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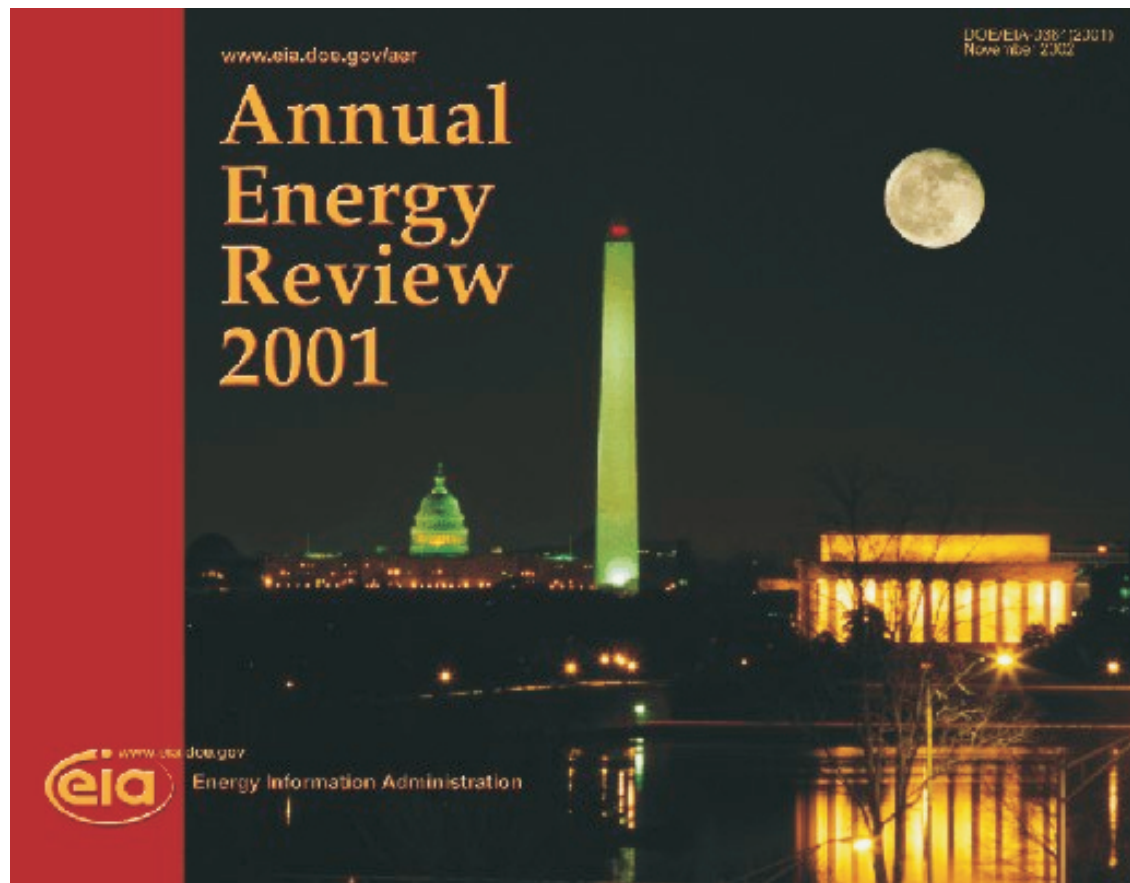
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# Annual Energy Review 2001



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Energy Information Administration



## Annual Energy Review 2001

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# Annual Energy Review 2001

November 2002

**Energy Information Administration**  
Office of Energy Markets and End Use  
U.S. Department of Energy  
Washington, DC 20585

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# Preface

The *Annual Energy Review (AER)* is a statistical history of energy activities in the United States. It documents trends and milestones in U.S. energy production, trade, storage, pricing, and consumption. Each new year of data that is added to the time series—which now reach into 7 decades—extends the story of how Americans have acquired and used energy. It is a story of continual change as the Nation's economy grew, energy requirements expanded, resource availability shifted, and interdependencies developed among nations.

Perhaps the greatest change in U.S. energy markets in recent years is that in the Nation's **electric power sector**. To address those developments and their effects on energy statistics, a team of Energy Information Administration (EIA) analysts conducted a review over the past year of how EIA collects, estimates, and reports electricity-related statistics. In particular, the review addressed how EIA reports fuel consumption for electrical generation. Because power facilities use many types of fuels and operate in all sectors of the economy (e.g., commercial buildings, such as hospitals and college campuses, and industrial facilities, such as paper mills and refineries), changes to the electric power data affected nearly all fuels in the *AER* and caused revisions in many *AER* tables. **Appendix H** of this report, "Estimating and Presenting Power Sector Fuel Use in EIA Publications and Analyses," summarizes EIA's study and its effects on the *AER* and other EIA reports.

Over the decades covered in this report, other energy industries experienced change on a large scale as well. A study of the **petroleum industry** data reveals how the United States gradually moved from a Nation that once met its own requirements for petroleum to one that depends on other nations for well over half its supply. Trend data show that the productivity of U.S. crude oil wells peaked in 1972, and that in 1993, for the first time, the amount of crude oil and natural gas plant liquids produced in the United States fell below the amount of crude oil and petroleum products imported into the country.

An examination of the **natural gas industry** data shows that natural gas well productivity peaked in 1971 and, in recent years, produced at about a third of that peak level. A transition occurred in our use of imported natural gas as well. Net imports stood at a mere 4 percent of natural gas consumption in 1986; 15 years later, the proportion had quadrupled.

**Coal industry** data show that transportation, residential, and commercial uses of coal essentially disappeared over the decades as consumption for electricity generation soared. While a change was occurring in how the Nation consumed coal, an upheaval was underway in how we got the coal: the Nation's output shifted from predominantly underground mines to surface mines and from mines east of the Mississippi to the West.

The **nuclear power industry**, which got its start in the United States in 1957, grew from an inconsequential contributor to the Nation's electrical output to supply more than one-fifth of the power used in the country.

The consumption of **renewable energy** peaked at 7.5 quadrillion Btu in 1996. The 2001 level was the lowest recorded since 1979. The largest component of the renewable energy total is hydroelectric power, which was adversely affected by drought in 2001 and hit its lowest level since 1968.

Time series provide a broad perspective on the trends and changes in **total energy usage** as well. For example, Americans' average use of energy per person in 1949 was 215 million British thermal units (Btu); that rate grew and reached a peak of 361 million Btu per person in 1978 and 1979; from 1988 on, Americans' energy usage per person was in the 340-to-350 million Btu range. Another broad indicator of energy usage is one that measures how much energy is consumed to produce our economic output. In 1949, the Nation consumed 20.6 thousand Btu for each (1996) dollar's worth of goods and services that was generated by the economy. Through the decades, the economy underwent tremendous growth and change, and the type of energy used and how it was consumed changed as well. By 2001, the measure had dropped to 10.4 thousand Btu per (1996) dollar of economic output.

Remarkable changes such as the ones touched on here could reasonably lead us to conclude that things will not stay as they now are. Anticipating and preparing for how our energy future will unfold is the challenge before us. We hope that this latest edition of the *Annual Energy Review* will help in that mission.



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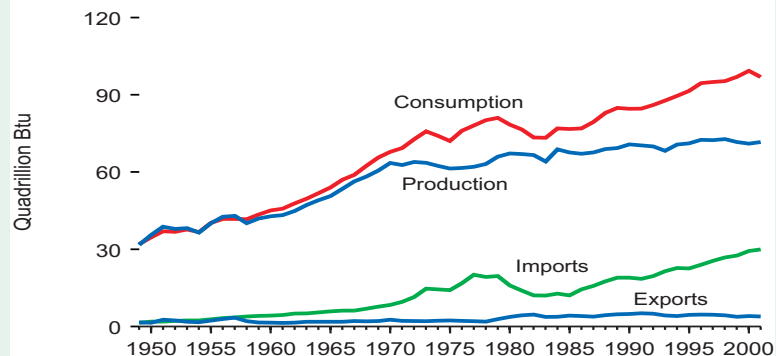
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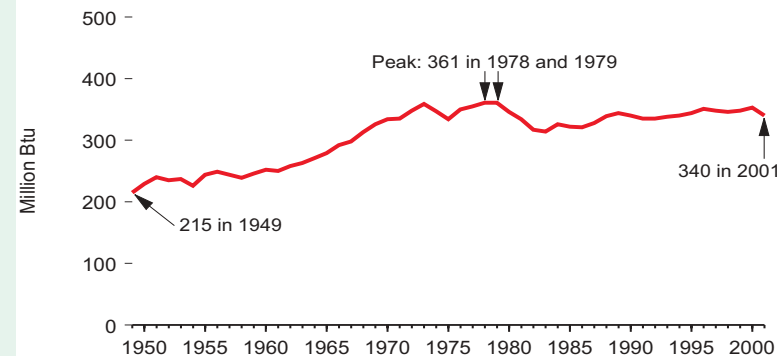
# Overview

**Figure 1. Energy Overview**



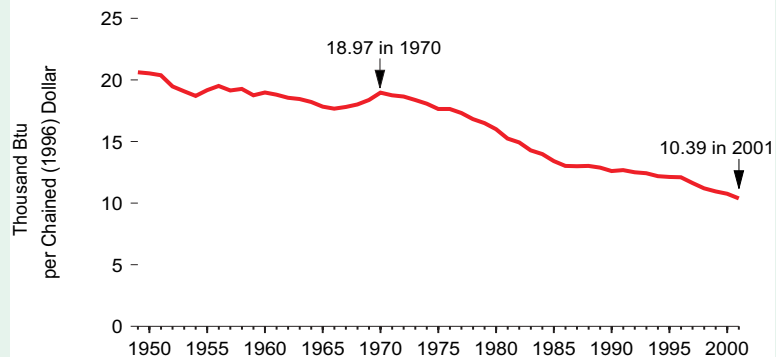
The United States was self-sufficient in energy until the late 1950s when energy consumption began to outpace domestic production. The Nation imported more energy to fill the gap. In 2001, net imported energy accounted for 27 percent of all energy consumed.

**Figure 2. Energy Consumption per Person**



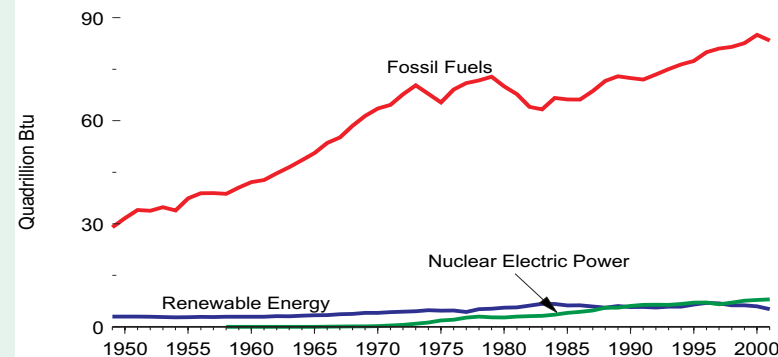
Energy use per person stood at 215 million Btu in 1949. The rate generally increased until the oil price shocks of the mid-1970s and early 1980s caused the pattern to reverse for a few years. After slight increases in the 1990s, the rate fell 4 percent from 2000 to 2001.

**Figure 3. Energy Use per Dollar of Gross Domestic Product**



Over the second half of the 20th century, the rate at which energy was consumed per dollar of the economy's output of goods and services fell dramatically. By the end of the century, the rate was half of the mid-century level. The rate in 2001 was 45 percent below that in 1970. The decline resulted from efficiency improvements and structural changes in the economy.

**Figure 4. Energy Consumption by Source**



Most energy consumed in the United States has come from fossil fuels. Renewable energy resources, mostly hydroelectricity and the industrial use of biomass, have supplied a relatively small but steady portion. In the late 1950s, nuclear fuel began to be used to generate electricity, and, by the late 1980s, contributed about the same share as renewable energy.

# Consumption by Source

Figure 5. Energy Consumption by Source, 1635-2001

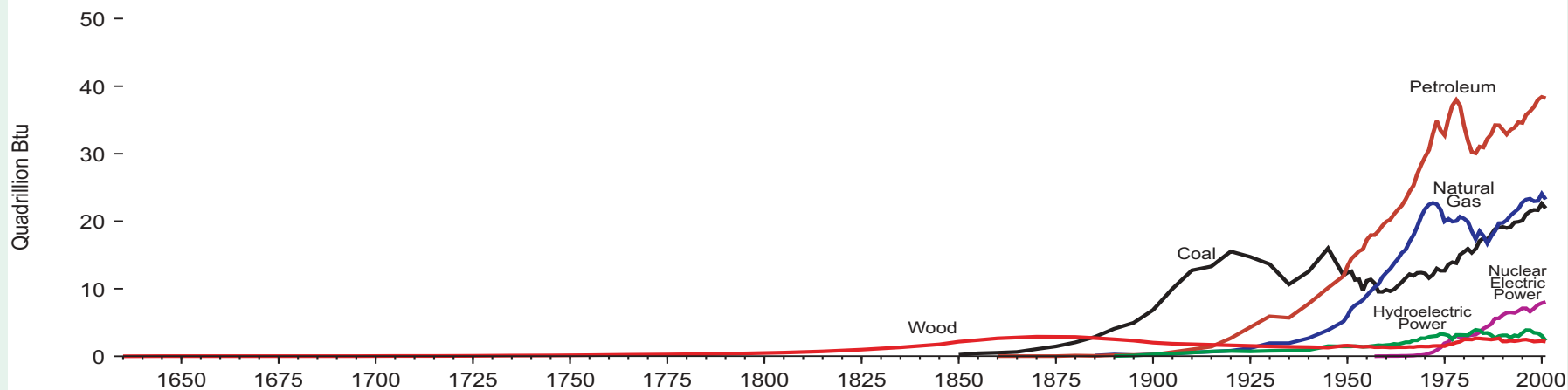
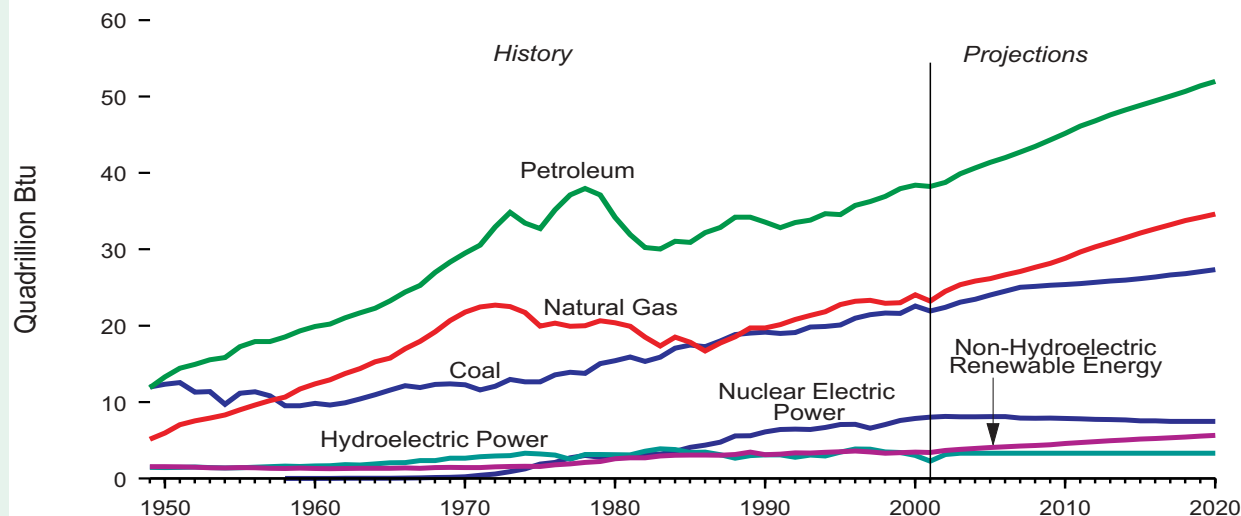


Figure 6. Energy Consumption History and Outlook, 1949-2020

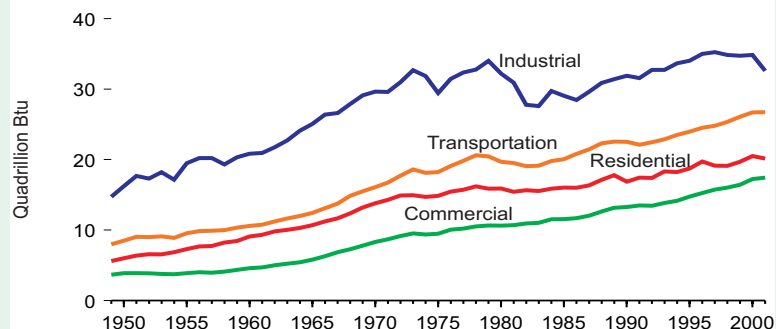


In the long view of American history, wood served as the preeminent form of energy for about half of the Nation’s history. Around 1885, coal surpassed wood’s usage. Despite its tremendous and rapid expansion, coal was, in turn, overtaken by petroleum in the middle of the 20th century. Natural gas, too, experienced rapid development into the second half of the 20th century, and coal began to expand again. Late in the 20th century still another form of energy, nuclear electric power, was developed and made significant contributions.

While the Nation’s energy history is one of large-scale change as new forms of energy were developed, the outlook for the next couple of decades (assuming current laws, regulations, and policies) is for continued growth and reliance on the three major fossil fuels—petroleum, natural gas, and coal—modest expansion in renewable resources, and relatively flat generation from nuclear electric power.

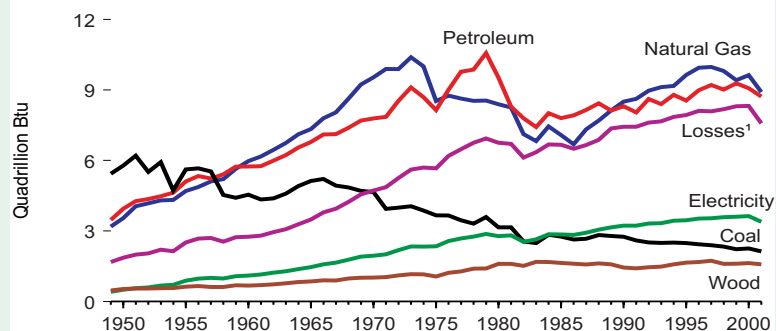
# Consumption by Sector

**Figure 7. Energy Consumption by End-Use**



The industrial sector of the economy used the largest share of energy and showed the greatest volatility. In particular, steep drops occurred in 1975 and 1980-83 in response to high oil prices. Transportation was the next largest energy consuming sector, followed by residential use and commercial use.

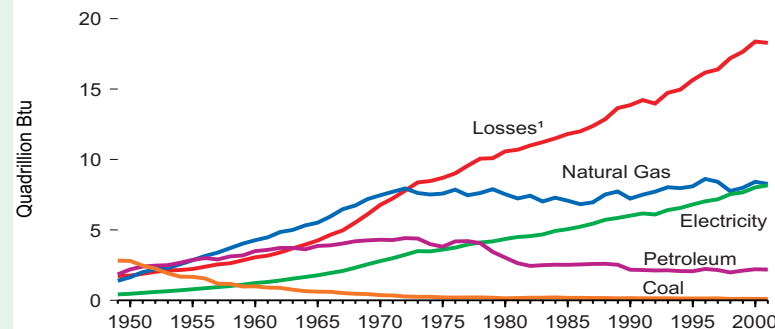
**Figure 9. Industrial Energy Consumption**



<sup>1</sup> Energy lost during generation, transmission, and distribution of electricity.

Coal, once the prominent form of energy in the industrial sector, gave way to natural gas and petroleum in the late 1950s. Both natural gas and petroleum expanded rapidly until the early 1970s; after that, large swings occurred. All forms of energy used in the industrial sector turned down in 2001.

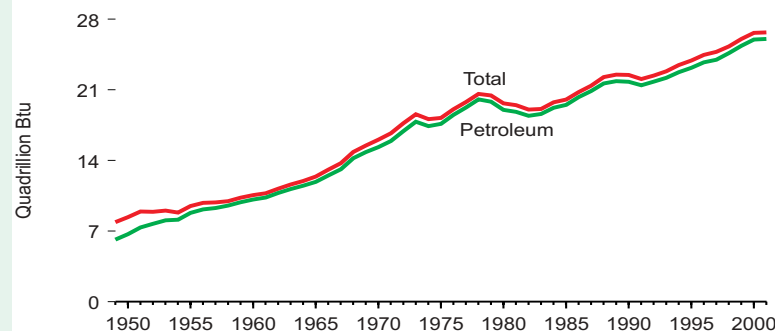
**Figure 8. Residential and Commercial Energy Consumption**



<sup>1</sup> Energy lost during generation, transmission, and distribution of electricity.

Coal, once important to residential and commercial consumers, was gradually replaced by other forms of energy. Petroleum use peaked in the early 1970s. Natural gas grew fast until the early 1970s and then fluctuated around the 1970 level over the next three decades. Meanwhile, electricity's use (and related losses) expanded dramatically.

