998 level. Most of the division’s drop (8 million barrels) in petroleum consumption occurred in Massachusetts. Utility petroleum consumption decreased to 144 million barrels from the 179 million barrels consumed in 1998. This decline in petroleum consumption by the utilities was due to the shift from utility to nonutility ownership of generating capability. That shift was apparent in the New England Census Division, where utilities consumed 59.8 percent less petroleum in 1999 than in 1998 due to divestiture of petroleum-fired capability (4,024 MW). Other factors (mild weather and competition from gas) affected demand for petroleum in the South Atlantic Census Division, where use of petroleum fell by 5.8 percent in 1999 from 1998 consumption.

Electric utilities received 131 million barrels of petroleum in 1999, down 34 million barrels from 1998 (utility petroleum stocks were also down to 44 million barrels).

This decline in use of petroleum by utilities was due, in part, to its higher delivered cost in 1999—$2.53 per million Btu, an increase of $ 0.39 per million Btu from 1998. Throughout the year, the average cost of petroleum fluctuated. In February, the average cost of petroleum paid by utilities fell to $1.72 per million Btu, the lowest monthly level since January 1974.[28] However, utilities reported a higher average cost for each successive month through the end of the year, reaching $3.54 per million Btu by December 1999.

**Gas.** Industry consumption of gas in 1999 rose to 6,866 Bcf, up by 0.9 percent from 1998. The increase occurred in 6 of the 10 Census divisions. The Census divisions showing the largest quantitative changes from 1998 were the West South Central, down by 391 Bcf (12.1 percent), the Middle Atlantic, up by 229 Bcf (34.1 percent), and the Pacific Contiguous, up by 276 Bcf (28.3 percent). Utility gas consumption decreased by 4.4 percent in 1999 from 1998. A portion of this decline in utility gas consumption can be accounted for by the 11,816 MW of gas-fired capability that was sold by utilities to nonutilities (75.9 percent of which was located in California and Illinois).

[27] For the most part, the delivered cost of fossil fuels includes all costs (i.e., transportation, taxes, etc.). However, some coal delivered to Alabama, Florida, Kentucky, and Tennessee is reported on FERC Form 423 as delivered to storage facilities (the cost reported for this does not include transportation costs incurred to transport the coal to the plant).

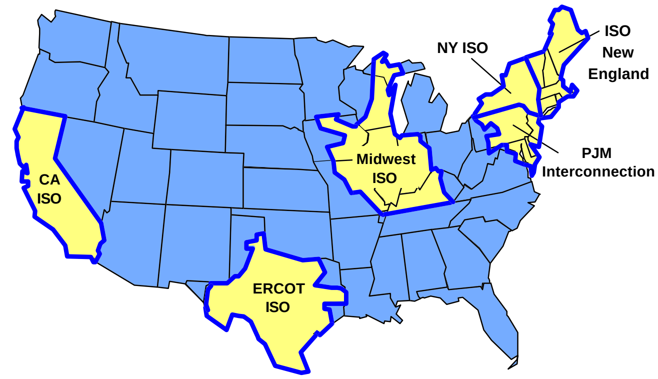
[28] Energy Information Administration, *Historical Monthly Energy Review* (HMER), DOE/EIA-0035 (73-92) (Washington, DC, August 1994), Table 9.1.

A significant drop in receipts of gas (36 Bcf) reported by utilities also occurred in the West South Central Census Division. Other divisions reporting decreases in gas receipts by utilities included the New England, Middle Atlantic, and Pacific Contiguous Census Divisions. The divestiture of several plants by utilities to nonutilities had a major effect on the quantity of gas receipts in these divisions. In fact, gas receipts in California, a State within the Pacific Contiguous Census Division, were 119 Bcf lower, as most of the gas-fired plants owned by Pacific Gas and Electric Company, San Diego Gas and Electric Company, and Southern California Edison Company were sold during 1998 and 1999. The sale of several gas-fired plants previously owned by utilities in Massachusetts, Maine, and New York also led to lower gas receipts in both the New England and Middle Atlantic Census Divisions. The average cost of gas delivered to utilities increased from 1998 to 1999 reaching $2.57 per million Btu.

## Wholesale Trade[29]

In 1999, wholesale trade continued to expand as the number of participants in the market grew. Activity in the wholesale market includes a variety of transactions (including hourly, daily, monthly, long-term bilateral contracts, sales and purchases through power exchanges, and financial transactions, such as futures and options). Newly established organizations like the independent system operators (ISOs) have created types of markets that did not exist before (Figure 8). Markets now exist for energy, automatic generation control, spinning reserves, other categories of ancillary services, and capacity. Organizations such as the New York Mercantile Exchange (NYMEX) offer trading opportunities in electricity futures and options at various hubs in the country. The California Power Exchange serves an adjunct to the California ISO and operates in a manner designed to complement operational activities of the California ISO. For the most part, all new wholesale electricity markets (due to restructuring) are still developing. A caveat is that prices for all categories of these transactions are not readily available. Available data are not complete and verifiable as they were under the fully regulated industry.

**Figure 8. U.S. Independent System Operators in Operation, 1999**




PJM = Pennsylvania-New Jersey-Maryland.

Notes: •ISO control of the transmission grid is incomplete in many of the regions shown on the map. Full implementation is likely to be completed in phases. •Midwest ISO has been approved, but is not yet operational. •Data are not available to show specific areas covered within regions. For example, the California ISO currently controls approximately 75 percent of the power grid in California.

Source: Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

In 1999, wholesale prices were just as volatile as they were in 1998 (Figures 9 and 10), partly due to a country-wide heat wave that was nearly as severe as the record-setting one in 1998. Inadequacy either of capacity or transmission, or both, contributed to sporadic surges in price in various regions of the country. Lack of liquidity in the wholesale electricity markets is another critical factor that precluded interaction of market forces in determination of prices.[30]

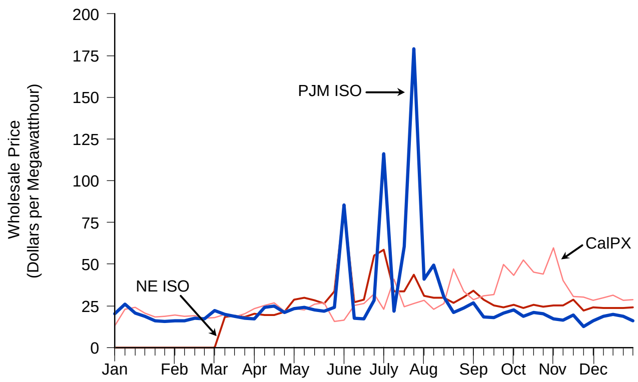
While prices were volatile in areas of the country, examination of the price-duration curve indicates that, except for a limited number of peak hours, the price of wholesale electricity was relatively stable (Table 6).[31] The highest maximum spot-market price, which was $1,077 per MWh, occurred in the Pennsylvania-New Jersey-Maryland (PJM) Interconnection region during 1 week in August 1999. Note that the reported high prices were for a short duration, say a few hours on any given day. In addition to this high, PJM Interconnection saw 6 other

[29] A wholesale market represents the sum of purchases and sales of energy and capacity for resale along with ancillary services needed to maintain reliability and power quality at the transmission level. A party that purchases energy, capacity, or ancillary services in the wholesale market to serve its own load is considered to be a participant within the framework of rules generally devised by the ISOs for coordinating transmission in conformity with approved standards.

[30] Because the availability of generation and transmission capacity is not uniform across the country, the effect on prices may vary in different areas. These price changes reflect current operating and weather conditions. For specific electrical system reliability incidents in 1999, see U.S. Department of Energy, *Report of the U.S. Department of Energy's Power Outage Study Team* (Washington, DC, March 2000).

[31] Energy Information Administration, *Annual Energy Outlook 1999*, DOE/EIA-0383(99) (Washington, DC, November 17, 1998), Figure 20, p. 28.

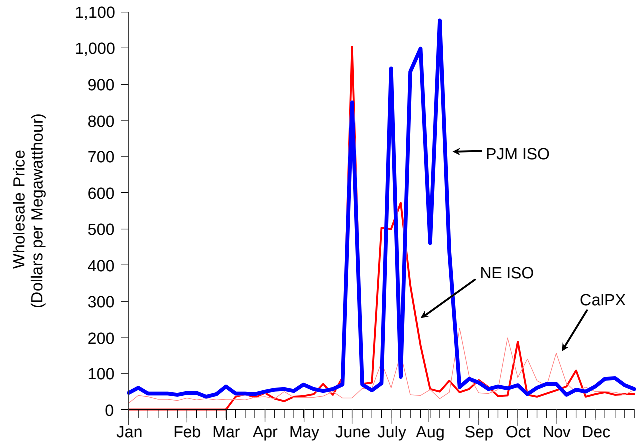
**Figure 9. Wholesale Average Price of Electricity at CalPX, PJM Interconnection, ISO New England, January Through December 1999**




Notes: Average is simple arithmetic mean of the clearing or hourly prices. ●PJM Interconnection covers Pennsylvania, New Jersey, Maryland, and Delaware. ●ISO New England covers Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

Sources: California Power Exchange (CalPX); Pennsylvania-New Jersey-Maryland (PJM) Interconnection, and ISO New England.

**Figure 10. Wholesale Maximum Price of Electricity at CalPX, PJM Interconnection, ISO New England, January Through December 1999**




Notes: Average is simple arithmetic mean of the clearing or hourly prices. ●PJM Interconnection covers Pennsylvania, New Jersey, Maryland, and Delaware. ●ISO New England covers Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

Sources: California Power Exchange (CalPX); Pennsylvania-New Jersey-Maryland (PJM) Interconnection, and ISO New England.

weekly periods during June, July, and August where prices ranged between $400 and $1,000 per MWh. The lowest average price was set during November for PJM Interconnection at $12.46 per MWh. The ISO New England (ISO NE) highest maximum price occurred during the second week of June at $1,003 per MWh. Subsequently, the ISO NE had a period starting in late June, of three straight weeks where prices mostly stayed above $500 per MWh, then dropped under $180 per MWh.

However, the day-ahead market for the California Power Exchange (CalPx) did not see the same level of activity.[32] Maximum price in CalPx did reach $225 per MWh in August and the monthly maximum prices ranged between $100 to $200 per MWh for each of the other months from June to November in 1999. Interestingly, the average monthly price for all these markets was below $50 per MWh for all but July in the PJM Interconnection where it averaged nearly $90 per MWh.

The futures market presents another aspect of wholesale electricity competition (Tables 7-11 and Figures 11-14). This market covers sales of electricity akin to commodity trading. The futures market provides crucial risk protection to any industry operating under the uncertainty of a competitive market. Power marketers, electric utilities, power producers, buyers, and investors wishing to provide liquidity to a market use the financial instruments traded in the futures markets to mitigate the impact of potential high prices.

Trading sites and types of electricity commodity futures are approved by the Federal Commodity Futures Trading Commission. Futures contracts do not reflect the hourly demand patterns for individual end-users. Futures prices are based upon quotes that use standard specifications describing the predetermined amount of electricity that is to be delivered to a known location at a specified point in time. The contractual specifications for the five trading sites in this report are shown in the inset box on page 21.

The volume of electricity trade in the futures markets relative to overall electricity sales has remained low, because this market is relatively new and deregulation

[32] The reader is cautioned against comparing values shown for 1999 against those cited in last year's report because in 1998, reported values for the California Power Exchange were only for April through December.

**Table 6. The Wholesale Price of Electricity at the California Power Exchange (CalPx), Pennsylvania-New Jersey-Maryland (PJM) Interconnection, and ISO New England (ISO NE), 1999**
(Dollars per Megawatthour)

| | Day Ahead | | Spot Market | | | |
|---|---|---|---|---|---|---|
| | CalPX | | PJM Interconnection | | ISO NE | |
| Time Interval | Average Price | Maximum Price | Average Price | Maximum Price | Average Price | Maximum Price |
| Jan 1 – Jan 2 | 12.89 | 18.99 | 20.06 | 47.59 | – | – |
| Jan 3 – Jan 9 | 23.14 | 39.01 | 25.87 | 61.52 | – | – |
| Jan 10 – Jan 16 | 24.13 | 36.00 | 20.77 | 45.90 | – | – |
| Jan 17 – Jan 23 | 20.78 | 28.86 | 18.64 | 45.10 | – | – |
| Jan 24 – Jan 30 | 18.29 | 29.00 | 16.00 | 44.97 | – | – |
| Jan 31 – Feb 6 | 18.89 | 25.19 | 15.76 | 42.18 | – | – |
| Feb 7 – Feb 13 | 19.57 | 32.60 | 15.95 | 46.30 | – | – |
| Feb 14 – Feb 20 | 18.78 | 27.73 | 16.22 | 47.47 | – | – |
| Feb 21 – Feb 27 | 18.95 | 31.07 | 17.77 | 37.06 | – | – |
| Feb 28 – Mar 6 | 17.70 | 27.84 | 17.15 | 43.95 | – | – |
| Mar 7 – Mar 13 | 17.79 | 29.46 | 22.32 | 64.04 | – | – |
| Mar 14 – Mar 20 | 19.76 | 28.33 | 19.98 | 45.22 | 18.29 | 35.64 |
| Mar 21 – Mar 27 | 18.31 | 27.78 | 18.60 | 45.90 | 19.04 | 43.71 |
| Mar 28 – April 3 | 20.15 | 35.00 | 17.68 | 44.07 | 18.31 | 33.94 |
| Apr 4 – Apr 10 | 23.31 | 35.88 | 17.27 | 49.90 | 20.07 | 47.67 |
| Apr 11 – Apr 17 | 25.23 | 31.59 | 24.26 | 55.10 | 19.44 | 30.28 |
| Apr 18 – Apr 24 | 26.83 | 50.01 | 24.94 | 56.66 | 19.46 | 23.17 |
| Apr 25 – May 1 | 21.88 | 35.00 | 20.84 | 52.88 | 21.31 | 35.70 |
| May 2 – May 8 | 23.46 | 35.05 | 23.50 | 69.68 | 28.52 | 38.55 |
| May 9 – May 15 | 22.68 | 35.15 | 24.10 | 57.80 | 29.91 | 42.66 |
| May 16 – May 22 | 26.08 | 38.57 | 22.57 | 52.40 | 28.40 | 72.04 |
| May 23 – May 29 | 26.63 | 50.75 | 21.77 | 57.70 | 26.49 | 41.76 |
| May 30 – Jun 5 | 15.82 | 33.01 | 24.22 | 69.66 | 33.80 | 90.00 |
| Jun 6 – Jun 12 | 16.49 | 32.00 | 85.38 | 850.00 | 85.27 | 1,003.21 |
| Jun 13 – Jun 19 | 25.29 | 58.74 | 17.73 | 69.24 | 27.25 | 71.21 |
| Jun 20 – Jun 26 | 26.30 | 58.82 | 17.31 | 53.70 | 28.57 | 75.97 |
| Jun 27 – Jul 3 | 32.26 | 131.05 | 28.41 | 73.04 | 55.20 | 503.35 |
| Jul 4 – Jul 10 | 23.13 | 60.53 | 116.19 | 944.00 | 58.51 | 500.00 |
| Jul 11 – Jul 17 | 40.80 | 153.83 | 21.80 | 90.40 | 33.62 | 572.54 |
| Jul 18 – Jul 24 | 24.31 | 42.01 | 60.62 | 935.00 | 33.81 | 344.01 |
| Jul 25 – Jul 31 | 26.58 | 40.65 | 179.22 | 999.00 | 43.81 | 178.48 |
| Aug 1 – Aug 7 | 28.19 | 55.00 | 41.03 | 460.16 | 31.01 | 56.61 |
| Aug 8 – Aug 14 | 23.05 | 31.00 | 49.28 | 1,077.31 | 29.77 | 50.26 |
| Aug 15 – Aug 21 | 26.59 | 48.17 | 30.25 | 436.81 | 29.81 | 80.39 |
| Aug 22 – Aug 28 | 47.26 | 225.00 | 20.90 | 63.23 | 26.96 | 48.13 |
| Aug 29 – Sep 4 | 33.64 | 92.20 | 23.67 | 85.92 | 30.32 | 56.65 |
| Sep 5 – Sep 11 | 28.61 | 47.64 | 26.84 | 75.00 | 34.05 | 81.34 |
| Sep 12 – Sep 18 | 30.95 | 44.99 | 18.23 | 57.84 | 28.51 | 62.62 |
| Sep 19 – Sep 25 | 31.91 | 56.09 | 18.12 | 64.60 | 25.09 | 37.41 |
| Sep 26 – Oct 2 | 49.71 | 199.24 | 20.82 | 58.54 | 24.03 | 39.81 |
| Oct 3 – Oct 9 | 43.25 | 90.01 | 22.38 | 68.90 | 25.54 | 188.07 |
| Oct 10 – Oct 16 | 52.59 | 140.37 | 18.85 | 43.17 | 23.67 | 41.71 |
| Oct 17 – Oct 23 | 45.34 | 79.99 | 20.99 | 60.45 | 25.80 | 36.54 |
| Oct 24 – Oct 30 | 44.10 | 65.79 | 20.17 | 70.68 | 24.31 | 45.26 |
| Oct 31 – Nov 6 | 59.84 | 156.05 | 17.04 | 71.01 | 25.15 | 53.65 |
| Nov 7 – Nov 13 | 40.15 | 74.16 | 16.23 | 41.75 | 25.19 | 64.23 |
| Nov 14 – Nov 20 | 30.44 | 47.98 | 19.31 | 56.28 | 28.80 | 109.04 |
| Nov 21 – Nov 27 | 30.40 | 63.37 | 12.46 | 50.81 | 22.31 | 35.97 |
| Nov 28 – Dec 4 | 28.25 | 50.00 | 16.10 | 64.63 | 24.12 | 42.61 |
| Dec 5 – Dec 11 | 30.03 | 49.99 | 18.74 | 85.20 | 23.91 | 49.37 |
| Dec 12 – Dec 18 | 31.26 | 49.30 | 19.84 | 88.10 | 23.84 | 42.37 |
| Dec 19 – Dec 25 | 28.31 | 40.95 | 18.54 | 68.49 | 23.79 | 42.44 |
| Dec 26 – Dec 31 | 28.89 | 55.51 | 16.07 | 57.00 | 24.20 | 44.17 |
| **1999** | | | | | | |
| January | 20.96 | 39.01 | 19.92 | 61.52 | – | – |
| February | 19.03 | 32.60 | 16.51 | 47.47 | – | – |
| March | 18.83 | 35.00 | 19.59 | 64.04 | – | – |
| April | 24.03 | 50.01 | 21.44 | 56.66 | 19.94 | 47.67 |
| May | 23.64 | 50.75 | 22.50 | 69.68 | 28.20 | 72.04 |
| June | 23.53 | 131.05 | 36.93 | 850.00 | 49.18 | 1,003.21 |
| July | 28.92 | 153.83 | 89.96 | 999.00 | 41.14 | 572.54 |
| August | 32.31 | 225.00 | 31.78 | 1,077.31 | 29.25 | 80.39 |
| September | 33.91 | 199.24 | 21.59 | 85.92 | 28.42 | 81.34 |
| October | 47.64 | 156.05 | 19.84 | 70.68 | 24.78 | 188.07 |
| November | 36.91 | 120.88 | 16.55 | 71.01 | 24.90 | 109.04 |
| December | 29.66 | 55.51 | 18.13 | 88.10 | 24.33 | 49.37 |

Notes: Average is the simple arithmetic mean of the clearing or hourly prices.
Sources: California Power Exchange; Pennsylvania, New Jersey, Maryland (PJM) Interconnection; and ISO New England.

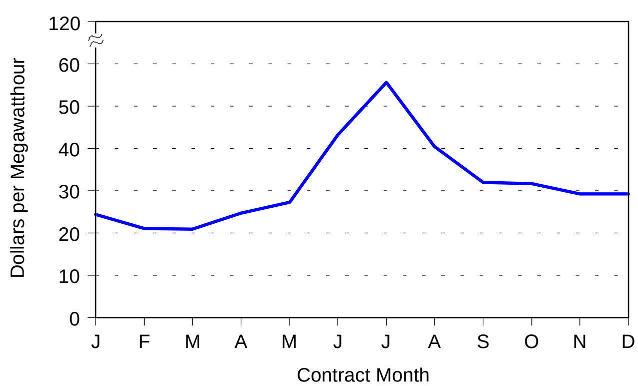
## Table 7. Average Monthly Settlement Prices for Electricity Futures at NYMEX Palo Verde, 1999

| Delivery Date | 1999 Contract Date (Dollars per Megawatthour) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July | August | September | October | November | December |
| **1999** | | | | | | | | | | | | |
| January . . . . . | NA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| February . . . . | 24.44 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| March . . . . . . | 22.74 | 21.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| April . . . . . . . | 22.11 | 21.79 | 20.95 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| May . . . . . . . . | 23.42 | 22.89 | 22.65 | 24.67 | -- | -- | -- | -- | -- | -- | -- | -- |
| June . . . . . . . | 29.32 | 27.26 | 26.74 | 26.95 | 27.24 | -- | -- | -- | -- | -- | -- | -- |
| July . . . . . . . . | 45.53 | 45.32 | 43.96 | 43.24 | 42.25 | 43.16 | -- | -- | -- | -- | -- | -- |
| August . . . . . | 62.26 | 64.74 | 58.30 | 58.43 | 57.20 | 58.68 | 55.67 | -- | -- | -- | -- | -- |
| September . . | 52.37 | 52.89 | 50.04 | 48.48 | 47.45 | 50.18 | 48.43 | 40.45 | -- | -- | -- | -- |
| October . . . . . | 28.00 | 28.95 | 29.04 | 29.81 | 30.35 | 32.77 | 31.81 | 33.36 | 32.00 | -- | -- | -- |
| November . . . | -- | -- | 27.00 | 26.81 | 26.65 | 29.59 | 29.24 | 31.00 | 30.52 | 31.61 | -- | -- |
| December . . . | -- | -- | 28.00 | 28.95 | 29.10 | 30.73 | 30.57 | 32.36 | 31.48 | 31.71 | 29.18 | -- |
| **2000** | | | | | | | | | | | | |
| January . . . . . | -- | -- | -- | 27.00 | 27.00 | 27.91 | 26.38 | 27.86 | 29.86 | 30.33 | 27.30 | 29.17 |
| February . . . . | -- | -- | -- | 24.00 | 24.00 | 24.91 | 24.57 | 26.68 | 26.86 | 26.86 | 25.50 | 26.38 |
| March . . . . . . | -- | -- | -- | 22.00 | 22.40 | 23.18 | 25.05 | 26.82 | 25.90 | 25.71 | 24.30 | 25.29 |
| April . . . . . . . | -- | -- | -- | 23.00 | 23.00 | 24.14 | 24.86 | 25.45 | 26.38 | 26.10 | 26.90 | 27.00 |
| May . . . . . . . . | -- | -- | -- | 22.00 | 22.00 | 23.91 | 24.19 | 25.45 | 26.38 | 26.10 | 26.90 | 27.00 |
| June . . . . . . . | -- | -- | -- | 31.00 | 31.00 | 31.32 | 30.33 | 30.50 | 31.67 | 33.95 | 33.90 | 34.05 |
| July . . . . . . . . | -- | 47.50 | 47.17 | 47.29 | 46.60 | 48.73 | 47.52 | 44.05 | 48.43 | 53.67 | 54.75 | 52.24 |
| August . . . . . | -- | 66.00 | 64.61 | 63.05 | 61.65 | 63.82 | 61.38 | 56.27 | 58.05 | 62.67 | 64.15 | 64.00 |
| September . . | -- | 52.50 | 53.91 | 51.62 | 49.95 | 52.50 | 54.05 | 49.59 | 47.33 | 50.38 | 51.75 | 51.00 |
| October . . . . . | -- | -- | -- | -- | -- | 32.25 | 31.52 | 31.59 | 31.19 | 31.19 | 32.00 | 32.00 |
| November . . . | -- | -- | -- | -- | -- | 29.60 | 28.62 | 28.77 | 29.00 | 29.00 | 29.00 | 29.29 |
| December . . . | -- | -- | -- | -- | -- | 31.25 | 30.24 | 30.59 | 30.19 | 30.00 | 30.00 | 30.29 |

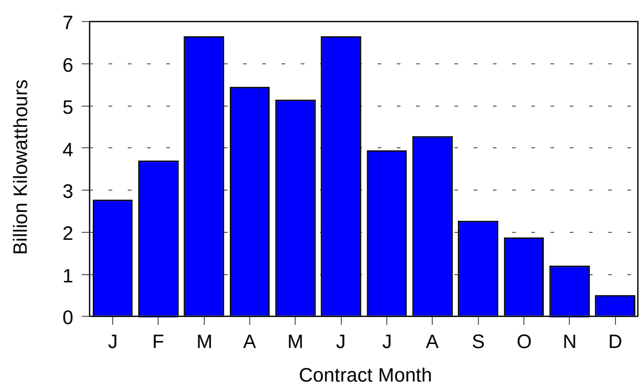
NYMEX = New York Mercantile Exchange.
NA = Not available.
Notes: • Prices are simple arithmetic mean of daily settlement prices. • Shaded values are Average Month Ahead Future Price.
Source: Commodity Futures Trading Commission.

## Figure 11. Daily Settlement Prices for Month Ahead Futures and Volume of Trade by Contract Month, NYMEX Palo Verde, 1999

### Settlement Price




### Trading Volume




NYMEX = New York Mercantile Exchange.
Source: Commodity Futures Trading Commission.

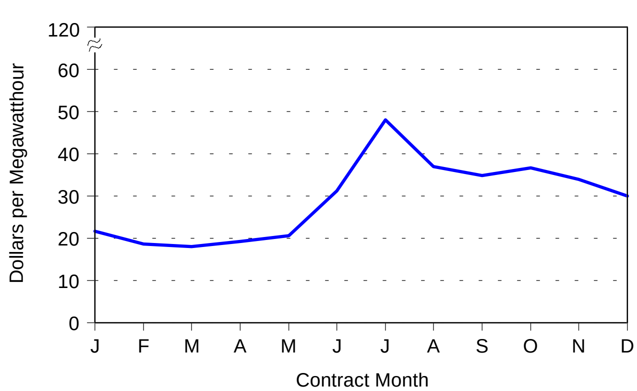
## Table 8. Average Monthly Settlement Prices for Electricity Futures at NYMEX California-Oregon Border, 1999

| Delivery Date | 1999 Contract Date (Dollars per Megawatthour) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July | August | September | October | November | December |
| **1999** | | | | | | | | | | | | |
| January . . . . | NA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| February . . . | 21.69 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| March . . . . . | 19.05 | 18.63 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| April . . . . . . | 18.42 | 18.58 | 18.05 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| May . . . . . . . | 17.00 | 16.89 | 16.26 | 19.22 | -- | -- | -- | -- | -- | -- | -- | -- |
| June . . . . . . | 17.63 | 17.16 | 16.52 | 17.48 | 20.53 | -- | -- | -- | -- | -- | -- | -- |
| July . . . . . . . | 26.58 | 27.21 | 25.43 | 26.43 | 26.95 | 31.16 | -- | -- | -- | -- | -- | -- |
| August . . . . | 44.47 | 48.11 | 42.22 | 40.71 | 41.10 | 44.23 | 48.06 | -- | -- | -- | -- | -- |
| September | 43.47 | 46.95 | 41.87 | 41.38 | 41.95 | 44.14 | 45.00 | 37.00 | -- | -- | -- | -- |
| October . . . . | 28.84 | 29.58 | 29.04 | 29.57 | 30.10 | 32.27 | 31.81 | 33.86 | 34.78 | -- | -- | -- |
| November . . | 30.68 | 30.79 | 30.57 | 31.05 | 31.00 | 32.23 | 32.29 | 34.05 | 34.90 | 36.61 | -- | -- |
| December . . | 31.00 | 31.00 | 30.87 | 31.52 | 32.20 | 33.95 | 34.90 | 36.41 | 36.33 | 36.86 | 33.94 | -- |
| **2000** | | | | | | | | | | | | |
| January . . . . | 27.06 | 27.79 | 28.70 | 29.24 | 29.50 | 30.82 | 30.43 | 31.59 | 32.43 | 33.19 | 30.10 | 30.06 |
| February . . . | -- | -- | -- | 26.00 | 25.90 | 27.55 | 27.14 | 26.09 | 27.14 | 28.33 | 26.90 | 27.24 |
| March . . . . . | -- | -- | -- | 21.00 | 21.90 | 25.00 | 25.71 | 25.77 | 25.05 | 24.38 | 23.80 | 23.90 |
| April . . . . . . | -- | -- | -- | -- | 22.60 | 25.00 | 26.00 | 25.32 | 25.00 | 24.48 | 24.00 | 24.14 |
| May . . . . . . . | -- | -- | -- | -- | -- | 20.93 | 22.71 | 23.32 | 23.00 | 22.48 | 22.00 | 22.05 |
| June . . . . . . | -- | -- | -- | -- | -- | 21.14 | 23.67 | 23.59 | 23.00 | 23.10 | 22.65 | 22.33 |
| July . . . . . . . | -- | 29.00 | 29.78 | 30.24 | 30.40 | 34.55 | 40.48 | 36.91 | 38.33 | 41.24 | 41.40 | 39.29 |
| August . . . . | -- | 48.67 | 48.39 | 47.43 | 47.40 | 51.36 | 53.05 | 48.64 | 48.71 | 53.29 | 55.05 | 54.86 |
| September | -- | 47.33 | 47.39 | 47.33 | 47.90 | 52.50 | 49.67 | 45.36 | 43.33 | 46.24 | 47.50 | 45.76 |
| October . . . . | -- | -- | -- | -- | -- | 31.00 | -- | -- | -- | 34.47 | 34.65 | 34.00 |
| November . . | -- | -- | -- | -- | -- | 31.00 | -- | -- | -- | 34.53 | 35.00 | 34.14 |
| December . . | -- | -- | -- | -- | -- | 33.00 | -- | -- | -- | 36.00 | 36.55 | 36.00 |

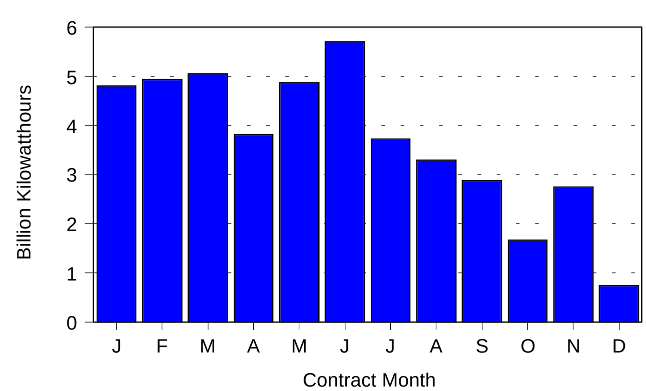
NYMEX = New York Mercantile Exchange.
NA = Not available.
Notes: • Prices are simple arithmetic mean of daily settlement prices. • Shaded values are Average Month Ahead Future Price.
Source: Commodity Futures Trading Commission.

## Figure 12. Daily Settlement Prices for Month Ahead Futures and Volume of Trade by Contract Month, NYMEX California-Oregon Border, 1999

### Settlement Price




### Trading Volume



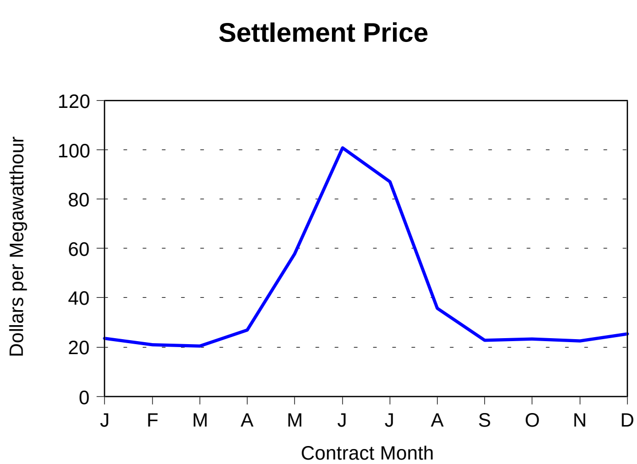

NYMEX = New York Mercantile Exchange.
Source: Commodity Futures Trading Commission.

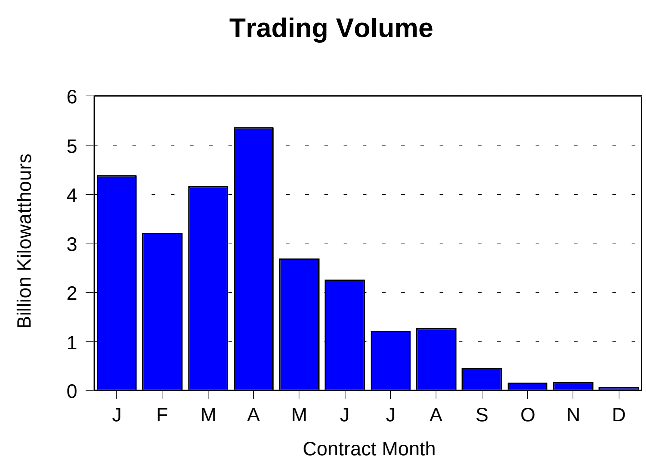
## Table 9. Average Monthly Settlement Prices for Electricity Futures at NYMEX Cinergy, 1999

| Delivery Date | 1999 Contract Date (Dollars per Megawatthour) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July | August | September | October | November | December |
| **1999** | | | | | | | | | | | | |
| January . . . . | NA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| February . . . | 23.56 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | – |
| March . . . . . | 22.84 | 20.88 | -- | -- | -- | -- | -- | -- | -- | -- | -- | – |
| April . . . . . . | 22.26 | 21.11 | 20.30 | -- | -- | -- | -- | -- | -- | -- | -- | – |
| May . . . . . . . | 28.79 | 27.37 | 25.22 | 26.94 | -- | -- | -- | -- | -- | -- | -- | – |
| June . . . . . . | 67.74 | 63.74 | 54.13 | 54.57 | 57.71 | -- | -- | -- | -- | -- | -- | – |
| July . . . . . . . | 138.05 | 136.21 | 112.39 | 114.19 | 120.00 | 100.95 | -- | -- | -- | -- | -- | – |
| August . . . . | 129.32 | 127.05 | 107.22 | 106.62 | 107.55 | 91.73 | 87.06 | -- | – | -- | -- | – |
| September | 38.11 | 37.00 | 34.48 | 33.95 | 36.65 | 35.95 | 33.71 | 35.68 | -- | -- | -- | – |
| October . . . . | 24.00 | 23.32 | 23.61 | 24.29 | 25.25 | 25.86 | 24.90 | 25.64 | 22.61 | -- | -- | – |
| November . . | 0.00 | 0.00 | 24.00 | 24.38 | 25.45 | 25.86 | 24.81 | 25.32 | 23.71 | 23.17 | -- | -- |
| December . . | 25.00 | 25.00 | 25.00 | 25.00 | 25.85 | 26.00 | 25.19 | 25.82 | 24.90 | 24.43 | 22.41 | -- |
| **2000** | | | | | | | | | | | | |
| January . . . . | 28.00 | 28.00 | 29.04 | 29.95 | 30.60 | 31.05 | 30.67 | 32.27 | 31.67 | 31.00 | 27.85 | 25.28 |
| February . . . | 27.74 | 27.00 | 27.00 | 27.43 | 28.75 | 29.00 | 28.19 | 29.09 | 28.57 | 27.95 | 25.60 | 23.81 |
| March . . . . . | 0.00 | 0.00 | 0.00 | 24.00 | 24.00 | 24.95 | 25.00 | 25.00 | 25.00 | 25.00 | 25.00 | 24.05 |
| April . . . . . . | 0.00 | 0.00 | 0.00 | 0.00 | 27.74 | 28.95 | 29.00 | 29.82 | 30.76 | 31.62 | 30.15 | 29.05 |
| May . . . . . . . | 0.00 | 0.00 | 0.00 | 50.00 | 52.80 | 53.05 | 58.48 | 65.82 | 71.29 | 74.29 | 70.00 | 62.57 |
| June . . . . . . | 0.00 | 0.00 | 0.00 | 95.22 | 98.00 | 90.95 | 90.76 | 120.64 | 140.10 | 150.38 | 142.50 | 147.00 |
| July . . . . . . . | 0.00 | 0.00 | 0.00 | 90.22 | 93.00 | 85.95 | 83.29 | 109.14 | 128.71 | 133.38 | 124.35 | 125.00 |
| August . . . . | -- | -- | -- | -- | -- | -- | 105.56 | 79.38 | 91.52 | 131.64 | 147.58 | 124.68 |
| September | -- | -- | -- | -- | -- | -- | 105.56 | 77.86 | 86.05 | 122.82 | 136.05 | 116.59 |
| October . . . . | -- | -- | -- | -- | -- | -- | 37.87 | 33.14 | 35.90 | 41.32 | 39.84 | 37.14 |
| November . . | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| December . . | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

NYMEX = New York Mercantile Exchange.
NA = Not available.
Notes: • Prices are simple arithmetic mean of daily settlement prices. • Shaded values are Average Month Ahead Future Price.
Source: Commodity Futures Trading Commission.

## Figure 13. Daily Settlement Prices for Month Ahead Futures and Volume of Trade by Contract Month, NYMEX Cinergy, 1999



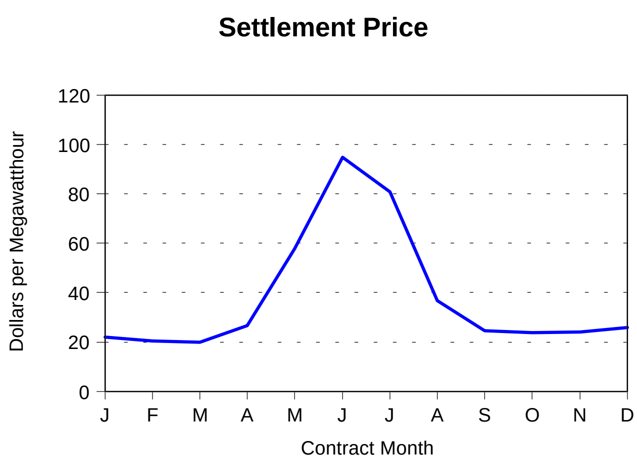

NYMEX = New York Mercantile Exchange.
Source: Commodity Futures Trading Commission.

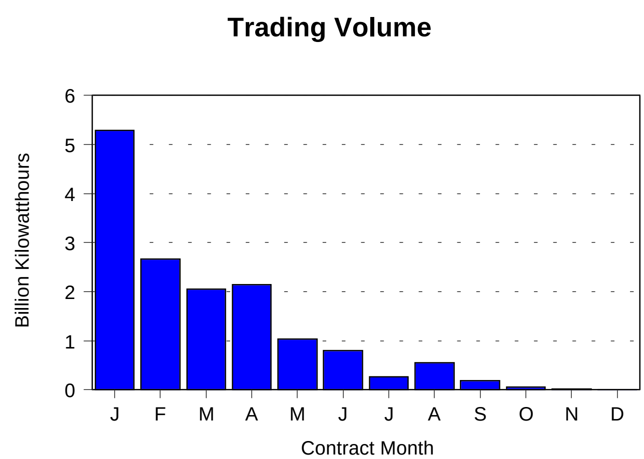
**Table 10. Average Monthly Settlement Prices for Electricity Futures at NYMEX Entergy, 1999**

| Delivery Date | 1999 Contract Date (Dollars per Megawatthour) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July | August | September | October | November | December |
| **1999** | | | | | | | | | | | | |
| January . . . . | NA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| February . . . | 21.94 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| March . . . . . | 21.53 | 20.31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| April . . . . . . | 21.32 | 20.74 | 20.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| May . . . . . . . | 27.84 | 26.42 | 24.74 | 26.72 | -- | -- | -- | -- | -- | -- | -- | -- |
| June . . . . . . | 64.32 | 60.74 | 52.70 | 54.19 | 57.82 | -- | -- | -- | -- | -- | -- | -- |
| July . . . . . . . | 126.47 | 125.26 | 106.65 | 111.00 | 120.30 | 94.84 | -- | -- | -- | -- | -- | -- |
| August . . . . | 119.42 | 118.47 | 100.43 | 103.14 | 108.90 | 86.64 | 80.83 | -- | -- | -- | -- | -- |
| September | 36.47 | 35.84 | 33.78 | 34.00 | 37.55 | 36.18 | 33.95 | 36.74 | -- | -- | -- | -- |
| October . . . . | 23.32 | 24.00 | 24.00 | 24.38 | 25.65 | 25.86 | 24.71 | 26.00 | 24.50 | -- | -- | -- |
| November . . | -- | 24.00 | 24.00 | 24.00 | 25.40 | 25.27 | 24.52 | 25.23 | 24.81 | 23.67 | -- | -- |
| December . . | 24.00 | 24.00 | 24.00 | 24.38 | 25.65 | 26.00 | 25.38 | 25.73 | 25.90 | 24.81 | 23.94 | -- |
| **2000** | | | | | | | | | | | | |
| January . . . . | -- | 27.00 | 28.48 | 29.00 | 29.00 | 29.91 | 30.52 | 31.73 | 32.10 | 30.81 | 29.50 | 25.89 |
| February . . . | -- | -- | -- | -- | -- | 28.33 | 27.00 | 27.00 | 27.57 | 28.00 | 28.00 | 26.90 |
| March . . . . . | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| April . . . . . . | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| May . . . . . . . | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| June . . . . . . | -- | -- | -- | -- | -- | -- | 56.91 | 64.29 | 70.43 | 73.90 | 70.05 | 61.67 |
| July . . . . . . . | -- | -- | -- | -- | -- | -- | -- | -- | 136.29 | 140.00 | 140.00 | 140.00 |
| August . . . . | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| September | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| October . . . . | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| November . . | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| December . . | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

NYMEX = New York Mercantile Exchange.
NA = Not available.
Source: Commodity Futures Trading Commission.
Notes: • Prices are simple arithmetic mean of daily settlement prices. • Shaded values are Average Month Ahead Future Price.
Source: Commodity Futures Trading Commission.

**Figure 14. Daily Settlement Prices for Month Ahead Futures and Volume of Trade by Contract Month, NYMEX Entergy, 1999**




NYMEX = New York Mercantile Exchange.
Source: Commodity Futures Trading Commission.

**Table 11. Average Monthly Settlement Prices for Electricity Futures at PJM Interconnection, 1999**

| Delivery Date | 1999 Contract Date (Dollars per Megawatthour) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July | August | September | October | November | December |
| **1999** | | | | | | | | | | | | |
| January | NA | NA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| February | NA | NA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| March | NA | NA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| April | NA | NA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| May | NA | NA | 27.78 | 29.11 | -- | -- | -- | -- | -- | -- | -- | -- |
| June | NA | NA | 38.67 | 40.33 | 42.24 | -- | -- | -- | -- | -- | -- | -- |
| July | NA | NA | 71.78 | 78.81 | 80.30 | 75.21 | -- | -- | -- | -- | -- | -- |
| August | NA | NA | 67.89 | 72.81 | 73.45 | 70.05 | 74.00 | -- | -- | -- | -- | -- |
| September | NA | NA | 0.00 | 34.90 | 35.80 | 36.50 | 35.24 | 36.89 | -- | -- | -- | -- |
| October | NA | NA | 0.00 | 0.00 | 0.00 | 0.00 | 26.00 | 26.45 | 26.89 | -- | -- | -- |
| November | NA | NA | 0.00 | 0.00 | 0.00 | 0.00 | 26.00 | 26.00 | 26.19 | 25.83 | -- | -- |
| December | NA | NA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 27.50 | 27.00 | 26.06 | -- |
| **2000** | | | | | | | | | | | | |
| January | NA | NA | 31.00 | 31.57 | 32.00 | 32.55 | 33.00 | 34.00 | 35.71 | 36.00 | 31.75 | 28.56 |
| February | NA | NA | 30.00 | 30.52 | 31.00 | 31.00 | 31.00 | 31.95 | 33.62 | 32.90 | 29.90 | 26.43 |
| March | NA | NA | 25.00 | 25.19 | 26.65 | 27.00 | 27.00 | 27.00 | 27.00 | 27.81 | 27.00 | 25.48 |
| April | NA | NA | 23.00 | 23.95 | 25.85 | 26.00 | 26.00 | 26.00 | 26.00 | 26.76 | 26.00 | 25.10 |
| May | NA | NA | 29.00 | 29.86 | 31.20 | 31.00 | 30.33 | 30.82 | 31.52 | 31.95 | 31.00 | 30.52 |
| June | NA | NA | 39.00 | 40.05 | 43.25 | 44.86 | 49.48 | 52.00 | 54.57 | 58.29 | 56.00 | 53.48 |
| July | NA | NA | 76.00 | 79.29 | 83.75 | 78.00 | 80.29 | 88.14 | 93.00 | 97.57 | 93.00 | 89.33 |
| August | NA | NA | 72.00 | 74.48 | 77.25 | 73.18 | 74.67 | 80.73 | 84.62 | 85.52 | 83.00 | 82.67 |
| September | NA | NA | 36.00 | 35.90 | 36.00 | 36.00 | 35.86 | 36.00 | 36.00 | 35.86 | 35.00 | 33.24 |
| October | NA | NA | 25.00 | 24.86 | 25.75 | 26.00 | 26.00 | 26.00 | 26.52 | 27.00 | 27.00 | 27.00 |
| November | NA | NA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| December | NA | NA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

PJM = Pennsylvania-New Jersey-Maryland. NA = Not available.
Notes: • Prices are simple arithmetic mean of daily settlement prices. • Shaded values are Average Month Ahead Future Price.
Source: Commodity Futures Trading Commission.

**Table 12. Total Volume of Trade for Each Contract Month**
(Billion Kilowatthours)

| Site | 1999 Contract Month | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July | August | September | October | November | December |
| Palo Verde | 2.756 | 3.695 | 6.632 | 5.434 | 5.133 | 6.645 | 3.928 | 4.266 | 2.255 | 1.857 | 1.198 | 0.500 |
| COB | 4.807 | 4.934 | 5.055 | 3.815 | 4.872 | 5.708 | 3.720 | 3.292 | 2.871 | 1.667 | 2.747 | 0.734 |
| Cinergy | 4.374 | 3.198 | 4.150 | 5.348 | 2.682 | 2.254 | 1.201 | 1.262 | 0.447 | 0.154 | 0.164 | 0.060 |
| Entergy | 5.282 | 2.672 | 2.054 | 2.139 | 1.043 | 0.800 | 0.272 | 0.558 | 0.193 | 0.063 | 0.020 | 0.009 |
| CBT | 0.037 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| PJM | NA | NA | 0.660 | 0.784 | 0.369 | 0.147 | 0.123 | 0.061 | 0.027 | 0.113 | 0.056 | 0.054 |

COB = California-Oregon Border, CBT = Chicago Board of Trade, PJM = Pennsylvania–New Jersey–Maryland (PJM) Interconnection.
Source: Commodity Futures Trading Commission.

is present in only about half the States. The largest volume traded option in 1999 was for the NYMEX Palo Verde at 6.6 billion kWh of electricity in June (Table 12). The NYMEX California-Oregon Border (COB) was next and had its largest volume of trade for the year in June at 5.7 billion kWh. NYMEX Cinergy peaked at 5.3 billion kWh in April, while subsequent months showed a declining volume in trade, ending with as little as 0.1 billion kWh in December. NYMEX Entergy had its highest volume of trade in January, at 5.3 billion kWh, while the lowest volume of 0.01 billion kWh occurred in December. April was also the month in which PJM Interconnection trade volume peaked at 0.8 billion kWh.

| Trading Site | Contract Specifications |
|---|---|
| NYMEX Palo Verde | 432 megawatthours delivered over a monthly period (as of 12/06/99); prior to 12/06/99, the quantity was 864 megawatthours over a monthly period |
| NYMEX California-Oregon Border (COB) | 432 megawatthours delivered over a monthly period |
| NYMEX Cinergy | 736 megawatthours delivered over a monthly period |
| NYMEX Entergy | 736 megawatthours delivered over a monthly period |
| PJM Interconnection | 736 megawatthours delivered over a monthly period |

## Retail Trade

**Price**. Retail prices for electricity have not, thus far, been affected by wholesale price volatility, as most retail rates are still regulated by State utility commissions. On a national level, the average revenue per kWh (often used as a proxy for price) of electricity sold by utilities in 1999 was 6.60 cents, a 2.1-percent decrease from the 1998 national average (Figure 15). Factors contributing to a decline in retail prices are difficult to formulate. Some observations can, however, be made in the absence of an empirical analysis and include the following:

- Deregulation in most States allows utilities an opportunity to recover stranded costs (including renegotiation or buy-out costs of high-priced power purchase contracts and regulatory assets). In exchange for this recovery, utilities are generally required to lower electricity rates and not raise them during a pre-specified transition period. Such arrangements effectively insulate retail prices from reflecting price changes occurring at the wholesale level.

- Delivered price of coal continued to decline to \$1.22 per million Btu in 1999 (down from the \$1.25-per-million-Btu level in 1998).

- The capacity utilization of nuclear power plants showed significant improvement.[33]

- Due to the absence of significant construction activity by investor-owned utilities, embedded plant asset valuations, in the aggregate, have declined.

- Productivity enhancements have been associated with reductions in operations and management costs.

Average revenue per kWh decreased in the major end-use sectors in 1999, compared with 1998 values. In the residential sector, on a cents-per-kWh basis, the price fell to 8.14 cents during the year from 8.26 cents in the prior year. Lower prices were also reported for the commercial and the industrial sectors in 1999 at 7.18 and 4.40 cents per kWh of electricity sold, respectively, compared with 7.41 and 4.48 cents per kWh, in 1998.

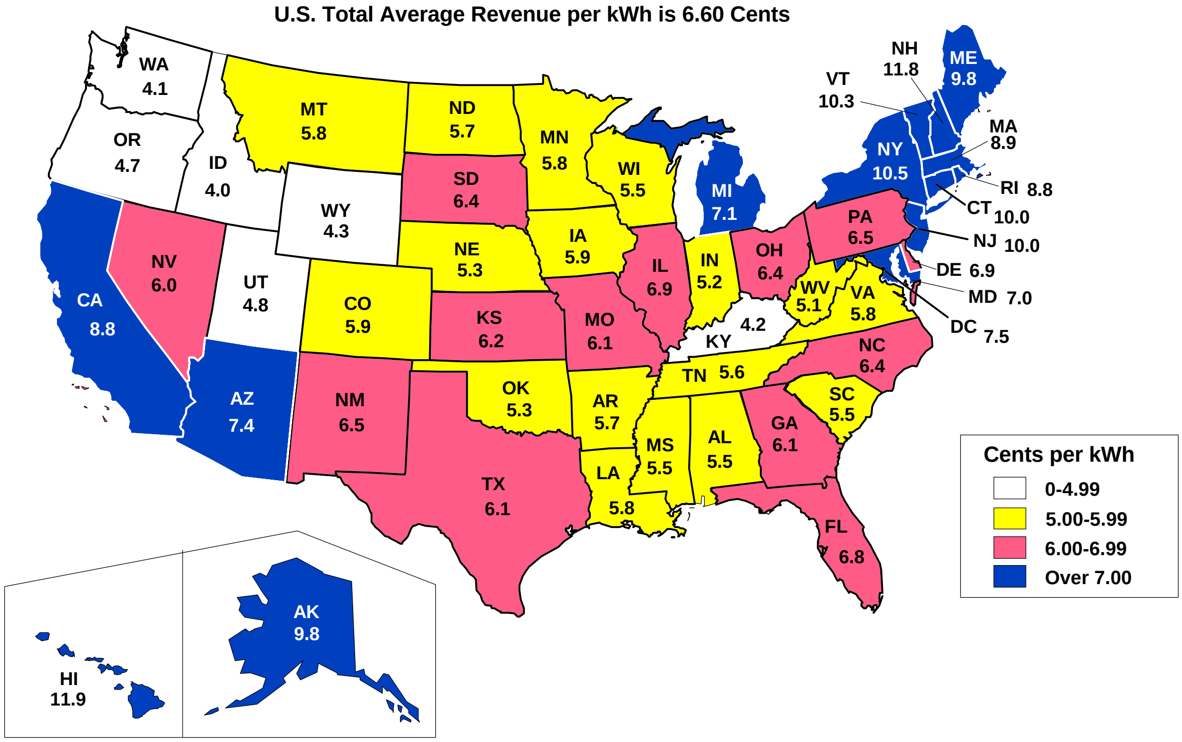
> Values for total sales—as well as revenue from those sales and average revenue per kWh of electricity sold in the retail market—do not account for all energy service providers. Consequently, the growth in sales is underestimated, in particular for the commercial and industrial sectors. Values for 1999 retail sales by energy service providers (includes power marketers and traditional electric utilities in deregulated markets) are estimated to total 49 billion kWh.

**Sales and Revenue**. As the Nation experienced its second warmest year this century, retail electricity sales in 1999 reached a record level of 3,296 billion kWh (Figure 16). This level of retail sales, which rose 1.7 percent from the amount reported in 1998 (the warmest year this century), maintained an upward trend established more than 50 years ago. Retail sales rose, compared with 1998 sales, in all three major consumer sectors—residential by 1.6 percent, commercial by 1.5 percent, and industrial by 2.2 percent. In addition to warmer temperatures, the country was also affected by variations in precipitation in 1999, including the following:

- Unusually wet conditions during January and April in the eastern portion of the country (Conversely, nearly a fifth of the country was unusually dry.)

[33] Although this advantage may be offset due to an increase in the price of other fossil fuels, coal and nuclear contributed to approximately 70 percent of the power generated in the country. The annual capacity factor for nuclear power set a record in 1999 at 85.5 percent according to the Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0335 (00/03) (Washington, DC, March 2000), Table 8.1.

## Figure 15. Estimated Average Revenue per Kilowatthour for All Sectors at Electric Utilities by State, 1999

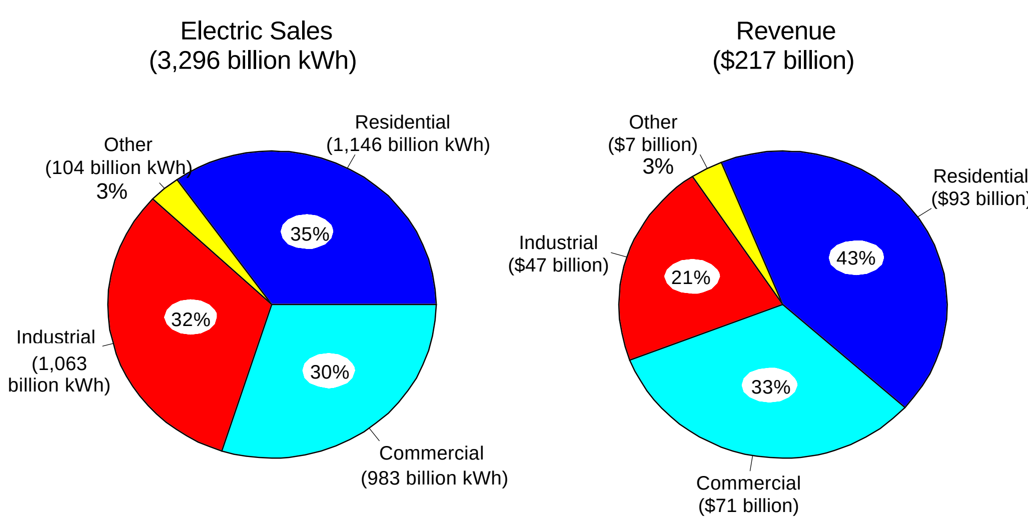



kWh = Kilowatthour.

Note: •Estimates are preliminary. •The average revenue per kilowatthour of electricity sold is calculated by dividing revenue by sales. •Values for average revenue per kilowatthour do not account for all energy service providers. Consequently, the growth in sales is underestimated (in particular for the commercial and industrial sectors). This, in turn, may affect the rates of associated revenue to sales of electricity.

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

## Figure 16. U.S. Electric Utility Sales and Revenue to Ultimate Consumers, 1999




kWh = kilowatthours.

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

- Record-setting drought during the growing season in the Ohio valley and in the Northeast

- Record-setting rainfall in September on the East Coast (North Carolina to Maine)

- Unusual dryness during the last 4 months of the year. (More than a third of the Nation was very dry in November, and a sixth of the Nation experienced severe to extreme drought in December.)

During the summer months of June through August, temperatures were more extreme in the eastern and south central portions of the country impacting sales at the State- and Census-division levels.

These high temperatures helped boost annual sales levels. In 1999, utilities in the South Atlantic Census Division sold the most electricity, 687 billion kWh, representing 20.8 percent of the Nation's total sales—the largest share among the Census divisions. Nearly all the States in the South Atlantic Census Division showed increases over the prior year. Florida (with a 27.2-percent share of the division's sales) had slightly milder temperatures in 1999 than in 1998, which was reflected by retail sales that were 0.4 percent less than in 1998. The second largest share of electricity sales occurred in the East North Central Census Division, where utilities reported sales of 561 billion kWh, or 2.8 percent higher than in 1998. The West South Central Census Division provided the third largest amount of retail sales, 466 billion kWh, which represented a 0.7-percent decrease from 1998. Nearly two-thirds of this division's sales occurred in Texas, which experienced a 1.0-percent decline in sales during the year.

In the East North Central Census Division, residential sales during July soared 19.4 percent over July 1998 sales.[34] Higher sales were reported by Ohio (29.2 percent), Indiana (26.3 percent), and Wisconsin (20.3 percent). Two other Census divisions showing large increases in residential sales in July 1999, compared with levels reported a year earlier, were the New England and Middle Atlantic Census Divisions, at 16.2 and 14.3 percent, respectively.

## Status of Bulk Power Transmission Systems

The domestic interconnected bulk power transmission systems have evolved over the years and are designed to interconnect utility loads and generators. In the past, neighboring utilities established interconnections among themselves and with each other to increase supply options, to augment reliability and to share reserves economically. These arrangements serve not only the needs of individual utilities but also handle inter-system power transfers as part of a larger, integrated system.[35]

The existing transmission system in the country consists of three major power interconnections—the Eastern Interconnect (the largest), Western Interconnect (the second largest) and the Texas Interconnect (Figure 17).[36] Potential transfer capability between the three grids (or interconnections) is extremely limited. Each grid, therefore, operates as a single very large utility and functions with a common set of operating guidelines.

The North American Electric Reliability Council (NERC)—an organization formed in the aftermath of the 1965 blackout in the northeastern States—ensures compliance with guidelines with a view to provide overall reliability and system security.

Various legislative initiatives since the late 1970s opened the door for competition in the area of power generation.[37] During the early 1990s, specific provisions of the Energy Policy Act (EPACT) of 1992 encouraged competition in promoting wholesale trade in electricity. With a view to advance EPACT's objectives, the FERC issued Order Nos. 888 and 889 on April 26, 1996, to "remove impediments to competition in wholesale trade and to

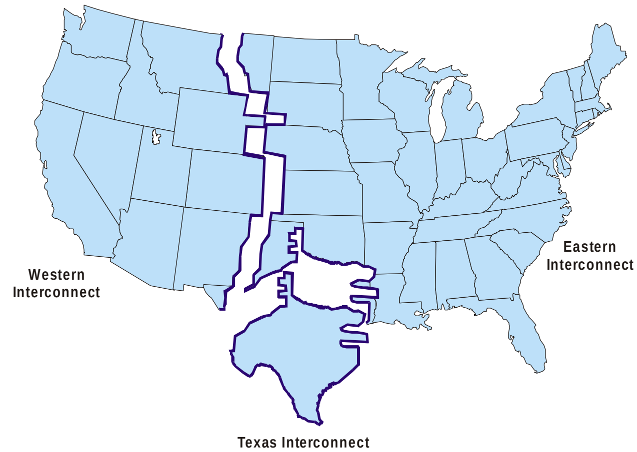
[34] Energy Information Administration, *Electric Power Monthly October 1999*, DOE/EIA-0226(99/10), (Washington, DC, October 1999) Table 45, p. 52.

[35] Vertically-integrated utilities own and operate their generation, transmission, and distribution facilities. These conditions are rapidly changing with ongoing deregulation of the industry. Mutually supportive transmission systems are now being viewed as super highways for movement of power. This raises concerns about supply adequacy and transmission reliability. For a fuller discussion, see Hirst, Kirby, and Hadley, *Generation and Transmission Adequacy in a Restructuring U.S. Electricity Industry* (June 1999). This analysis report was prepared for the Edison Electric Institute, Washington, DC.

[36] Inclusion of Quebec (Canadian) and Mexican interconnections completes what is known as the North American power grid.

[37] For a detailed discussion, refer to Energy Information Administration, *The Changing Structure of the Electric Power Industry: An Update*, 1996, DOE/EIA-0562(96)(Washington, DC, December 1996).

**Figure 17. Major Transmission Networks**




Source: Energy Information Administration.

bring more efficient, lower cost power to the Nation's electricity customers."[38]

To attain the above goal, FERC established procedures to ensure the availability of non-discriminatory transmission access to wholesale power marketers over public utilities' transmission facilities under its jurisdiction. FERC expected that issuance of its Orders would alleviate discrimination in transmission services in interstate commerce and would provide an orderly and fair transition to bulk power markets without impairing reliability and system security.[39]

FERC's initiatives in promoting competition at the wholesale level have led to several developments that warrant additional fundamental regulatory changes with respect to the modalities in which transmission access should be handled. Since 1996, there has been a significant increase in the number of power marketers.[40] Nonutility generators (including various subsets of independent power producers) have also increased generating capability and, therefore, their electricity sales at market-based rates. Taken together, these developments have caused an exponential increase in trading at the wholesale level since the issuance of FERC Orders.

In view of what is stated above, the Nation's existing transmission grid is being utilized more intensively and in different ways than in the past.[41] Introduction of competition in the market may also reduce cooperation among transmission owners adding to the complexity of maintaining system reliability. In addition, observed increases in transmission business trends have not been associated with increases in load serving and transfer capability of the bulk transmission system.[42] Continuing declines in both annual maintenance and capital expenditures in transmission are another impediment to system improvement.[43]

States have also been actively paving the way for promoting competition at the retail level—the next frontier. By the end of 1999, 24 States and the District of Columbia had acted to restructure the industry in their States. In some cases, States have called upon their jurisdictional utilities to unbundle their generation, transmission, and distribution activities (including unbundling of tariff components); others worked through a set of pre-designed pilot programs as precursors to the implementation of retail choice for the customers in their States.[44] The resulting changes

[38] Federal Energy Regulatory Commission, Order No. 888, Docket Nos. RM95-8-000 and RM94-7-001 *Promoting Wholesale competition Through Open Access Nondiscriminatory Transmission Services by Public Utilities*; *Recovery of Stranded Costs by Public Utilities and Transmitting Utilities*, (Final Rule issued on April 24, 1996) p. 1.

[39] Ensuring recovery of stranded costs as a result of this action was also an integral part of FERC's Orders. Ramifications of this part of FERC's order are not discussed in this segment.

[40] According to FERC's power marketer quarterly filings, there were eight active power marketers in the first quarter of 1995. Their sales totaled 1.8 Mwh. By the first quarter of 1999, such sales escalated to over 400 Mwh, traded by more than 100 power marketers, indicating an increase in the volume and intensity of trading. The Commission has granted market-based rate authority to more than 800 entities, of which nearly 500 are power marketers (including more than 100 power marketers affiliated with investor-owned utilities). See Federal Energy Regulatory Commission, Docket No. RM99-2-000, Order No. 2000, *Regional Transmission Organization*( December 20, 1999), p. 15.

[41] Recent assessments made by the North American Electric Reliability Council (NERC) indicate that although transmission line loadings are increasing, very little is being done to increase the load serving and transfer capability of the bulk transmission systems. NERC maintains that improvements to the transmission system are not keeping pace with increasing demands being placed on the system. See North American Electric Reliability Council, *1999 Summer Assessment: Reliability of Bulk Electric Supply in North America* (June 1999), p. 4.

[42] Ibid., p. 4.

[43] Electric Power Research Institute, *Electricity Technology Roadmap: 1999 Summary and Synthesis*, CI-112677-V1 (Palo Alto, California, July 1999), p. 27.

[44] In fact, this statement is in the nature of an over-simplification of the rather complex process of initiating competition at the retail level in the States. As an example, divestiture of generating assets of generating assets was not mandated in most restructuring initiatives at the State level. Many other issues involved inputs from concerned stakeholders. For additional information on the subject, see Energy Information Administration, *The Changing Structure of the Electric Power Industry: Selected Issues, 1998*, (DOE / EIA-562(98) (Washington, DC, July 1998).)

significantly affected the way in which electricity was generated, transmitted, and distributed to wholesale and retail customers.[45] Thus, opening electricity markets to retail competition in States adds another measure of complexity to a complex evolutionary system initiated by FERC in its 1996 Orders.

The cumulative effects of changes in patterns of wholesale and retail trade has been to exacerbate the burden on the transmission grid. Regional development of independent system operators (ISOs), as envisaged in FERC's 1996 Orders, has been uneven. Difficulties in forming multi-State ISOs remain unresolved. The inability to secure agreement in formulating ISOs in some other regions has been a frustrating experience.[46] According to FERC, these developments have completely changed the landscape from the one that it faced at the time Order Nos. 888 and 889 were being developed and pose new regulatory and industry challenges.

FERC delineated transmission-related impediments to competition in two broad categories:

- Impediments consisting of engineering and economic inefficiencies inherent in the current operation that hinder development of fully competitive power markets and impose avoidable costs on consumers

- Continuing opportunities for transmission owners to unduly discriminate in the operation of their transmission system to favor their own affiliates.