**Figure 10. Transportation Energy Consumption**

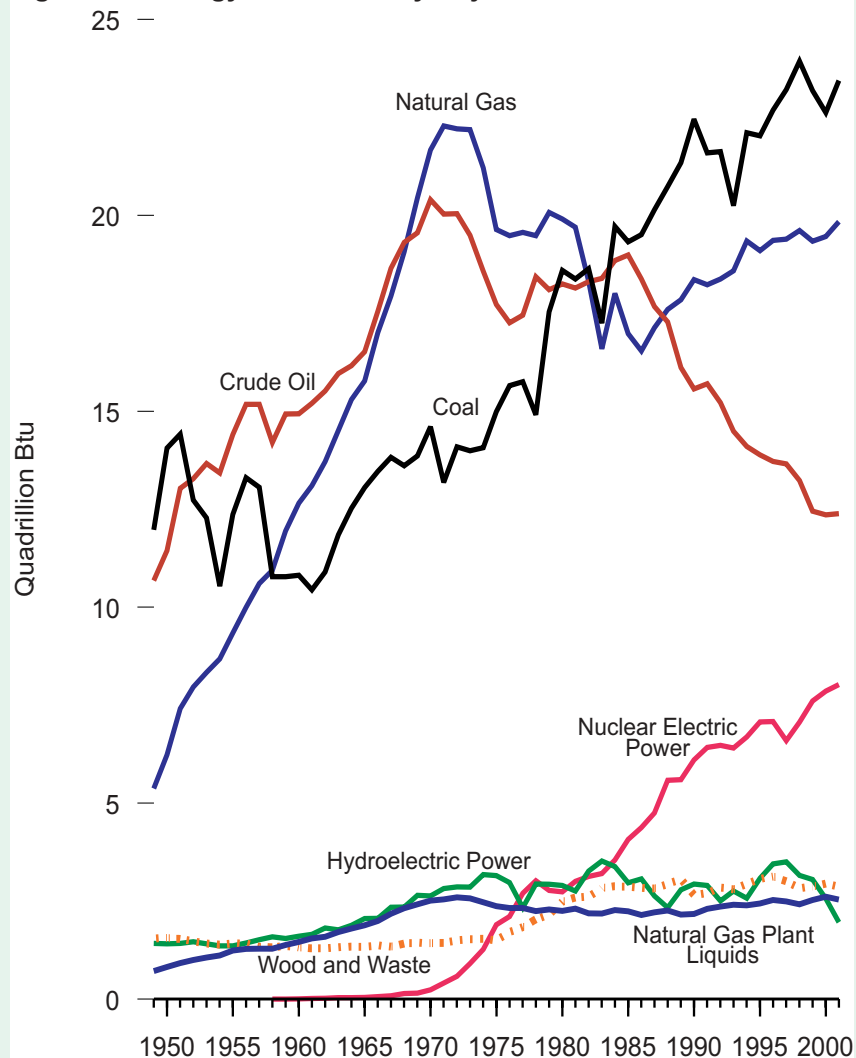


The transportation sector's use of energy, which is overwhelmingly petroleum, more than tripled from 1949 to 2001. Motor gasoline accounts for about two-thirds of the petroleum consumed in the sector. Distillate fuel oil and jet fuel are other important petroleum products used in the sector.



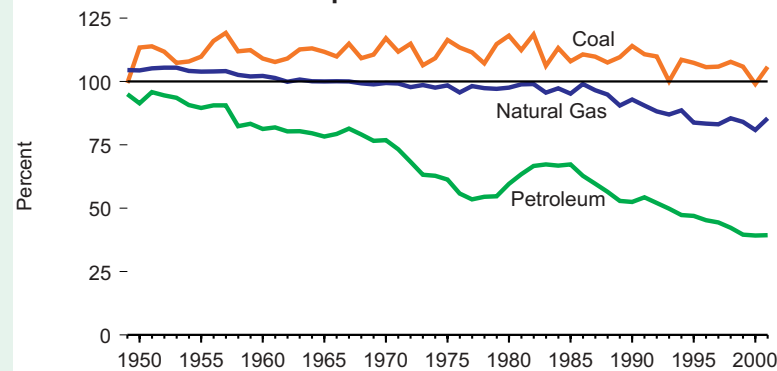
# Production and Trade

**Figure 11. Energy Production by Major Source**



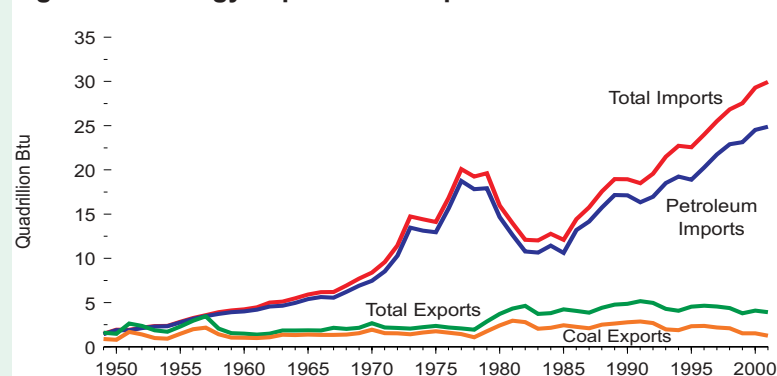
Most energy produced in the United States comes from fossil fuels—coal, natural gas, and crude oil. Coal, the leading source at the middle of the 20th century, was surpassed by crude oil and natural gas for many years, but again became the leading source of energy in the mid-1980s, used primarily for electric generation. Hydroelectric output in 2001 was the lowest level since 1966.

**Figure 12. Fossil Fuel Production as Share of Its Consumption**



The Nation almost always produced more than enough coal for our own requirements. For many years, we were also self-sufficient in natural gas, but after 1967, we produced less than we consumed each year. Petroleum production fell far short of domestic requirements.

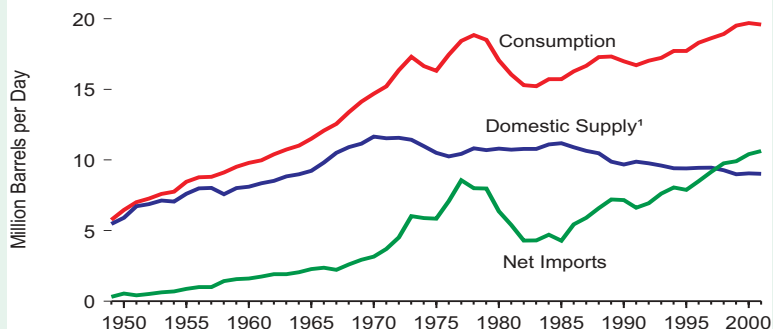
**Figure 13. Energy Imports and Exports**



Since the late 1950s, the Nation imported more energy than it exported. In 2001, the United States imported 30 quadrillion Btu of energy and exported 4 quadrillion Btu. Most imported energy was in the form of petroleum; in recent years, natural gas imports grew, primarily from Canada. Exported energy was primarily in the form of coal until the late 1970s when petroleum exports expanded, and, in some years, even exceeded coal exports.

# Petroleum Overview and Crude Oil Production

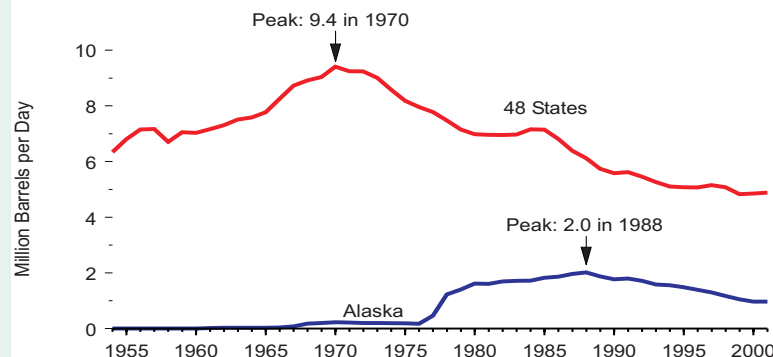
**Figure 14. Petroleum Overview**



<sup>1</sup> Crude oil and natural gas plant liquids production; refinery gains; and field production of other components.

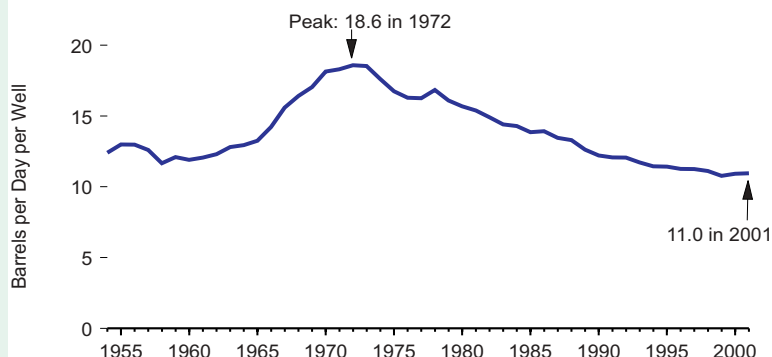
When U.S. domestic supply of petroleum peaked at 11.7 million barrels per day in 1970, net imports stood at 3.2 million barrels per day. As domestic supply declined, consumption grew. In 1998, for the first time, net imports surpassed domestic supply. In 2001, domestic supply was 9.0 million barrels per day and net imports were 10.6 million barrels per day.

**Figure 15. 48 States and Alaskan Crude Oil Production**



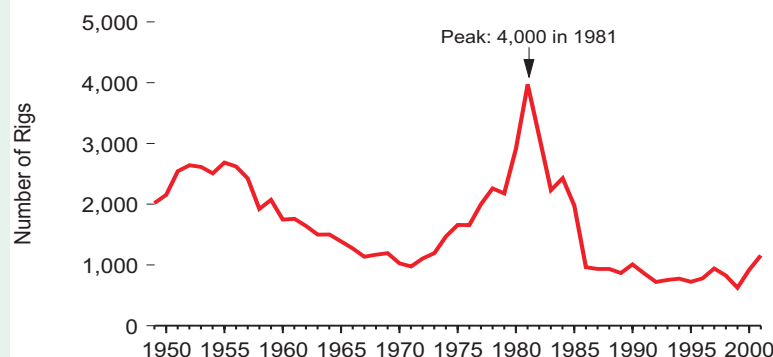
Crude oil production peaked in the U.S. 48 States at 9.4 million barrels per day in 1970. As production fell in the 48 States, Alaska's production came on line and helped supply U.S. needs. Alaskan production peaked at 2.0 million barrels per day in 1988, then fell to less than half the peak rate by 2001.

**Figure 16. Crude Oil Well Productivity**



The amount of crude oil produced per day per well rose sharply in the 1960s, reached a peak of 18.6 barrels per day per well in 1972, and, except for a brief recovery in 1978, fell through 1999. In 2001, productivity measured 11.0 barrels per day per well, 41 percent below the peak.

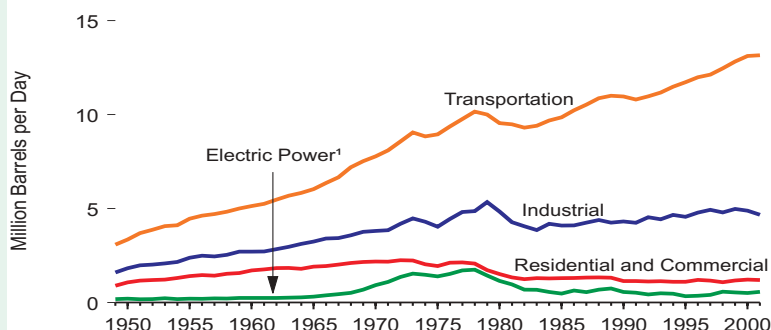
**Figure 17. Crude Oil and Natural Gas Rotary Rigs in Operation**



Rotary rig activity declined sharply in the period from 1955 to 1971. After 1971, the number of rigs in operation began to climb again, and a peak of 4 thousand rigs in operation was registered in 1981. A sharp decline followed, and the number of rigs in operation in 2001 stood at 71 percent below the peak level in 1981.

# Petroleum Consumption and Prices

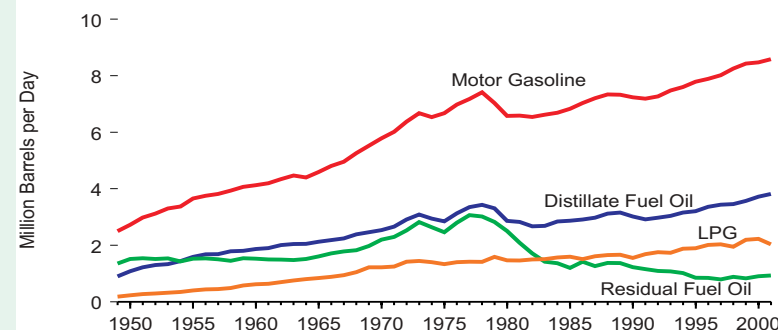
**Figure 18. Petroleum Consumption by Sector**



<sup>1</sup> Through 1988, electric utilities only; after 1988, includes independent power producers.

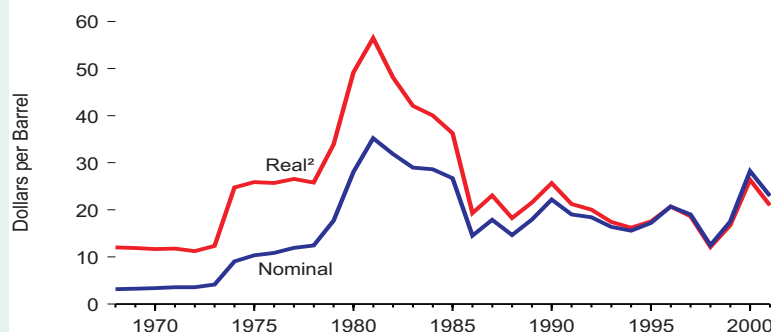
Transportation was the largest consuming sector of petroleum and the one showing the greatest expansion over the second half of the 20th century. In 2001, 13 million barrels per day of petroleum products were consumed for transportation purposes, accounting for 69 percent of all petroleum used.

**Figure 19. Petroleum Consumption by Selected Product**



Motor gasoline is the single largest petroleum product consumed in the United States. Its consumption stood at 8.6 million barrels per day in 2001, 44 percent of all petroleum consumption. Distillate fuel oil and liquefied petroleum gases (LPG) are other important products. The use of residual fuel oil fell off sharply after 1977.

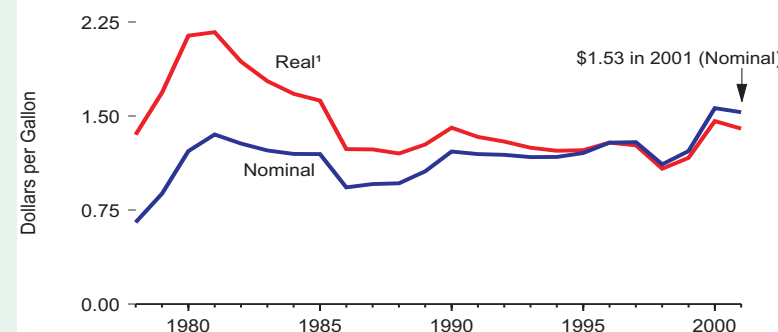
**Figure 20. Crude Oil Refiner Acquisition Cost<sup>1</sup>**



<sup>1</sup> Composite of domestic and imported crude oil. <sup>2</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflator.

The refiner acquisition composite (domestic and foreign) cost of crude oil in nominal (unadjusted for inflation) dollars peaked at \$35 per barrel in 1981. The price fell dramatically over the years that followed, reaching \$18 per barrel in 1999. It jumped to \$28 per barrel in 2000 and then declined again to \$23 per barrel in 2001.

**Figure 21. Price of Motor Gasoline**

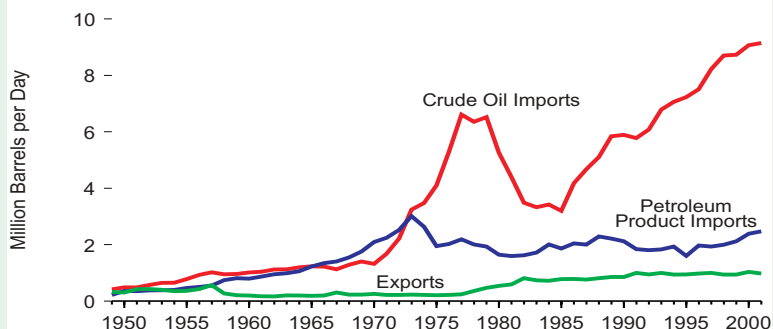


<sup>1</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflator.

In nominal (unadjusted for inflation) dollars, Americans paid an average of 65¢ per gallon for motor gasoline in 1978. The 2001 average price of \$1.53 was 135 percent higher than the 1978 rate but, adjusted for inflation, it was 4 percent higher.

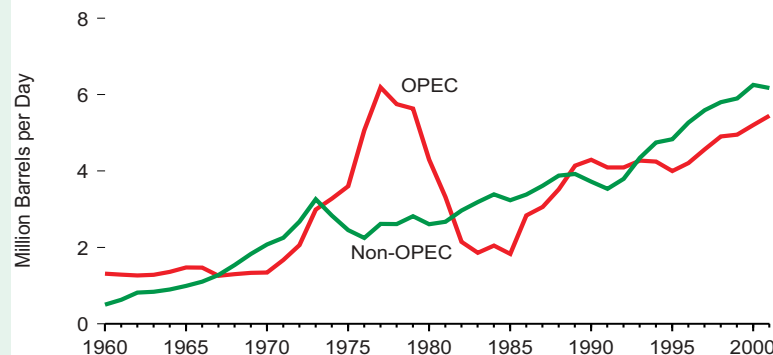
# Petroleum Trade

**Figure 22. Petroleum Trade**



U.S. crude oil imports grew rapidly from mid-century until the late 1970s. From 1979 to 1985, imports fell sharply due to improved efficiency and conservation efforts. After 1985, the upward trend resumed. In 2001, crude oil imports reached a record-high level of 9.1 million barrels per day, and petroleum product imports stood at 2.5 million barrels per day.

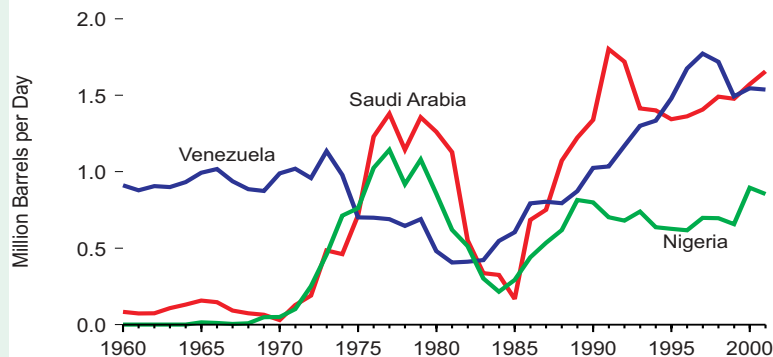
**Figure 23. Imports From OPEC and Non-OPEC Countries**



OPEC = Organization of Petroleum Exporting Countries.

As U.S. petroleum imports rose sharply in the late 1970s, the Nation's reliance on petroleum from the Organization of Petroleum Exporting Countries (OPEC) grew. In 1977, 70 percent of U.S. petroleum imports came from OPEC countries. After 1992, more petroleum imports came from non-OPEC countries than from OPEC countries.

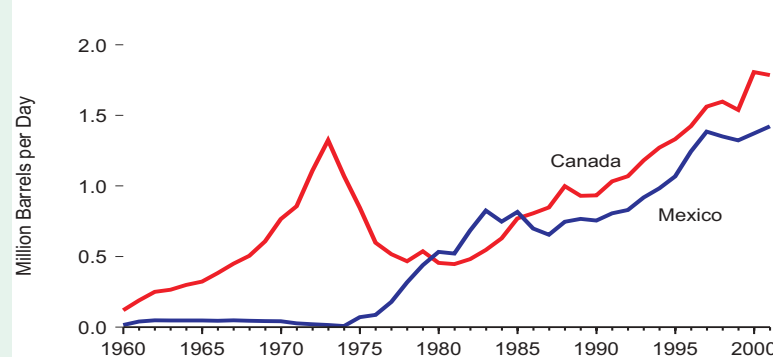
**Figure 24. Imports From Selected OPEC Countries**



OPEC = Organization of Petroleum Exporting Countries.

Among OPEC countries, Saudi Arabia, Venezuela, and Nigeria—nations from three different continents—were key suppliers of petroleum to the American market. Each experienced wide fluctuation in the amount of petroleum it sold to the United States over the decades. In 2001, the three together accounted for three-fourths of U.S. imports from OPEC countries.

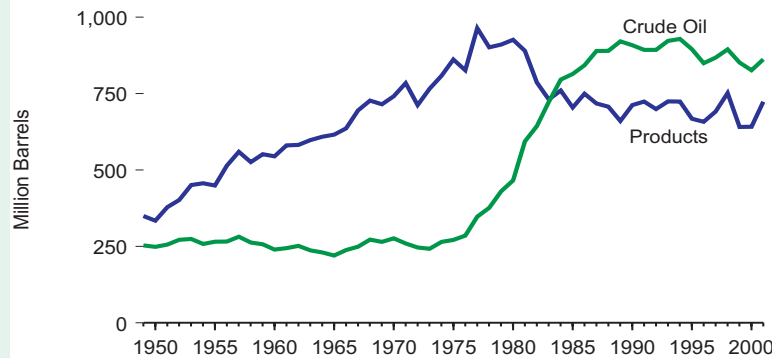
**Figure 25. Imports From Canada and Mexico**



Canada and Mexico, our national neighbors, supplied the largest quantities of petroleum from non-OPEC countries. Imports from Mexico were insignificant until the mid-1970s when they began to play a key role in U.S. supplies. In 2001, Canada and Mexico together provided over one-fourth of all U.S. petroleum imports.

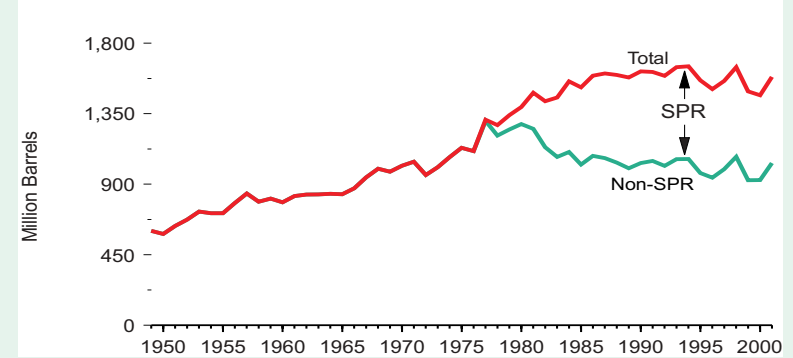
# Petroleum Stocks

**Figure 26. Stocks of Crude Oil and Products**



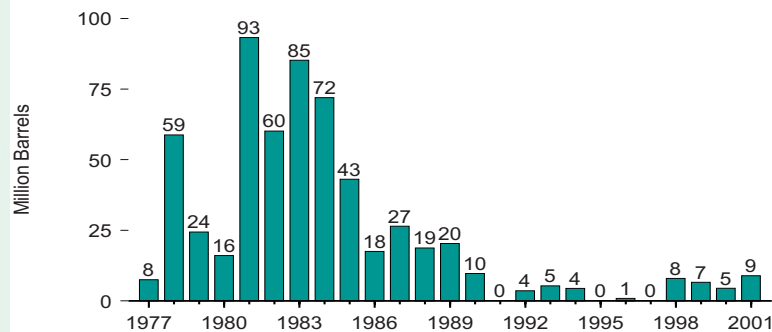
Through 1983, the Nation held most of its petroleum storage in the form of products, which are ready for the market. After that, most petroleum in storage was in the form of crude oil. At the end of 2001, petroleum stocks totaled 1.6 billion barrels, 54 percent crude oil and 46 percent products.

**Figure 27. Strategic Petroleum Reserve (SPR) Stocks**



In 1977, the United States began building a national reserve of petroleum stocks in case of emergency. The amount of crude oil held in the Strategic Petroleum Reserve (SPR) peaked at 592 million barrels in 1994 and 1995. The level at the end of 2001 was 550 million barrels. As SPR stocks were built, non-SPR stocks were reduced slightly.

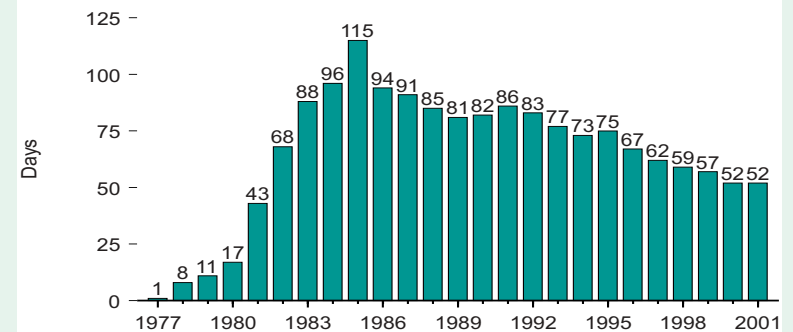
**Figure 28. Crude Oil Imports for SPR<sup>1</sup>**



<sup>1</sup>Imported by SPR and imported by others for SPR.

Most of the crude oil in SPR is imported oil, and most of it came in during the early 1980s. In fact, from 1991 through 1997, only 14 million barrels were imported for the reserve, and in 3 of those years, no oil at all was imported for the reserve. In 2001, 9 million barrels of crude oil were imported for SPR.

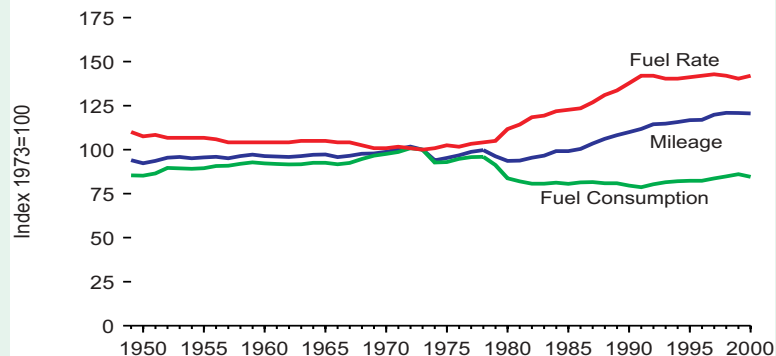
**Figure 29. SPR Stocks as Days' Worth of Net Imports**



An important SPR measure is the number of days' worth of total net imports of petroleum that could be met by the reserve in an emergency. The peak level occurred in 1985 when the reserve could have supplied 115 days of petroleum net imports, at the 1985 level. The rate trended down since then and stood at 52 days at the end of 2001.

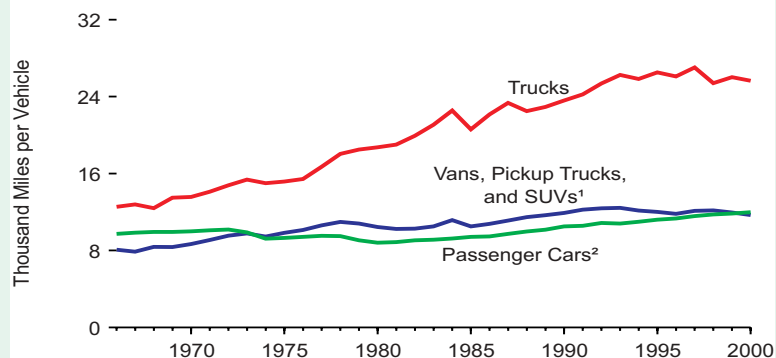
# Motor Vehicles

**Figure 30. Motor Vehicle Indicators**



The composite motor vehicle fuel rate (miles per gallon) soared 42 percent from 1973 to 1991 but remained nearly flat over succeeding years. Mileage (miles driven per vehicle) grew steadily from 1980 to 1998, but declined slightly in 1999 and 2000. Fuel consumption per vehicle fell 21 percent from 1973 to 1991, but rebounded 7 percent by 2000.

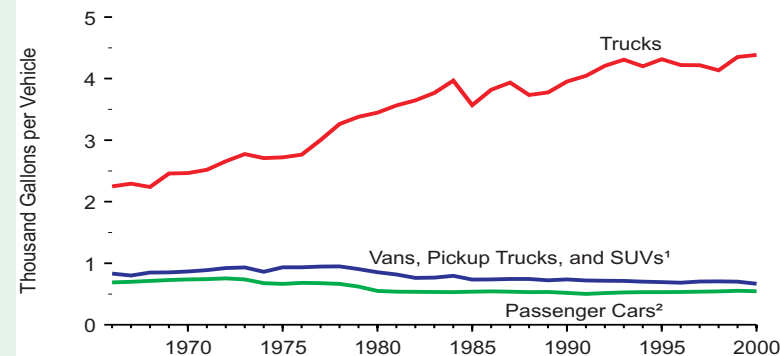
**Figure 32. Motor Vehicle Mileage**



<sup>1</sup> Sport-utility vehicle. <sup>2</sup> Motorcycles are included through 1989.

Truck miles traveled per year greatly exceeded that of other vehicle types and grew sharply from 1966 to 2000, up 105 percent. In 2000, trucks averaged 26 thousand miles per vehicle per year, while passenger cars, vans, pickup trucks, and sport utility vehicles averaged just under 12 thousand miles per year.

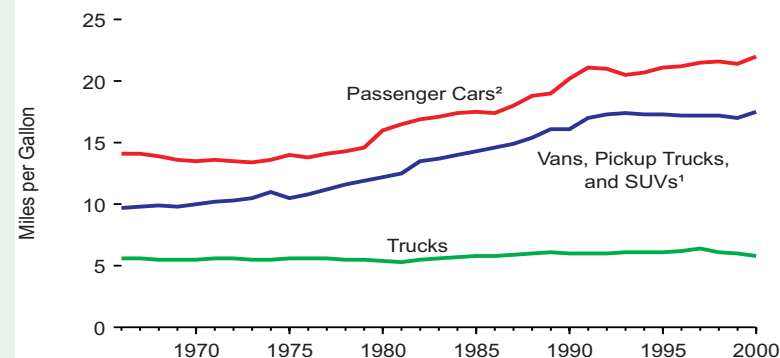
**Figure 31. Motor Vehicle Fuel Consumption**



<sup>1</sup> Sport-utility vehicle. <sup>2</sup> Motorcycles are included through 1989.

From 1966 to 2000, truck fuel consumption rates rose 95 percent from 2.3 thousand gallons per truck to 4.4 thousand gallons per truck. Fuel consumption rates of other vehicle types fell: passenger cars down 21 percent and other vehicles down 20 percent.

**Figure 33. Motor Vehicle Fuel Rates**



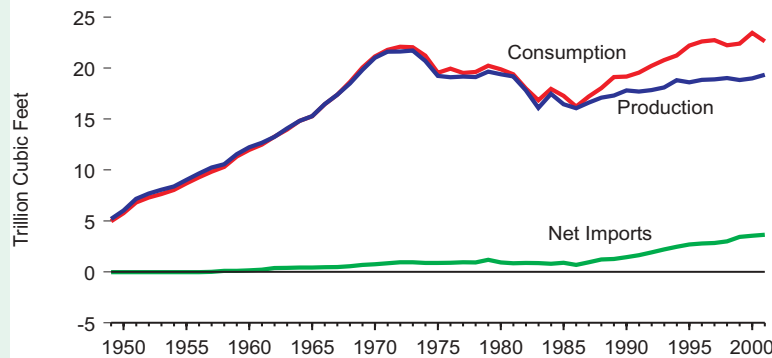
<sup>1</sup> Sport-utility vehicle. <sup>2</sup> Motorcycles are included through 1989.

Since 1976, the average fuel rates (miles per gallon) of passenger cars and vans, pickup trucks, and sport utility vehicles trended upward, starting the new century with much better rates than they had a quarter century earlier. The truck fuel rate, however, declined each year from 1998 through 2000.

Note: Motor vehicles include passenger cars, motorcycles, vans, pickup trucks, sport utility vehicles, trucks, and buses.

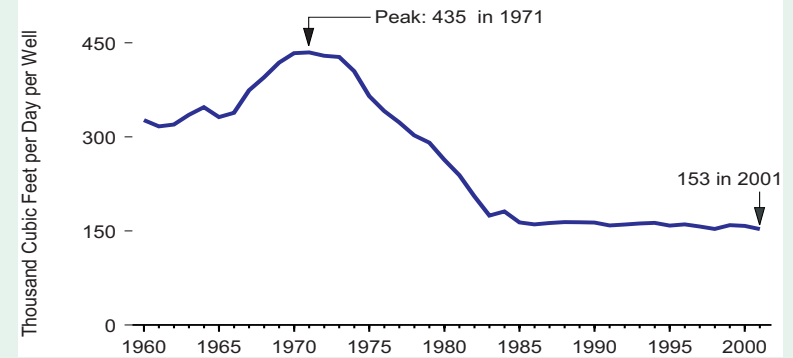
# Natural Gas

**Figure 34. Natural Gas Overview**



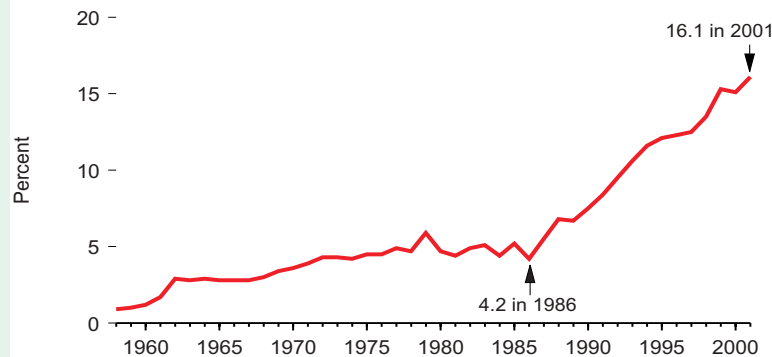
U.S. natural gas production and consumption were nearly in balance through 1986. When consumption began to outpace production, imports of natural gas rose to meet U.S. requirements for the fuel. In 2001, consumption stood at 22.6 trillion cubic feet (Tcf), production at 19.4 Tcf, and net imports at 3.6 Tcf.

**Figure 35. Natural Gas Well Productivity**



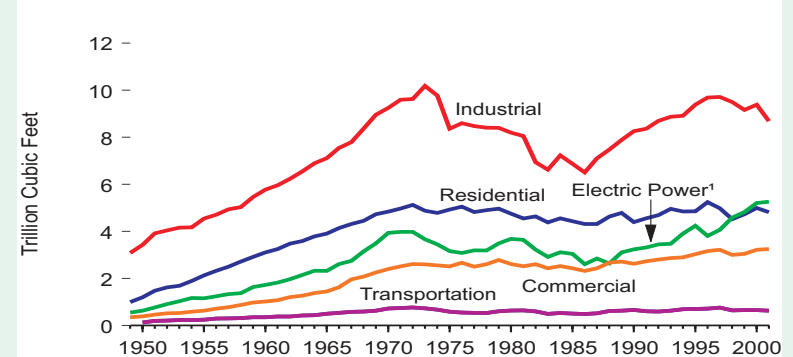
Gas well productivity, measured as gross withdrawals per day per well, grew rapidly in the late 1960s, peaked in 1971, and then fell sharply until the mid-1980s. Productivity remained nearly steady after 1985. The 2001 rate of 153 thousand cubic feet per day per well was 65 percent below the 1971 peak level.

**Figure 36. Net Imports as Share of Consumption**



Net imports as a share of consumption registered in the 4-to-5 percent range in the 1970s and early 1980s. Net imports measured 4.2 percent of consumption in 1986, which was followed by consumption increases that outpaced production growth. Net imports expanded, and in 2001 accounted for 16.1 percent of consumption.

**Figure 37. Natural Gas Consumption by Sector**

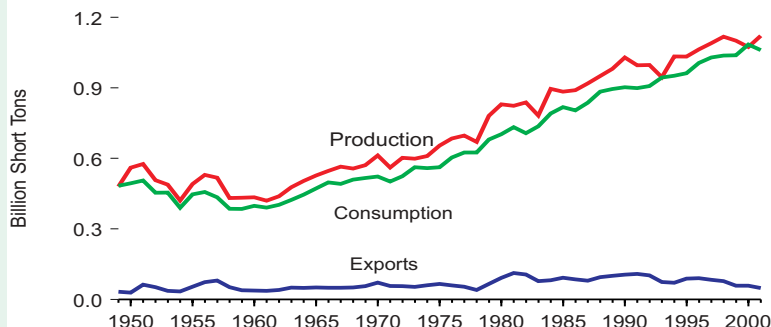


<sup>1</sup> Through 1988, electric utilities only; after 1988, includes independent power producers.

The industrial sector was both the largest consuming sector of natural gas and the sector with the greatest volatility over the years due to variability in industrial output. The electric power sector accounted for nearly one-fourth of all natural gas consumption in 2001.

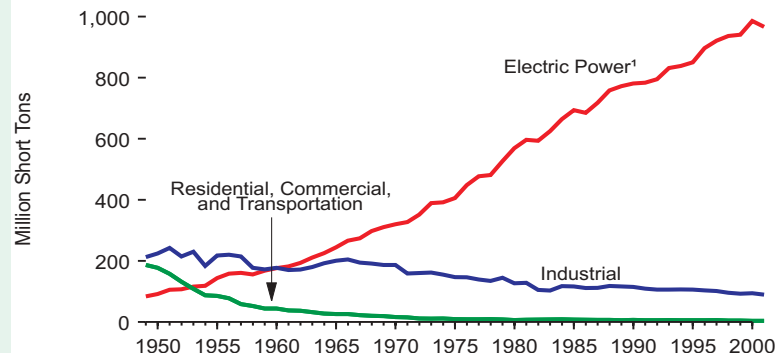
# Coal

**Figure 38. Coal Overview**



Unlike petroleum or natural gas, domestic supplies of coal nearly always outpaced U.S. consumption of the resource. Coal exports peaked at 113 million short tons in 1981. In 2001, the United States exported 49 million short tons, over a third of it to Canada.

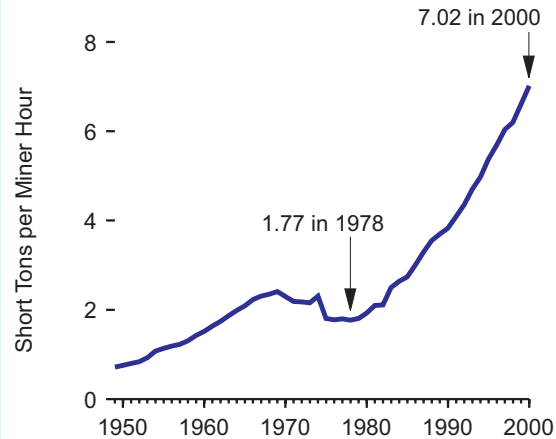
**Figure 39. Coal Consumption by Sector**



<sup>1</sup> Through 1988, electric utilities only; after 1988, includes independent power producers.

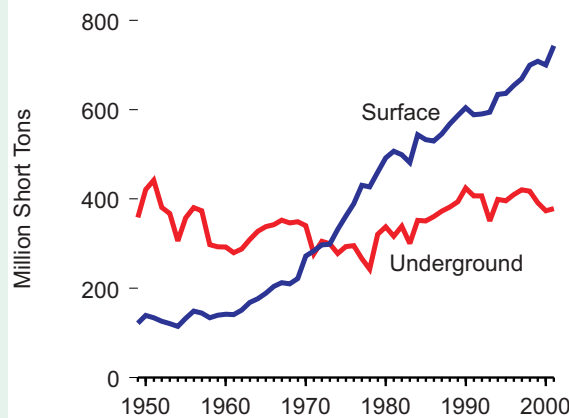
In the 1950s, most coal was consumed in the industrial sector, many homes were still heated by coal, and the transportation sector consumed coal in steam-driven trains and ships. By the 1960s, most coal was used for generating electricity and by 2001 the electric power sector's share stood at 91 percent of all coal consumption.

**Figure 40. Coal Mining Productivity**



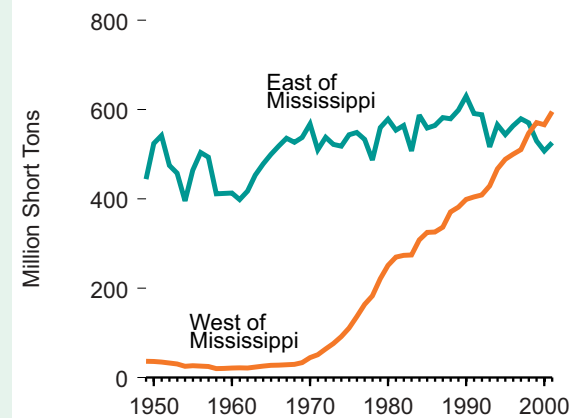
Improved mining technology and the shift toward more surface-mined coal promoted increased productivity from the Nation's mines after 1978.

**Figure 41. Production by Mining Method**



Most growth of coal production came from surface mines, which surpassed underground production after 1973.

**Figure 42. Production by Location**

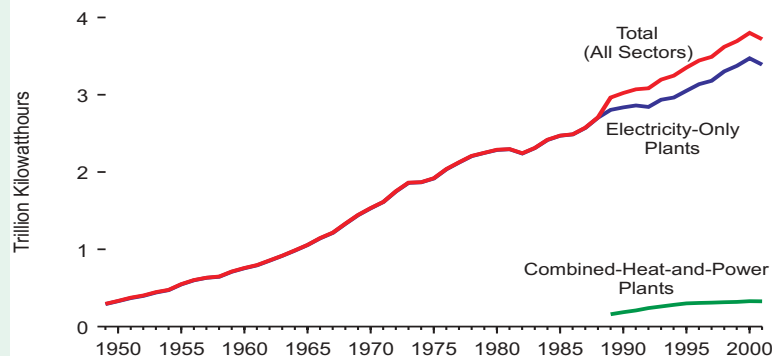


Western coal production expanded tremendously after 1969 and exceeded production from the East beginning in 1999.