Other shortcomings identified by FERC include complaints with respect to the determination of total transfer capability (TTC) and the available transfer capability (ATC). Inability to determine ATC in a timely fashion impacts on trades that can be handled on a given system. Similarly, congestion management issues, if not resolved in a timely fashion, inhibit system capability to provide least-cost power.

With a view to alleviate some of the problems listed above, in a Notice of Proposed Rulemaking (called the NOPR), FERC took a major step by espousing a proposal to create regional transmission organizations (RTOs) nationwide.[47] On May 15, 1999, the Commission proposed to require each public utility that owns, operates, or controls facilities for transmission of electric energy in interstate commerce to make certain filings (by October 15, 2000) with respect to the formation and participation in RTOs. Minimum characteristics and functions that a transmission entity must satisfy to be considered an RTO were also specified. More specifically, the proposed RTOs are required to be independent from market participants and should have appropriate regional scope and configuration together with the authority over transmission facilities to maintain reliability. FERC proposed a voluntary and collaborative process to accommodate regional needs.

Subsequent to the issuance of the RTO NOPR, the Commission held 11 public conferences across the country to hear views from interested stakeholders. The Commission also received inputs from State regulatory agencies on the subject. On the basis of these deliberations, the Commission issued its ruling in Order 2000 on December 20, 1999.[48] In its Order, the Commission adopted a flexible approach that permits different types of RTOs like the non-profit independent system operators and the for-profit transmission companies. The Order also embodies a principle of open architecture and permits its members to improve its structure when deemed necessary to meet evolving market needs.

All RTOs are, however, required to abide by four core characteristics and eight key functions. The core characteristics are independence, scope and regional configuration, operational authority, and short-term reliability. The eight key functions are tariff administration and design, congestion management, parallel path flows, ancillary services, Open Access Same-Time Information System (OASIS), market monitoring, planning and expansion, and interregional cooperation (see text box on page 26). The Commission, however, hopes that the RTOs "will alleviate stress on the bulk power system caused by changes in the structure of the industry, improve efficiencies in transmission grid management, improve grid reliability, remove remaining opportunities for discriminatory transmission practices, cut transaction costs, facilitate the success of

[45] Transmission system links generating power plants to medium and high-voltage lines (69-765 kilovolts) and different customer load centers. Thus, before electricity reaches customers, large portions of it may have been moved from distant locations to substations close to the local distribution system(s).

[46] Note that FERC's jurisdictional utilities utilities cover 70 percent of the Nation's transmission facilities leaving the remainder in the hands of utilities outside FERC's oversight.

[47] Federal Energy Regulatory Commission, Docket No. RM-99-2-000, *Notice of Proposed Rulemaking* (May 13, 1999).

[48] Federal Energy Regulatory Commission, Docket No. RM-99-2-000, Order No. 2000, *Regional Transmission Organizations* (December 20, 1999).

## Summary of FERC Order 2000: The RTO Final Rule

FERC Order 2000 was issued on December 20, 1999, to encourage all transmission owners to voluntarily join regional transmission organizations (RTOs) to help to address the engineering and economic inefficiencies inherent in the current transmission system and to correct perceived or real discrimination by transmission owners. Order 2000:

- Does NOT: (a) require RTO participation, (b) draw regional RTO boundaries, (c) favor ISOs (Independent Transmission System Operators) over transcos (independent, privately-owned transmission-owning companies) or hybrids.
- States three general principles: (a) to encourage, but not mandate, RTO participation, (b) to refrain from proscribing a particular organizational form as long as the RTO satisfies certain minimum characteristics and functions, and (3) to offer organizers maximum flexibility on how an RTO can satisfy the minimum characteristics and functions.
- States as its basic rationale that the performance of the wholesale power market will improve as owners relinquish control of transmission operation.
- Requires that jurisdictional transmission owners or operators, by October 15, 2000, file to be part of an RTO proposal, or alternatively, to describe its efforts to participate in an RTO, explain its reasons for not doing so, and discuss actions that it is taking to resolve obstacles to joining an RTO.
- Requires members of existing FERC-approved ISOs, by January 15, 2001, to show whether and how their organizations meet the Order 2000 new RTO Standard.
- States a goal to have RTOs up and running by December 15, 2001.
- Proposes, in order to help implement the Rule, a voluntary and collaborative process involving all stakeholders to determine, with FERC staff assistance, the optimum size and structure of the RTO.
- As “sticks” to prod utility participation in RTOs, will consider on a case-by-case basis requiring RTO participation as a condition for mergers or acquisition approval, as a condition for market-based rate approval, or as a remedy for a discrimination complaint.
- As “carrots” to encourage utility participation in RTOs, provided the incentives can be justified as necessary to the formation of an RTO, may offer on a case-by-case basis, an increased rate-of-return on equity for transmission facilities, performance-based rates, acquisition adjustments (premiums), light-handed regulation, flexible treatment of depreciation, and/or incremental pricing for transmission grid expansion.
- Requires the RTO to demonstrate that it meets Four Minimum Characteristics and Eight Minimum Functions in order to gain FERC approval.
- Lists Four Minimum Characteristics:
  - (1) Independence
  - (2) Appropriate geographic scope and regional configuration
  - (3) Operational authority for all transmission facilities under the RTOs control, and
  - (4) Exclusive short-term reliability authority.
- Lists Eight Minimum Functions:
  - (1) Transmission tariff development and administration that will promote efficient use and expansion of transmission and generation facilities
  - (2) Develop congestion management procedures
  - (3) Develop and implement loop flow and parallel path procedures
  - (4) Serve as the provider of last resort for all ancillary services
  - (5) Operate a single OASIS (Open-Access Same-Time Information System) for all transmission under its control and be responsible for independently calculating Total Transmission Capacity and Available Transmission Capacity
  - (6) Monitor markets to measure market power and market design flaws and propose remedies
  - (7) Plan and coordinate necessary transmission upgrades and additions, including coordinating its efforts with State regulators, and
  - (8) Develop mechanisms to coordinate its activities with other regions, whether or not an RTO exists in those regions, especially concerning reliability and market interfaces.
- Strongly encourages participation in RTO formation, but gives no specific requirements for State participation or authority.

Source: National Regulatory Research Institute (NRRI), “NRRI Summary of FERC Order 2000: The RTO Final Rule.” See http://nrri.ohio-state.edu/index.htm.

State retail programs, and facilitate lighter-handed regulation."[49]

To attain the above goals, the Commission also provides guidance on a variety of new transmission pricing reforms. These include single system rates and congestion pricing. In addition, the Commission will also consider a variety of other innovative proposals like performance-based regulation, possible changes in determining depreciation, as well as incremental pricing for new investments in transmission.

According to FERC, the proposed RTOs will be operational by December 15, 2001. The Order, however, applies only to those utilities that are under FERC's jurisdiction. Many segments of the transmission network are under the control of utilities but not under FERC's jurisdiction. These utilities (mostly municipals, power districts, State agencies, and cooperatives) are faced with restrictions on usage of electrical facilities funded by tax-exempt bonds. For-profit entities would have access and use of these electrical facilities when they are integrated into a regional transmission organization and this is prohibited under tax-exempt finance regulations. For these utilities to join, they would either have to refinance these bonds and remove the restrictions or acquire a relief of this tax burden. These concerns are under review and it is likely that Congress will enact legislation that permits public utilities to participate without jeopardizing the status of tax-exempt bonds.

## Status of State Restructuring of the Electric Power Industry[50]

Since the passage of Energy Policy Act in 1992 and issuance of FERC Order Nos. 888 and 889 in 1996, States have been actively involved in industry restructuring by promoting competition in the retail markets for electricity. In 1996, California and Rhode Island passed landmark legislation to restructure their electric power industry and give their consumers the right to choose an alternative supplier for providing electricity.

Several factors are influencing the move from a highly regulated monopolistic industry to a less regulated competitive industry. The relatively high prices for electricity in California and in the New England States prompted consumers to support the development of competitive retail markets for electric power generation. Advances in generator technology and falling fuel prices made gas turbines competitive with large baseload generators. Additionally, deregulation of other industries, such as telecommunications and the airlines have proven that competition can be beneficial both in lowering prices and introducing new products and innovations. Price disparities, technological advances, fuel prices, and the trend toward deregulation set the stage for deregulation, or more accurately, re-regulation, of the electric power industry.

By the end of 1999, 24 States and the District of Columbia had passed legislation or issued regulatory orders that will allow their consumers access to competitive electricity retail markets (Figure 1). The remaining States are conducting studies to determine the benefits of restructuring and address the many issues that evolve from restructuring for retail competition.

States restructuring their electric power industry must address many complex issues. How to quantify and allow recovery of utilities' stranded costs is one of the most contentious issues. Stranded costs represent utilities' investments in generators, power contracts, liabilities, and other assets that were to be recovered over time through regulated rates. Under restructuring, the generation portion of the industry will not be regulated, and market forces will set the price for energy. With competitive pricing for generation services, utilities may not be able recover the investment costs in generation and in other areas. These costs are called stranded costs. Most States that have initiated restructuring have allowed investor-owned utilities to recover (either fully or partially) their stranded costs in a manner which is determined by each State.

The primary goal of restructuring is to lower the price of electricity at the wholesale and retail levels. During the transition period, while utilities recover stranded costs, many States require either a reduction or a freeze in rates to be paid by consumers who do not choose to switch to a competitive energy supplier. Ensuring reliability of electric power and protection of consumers, especially residential and other small consumers, are also cited as goals by States. Consumer education programs need to be funded and implemented, and continuing programs for low-income consumers, energy efficiency programs, and research and development issues need to be addressed. Funding for these programs

[49] Federal Energy Regulatory Commission, Press Release (December 15, 1999).
[50] The most current status of State restructuring activity is available on the Internet at http://www.eia.doe.gov/cneaf/electricity/chg_str/regmap.html.

may come through the creation of a public programs benefit fund supported by ratepayers or through other State and Federal sources.

As competition in generation progresses, incumbent utilities may be in a position to dominate in their markets by virtue of the assets (for example, generation, transmission, and distribution) at their disposal. Even where utilities divest generating assets (regardless whether these actions were mandated or voluntary), they still own distribution and transmission facilities. Control of these facilities could be used to create barriers of entry for new entrants and to impede growth of competitive markets.[51] In some cases, incumbent utilities could also exercise market power by raising prices (in excess of prices likely to prevail in a competitive regime) and maintaining such prices for a significant time period.[52] State regulatory authorities have taken several steps to mitigate market power and prescribe standards of conduct for affiliates associated with utilities.

retail competition. Those States—Arkansas, Delaware, Maryland, New Jersey, New Mexico, Ohio, Oregon, and Texas—joined the 13 States that had already enacted restructuring legislation (Arizona, California, Connecticut, Illinois, Maine, Massachusetts, Montana, Nevada, New Hampshire, Oklahoma, Pennsylvania, Rhode Island, and Virginia). A few States—Michigan, New York, and West Virginia—have comprehensive regulatory orders issued by the public utility commissions to restructure and allow retail access.

In 1999, customers in 12 States could actually choose their electricity suppliers. In California, Rhode Island, Massachusetts, and New Jersey, almost all consumers have the right to choose. In Arizona, Delaware, Illinois, Michigan, Montana, New Hampshire, New York, and Pennsylvania, choice is being phased-in and is limited to anywhere from a few consumers in Montana to two-thirds of them in Pennsylvania, where all consumers are scheduled for retail access by January 2000.

**An Update Through August 2000:**

- West Virginia and Michigan have passed legislation.
- Pending Legislation did not pass in Alaska, South Carolina, Iowa, and Wyoming.
- Colorado, Georgia, Tennessee, Kansas, Indiana, and South Dakota were no longer actively conducting studies.

The range of issues (stemming from promoting retail competition in electricity) that States face differs somewhat, based on diverse conditions prevailing in each of them. There are, however, some common areas of concern:

- Providing non-discriminatory access to all electric suppliers
- Ensuring reliability in supplies and designation of supplier of the last resort during transition
- Evaluating performance-based ratemaking
- ensuring penetration of renewable power generation and provisions for net metering
- Loss of tax base for local authorities as power plants are sold
- Setting standards of conduct for suppliers and utility affiliates
- Environmental considerations
- Consumer protection programs
- Role of public power utilities in promoting competition.

In 1999, eight States passed comprehensive legislation to restructure their electric power industry and introduce

In other States that may allow retail competition in the future, State regulatory authorities are conducting hearings and issuing rules to implement restructuring legislation and begin the transition to a competitive retail market. States due to begin retail competition in 2000 include Maine, Maryland, and Connecticut. Nevada, originally scheduled to begin competition in 1999, has delayed indefinitely. In 1996, Vermont had issued an order to implement retail competition, but the legislation to authorize the plan failed and has not been reintroduced.

As of January 2000, Alabama, Alaska, Colorado, Florida, Georgia, Hawaii, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, South Carolina, South Dakota, Tennessee, Utah, Vermont, Washington, Wisconsin, and Wyoming were all actively conducting investigations into restructuring and/or have produced reports on certain issues while still studying others. Many of these States have relatively low prices for electricity and do not feel an immediate need to restructure.

[51] Utilities can also favor their own affiliates to the detriment of other participants in the markets.

[52] Refer to Department of Energy, Office of Economic, Electricity and Natural Gas Analysis, *Horizontal Market Power in Restructured Electricity Markets* (March 2000).

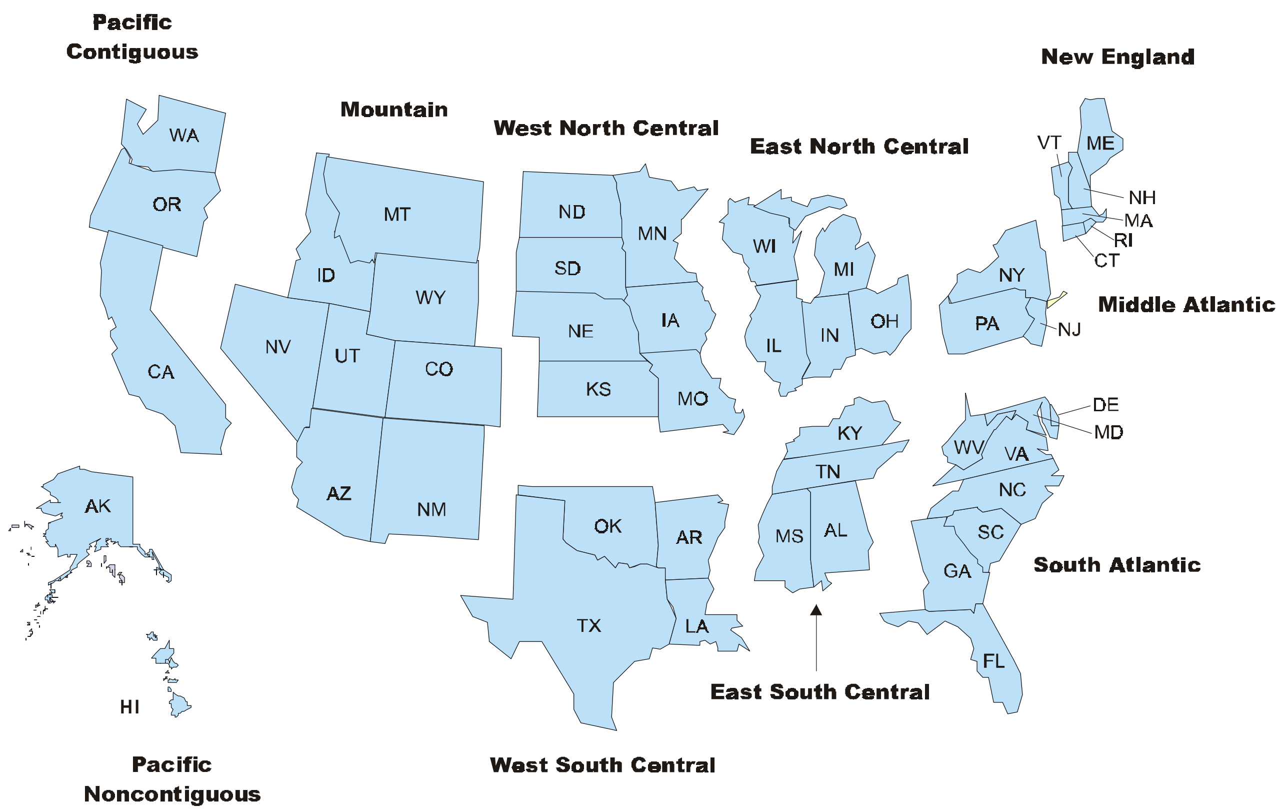
# Appendix A. U.S. Electric Power Industry Statistics

Some of the 1999 data in this Appendix have been estimated using standard statistical techniques. To give the reader a better idea of the accuracy of these estimates, they are reported along with the “relative standard error” (RSE). Ordinarily, it is expected that on approximately two out of three occasions, the true value of a statistic, such as a total, will be within one standard error, either high or low, of the estimated statistic. A relative standard error is the standard error divided by the statistic (for example, a total) expressed as a percent. The smaller the RSE, the smaller is the range around the estimate and, therefore, the more confidence one can have in using the estimate. (Another name for relative standard error is “coefficient of variation,” or CV, and the EIA has often used that term.)

For example, if a total is estimated to be 213.3, with an estimated RSE of 5 percent, then there are about two chances in three that the actual total is between 202.6 and 224.0. Nonsampling error is not fully taken into account, and may make results substantially less accurate. Thus, a more reasonable estimated total to report, along with an estimated RSE of 5 percent, would be 210.

Technical information regarding the sources and quality of the data in this report is available in the Technical Notes of the *Electric Power Monthly*, DOE/EIA-0226. That report is accessible via the Internet at: http://www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html.

## Figure A1. Census Divisions




Source: Energy Information Administration.

## Table A1. Net Generation, 1990 Through 1999
(Million Kilowatthours)

| Period | Industry | Utilities | Nonutilities |
|---|---|---|---|
| 1990 | 3,018,587 | 2,808,151 | 210,436 |
| 1991 | 3,065,296 | 2,825,023 | 240,273 |
| 1992 | 3,083,367 | 2,797,219 | 286,148 |
| 1993 | 3,196,924 | 2,882,525 | 314,399 |
| 1994 | 3,253,799 | 2,910,712 | 343,087 |
| 1995 | 3,357,837 | 2,994,529 | 363,308 |
| 1996 | 3,446,994 | 3,077,442 | 369,552 |
| 1997 | 3,494,223 | 3,122,523 | 371,700 |
| 1998 | 3,617,873 | 3,212,171 | 405,702 |
| 1999 | 3,691,073 | 3,173,674 | 517,400 |

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 and prior years are final.•Due to restructuring of the electric power industry, electric utilities are selling plants to the nonutility sector. This will affect comparisons of current and historical data. •Totals may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, Form EIA-759, ''Monthly Utility Power Plant Report'' Form EIA-900, ''Monthly Nonutility Power Plant Report.'' Form EIA-860B, ''Annual Electric Generator Report - Nonutility,'' and predecessor forms.

## Table A2. Consumption of Fossil Fuels, 1990 Through 1999

| Period | Industry | | | Utilities | | | Nonutilities | | |
|---|---|---|---|---|---|---|---|---|---|
| | Coal (thousand short tons) | Petroleum (thousand barrels) | Gas (thousand Mcf) | Coal (thousand short tons) | Petroleum (thousand barrels) | Gas (thousand Mcf) | Coal (thousand short tons) | Petroleum (thousand barrels) | Gas (thousand Mcf) |
| 1990 | 805,860 | 223,932 | 4,175,352 | 773,549 | 196,054 | 2,787,332 | 32,311 | 27,878 | 1,388,020 |
| 1991 | 810,387 | 212,768 | 5,723,570 | 772,268 | 184,886 | 2,789,014 | 38,119 | 27,882 | 2,934,556 |
| 1992 | 824,467 | 179,211 | 6,198,097 | 779,860 | 147,335 | 2,765,608 | 44,607 | 31,876 | 3,432,489 |
| 1993 | 861,851 | 199,415 | 6,378,144 | 813,508 | 162,454 | 2,682,440 | 48,343 | 36,961 | 3,695,704 |
| 1994 | 869,531 | 192,893 | 6,727,443 | 817,270 | 151,004 | 2,987,146 | 52,261 | 41,889 | 3,740,297 |
| 1995 | 879,336 | 137,182 | 7,112,444 | 829,007 | 102,150 | 3,196,507 | 50,329 | 35,032 | 3,915,937 |
| 1996 | 927,880 | 151,718 | 6,917,097 | 874,681 | 113,274 | 2,732,107 | 53,199 | 38,444 | 4,184,990 |
| 1997 | 952,918 | 160,021 | 6,153,423 | 900,361 | 125,146 | 2,968,453 | 52,557 | 34,875 | 3,184,970 |
| 1998 | 967,718 | 232,890 | 6,805,501 | 910,867 | 178,614 | 3,258,054 | 56,851 | 54,276 | 3,547,447 |
| 1999 | 956,568 | 186,622 | 6,865,864 | 894,120 | 143,830 | 3,113,419 | 62,448 | 42,792 | 3,752,445 |

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 and prior years are final. •Does not include petroleum coke consumption. The 1999 utility petroleum coke consumption was 1,608 thousand short tons and 1,769 thousand short tons in 1998. The 1999 nonutility petroleum coke consumption was 3,082 thousand short tons and 4,470 thousand short tons in 1998. •Due to restructuring of the electric power industry, electric utilities are selling plants to the nonutility sector. This will affect comparisons of current and historical data.•Nonutility data for 1998 and prior years are for fuels consumed to produce both electricity and steam. •Totals may not equal sum of components because of independent rounding.

Sources: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.'' Form EIA-900, ''Monthly Nonutility Power Plant Report,'' Form EIA-860B, ''Annual Electric Generator Report - Nonutility,'' and predecessor forms.

## Table A3. Fossil Fuel Stocks, 1990 Through 1999

| Period | Industry | | Utilities | | Nonutilities | |
|---|---|---|---|---|---|---|
| | Coal (thousand short tons) | Petroleum (thousand barrels) | Coal (thousand short tons) | Petroleum (thousand barrels) | Coal (thousand short tons) | Petroleum (thousand barrels) |
| 1990 .................. | 156,166 | 83,501 | 156,166 | 83,501 | NA | NA |
| 1991 .................. | 157,876 | 74,993 | 157,876 | 74,993 | NA | NA |
| 1992 .................. | 154,130 | 71,849 | 154,130 | 71,849 | NA | NA |
| 1993 .................. | 111,341 | 62,443 | 111,341 | 62,443 | NA | NA |
| 1994 .................. | 126,897 | 62,986 | 126,897 | 62,986 | NA | NA |
| 1995 .................. | 126,304 | 50,495 | 126,304 | 50,495 | NA | NA |
| 1996 .................. | 114,623 | 47,690 | 114,623 | 47,690 | NA | NA |
| 1997 .................. | 98,826 | 48,792 | 98,826 | 48,792 | NA | NA |
| 1998 .................. | 120,501 | 53,790 | 120,501 | 53,790 | NA | NA |
| 1999 .................. | 142,543 | 52,977 | 128,493 | 44,312 | 14,050 | 8,666 |

NA NA = not available.

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values are final. •Does not include petroleum coke stocks. The utility stocks of petroleum coke at the end of 1999 were 355 thousand short tons and 559 thousand short tons at the end of 1998. The nonutility petroleum coke stocks at the end of 1999 were 143 thousand short tons. •Totals may not equal sum of components because of independent rounding. •Due to restructuring of the electric power industry, electric utilities are selling plants to the nonutility sector. This will affect comparisons of current and historical data.

Sources: Energy Information Administration, Form EIA-759, ‘‘Monthly Power Plant Report.’’ Form EIA-900, ‘‘Monthly Nonutility Power Plant Report,’’ Form EIA-860B, ‘‘Annual Electric Generator Report - Nonutility,’’ and predecessor forms.

## Table A4. Electric Utility Retail Sales of Electricity by Sector, 1990 Through 1999
(Million Kilowatthours)

| Period | Residential | Commercial | Industrial | Other | All Sectors |
|---|---|---|---|---|---|
| 1990..................................... | 924,019 | 751,027 | 945,522 | 91,988 | 2,712,555 |
| 1991..................................... | 955,417 | 765,664 | 946,583 | 94,339 | 2,762,003 |
| 1992..................................... | 935,939 | 761,271 | 972,714 | 93,442 | 2,763,365 |
| 1993..................................... | 994,781 | 794,573 | 977,164 | 94,944 | 2,861,462 |
| 1994..................................... | 1,008,482 | 820,269 | 1,007,981 | 97,830 | 2,934,563 |
| 1995..................................... | 1,042,501 | 862,685 | 1,012,693 | 95,407 | 3,013,287 |
| 1996..................................... | 1,082,491 | 887,425 | 1,030,356 | 97,539 | 3,097,810 |
| 1997..................................... | 1,075,767 | 928,440 | 1,032,653 | 102,901 | 3,139,761 |
| 1998..................................... | 1,127,735 | 968,528 | 1,040,038 | 103,518 | 3,239,818 |
| 1999..................................... | 1,145,702 | 982,887 | 1,063,252 | 104,178 | 3,296,019 |

Notes: •Values for 1999 are preliminary; values for 1998 and prior years are final. •Values do not include retail sales by all energy service providers, (Power Marketers). Those sales are estimated to total 49 billion kilowatthours in 1999. •Retail sales and net generation may not correspond exactly for a particular month for a variety of reasons (i.e., sales data may include purchases of electricity from nonutilities or imported electricity). Net generation is for the calendar month while retail sales and associated revenue accumulate from bills collected for periods of time (28 to 35 days) that vary dependent upon customer class and consumption occurring in and outside the calendar month. •Totals may not equal sum of components because of independent rounding.

Sources: 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 A5. Revenue from Electric Utility Retail Sales of Electricity by Sector, 1990 Through 1999
(Million Dollars)

| Period | Residential | Commercial | Industrial | Other | All Sectors |
|---|---|---|---|---|---|
| 1990 | 72,378 | 55,117 | 44,857 | 5,891 | 178,243 |
| 1991 | 76,828 | 57,655 | 45,737 | 6,138 | 186,359 |
| 1992 | 76,848 | 58,343 | 46,993 | 6,296 | 188,480 |
| 1993 | 82,814 | 61,521 | 47,357 | 6,528 | 198,220 |
| 1994 | 84,552 | 63,396 | 48,069 | 6,689 | 202,706 |
| 1995 | 87,610 | 66,365 | 47,175 | 6,567 | 207,717 |
| 1996 | 90,501 | 67,827 | 47,385 | 6,741 | 212,455 |
| 1997 | 90,694 | 70,482 | 46,772 | 7,110 | 215,059 |
| 1998 | 93,164 | 71,769 | 46,550 | 6,863 | 218,346 |
| 1999 | 93,239 | 70,606 | 46,738 | 6,823 | 217,406 |

Notes: •Values for 1999 are preliminary; values for 1998 and prior years are final. •Retail sales and net generation may not correspond exactly for a particular month for a variety of reasons (i.e., sales data may include purchases of electricity from nonutilities or imported electricity). Net generation is for the calendar month while retail sales and associated revenue accumulate from bills collected for periods of time (28 to 35 days) that vary dependent upon customer class and consumption occurring in and outside the calendar month. •Totals may not equal sum of components because of independent rounding.

Sources: 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 A6. Electric Utility Average Revenue per Kilowatthour by Sector, 1990 Through 1999
(Cents)

| Period | Residential | Commercial | Industrial | Other | All Sectors |
|---|---|---|---|---|---|
| 1990 | 7.83 | 7.34 | 4.74 | 6.40 | 6.57 |
| 1991 | 8.04 | 7.53 | 4.83 | 6.51 | 6.75 |
| 1992 | 8.21 | 7.66 | 4.83 | 6.74 | 6.82 |
| 1993 | 8.32 | 7.74 | 4.85 | 6.88 | 6.93 |
| 1994 | 8.38 | 7.73 | 4.77 | 6.84 | 6.91 |
| 1995 | 8.40 | 7.69 | 4.66 | 6.88 | 6.89 |
| 1996 | 8.36 | 7.64 | 4.60 | 6.91 | 6.86 |
| 1997 | 8.43 | 7.59 | 4.53 | 6.91 | 6.85 |
| 1998 | 8.26 | 7.41 | 4.48 | 6.63 | 6.74 |
| 1999 | 8.14 | 7.18 | 4.40 | 6.55 | 6.60 |

Notes: •Values for 1999 are preliminary; values for 1998 and prior years are final. •Retail sales and net generation may not correspond exactly for a particular month for a variety of reasons (i.e., sales data may include purchases of electricity from nonutilities or imported electricity). Net generation is for the calendar month while retail sales and associated revenue accumulate from bills collected for periods of time (28 to 35 days) that vary dependent upon customer class and consumption occurring in and outside the calendar month. •Totals may not equal sum of components because of independent rounding.

Sources: 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 A7. Net Generation by Census Division and State, 1999 and 1998

| Census Division and State | Industry 1999 Generation (million kWh) | Industry 1998 Generation (million kWh). | Utility 1999 Generation (million kWh) | Utility 1998 Generation (million kWh). | Nonutility 1999 Generation (million kWh) | Nonutility 1998 Generation (million kWh). |
|---|---|---|---|---|---|---|
| **New England** | **108,151** | **105,270** | **44,653** | **65,398** | **63,499** | **39,872** |
| Connecticut | 27,901 | 19,669 | 20,484 | 15,123 | 7,417 | 4,546 |
| Maine | 11,941 | 11,115 | 1,189 | 3,548 | 10,752 | 7,567 |
| Massachusetts | 39,601 | 45,816 | 4,360 | 26,035 | 35,241 | 19,781 |
| New Hampshire | 16,329 | 16,103 | 13,876 | 14,238 | 2,453 | 1,865 |
| Rhode Island | 6,776 | 7,659 | 9 | 2,061 | 6,767 | 5,597 |
| Vermont | 5,603 | 4,909 | 4,735 | 4,393 | 868 | 515 |
| **Middle Atlantic** | **396,521** | **389,354** | **297,473** | **325,655** | **99,048** | **63,699** |
| New Jersey | 56,966 | 53,667 | 38,867 | 35,912 | 18,098 | 17,755 |
| New York | 145,070 | 144,554 | 97,009 | 115,841 | 48,061 | 28,713 |
| Pennsylvania | 194,485 | 191,133 | 161,596 | 173,903 | 32,889 | 17,231 |
| **East North Central** | **590,551** | **561,131** | **547,482** | **528,168** | **43,070** | **32,964** |
| Illinois | 163,224 | 138,747 | 149,808 | 131,274 | 13,416 | 7,473 |
| Indiana | 121,834 | 117,521 | 114,183 | 112,772 | 7,651 | 4,749 |
| Michigan | 103,655 | 100,566 | 87,875 | 85,146 | 15,780 | 15,420 |
| Ohio | 142,577 | 147,941 | 140,912 | 146,446 | 1,665 | 1,495 |
| Wisconsin | 59,262 | 56,356 | 54,704 | 52,530 | 4,558 | 3,827 |
| **West North Central** | **276,686** | **270,961** | **268,491** | **265,767** | **8,195** | **5,193** |
| Iowa | 38,176 | 38,206 | 37,032 | 37,086 | 1,144 | 1,120 |
| Kansas | 42,107 | 41,585 | 42,003 | 41,481 | 105 | 104 |
| Minnesota | 49,247 | 47,418 | 44,154 | 43,977 | 5,093 | 3,441 |
| Missouri | 73,839 | 75,194 | 73,505 | 74,895 | 334 | 299 |
| Nebraska | 31,345 | 28,797 | 29,981 | 28,720 | 1,365 | 77 |
| North Dakota | 31,414 | 30,672 | 31,260 | 30,519 | 155 | 153 |
| South Dakota | 10,557 | 9,089 | 10,557 | 9,089 | — | — |
| **South Atlantic** | **743,021** | **736,221** | **687,223** | **684,175** | **55,798** | **52,046** |
| Delaware | 6,820 | 6,899 | 6,239 | 6,318 | 580 | 581 |
| District of Columbia | 230 | 244 | 230 | 244 | — | — |
| Florida | 187,237 | 189,461 | 166,914 | 169,450 | 20,322 | 20,011 |
| Georgia | 119,485 | 115,331 | 110,537 | 108,721 | 8,948 | 6,611 |
| Maryland | 52,059 | 50,650 | 49,324 | 48,514 | 2,736 | 2,136 |
| North Carolina | 117,948 | 121,372 | 109,882 | 113,112 | 8,066 | 8,260 |
| South Carolina | 89,762 | 87,245 | 87,347 | 84,398 | 2,415 | 2,847 |
| Virginia | 74,837 | 72,198 | 65,071 | 63,814 | 9,766 | 8,384 |
| West Virginia | 94,643 | 92,821 | 91,678 | 89,605 | 2,965 | 3,217 |
| **East South Central** | **342,224** | **343,132** | **317,462** | **325,677** | **24,762** | **17,455** |
| Alabama | 121,123 | 120,032 | 113,909 | 113,393 | 7,214 | 6,639 |
| Kentucky | 92,633 | 90,936 | 81,658 | 86,150 | 10,974 | 4,786 |
| Mississippi | 35,025 | 34,434 | 32,212 | 31,991 | 2,813 | 2,442 |
| Tennessee | 93,444 | 97,730 | 89,683 | 94,142 | 3,761 | 3,588 |
| **West South Central** | **549,207** | **546,311** | **451,705** | **453,828** | **97,502** | **92,484** |
| Arkansas | 47,592 | 45,663 | 44,131 | 43,200 | 3,461 | 2,463 |
| Louisiana | 89,316 | 89,622 | 64,837 | 66,107 | 24,479 | 23,515 |
| Oklahoma | 54,849 | 56,189 | 50,279 | 51,453 | 4,570 | 4,737 |
| Texas | 357,450 | 354,837 | 292,458 | 293,068 | 64,992 | 61,769 |
| **Mountain** | **310,931** | **307,433** | **296,479** | **294,208** | **14,452** | **13,225** |
| Arizona | 83,921 | 82,081 | 83,096 | 81,300 | 825 | 781 |
| Colorado | 39,546 | 38,851 | 36,167 | 35,471 | 3,379 | 3,380 |
| Idaho | 14,454 | 13,849 | 12,456 | 11,978 | 1,998 | 1,871 |
| Montana | 29,263 | 28,461 | 27,597 | 27,618 | 1,666 | 844 |
| Nevada | 30,751 | 30,591 | 26,486 | 26,553 | 4,265 | 4,038 |
| New Mexico | 32,589 | 32,342 | 31,655 | 31,429 | 935 | 913 |
| Utah | 36,760 | 35,910 | 36,071 | 35,161 | 689 | 750 |
| Wyoming | 43,646 | 45,347 | 42,951 | 44,699 | 695 | 649 |
| **Pacific Contiguous** | **357,550** | **341,976** | **251,646** | **258,408** | **105,905** | **83,569** |
| California | 184,630 | 188,760 | 87,875 | 114,928 | 96,754 | 73,832 |
| Oregon | 56,491 | 51,141 | 51,698 | 46,351 | 4,793 | 4,790 |
| Washington | 116,429 | 102,075 | 112,072 | 97,128 | 4,357 | 4,947 |
| **Pacific Noncontiguous** | **16,230** | **16,082** | **11,061** | **10,886** | **5,169** | **5,196** |
| Alaska | 5,908 | 5,859 | 4,609 | 4,588 | 1,299 | 1,271 |
| Hawaii | 10,322 | 10,223 | 6,452 | 6,298 | 3,870 | 3,926 |
| **U.S. Total** | **3,691,073** | **3,617,873** | **3,173,674** | **3,212,171** | **517,400** | **405,702** |

kWh = Kilowatthours.