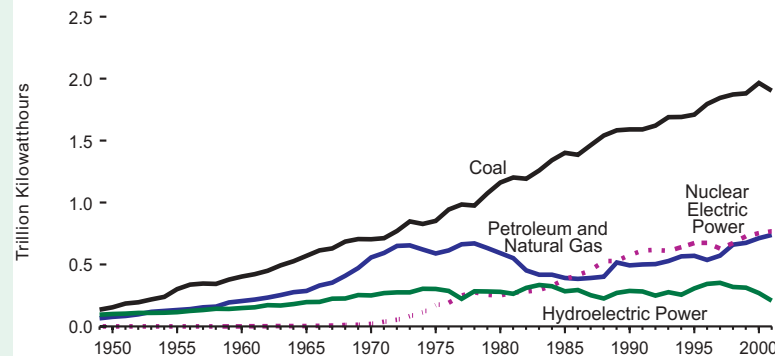
# Electricity Generation and Useful Thermal Output

**Figure 43. Electric Power Net Generation**



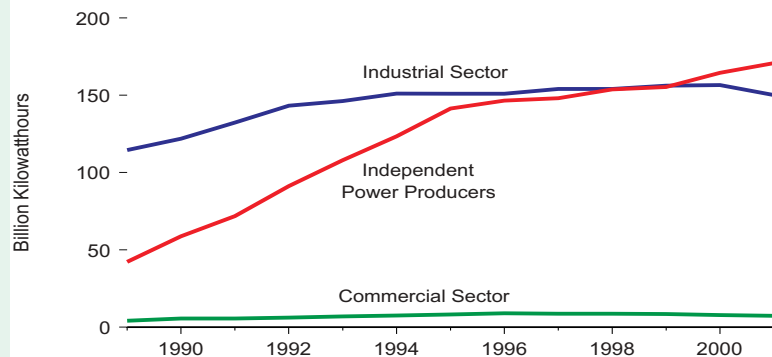
Electric power generation grew from 0.3 trillion kilowatthours in 1949 to 3.7 trillion kilowatthours in 2001. Over the entire span, electricity net generation failed to increase in only two recession-affected years, 1982 and 2001, when 2-percent decreases were recorded.

**Figure 44. Major Sources of Net Generation**



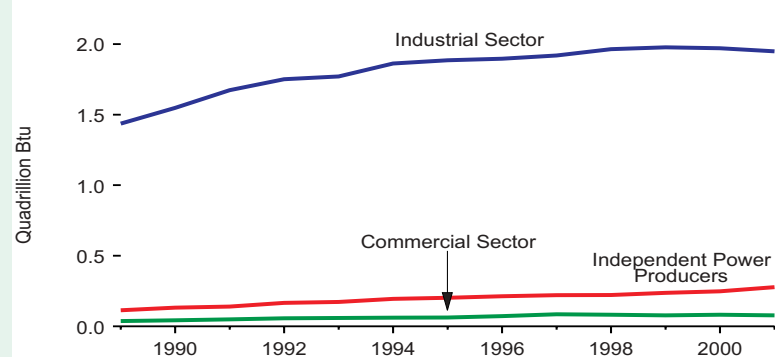
Most net generation of electricity came from coal. In fact, in 2001, fossil fuels (coal, petroleum, and natural gas) accounted for 71 percent of all net generation, while nuclear electric power contributed 21 percent, and renewable energy resources 8 percent. Most net generation from renewable energy resources was derived from hydroelectric power.

**Figure 45. Net Generation at Combined-Heat-and- Power Plants**



Some facilities exist to produce only electricity; others function as combined-heat-and-power (CHP) plants that produce both electricity and heat from a single heat source. Some paper mills and refineries, which are part of the industrial sector, operate as CHP plants, and some commercial sector facilities, such as hospitals and college campuses, are CHP facilities.

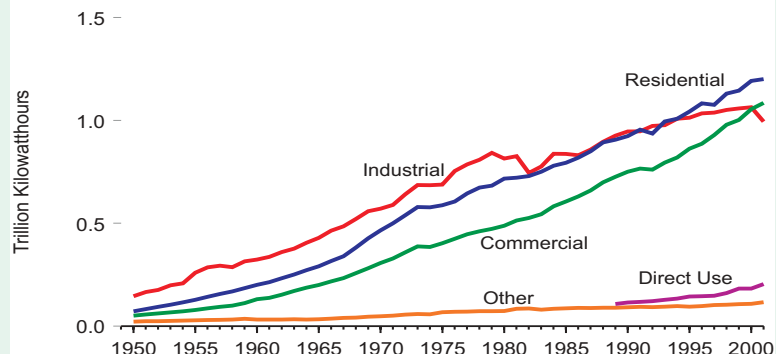
**Figure 46. Useful Thermal Output at Combined-Heat- and- Power Plants**



The non-electrical output at a combined-heat-and-power (CHP) plant is called useful thermal output. Useful thermal output is thermal energy that is available from the plant for use in industrial or commercial processes or heating or cooling applications. In 2001, nearly 2 quadrillion Btu of useful thermal output was created by the industrial sector.

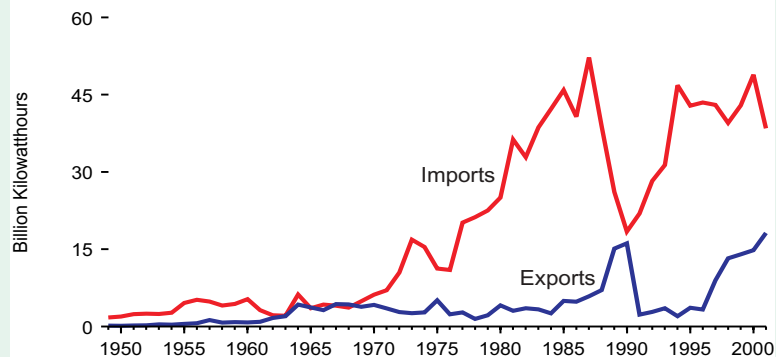
# Electricity Sales, Prices, and Trade

**Figure 47. Retail Sales by Sector**



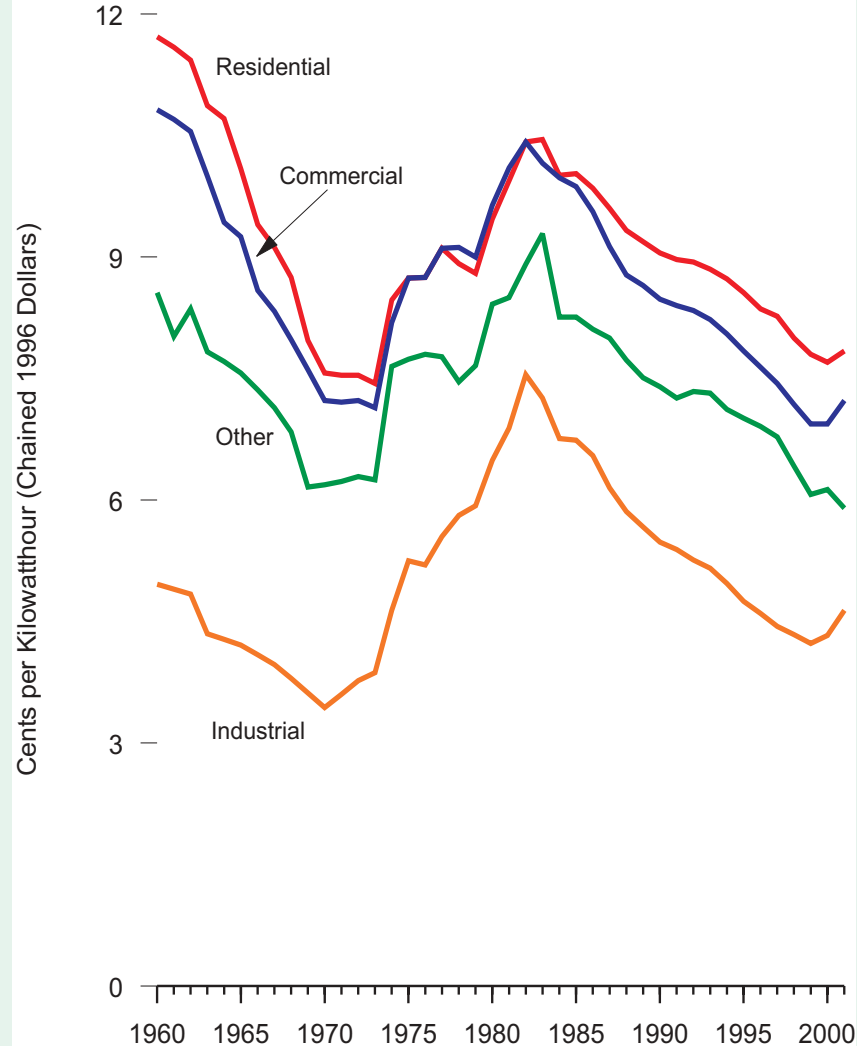
After mid-century, enormous growth occurred in electricity sales in all three major sectors—residential, industrial, and commercial. Beginning in 1993, residential sales surpassed industrial sales. The industrial sector’s use of electricity showed the greatest volatility, especially from the late 1970s through the mid 1980s.

**Figure 49. Electricity Trade**



Except for a few years in the 1960s when imported and exported electricity were nearly equal, the United States imported more electricity than it exported. Most electricity trade occurred with Canada, with smaller exchanges between the United States and Mexico. In 2001, net imported electricity was less than 1 percent of all electricity used in the United States.

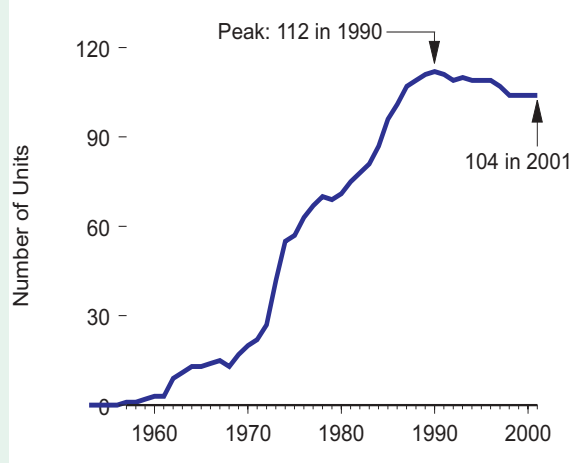
**Figure 48. Average Real Retail Prices of Electricity by Sector**



In inflation-adjusted terms, most electricity sector prices fell steeply in the 1960s, reversed course around 1970 to rise sharply through the early 1980s, and then recorded a pattern of steady decline until 2001, when prices turned up again. Over the decades, industrial consumers paid the lowest rates for electricity; residential customers usually paid the highest prices. In 2001, all sectors paid lower rates than they had in 1960, when adjusted for inflation.

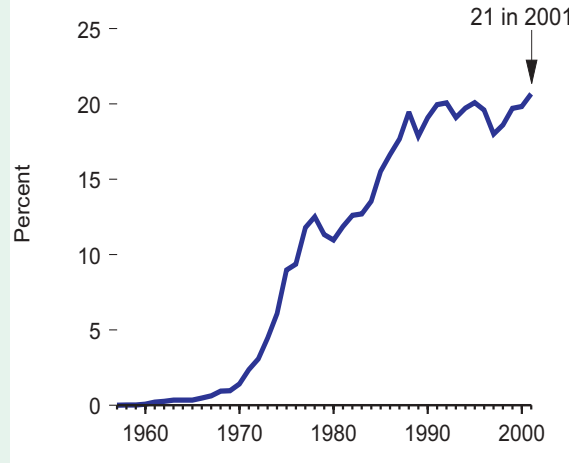
# Nuclear Electric Power

**Figure 50. Number of Operable Units**



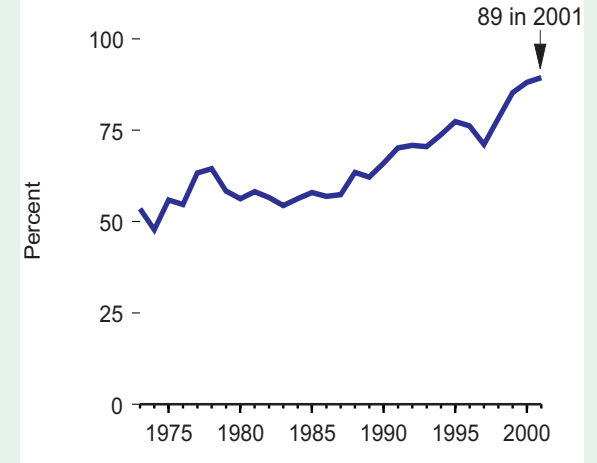
In 1957, a new plant in Shippingport, Pennsylvania, became the first operable nuclear electric plant in the United States. Many new units became operable in the 1970s and 1980s.

**Figure 51. Nuclear's Share of Electricity**



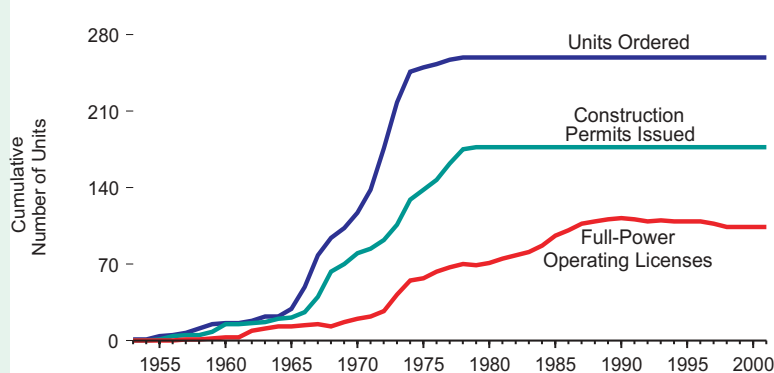
Over the latter part of the last century, nuclear electric power played a key role in meeting the Nation's rapidly growing electricity requirement. In 2001, 21 percent of all U.S. electricity came from nuclear electric

**Figure 52. Capacity Factors**



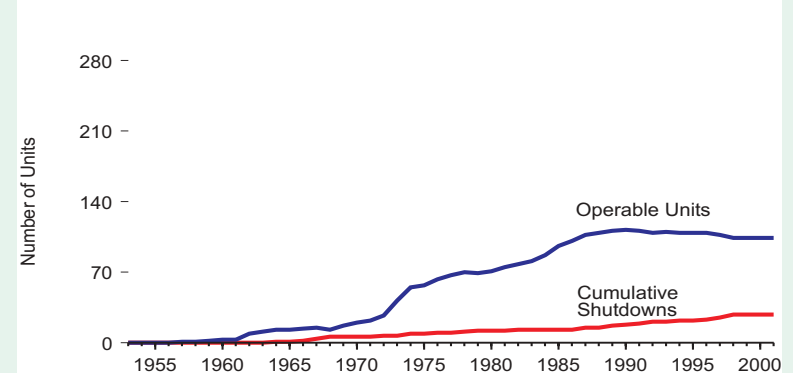
Capacity factors measure actual power generation as a share of maximum possible output. Factors for the industry were in the 50-to-60 percent range through the 1980s, but improved to 89 percent by 2001.

**Figure 53. Cumulative Unit Orders, Permits, and Licenses**



A total of 259 nuclear electric power units have been ordered over the history of the industry in the United States. The last new orders were placed in 1978. Of the 259 orders, 177 advanced to the issuance of construction permits and, of those, 132 gained full-power operating licenses.

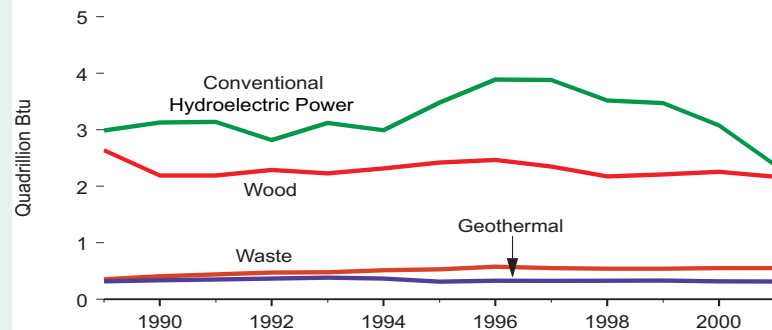
**Figure 54. Operable Units and Cumulative Shutdowns**



Out of the 132 units that were granted full-power operating licenses, over time 28 were shut down permanently. The largest number of units ever operable in the United States was 112 in 1990. From 1998 through 2001, 104 units were operable.

# Renewable Energy

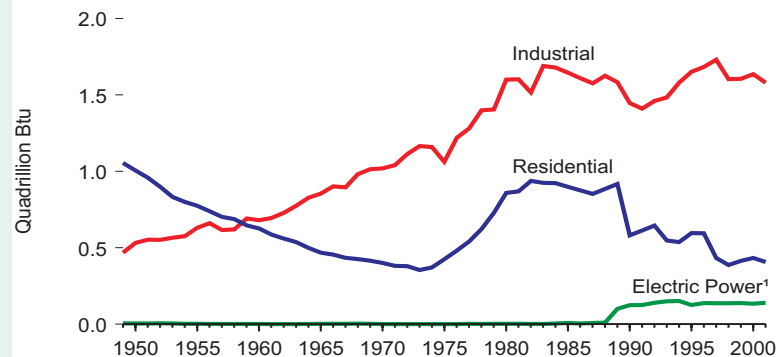
**Figure 55. Renewable Energy Consumption by Source**



Note: Wood includes wood, black liquor, and other wood waste.

Total U.S. renewable energy consumption, which stood at about 7 quadrillion Btu per year from 1995 to 1999, fell in 2000 and 2001. Conventional hydroelectric power, which accounted for about half of the total, declined steeply in 2000 and 2001. Wood was the next largest source of renewable energy, followed by waste and geothermal. Smaller quantities came from alcohol fuels, solar, and wind.

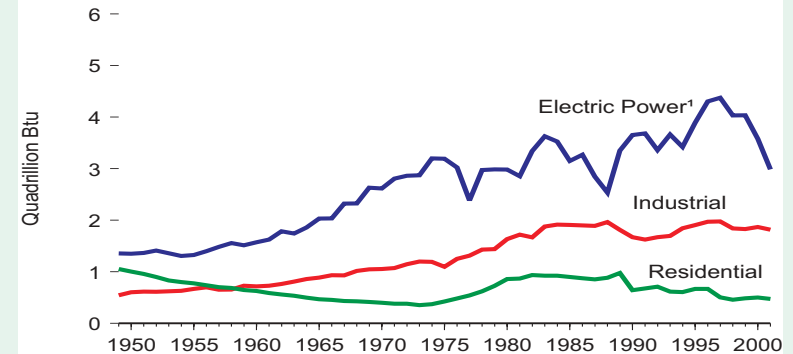
**Figure 57. Wood Consumption by Selected Sector**



<sup>1</sup> Through 1988, electric utilities only; after 1988, includes independent power producers.

Except for the period from 1974 through 1982, residential use of wood generally declined over the second half of the 20th century, while the industrial sector's use of wood, mainly black liquor, expanded. Twenty-two percent of all wood consumed in 2001 was used to generate electricity. Commercial use of wood was very small.

**Figure 56. Renewable Energy Consumption by Sector**



<sup>1</sup> Through 1988, electric utilities only; after 1988, includes independent power producers.

Most renewable energy was consumed by the electric power sector to generate electricity. After 1958, the industrial sector was the second largest consuming sector of renewable energy, mostly black liquor, a by-product of paper production. Residential sector usage of renewable energy (mostly wood) was the third largest consuming sector.

**Figure 58. Solar Collector Shipments and Trade**

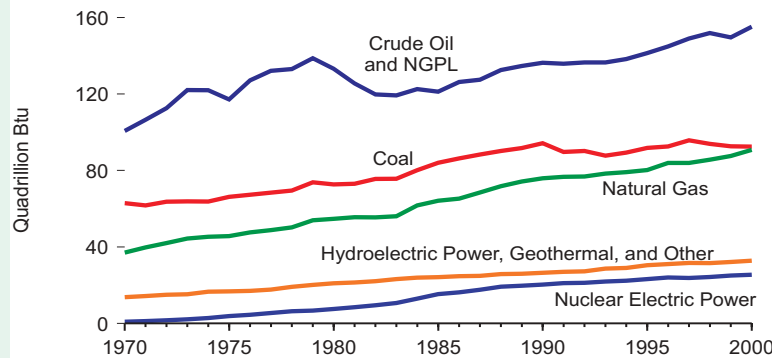


Note: Data were not collected for 1985. Shipments include all domestically manufactured collectors plus imports.

Solar collector total shipments peaked in 1981 at 21 million square feet. From 1991 through 2000, the level of shipments was about 7 to 8 million square feet per year. Since 1983, imports of solar collectors exceeded exports, and the imports trend was generally increasing.