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 are final.•Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.'' Form EIA-860B, ''Annual Electric Generator Report-Nonutility.'' Form EIA-900, ''Monthly Nonutility Power Plant Report.''

## Table A8. Net Generation from Coal by Census Division and State, 1999 and 1998

| Census Division and State | Industry | | Utility | | Nonutility | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 |
| | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). |
| **New England** | **17,666** | **18,772** | **4,402** | **13,163** | **13,264** | **5,609** |
| Connecticut | 2,081 | 3,016 | 0 | 1,482 | 2,081 | 1,534 |
| Maine | 977 | 996 | — | — | 977 | 996 |
| Massachusetts | 11,280 | 11,246 | 1,074 | 8,167 | 10,207 | 3,079 |
| New Hampshire | 3,328 | 3,513 | 3,328 | 3,513 | — | — |
| Rhode Island | — | — | — | — | — | — |
| Vermont | — | — | — | — | — | — |
| **Middle Atlantic** | **141,968** | **149,484** | **102,918** | **135,606** | **39,051** | **13,878** |
| New Jersey | 8,002 | 7,645 | 6,388 | 5,587 | 1,614 | 2,059 |
| New York | 22,956 | 25,180 | 10,949 | 23,504 | 12,007 | 1,677 |
| Pennsylvania | 111,010 | 116,658 | 85,580 | 106,516 | 25,430 | 10,142 |
| **East North Central** | **424,997** | **427,940** | **409,118** | **418,625** | **15,879** | **9,315** |
| Illinois | 75,245 | 75,558 | 64,919 | 70,306 | 10,326 | 5,251 |
| Indiana | 114,706 | 111,594 | 112,337 | 110,696 | 2,369 | 898 |
| Michigan | 70,596 | 70,583 | 69,118 | 69,143 | 1,478 | 1,441 |
| Ohio | 123,294 | 129,122 | 122,846 | 128,694 | 448 | 428 |
| Wisconsin | 41,157 | 41,083 | 39,899 | 39,786 | 1,258 | 1,297 |
| **West North Central** | **204,591** | **204,572** | **201,291** | **201,886** | **3,300** | **2,686** |
| Iowa | 32,937 | 32,849 | 31,946 | 31,884 | 990 | 966 |
| Kansas | 29,649 | 28,024 | 29,649 | 28,024 | — | — |
| Minnesota | 30,252 | 31,236 | 28,367 | 29,884 | 1,885 | 1,352 |
| Missouri | 61,544 | 62,732 | 61,250 | 62,489 | 294 | 243 |
| Nebraska | 17,841 | 18,381 | 17,794 | 18,336 | 47 | 45 |
| North Dakota | 28,695 | 28,257 | 28,610 | 28,176 | 85 | 81 |
| South Dakota | 3,674 | 3,094 | 3,674 | 3,094 | — | — |
| **South Atlantic** | **412,697** | **406,762** | **395,574** | **390,090** | **17,122** | **16,672** |
| Delaware | 2,867 | 3,912 | 2,762 | 3,812 | 105 | 100 |
| District of Columbia | — | — | — | — | — | — |
| Florida | 66,987 | 70,279 | 62,681 | 65,470 | 4,306 | 4,809 |
| Georgia | 75,512 | 71,244 | 74,068 | 69,873 | 1,445 | 1,371 |
| Maryland | 29,683 | 29,295 | 29,352 | 29,077 | 331 | 218 |
| North Carolina | 72,682 | 72,968 | 68,569 | 69,001 | 4,112 | 3,967 |
| South Carolina | 36,197 | 32,971 | 35,246 | 32,378 | 950 | 593 |
| Virginia | 35,474 | 34,879 | 31,743 | 31,471 | 3,730 | 3,407 |
| West Virginia | 93,295 | 91,213 | 91,152 | 89,007 | 2,143 | 2,206 |
| **East South Central** | **232,853** | **227,219** | **220,023** | **220,737** | **12,830** | **6,482** |
| Alabama | 73,719 | 71,933 | 73,221 | 71,459 | 498 | 474 |
| Kentucky | 88,915 | 86,538 | 78,545 | 82,411 | 10,370 | 4,126 |
| Mississippi | 13,070 | 11,779 | 13,037 | 11,748 | 33 | 32 |
| Tennessee | 57,149 | 56,969 | 55,221 | 55,120 | 1,928 | 1,850 |
| **West South Central** | **220,256** | **213,657** | **214,444** | **207,556** | **5,812** | **6,101** |
| Arkansas | 24,654 | 23,181 | 24,612 | 23,141 | 42 | 40 |
| Louisiana | 21,244 | 20,836 | 21,166 | 20,762 | 77 | 74 |
| Oklahoma | 33,552 | 34,223 | 30,588 | 31,026 | 2,963 | 3,197 |
| Texas | 140,806 | 135,416 | 138,077 | 132,627 | 2,729 | 2,789 |
| **Mountain** | **209,735** | **208,705** | **207,400** | **207,006** | **2,335** | **1,699** |
| Arizona | 38,348 | 36,564 | 37,994 | 36,226 | 354 | 338 |
| Colorado | 32,907 | 33,367 | 32,605 | 33,079 | 302 | 288 |
| Idaho | 62 | 59 | — | — | 62 | 59 |
| Montana | 16,981 | 16,785 | 15,982 | 16,508 | 1,000 | 277 |
| Nevada | 16,908 | 17,162 | 16,908 | 17,162 | — | — |
| New Mexico | 28,068 | 27,538 | 28,068 | 27,538 | — | — |
| Utah | 34,514 | 33,726 | 34,125 | 33,207 | 389 | 519 |
| Wyoming | 41,946 | 43,504 | 41,719 | 43,287 | 227 | 217 |
| **Pacific Contiguous** | **14,918** | **14,871** | **12,354** | **12,639** | **2,565** | **2,232** |
| California | 2,514 | 2,184 | — | — | 2,514 | 2,184 |
| Oregon | 3,726 | 3,375 | 3,698 | 3,348 | 28 | 27 |
| Washington | 8,678 | 9,312 | 8,656 | 9,291 | 23 | 22 |
| **Pacific Noncontiguous** | **1,891** | **1,964** | **156** | **171** | **1,735** | **1,793** |
| Alaska | 527 | 525 | 156 | 171 | 371 | 354 |
| Hawaii | 1,364 | 1,439 | — | — | 1,364 | 1,439 |
| **U.S. Total** | **1,881,571** | **1,873,946** | **1,767,679** | **1,807,480** | **113,892** | **66,466** |

kWh = Kilowatthours.

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 are final.•Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ‘‘Monthly Power Plant Report.’’ Form EIA-860B, ‘‘Annual Electric Generator Report-Nonutility.’’ Form EIA-900, ‘‘Monthly Nonutility Power Plant Report.’’

## Table A9. Net Generation from Petroleum by Census Division and State, 1999 and 1998

| Census Division and State | Industry | | Utility | | Nonutility | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 |
| | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). |
| **New England** | **24,772** | **25,660** | **8,285** | **21,758** | **16,487** | **3,902** |
| Connecticut | 8,001 | 8,654 | 5,794 | 8,608 | 2,207 | 46 |
| Maine | 4,288 | 2,615 | 673 | 1,728 | 3,615 | 888 |
| Massachusetts | 10,485 | 12,458 | 300 | 10,019 | 10,185 | 2,439 |
| New Hampshire | 1,583 | 1,429 | 1,486 | 1,353 | 96 | 77 |
| Rhode Island | 393 | 461 | 9 | 9 | 383 | 452 |
| Vermont | 23 | 42 | 22 | 41 | 1 | 1 |
| **Middle Atlantic** | **17,941** | **20,268** | **15,330** | **19,107** | **2,612** | **1,161** |
| New Jersey | 861 | 722 | 532 | 485 | 329 | 236 |
| New York | 13,387 | 14,952 | 11,735 | 14,524 | 1,653 | 428 |
| Pennsylvania | 3,693 | 4,594 | 3,063 | 4,097 | 629 | 496 |
| **East North Central** | **4,327** | **4,281** | **3,163** | **3,217** | **1,164** | **1,064** |
| Illinois | 464 | 920 | 372 | 838 | 91 | 82 |
| Indiana | 1,016 | 1,018 | 813 | 821 | 203 | 197 |
| Michigan | 1,437 | 1,152 | 1,283 | 1,005 | 155 | 147 |
| Ohio | 490 | 371 | 474 | 351 | 16 | 20 |
| Wisconsin | 920 | 820 | 221 | 201 | 699 | 619 |
| **West North Central** | **1,954** | **1,908** | **1,488** | **1,309** | **467** | **599** |
| Iowa | 139 | 123 | 128 | 110 | 11 | 13 |
| Kansas | 314 | 126 | 311 | 122 | 3 | 4 |
| Minnesota | 1,104 | 1,202 | 674 | 650 | 430 | 552 |
| Missouri | 290 | 323 | 281 | 311 | 9 | 12 |
| Nebraska | 30 | 43 | 29 | 42 | 1 | 1 |
| North Dakota | 54 | 64 | 40 | 47 | 13 | 17 |
| South Dakota | 24 | 27 | 24 | 27 | — | — |
| **South Atlantic** | **50,036** | **52,990** | **46,527** | **49,886** | **3,508** | **3,105** |
| Delaware | 1,496 | 1,515 | 1,234 | 1,234 | 262 | 281 |
| District of Columbia | 230 | 244 | 230 | 244 | — | — |
| Florida | 37,247 | 41,537 | 36,697 | 40,955 | 550 | 582 |
| Georgia | 1,927 | 1,910 | 663 | 673 | 1,265 | 1,237 |
| Maryland | 4,048 | 3,324 | 3,897 | 3,312 | 151 | 12 |
| North Carolina | 961 | 851 | 284 | 286 | 676 | 565 |
| South Carolina | 385 | 441 | 301 | 332 | 84 | 109 |
| Virginia | 3,555 | 2,973 | 3,035 | 2,654 | 520 | 319 |
| West Virginia | 187 | 195 | 186 | 194 | 1 | 1 |
| **East South Central** | **4,629** | **7,301** | **3,902** | **6,504** | **727** | **797** |
| Alabama | 280 | 402 | 154 | 259 | 126 | 143 |
| Kentucky | 685 | 769 | 104 | 127 | 581 | 642 |
| Mississippi | 3,154 | 5,421 | 3,142 | 5,418 | 12 | 3 |
| Tennessee | 510 | 709 | 502 | 700 | 7 | 10 |
| **West South Central** | **3,994** | **3,044** | **692** | **888** | **3,302** | **2,156** |
| Arkansas | 159 | 154 | 142 | 144 | 17 | 10 |
| Louisiana | 2,078 | 2,362 | 397 | 600 | 1,681 | 1,762 |
| Oklahoma | 13 | 14 | 8 | 8 | 5 | 6 |
| Texas | 1,745 | 514 | 146 | 136 | 1,599 | 377 |
| **Mountain** | **928** | **698** | **244** | **260** | **684** | **438** |
| Arizona | 48 | 63 | 46 | 61 | 1 | 2 |
| Colorado | 42 | 49 | 32 | 37 | 10 | 12 |
| Idaho | * | 1 | * | * | * | * |
| Montana | 469 | 427 | 15 | 14 | 455 | 412 |
| Nevada | 245 | 52 | 35 | 50 | 209 | 1 |
| New Mexico | 44 | 26 | 40 | 23 | 3 | 3 |
| Utah | 32 | 35 | 29 | 31 | 3 | 4 |
| Wyoming | 48 | 46 | 46 | 43 | 2 | 3 |
| **Pacific Contiguous** | **1,962** | **2,381** | **69** | **193** | **1,893** | **2,188** |
| California | 1,923 | 2,268 | 52 | 121 | 1,871 | 2,147 |
| Oregon | 8 | 33 | 8 | 33 | * | * |
| Washington | 32 | 79 | 10 | 38 | 22 | 41 |
| **Pacific Noncontiguous** | **8,480** | **8,402** | **7,227** | **7,038** | **1,253** | **1,364** |
| Alaska | 851 | 823 | 798 | 755 | 53 | 68 |
| Hawaii | 7,629 | 7,579 | 6,430 | 6,284 | 1,200 | 1,295 |
| **U.S. Total** | **119,025** | **126,932** | **86,929** | **110,158** | **32,096** | **16,775** |

* = For detailed data, the absolute value is less than 0.5; for percentage calculations, the absolute value is less than 0.05 percent.

kWh = Kilowatthours.

Notes: •Petroleum includes fuel oil Nos. 2,4,5 and 6, crude oil, kerosene, and petroleum coke. Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 are final.•Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.'' Form EIA-860B, ''Annual Electric Generator Report-Nonutility.'' Form EIA-900, ''Monthly Nonutility Power Plant Report.''

## Table A10. Net Generation from Gas by Census Division and State, 1999 and 1998

| Census Division and State | Industry | | Utility | | Nonutility | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 |
| | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). |
| **New England** | **19,734** | **24,341** | **2,109** | **4,860** | **17,625** | **19,481** |
| Connecticut | 2,577 | 2,247 | 1,180 | 977 | 1,397 | 1,270 |
| Maine | 21 | 1,251 | — | — | 21 | 1,251 |
| Massachusetts | 10,811 | 13,686 | 866 | 1,819 | 9,946 | 11,867 |
| New Hampshire | 48 | 78 | 45 | 10 | 2 | 69 |
| Rhode Island | 6,259 | 7,078 | — | 2,053 | 6,259 | 5,025 |
| Vermont | 18 | 1 | 18 | 1 | — | — |
| **Middle Atlantic** | **69,671** | **64,013** | **21,218** | **23,339** | **48,453** | **40,674** |
| New Jersey | 17,926 | 17,007 | 3,122 | 2,854 | 14,804 | 14,153 |
| New York | 47,273 | 42,645 | 17,183 | 19,913 | 30,090 | 22,732 |
| Pennsylvania | 4,472 | 4,361 | 913 | 572 | 3,559 | 3,788 |
| **East North Central** | **27,054** | **26,093** | **7,876** | **9,117** | **19,177** | **16,976** |
| Illinois | 4,891 | 5,894 | 3,042 | 4,483 | 1,849 | 1,411 |
| Indiana | 5,573 | 4,305 | 626 | 775 | 4,948 | 3,530 |
| Michigan | 13,507 | 12,995 | 2,448 | 2,152 | 11,058 | 10,843 |
| Ohio | 1,108 | 868 | 747 | 519 | 360 | 349 |
| Wisconsin | 1,975 | 2,030 | 1,013 | 1,188 | 962 | 843 |
| **West North Central** | **8,371** | **6,567** | **5,899** | **5,832** | **2,472** | **735** |
| Iowa | 431 | 477 | 364 | 412 | 67 | 65 |
| Kansas | 2,978 | 3,014 | 2,886 | 2,924 | 92 | 89 |
| Minnesota | 1,436 | 1,109 | 523 | 652 | 914 | 456 |
| Missouri | 1,625 | 1,273 | 1,597 | 1,232 | 28 | 40 |
| Nebraska | 1,665 | 431 | 348 | 400 | 1,317 | 31 |
| North Dakota | 55 | 53 | * | * | 55 | 53 |
| South Dakota | 181 | 211 | 181 | 211 | — | — |
| **South Atlantic** | **58,483** | **52,845** | **44,914** | **39,397** | **13,568** | **13,447** |
| Delaware | 2,452 | 1,471 | 2,243 | 1,272 | 209 | 200 |
| District of Columbia | — | — | — | — | — | — |
| Florida | 43,426 | 39,693 | 35,854 | 31,711 | 7,572 | 7,982 |
| Georgia | 2,907 | 2,799 | 1,654 | 1,769 | 1,253 | 1,030 |
| Maryland | 2,549 | 2,199 | 1,339 | 1,054 | 1,210 | 1,145 |
| North Carolina | 1,226 | 1,300 | 851 | 936 | 375 | 364 |
| South Carolina | 815 | 876 | 337 | 415 | 478 | 461 |
| Virginia | 4,868 | 4,178 | 2,600 | 2,199 | 2,268 | 1,979 |
| West Virginia | 240 | 327 | 37 | 42 | 203 | 285 |
| **East South Central** | **13,319** | **12,789** | **10,173** | **9,131** | **3,145** | **3,658** |
| Alabama | 3,890 | 4,444 | 1,882 | 2,449 | 2,009 | 1,995 |
| Kentucky | 458 | 498 | 453 | 496 | 5 | 2 |
| Mississippi | 8,412 | 6,982 | 7,605 | 5,635 | 808 | 1,347 |
| Tennessee | 558 | 865 | 234 | 551 | 324 | 315 |
| **West South Central** | **245,198** | **246,804** | **166,899** | **169,222** | **78,299** | **77,582** |
| Arkansas | 4,849 | 5,070 | 3,764 | 3,704 | 1,084 | 1,366 |
| Louisiana | 47,731 | 46,004 | 30,163 | 28,318 | 17,568 | 17,686 |
| Oklahoma | 17,952 | 18,315 | 16,614 | 17,000 | 1,339 | 1,315 |
| Texas | 174,666 | 177,417 | 116,358 | 120,201 | 58,308 | 57,216 |
| **Mountain** | **25,144** | **22,528** | **17,198** | **14,788** | **7,946** | **7,741** |
| Arizona | 5,027 | 3,914 | 4,557 | 3,472 | 470 | 441 |
| Colorado | 5,019 | 3,927 | 2,050 | 964 | 2,969 | 2,963 |
| Idaho | 337 | 322 | — | — | 337 | 322 |
| Montana | 37 | 87 | 20 | 41 | 17 | 46 |
| Nevada | 9,295 | 8,687 | 6,736 | 6,189 | 2,559 | 2,497 |
| New Mexico | 4,235 | 4,542 | 3,304 | 3,631 | 931 | 910 |
| Utah | 798 | 674 | 515 | 463 | 283 | 211 |
| Wyoming | 397 | 376 | 16 | 27 | 381 | 349 |
| **Pacific Contiguous** | **94,376** | **89,516** | **17,255** | **30,987** | **77,121** | **58,528** |
| California | 84,177 | 77,652 | 13,918 | 26,385 | 70,258 | 51,266 |
| Oregon | 6,668 | 7,252 | 2,759 | 3,467 | 3,909 | 3,785 |
| Washington | 3,531 | 4,612 | 578 | 1,135 | 2,953 | 3,477 |
| **Pacific Noncontiguous** | **4,053** | **3,719** | **2,839** | **2,549** | **1,214** | **1,170** |
| Alaska | 3,713 | 3,396 | 2,839 | 2,549 | 874 | 848 |
| Hawaii | 340 | 323 | — | — | 340 | 323 |
| **U.S. Total** | **565,403** | **549,215** | **296,381** | **309,222** | **269,021** | **239,992** |

* = For detailed data, the absolute value is less than 0.5; for percentage calculations, the absolute value is less than 0.05 percent.

kWh = Kilowatthours.

Notes: •Gas includes natural gas, waste heat, waste gas, butane, methane, propane, other gas, and digester gas. Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 are final.•Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.'' Form EIA-860B, ''Annual Electric Generator Report-Nonutility.'' Form EIA-900, ''Monthly Nonutility Power Plant Report.''

## Table A11. Net Generation from Nuclear by Census Division and State, 1999 and 1998

| Census Division and State | Industry | | Utility | | Nonutility | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 |
| | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). |
| **New England** | **29,884** | **20,686** | **27,342** | **20,686** | **2,542** | –- |
| Connecticut | 12,675 | 3,243 | 12,675 | 3,243 | — | –- |
| Maine | — | — | — | — | — | –- |
| Massachusetts | 4,473 | 5,698 | 1,931 | 5,698 | 2,542 | –- |
| New Hampshire | 8,676 | 8,387 | 8,676 | 8,387 | — | –- |
| Rhode Island | — | — | — | — | — | –- |
| Vermont | 4,059 | 3,358 | 4,059 | 3,358 | — | –- |
| **Middle Atlantic** | **137,113** | **119,595** | **136,874** | **119,595** | **238** | –- |
| New Jersey | 28,971 | 27,132 | 28,971 | 27,132 | — | –- |
| New York | 37,019 | 31,314 | 37,019 | 31,314 | — | –- |
| Pennsylvania | 71,123 | 61,149 | 70,885 | 61,149 | 238 | –- |
| **East North Central** | **124,245** | **93,963** | **123,863** | **93,963** | **381** | –- |
| Illinois | 81,737 | 55,596 | 81,356 | 55,596 | 381 | –- |
| Indiana | — | — | — | — | — | –- |
| Michigan | 14,591 | 12,494 | 14,591 | 12,494 | — | –- |
| Ohio | 16,422 | 16,476 | 16,422 | 16,476 | — | –- |
| Wisconsin | 11,495 | 9,397 | 11,495 | 9,397 | — | –- |
| **West North Central** | **44,790** | **42,598** | **44,790** | **42,598** | **—** | –- |
| Iowa | 3,640 | 3,768 | 3,640 | 3,768 | — | –- |
| Kansas | 9,157 | 10,411 | 9,157 | 10,411 | — | –- |
| Minnesota | 13,316 | 11,644 | 13,316 | 11,644 | — | –- |
| Missouri | 8,587 | 8,517 | 8,587 | 8,517 | — | –- |
| Nebraska | 10,091 | 8,259 | 10,091 | 8,259 | — | –- |
| North Dakota | — | — | — | — | — | –- |
| South Dakota | — | — | — | — | — | –- |
| **South Atlantic** | **192,954** | **190,598** | **192,954** | **190,598** | **—** | –- |
| Delaware | — | — | — | — | — | –- |
| District of Columbia | — | — | — | — | — | –- |
| Florida | 31,526 | 31,115 | 31,526 | 31,115 | — | –- |
| Georgia | 31,478 | 31,380 | 31,478 | 31,380 | — | –- |
| Maryland | 13,312 | 13,331 | 13,312 | 13,331 | — | –- |
| North Carolina | 37,524 | 38,778 | 37,524 | 38,778 | — | –- |
| South Carolina | 50,814 | 48,759 | 50,814 | 48,759 | — | –- |
| Virginia | 28,301 | 27,234 | 28,301 | 27,234 | — | –- |
| West Virginia | — | — | — | — | — | –- |
| **East South Central** | **66,548** | **66,241** | **66,548** | **66,241** | **—** | –- |
| Alabama | 30,892 | 28,663 | 30,892 | 28,663 | — | –- |
| Kentucky | — | — | — | — | — | –- |
| Mississippi | 8,428 | 9,191 | 8,428 | 9,191 | — | –- |
| Tennessee | 27,227 | 28,388 | 27,227 | 28,388 | — | –- |
| **West South Central** | **62,791** | **68,210** | **62,791** | **68,210** | **—** | –- |
| Arkansas | 12,920 | 13,097 | 12,920 | 13,097 | — | –- |
| Louisiana | 13,112 | 16,428 | 13,112 | 16,428 | — | –- |
| Oklahoma | — | — | — | — | — | –- |
| Texas | 36,760 | 38,685 | 36,760 | 38,685 | — | –- |
| **Mountain** | **30,416** | **30,301** | **30,416** | **30,301** | **—** | –- |
| Arizona | 30,416 | 30,301 | 30,416 | 30,301 | — | –- |
| Colorado | — | — | — | — | — | –- |
| Idaho | — | — | — | — | — | –- |
| Montana | — | — | — | — | — | –- |
| Nevada | — | — | — | — | — | –- |
| New Mexico | — | — | — | — | — | –- |
| Utah | — | — | — | — | — | –- |
| Wyoming | — | — | — | — | — | –- |
| **Pacific Contiguous** | **39,458** | **41,510** | **39,458** | **41,510** | **—** | –- |
| California | 33,372 | 34,594 | 33,372 | 34,594 | — | –- |
| Oregon | — | — | — | — | — | –- |
| Washington | 6,086 | 6,916 | 6,086 | 6,916 | — | –- |
| **Pacific Noncontiguous** | **—** | **—** | **—** | **—** | **—** | –- |
| Alaska | — | — | — | — | — | –- |
| Hawaii | — | — | — | — | — | –- |
| **U.S. Total** | **728,198** | **673,702** | **725,036** | **673,702** | **3,162** | –- |

kWh = Kilowatthours.

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 are final.•Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.'' Form EIA-900, ''Monthly Nonutility Power Plant Report.''

## Table A12. Net Generation from Hydroelectric by Census Division and State, 1999 and 1998

| Census Division and State | Industry | | Utility | | Nonutility | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 |
| | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). |
| **New England** | **5,978** | **7,621** | **1,834** | **4,359** | **4,145** | **3,262** |
| Connecticut | 422 | 448 | 368 | 384 | 54 | 64 |
| Maine | 2,610 | 3,716 | 516 | 1,820 | 2,094 | 1,896 |
| Massachusetts | 483 | 674 | 189 | 331 | 294 | 343 |
| New Hampshire | 1,390 | 1,597 | 339 | 975 | 1,051 | 622 |
| Rhode Island | 7 | 9 | — | — | 7 | 9 |
| Vermont | 1,065 | 1,177 | 421 | 848 | 645 | 329 |
| **Middle Atlantic** | **22,758** | **29,947** | **21,133** | **28,003** | **1,625** | **1,944** |
| New Jersey | –128 | –126 | –145 | –146 | 17 | 21 |
| New York | 21,432 | 28,151 | 20,124 | 26,582 | 1,309 | 1,570 |
| Pennsylvania | 1,454 | 1,921 | 1,155 | 1,568 | 299 | 354 |
| **East North Central** | **3,419** | **3,239** | **3,051** | **2,806** | **369** | **434** |
| Illinois | 128 | 140 | 52 | 51 | 76 | 90 |
| Indiana | 407 | 479 | 407 | 479 | — | — |
| Michigan | 545 | 482 | 435 | 352 | 110 | 130 |
| Ohio | 423 | 406 | 423 | 406 | — | — |
| Wisconsin | 1,917 | 1,732 | 1,734 | 1,518 | 183 | 214 |
| **West North Central** | **14,779** | **13,883** | **14,534** | **13,593** | **245** | **289** |
| Iowa | 948 | 913 | 931 | 893 | 17 | 20 |
| Kansas | 10 | 11 | — | — | 10 | 11 |
| Minnesota | 1,076 | 953 | 857 | 695 | 218 | 258 |
| Missouri | 1,740 | 2,269 | 1,740 | 2,269 | — | — |
| Nebraska | 1,719 | 1,683 | 1,719 | 1,683 | — | — |
| North Dakota | 2,609 | 2,296 | 2,609 | 2,296 | — | — |
| South Dakota | 6,677 | 5,758 | 6,677 | 5,758 | — | — |
| **South Atlantic** | **9,310** | **16,795** | **7,236** | **14,204** | **2,075** | **2,592** |
| Delaware | — | — | — | — | — | — |
| District of Columbia | — | — | — | — | — | — |
| Florida | 140 | 199 | 140 | 199 | — | — |
| Georgia | 2,704 | 5,061 | 2,674 | 5,025 | 30 | 35 |
| Maryland | 1,422 | 1,740 | 1,422 | 1,740 | — | — |
| North Carolina | 3,964 | 5,804 | 2,654 | 4,111 | 1,310 | 1,693 |
| South Carolina | 706 | 2,579 | 650 | 2,513 | 56 | 66 |
| Virginia | –546 | 328 | –608 | 255 | 61 | 72 |
| West Virginia | 920 | 1,086 | 303 | 361 | 618 | 725 |
| **East South Central** | **17,497** | **23,864** | **16,815** | **23,065** | **682** | **799** |
| Alabama | 7,760 | 10,564 | 7,760 | 10,564 | — | — |
| Kentucky | 2,557 | 3,116 | 2,557 | 3,116 | — | — |
| Mississippi | — | — | — | — | — | — |
| Tennessee | 7,181 | 10,184 | 6,499 | 9,385 | 682 | 799 |
| **West South Central** | **7,670** | **9,024** | **6,879** | **7,952** | **791** | **1,072** |
| Arkansas | 2,696 | 3,117 | 2,693 | 3,114 | 3 | 3 |
| Louisiana | 783 | 1,063 | — | — | 783 | 1,063 |
| Oklahoma | 3,069 | 3,420 | 3,069 | 3,420 | — | — |
| Texas | 1,122 | 1,425 | 1,117 | 1,419 | 5 | 6 |
| **Mountain** | **42,186** | **42,805** | **41,066** | **41,693** | **1,119** | **1,112** |
| Arizona | 10,083 | 11,239 | 10,083 | 11,239 | — | — |
| Colorado | 1,578 | 1,508 | 1,480 | 1,392 | 98 | 116 |
| Idaho | 13,309 | 12,880 | 12,456 | 11,978 | 853 | 902 |
| Montana | 11,723 | 11,119 | 11,581 | 11,054 | 142 | 64 |
| Nevada | 2,820 | 3,166 | 2,807 | 3,151 | 13 | 15 |
| New Mexico | 243 | 236 | 243 | 236 | — | — |
| Utah | 1,260 | 1,315 | 1,247 | 1,299 | 13 | 16 |
| Wyoming | 1,170 | 1,342 | 1,170 | 1,342 | — | — |
| **Pacific Contiguous** | **182,914** | **170,476** | **180,549** | **167,600** | **2,366** | **2,876** |
| California | 40,529 | 50,760 | 38,842 | 48,687 | 1,686 | 2,073 |
| Oregon | 45,571 | 39,901 | 45,234 | 39,503 | 337 | 398 |
| Washington | 96,815 | 79,815 | 96,472 | 79,410 | 343 | 405 |
| **Pacific Noncontiguous** | **922** | **1,235** | **835** | **1,127** | **87** | **108** |
| Alaska | 817 | 1,113 | 817 | 1,113 | — | — |
| Hawaii | 106 | 121 | 19 | 14 | 87 | 108 |
| **U.S. Total** | **307,434** | **318,889** | **293,932** | **304,403** | **13,503** | **14,486** |

kWh = Kilowatthours.

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 are final.•Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.'' Form EIA-860B, ''Annual Electric Generator Report-Nonutility.'' Form EIA-900, ''Monthly Nonutility Power Plant Report.''

## Table A13. Net Generation from Other by Census Division and State, 1999 and 1998

| Census Division and State | Industry | | Utility | | Nonutility | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 |
| | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). | Generation (million kWh) | Generation (million kWh). |
| **New England** | **10,117** | **8,190** | **681** | **573** | **9,436** | **7,618** |
| Connecticut | 2,145 | 2,061 | 467 | 427 | 1,678 | 1,634 |
| Maine | 4,046 | 2,536 | — | 0 | 4,046 | 2,536 |
| Massachusetts | 2,068 | 2,053 | — | — | 2,068 | 2,053 |
| New Hampshire | 1,304 | 1,098 | — | — | 1,304 | 1,098 |
| Rhode Island | 118 | 111 | — | — | 118 | 111 |
| Vermont | 437 | 331 | 214 | 145 | 223 | 185 |
| **Middle Atlantic** | **7,070** | **6,047** | ***** | **5** | **7,070** | **6,042** |
| New Jersey | 1,334 | 1,286 | — | — | 1,334 | 1,286 |
| New York | 3,003 | 2,311 | * | 5 | 3,002 | 2,306 |
| Pennsylvania | 2,733 | 2,450 | — | — | 2,733 | 2,450 |
| **East North Central** | **6,509** | **5,616** | **409** | **441** | **6,100** | **5,175** |
| Illinois | 759 | 639 | 67 | — | 693 | 639 |
| Indiana | 131 | 124 | — | — | 131 | 124 |
| Michigan | 2,979 | 2,860 | — | — | 2,979 | 2,860 |
| Ohio | 841 | 698 | — | — | 841 | 698 |
| Wisconsin | 1,798 | 1,294 | 343 | 441 | 1,456 | 853 |
| **West North Central** | **2,200** | **1,433** | **489** | **549** | **1,711** | **884** |
| Iowa | 81 | 75 | 22 | 19 | 60 | 56 |
| Kansas | — | — | — | — | — | — |
| Minnesota | 2,064 | 1,275 | 417 | 451 | 1,647 | 823 |
| Missouri | 53 | 81 | 50 | 78 | 3 | 3 |
| Nebraska | — | 1 | — | 1 | — | — |
| North Dakota | 2 | 2 | — | — | 2 | 2 |
| South Dakota | — | — | — | — | — | — |
| **South Atlantic** | **19,541** | **16,231** | **16** | **—** | **19,524** | **16,231** |
| Delaware | 4 | — | — | — | 4 | — |
| District of Columbia | — | — | — | — | — | — |
| Florida | 7,911 | 6,638 | 16 | — | 7,894 | 6,638 |
| Georgia | 4,956 | 2,937 | — | — | 4,956 | 2,937 |
| Maryland | 1,044 | 761 | — | — | 1,044 | 761 |
| North Carolina | 1,593 | 1,671 | — | — | 1,593 | 1,671 |
| South Carolina | 847 | 1,618 | — | — | 847 | 1,618 |
| Virginia | 3,186 | 2,606 | — | — | 3,186 | 2,606 |
| West Virginia | * | * | — | — | * | * |
| **East South Central** | **7,378** | **5,719** | **—** | **—** | **7,378** | **5,719** |
| Alabama | 4,581 | 4,027 | — | — | 4,581 | 4,027 |
| Kentucky | 19 | 16 | — | — | 19 | 16 |
| Mississippi | 1,960 | 1,061 | — | — | 1,960 | 1,061 |
| Tennessee | 819 | 615 | — | — | 819 | 615 |
| **West South Central** | **9,299** | **5,573** | ***** | ***** | **9,299** | **5,573** |
| Arkansas | 2,315 | 1,044 | — | — | 2,315 | 1,044 |
| Louisiana | 4,369 | 2,930 | — | — | 4,369 | 2,930 |
| Oklahoma | 264 | 218 | — | — | 264 | 218 |
| Texas | 2,351 | 1,381 | * | * | 2,351 | 1,380 |
| **Mountain** | **2,523** | **2,395** | **156** | **160** | **2,367** | **2,235** |
| Arizona | — | — | — | — | — | — |
| Colorado | — | — | — | — | — | — |
| Idaho | 746 | 587 | — | — | 746 | 587 |
| Montana | 53 | 44 | — | — | 53 | 44 |
| Nevada | 1,484 | 1,524 | — | — | 1,484 | 1,524 |
| New Mexico | — | — | — | — | — | — |
| Utah | 156 | 160 | 156 | 160 | — | — |
| Wyoming | 85 | 79 | — | — | 85 | 79 |
| **Pacific Contiguous** | **23,921** | **23,223** | **1,961** | **5,478** | **21,960** | **17,744** |
| California | 22,116 | 21,303 | 1,691 | 5,141 | 20,425 | 16,162 |
| Oregon | 519 | 580 | — | — | 519 | 580 |
| Washington | 1,286 | 1,339 | 270 | 337 | 1,016 | 1,002 |
| **Pacific Noncontiguous** | **885** | **763** | **4** | ***** | **881** | **762** |
| Alaska | 2 | 2 | — | — | 2 | 2 |
| Hawaii | 883 | 761 | 4 | * | 879 | 761 |
| **U.S. Total** | **89,442** | **75,189** | **3,716** | **7,206** | **85,726** | **67,983** |

* = For detailed data, the absolute value is less than 0.5; for percentage calculations, the absolute value is less than 0.05 percent.

kWh = Kilowatthours.

Notes: •Other includes geothermal, wood, wind, waste, and solar. Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 are final.•Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.'' Form EIA-860B, ''Annual Electric Generator Report-Nonutility.'' Form EIA-900, ''Monthly Nonutility Power Plant Report.''

## Table A14. Coal Consumption by Census Division and State, 1999 and 1998

| Census Division and State | Industry | | Utility | | Nonutility | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 |
| | Consumption (thousand short tons) | Consumption (thousand short tons). | Consumption (thousand short tons) | Consumption (thousand short tons). | Consumption (thousand short tons) | Consumption (thousand short tons). |
| **New England** | **9,040** | **8,136** | **1,768** | **5,183** | **7,273** | **2,953** |
| Connecticut | 1,141 | 1,271 | 0 | 590 | 1,141 | 681 |
| Maine | 535 | 1,051 | — | — | 535 | 1,051 |
| Massachusetts | 6,023 | 4,349 | 427 | 3,128 | 5,596 | 1,221 |
| New Hampshire | 1,341 | 1,465 | 1,341 | 1,465 | — | — |
| Rhode Island | — | — | — | — | — | — |
| Vermont | — | — | — | — | — | — |
| **Middle Atlantic** | **62,966** | **66,245** | **41,554** | **54,738** | **21,412** | **11,507** |
| New Jersey | 3,468 | 3,284 | 2,583 | 2,357 | 885 | 927 |
| New York | 10,996 | 10,773 | 4,412 | 9,410 | 6,583 | 1,363 |
| Pennsylvania | 48,502 | 52,188 | 34,558 | 42,971 | 13,943 | 9,217 |
| **East North Central** | **208,995** | **213,764** | **200,288** | **204,721** | **8,707** | **9,043** |
| Illinois | 41,657 | 42,797 | 35,995 | 38,255 | 5,662 | 4,542 |
| Indiana | 56,404 | 55,875 | 55,105 | 55,086 | 1,299 | 789 |
| Michigan | 34,425 | 35,347 | 33,615 | 34,021 | 810 | 1,326 |
| Ohio | 52,368 | 55,239 | 52,122 | 54,455 | 246 | 784 |
| Wisconsin | 24,140 | 24,505 | 23,450 | 22,903 | 690 | 1,602 |
| **West North Central** | **132,347** | **134,596** | **130,538** | **130,374** | **1,809** | **4,222** |
| Iowa | 20,614 | 21,736 | 20,071 | 20,031 | 543 | 1,705 |
| Kansas | 18,888 | 17,627 | 18,888 | 17,627 | — | — |
| Minnesota | 18,147 | 19,683 | 17,114 | 17,902 | 1,033 | 1,781 |
| Missouri | 36,707 | 37,549 | 36,546 | 37,165 | 161 | 384 |
| Nebraska | 11,245 | 11,587 | 11,219 | 11,505 | 26 | 82 |
| North Dakota | 24,586 | 24,548 | 24,540 | 24,278 | 46 | 270 |
| South Dakota | 2,159 | 1,866 | 2,159 | 1,866 | — | — |
| **South Atlantic** | **167,852** | **170,533** | **158,463** | **157,764** | **9,388** | **12,769** |
| Delaware | 1,302 | 1,721 | 1,244 | 1,592 | 57 | 129 |
| District of Columbia | — | — | — | — | — | — |
| Florida | 28,451 | 30,028 | 26,090 | 27,542 | 2,361 | 2,486 |
| Georgia | 32,298 | 32,136 | 31,506 | 30,731 | 792 | 1,405 |
| Maryland | 11,112 | 11,359 | 10,931 | 10,968 | 181 | 391 |
| North Carolina | 28,762 | 29,597 | 26,507 | 26,834 | 2,255 | 2,763 |
| South Carolina | 14,187 | 13,386 | 13,666 | 12,664 | 521 | 722 |
| Virginia | 14,472 | 15,600 | 12,427 | 12,300 | 2,045 | 3,300 |
| West Virginia | 37,268 | 36,705 | 36,093 | 35,132 | 1,175 | 1,573 |
| **East South Central** | **104,411** | **101,975** | **97,377** | **96,320** | **7,035** | **5,655** |
| Alabama | 33,701 | 32,275 | 33,428 | 31,474 | 273 | 801 |
| Kentucky | 40,396 | 38,246 | 34,710 | 35,842 | 5,686 | 2,404 |
| Mississippi | 6,040 | 5,723 | 6,022 | 5,684 | 18 | 39 |
| Tennessee | 24,274 | 25,731 | 23,216 | 23,320 | 1,057 | 2,411 |
| **West South Central** | **148,176** | **146,105** | **144,989** | **141,671** | **3,187** | **4,434** |
| Arkansas | 14,997 | 14,358 | 14,974 | 14,277 | 23 | 81 |
| Louisiana | 13,959 | 13,877 | 13,916 | 13,850 | 42 | 27 |
| Oklahoma | 19,977 | 20,492 | 18,353 | 18,883 | 1,625 | 1,609 |
| Texas | 99,242 | 97,378 | 97,746 | 94,661 | 1,496 | 2,717 |
| **Mountain** | **112,424** | **113,947** | **111,144** | **111,787** | **1,280** | **2,160** |
| Arizona | 19,220 | 18,704 | 19,025 | 18,316 | 194 | 388 |
| Colorado | 17,870 | 18,020 | 17,704 | 17,663 | 166 | 357 |
| Idaho | 34 | 189 | — | — | 34 | 189 |
| Montana | 10,746 | 10,897 | 10,198 | 10,627 | 548 | 270 |
| Nevada | 7,763 | 7,961 | 7,763 | 7,961 | — | — |
| New Mexico | 16,224 | 15,883 | 16,224 | 15,883 | — | — |
| Utah | 14,804 | 15,123 | 14,590 | 14,664 | 213 | 459 |
| Wyoming | 25,764 | 27,171 | 25,639 | 26,674 | 125 | 497 |
| **Pacific Contiguous** | **9,267** | **10,356** | **7,860** | **8,147** | **1,406** | **2,209** |
| California | 1,379 | 2,068 | — | — | 1,379 | 2,068 |
| Oregon | 2,169 | 2,098 | 2,154 | 2,037 | 15 | 61 |
| Washington | 5,719 | 6,191 | 5,707 | 6,111 | 12 | 80 |
| **Pacific Noncontiguous** | **1,091** | **2,061** | **140** | **162** | **951** | **1,899** |
| Alaska | 343 | 748 | 140 | 162 | 203 | 586 |
| Hawaii | 748 | 1,313 | — | — | 748 | 1,313 |
| **U.S. Total** | **956,568** | **967,718** | **894,120** | **910,867** | **62,448** | **56,851** |

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 are final. •Nonutility data for 1998 and prior years are for fuels consumed to produce both electricity and steam.•Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.'' Form EIA-860B, ''Annual Electric Generator Report-Nonutility.'' Form EIA-900, ''Monthly Nonutility Power Plant Report.''

## Table A15. Petroleum Consumption by Census Division and State, 1999 and 1998

| Census Division and State | Industry | | Utility | | Nonutility | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 |
| | Consumption (thousand barrels) | Consumption (thousand barrels). | Consumption (thousand barrels) | Consumption (thousand barrels). | Consumption (thousand barrels) | Consumption (thousand barrels). |
| **New England** | **42,375** | **52,776** | **14,486** | **36,003** | **27,889** | **16,773** |
| Connecticut | 13,750 | 14,989 | 10,008 | 14,606 | 3,743 | 383 |
| Maine | 7,195 | 7,428 | 1,133 | 2,973 | 6,062 | 4,455 |
| Massachusetts | 17,870 | 25,414 | 600 | 15,924 | 17,271 | 9,490 |
| New Hampshire | 2,826 | 3,108 | 2,663 | 2,372 | 163 | 736 |
| Rhode Island | 669 | 1,724 | 19 | 20 | 650 | 1,704 |
| Vermont | 65 | 114 | 64 | 109 | 1 | 5 |
| **Middle Atlantic** | **31,072** | **35,498** | **27,045** | **32,173** | **4,027** | **3,325** |
| New Jersey | 1,763 | 1,709 | 1,205 | 1,085 | 559 | 624 |
| New York | 22,908 | 25,951 | 20,243 | 24,350 | 2,665 | 1,601 |
| Pennsylvania | 6,400 | 7,838 | 5,597 | 6,738 | 804 | 1,100 |
| **East North Central** | **6,465** | **9,147** | **5,222** | **4,819** | **1,243** | **4,328** |
| Illinois | 796 | 1,755 | 722 | 1,338 | 74 | 417 |
| Indiana | 899 | 1,865 | 555 | 447 | 345 | 1,418 |
| Michigan | 2,692 | 2,289 | 2,620 | 2,087 | 73 | 202 |
| Ohio | 1,005 | 837 | 985 | 635 | 20 | 202 |
| Wisconsin | 1,072 | 2,401 | 341 | 312 | 732 | 2,089 |
| **West North Central** | **2,832** | **4,201** | **2,044** | **1,709** | **788** | **2,492** |
| Iowa | 313 | 335 | 299 | 269 | 14 | 66 |
| Kansas | 637 | 299 | 632 | 298 | 5 | 1 |
| Minnesota | 930 | 2,450 | 201 | 177 | 729 | 2,273 |
| Missouri | 718 | 739 | 703 | 714 | 16 | 25 |
| Nebraska | 71 | 95 | 70 | 93 | 2 | 2 |
| North Dakota | 103 | 214 | 81 | 89 | 23 | 125 |
| South Dakota | 59 | 68 | 59 | 68 | — | — |
| **South Atlantic** | **78,755** | **99,887** | **73,997** | **78,579** | **4,758** | **21,308** |
| Delaware | 2,264 | 2,565 | 2,059 | 2,111 | 205 | 454 |
| District of Columbia | 547 | 566 | 547 | 566 | — | — |
| Florida | 57,157 | 64,536 | 56,225 | 62,046 | 932 | 2,490 |
| Georgia | 2,698 | 14,607 | 1,416 | 1,591 | 1,282 | 13,016 |
| Maryland | 7,373 | 6,501 | 7,117 | 6,159 | 256 | 342 |
| North Carolina | 1,688 | 3,111 | 632 | 635 | 1,056 | 2,476 |
| South Carolina | 950 | 1,663 | 807 | 809 | 142 | 854 |
| Virginia | 5,754 | 5,992 | 4,873 | 4,338 | 881 | 1,654 |
| West Virginia | 323 | 346 | 321 | 324 | 2 | 22 |
| **East South Central** | **6,822** | **11,537** | **6,535** | **10,559** | **287** | **978** |
| Alabama | 509 | 1,342 | 295 | 472 | 214 | 870 |
| Kentucky | 260 | 299 | 220 | 265 | 39 | 34 |
| Mississippi | 4,999 | 8,407 | 4,978 | 8,376 | 21 | 31 |
| Tennessee | 1,054 | 1,490 | 1,042 | 1,447 | 13 | 43 |
| **West South Central** | **2,100** | **2,269** | **1,215** | **1,617** | **885** | **652** |
| Arkansas | 289 | 413 | 260 | 279 | 29 | 134 |
| Louisiana | 771 | 1,444 | 644 | 1,050 | 127 | 394 |
| Oklahoma | 33 | 82 | 24 | 18 | 8 | 64 |
| Texas | 1,008 | 331 | 288 | 271 | 720 | 60 |
| **Mountain** | **866** | **736** | **472** | **515** | **394** | **221** |
| Arizona | 90 | 122 | 88 | 117 | 2 | 5 |
| Colorado | 88 | 160 | 72 | 83 | 16 | 77 |
| Idaho | 1 | 4 | * | 1 | * | 3 |
| Montana | 34 | 54 | 30 | 33 | 5 | 21 |
| Nevada | 428 | 102 | 73 | 99 | 355 | 3 |
| New Mexico | 78 | 54 | 72 | 45 | 6 | 9 |
| Utah | 57 | 68 | 52 | 58 | 5 | 10 |
| Wyoming | 89 | 173 | 85 | 80 | 4 | 93 |
| **Pacific Contiguous** | **552** | **1,258** | **155** | **419** | **397** | **839** |
| California | 479 | 641 | 120 | 278 | 359 | 363 |
| Oregon | 16 | 65 | 15 | 59 | 1 | 6 |
| Washington | 57 | 553 | 19 | 83 | 37 | 470 |
| **Pacific Noncontiguous** | **14,783** | **15,581** | **12,659** | **12,221** | **2,124** | **3,360** |
| Alaska | 1,554 | 1,696 | 1,464 | 1,357 | 89 | 339 |
| Hawaii | 13,230 | 13,886 | 11,195 | 10,865 | 2,035 | 3,021 |
| **U.S. Total** | **186,622** | **232,890** | **143,830** | **178,614** | **42,792** | **54,276** |

* = For detailed data, the absolute value is less than 0.5; for percentage calculations, the absolute value is less than 0.05 percent.

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 are final. •While generation includes petroleum coke, consumption does not. The 1999 utility petroleum coke consumption was 1,608 thousand short tons and 1,769 thousand short tons in 1998. The 1999 nonutility petroleum coke consumption was 3,082 thousand short tons and 4,470 thousand short tons in 1998. •Nonutility data for 1998 and prior years are for fuels consumed to produce both electricity and steam.•Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ‘‘Monthly Power Plant Report.’’ Form EIA-860B, ‘‘Annual Electric Generator Report-Nonutility.’’ Form EIA-900, ‘‘Monthly Nonutility Power Plant Report.’’

## Table A16. Gas Consumption by Census Division and State, 1999 and 1998

| Census Division and State | Industry 1999 Consumption (MMcf) | Industry 1998 Consumption (MMcf). | Utility 1999 Consumption (MMcf) | Utility 1998 Consumption (MMcf). | Nonutility 1999 Consumption (MMcf) | Nonutility 1998 Consumption (MMcf). |
|---|---|---|---|---|---|---|
| **New England** | **267,900** | **194,868** | **22,057** | **45,073** | **245,843** | **149,795** |
| Connecticut | 32,582 | 28,048 | 13,095 | 10,719 | 19,488 | 17,329 |
| Maine | 290 | 91 | — | — | 290 | 91 |
| Massachusetts | 146,871 | 105,949 | 8,141 | 18,427 | 138,730 | 87,522 |
| New Hampshire | 606 | 164 | 572 | 149 | 34 | 15 |
| Rhode Island | 87,301 | 60,427 | — | 15,589 | 87,301 | 44,838 |
| Vermont | 250 | 188 | 250 | 188 | — | — |
| **Middle Atlantic** | **900,692** | **671,468** | **224,849** | **246,234** | **675,842** | **425,234** |
| New Jersey | 239,138 | 177,088 | 32,650 | 30,996 | 206,487 | 146,092 |
| New York | 601,535 | 433,872 | 181,823 | 208,348 | 419,712 | 225,524 |
| Pennsylvania | 60,019 | 60,508 | 10,376 | 6,890 | 49,643 | 53,618 |
| **East North Central** | **392,169** | **499,212** | **124,675** | **137,766** | **267,494** | **361,446** |
| Illinois | 66,511 | 93,864 | 40,716 | 56,337 | 25,796 | 37,527 |
| Indiana | 76,666 | 241,754 | 7,655 | 9,096 | 69,011 | 232,658 |
| Michigan | 205,372 | 80,403 | 51,122 | 48,321 | 154,249 | 32,082 |
| Ohio | 16,130 | 50,440 | 11,105 | 7,663 | 5,025 | 42,777 |
| Wisconsin | 27,490 | 32,750 | 14,077 | 16,348 | 13,413 | 16,402 |
| **West North Central** | **108,720** | **104,025** | **74,241** | **74,525** | **34,479** | **29,500** |
| Iowa | 6,179 | 9,834 | 5,249 | 5,947 | 930 | 3,887 |
| Kansas | 37,173 | 40,191 | 35,889 | 36,896 | 1,284 | 3,295 |
| Minnesota | 19,341 | 25,201 | 6,595 | 7,738 | 12,747 | 17,463 |
| Missouri | 19,813 | 17,545 | 19,427 | 16,035 | 386 | 1,510 |
| Nebraska | 22,922 | 5,408 | 4,555 | 5,044 | 18,368 | 364 |
| North Dakota | 765 | 2,981 | 0 | 0 | 765 | 2,981 |
| South Dakota | 2,527 | 2,865 | 2,527 | 2,865 | — | — |
| **South Atlantic** | **604,892** | **662,147** | **415,634** | **366,270** | **189,258** | **295,877** |
| Delaware | 22,798 | 17,685 | 19,878 | 11,135 | 2,919 | 6,550 |
| District of Columbia | — | — | — | — | — | — |
| Florida | 424,895 | 386,902 | 319,274 | 281,346 | 105,621 | 105,556 |
| Georgia | 38,017 | 41,623 | 20,537 | 22,371 | 17,480 | 19,252 |
| Maryland | 33,275 | 34,832 | 16,399 | 12,303 | 16,876 | 22,529 |
| North Carolina | 15,809 | 18,318 | 10,584 | 12,418 | 5,225 | 5,900 |
| South Carolina | 11,787 | 12,068 | 5,118 | 5,893 | 6,669 | 6,175 |
| Virginia | 55,095 | 43,423 | 23,457 | 20,386 | 31,637 | 23,037 |
| West Virginia | 3,216 | 107,295 | 385 | 417 | 2,831 | 106,878 |
| **East South Central** | **175,463** | **196,038** | **131,592** | **113,882** | **43,871** | **82,156** |
| Alabama | 48,934 | 75,279 | 20,918 | 25,546 | 28,016 | 49,733 |
| Kentucky | 5,655 | 5,782 | 5,590 | 5,760 | 65 | 22 |
| Mississippi | 112,888 | 96,803 | 101,623 | 76,362 | 11,265 | 20,441 |
| Tennessee | 7,986 | 18,173 | 3,460 | 6,213 | 4,526 | 11,960 |
| **West South Central** | **2,829,714** | **3,220,796** | **1,737,553** | **1,776,122** | **1,092,161** | **1,444,674** |
| Arkansas | 55,213 | 72,215 | 40,088 | 40,576 | 15,126 | 31,639 |
| Louisiana | 565,381 | 560,525 | 320,328 | 318,395 | 245,053 | 242,130 |
| Oklahoma | 188,516 | 197,920 | 169,845 | 174,577 | 18,671 | 23,343 |
| Texas | 2,020,604 | 2,390,136 | 1,207,293 | 1,242,574 | 813,312 | 1,147,562 |
| **Mountain** | **288,489** | **241,767** | **177,649** | **156,010** | **110,840** | **85,757** |
| Arizona | 57,428 | 42,931 | 50,875 | 38,674 | 6,552 | 4,257 |
| Colorado | 60,574 | 37,447 | 19,155 | 10,627 | 41,419 | 26,820 |
| Idaho | 4,696 | 6,847 | — | — | 4,696 | 6,847 |
| Montana | 522 | 4,343 | 289 | 522 | 234 | 3,821 |
| Nevada | 100,799 | 84,091 | 65,105 | 60,937 | 35,694 | 23,154 |
| New Mexico | 48,570 | 51,557 | 35,581 | 39,034 | 12,989 | 12,523 |
| Utah | 10,423 | 7,275 | 6,478 | 5,945 | 3,945 | 1,330 |
| Wyoming | 5,478 | 7,276 | 167 | 271 | 5,311 | 7,005 |
| **Pacific Contiguous** | **1,250,361** | **974,744** | **174,639** | **313,388** | **1,075,722** | **661,356** |
| California | 1,124,652 | 863,872 | 144,655 | 271,154 | 979,997 | 592,718 |
| Oregon | 77,821 | 61,059 | 23,292 | 28,883 | 54,530 | 32,176 |
| Washington | 47,888 | 49,814 | 6,693 | 13,352 | 41,195 | 36,462 |
| **Pacific Noncontiguous** | **47,464** | **40,436** | **30,529** | **28,784** | **16,935** | **11,652** |
| Alaska | 42,720 | 40,299 | 30,529 | 28,784 | 12,191 | 11,515 |
| Hawaii | 4,744 | 137 | — | — | 4,744 | 137 |
| **U.S. Total** | **6,865,864** | **6,805,501** | **3,113,419** | **3,258,054** | **3,752,445** | **3,547,447** |

MMcf = Million cubic feet.

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values for 1999 are final. Values for 1998 are final. •Nonutility data for 1998 and prior years are for fuels consumed to produce both electricity and steam.•Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.'' Form EIA-860B, ''Annual Electric Generator Report-Nonutility.'' Form EIA-900, ''Monthly Nonutility Power Plant Report.''

## Table A17. Coal Stocks by Census Division, 1999 and 1998

| Census Division | Industry | | Utility | | Nonutility | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 |
| | Stocks (thousand short tons) | Stocks (thousand short tons). | Stocks (thousand short tons) | Stocks (thousand short tons). | Stocks (thousand short tons) | Stocks (thousand short tons). |
| New England | W | 575 | W | 575 | 693 | — |
| Middle Atlantic | 8,800 | 10,232 | 4,307 | 10,232 | 4,493 | — |
| East North Central | 38,255 | 34,128 | 33,073 | 34,128 | 5,182 | — |
| West North Central | W | 17,961 | 21,199 | 17,961 | W | — |
| South Atlantic | 23,736 | 20,938 | 22,924 | 20,938 | 812 | — |
| East South Central | W | 10,808 | 12,154 | 10,808 | W | — |
| West South Central | 21,980 | 14,396 | 21,626 | 14,396 | 354 | — |
| Mountain | W | 10,404 | 11,797 | 10,404 | W | — |
| Pacific Contiguous | W | 1,060 | W | 1,060 | 105 | — |
| Pacific Noncontiguous | W | –- | –- | –- | W | — |
| **U.S. Total** | **142,543** | **120,501** | **128,493** | **120,501** | **14,050** | **—** |

W = Withheld to avoid disclosure of individual company data.

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values are final. Values for 1998 are final.•Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.'' Form EIA-900, ''Monthly Nonutility Power Plant Report.''

## Table A18. Petroleum Stocks by Census Division, 1999 and 1998

| Census Division | Industry | | Utility | | Nonutility | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 |
| | Stocks (thousand barrels) | Stocks (thousand barrels). | Stocks (thousand barrels) | Stocks (thousand barrels). | Stocks (thousand barrels) | Stocks (thousand barrels). |
| New England | 5,693 | 3,555 | 990 | 3,555 | 4,703 | — |
| Middle Atlantic | 9,538 | 12,356 | 7,890 | 12,356 | 1,649 | — |
| East North Central | W | 3,625 | 2,536 | 3,625 | W | — |
| West North Central | W | 2,002 | 2,017 | 2,002 | W | — |
| South Atlantic | 18,594 | 15,559 | 17,182 | 15,559 | 1,412 | — |
| East South Central | W | 2,946 | 2,117 | 2,946 | W | — |
| West South Central | W | 7,087 | 6,433 | 7,087 | W | — |
| Mountain | W | 939 | 1,052 | 939 | W | — |
| Pacific Contiguous | W | 4,592 | 2,600 | 4,592 | W | — |
| Pacific Noncontiguous | W | 1,128 | 1,495 | 1,128 | W | — |
| **U.S. Total** | **52,977** | **53,790** | **44,312** | **53,790** | **8,666** | **—** |

W = Withheld to avoid disclosure of individual company data.

Notes: •Values for the industry and nonutilities for 1999 are preliminary; utility values are final. Values for 1998 are final. •Does not include petroleum coke stocks. The utility stocks of petroleum coke at the end of 1999 were 355 thousand short tons and 559 thousand short tons at the end of 1998. The nonutility petroleum coke stocks at the end of 1999 were 143 thousand short tons. •Totals may not equal sum of components because of independent rounding. •For a given fuel type, estimated totals for nonutility data at the Census division level will not exactly equal the sum of the estimated totals for all corresponding States. This is because Census division level estimation is done by combining data regardless of State; thus avoiding the need to add State level estimates that may not all be available.

Source: Energy Information Administration, Form EIA-759, ''Monthly Power Plant Report.'' Form EIA-900, ''Monthly Nonutility Power Plant Report.''

## Table A19. Fossil Fuel Receipts at U.S. Electric Utilities by Census Division and State, 1999 and 1998

| Census Division<br>State | Coal (thousand short tons) | | Petroleum (thousand barrels) | | Gas (million cubic feet) | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1999 | 1998 | 1999 | 1998 |
| **New England** | **1,764** | **5,538** | **13,621** | **35,559** | **23,065** | **47,377** |
| Connecticut | 35 | 657 | 9,756 | 14,192 | 14,093 | 10,396 |
| Maine | — | — | 1,045 | 3,204 | — | — |
| Massachusetts | 394 | 3,473 | 205 | 15,733 | 8,524 | 21,207 |
| New Hampshire | 1,335 | 1,408 | 2,615 | 2,427 | 196 | — |
| Rhode Island | — | — | — | — | — | 15,586 |
| Vermont | — | — | — | 4 | 252 | 187 |
| **Middle Atlantic** | **40,575** | **55,557** | **25,624** | **31,908** | **209,381** | **226,248** |
| New Jersey | 2,597 | 2,312 | 2,437 | 1,781 | 19,473 | 16,742 |
| New York | 4,047 | 9,296 | 18,477 | 22,928 | 180,131 | 204,700 |
| Pennsylvania | 33,932 | 43,948 | 4,709 | 7,199 | 9,778 | 4,807 |
| **East North Central** | **201,873** | **208,745** | **4,586** | **4,691** | **89,494** | **102,818** |
| Illinois | 36,241 | 39,867 | 771 | 1,241 | 34,497 | 51,887 |
| Indiana | 56,933 | 57,091 | 665 | 500 | 3,816 | 4,258 |
| Michigan | 33,281 | 34,906 | 2,367 | 2,418 | 43,686 | 40,813 |
| Ohio | 51,568 | 53,442 | 739 | 491 | 3,222 | 1,532 |
| Wisconsin | 23,850 | 23,438 | 44 | 41 | 4,273 | 4,328 |
| **West North Central** | **133,751** | **134,443** | **738** | **659** | **45,268** | **43,200** |
| Iowa | 21,474 | 21,657 | 159 | 121 | 3,958 | 3,154 |
| Kansas | 19,553 | 18,445 | 356 | 248 | 29,991 | 29,899 |
| Minnesota | 16,559 | 17,915 | 42 | 45 | 2,246 | 2,176 |
| Missouri | 37,486 | 38,589 | 116 | 158 | 7,402 | 5,984 |
| Nebraska | 11,970 | 11,940 | 15 | 15 | 1,671 | 1,981 |
| North Dakota | 24,650 | 24,199 | 50 | 72 | * | 1 |
| South Dakota | 2,059 | 1,699 | — | — | — | 5 |
| **South Atlantic** | **159,284** | **159,850** | **69,006** | **74,512** | **335,459** | **285,398** |
| Delaware | 1,204 | 1,744 | 2,071 | 2,116 | 21,859 | 11,148 |
| District of Columbia | — | — | 412 | 446 | — | — |
| Florida | 25,477 | 27,904 | 54,285 | 59,824 | 269,232 | 241,059 |
| Georgia | 33,296 | 31,748 | 575 | 738 | 10,684 | 10,682 |
| Maryland | 11,143 | 10,845 | 6,675 | 6,005 | 12,149 | 4,988 |
| North Carolina | 25,575 | 27,818 | 497 | 406 | 1,986 | 1,879 |
| South Carolina | 12,877 | 12,945 | 93 | 109 | 337 | 435 |
| Virginia | 12,932 | 12,716 | 4,024 | 4,543 | 18,807 | 14,859 |
| West Virginia | 36,780 | 34,130 | 374 | 324 | 405 | 348 |
| **East South Central** | **99,586** | **100,791** | **5,717** | **8,851** | **76,294** | **56,595** |
| Alabama | 30,192 | 30,920 | 170 | 112 | 2,174 | 1,731 |
| Kentucky | 35,435 | 36,962 | 212 | 208 | 875 | 805 |
| Mississippi | 6,423 | 5,886 | 4,982 | 8,379 | 73,245 | 54,059 |
| Tennessee | 27,537 | 27,023 | 352 | 152 | — | — |
| **West South Central** | **151,343** | **144,195** | **942** | **1,607** | **1,676,039** | **1,712,041** |
| Arkansas | 15,406 | 14,173 | 109 | 90 | 26,189 | 22,561 |
| Louisiana | 13,854 | 14,043 | 636 | 1,264 | 306,767 | 289,492 |
| Oklahoma | 20,999 | 19,747 | 10 | 7 | 160,569 | 177,976 |
| Texas | 101,084 | 96,231 | 187 | 246 | 1,182,513 | 1,222,012 |
| **Mountain** | **112,242** | **112,208** | **364** | **364** | **162,672** | **134,733** |
| Arizona | 19,712 | 18,826 | 127 | 144 | 48,136 | 35,888 |
| Colorado | 18,389 | 18,061 | 7 | — | 15,799 | 3,544 |
| Idaho | — | — | — | — | — | — |
| Montana | 10,417 | 10,520 | 20 | 14 | 373 | 199 |
| Nevada | 8,075 | 8,035 | 20 | 30 | 58,902 | 51,812 |
| New Mexico | 16,059 | 15,841 | 65 | 53 | 34,862 | 39,169 |
| Utah | 14,193 | 14,896 | 42 | 42 | 4,435 | 4,045 |
| Wyoming | 25,396 | 26,029 | 84 | 81 | 166 | 77 |
| **Pacific Contiguous** | **7,812** | **8,120** | **65** | **124** | **171,352** | **295,660** |
| California | — | — | 10 | 103 | 148,001 | 266,743 |
| Oregon | 2,326 | 2,014 | 42 | 6 | 23,351 | 28,915 |
| Washington | 5,486 | 6,106 | 13 | 15 | — | 2 |
| **Pacific Noncontiguous** | **—** | **—** | **10,744** | **6,916** | **20,430** | **18,887** |
| Alaska | — | — | — | — | 20,430 | 18,887 |
| Hawaii | — | — | 10,744 | 6,916 | — | — |
| **U. S. Total** | **908,232** | **929,448** | **131,407** | **165,191** | **2,809,455** | **2,922,957** |

* =Value less than 0.5.