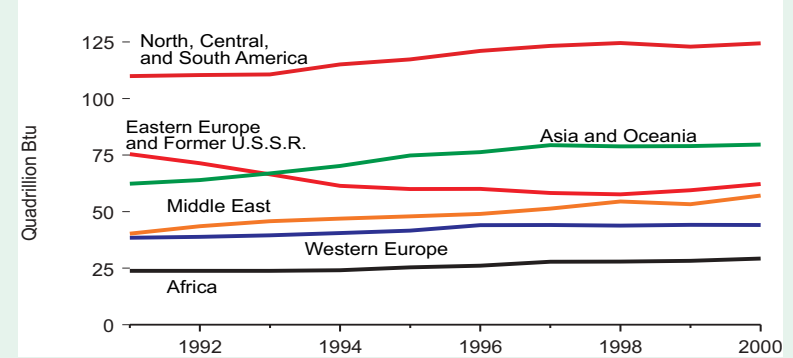
# International Energy

**Figure 59. World Primary Energy Production by Source**



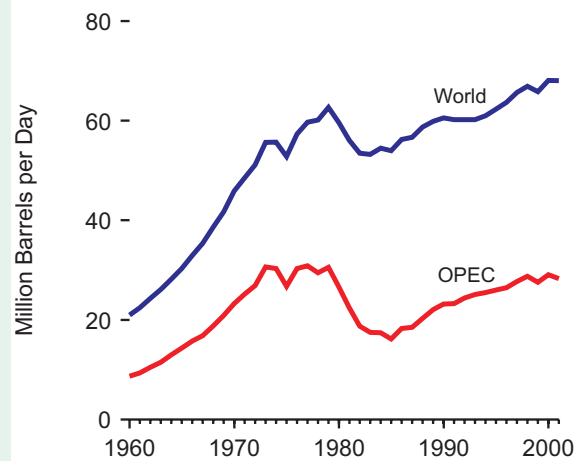
From 1970 to 2000, world primary energy production grew by 84 percent. Growth occurred in all types of energy. In 2000, fossil fuels accounted for 85 percent of all energy produced worldwide, renewable energy 8 percent, and nuclear power 6 percent.

**Figure 60. World Primary Energy Production by Region**



One-third of the 397 quadrillion Btu of energy produced worldwide in 2000 came from North, Central, and South America. Between 1991 and 2000, total primary energy production grew in all major regions of the world except Eastern Europe and the Former U.S.S.R., where production fell by 18 percent.

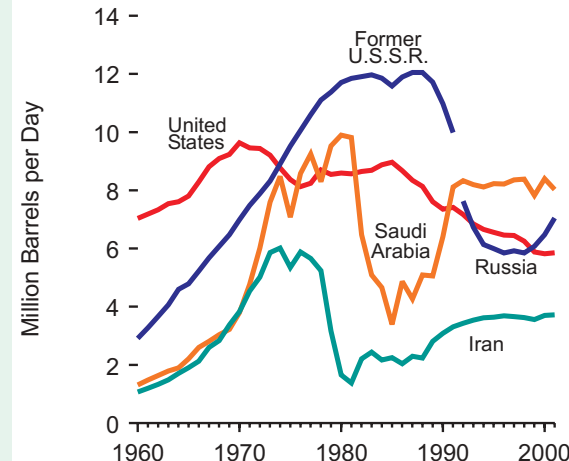
**Figure 61. World Crude Oil Production**



OPEC = Organization of Petroleum Exporting Countries.

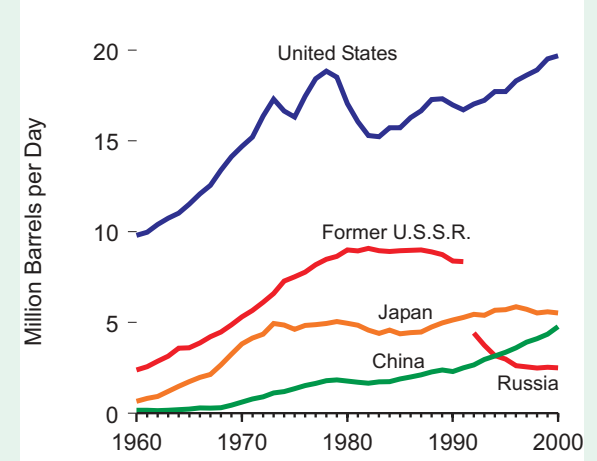
World crude oil production was 68 million barrels per day in 2000 and 2001. OPEC's share fell from 55 percent in 1973 to 42 percent in 2001.

**Figure 62. Leading Crude Oil Producers**



After 1991, Saudi Arabia was the largest producer. U.S. production peaked in 1970. After 1998, Russia's production surpassed U.S. output.

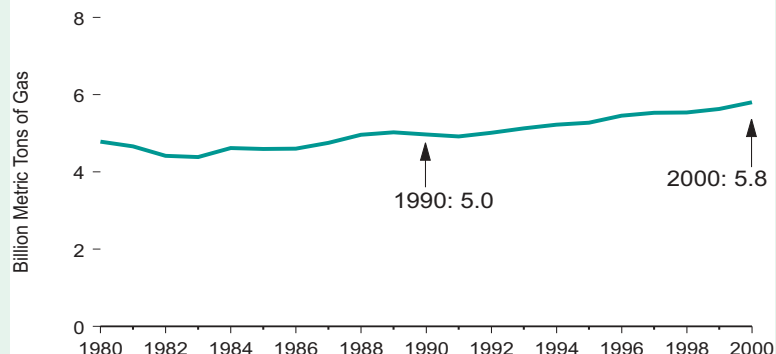
**Figure 63. Leading Petroleum Consumers**



The United States accounted for 26 percent of world consumption of petroleum in 2000. Japan and China accounted for 7 and 6 percent, respectively.

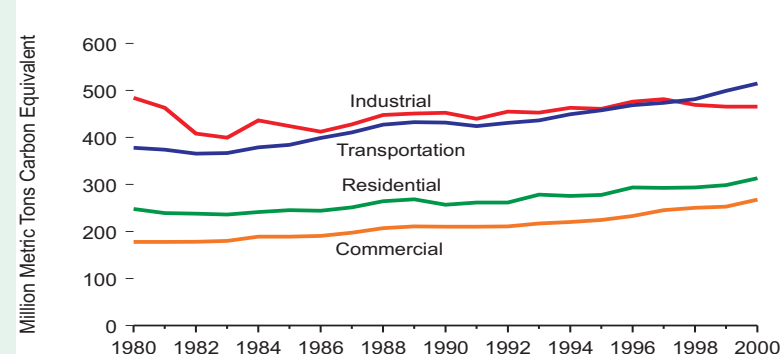
# Carbon Dioxide Emissions

**Figure 64. Carbon Dioxide Emissions**



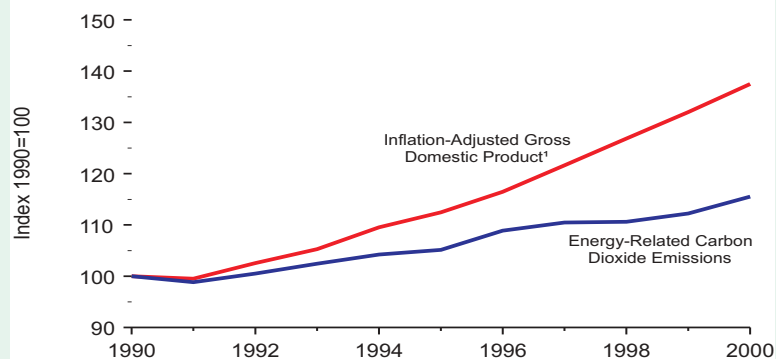
In the United States, fossil fuel combustion is responsible for 98 percent of all emissions from carbon dioxide, which is the most significant greenhouse gas. Total carbon dioxide emissions reached 5.8 billion metric tons of gas in 2000, 17 percent higher than the 1990 level.

**Figure 65. Carbon Dioxide Emissions From Energy Use**



The level of carbon dioxide emissions generated by the industrial sector exceeded other sector levels until 1998 when it was surpassed by transportation emissions. Commercial sector emissions, the smallest of the four sectors, registered the largest percentage gain, 27, from 1990 to 2000.

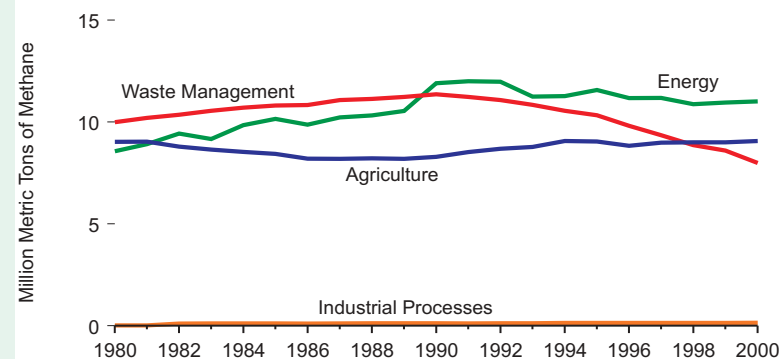
**Figure 66. GDP Growth and Carbon Dioxide Emissions**



<sup>1</sup> Based on chained (1996) dollars.

While gross domestic product (GDP) grew by 38 percent from 1990 to 2000, energy-related carbon dioxide emissions grew by 16 percent. It was primarily the use of less energy per unit of economic output, rather than the use of low-carbon fuels, that held the rate of carbon dioxide emissions growth below that of the inflation-adjusted gross domestic product.

**Figure 67. Methane Emissions by Sector**



In 2000, methane emissions accounted for 9 percent of total U.S. greenhouse gas emissions, weighted by global warming potential. Most methane emissions come from energy, agricultural activities, and waste management. The production, processing, and distribution of natural gas accounted for two-thirds of all energy-related methane emissions in 2000.

## Figure Sources

Data for “Energy Perspectives” figures and text are derived from the following *Annual Energy Review 2001* tables and other sources as cited.

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# Energy Overview

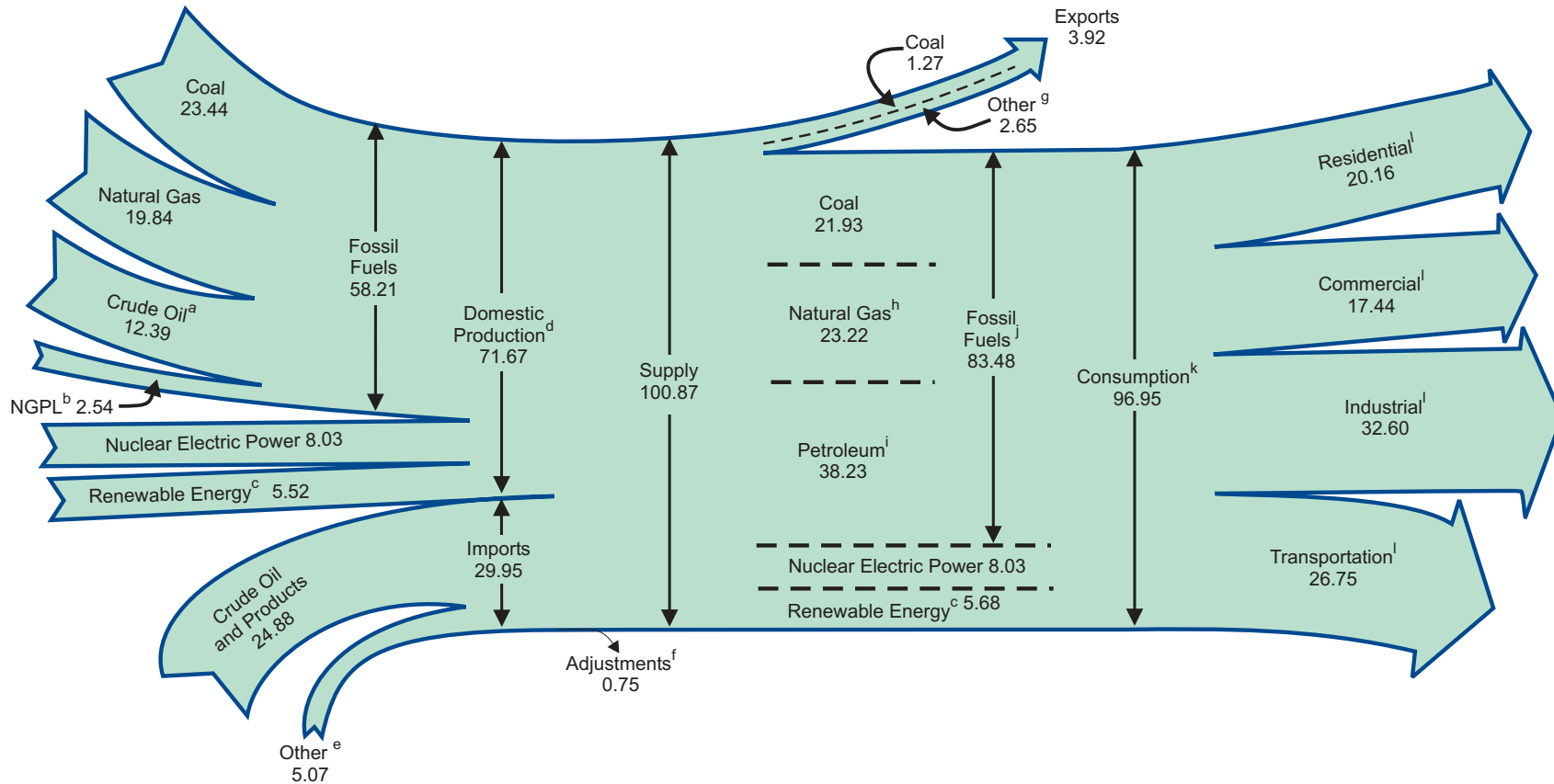


The United States at night from orbit. Source: National Oceanographic and Atmospheric Administration satellite imagery; mosaic provided by U.S. Geological Survey.





**Diagram 1. Energy Flow, 2001**  
(Quadrillion Btu)

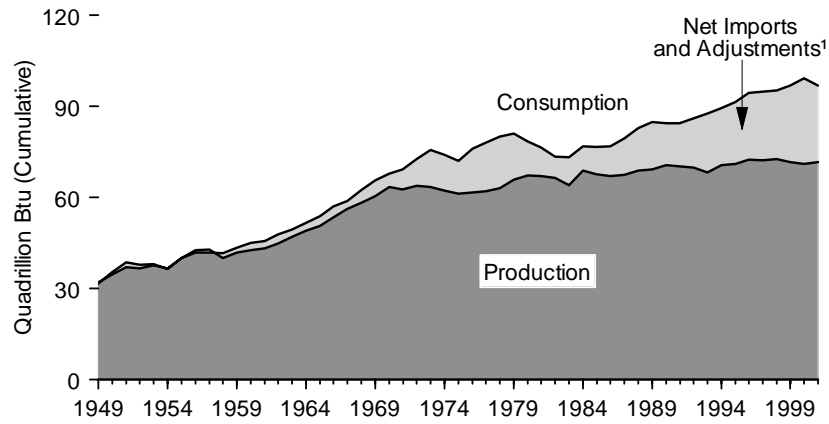


<sup>a</sup> Includes lease condensate.  
<sup>b</sup> Natural gas plant liquids.  
<sup>c</sup> Conventional hydroelectric power, wood, waste, ethanol blended into motor gasoline, geothermal, solar, and wind.  
<sup>d</sup> Includes -0.09 quadrillion Btu hydroelectric pumped storage.  
<sup>e</sup> Natural gas, coal, coal coke, and electricity.  
<sup>f</sup> Stock changes, losses, gains, miscellaneous blending components, and unaccounted-for supply.  
<sup>g</sup> Crude oil, petroleum products, natural gas, electricity, and coal coke.  
<sup>h</sup> Includes supplemental gaseous fuels.  
<sup>i</sup> Petroleum products, including natural gas plant liquids.

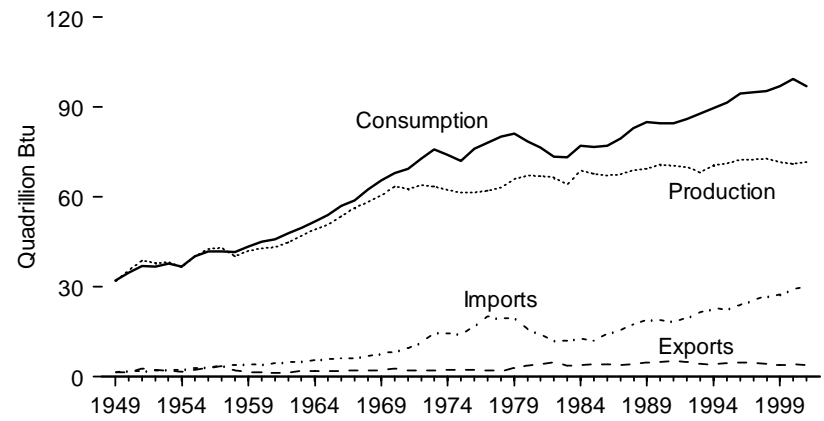
<sup>j</sup> Includes, in quadrillion Btu, 0.04 coal coke net imports and 0.05 electricity net imports from fossil fuels.  
<sup>k</sup> Includes, in quadrillion Btu, -0.09 hydroelectric pumped storage and -0.15 ethanol blended into motor gasoline, which is accounted for in both fossil fuels and renewable energy but counted only once in total consumption.  
<sup>l</sup> Primary consumption, electricity retail sales, and electrical system energy losses, which are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Note 1 at end of Electricity section.  
 Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.  
 Sources: Tables 1.1, 1.2, 1.3, 1.4, and 2.1a.

**Figure 1.1 Energy Overview**

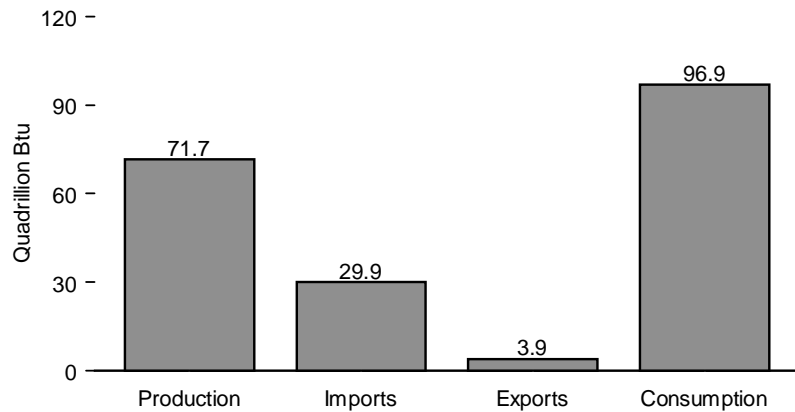
**Overview, 1949-2001**



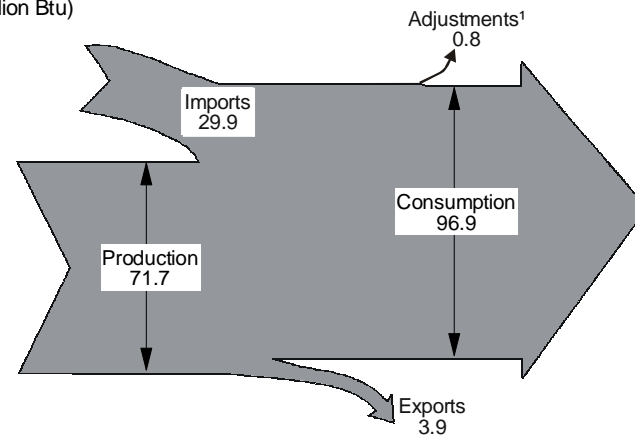
**Overview, 1949-2001**



**Overview, 2001**



**Energy Flow, 2001**  
(Quadrillion Btu)



<sup>1</sup> Stock changes, losses, gains, miscellaneous blending components, and unaccounted-for supply.

Source: Table 1.1.