Notes: •Data are final. Does not include petroleum coke. Petroleum coke receipts in 1999 were 2,906 thousand short tons and 3,217 thousand short tons in 1998. •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 A20. Average Delivered Cost of Fossil Fuel Receipts at U.S. Electric Utilities by Census Division and State, 1998 and 1999

| Census Division State | Coal[1] | | | Petroleum | | | Gas | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1999 | | 1998 | 1999 | | 1998 | 1999 | | 1998 |
| | (cents per million Btu) | ($ per short ton) | (cents per million Btu) | (cents per million Btu). | ($ per barrel) | (cents per million Btu) | (cents per million Btu). | ($ per Mcf) | (cents per million Btu) |
| **New England** | **156.8** | **41.22** | **167.6** | **218.4** | **13.98** | **203.5** | **267.1** | **2.74** | **283.7** |
| Connecticut | 169.3 | 45.85 | 181.1 | 223.5 | 14.30 | 218.7 | 267.3 | 2.74 | 236.9 |
| Maine | — | — | — | 177.9 | 11.27 | 202.1 | — | — | — |
| Massachusetts | 173.4 | 45.63 | 167.6 | 243.2 | 15.31 | 192.6 | 265.3 | 2.72 | 273.8 |
| New Hampshire | 151.5 | 39.79 | 161.2 | 213.6 | 13.75 | 187.2 | 261.0 | 2.67 | — |
| Rhode Island | — | — | — | — | — | — | — | — | 328.5 |
| Vermont | — | — | — | — | — | 327.1 | 319.3 | 3.23 | 286.1 |
| **Middle Atlantic** | **132.5** | **33.48** | **137.6** | **247.4** | **15.62** | **210.6** | **281.1** | **2.88** | **252.0** |
| New Jersey | 145.4 | 38.23 | 159.0 | 288.2 | 18.07 | 242.2 | 298.9 | 3.08 | 262.0 |
| New York | 144.9 | 37.77 | 143.4 | 236.5 | 14.96 | 203.5 | 278.5 | 2.85 | 249.6 |
| Pennsylvania | 129.9 | 32.61 | 135.0 | 269.1 | 16.96 | 225.7 | 293.1 | 3.03 | 316.5 |
| **East North Central** | **125.9** | **26.60** | **129.9** | **334.4** | **20.36** | **288.7** | **251.2** | **2.06** | **230.6** |
| Illinois | 143.7 | 27.47 | 155.7 | 345.0 | 21.13 | 275.2 | 236.2 | 2.41 | 220.7 |
| Indiana | 111.0 | 23.58 | 112.3 | 426.3 | 24.57 | 319.4 | 289.3 | 2.97 | 280.5 |
| Michigan | 130.6 | 27.39 | 133.4 | 289.2 | 18.11 | 280.6 | 252.3 | 1.53 | 232.4 |
| Ohio | 136.2 | 32.47 | 136.5 | 391.7 | 22.71 | 332.6 | 306.4 | 3.15 | 308.4 |
| Wisconsin | 102.3 | 18.66 | 107.4 | 413.7 | 24.32 | 348.9 | 290.5 | 2.93 | 264.1 |
| **West North Central** | **87.3** | **14.58** | **88.9** | **359.5** | **21.59** | **292.6** | **249.5** | **2.51** | **224.1** |
| Iowa | 82.1 | 14.09 | 87.6 | 398.8 | 23.34 | 332.9 | 313.7 | 3.15 | 305.9 |
| Kansas | 95.4 | 16.47 | 98.1 | 319.0 | 19.77 | 265.5 | 234.1 | 2.36 | 213.7 |
| Minnesota | 109.6 | 19.47 | 106.9 | 420.9 | 24.33 | 352.7 | 266.3 | 2.69 | 233.8 |
| Missouri | 92.6 | 16.56 | 91.7 | 381.5 | 22.12 | 275.0 | 265.6 | 2.66 | 223.4 |
| Nebraska | 55.4 | 9.42 | 58.6 | 431.5 | 24.95 | 354.5 | 281.1 | 2.80 | 242.7 |
| North Dakota | 73.0 | 9.56 | 76.2 | 417.2 | 24.34 | 311.9 | 404.0 | 4.21 | 369.3 |
| South Dakota | 93.6 | 16.16 | 92.7 | — | — | — | — | — | 176.7 |
| **South Atlantic** | **141.1** | **34.84** | **144.7** | **249.7** | **15.89** | **209.2** | **296.6** | **3.08** | **279.3** |
| Delaware | 158.9 | 41.12 | 156.3 | 243.9 | 15.46 | 214.7 | 303.3 | 2.98 | 297.7 |
| District of Columbia | — | — | — | 339.5 | 20.43 | 252.9 | — | — | — |
| Florida | 158.9 | 39.08 | 164.8 | 245.6 | 15.69 | 205.9 | 297.2 | 3.10 | 276.2 |
| Georgia | 154.6 | 36.29 | 154.5 | 389.6 | 22.66 | 327.6 | 248.9 | 2.57 | 316.0 |
| Maryland | 137.9 | 35.69 | 145.7 | 257.4 | 16.33 | 211.5 | 307.6 | 3.20 | 263.2 |
| North Carolina | 143.8 | 35.80 | 143.8 | 398.4 | 23.12 | 310.5 | 283.3 | 2.92 | 267.9 |
| South Carolina | 141.6 | 36.29 | 144.7 | 406.7 | 23.60 | 327.6 | 347.3 | 3.57 | 353.4 |
| Virginia | 134.3 | 34.11 | 137.8 | 229.9 | 14.54 | 203.7 | 299.7 | 3.17 | 295.4 |
| West Virginia | 118.2 | 29.22 | 122.2 | 463.5 | 27.08 | 370.9 | 299.8 | 3.00 | 351.4 |
| **East South Central** | **123.2** | **28.03** | **126.0** | **181.1** | **11.84** | **205.7** | **245.2** | **2.52** | **224.5** |
| Alabama | 147.6 | 32.36 | 157.5 | 326.0 | 19.05 | 287.6 | 295.1 | 2.98 | 247.5 |
| Kentucky | 105.8 | 24.52 | 105.9 | 431.9 | 25.31 | 383.3 | 340.4 | 3.49 | 331.9 |
| Mississippi | 155.2 | 34.34 | 153.8 | 154.1 | 10.22 | 199.2 | 242.6 | 2.49 | 222.1 |
| Tennessee | 113.1 | 26.32 | 112.5 | 393.3 | 23.11 | 304.5 | — | — | — |
| **West South Central** | **120.4** | **18.86** | **123.4** | **255.9** | **16.07** | **250.1** | **249.0** | **2.55** | **227.0** |
| Arkansas | 145.6 | 25.19 | 147.2 | 329.3 | 19.47 | 370.8 | 253.0 | 2.59 | 224.0 |
| Louisiana | 139.8 | 22.79 | 142.9 | 204.2 | 13.25 | 222.3 | 249.0 | 2.59 | 227.4 |
| Oklahoma | 91.2 | 15.73 | 91.0 | 495.5 | 29.62 | 292.2 | 271.7 | 2.79 | 241.2 |
| Texas | 120.0 | 18.01 | 123.9 | 396.0 | 22.95 | 362.1 | 245.8 | 2.51 | 224.9 |
| **Mountain** | **106.1** | **20.69** | **107.3** | **487.2** | **28.33** | **423.9** | **247.5** | **2.53** | **230.8** |
| Arizona | 132.7 | 27.21 | 133.1 | 479.8 | 27.95 | 429.0 | 264.3 | 2.67 | 239.1 |
| Colorado | 98.5 | 19.20 | 98.7 | 543.8 | 30.92 | — | 256.9 | 2.65 | 300.3 |
| Idaho | — | — | — | — | — | — | — | — | — |
| Montana | 72.7 | 12.26 | 67.4 | 491.0 | 28.89 | 466.0 | 184.5 | 2.02 | 191.8 |
| Nevada | 129.4 | 29.13 | 129.8 | 452.6 | 26.45 | 379.6 | 242.3 | 2.51 | 230.2 |
| New Mexico | 132.9 | 24.27 | 130.6 | 502.3 | 28.69 | 439.3 | 228.2 | 2.31 | 220.0 |
| Utah | 103.1 | 23.96 | 114.8 | 513.6 | 30.14 | 439.6 | 253.8 | 2.65 | 202.5 |
| Wyoming | 76.2 | 13.39 | 78.6 | 476.0 | 27.81 | 405.5 | 372.3 | 3.89 | 796.0 |
| **Pacific Contiguous** | **140.8** | **23.77** | **138.4** | **413.2** | **24.43** | **292.4** | **261.8** | **2.65** | **257.5** |
| California | — | — | — | 327.2 | 19.91 | 274.7 | 272.5 | 2.76 | 268.6 |
| Oregon | 107.9 | 19.34 | 108.9 | 414.1 | 24.35 | 331.9 | 193.6 | 1.96 | 154.1 |
| Washington | 156.0 | 25.65 | 148.7 | 478.8 | 28.15 | 405.3 | — | — | 325.9 |
| **Pacific Noncontiguous** | **—** | **—** | **—** | **319.9** | **20.08** | **261.5** | **159.3** | **1.59** | **179.8** |
| Alaska | — | — | — | — | — | — | 159.3 | 1.59 | 179.8 |
| Hawaii | — | — | — | 319.9 | 20.08 | 261.5 | — | — | — |
| **U. S. Total** | **121.6** | **24.72** | **125.2** | **252.7** | **16.03** | **213.6** | **257.4** | **2.62** | **238.1** |

[1] Some coal delivered to Alabama, Florida, Kentucky, and Tennessee is reported on FERC Form 423 as delivered to storage facilities. The cost reported for this coal does not include transportation costs incurred later in transporting the coal to the plant.

Mcf = thousand cubic feet.

NM = Not Meaningful.

Notes: •Data are final. Does not include petroleum coke. Petroleum coke cost in 1999 was 65.4 cents per million Btu and in 1998 was 71.2 cents per million Btu.•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 A21. Retail Sales of Electricity, Revenue, and Average Revenue per Kilowatthour (and RSEs) by U.S. Electric Utilities to Ultimate Consumers by Census Division, and State, 1999 and 1998 -- All Sectors

| Census Division and State | 1999 | | 1998 | 1999 | | 1998 | 1999 | | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| | Sales (million kWh) | RSE (percent) | Sales (million kWh) | Revenue (million dollars) | RSE (percent) | Revenue (million dollars) | Average Revenue per kWh (cents) | RSE (percent) | Average Revenue per kWh (cents) |
| **New England** | **114,842** | **0.2** | **110,647** | **10,995** | **0.4** | **11,062** | **9.6** | **0.3** | **10.0** |
| Connecticut | 29,782 | .1 | 28,956 | 2,966 | .2 | 2,983 | 10.0 | .1 | 10.3 |
| Maine | 11,974 | .2 | 11,599 | 1,169 | .1 | 1,131 | 9.8 | .1 | 9.8 |
| Massachusetts | 50,715 | .5 | 48,607 | 4,518 | .9 | 4,659 | 8.9 | .8 | 9.6 |
| New Hampshire | 9,730 | .3 | 9,254 | 1,149 | .3 | 1,104 | 11.8 | .2 | 11.9 |
| Rhode Island | 7,124 | .1 | 6,868 | 624 | .2 | 658 | 8.8 | .2 | 9.6 |
| Vermont | 5,516 | .2 | 5,363 | 569 | .3 | 527 | 10.3 | .3 | 9.8 |
| **Middle Atlantic** | **332,003** | **.4** | **325,581** | **29,202** | **.6** | **30,899** | **8.8** | **.4** | **9.5** |
| New Jersey | 70,571 | .1 | 68,162 | 7,076 | .1 | 6,932 | 10.0 | .1 | 10.2 |
| New York | 127,998 | .9 | 131,161 | 13,428 | 1.1 | 14,043 | 10.5 | .6 | 10.7 |
| Pennsylvania | 133,434 | .6 | 126,258 | 8,698 | 1.1 | 9,923 | 6.5 | .9 | 7.9 |
| **East North Central** | **561,062** | **.2** | **545,637** | **35,687** | **.2** | **35,408** | **6.4** | **.2** | **6.5** |
| Illinois | 132,112 | .2 | 131,217 | 9,133 | .4 | 9,792 | 6.9 | .3 | 7.5 |
| Indiana | 97,041 | .6 | 92,059 | 5,091 | .6 | 4,914 | 5.2 | .3 | 5.3 |
| Michigan | 103,224 | .3 | 100,506 | 7,373 | .7 | 7,129 | 7.1 | .7 | 7.1 |
| Ohio | 164,772 | .4 | 159,793 | 10,568 | .4 | 10,198 | 6.4 | .3 | 6.4 |
| Wisconsin | 63,914 | .3 | 62,061 | 3,523 | .4 | 3,376 | 5.5 | .3 | 5.4 |
| **West North Central** | **236,673** | **.2** | **236,377** | **14,022** | **.4** | **14,019** | **5.9** | **.2** | **5.9** |
| Iowa | 37,801 | .4 | 37,318 | 2,216 | .6 | 2,255 | 5.9 | .6 | 6.0 |
| Kansas | 33,775 | .3 | 34,140 | 2,103 | .5 | 2,145 | 6.2 | .4 | 6.3 |
| Minnesota | 57,251 | .6 | 56,744 | 3,346 | 1.0 | 3,239 | 5.8 | .5 | 5.7 |
| Missouri | 68,564 | .3 | 68,986 | 4,157 | .7 | 4,195 | 6.1 | .6 | 6.1 |
| Nebraska | 22,786 | .5 | 23,145 | 1,206 | .8 | 1,227 | 5.3 | .5 | 5.3 |
| North Dakota | 8,606 | .8 | 8,220 | 493 | 1.0 | 469 | 5.7 | .5 | 5.7 |
| South Dakota | 7,890 | .5 | 7,824 | 502 | .8 | 489 | 6.4 | .4 | 6.3 |
| **South Atlantic** | **686,902** | **.1** | **679,757** | **43,610** | **.2** | **43,745** | **6.3** | **.1** | **6.4** |
| Delaware | 10,747 | .2 | 10,398 | 739 | .2 | 716 | 6.9 | .1 | 6.9 |
| District of Columbia | 10,418 | — | 10,281 | 777 | — | 762 | 7.5 | — | 7.4 |
| Florida | 186,698 | .2 | 187,355 | 12,787 | .3 | 13,127 | 6.8 | .2 | 7.0 |
| Georgia | 111,910 | .4 | 110,720 | 6,881 | .7 | 7,087 | 6.1 | .6 | 6.4 |
| Maryland | 59,090 | .2 | 57,834 | 4,159 | .4 | 4,045 | 7.0 | .3 | 7.0 |
| North Carolina | 114,750 | .4 | 113,596 | 7,393 | .5 | 7,332 | 6.4 | .2 | 6.5 |
| South Carolina | 73,217 | .3 | 72,454 | 4,055 | .3 | 4,008 | 5.5 | .3 | 5.5 |
| Virginia | 92,931 | .3 | 90,609 | 5,434 | .5 | 5,324 | 5.8 | .2 | 5.9 |
| West Virginia | 27,141 | .1 | 26,511 | 1,385 | .1 | 1,345 | 5.1 | .1 | 5.1 |
| **East South Central** | **298,076** | **.5** | **289,283** | **15,472** | **.4** | **15,257** | **5.2** | **.4** | **5.3** |
| Alabama | 80,393 | .4 | 79,173 | 4,454 | .7 | 4,404 | 5.5 | .5 | 5.6 |
| Kentucky | 78,647 | 1.8 | 75,850 | 3,289 | 1.1 | 3,155 | 4.2 | 1.4 | 4.2 |
| Mississippi | 44,293 | 1.1 | 42,510 | 2,432 | 1.4 | 2,543 | 5.5 | 1.0 | 6.0 |
| Tennessee | 94,742 | .6 | 91,750 | 5,297 | .5 | 5,155 | 5.6 | .3 | 5.6 |
| **West South Central** | **466,363** | **.2** | **469,633** | **27,606** | **.5** | **27,849** | **5.9** | **.4** | **5.9** |
| Arkansas | 39,623 | .6 | 39,315 | 2,253 | .6 | 2,272 | 5.7 | .5 | 5.8 |
| Louisiana | 78,441 | .3 | 77,716 | 4,561 | .6 | 4,490 | 5.8 | .5 | 5.8 |
| Oklahoma | 46,733 | .6 | 47,897 | 2,500 | 1.2 | 2,602 | 5.3 | .8 | 5.4 |
| Texas | 301,566 | .3 | 304,705 | 18,293 | .7 | 18,486 | 6.1 | .5 | 6.1 |
| **Mountain** | **209,012** | **.2** | **206,019** | **12,489** | **.4** | **12,210** | **6.0** | **.3** | **5.9** |
| Arizona | 57,631 | .3 | 55,843 | 4,290 | .9 | 4,092 | 7.4 | .9 | 7.3 |
| Colorado | 40,970 | .3 | 39,574 | 2,411 | .3 | 2,357 | 5.9 | .1 | 6.0 |
| Idaho | 21,797 | .3 | 21,276 | 867 | .6 | 855 | 4.0 | .4 | 4.0 |
| Montana | 10,027 | 2.2 | 13,774 | 585 | .8 | 661 | 5.8 | 2.5 | 4.8 |
| Nevada | 26,272 | .6 | 25,037 | 1,565 | .9 | 1,442 | 6.0 | .3 | 5.8 |
| New Mexico | 18,104 | .7 | 18,173 | 1,181 | .7 | 1,233 | 6.5 | .7 | 6.8 |
| Utah | 21,951 | .2 | 20,700 | 1,059 | .3 | 1,069 | 4.8 | .2 | 5.2 |
| Wyoming | 12,259 | .9 | 11,641 | 531 | 1.1 | 502 | 4.3 | .4 | 4.3 |
| **Pacific Contiguous** | **376,420** | **.5** | **362,528** | **26,691** | **.3** | **26,318** | **7.1** | **.4** | **7.3** |
| California | 233,478 | .4 | 226,396 | 20,508 | .4 | 20,439 | 8.8 | .3 | 9.0 |
| Oregon | 49,893 | 1.8 | 45,083 | 2,353 | .8 | 2,209 | 4.7 | 1.1 | 4.9 |
| Washington | 93,048 | 1.3 | 91,050 | 3,830 | .6 | 3,670 | 4.1 | .9 | 4.0 |
| **Pacific Noncontiguous** | **14,667** | **.1** | **14,356** | **1,632** | **.2** | **1,578** | **11.1** | **.2** | **11.0** |
| Alaska | 5,286 | .2 | 5,095 | 517 | .4 | 508 | 9.8 | .3 | 10.0 |
| Hawaii | 9,381 | .1 | 9,261 | 1,115 | .2 | 1,070 | 11.9 | .2 | 11.6 |
| **U.S. Total** | **3,296,019** | **.1** | **3,239,818** | **217,406** | **.1** | **218,346** | **6.60** | **.1** | **6.74** |

kWh = Kilowatthours.

RSE = Relative standard error.

Notes: •Values for 1999 are preliminary; values for 1998 are final. •Values do not include retail sales by all energy service providers, (Power Marketers). Those sales are estimated to total 49 billion kilowatthours in 1999. •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.

Sources: 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 A22. Retail Sales of Electricity, Revenue, and Average Revenue per Kilowatthour (and RSEs) by U.S. Electric Utilities to Ultimate Consumers by Census Division, and State, 1999 and 1998 -- Residential

| Census Division and State | 1999 | | 1998 | 1999 | | 1998 | 1999 | | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| | Sales (million kWh) | RSE (percent) | Sales (million kWh) | Revenue (million dollars) | RSE (percent) | Revenue (million dollars) | Average Revenue per kWh (cents) | RSE (percent) | Average Revenue per kWh (cents) |
| **New England** | **40,995** | **0.2** | **38,769** | **4,586** | **0.2** | **4,483** | **11.2** | **0.2** | **11.6** |
| Connecticut | 11,622 | .2 | 10,935 | 1,332 | .3 | 1,306 | 11.5 | .1 | 11.9 |
| Maine | 3,709 | .1 | 3,589 | 485 | .1 | 467 | 13.1 | .1 | 13.0 |
| Massachusetts | 17,434 | .5 | 16,388 | 1,757 | .6 | 1,737 | 10.1 | .6 | 10.6 |
| New Hampshire | 3,571 | .3 | 3,384 | 497 | .3 | 471 | 13.9 | .2 | 13.9 |
| Rhode Island | 2,662 | .1 | 2,522 | 271 | .3 | 275 | 10.2 | .2 | 10.9 |
| Vermont | 1,997 | .4 | 1,951 | 244 | .3 | 227 | 12.2 | .5 | 11.6 |
| **Middle Atlantic** | **111,957** | **.8** | **104,788** | **12,501** | **.9** | **12,244** | **11.2** | **.3** | **11.7** |
| New Jersey | 24,558 | .3 | 23,191 | 2,806 | .2 | 2,642 | 11.4 | .2 | 11.4 |
| New York | 42,301 | 1.7 | 40,240 | 5,671 | 1.7 | 5,496 | 13.4 | .3 | 13.7 |
| Pennsylvania | 45,098 | 1.2 | 41,358 | 4,025 | 1.4 | 4,106 | 8.9 | .8 | 9.9 |
| **East North Central** | **165,949** | **.3** | **160,431** | **13,608** | **.3** | **13,652** | **8.2** | **.2** | **8.5** |
| Illinois | 39,678 | .5 | 39,685 | 3,422 | .7 | 3,908 | 8.6 | .3 | 9.8 |
| Indiana | 29,043 | 1.1 | 27,334 | 2,007 | 1.0 | 1,916 | 6.9 | .4 | 7.0 |
| Michigan | 30,729 | .1 | 29,808 | 2,680 | .2 | 2,584 | 8.7 | .2 | 8.7 |
| Ohio | 46,972 | .4 | 44,516 | 4,075 | .5 | 3,875 | 8.7 | .3 | 8.7 |
| Wisconsin | 19,527 | .8 | 19,087 | 1,424 | .9 | 1,369 | 7.3 | .3 | 7.2 |
| **West North Central** | **83,508** | **.4** | **84,066** | **6,110** | **.5** | **6,152** | **7.3** | **.3** | **7.3** |
| Iowa | 11,841 | .8 | 11,855 | 958 | .7 | 993 | 8.1 | .8 | 8.4 |
| Kansas | 11,398 | .6 | 11,832 | 869 | .7 | 905 | 7.6 | .4 | 7.7 |
| Minnesota | 18,034 | .8 | 17,378 | 1,337 | 1.0 | 1,273 | 7.4 | .5 | 7.3 |
| Missouri | 27,543 | .8 | 28,265 | 1,961 | 1.1 | 2,001 | 7.1 | .7 | 7.1 |
| Nebraska | 7,938 | 1.0 | 8,160 | 515 | 1.2 | 527 | 6.5 | .5 | 6.5 |
| North Dakota | 3,449 | 1.4 | 3,272 | 225 | 1.5 | 212 | 6.5 | .6 | 6.5 |
| South Dakota | 3,304 | 1.0 | 3,303 | 245 | 1.2 | 240 | 7.4 | .3 | 7.3 |
| **South Atlantic** | **276,209** | **.2** | **274,833** | **21,234** | **.3** | **21,443** | **7.7** | **.2** | **7.8** |
| Delaware | 3,556 | .2 | 3,339 | 321 | .2 | 305 | 9.0 | .2 | 9.1 |
| District of Columbia | 1,643 | — | 1,596 | 131 | — | 128 | 8.0 | — | 8.0 |
| Florida | 93,610 | .3 | 95,768 | 7,226 | .4 | 7,557 | 7.7 | .2 | 7.9 |
| Georgia | 41,589 | .8 | 41,519 | 3,083 | 1.3 | 3,185 | 7.4 | .9 | 7.7 |
| Maryland | 23,348 | .3 | 22,407 | 1,959 | .5 | 1,890 | 8.4 | .3 | 8.4 |
| North Carolina | 43,560 | .8 | 42,890 | 3,483 | .9 | 3,434 | 8.0 | .3 | 8.0 |
| South Carolina | 23,668 | .6 | 23,558 | 1,771 | .7 | 1,767 | 7.5 | .3 | 7.5 |
| Virginia | 35,787 | .7 | 34,703 | 2,665 | .8 | 2,608 | 7.4 | .3 | 7.5 |
| West Virginia | 9,448 | .3 | 9,053 | 594 | .3 | 570 | 6.3 | .1 | 6.3 |
| **East South Central** | **101,417** | **.6** | **100,817** | **6,467** | **.6** | **6,502** | **6.4** | **.3** | **6.4** |
| Alabama | 27,100 | 1.0 | 27,327 | 1,909 | 1.2 | 1,897 | 7.0 | .4 | 6.9 |
| Kentucky | 22,681 | 1.4 | 21,669 | 1,249 | 1.7 | 1,216 | 5.5 | .6 | 5.6 |
| Mississippi | 16,378 | 1.0 | 16,392 | 1,073 | 1.5 | 1,152 | 6.5 | 1.2 | 7.0 |
| Tennessee | 35,259 | 1.0 | 35,428 | 2,235 | .9 | 2,238 | 6.3 | .1 | 6.3 |
| **West South Central** | **166,967** | **.5** | **170,993** | **12,297** | **.7** | **12,695** | **7.4** | **.3** | **7.4** |
| Arkansas | 13,994 | .6 | 14,339 | 1,036 | .6 | 1,076 | 7.4 | .5 | 7.5 |
| Louisiana | 26,583 | .5 | 26,709 | 1,891 | .8 | 1,889 | 7.1 | .7 | 7.1 |
| Oklahoma | 18,258 | .9 | 19,511 | 1,198 | 1.3 | 1,282 | 6.6 | .7 | 6.6 |
| Texas | 108,132 | .8 | 110,434 | 8,171 | 1.1 | 8,448 | 7.6 | .4 | 7.7 |
| **Mountain** | **67,519** | **.2** | **64,980** | **5,125** | **.6** | **4,897** | **7.6** | **.5** | **7.5** |
| Arizona | 22,599 | .3 | 21,611 | 2,036 | 1.5 | 1,875 | 9.0 | 1.5 | 8.7 |
| Colorado | 13,177 | .5 | 12,652 | 969 | .4 | 942 | 7.4 | .1 | 7.4 |
| Idaho | 6,776 | .4 | 6,610 | 357 | .4 | 349 | 5.3 | .5 | 5.3 |
| Montana | 3,545 | 1.1 | 3,722 | 246 | .7 | 242 | 6.9 | 4.1 | 6.5 |
| Nevada | 8,396 | 1.1 | 7,975 | 598 | 1.0 | 558 | 7.1 | .2 | 7.0 |
| New Mexico | 4,626 | .8 | 4,642 | 395 | .8 | 411 | 8.5 | .9 | 8.8 |
| Utah | 6,270 | .6 | 5,756 | 389 | .5 | 394 | 6.2 | .4 | 6.8 |
| Wyoming | 2,130 | 1.3 | 2,013 | 136 | 1.5 | 126 | 6.4 | .4 | 6.3 |
| **Pacific Contiguous** | **126,623** | **.5** | **123,650** | **10,722** | **.5** | **10,526** | **8.5** | **.1** | **8.5** |
| California | 75,662 | .7 | 74,792 | 8,005 | .6 | 7,930 | 10.6 | .2 | 10.6 |
| Oregon | 17,892 | .7 | 17,496 | 1,029 | .6 | 1,019 | 5.7 | .3 | 5.8 |
| Washington | 33,069 | .4 | 31,362 | 1,689 | .5 | 1,577 | 5.1 | .3 | 5.0 |
| **Pacific Noncontiguous** | **4,559** | **.1** | **4,409** | **588** | **.2** | **568** | **12.9** | **.2** | **12.9** |
| Alaska | 1,869 | .2 | 1,768 | 208 | .3 | 203 | 11.1 | .3 | 11.5 |
| Hawaii | 2,690 | .1 | 2,641 | 380 | .3 | 365 | 14.1 | .2 | 13.8 |
| **U.S. Total** | **1,145,702** | **.2** | **1,127,735** | **93,239** | **.2** | **93,164** | **8.14** | **.1** | **8.26** |

kWh = Kilowatthours.

RSE = Relative standard error.

Notes: •Values for 1999 are preliminary; values for 1998 are final. •Values do not include retail sales by all energy service providers, (Power Marketers). Those sales are estimated to total 49 billion kilowatthours in 1999. •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.