**Table 1.1 Energy Overview, 1949-2001**  
(Quadrillion Btu)

Year	Production				Imports		Exports		Adjustments <sup>8</sup>	Consumption			
	Fossil Fuels <sup>1</sup>	Nuclear Electric Power <sup>2</sup>	Renewable Energy <sup>3</sup>	Total <sup>4</sup>	Petroleum <sup>5</sup>	Total <sup>6</sup>	Coal	Total <sup>7</sup>		Fossil Fuels <sup>9</sup>	Nuclear Electric Power <sup>2</sup>	Renewable Energy <sup>10</sup>	Total <sup>4,11</sup>
1949	28.75	0	2.97	31.72	1.43	1.47	0.88	1.59	0.40	29.00	0	3.00	32.00
1950	32.56	0	2.98	35.54	1.89	1.93	0.79	1.47	-1.37	31.63	0	3.00	34.63
1951	35.79	0	2.96	38.75	1.87	1.92	1.68	2.62	-1.05	34.01	0	2.99	37.00
1952	34.98	0	2.94	37.92	2.11	2.17	1.40	2.37	-0.95	33.80	0	2.97	36.77
1953	35.35	0	2.83	38.18	2.28	2.34	0.98	1.87	-0.96	34.83	0	2.86	37.68
1954	33.76	0	2.75	36.52	2.32	2.37	0.91	1.70	-0.53	33.88	0	2.78	36.66
1955	37.36	0	2.78	40.15	2.75	2.83	1.46	2.29	-0.44	37.41	0	2.83	40.24
1956	39.77	0	2.85	42.62	3.17	3.25	1.98	2.95	-1.13	38.89	0	2.90	41.79
1957	40.13	(s)	2.85	42.98	3.46	3.57	2.17	3.45	-1.29	38.93	(s)	2.89	41.82
1958	37.22	(s)	2.92	40.13	3.72	3.92	1.42	2.06	-0.32	38.72	(s)	2.95	41.67
1959	39.05	(s)	2.90	41.95	3.91	4.11	1.05	1.54	-1.03	40.55	(s)	2.94	43.49
1960	39.87	0.01	2.93	42.80	4.00	4.23	1.02	1.48	-0.43	42.14	0.01	2.98	45.12
1961	40.31	0.02	2.95	43.28	4.19	4.46	0.98	1.38	-0.60	42.76	0.02	2.98	45.76
1962	41.73	0.03	3.12	44.88	4.56	5.01	1.08	1.48	-0.57	44.68	0.03	3.12	47.83
1963	44.04	0.04	3.10	47.17	4.65	5.10	1.36	1.85	-0.78	46.51	0.04	3.10	49.65
1964	45.79	0.04	3.23	49.06	4.96	5.49	1.34	1.84	-0.87	48.54	0.04	3.25	51.83
1965	47.23	0.04	3.40	50.68	5.40	5.92	1.38	1.85	-0.72	50.58	0.04	3.40	54.02
1966	50.04	0.06	3.43	53.53	5.63	6.18	1.35	1.85	-0.83	53.51	0.06	3.45	57.02
1967	52.60	0.09	3.69	56.38	5.56	6.19	1.35	2.15	-1.52	55.13	0.09	3.69	58.91
1968	54.31	0.14	3.78	58.23	6.21	6.93	1.38	2.03	-0.71	58.50	0.14	3.77	62.41
1969	56.29	0.15	4.10	60.54	6.90	7.71	1.53	2.15	-0.47	61.36	0.15	4.11	65.63
1970	59.19	0.24	4.08	63.50	7.47	8.39	1.94	2.66	-1.37	63.52	0.24	4.10	67.86
1971	58.04	0.41	4.27	62.72	8.54	9.58	1.55	2.18	-0.82	64.60	0.41	4.31	69.31
1972	58.94	0.58	4.40	63.92	10.30	11.46	1.53	2.14	-0.48	67.70	0.58	4.48	72.76
1973	58.24	0.91	4.43	63.58	13.47	14.73	1.43	2.05	-0.46	70.32	0.91	4.58	75.81
1974	56.33	1.27	4.77	62.37	13.13	14.41	1.62	2.22	-0.48	67.91	1.27	4.90	74.08
1975	54.73	1.90	4.72	61.36	12.95	14.11	1.76	2.36	-1.07	65.35	1.90	4.79	72.04
1976	54.72	2.11	4.77	61.60	15.67	16.84	1.60	2.19	-0.18	69.10	2.11	4.86	76.07
1977	55.10	2.70	4.25	62.05	18.76	20.09	1.44	2.07	-1.95	70.99	2.70	4.43	78.12
1978	55.07	3.02	5.04	63.14	17.82	19.25	1.08	1.93	-0.34	71.86	3.02	5.24	80.12
1979	58.01	2.78	5.17	65.95	17.93	19.62	1.75	2.87	-1.65	72.89	2.78	5.38	81.04
1980	59.01	2.74	5.49	67.24	14.66	15.97	2.42	3.72	-1.05	69.98	2.74	5.71	78.44
1981	58.53	3.01	5.47	67.01	12.64	13.97	2.94	4.33	-0.08	67.75	3.01	5.82	76.57
1982	57.46	3.13	5.99	66.57	10.78	12.09	2.79	4.63	-0.59	64.04	3.13	6.29	73.44
1983	54.42	3.20	6.49	64.11	10.65	12.03	2.04	3.72	0.90	63.29	3.20	6.86	73.32
1984	58.85	3.55	6.43	68.83	11.43	12.77	2.15	3.80	-0.82	66.62	3.55	6.84	76.97
1985	57.54	R4.08	6.03	R67.65	10.61	12.10	2.44	4.23	1.19	66.22	R4.08	6.46	R76.70
1986	56.58	R4.38	6.13	R67.09	13.20	14.44	2.25	4.06	-0.50	66.15	R4.38	6.51	R76.97
1987	57.17	R4.75	5.69	R67.61	14.16	15.76	2.09	3.85	-0.04	68.63	R4.75	6.17	R79.48
1988	57.87	R5.59	5.49	R68.95	15.75	17.56	2.50	4.42	0.89	71.66	R5.59	5.82	R82.99
1989	57.47	R5.60	R6.27	R69.34	17.16	18.96	2.64	4.77	R1.40	R72.95	R5.60	R6.44	R84.93
1990	58.56	R6.10	R6.10	R70.73	17.12	18.95	2.77	4.87	R-0.25	R72.35	R6.10	R6.21	R84.57
1991	57.83	R6.42	R6.13	R70.33	16.35	18.50	2.85	5.16	R0.97	R72.05	R6.42	R6.28	R84.64
1992	57.59	R6.48	5.91	R69.93	16.97	19.58	2.68	4.96	R1.50	R73.57	R6.48	6.13	R86.05
1993	55.74	R6.41	6.16	R68.26	18.51	21.50	1.96	4.28	R2.30	R75.10	R6.41	R6.40	R87.78
1994	57.95	R6.69	R6.06	R70.68	19.24	22.73	1.88	4.08	R0.24	R76.62	R6.69	R6.40	R89.57
1995	57.46	R7.08	R6.67	R71.17	18.88	22.57	2.32	4.54	R2.30	R77.61	R7.08	R6.96	R91.50
1996	58.30	R7.09	R7.14	R72.49	20.29	24.01	2.37	R4.64	R2.66	R80.10	R7.09	R7.45	R94.52
1997	58.76	R6.60	R7.08	R72.39	21.74	25.51	2.19	R4.56	R1.64	R81.20	R6.60	R7.32	R94.97
1998	R59.20	R7.07	R6.56	R72.79	22.91	R26.85	2.09	R4.37	R0.08	R81.65	R7.07	R6.78	R95.34
1999	R57.51	R7.61	R6.58	R71.64	23.13	R27.54	1.53	R3.80	R1.58	R82.75	R7.61	R6.79	R96.97
2000	R57.05	R7.86	R6.20	R71.06	R24.53	R29.31	1.53	R4.09	R3.05	R85.18	R7.86	R6.46	R99.32
2001P	58.21	8.03	5.52	71.67	24.88	29.95	1.27	3.92	-0.75	83.48	8.03	5.68	96.95

<sup>1</sup> Coal, natural gas (dry), crude oil, and natural gas plant liquids.

<sup>2</sup> See Note 1 at end of section.

<sup>3</sup> End-use consumption and electricity net generation.

<sup>4</sup> Also includes hydroelectric pumped storage.

<sup>5</sup> Crude oil and petroleum products. Includes imports into the Strategic Petroleum Reserve.

<sup>6</sup> Also includes natural gas, coal, coal coke, and electricity.

<sup>7</sup> Also includes natural gas, petroleum, coal coke, and electricity.

<sup>8</sup> A balancing item. Includes stock changes, losses, gains, miscellaneous blending components, and unaccounted-for supply.

<sup>9</sup> Coal, coal coke net imports, natural gas, petroleum, and electricity net imports derived from fossil fuels.

<sup>10</sup> End-use consumption, electricity net generation, and electricity net imports derived from renewable energy.

<sup>11</sup> Alcohol (ethanol blended into motor gasoline) is included in consumption values for both "Fossil Fuels" and "Renewable Energy," but is counted only once in total energy consumption.

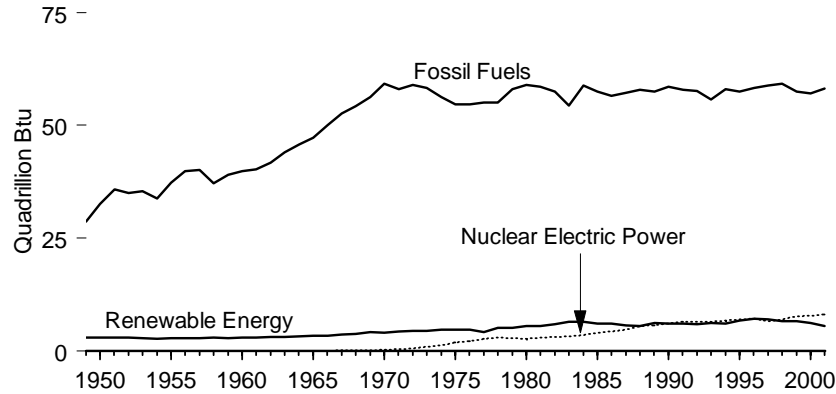
R=Revised. P=Preliminary. (s)=Less than 0.005 quadrillion Btu.

Note: Totals may not equal sum of components due to independent rounding.

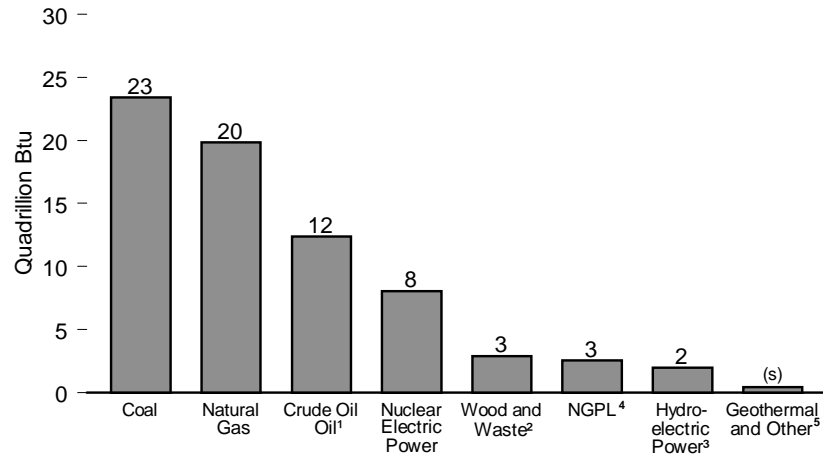
Sources: Tables 1.2, 1.3, and 1.4.

**Figure 1.2 Energy Production by Source**

**By Fossil Fuels, Nuclear Electric Power, and Renewable Energy, 1949-2001**



**By Source, 2001**



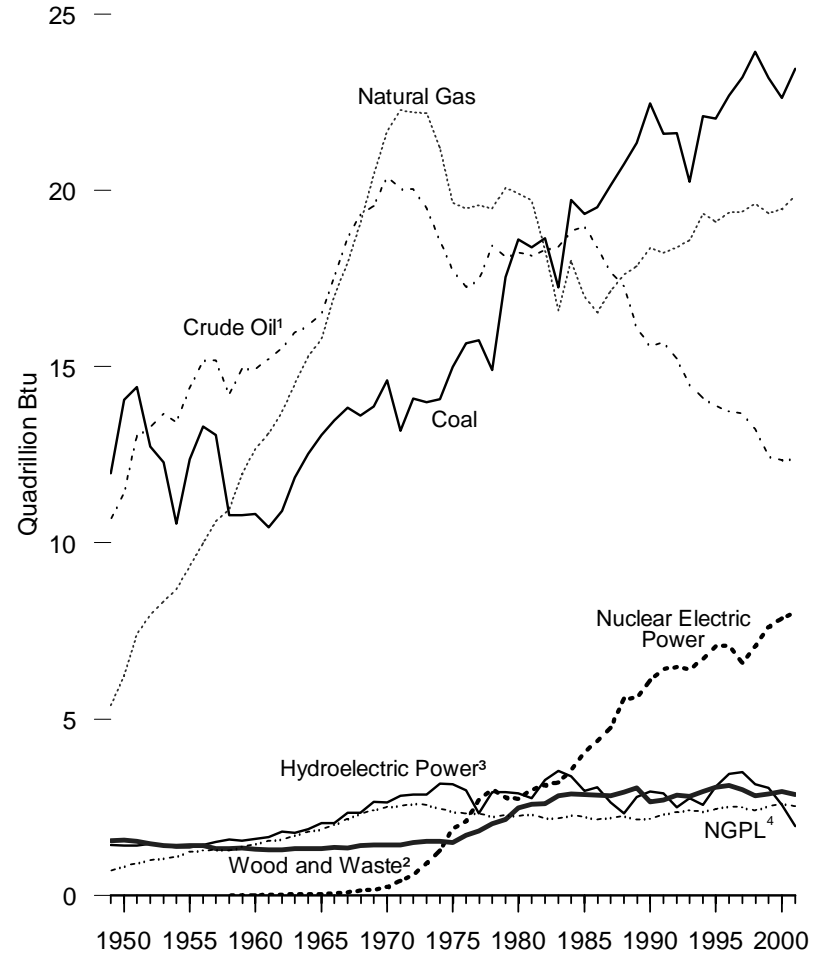
<sup>1</sup> Includes lease condensate.

<sup>2</sup> Includes ethanol blended into motor gasoline.

<sup>3</sup> Conventional and pumped-storage hydroelectric power.

<sup>4</sup> Natural gas plant liquids.

**By Major Source, 1949-2001**



<sup>5</sup> Solar and wind.

(s)=Less than 0.5 quadrillion Btu.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 1.2.

**Table 1.2 Energy Production by Source, 1949-2001**  
(Quadrillion Btu)

Year	Fossil Fuels					Nuclear Electric Power <sup>3</sup>	Hydro-electric Pumped Storage <sup>4</sup>	Renewable Energy <sup>1</sup>					Total	Total
	Coal	Natural Gas (Dry)	Crude Oil <sup>2</sup>	Natural Gas Plant Liquids	Total			Conventional Hydroelectric Power	Wood, Waste, Alcohol <sup>5</sup>	Geothermal	Solar	Wind		
1949	11.974	5.377	10.683	0.714	28.748	0	(6)	1.425	1.549	0	NA	NA	2.974	31.722
1950	14.060	6.233	11.447	0.823	32.563	0	(6)	1.415	1.562	0	NA	NA	2.978	35.540
1951	14.419	7.416	13.037	0.920	35.792	0	(6)	1.424	1.535	0	NA	NA	2.958	38.751
1952	12.734	7.964	13.281	0.998	34.977	0	(6)	1.466	1.474	0	NA	NA	2.940	37.917
1953	12.278	8.339	13.671	1.062	35.349	0	(6)	1.413	1.419	0	NA	NA	2.831	38.181
1954	10.542	8.682	13.427	1.113	33.764	0	(6)	1.360	1.394	0	NA	NA	2.754	36.518
1955	12.370	9.345	14.410	1.240	37.364	0	(6)	1.360	1.424	0	NA	NA	2.784	40.148
1956	13.306	10.002	15.180	1.283	39.771	0	(6)	1.435	1.416	0	NA	NA	2.851	42.622
1957	13.061	10.605	15.178	1.289	40.133	(s)	(6)	1.516	1.334	0	NA	NA	2.849	42.983
1958	10.783	10.942	14.204	1.287	37.216	0.002	(6)	1.592	1.323	0	NA	NA	2.915	40.133
1959	10.778	11.952	14.933	1.383	39.045	0.002	(6)	1.548	1.353	0	NA	NA	2.901	41.949
1960	10.817	12.656	14.935	1.461	39.869	0.006	(6)	1.608	1.320	0.001	NA	NA	2.929	42.804
1961	10.447	13.105	15.206	1.549	40.307	0.020	(6)	1.656	1.295	0.002	NA	NA	2.953	43.280
1962	10.901	13.717	15.522	1.593	41.732	0.026	(6)	1.816	1.300	0.002	NA	NA	3.119	44.877
1963	11.849	14.513	15.966	1.709	44.037	0.038	(6)	1.771	1.323	0.004	NA	NA	3.098	47.174
1964	12.524	15.298	16.164	1.803	45.789	0.040	(6)	1.886	1.337	0.005	NA	NA	3.228	49.056
1965	13.055	15.775	16.521	1.883	47.235	0.043	(6)	2.059	1.335	0.004	NA	NA	3.398	50.676
1966	13.468	17.011	17.561	1.996	50.035	0.064	(6)	2.062	1.369	0.004	NA	NA	3.435	53.534
1967	13.825	17.943	18.651	2.177	52.597	0.088	(6)	2.347	1.340	0.007	NA	NA	3.694	56.379
1968	13.609	19.068	19.308	2.321	54.306	0.142	(6)	2.349	1.419	0.009	NA	NA	3.778	58.225
1969	13.863	20.446	19.556	2.420	56.286	0.154	(6)	2.648	1.440	0.013	NA	NA	4.102	60.541
1970	14.607	21.666	20.401	2.512	59.186	0.239	(6)	2.634	1.431	0.011	NA	NA	4.076	63.501
1971	13.186	22.280	20.033	2.544	58.042	0.413	(6)	2.824	1.432	0.012	NA	NA	4.268	62.723
1972	14.092	22.208	20.041	2.598	58.938	0.584	(6)	2.864	1.503	0.031	NA	NA	4.398	63.920
1973	13.992	22.187	19.493	2.569	58.241	0.910	(6)	2.861	1.529	0.043	NA	NA	4.433	63.585
1974	14.074	21.210	18.575	2.471	56.331	1.272	(6)	3.177	1.540	0.053	NA	NA	4.769	62.372
1975	14.989	19.640	17.729	2.374	54.733	1.900	(6)	3.155	1.499	0.070	NA	NA	4.723	61.357
1976	15.654	19.480	17.262	2.327	54.723	2.111	(6)	2.976	1.713	0.078	NA	NA	4.768	61.602
1977	15.755	19.565	17.454	2.327	55.101	2.702	(6)	2.333	1.838	0.077	NA	NA	4.249	62.052
1978	14.910	19.485	18.434	2.245	55.074	3.024	(6)	2.937	2.038	0.064	NA	NA	5.039	63.137
1979	17.540	20.076	18.104	2.286	58.006	2.776	(6)	2.931	2.152	0.084	NA	NA	5.166	65.948
1980	18.598	19.908	18.249	2.254	59.008	2.739	(6)	2.900	2.485	0.110	NA	NA	5.494	67.241
1981	18.377	19.699	18.146	2.307	58.529	3.008	(6)	2.758	2.590	0.123	NA	NA	5.471	67.007
1982	18.639	18.319	18.309	2.191	57.458	3.131	(6)	3.266	2.615	0.105	NA	NA	5.985	66.574
1983	17.247	16.593	18.392	2.184	54.416	3.203	(6)	3.527	2.831	0.129	NA	(s)	6.488	64.106
1984	19.719	18.008	18.848	2.274	58.849	3.553	(6)	3.386	2.880	0.165	(s)	(s)	6.431	68.832
1985	19.325	16.980	18.992	2.241	57.539	R4.076	(6)	2.970	2.864	0.198	(s)	(s)	6.033	R67.647
1986	19.509	16.541	18.376	2.149	56.575	R4.380	(6)	3.071	2.841	0.219	(s)	(s)	6.132	R67.087
1987	20.141	17.136	17.675	2.215	57.167	R4.754	(6)	2.635	2.823	0.229	(s)	(s)	5.687	R67.608
1988	20.738	17.599	17.279	2.260	57.875	R5.587	(6)	2.334	2.937	0.217	(s)	(s)	5.489	R68.951
1989	21.346	17.847	16.117	2.158	57.468	R5.602	(6)	R2.828	R3.062	R0.306	R0.055	R0.019	R6.271	R69.341
1990	22.456	18.362	15.571	2.175	58.564	R6.104	-0.036	R3.030	R2.661	R0.325	R0.060	R0.024	R6.100	R70.732
1991	21.594	18.229	15.701	2.306	57.829	R6.422	-0.047	R3.001	R2.702	R0.336	R0.063	R0.027	R6.130	R70.334
1992	21.629	18.375	15.223	2.363	57.590	R6.479	-0.043	2.617	R2.847	R0.349	R0.064	0.030	R5.907	R69.933
1993	20.249	18.584	14.494	2.408	55.736	R6.410	-0.042	2.892	R2.804	R0.364	R0.066	0.031	R6.157	R68.262
1994	22.111	19.348	14.103	2.391	57.952	R6.694	-0.035	R2.683	R2.939	R0.338	R0.069	0.036	R6.065	R70.676
1995	22.029	19.101	13.887	2.442	57.458	R7.075	-0.028	R3.205	R3.068	R0.294	R0.070	0.033	R6.669	R71.175
1996	22.684	19.363	13.723	2.530	58.299	R7.087	-0.032	R3.590	R3.127	R0.316	R0.071	R0.033	R7.137	R72.491
1997	23.211	19.394	13.658	2.495	58.758	R6.597	R-0.041	R3.640	R3.006	R0.325	R0.070	R0.034	R7.075	R72.389
1998	23.935	R19.613	13.235	2.420	R59.204	R7.068	-0.046	R3.297	R2.835	R0.328	R0.070	0.031	R6.561	R72.787
1999	23.186	R19.341	12.451	2.528	R57.505	R7.610	R-0.062	R3.268	R2.872	R0.331	R0.069	0.046	R6.585	R71.638
2000	R22.623	R19.461	R12.358	R2.611	R57.054	R7.862	R-0.057	R2.811	R2.948	R0.317	R0.066	R0.057	R6.199	R71.059
2001 <sup>P</sup>	23.441	19.839	12.390	2.541	58.211	8.028	-0.090	2.219	2.869	0.313	0.064	0.059	5.524	71.673

<sup>1</sup> End-use consumption and electricity net generation.

<sup>2</sup> Includes lease condensate.

<sup>3</sup> See Note 1 at end of section.

<sup>4</sup> Pumped storage facility production minus energy used for pumping.

<sup>5</sup> Alcohol is ethanol blended into motor gasoline.

<sup>6</sup> Included in conventional hydroelectric power.

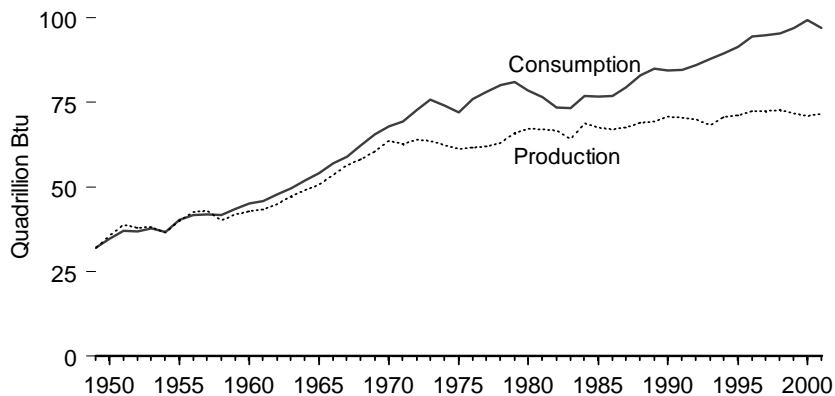
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.0005 quadrillion Btu.

Note: Totals may not equal sum of components due to independent rounding.

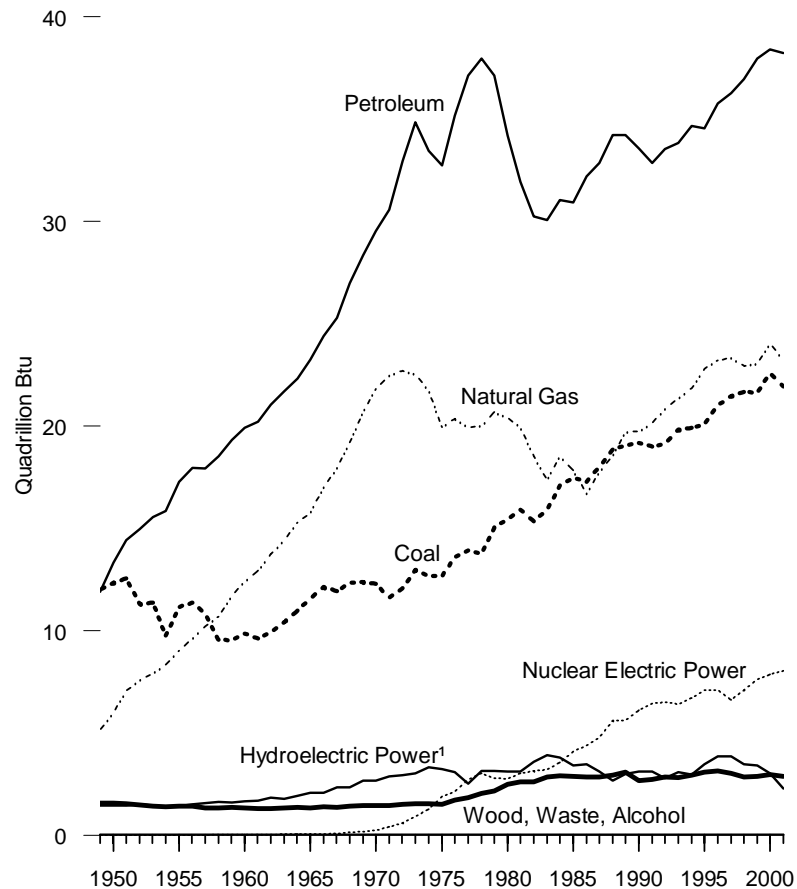
Sources: Tables 5.1, 6.1, 7.1, 8.2a, 10.2a, 10.2b, and A2-A6.

**Figure 1.3 Energy Consumption by Source**

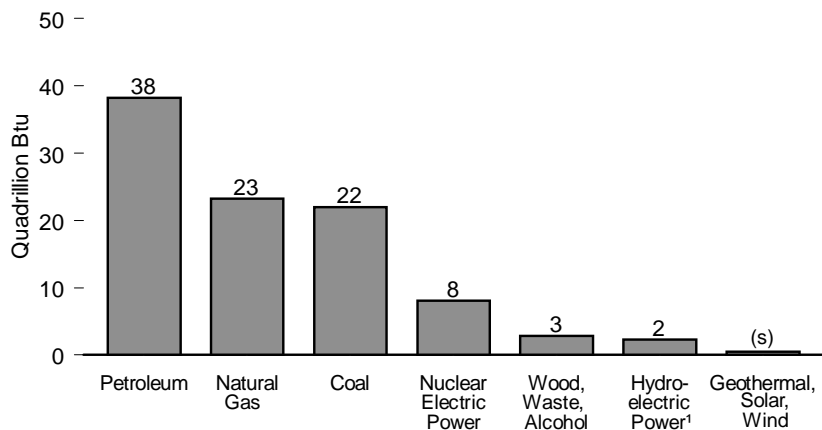
**Production and Consumption, 1949-2001**



**By Major Source, 1949-2001**



**By Source, 2001**



<sup>1</sup> Conventional and pumped-storage hydroelectric power.  
(s)=Less than 0.5 quadrillion Btu.

Note: Because vertical scales differ, graphs should not be compared.  
Sources: Tables 1.2 and 1.3.

**Table 1.3 Energy Consumption by Source, 1949-2001**  
(Quadrillion Btu)

Year	Fossil Fuels					Total	Nuclear Electric Power	Hydro-electric Pumped Storage <sup>5</sup>	Renewable Energy <sup>1</sup>					Total <sup>7</sup>	
	Coal	Coal Coke Net Imports	Natural Gas <sup>2</sup>	Petroleum <sup>3</sup>	Electricity Net Imports <sup>4</sup>				Conventional Hydroelectric Power <sup>6</sup>	Wood, Waste, Alcohol <sup>7</sup>	Geothermal <sup>8</sup>	Solar	Wind		Total
1949	11.981	-0.007	5.145	11.883	(9)	29.002	0	(9)	1.449	1.549	NA	NA	NA	2.998	32.000
1950	12.347	0.001	5.968	13.315	(9)	31.632	0	(9)	1.440	1.562	NA	NA	NA	3.003	34.635
1951	12.553	-0.021	7.049	14.428	(9)	34.008	0	(9)	1.454	1.535	NA	NA	NA	2.988	36.996
1952	11.306	-0.012	7.550	14.956	(9)	33.800	0	(9)	1.496	1.474	NA	NA	NA	2.970	36.770
1953	11.373	-0.009	7.907	15.556	(9)	34.826	0	(9)	1.439	1.419	NA	NA	NA	2.857	37.684
1954	9.715	-0.007	8.330	15.839	(9)	33.877	0	(9)	1.388	1.394	NA	NA	NA	2.783	36.660
1955	11.167	-0.010	8.998	17.255	(9)	37.410	0	(9)	1.407	1.424	NA	NA	NA	2.832	40.242
1956	11.350	-0.013	9.614	17.937	(9)	38.888	0	(9)	1.487	1.416	NA	NA	NA	2.903	41.791
1957	10.821	-0.017	10.191	17.932	(9)	38.926	(s)	(9)	1.557	1.334	NA	NA	NA	2.890	41.816
1958	9.533	-0.007	10.663	18.527	(9)	38.717	0.002	(9)	1.629	1.323	NA	NA	NA	2.952	41.670
1959	9.518	-0.008	11.717	19.323	(9)	40.550	0.002	(9)	1.587	1.353	NA	NA	NA	2.940	43.493
1960	9.838	-0.006	12.385	19.919	(9)	42.137	0.006	(9)	1.657	1.320	0.001	NA	NA	2.977	45.120
1961	9.623	-0.008	12.926	20.216	(9)	42.758	0.020	(9)	1.680	1.295	0.002	NA	NA	2.977	45.755
1962	9.906	-0.006	13.731	21.049	(9)	44.681	0.026	(9)	1.822	1.300	0.002	NA	NA	3.124	47.832
1963	10.413	-0.007	14.403	21.701	(9)	46.509	0.038	(9)	1.772	1.323	0.004	NA	NA	3.099	49.647
1964	10.964	-0.010	15.288	22.301	(9)	48.543	0.040	(9)	1.907	1.337	0.005	NA	NA	3.248	51.831
1965	11.581	-0.018	15.769	23.246	(9)	50.577	0.043	(9)	2.058	1.335	0.004	NA	NA	3.397	54.016
1966	12.143	-0.025	16.995	24.401	(9)	53.514	0.064	(9)	2.073	1.369	0.004	NA	NA	3.446	57.024
1967	11.914	-0.015	17.945	25.284	(9)	55.127	0.088	(9)	2.344	1.340	0.007	NA	NA	3.691	58.906
1968	12.331	-0.017	19.210	26.979	(9)	58.502	0.142	(9)	2.342	1.419	0.009	NA	NA	3.771	62.415
1969	12.382	-0.036	20.678	28.338	(9)	61.362	0.154	(9)	2.659	1.440	0.013	NA	NA	4.113	65.628
1970	12.265	-0.058	21.795	29.521	(9)	63.522	0.239	(9)	2.654	1.431	0.011	NA	NA	4.096	67.858
1971	11.598	-0.033	22.469	30.561	(9)	64.596	0.413	(9)	2.861	1.432	0.012	NA	NA	4.305	69.314
1972	12.077	-0.026	22.698	32.947	(9)	67.696	0.584	(9)	2.944	1.503	0.031	NA	NA	4.478	72.758
1973	12.971	-0.007	22.512	34.840	(9)	70.316	0.910	(9)	3.010	1.529	0.043	NA	NA	4.581	75.808
1974	12.663	0.056	21.732	33.455	(9)	67.906	1.272	(9)	3.309	1.540	0.053	NA	NA	4.902	74.080
1975	12.663	0.014	19.948	32.731	(9)	65.355	1.900	(9)	3.219	1.499	0.070	NA	NA	4.788	72.042
1976	13.584	(s)	20.345	35.175	(9)	69.104	2.111	(9)	3.066	1.713	0.078	NA	NA	4.857	76.072
1977	13.922	0.015	19.931	37.122	(9)	70.989	2.702	(9)	2.515	1.838	0.077	NA	NA	4.431	78.122
1978	13.766	0.125	20.000	37.965	(9)	71.856	3.024	(9)	3.141	2.038	0.064	NA	NA	5.243	80.123
1979	15.040	0.063	20.666	37.123	(9)	72.892	2.776	(9)	3.141	2.152	0.084	NA	NA	5.377	81.044
1980	15.423	-0.035	20.394	34.202	(9)	69.984	2.739	(9)	3.118	2.485	0.110	NA	NA	5.712	78.435
1981	15.908	-0.016	19.928	31.931	(9)	67.750	3.008	(9)	3.105	2.590	0.123	NA	NA	5.818	76.569
1982	15.322	-0.022	18.505	30.232	(9)	64.037	3.131	(9)	3.572	2.615	0.105	NA	NA	6.292	73.441
1983	15.894	-0.016	17.357	30.054	(9)	63.290	3.203	(9)	3.899	2.831	0.129	NA	(s)	6.860	73.317
1984	17.071	-0.011	18.507	31.051	(9)	66.617	3.553	(9)	3.800	2.880	0.165	(s)	(s)	6.845	76.972
1985	17.478	-0.013	17.834	30.922	(9)	66.221	R4.076	(9)	3.398	2.864	0.198	(s)	(s)	6.460	R76.705
1986	17.260	-0.017	16.708	32.196	(9)	66.148	R4.380	(9)	3.446	2.841	0.219	(s)	(s)	6.507	R76.974
1987	18.008	0.009	17.744	32.865	(9)	68.626	R4.754	(9)	3.117	2.823	0.229	(s)	(s)	6.170	R79.481
1988	18.846	0.040	18.552	34.222	(9)	71.660	R5.587	(9)	2.662	2.937	0.217	(s)	(s)	5.817	R82.994
1989	R19.051	0.030	R19.712	34.211	-0.050	R72.954	R5.602	(9)	R2.987	R3.062	R0.317	R0.055	R0.019	R6.441	R84.926
1990	R19.156	0.005	R19.718	33.553	-0.080	R72.352	R6.104	-0.036	R3.128	R2.661	R0.337	R0.060	R0.024	R6.209	R84.567
1991	R18.992	0.010	R20.149	32.845	0.059	R72.055	R6.422	-0.047	R3.139	R2.702	R0.351	R0.063	R0.027	R6.283	R84.640
1992	R19.122	0.035	R20.835	33.527	0.053	R73.572	R6.479	-0.043	2.818	R2.847	R0.368	R0.064	0.030	R6.127	R86.051
1993	R19.835	0.027	R21.351	33.841	0.050	R75.105	R6.410	-0.042	3.119	R2.804	R0.382	R0.066	0.031	R6.403	R87.780
1994	R19.909	0.058	R21.842	34.670	0.140	R76.619	R6.694	-0.035	2.993	R2.939	R0.366	R0.069	0.036	R6.401	R89.571
1995	R20.089	0.061	R22.784	34.553	0.121	R77.608	R7.075	-0.028	R3.480	R3.068	R0.312	R0.070	0.033	R6.962	R91.501
1996	R21.002	R0.035	R23.196	35.757	0.109	R80.100	R7.087	-0.032	R3.889	R3.127	R0.329	R0.071	R0.033	R7.450	R94.521
1997	R21.445	R0.057	R23.327	36.266	R0.107	R81.203	R6.597	R-0.041	R3.881	R3.006	R0.325	R0.070	R0.034	R7.316	R94.969
1998	R21.656	R0.080	R22.934	36.934	R0.047	R81.650	R7.068	-0.046	R3.518	R2.835	R0.329	R0.070	0.031	R6.782	R95.338
1999	R21.623	R0.070	R23.008	37.960	R0.091	R82.751	R7.610	R-0.062	R3.472	R2.872	R0.332	R0.069	0.046	R6.790	R96.968
2000	R22.580	R0.077	R24.042	R38.404	R0.082	R85.184	R7.862	R-0.057	R3.077	R2.948	R0.317	R0.066	R0.057	R6.465	R99.315
2001P	21.928	0.043	23.224	38.232	0.049	83.476	8.028	-0.090	2.376	2.869	0.315	0.064	0.059	5.683	96.950

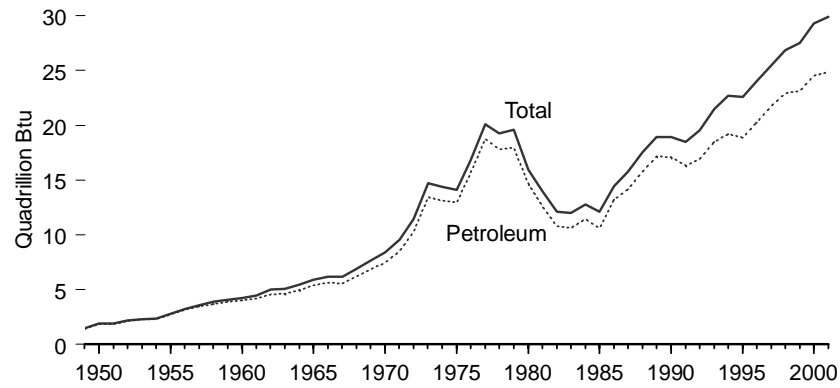
1 End-use consumption, electricity net generation, and net imports of electricity from renewable energy.  
2 Includes supplemental gaseous fuels.  
3 Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel.  
4 Electricity net imports from fossil fuels. May include some nuclear-generated electricity.  
5 Pumped storage facility production minus energy used for pumping.  
6 Through 1988, includes all electricity net imports. From 1989, includes only electricity net imports derived from hydroelectric power.  
7 Alcohol (ethanol blended into motor gasoline) is included in both "Petroleum" and "Alcohol," but is

counted only once in total energy consumption.  
8 From 1989, includes electricity imports from Mexico that are derived from geothermal energy.  
9 Included in conventional hydroelectric power.  
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.0005 and greater than -0.0005 quadrillion Btu.  
Note: Totals may not equal sum of components due to independent rounding.  
Sources: Tables 5.1, 6.1, 7.1, 7.7, 8.1, 8.2a, 10.1, and A2-A6.

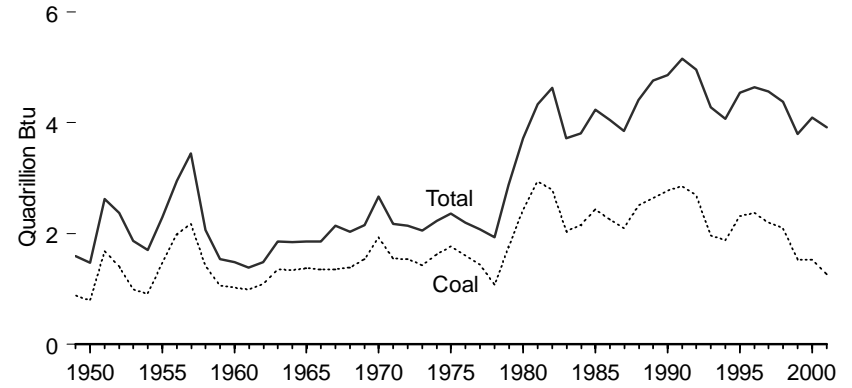


**Figure 1.4 Energy Imports, Exports, and Net Imports, 1949-2001**

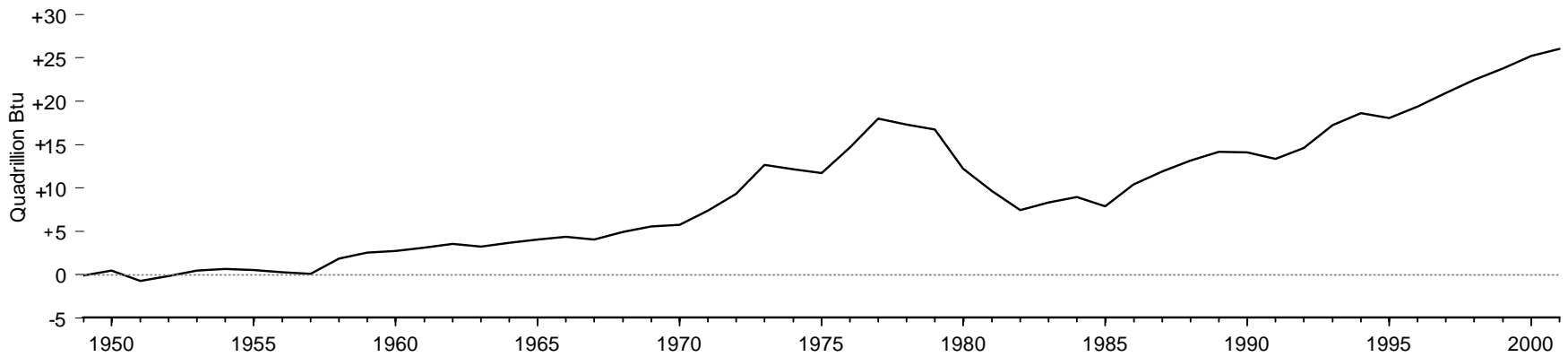
**Energy Imports**



**Energy Exports**



**Energy Net Imports**



Notes: Negative net imports are net exports. Because vertical scales differ, graphs should not be compared.

Source: Table 1.4.