Sources: 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 A23. Retail Sales of Electricity, Revenue, and Average Revenue per Kilowatthour (and RSEs) by U.S. Electric Utilities to Ultimate Consumers by Census Division, and State, 1999 and 1998 -- Commercial

| Census Division and State | 1999 | | 1998 | 1999 | | 1998 | 1999 | | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| | Sales (million kWh) | RSE (percent) | Sales (million kWh) | Revenue (million dollars) | RSE (percent) | Revenue (million dollars) | Average Revenue per kWh (cents) | RSE (percent) | Average Revenue per kWh (cents) |
| **New England** | **45,973** | **0.2** | **44,276** | **4,278** | **0.5** | **4,337** | **9.3** | **0.4** | **9.8** |
| Connecticut | 11,812 | .1 | 11,683 | 1,145 | .2 | 1,169 | 9.7 | .1 | 10.0 |
| Maine | 3,485 | .1 | 3,324 | 365 | .1 | 343 | 10.5 | .1 | 10.3 |
| Massachusetts | 22,392 | .4 | 21,422 | 1,925 | 1.0 | 2,003 | 8.6 | .9 | 9.4 |
| New Hampshire | 3,525 | .1 | 3,328 | 402 | .3 | 388 | 11.4 | .3 | 11.6 |
| Rhode Island | 2,859 | — | 2,731 | 238 | .2 | 253 | 8.3 | .2 | 9.3 |
| Vermont | 1,900 | .4 | 1,786 | 203 | .5 | 181 | 10.7 | .3 | 10.1 |
| **Middle Atlantic** | **118,683** | **.7** | **120,478** | **11,104** | **.7** | **12,314** | **9.4** | **.6** | **10.2** |
| New Jersey | 32,428 | .1 | 31,127 | 3,169 | .1 | 3,141 | 9.8 | .1 | 10.1 |
| New York | 47,706 | 1.8 | 53,164 | 5,412 | 1.4 | 6,184 | 11.3 | 1.3 | 11.6 |
| Pennsylvania | 38,549 | .5 | 36,188 | 2,522 | .9 | 2,989 | 6.5 | .7 | 8.3 |
| **East North Central** | **152,118** | **.3** | **147,552** | **11,004** | **.3** | **10,804** | **7.2** | **.1** | **7.3** |
| Illinois | 40,180 | .3 | 39,681 | 2,982 | .3 | 3,085 | 7.4 | .4 | 7.8 |
| Indiana | 20,294 | .5 | 19,368 | 1,218 | .5 | 1,177 | 6.0 | .2 | 6.1 |
| Michigan | 34,972 | 1.0 | 33,840 | 2,749 | 1.1 | 2,642 | 7.9 | .2 | 7.8 |
| Ohio | 39,675 | .3 | 38,472 | 3,051 | .4 | 2,950 | 7.7 | .2 | 7.7 |
| Wisconsin | 16,998 | .2 | 16,193 | 1,003 | .3 | 951 | 5.9 | .2 | 5.9 |
| **West North Central** | **67,106** | **.3** | **65,601** | **4,085** | **.4** | **4,040** | **6.1** | **.2** | **6.2** |
| Iowa | 8,352 | .7 | 8,034 | 537 | .9 | 536 | 6.4 | .6 | 6.7 |
| Kansas | 11,856 | .6 | 12,073 | 739 | .8 | 766 | 6.2 | .5 | 6.3 |
| Minnesota | 11,208 | 1.0 | 10,436 | 702 | .9 | 656 | 6.3 | .6 | 6.3 |
| Missouri | 23,994 | .4 | 23,896 | 1,430 | .8 | 1,430 | 6.0 | .5 | 6.0 |
| Nebraska | 6,686 | .4 | 6,594 | 364 | .6 | 359 | 5.4 | .5 | 5.4 |
| North Dakota | 2,678 | 1.4 | 2,305 | 159 | 1.1 | 143 | 5.9 | .6 | 6.2 |
| South Dakota | 2,332 | .7 | 2,263 | 154 | .6 | 150 | 6.6 | .4 | 6.6 |
| **South Atlantic** | **224,986** | **.1** | **218,067** | **14,213** | **.2** | **14,048** | **6.3** | **.1** | **6.4** |
| Delaware | 3,389 | .2 | 3,227 | 244 | .3 | 228 | 7.2 | .2 | 7.1 |
| District of Columbia | 8,146 | — | 8,051 | 609 | — | 598 | 7.5 | — | 7.4 |
| Florida | 69,287 | .2 | 67,346 | 4,312 | .4 | 4,298 | 6.2 | .2 | 6.4 |
| Georgia | 34,059 | .3 | 32,766 | 2,230 | .5 | 2,297 | 6.5 | .5 | 7.0 |
| Maryland | 25,008 | .1 | 24,284 | 1,703 | .4 | 1,656 | 6.8 | .3 | 6.8 |
| North Carolina | 35,011 | .4 | 33,637 | 2,215 | .5 | 2,137 | 6.3 | .3 | 6.4 |
| South Carolina | 16,692 | .3 | 16,370 | 1,046 | .3 | 1,021 | 6.3 | .2 | 6.2 |
| Virginia | 26,920 | .1 | 26,176 | 1,494 | .3 | 1,469 | 5.5 | .2 | 5.6 |
| West Virginia | 6,474 | .3 | 6,208 | 359 | .3 | 345 | 5.6 | .1 | 5.6 |
| **East South Central** | **55,308** | **2.2** | **66,012** | **3,382** | **2.2** | **4,103** | **6.1** | **.3** | **6.2** |
| Alabama | 16,358 | 3.4 | 17,662 | 1,088 | 3.2 | 1,155 | 6.6 | .3 | 6.5 |
| Kentucky | 12,989 | .6 | 12,729 | 675 | .9 | 675 | 5.2 | .4 | 5.3 |
| Mississippi | 11,256 | 1.1 | 10,781 | 677 | 1.3 | 713 | 6.0 | 1.0 | 6.6 |
| Tennessee | 14,705 | 7.4 | 24,840 | 942 | 7.0 | 1,560 | 6.4 | .4 | 6.3 |
| **West South Central** | **117,289** | **.2** | **115,169** | **7,482** | **.5** | **7,395** | **6.4** | **.4** | **6.4** |
| Arkansas | 8,402 | .6 | 8,205 | 488 | .7 | 484 | 5.8 | .5 | 5.9 |
| Louisiana | 17,580 | .4 | 17,274 | 1,156 | .6 | 1,132 | 6.6 | .6 | 6.6 |
| Oklahoma | 12,511 | .8 | 12,459 | 696 | 1.6 | 705 | 5.6 | .9 | 5.7 |
| Texas | 78,797 | .2 | 77,231 | 5,142 | .6 | 5,074 | 6.5 | .5 | 6.6 |
| **Mountain** | **68,745** | **.2** | **64,275** | **4,273** | **.2** | **4,116** | **6.2** | **.1** | **6.4** |
| Arizona | 19,966 | .4 | 18,440 | 1,482 | .4 | 1,430 | 7.4 | .2 | 7.8 |
| Colorado | 17,331 | .4 | 15,959 | 957 | .4 | 904 | 5.5 | .2 | 5.7 |
| Idaho | 6,450 | 1.0 | 6,005 | 270 | 1.0 | 261 | 4.2 | .3 | 4.3 |
| Montana | 3,047 | .9 | 3,313 | 195 | .4 | 195 | 6.4 | 2.6 | 5.9 |
| Nevada | 6,047 | .3 | 5,655 | 404 | .5 | 368 | 6.7 | .3 | 6.5 |
| New Mexico | 5,959 | 1.0 | 5,703 | 442 | 1.0 | 445 | 7.4 | .6 | 7.8 |
| Utah | 7,350 | .4 | 6,709 | 384 | .3 | 383 | 5.2 | .3 | 5.7 |
| Wyoming | 2,594 | .6 | 2,490 | 138 | .7 | 131 | 5.3 | .3 | 5.3 |
| **Pacific Contiguous** | **127,395** | **.3** | **122,015** | **10,198** | **.5** | **10,051** | **8.0** | **.4** | **8.2** |
| California | 89,941 | .4 | 85,678 | 8,359 | .6 | 8,275 | 9.3 | .5 | 9.7 |
| Oregon | 14,450 | .6 | 14,103 | 720 | .4 | 705 | 5.0 | .3 | 5.0 |
| Washington | 23,003 | .3 | 22,235 | 1,119 | .5 | 1,070 | 4.9 | .4 | 4.8 |
| **Pacific Noncontiguous** | **5,284** | **.1** | **5,083** | **588** | **.2** | **560** | **11.1** | **.1** | **11.0** |
| Alaska | 2,397 | .2 | 2,307 | 222 | .4 | 219 | 9.3 | .3 | 9.5 |
| Hawaii | 2,887 | .1 | 2,776 | 366 | .1 | 342 | 12.7 | .1 | 12.3 |
| **U.S. Total** | **982,887** | **.2** | **968,528** | **70,606** | **.2** | **71,769** | **7.18** | **.1** | **7.41** |

kWh = Kilowatthours.
RSE = Relative standard error.
Notes: •Values for 1999 are preliminary; values for 1998 are final. •Values do not include retail sales by all energy service providers, (Power Marketers). Those sales are estimated to total 49 billion kilowatthours in 1999. •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.
Sources: 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 A24. Retail Sales of Electricity, Revenue, and Average Revenue per Kilowatthour (and RSEs) by U.S. Electric Utilities to Ultimate Consumers by Census Division, and State, 1999 and 1998 -- Industrial**

| Census Division and State | 1999 Sales (million kWh) | 1999 RSE (percent) | 1998 Sales (million kWh) | 1999 Revenue (million dollars) | 1999 RSE (percent) | 1998 Revenue (million dollars) | 1999 Average Revenue per kWh (cents) | 1999 RSE (percent) | 1998 Average Revenue per kWh (cents) |
|---|---|---|---|---|---|---|---|---|---|
| **New England** | **26,378** | **0.3** | **26,059** | **1,937** | **0.7** | **2,039** | **7.3** | **0.5** | **7.8** |
| Connecticut | 5,854 | .1 | 5,838 | 434 | .2 | 449 | 7.4 | .2 | 7.7 |
| Maine | 4,720 | .4 | 4,622 | 303 | .5 | 306 | 6.4 | .3 | 6.6 |
| Massachusetts | 10,290 | .6 | 10,212 | 756 | 1.7 | 835 | 7.4 | 1.3 | 8.2 |
| New Hampshire | 2,497 | .6 | 2,415 | 232 | .6 | 228 | 9.3 | .2 | 9.4 |
| Rhode Island | 1,425 | .1 | 1,439 | 95 | .4 | 109 | 6.7 | .3 | 7.6 |
| Vermont | 1,591 | 1.2 | 1,534 | 116 | 1.7 | 112 | 7.3 | .7 | 7.3 |
| **Middle Atlantic** | **86,806** | **.5** | **85,918** | **4,244** | **1.0** | **4,976** | **4.9** | **.9** | **5.8** |
| New Jersey | 13,067 | .1 | 13,339 | 1,009 | .2 | 1,059 | 7.7 | .1 | 7.9 |
| New York | 25,223 | .8 | 25,089 | 1,215 | 1.0 | 1,241 | 4.8 | .7 | 4.9 |
| Pennsylvania | 48,516 | .7 | 47,490 | 2,020 | 2.0 | 2,676 | 4.2 | 1.8 | 5.6 |
| **East North Central** | **228,394** | **.5** | **222,901** | **10,072** | **.6** | **9,925** | **4.4** | **.2** | **4.5** |
| Illinois | 43,639 | .7 | 43,031 | 2,155 | .7 | 2,199 | 4.9 | .4 | 5.1 |
| Indiana | 47,168 | .5 | 44,848 | 1,813 | .5 | 1,770 | 3.8 | .4 | 3.9 |
| Michigan | 36,673 | 2.8 | 35,983 | 1,851 | 2.8 | 1,809 | 5.0 | .7 | 5.0 |
| Ohio | 74,251 | .6 | 72,998 | 3,211 | .4 | 3,142 | 4.3 | .4 | 4.3 |
| Wisconsin | 26,664 | .3 | 26,040 | 1,042 | .4 | 1,004 | 3.9 | .3 | 3.9 |
| **West North Central** | **80,441** | **.4** | **80,826** | **3,470** | **.6** | **3,459** | **4.3** | **.3** | **4.3** |
| Iowa | 16,201 | .4 | 16,079 | 632 | .7 | 641 | 3.9 | .7 | 4.0 |
| Kansas | 10,180 | 1.2 | 9,762 | 461 | 1.9 | 435 | 4.5 | .8 | 4.5 |
| Minnesota | 27,287 | .7 | 28,214 | 1,253 | 1.2 | 1,257 | 4.6 | .5 | 4.5 |
| Missouri | 16,004 | 1.6 | 15,801 | 702 | 1.0 | 699 | 4.4 | 1.4 | 4.4 |
| Nebraska | 6,834 | .6 | 6,916 | 246 | .7 | 249 | 3.6 | .5 | 3.6 |
| North Dakota | 2,030 | 2.2 | 2,187 | 90 | 1.9 | 94 | 4.4 | .7 | 4.3 |
| South Dakota | 1,905 | .5 | 1,868 | 86 | .8 | 83 | 4.5 | .6 | 4.4 |
| **South Atlantic** | **164,174** | **.2** | **165,686** | **6,848** | **.2** | **6,957** | **4.2** | **.2** | **4.2** |
| Delaware | 3,748 | .3 | 3,779 | 167 | .5 | 176 | 4.5 | .4 | 4.7 |
| District of Columbia | 249 | — | 262 | 11 | — | 11 | 4.6 | — | 4.4 |
| Florida | 17,986 | .7 | 18,448 | 859 | .8 | 887 | 4.8 | .8 | 4.8 |
| Georgia | 34,916 | .3 | 35,077 | 1,447 | .4 | 1,483 | 4.1 | .4 | 4.2 |
| Maryland | 9,919 | .3 | 10,344 | 425 | .4 | 429 | 4.3 | .3 | 4.1 |
| North Carolina | 34,074 | .4 | 34,986 | 1,555 | .7 | 1,620 | 4.6 | .3 | 4.6 |
| South Carolina | 31,955 | .3 | 31,606 | 1,184 | .4 | 1,165 | 3.7 | .3 | 3.7 |
| Virginia | 20,202 | .4 | 20,024 | 777 | .6 | 764 | 3.8 | .4 | 3.8 |
| West Virginia | 11,126 | .1 | 11,161 | 423 | .1 | 422 | 3.8 | — | 3.8 |
| **East South Central** | **135,421** | **1.4** | **116,859** | **5,270** | **1.5** | **4,305** | **3.9** | **.7** | **3.7** |
| Alabama | 36,288 | 3.0 | 33,539 | 1,409 | 3.8 | 1,306 | 3.9 | 1.2 | 3.9 |
| Kentucky | 39,707 | 2.6 | 38,260 | 1,216 | 1.7 | 1,115 | 3.1 | 2.5 | 2.9 |
| Mississippi | 15,877 | 1.1 | 14,599 | 624 | 1.4 | 616 | 3.9 | .9 | 4.2 |
| Tennessee | 43,549 | 2.3 | 30,461 | 2,021 | 2.7 | 1,269 | 4.6 | .6 | 4.2 |
| **West South Central** | **161,613** | **.3** | **162,942** | **6,576** | **.5** | **6,484** | **4.1** | **.5** | **4.0** |
| Arkansas | 16,520 | .9 | 16,066 | 684 | .9 | 669 | 4.1 | .7 | 4.2 |
| Louisiana | 31,528 | .1 | 30,999 | 1,345 | .5 | 1,288 | 4.3 | .4 | 4.2 |
| Oklahoma | 13,220 | .7 | 13,175 | 475 | 1.3 | 481 | 3.6 | 1.3 | 3.7 |
| Texas | 100,345 | .4 | 102,702 | 4,072 | .7 | 4,047 | 4.1 | .8 | 3.9 |
| **Mountain** | **64,234** | **.5** | **68,508** | **2,658** | **.4** | **2,766** | **4.1** | **.4** | **4.0** |
| Arizona | 11,495 | 1.2 | 12,549 | 621 | .8 | 643 | 5.4 | 1.2 | 5.1 |
| Colorado | 9,449 | .9 | 9,998 | 406 | 1.0 | 433 | 4.3 | .2 | 4.3 |
| Idaho | 8,284 | .7 | 8,393 | 227 | 1.5 | 233 | 2.7 | .7 | 2.8 |
| Montana | 3,173 | 6.6 | 6,403 | 125 | 3.7 | 204 | 3.9 | 14.5 | 3.2 |
| Nevada | 10,980 | .5 | 10,518 | 527 | 1.1 | 480 | 4.8 | .7 | 4.6 |
| New Mexico | 5,918 | 1.7 | 6,186 | 251 | 1.7 | 277 | 4.2 | 1.4 | 4.5 |
| Utah | 7,582 | .1 | 7,511 | 254 | .1 | 259 | 3.4 | .1 | 3.5 |
| Wyoming | 7,354 | 1.0 | 6,950 | 247 | 1.3 | 235 | 3.4 | .4 | 3.4 |
| **Pacific Contiguous** | **111,209** | **1.2** | **105,733** | **5,242** | **.7** | **5,224** | **4.7** | **.8** | **4.9** |
| California | 60,665 | .3 | 58,856 | 3,773 | .6 | 3,876 | 6.2 | .5 | 6.6 |
| Oregon | 17,171 | 7.1 | 13,070 | 577 | 4.9 | 457 | 3.4 | 2.9 | 3.5 |
| Washington | 33,373 | 1.7 | 33,807 | 892 | 1.5 | 891 | 2.7 | 1.5 | 2.6 |
| **Pacific Noncontiguous** | **4,581** | **.1** | **4,606** | **422** | **.3** | **415** | **9.2** | **.2** | **9.0** |
| Alaska | 833 | .4 | 818 | 60 | .8 | 59 | 7.2 | .5 | 7.2 |
| Hawaii | 3,748 | .1 | 3,787 | 361 | .3 | 357 | 9.6 | .2 | 9.4 |
| **U.S. Total** | **1,063,252** | **.3** | **1,040,038** | **46,738** | **.3** | **46,550** | **4.40** | **.2** | **4.48** |

kWh = Kilowatthours.
RSE = Relative standard error.
Notes: •Values for 1999 are preliminary; values for 1998 are final. •Values do not include retail sales by all energy service providers, (Power Marketers). Those sales are estimated to total 49 billion kilowatthours in 1999. •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.
Sources: 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 A25. Capability Sold by Utilities to Nonutilities by State, Company, and Energy Source, 1999
(Megawatts)

| State/Seller/Plant | Energy Source[a] | Capability | Buyer |
|---|---|---|---|
| **California** | | **6,265** | |
| **Pacific Gas & Electric Co** | | | |
| Contra Costa | Gas | 680 | Southern Energy |
| Pittsburg | Gas | 2,022 | Southern Energy |
| Potrero | Gas | 363 | Southern Energy |
| The Geysers | Geothermal | 1,224 | Calpine Corporation |
| **San Diego Gas & Electric Co** | | | |
| Division | Petroleum | 16 | Dynegy/NRG |
| El Cajon | Gas | 16 | Dynegy/NRG |
| Encina | Gas | 967 | Dynegy/NRG |
| Kearny | Gas | 149 | Dynegy/NRG |
| Miramar | Gas | 39 | Dynegy/NRG |
| Naval Station | Gas | 23 | Dynegy/NRG |
| Naval Training Ctr | Gas | 16 | Dynegy/NRG |
| North Island | Gas | 38 | Dynegy/NRG |
| South Bay | Gas | 712 | Port of San Diego |
| **Connecticut** | | **3,179** | |
| **Connecticut Light & Power Co** | | | |
| Branford | Petroleum | 15 | NRG Energy |
| Cos Cob | Petroleum | 51 | NRG Energy |
| Devon | Gas | 358 | NRG Energy |
| Franklin Drive | Petroleum | 17 | NRG Energy |
| Middletown | Petroleum | 770 | NRG Energy |
| Montville | Petroleum | 497 | NRG Energy |
| Norwalk Harbor | Petroleum | 342 | NRG Energy |
| Torrington | Petroleum | 17 | NRG Energy |
| **United Illuminating Co** | | | |
| Bridgeport Harbor | Petroleum | 646 | Wivest-Connecticut |
| New Haven Harbor | Petroleum | 466 | Wivest-Connecticut |
| **Florida** | | **608** | |
| **Orlando Utilities Comm** | | | |
| Indian River | Gas | 608 | Reliant Energy Indian River LLC |
| **Illinois** | | **14,177** | |
| **Commonwealth Edison Co** | | | |
| Bloom | Petroleum | 64 | Midwest Generation LLC |
| Calmumet | Gas | 149 | Midwest Generation LLC |
| Collins | Gas | 2,698 | Midwest Generation LLC |
| Crawford | Coal | 701 | Midwest Generation LLC |
| Electric Junction | Gas | 178 | Midwest Generation LLC |
| Fisk | Coal | 523 | Midwest Generation LLC |
| Joliet 29 | Coal | 441 | Midwest Generation LLC |
| Joliet 9 | Coal | 1,036 | Midwest Generation LLC |
| Lombard | Petroleum | 64 | Midwest Generation LLC |
| Powerton | Coal | 1,538 | Midwest Generation LLC |
| Sabrooke | Petroleum | 86 | Midwest Generation LLC |
| Waukegan | Coal | 897 | Midwest Generation LLC |
| Will County | Coal | 1,060 | Midwest Generation LLC |
| **Ilinois Power Co.** | | | |
| Baldwin | Coal | 1,751 | Illinova Power Marketing |
| Clinton | Nuclear | 930 | Amergen |
| Havana | Petroleum | 666 | Illinova Power Marketing |
| Hennepin | Coal | 289 | Illinova Power Marketing |
| Oglesby | Gas | 60 | Illinova Power Marketing |
| Stallings | Gas | 77 | Illinova Power Marketing |
| Tilton | Gas | 176 | Illinova Power Marketing |
| Vermilion | Petroleum | 186 | Illinova Power Marketing |
| Wood River | Gas | 607 | Illinova Power Marketing |

## Table A25. Capability Sold by Utilities to Nonutilities by State, Company, and Energy Source, 1999 (Continued)

| State/Seller/Plant | Energy Source[a] | Capability | Buyer |
|---|---|---|---|
| **Maine** | | **1,402** | |
| **Bangor Hydro-Electric Co** | | | |
| Ellsworth | Hydroelectric | 9 | PP & L Global Inc |
| Howland | Hydroelectric | 2 | PP & L Global Inc |
| Medway | Hydroelectric | 3 | PP & L Global Inc |
| Milford | Hydroelectric | 6 | PP & L Global Inc |
| Stillwater | Hydroelectric | 2 | PP & L Global Inc |
| Veazie A | Hydroelectric | 5 | PP & L Global Inc |
| Veazie B | Hydroelectric | 3 | PP & L Global Inc |
| West Enfield | Hydroelectric | 13 | PP & L Global Inc |
| **Central Maine Power Co** | | | |
| Androscog Mill Lower | Hydroelectric | * | FPL Group |
| Androscoggin 3 | Hydroelectric | 4 | FPL Group |
| Aroostook Valley | Wood, or Wood Waste | 30 | FPL Group |
| Bar Mills | Hydroelectric | 4 | FPL Group |
| Bates Mill Lower | Hydroelectric | * | FPL Group |
| Bates Mill Upper | Hydroelectric | * | FPL Group |
| Bonny Eagle | Hydroelectric | 10 | FPL Group |
| Brunswick | Hydroelectric | 20 | FPL Group |
| Cataract | Hydroelectric | 8 | FPL Group |
| Cataract W Channel | Hydroelectric | 1 | FPL Group |
| Charles E Monty | Hydroelectric | 23 | FPL Group |
| Continental Mills | Hydroelectric | * | FPL Group |
| Deer Rips | Hydroelectric | 6 | FPL Group |
| Fort Halifax | Hydroelectric | 2 | FPL Group |
| Gulf Island | Hydroelectric | 23 | FPL Group |
| Harris | Hydroelectric | 88 | FPL Group |
| Hill Mill | Hydroelectric | 0 | FPL Group |
| Hiram | Hydroelectric | 12 | FPL Group |
| Islesboro Diesel | Petroleum | * | FPL Group |
| Kezar Falls - Lower | Hydroelectric | * | FPL Group |
| Kezar Falls - Upper | Hydroelectric | * | FPL Group |
| Ledgemere | Hydroelectric | * | FPL Group |
| Mason Steam | Petroleum | 98 | FPL Group |
| Mesalonsk 2 | Hydroelectric | 3 | FPL Group |
| Mesalonsk 3 | Hydroelectric | 2 | FPL Group |
| Mesalonsk 5 | Hydroelectric | 2 | FPL Group |
| North Gorham | Hydroelectric | 2 | FPL Group |
| Peaks Island Diesel | Petroleum | 2 | FPL Group |
| Shawmut | Hydroelectric | 10 | FPL Group |
| Skelton | Hydroelectric | 20 | FPL Group |
| Smelt Hill | Hydroelectric | * | FPL Group |
| West Buxton | Hydroelectric | 7 | FPL Group |
| Weston | Hydroelectric | 13 | FPL Group |
| William F Wyman | Petroleum | 838 | FPL Group |
| Williams | Hydroelectric | 15 | FPL Group |
| Wyman | Hydroelectric | 80 | FPL Group |
| **Maine Public Service Co** | | | |
| Caribou | Hydroelectric | 31 | PDI New England Inc |
| Flos Inn | Petroleum | 4 | PDI New England Inc |
| Squa Pan | Hydroelectric | 1 | PDI New England Inc |
| **Maryland** | | **18** | |
| **Pennsylvania Electric Co** | | | |
| Deep Creek | Hydroelectric | 18 | Sithe Energies Inc |

## Table A25. Capability Sold by Utilities to Nonutilities by State, Company, and Energy Source, 1999 (Continued)

| State/Seller/Plant | Energy Source[a] | Capability | Buyer |
|---|---|---|---|
| **Massachusetts** | | **1,160** | |
| **Boston Edison Co** | | | |
| Pilgrim | Nuclear | 665 | Entergy Nuclear |
| **Montaup Electric Co.** | | | |
| Somerset | Coal | 221 | NRG Energy |
| **Western Massachusetts Elec Co** | | | |
| Doreen | Petroleum | 17 | Consol Edison Energy |
| Dwight | Hydroelectric | 1 | Consol Edison Energy |
| Gardner Falls | Hydroelectric | 4 | Consol Edison Energy |
| Indian Orchard | Hydroelectric | 4 | Consol Edison Energy |
| Putts Bridge | Hydroelectric | 4 | Consol Edison Energy |
| Red Bridge | Hydroelectric | * | Consol Edison Energy |
| West Springfield | Petroleum | 227 | Consol Edison Energy |
| Woodland Lane | Petroleum | 17 | Consol Edison Energy |
| **Montana** | | **1,951** | |
| **Montana Power Co** | | | |
| Black Eagle | Hydroelectric | 14 | PP & L Global Inc |
| Cochrane | Hydroelectric | 23 | PP & L Global Inc |
| Colstrip | Coal | 1,354 | PP & L Global Inc |
| Corette | Coal | 156 | PP & L Global Inc |
| Hauser | Hydroelectric | 10 | PP & L Global Inc |
| Holter | Hydroelectric | 21 | PP & L Global Inc |
| Kerr | Hydroelectric | 180 | PP & L Global Inc |
| Madison | Hydroelectric | 7 | PP & L Global Inc |
| Morony | Hydroelectric | 22 | PP & L Global Inc |
| Mystic Lake | Hydroelectric | 12 | PP & L Global Inc |
| Rainbow | Hydroelectric | 24 | PP & L Global Inc |
| Ryan | Hydroelectric | 57 | PP & L Global Inc |
| Thompson Falls | Hydroelectric | 71 | PP & L Global Inc |
| **New Jersey** | | **1,319** | |
| **Jersey Central Power & Light Co** | | | |
| Gilbert | Petroleum | 538 | Sithe Energies Inc |
| Glen Gardner | Petroleum | 160 | Sithe Energies Inc |
| Sayreville | Petroleum | 409 | Sithe Energies Inc |
| Werner | Petroleum | 212 | Sithe Energies Inc |
| **New York** | | **12,241** | |
| **Consolidated Edison Co-NY Inc** | | | |
| Arthur Kill | Petroleum | 840 | NRG Energy |
| Astoria | Petroleum | 1,704 | Orion Power |
| Gowanus | Petroleum | 469 | Orion Power |
| Narrows | Petroleum | 261 | Orion Power |
| Ravenswood | Petroleum | 2,167 | Keyspan |
| **New York State Elec & Gas Co** | | | |
| Goudney | Coal | 127 | AES Corporation |
| Greenidge | Coal | 160 | AES Corporation |
| Hickling | Coal | 82 | AES Corporation |
| Jennison | Coal | 67 | AES Corporation |
| Kintigh | Coal | 674 | AES Corporation |
| Milliken | Coal | 312 | AES Corporation |
| **Niagara Mohawk Power Corp** | | | |
| Allens Falls | Hydroelectric | 4 | NRG Energy |
| Baldwinsville | Hydroelectric | * | NRG Energy |
| Beardslee | Hydroelectric | 16 | NRG Energy |
| Beebee Island | Hydroelectric | 7 | NRG Energy |
| Belfort | Hydroelectric | 2 | NRG Energy |
| Bennetts Bridge | Hydroelectric | 16 | NRG Energy |
| Black River | Hydroelectric | 7 | NRG Energy |
| Blake | Hydroelectric | 14 | NRG Energy |

## Table A25. Capability Sold by Utilities to Nonutilities by State, Company, and Energy Source, 1999 (Continued)

| State/Seller/Plant | Energy Source[a] | Capability | Buyer |
|---|---|---|---|
| **New York (Continued)** | | | |
| **Niagara Mohawk Power Corp (Continued)** | | | |
| Brown Falls | Hydroelectric | 16 | NRG Energy |
| C R Huntley | Petroleum | 766 | NRG Energy |
| Chasm | Hydroelectric | 3 | NRG Energy |
| Colton | Hydroelectric | 26 | NRG Energy |
| Deferiet | Hydroelectric | 11 | NRG Energy |
| Dunkirk | Petroleum | 584 | NRG Energy |
| E J West | Hydroelectric | 22 | NRG Energy |
| Eagle | Hydroelectric | 6 | NRG Energy |
| East Norfolk | Hydroelectric | 4 | NRG Energy |
| Eel Weir | Hydroelectric | 1 | NRG Energy |
| Effley | Hydroelectric | 3 | NRG Energy |
| Elmer | Hydroelectric | 2 | NRG Energy |
| Ephratah | Hydroelectric | 3 | NRG Energy |
| Feeder Dam | Hydroelectric | 4 | NRG Energy |
| Five Falls | Hydroelectric | 22 | NRG Energy |
| Flat Rock | Hydroelectric | 5 | NRG Energy |
| Franklin | Hydroelectric | 2 | NRG Energy |
| Fulton | Hydroelectric | 1 | NRG Energy |
| Glenwood | Hydroelectric | 1 | NRG Energy |
| Granby | Hydroelectric | 9 | NRG Energy |
| Green Island | Hydroelectric | 5 | NRG Energy |
| Hannawa | Hydroelectric | 7 | NRG Energy |
| Herrings | Hydroelectric | 5 | NRG Energy |
| Heuvelton | Hydroelectric | 1 | NRG Energy |
| High Dam | Hydroelectric | 8 | NRG Energy |
| High Falls | Hydroelectric | 5 | NRG Energy |
| Higley | Hydroelectric | 5 | NRG Energy |
| Hogansburg | Hydroelectric | * | NRG Energy |
| Hydraulic Race | Hydroelectric | 2 | NRG Energy |
| Inghams | Hydroelectric | 6 | NRG Energy |
| Johnsonville | Hydroelectric | 1 | NRG Energy |
| Kamargo | Hydroelectric | 3 | NRG Energy |
| Lighthouse Hill | Hydroelectric | 4 | NRG Energy |
| Macomb | Hydroelectric | 1 | NRG Energy |
| Mechanicsville | Hydroelectric | * | NRG Energy |
| Minetto | Hydroelectric | 7 | NRG Energy |
| Moshier | Hydroelectric | 8 | NRG Energy |
| Norfolk | Hydroelectric | 4 | NRG Energy |
| Norwood | Hydroelectric | 2 | NRG Energy |
| Oak Orchard | Hydroelectric | * | NRG Energy |
| Oswegatchie | Hydroelectric | * | NRG Energy |
| Oswego | Petroleum | 1,659 | NRG Energy |
| Oswego Falls East | Hydroelectric | 5 | NRG Energy |
| Oswego Falls West | Hydroelectric | 2 | NRG Energy |
| Parishville | Hydroelectric | 3 | NRG Energy |
| Piercefield | Hydroelectric | 3 | NRG Energy |
| Prospect | Hydroelectric | 19 | NRG Energy |
| Rainbow Falls | Hydroelectric | 23 | NRG Energy |
| Raymondville | Hydroelectric | 2 | NRG Energy |
| Schaghticoke | Hydroelectric | * | NRG Energy |
| School Street | Hydroelectric | 34 | NRG Energy |
| Schuylerville | Hydroelectric | 1 | NRG Energy |
| Sewalls | Hydroelectric | 2 | NRG Energy |
| Sherman Island | Hydroelectric | 24 | NRG Energy |
| Soft Maple | Hydroelectric | 8 | NRG Energy |
| South Colton | Hydroelectric | 19 | NRG Energy |
| South Edwards | Hydroelectric | 3 | NRG Energy |

## Table A25. Capability Sold by Utilities to Nonutilities by State, Company, and Energy Source, 1999 (Continued)

| State/Seller/Plant | Energy Source[a] | Capability | Buyer |
|---|---|---|---|
| **New York (Continued)** | | | |
| **Niagara Mohawk Power Corp (Continued)** | | | |
| South Glen Falls | Hydroelectric | 10 | NRG Energy |
| Spier Falls | Hydroelectric | 38 | NRG Energy |
| Stark | Hydroelectric | 26 | NRG Energy |
| Stewarts Bridge | Hydroelectric | 35 | NRG Energy |
| Stuyvesant Falls | Hydroelectric | * | NRG Energy |
| Sugar Island | Hydroelectric | 4 | NRG Energy |
| Talcville | Hydroelectric | 1 | NRG Energy |
| Taylorville | Hydroelectric | 5 | NRG Energy |
| Trenton Falls | Hydroelectric | 30 | NRG Energy |
| Varick | Hydroelectric | 6 | NRG Energy |
| Waterport | Hydroelectric | 2 | NRG Energy |
| Yaleville | Hydroelectric | 1 | NRG Energy |
| **Orange & Rockland Utils Inc** | | | |
| Bowline | Gas | 1,215 | Southern Energy |
| Grahamsville | Hydroelectric | 17 | Southern Energy |
| Hillburn | Gas | 36 | Southern Energy |
| Lovett | Coal | 447 | NRG Energy |
| Mongaup | Hydroelectric | 4 | Southern Energy |
| Rio | Hydroelectric | 10 | Southern Energy |
| Shoemaker | Gas | 40 | Southern Energy |
| Swinging Bridge 1 | Hydroelectric | 5 | Southern Energy |
| Swinging Bridge 2 | Hydroelectric | 8 | Southern Energy |
| **Pennsylvania** | | **8,563** | |
| **GPU Nuclear Corp** | | | |
| Three Mile Island | Nuclear | 786 | Amergen |
| **Metropolitan Edison Co** | | | |
| Hamilton | Petroleum | 20 | Sithe Energies Inc |
| Hunterstown | Petroleum | 60 | Sithe Energies Inc |
| Mountain | Petroleum | 40 | Sithe Energies Inc |
| Ortanna | Petroleum | 20 | Sithe Energies Inc |
| Portland | Gas | 570 | Sithe Energies Inc |
| Shawnee | Petroleum | 20 | Sithe Energies Inc |
| Titus | Petroleum | 274 | Sithe Energies Inc |
| Tolna | Petroleum | 40 | Sithe Energies Inc |
| York Haven | Hydroelectric | 19 | Sithe Energies Inc |
| **Penn Power & Light Co** | | | |
| Sunbury | Petroleum | 368 | Sunbury Holding LLC |
| **Pennsylvania Electric Co** | | | |
| Blossburg | Gas | 19 | Sithe Energies Inc |
| Conemaugh | Petroleum | 1,711 | Sithe Energies Inc |
| Homer City | Coal | 1,884 | Edison Mission Energy |
| Keystone | Petroleum | 1,711 | Sithe Energies Inc |
| Piney | Hydroelectric | 27 | Sithe Energies Inc |
| Seward | Coal | 196 | Sithe Energies Inc |
| Shawville | Petroleum | 603 | Sithe Energies Inc |
| Warren | Petroleum | 139 | Sithe Energies Inc |
| Wayne | Petroleum | 56 | Sithe Energies Inc |
| **Washington** | | **1** | |
| **Avista Corp** | | | |
| Meyers Falls | Hydroelectric | 1 | Hydro Technologies |
| | **Total** | **50,884** | |

[a]**Gas** includes gas fueled fuel cell units and waste heat. **Petroleum** includes fuel oil Nos. 2, 4, 5, and 6, crude oil, kerosene, and petroleum coke.
* = The absolute value is less than 0.5.
Notes: Capability is net summer. Data are preliminary.
Source: Energy Information Administration, Form EIA-860A, “Annual Electric Generator Report – Utility.”

## Table A26. Generating Capability Additions by State, Company, Energy Source, and Sector, 1999
(Megawatts)

| State/Company | Plant | Capability | Energy Source[a] |
|---|---|---|---|
| | **Utilities** | | |
| **Alaska** | | **6.3** | |
| North Slope Borough of | NSB Nuiqsut Utility | 2.7 | Petroleum |
| Alaska Power Co | Naukati | 0.3 | Petroleum |
| Naknek Electric Assn Inc | Naknek | 1.3 | Petroleum |
| Nome Joint Utility Systems | Snake River | 2.0 | Petroleum |
| **Alabama** | | **423.4** | |
| Alabama Power Co | Washington County | 109.0 | Gas |
| Oglethorpe Power Corp | Smarr Energy Center | 217.4 | Gas |
| Alabama Power Co | Burkville Cogen | 97.0 | Gas |
| **Arkansas** | | **108.0** | |
| Arkansas Electric Coop Corp | Dam 2 | 36.0 | Hydroelectric |
| | Dam 2 | 36.0 | Hydroelectric |
| | Dam 2 | 36.0 | Hydroelectric |
| **Arizona** | | **0.1** | |
| Arizona Public Service Co | Glendale | 0.1 | Solar |
| **Colorado** | | **196.7** | |
| Trinidad City of | Trinidad | 5.7 | Petroleum |
| Colorado Springs City of | Ray D Nixon | 63.0 | Gas |
| Public Service Co of Colorado | Fort St Vrain | 128.0 | Gas |
| **Florida** | | **470.0** | |
| Florida Power Corp | Hines Energy Complex | 470.0 | Gas |
| **Iowa** | | **23.5** | |
| New Hampton City of | New Hampton | 10.6 | Petroleum |
| Rockford City of | Rockford | 1.6 | Petroleum |
| Lake Mills City of | Lake Mills | 7.6 | Petroleum |
| Sumner City of | Sumner | 1.8 | Petroleum |
| Maquoketa City of | Maquoketa | 1.9 | Petroleum |
| **Illinois** | | **278.5** | |
| Carlyle City of | Carlyle | 2.5 | Petroleum |
| Illinois Power Co | Tilton | 176.0 | Gas |
| Soyland Power Coop Inc | Alsey | 50.0 | Gas |
| | Alsey | 30.0 | Gas |
| | Alsey | 20.0 | Gas |
| **Kansas** | | **26.4** | |
| Erie City of | Erie Energy Center | 11.0 | Petroleum |
| Goodland City of | Goodland | 1.2 | Gas |
| Oxford City of | City of Oxford | 3.2 | Petroleum |
| Erie City of | Erie Energy Center | 11.0 | Petroleum |
| **Kentucky** | | **658.0** | |
| East Kentucky Power Coop Inc | JK Smith | 110.0 | Gas |
| | JK Smith | 110.0 | Gas |
| | JK Smith | 110.0 | Gas |
| Kentucky Utilities Co | EW Brown | 328.0 | Gas |
| **Maryland** | | **3.6** | |
| Berlin Town of | Berlin | 1.8 | Petroleum |
| | Berlin | 1.8 | Petroleum |
| **Michigan** | | **626.9** | |
| Thumb Electric Coop-Michigan | Caro | 2.1 | Petroleum |
| Detroit Edison Co | Greenwood | 226.0 | Gas |
| Associated Electric Coop Inc | Nodaway | 182.8 | Gas |
| Detroit Edison Co | Belle River | 216.0 | Gas |

## Table A26. Generating Capability Additions by State, Company, Energy Source, and Sector, 1999 (Continued)

| State/Company | Plant | Capability | Energy Source[a] |
|---|---|---|---|
| **Minnesota** | | **5.1** | |
| Delano City of | Delano | 3.1 | Petroleum |
| Lake Crystal City of | Lake Crystal | 2.0 | Petroleum |
| **Missouri** | | **252.7** | |
| Kahoka City of | Kahoka | 1.1 | Petroleum |
| Shelbina City of | Shelbina Power #2 | 1.8 | Petroleum |
| Associated Electric Coop Inc | Essex | 112.6 | Gas |
| | St Francis | 135.0 | Gas |
| Kahoka City of | Kahoka | 2.2 | Petroleum |
| **North Carolina** | | **165.0** | |
| Carolina Power & Light Co | Asheville | 165.0 | Gas |
| **Nebraska** | | **1.1** | |
| Deshler City of | Deshler | 1.1 | Petroleum |
| **New York** | | **67.0** | |
| Rochester Gas & Electric Co | Allegany Cogen | 25.0 | Waste Heat |
| | Allegany Cogen | 42.0 | Gas |
| **Ohio** | | **73.1** | |
| American Mun Power-Ohio Inc | Jackson Cntr Peaking | 1.8 | Petroleum |
| | Belleville | 21.0 | Hydroelectric |
| | Belleville | 21.0 | Hydroelectric |
| | Bryan Peaking | 5.5 | Petroleum |
| | Arcanum Peaking | 1.8 | Petroleum |
| | Orrville Peaking | 5.5 | Petroleum |
| | Dover Peaking | 11.0 | Petroleum |
| | Napoleon Peaking | 5.5 | Petroleum |
| **South Carolina** | | **56.8** | |
| South Carolina Electric&Gas Co | Cogen South | 55.0 | Coal |
| Sleepy Eye Public Utility Comm | Sleepy Eye | 1.8 | Petroleum |
| **Utah** | | **10.5** | |
| St George City of | Bloomington Power Pl | 10.5 | Petroleum |
| **Washington** | | **8.4** | |
| PUD No 1 of Klickitat County | Roosevelt Biogas 1 | 8.4 | Refuse |
| **Wisconsin** | | **32.2** | |
| Manitowoc Public Utilities | Custer Energy Center | 17.0 | Gas |
| Northwestern Wisconsin Elec Co | Mobile Diesel | 0.5 | Petroleum |
| American Mun Power-Ohio Inc | Versailles Peaking | 5.5 | Petroleum |
| Wisconsin Public Service Corp | Lincoln Turbine | 9.2 | Wind |
| **Wyoming** | | **3.4** | |
| Platte River Power Authority | Medicine Bow | 3.4 | Wind |
| **Utility Subtotal** | | **3,496.7** | |
| | **Nonutilities** | | |
| **Alaska** | | **9.4** | |
| University of Alaska | University of Alaska Fairbanks | 9.4 | Petroleum |
| **Alabama** | | **127.7** | |
| Mobile Energy Serv Co LLC | Mobile Energy Services Co LLC | 40.0 | Multifuel |
| South Eastern Elec Devl Corp | South Eastern Electric Devl Corp Lee County AL Facility | 87.7 | Gas |
| **California** | | **320.0** | |
| Minnesota Methane LLC | BKK Landfill | 4.6 | Landfill Gas |
| Mountainview Power Co LLC | Mountainview Power Co LLC | 107.2 | Gas |
| Oak Creek Energy Systems Inc | Oak Creek Energy Systems Inc | 23.1 | Wind |
| Pacific West 1 | Pacific West | 2.1 | Wind |
| Riverside Canal Power Co Inc | Riverside Canal Power Co | 131.2 | Gas |
| Sierra Pacific Industries Inc | Anderson Facility | 3.7 | Wood |
| | Lincoln Facility | 1.4 | Wood |
| | Quincy Facility | 7.0 | Wood |
| Zond Cabazon Development Corp | Cabazon Wind Farm | 39.8 | Wind |

## Table A26. Generating Capability Additions by State, Company, Energy Source, and Sector, 1999 (Continued)

| State/Company | Plant | Capability | Energy Source[a] |
|---|---|---|---|
| **Colorado** | | **59.5** | |
| Colorado Energy Management LLC | Brush IV | 59.5 | Gas |
| **Connecticut** | | **168.7** | |
| Bridgeport Energy LLC | Bridgeport Energy | 168.7 | Gas |
| **Florida** | | **46.5** | |
| Cargill Fertilizer Inc | Cargill Fertilizer Inc | 39.5 | Multifuel |
| Perpetual Energy Corp | Perpetual Energy Corp | 7.0 | Wood |
| **Georgia** | | **5.1** | |
| Katy Industries | Savannah Energy Systems Co | 5.1 | Gas |
| **Iowa** | | **193.5** | |
| Bio Energy Partners | Metro Methane Recovery Facility | 0.8 | Landfill Gas |
| Midwest Wind Developers | Storm Lake I | 112.5 | Wind |
| Storm Lake Pwr Prtnrs II LLC | Storm Lake II | 80.3 | Wind |
| **Illinois** | | **909.3** | |
| Alliant Indst Serv Energy Appl | Alliant SBG-9805 Rockford Products | 5.0 | Gas |
| Bio Energy Partners | Tazewell Gas Recovery | 0.6 | Landfill Gas |
| Elwood Energy LLC | Elwood Energy LLC | 652.8 | Gas |
| Resource Technology Corp | Biodyne Pontiac | 1.8 | Landfill Gas |
| Rocky Road Power LLC | Rocky Road Power LLC | 249.1 | Gas |
| **Indiana** | | **7.6** | |
| Bio Energy Partners | Deercroft Gas Recovery | 0.8 | Landfill Gas |
| Rolls Royce Corp | Rolls Royce Corp | 6.8 | Multifuel |
| **Louisiana** | | **393.2** | |
| Exxon Mobil Chemical Co | Baton Rouge Cogen | 358.8 | Gas |
| Gaylord Container Corp | Gaylord Container Corp Bogalusa | 34.4 | Multifuel |
| **Massachusetts** | | **422.4** | |
| Dighton Power Associates LP | Dighton Power Associates | 170.0 | Gas |
| Harris Energy Realty Corp | Harris Energy Realty Corp | 3.2 | Hydroelectric |
| Massachusetts Water Res Auth | Deer Island Treatment Plant | 16.4 | Multifuel |
| Power Development Co Inc | Berkshire Power | 231.2 | Multifuel |
| Wellesley College | Wellesley College Utility Plant | 1.6 | Gas |
| **Maryland** | | **187.4** | |
| AES WR LP | AES Warrior Run Cogeneration Facility | 187.4 | Multifuel |
| **Maine** | | **92.8** | |
| Androscoggin Energy LLC | Androscoggin Cogeneration Center | 92.8 | Multifuel |
| **Michigan** | | **365.0** | |
| Central Wayne Energy Recvy LP | Central Wayne Air Quality Energy Recovery Proj | 20.5 | Multifuel |
| CMS Gen MI Power LLC | Kalamazoo River Generating Station | 62.1 | Gas |
| | Livingston Generating Station | 144.2 | Gas |
| Dearborn Indstl Gen LLC | Dearborn Industrial Generation | 135.2 | Gas |
| Lafarge Corp | LaFarge Corp Alpena | 3.0 | Multifuel |
| **Minnesota** | | **150.5** | |
| Lake Benton Pwr Prtnrs II LLC | Lake Benton II | 103.5 | Wind |
| Northern Alternative Energy | Lakota Ridge | 11.3 | Wind |
| | Shalokatan Hills | 11.9 | Wind |
| The Thomson Corp | West Group Generator Building | 13.7 | Gas |
| Woodstock Hills LLC | Woodstock Windfarm | 10.2 | Wind |
| **Mississippi** | | **885.8** | |
| Caledonia Power I LLC | Caledonia Power Facility | 519.2 | Gas |
| New Albany Power I LLC | New Albany Power Facility | 366.6 | Gas |
| **North Carolina** | | **5.5** | |
| Catalytica Pharmaceuticals Inc | Catalytica Pharmaceuticals Inc | 1.0 | Petroleum |
| Davidson Water Inc | Davidson Water Inc | 3.9 | Gas |
| R J Reynolds Tobacco Co | Tobaccoville Utility Plant | 0.6 | Landfill Gas |
| **New Hampshire** | | **5.3** | |
| Durgin & Crowell Lumber Co Inc | Durgin and Crowell Lumber Co Inc | 5.3 | Gas |
| **New Jersey** | | **4.4** | |
| Bristol Myers Squibb Co | Bristol Myers Squibb Co | 1.0 | Multifuel |
| Schering Corp | Schering Corp Cogeneration Facility | 3.4 | Multifuel |

## Table A26. Generating Capability Additions by State, Company, Energy Source, and Sector, 1999 (Continued)

| State/Company | Plant | Capability | Energy Source[a] |
|---|---|---|---|
| **Nevada** | | **215.5** | |
| El Dorado Energy LLC | El Dorado Energy | 215.5 | Gas |
| **New York** | | **86.0** | |
| Bio Energy Partners | High Acres Gas Recovery | 0.8 | Landfill Gas |
| Northbrook New York LLC | Glen Park Hydroelectric Project | 31.1 | Hydroelectric |
| South Glens Falls Energy LLC | South Glens Falls Energy LLC | 54.1 | Multifuel |
| **Pennsylvania** | | **74.6** | |
| Allegheny Energy Unit 1&2 LLC | Allegheny Energy Unit 1&2 | 74.6 | Gas |
| **Tennessee** | | **499.8** | |
| Brownsville Power I LLC | Brownsville Peaking Power Plant | 499.8 | Gas |
| **Texas** | | **1,374.5** | |
| BASF Corp | Freeport | 79.7 | Multifuel |
| Denver City Energy Assoc LP | Mustang Station | 448.3 | Gas |
| Frontera Generation LP | Frontera Generation Facility | 280.5 | Gas |
| Goodyear Tire & Rubber Co | The Goodyear Tire and Rubber Co | 25.5 | Gas |
| Ingleside Cogeneration LP | Ingleside Cogeneration | 465.4 | Multifuel |
| West Texas Wind Energy Partner | West Texas Wind Energy LLC | 75.0 | Wind |
| **Wisconsin** | | **159.2** | |
| De Pere Energy LLC | De Pere Energy Center | 159.2 | Multifuel |
| **Nonutility Subtotal** | | **6,768.9** | |
| **Utility Subtotal** | | **3,496.7** | |
| **Total** | | **10,265.6** | |

[a]**Gas** includes gas fueled fuel cell units and waste heat. **Petroleum** includes fuel oil Nos. 2, 4, 5, and 6, crude oil, kerosene, and petroleum coke.

Notes: Capability is net summer. Data are preliminary.

Sources: Energy Information Administration, Form EIA-860A, “Annual Electric Generator Report-Utility,” and Form EIA-860B, “Annual Electric Generator Report – Nonutility.”

## Table A27. Generating Capability Retirements By State, Company, Energy Source, and Sector, 1999
(Megawatts)

| State/Company | Plant | Capability | Energy Source[a] |
|---|---|---|---|
| | **Utilities** | | |
| **Alaska** | | | |
| Alaska Power Co | Skagway | 1.3 | Petroleum |
| North Slope Borough of | NSB Nuiqsut Utility | 1.0 | Petroleum |
| **Colorado** | | | |
| Trinidad City of | Trinidad | 3.8 | Gas |
| **Florida** | | | |
| Tallahassee City of | S O Purdom | 46.0 | Gas |
| **Iowa** | | | |
| Tipton City of | Tipton | 0.3 | Petroleum |
| Independence City of | Independence | 0.4 | Petroleum |
| **Maryland** | | | |
| Berlin Town of | Berlin | 1.1 | Petroleum |
| **Massachusetts** | | | |
| New England Power Co | Glouchester | 19.0 | Petroleum |
| | Newburyport | 5.0 | Petroleum |
| **Missouri** | | | |
| La Plata City of | La Plata | 0.6 | Petroleum |
| **New York** | | | |
| Rochester Gas & Electric Co | Rochester 3 | 80.0 | Coal |
| **Wisconsin** | | | |
| River Falls City of | Junction | 2.0 | Petroleum |
| **Utility Subtotal** | | **160.5** | |
| **Nonutility Subtotal** | | -- | |
| **Total** | | **160.5** | |

[a]**Gas** includes gas fueled fuel cell units and waste heat. **Petroleum** includes fuel oil Nos. 2, 4, 5, and 6, crude oil, kerosene, and petroleum coke.

Note: Capability is net summer. Data are preliminary.

Source: Energy Information Administration, Form EIA-860A, "Annual Electric Generator Report-Utility." Form EIA-860B, "Annual Electric Generator Report – Nonutility."

# 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.

**Adjustment Bid:** A bid that is used by the Independent System Operator to adjust supply or demand when congestion on the transmission system is anticipated.

**Aggregator:** Any marketer, broker, public agency, city, county, or special district that combines the loads of multiple end-use customers in facilitating the sale and purchase of electric energy, transmission, and other services on behalf of these customers.

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

**Ancillary Services**: Necessary services that must be provided in the generation and delivery of electricity. As defined by the Federal Energy Regulatory Commission, they include: coordination and scheduling services (load following, energy imbalance service, control of transmission congestion); automatic generation control (load frequency control and the economic dispatch of plants); contractual agreements (loss compensation service); and support of system integrity and security (reactive power, or spinning and operating reserves).

**Anthracite**: The highest rank of coal; used primarily for residential and commercial space heating. It is hard, brittle, and black lustrous coal, often referred to as hard coal, containing a high percentage of fixed carbon and a low percentage of volatile matter. The moisture content of fresh-mined anthracite generally is less than 15 percent. The heat content of anthracite ranges from 22 to 28 million Btu per ton on a moist, mineral-matter-free basis. The heat content of anthracite coal consumed in the United States averages 25 million Btu per ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter). *Note*: Since the 1980's, anthracite refuse or mine waste has been used for steam electric power generation. This fuel typically has a heat content of 15 million Btu per ton or less.

**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 "received" 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.

**Bilateral Agreement:** Written statement signed by a pair of communicating parties that specifies what data may be exchanged between them.

**Bilateral Contract:** A direct contract between the power producer and user or broker outside of a centralized power pool or power exchange.

**Bituminous Coal**: A dense coal, usually black, sometimes dark brown, often with well-defined bands of bright and dull material, used primarily as fuel in steam-electric power generation, with substantial quantities also used for heat and power applications in manufacturing and to make coke. Bituminous coal is the most abundant coal in active U.S. mining regions. Its moisture content usually is less then 20 percent. The heat content of bituminous coal ranges from 21 to 30 million Btu per ton on a moist, mineral-matter-free basis. The heat content of bituminous coal consumed in the United States averages 24 million Btu per ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter).

**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.

**Broker:** An entity that arranges the sale and purchase of electric energy, transmission, and other services between buyers and sellers, but does not take title to any of the power sold.

**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.

**Bundled Utility Service:** All generation, transmission, and distribution services provided by one entity for a single charge. This would include ancillary services and retail services.

**California Power Exchange:** The California Power Exchange Corporation, a State chartered, non-profit corporation charged with providing Day-Ahead and Hour-Ahead markets for energy and ancillary services, if it chooses to self-provide, in accordance with the power exchange tariff. The power exchange is a Scheduling Coordinator and is independent of both the Independent System Operator and all other market participants.

**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 readily combustible black or brownish-black rock whose composition, including inherent moisture, consists of more than 50 percent by weight and more than 70 percent by volume of carbonaceous material. It is formed from plant remains that have been compacted, hardened, chemically altered, and metamorphosed by heat and pressure over geologic time.

**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 "another form of useful thermal energy through the sequential use of energy," 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 is 5 barrels (of 42 U.S. gallons each) per short ton. Coke from petroleum has a heating value of 6.024 million Btu per barrel.

**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.

**Competitive Transition Charge:** A non-bypassable charge levied on each customer of a distribution utility, including those who are served under contracts with nonutility suppliers, for recovery of a utility's transition costs.

**Congestion:** A condition that occurs when insufficient transfer capacity is available to implement all of the preferred schedules for electricity transmission simultaneously.

**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.

**Cost-of-Service Regulation:** Traditional electric utility regulation under which a utility is allowed to set rates based on the cost of providing service to customers and the right to earn a limited profit.

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

**Customer Choice:** Allowing all customers to purchase kilowatthours of electricity from any of a number of companies that compete with each other.

**Day-Ahead Market:** The forward market for energy and ancillary services to be supplied during the settlement period of a particular trading day that is conducted by the Independent System Operator, the power exchange, and other Scheduling Coordinators. This market closes with the Independent System Operator's acceptance of the final day-ahead schedule.

**Day-Ahead Schedule:** A schedule prepared by a Scheduling Coordinator or the Independent System Operator before the beginning of a trading day. This schedule indicates the levels of generation and demand scheduled for each settlement period that trading day.

**Demand:** The rate at which energy is delivered to loads and scheduling points by generation, transmission, and distribution facilities.

**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 Bid:** A bid into the power exchange indicating a quantity of energy or an ancillary service that an eligible customer is willing to purchase and, if relevant, the maximum price that the customer is willing to pay.

**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.

**Deregulation:** The elimination of regulation from a previously regulated industry or sector of an industry.

**Direct Access:** The ability of a retail customer to purchase commodity electricity directly from the wholesale market rather than through a local distribution utility.

**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:** The delivery of electricity to retail customers (including homes, businesses, etc.).

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

**Divestiture:** The stripping off of one utility function from the others by selling (spinning-off) or in some other way changing the ownership of the assets related to that function. Stripping off is most commonly associated with spinning-off generation assets so they are no longer owned by the shareholders that own the transmission and distribution assets.

**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 Service Provider:** An entity that provides electric service to a retail or end-use customer.

**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.

**EPACT:** The Energy Policy Act of 1992 addresses a wide variety of energy issues. The legislation creates a new class of power generators, exempt wholesale generators, that are exempt from the provisions of the Public Holding Company Act of 1935 and grants the authority to the Federal Energy Regulatory Commission to order and condition access by eligible parties to the interconnected transmission grid.

**Exempt Wholesale Generator:** Created under the 1992 Energy Policy Act, these wholesale generators are exempt from certain financial and legal restrictions stipulated in the Public Utilities Holding Company Act of 1935.

**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 he 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**: Particulate matter from coal ash in which the particle diameter is less than 1 x $10^{-4}$ 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.

**Futures Market:** Arrangement through a contract for the delivery of a commodity at a future time and at a price specified at the time of purchase. The price is based on an auction or market basis. This is a standardized, exchange-traded, and government regulated hedging mechanism.

**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).

**Generation Company:** A regulated or non-regulated entity (depending upon the industry structure) that operates and maintains existing generating plants. The generation company may own the generation plants or interact with the short-term market on behalf of plant owners. In the context of restructuring the market for electricity, the generation company is sometimes used to describe a specialized “marketer” for the generating plants formerly owned by a vertically-integrated utility.

**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.

**Hedging Contracts:** Contracts which establish future prices and quantities of electricity independent of the short-term market. Derivatives may be used for this purpose.

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

**Independent Power Producers:** Entities that are also considered nonutility power producers in the United States. These facilities are wholesale electricity producers that operate within the franchised service territories of host utilities and are usually authorized to sell at market-based rates. Unlike traditional electric utilities, Independent Power Producers do not possess transmission facilities or sell electricity in the retail market.

**Independent System Operators:** An independent, Federally-regulated entity that coordinates regional transmission in a non-discriminatory manner and ensures the safety and reliability of the electric system.

**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 Form EIA-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 EIA-411).

**Investor-Owned Utility:** A class of utility whose stock is publicly traded and which is organized as a taxpaying business, usually financed by the sale of securities in the capital market. It is regulated and authorized to achieve an allowed rate of return.

**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**: The lowest rank of coal, often referred to as brown coal, used almost exclusively as fuel for steam-electric power generation. It is brownish-black and has a high inherent moisture content, sometimes as high as 45 percent. The heat content of lignite ranges from 9 to 17 million Btu per ton on a moist, mineral-matter-free basis. The heat content of lignite consumed in the United States averages 13 million Btu per ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter).

**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.

**Market-Based Pricing:** Electric service prices determined in an open market system of supply and demand under which the price is set solely by agreement as to what a buyer will pay and a seller will accept. Such prices could recover less or more than full costs, depending upon what the buyer and seller see as their relevant opportunities and risks.

**Market Clearing Price:** The price at which supply equals demand for the Day Ahead and/or Hour Ahead Markets.

**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.

**Monopoly:** One seller of electricity with control over market sales.

**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 ystem 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.

**Open Access:** A regulatory mandate to allow others to use a utility's transmission and distribution facilities to move bulk power from one point to another on a nondiscriminatory basis for a cost-based fee.

**Operable Nuclear Unit**: A nuclear unit is "operable" 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 Exchange:** The entity that will establish a competitive spot market for electric power through day- and/or hour-ahead auction of generation and demand bids.

**Power Exchange Generation:** Generation being scheduled by the power exchange.

**Power Exchange Load:** Load that has been scheduled by the power exchange and which is received through the use of transmission or distribution facilities owned by participating transmission owners.

**Power Marketers:** Business entities engaged in buying, selling, and marketing electricity. Power marketers do not usually own generating or transmission facilities. Power marketers, as opposed to brokers, take ownership of the electricity and are involved in interstate trade. These entities file with the Federal Energy Regulatory Commission for status as a power marketer.

**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.

**PURPA:** The Public Utility Regulatory Policies Act of 1978, passed by the U.S. Congress. This statute requires States to implement utility conservation programs and create special markets for co-generators and small producers who meet certain standards, including the requirement that States set the prices and quantities of power the utilities must buy from such facilities.

**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).

**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.

**Regional Transmission Group:** A utility industry concept that the Federal Energy Regulatory Commission embraced for the certification of voluntary groups that would be responsible for transmission planning and use on a regional basis.

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

**Reliability:** Electric system reliability has two components—adequacy and security. Adequacy is the ability of the electric system to supply to aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and unscheduled outages of system facilities. Security is the ability of the electric system to withstand sudden disturbances, such as electric short circuits or unanticipated loss of system facilities. The degree of reliability may be measured by the frequency, duration, and magnitude of adverse effects on consumer services.

**Renewable Resources:** Naturally, but flow-limited resources that can be replenished. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Some (such as geothermal and biomass) may be stock-limited in that stocks are depleted by use, but on a time scale of decades, or perhaps centuries, they can probably be replenished. Renewable energy resources include: biomass, hydro, geothermal, solar and wind. In the future, they could also include the use of ocean thermal, wave, and tidal action technologies. Utility renewable resource applications include bulk electricity generation, on-site electricity generation, distributed electricity generation, non-grid-connected generation, and demand-reduction (energy efficiency) technologies.

**Reregulation:** The design and implementation of regulatory practices to be applied to the remaining regulated entities after restructuring of the vertically-integrated electric utility. The remaining regulated entities would be those that continue to exhibit characteristics of a natural monopoly, where imperfections in the market prevent the realization of more competitive results, and where, in light of other policy considerations, competitive results are unsatisfactory in one or more respects. Regulation could employ the same or different regulatory practices as those used before restructuring.

**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.

**Restructuring:** The process of replacing a monopoly system of electric utilities with competing sellers, allowing individual retail customers to choose their electricity supplier but still receive delivery over the power lines of the local utility. It includes the reconfiguration of the vertically-integrated electric utility.

**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.

**Retail Competition:** The concept under which multiple sellers of electric power can sell directly to end-use customers and the process and responsibilities necessary to make it occur.

**Retail Market:** A market in which electricity and other energy services are sold directly to the end-use customer.

**Retail Wheeling:** The process of moving electric power from a point of generation across one or more utility-owned transmission and distribution systems to a retail customer.

**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.

**Scheduling Coordinators:** Entities certified by the Federal Energy Regulatory Commission that act as a go-between with the Independent System Operator on behalf of generators, supply aggregators (wholesale marketers), retailers, and customers to schedule the distribution of electricity.

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

**Securitization:** A proposal for issuing bonds that would be used to buy down existing power contracts or other obligations. The bonds would be repaid by designating a portion of future customer bill payments. Customer bills would be lowered, since the cost of bond payments would be less than the power contract costs that would be avoided.

**Securitize:** The aggregation of contracts for the purchase of the power output from various energy projects into one pool which then offers shares for sale in the investment market. This strategy diversifies project risks from what they would be if each project were financed individually, thereby reducing the cost of financing. Fannie Mae performs such a function in the home mortgage market.

**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.

**Stranded Benefits:** Benefits associated with regulated retail electric service which may be at risk under open market retail competition. Examples are conservation programs, fuel diversity, reliability of supply, and tax revenues based on utility revenues.

**Stranded Costs:** Prudent costs incurred by a utility which may not be recoverable under market-based retail competition. Examples are undepreciated generating facilities, deferred costs, and long-term contract costs.

**Subbituminous Coal**: A coal whose properties range from those of lignite to those of bituminous coal and are used primarily as fuel for steam-electric power generation. It may be dull, dark brown to black, soft and crumbly at the lower end of the range, to bright, jet black, hard, and relatively strong at the upper end. Subbituminous coal contains 20 to 30 percent inherent moisture by weight. The heat content of subbituminous coal ranges from 17 to 24 million Btu per ton on a moist, mineral-matter-free basis. The heat content of subbituminous coal consumed in the United States averages 17 to 18 million Btu per ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter).

**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.

**Transmitting Utility:** This is a regulated entity which owns, and may construct and maintain, wires used to transmit wholesale power. It may or may not handle the power dispatch and coordination functions. It is regulated to provide non-discriminatory connections, comparable service, and cost recovery. According to EPACT, this includes any electric utility, qualifying cogeneration facility, qualifying small power production facility, or Federal power marketing agency which owns or operates electric power transmission facilities which are used for the sale of electric energy at wholesale.

**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.

**Unbundling:** The separating of the total process of electric power service from generation to metering into its component parts for the purpose of separate pricing or service offerings.

**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.

**Utility Distribution Companies:** The entities that will continue to provide regulated services for the distribution of electricity to customers and serve customers who do not choose direct access. Regardless of where a consumer chooses to purchase power, the customer's current utility, also known as the utility distribution company, will deliver the power to the consumer's home, business, or farm.

**Vertical Integration:** An arrangement whereby the same company owns all the different aspects of making, selling, and delivering a product or service. In the electric industry, it refers to the historically common arrangement whereby a utility would own its own generating plants, transmission system, and distribution lines to provide all aspects of electric service.

**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.

**Volumetric Wires Charge:** A type of charge for using the transmission and/or distribution system that is based on the volume of electricity that is transmitted.

**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 Competition:** A system whereby a distributor of power would have the option to buy its power from a variety of power producers, and the power producers would be able to compete to sell their power to a variety of distribution companies.

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

**Wholesale Power Market:** The purchase and sale of electricity from generators to resellers (who sell to retail customers), along with the ancillary services needed to maintain reliability and power quality at the transmission level.

**Wholesale Transmission Services:** The transmission of electric energy sold, or to be sold, at wholesale in interstate commerce (from EPACT).

**Wires Charge:** A broad term which refers to charges levied on power suppliers or their customers for the use of the transmission or distribution wires.