**Table 1.4 Energy Imports, Exports, and Net Imports, 1949-2001**  
(Quadrillion Btu)

Year	Imports					Exports					Net Imports				
	Coal	Natural Gas	Petroleum <sup>1</sup>	Other <sup>2</sup>	Total	Coal	Natural Gas	Petroleum	Other <sup>2</sup>	Total	Coal	Natural Gas	Petroleum <sup>1</sup>	Other <sup>2</sup>	Total
1949	0.01	0.00	1.43	0.03	1.47	0.88	0.02	0.68	0.02	1.59	-0.87	-0.02	0.75	0.02	-0.13
1950	0.01	0.00	1.89	0.04	1.93	0.79	0.03	0.64	0.01	1.47	-0.78	-0.03	1.24	0.03	0.47
1951	0.01	0.00	1.87	0.04	1.92	1.68	0.03	0.89	0.03	2.62	-1.67	-0.03	0.98	0.01	-0.71
1952	0.01	0.01	2.11	0.04	2.17	1.40	0.03	0.91	0.02	2.37	-1.40	-0.02	1.20	0.02	-0.20
1953	0.01	0.01	2.28	0.04	2.34	0.98	0.03	0.84	0.02	1.87	-0.97	-0.02	1.44	0.02	0.47
1954	0.01	0.01	2.32	0.04	2.37	0.91	0.03	0.75	0.01	1.70	-0.91	-0.02	1.58	0.02	0.67
1955	0.01	0.01	2.75	0.06	2.83	1.46	0.03	0.77	0.02	2.29	-1.46	-0.02	1.98	0.04	0.54
1956	0.01	0.01	3.17	0.06	3.25	1.98	0.04	0.91	0.02	2.95	-1.98	-0.03	2.26	0.04	0.30
1957	0.01	0.04	3.46	0.06	3.57	2.17	0.04	1.20	0.03	3.45	-2.16	(s)	2.26	0.02	0.12
1958	0.01	0.14	3.72	0.05	3.92	1.42	0.04	0.58	0.02	2.06	-1.41	0.10	3.14	0.03	1.86
1959	0.01	0.14	3.91	0.05	4.11	1.05	0.02	0.45	0.02	1.54	-1.04	0.12	3.46	0.03	2.57
1960	0.01	0.16	4.00	0.06	4.23	1.02	0.01	0.43	0.02	1.48	-1.02	0.15	3.57	0.04	2.74
1961	(s)	0.23	4.19	0.04	4.46	0.98	0.01	0.37	0.02	1.38	-0.98	0.22	3.82	0.02	3.08
1962	0.01	0.42	4.56	0.03	5.01	1.08	0.02	0.36	0.03	1.48	-1.08	0.40	4.20	(s)	3.53
1963	0.01	0.42	4.65	0.03	5.10	1.36	0.02	0.44	0.03	1.85	-1.35	0.40	4.21	-0.01	3.25
1964	0.01	0.46	4.96	0.07	5.49	1.34	0.02	0.43	0.06	1.84	-1.33	0.44	4.53	0.01	3.65
1965	(s)	0.47	5.40	0.04	5.92	1.38	0.03	0.39	0.06	1.85	-1.37	0.44	5.01	-0.02	4.06
1966	(s)	0.50	5.63	0.05	6.18	1.35	0.03	0.41	0.06	1.85	-1.35	0.47	5.21	-0.01	4.32
1967	0.01	0.58	5.56	0.04	6.19	1.35	0.08	0.65	0.06	2.15	-1.35	0.50	4.91	-0.02	4.04
1968	0.01	0.67	6.21	0.04	6.93	1.38	0.10	0.49	0.06	2.03	-1.37	0.58	5.73	-0.02	4.90
1969	(s)	0.75	6.90	0.06	7.71	1.53	0.05	0.49	0.08	2.15	-1.53	0.70	6.42	-0.02	5.56
1970	(s)	0.85	7.47	0.07	8.39	1.94	0.07	0.55	0.11	2.66	-1.93	0.77	6.92	-0.04	5.72
1971	(s)	0.96	8.54	0.08	9.58	1.55	0.08	0.47	0.07	2.18	-1.54	0.88	8.07	(s)	7.41
1972	(s)	1.05	10.30	0.11	11.46	1.53	0.08	0.47	0.06	2.14	-1.53	0.97	9.83	0.05	9.32
1973	(s)	1.06	13.47	0.20	14.73	1.43	0.08	0.49	0.06	2.05	-1.42	0.98	12.98	0.14	12.68
1974	0.05	0.99	13.13	0.25	14.41	1.62	0.08	0.46	0.06	2.22	-1.57	0.91	12.66	0.19	12.19
1975	0.02	0.98	12.95	0.16	14.11	1.76	0.07	0.44	0.08	2.36	-1.74	0.90	12.51	0.08	11.75
1976	0.03	0.99	15.67	0.15	16.84	1.60	0.07	0.47	0.06	2.19	-1.57	0.92	15.20	0.09	14.65
1977	0.04	1.04	18.76	0.26	20.09	1.44	0.06	0.51	0.06	2.07	-1.40	0.98	18.24	0.20	18.02
1978	0.07	0.99	17.82	0.36	19.25	1.08	0.05	0.77	0.03	1.93	-1.00	0.94	17.06	0.33	17.32
1979	0.05	1.30	17.93	0.33	19.62	1.75	0.06	1.00	0.06	2.87	-1.70	1.24	16.93	0.27	16.75
1980	0.03	1.01	14.66	0.28	15.97	2.42	0.05	1.16	0.09	3.72	-2.39	0.96	13.50	0.18	12.25
1981	0.03	0.92	12.64	0.39	13.97	2.94	0.06	1.26	0.06	4.33	-2.92	0.86	11.38	0.33	9.65
1982	0.02	0.95	10.78	0.35	12.09	2.79	0.05	1.73	0.06	4.63	-2.77	0.90	9.05	0.28	7.46
1983	0.03	0.94	10.65	0.41	12.03	2.04	0.06	1.57	0.05	3.72	-2.01	0.89	9.08	0.36	8.31
1984	0.03	0.85	11.43	0.46	12.77	2.15	0.06	1.54	0.05	3.80	-2.12	0.79	9.89	0.40	8.96
1985	0.05	0.95	10.61	0.49	12.10	2.44	0.06	1.66	0.08	4.23	-2.39	0.90	8.95	0.41	7.87
1986	0.06	0.75	13.20	0.43	14.44	2.25	0.06	1.67	0.08	4.06	-2.19	0.69	11.53	0.36	10.38
1987	0.04	0.99	14.16	0.57	15.76	2.09	0.05	1.63	0.08	3.85	-2.05	0.94	12.53	0.49	11.91
1988	0.05	1.30	15.75	0.47	17.56	2.50	0.07	1.74	0.10	4.42	-2.45	1.22	14.01	0.37	13.15
1989	0.07	1.39	17.16	0.34	18.96	2.64	0.11	1.84	0.18	4.77	-2.57	1.28	15.33	0.15	14.19
1990	0.07	1.55	17.12	0.22	18.95	2.77	0.09	1.82	0.18	4.87	-2.70	1.46	15.29	0.03	14.09
1991	0.08	1.80	16.35	0.27	18.50	2.85	0.13	2.13	0.04	5.16	-2.77	1.67	14.22	0.22	13.34
1992	0.10	2.16	16.97	0.35	19.58	2.68	0.22	2.01	0.05	4.96	-2.59	1.94	14.96	0.31	14.62
1993	0.20	2.40	18.51	0.39	21.50	1.96	0.14	2.12	0.06	4.28	-1.76	2.25	16.40	0.32	17.22
1994	0.22	2.68	19.24	0.58	22.73	1.88	0.16	1.99	0.05	4.08	-1.66	2.52	17.26	0.53	18.65
1995	0.24	2.90	18.88	0.55	22.57	2.32	0.16	1.99	0.07	4.54	-2.08	2.74	16.89	0.47	18.03
1996	0.20	3.00	20.29	0.52	24.01	2.37	0.16	2.06	R0.06	R4.64	-2.17	2.85	18.23	R0.46	R19.37
1997	0.19	3.06	21.74	0.52	25.51	2.19	0.16	2.10	R0.11	R4.56	-2.01	2.90	19.64	R0.41	20.94
1998	0.22	3.22	22.91	0.50	R26.85	2.09	0.16	1.97	R0.15	R4.37	-1.87	3.06	20.94	R0.35	22.47
1999	0.23	3.66	23.13	0.52	R27.54	1.53	0.16	1.95	R0.15	R3.80	-1.30	3.50	21.18	R0.37	R23.75
2000	0.31	R3.87	R24.53	R0.59	R29.31	1.53	R0.25	2.15	R0.17	R4.09	-1.21	R3.62	R22.38	R0.42	R25.21
2001 <sup>P</sup>	0.49	4.12	24.88	0.45	29.95	1.27	0.40	2.06	0.20	3.92	-0.77	3.72	22.82	0.25	26.03

<sup>1</sup> Includes imports into the Strategic Petroleum Reserve, which began in 1977.

<sup>2</sup> Coal coke and small amounts of electricity transmitted across U.S. borders with Canada and Mexico.

R=Revised. P=Preliminary. (s)=Less than 0.005 quadrillion Btu and greater than -0.005 quadrillion Btu.

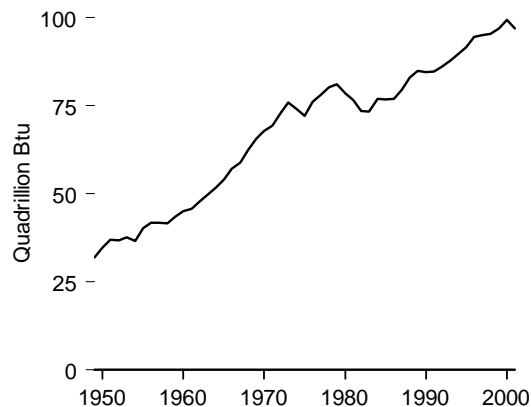
Notes: Includes trade between the United States (50 States and the District of Columbia) and its

territories and possessions. Totals or net import items may not equal sum of components due to independent rounding.

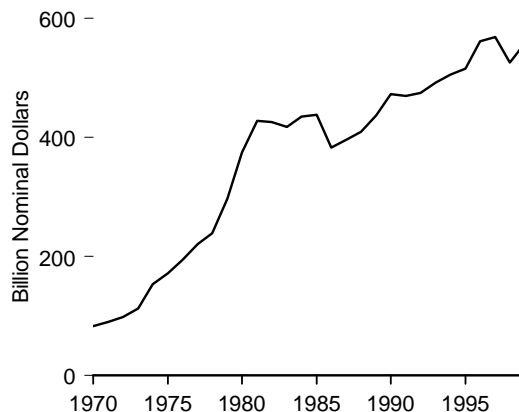
Sources: Tables 5.1, 6.1, 7.1, 7.7, 8.1, 10.2b, and A2-A6.

**Figure 1.5 Energy Consumption and Expenditures Indicators**

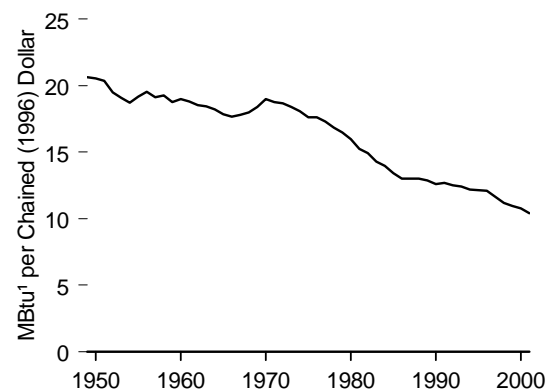
**Energy Consumption, 1949-2001**



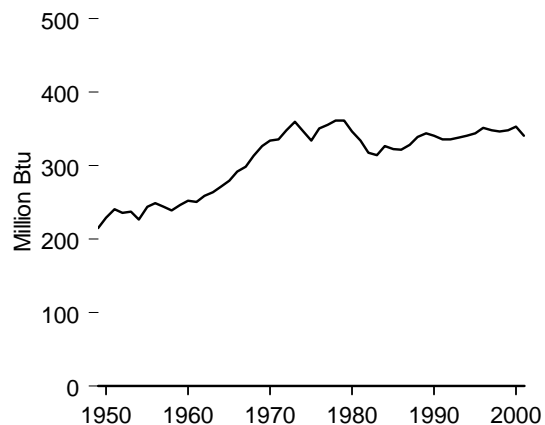
**Energy Expenditures, 1970-1999**



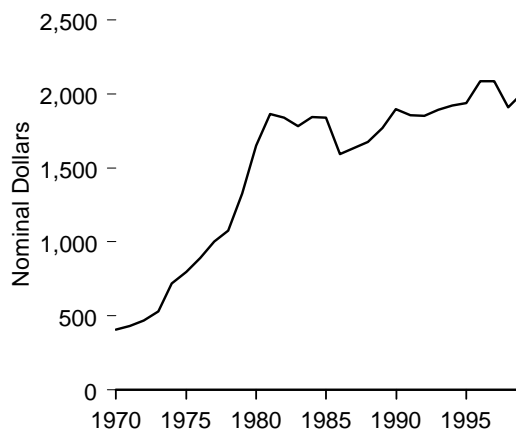
**Energy Consumption per Dollar of Gross Domestic Product, 1949-2001**



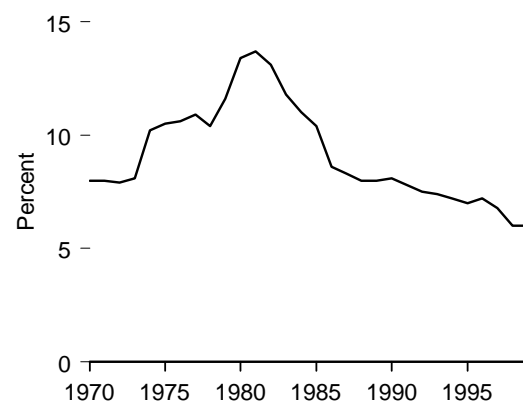
**Energy Consumption per Person, 1949-2001**



**Energy Expenditures per Person, 1970-1999**



**Energy Expenditures as Share of Gross Domestic Product, 1970-1999**



<sup>1</sup> Thousand Btu.

Source: Table 1.5.

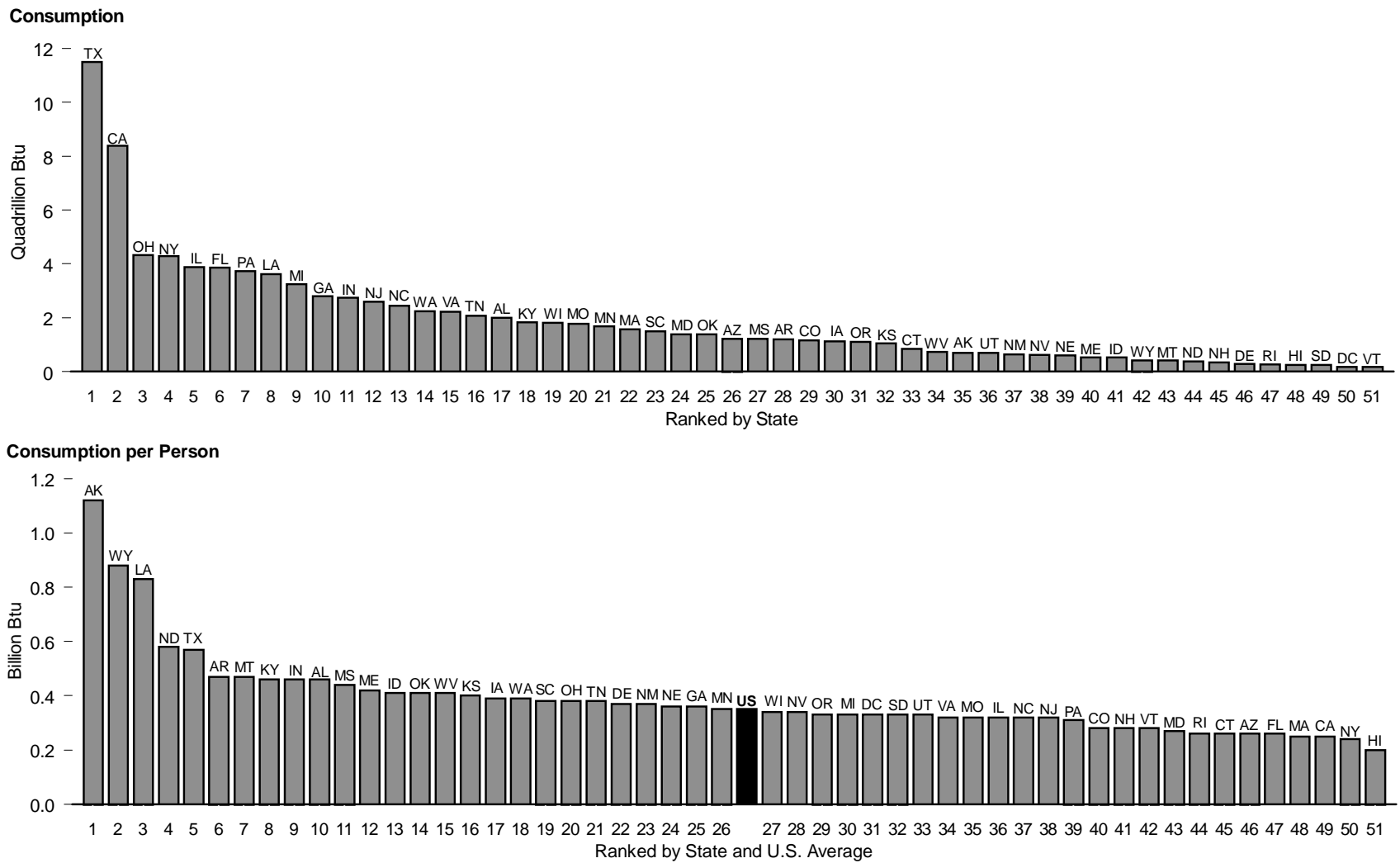
**Table 1.5 Energy Consumption and Expenditures Indicators, 1949-2001**

Year	Energy Consumption	Energy Consumption per Person	Energy Expenditures	Energy Expenditures per Person	Gross Domestic Product (GDP)	Energy Expenditures as Share of GDP	Gross Domestic Product (GDP)	Energy Consumption per Dollar of GDP
	Quadrillion Btu	Million Btu	Million Nominal Dollars	Nominal Dollars	Billion Nominal Dollars	Percent	Billion Chained (1996) Dollars	Thousand Btu per Chained (1996) Dollar
1949	32.00	215	NA	NA	267.7	NA	1,550.9	20.63
1950	34.63	229	NA	NA	294.3	NA	1,686.6	20.54
1951	37.00	240	NA	NA	339.5	NA	1,815.1	20.38
1952	36.77	235	NA	NA	358.6	NA	1,887.3	19.48
1953	37.68	237	NA	NA	379.9	NA	1,973.9	19.09
1954	36.66	226	NA	NA	381.1	NA	1,960.5	18.70
1955	40.24	244	NA	NA	415.2	NA	2,099.5	19.17
1956	41.79	249	NA	NA	438.0	NA	2,141.1	19.52
1957	41.82	244	NA	NA	461.5	NA	2,183.9	19.15
1958	41.67	239	NA	NA	467.9	NA	2,162.8	19.27
1959	43.49	246	NA	NA	507.4	NA	2,319.0	18.75
1960	45.12	252	NA	NA	527.4	NA	2,376.7	18.98
1961	45.76	250	NA	NA	545.7	NA	2,432.0	18.81
1962	47.83	258	NA	NA	586.5	NA	2,578.9	18.55
1963	49.65	263	NA	NA	618.7	NA	2,690.4	18.45
1964	51.83	271	NA	NA	664.4	NA	2,846.5	18.21
1965	54.02	279	NA	NA	720.1	NA	3,028.5	17.84
1966	57.02	292	NA	NA	789.3	NA	3,227.5	17.67
1967	58.91	298	NA	NA	834.1	NA	3,308.3	17.81
1968	62.41	313	NA	NA	911.5	NA	3,466.1	18.01
1969	65.63	326	NA	NA	985.3	NA	3,571.4	18.38
1970	67.86	334	82,862	408	1,039.7	8.0	3,578.0	18.97
1971	69.31	335	90,032	435	1,128.6	8.0	3,697.7	18.75
1972	72.76	348	98,084	469	1,240.4	7.9	3,898.4	18.66
1973	75.81	359	111,918	530	1,385.5	8.1	4,123.4	18.38
1974	74.08	347	153,377	719	1,501.0	10.2	4,099.0	18.07
1975	72.04	334	171,828	797	1,635.2	10.5	4,084.4	17.64
1976	76.07	350	193,880	891	1,823.9	10.6	4,311.7	17.64
1977	78.12	355	220,423	1,003	2,031.4	10.9	4,511.8	17.32
1978	80.12	361	239,219	1,077	2,295.9	10.4	4,760.6	16.83
1979	81.04	361	297,563	1,325	2,566.4	11.6	4,912.1	16.50
1980	78.44	346	R374,360	1,652	2,795.6	13.4	4,900.9	16.00
1981	76.57	334	427,769	1,864	3,131.3	13.7	5,021.0	15.25
1982	73.44	317	426,187	1,840	3,259.2	13.1	4,919.3	14.93
1983	73.32	314	R417,111	1,784	3,534.9	11.8	5,132.3	14.29
1984	76.97	326	R434,450	1,842	3,932.7	11.0	5,505.2	13.98
1985	R76.70	R322	R437,321	1,838	4,213.0	10.4	5,717.1	R13.42
1986	R76.97	321	R382,789	1,594	4,452.9	8.6	5,912.4	R13.02
1987	R79.48	R328	R395,770	1,633	4,742.5	8.3	6,113.3	R13.00
1988	R82.99	R339	R409,608	1,675	5,108.3	8.0	6,368.4	R13.03
1989	R84.93	R344	R436,582	R1,769	5,489.1	8.0	6,591.8	R12.88
1990	R84.57	R340	R471,940	1,897	5,803.2	8.1	6,707.9	R12.61
1991	R84.64	R335	R469,656	R1,856	5,986.2	7.8	6,676.4	R12.68
1992	R86.05	335	R474,717	R1,851	6,318.9	7.5	6,880.0	R12.51
1993	R87.78	R338	R492,156	R1,894	6,642.3	7.4	7,062.6	R12.43
1994	R89.57	R340	R505,771	R1,922	7,054.3	7.2	7,347.7	R12.19
1995	R91.50	R344	R515,358	R1,935	7,400.5	7.0	7,543.8	R12.13
1996	R94.52	R351	R561,803	R2,085	7,813.2	7.2	7,813.2	R12.10
1997	R94.97	R348	R568,242	R2,084	8,318.4	6.8	8,159.5	R11.64
1998	R95.34	R346	526,224	1,908	R8,781.5	6.0	R8,508.9	R11.20
1999	R96.97	R348	558,742	2,002	R9,268.6	6.0	R8,856.5	R10.95
2000	R99.32	R353	NA	NA	R9,872.9	NA	R9,224.0	R10.77
2001P	96.95	340	NA	NA	10,208.1	NA	9,333.8	10.39

R=Revised. P=Preliminary. NA=Not available.  
Note: See "Chained Dollars" in the Glossary.

Sources: **Energy Consumption:** Table 1.3. **Energy Expenditures:** Table 3.4. **Gross Domestic Product:** Table E1. **Population Data:** Table E1. **Other Columns:** Calculated by EIA.

**Figure 1.6 State-Level Energy Consumption and Consumption per Person, 1999**



Source: Table 1.6.

**Table 1.6 State-Level Energy Consumption, Expenditures, and Prices, 1999**

Rank	Consumption		Consumption per Person		Expenditures		Expenditures per Person		Prices	
	State	Trillion Btu	State	Million Btu	State	Million Dollars	State	Dollars	State	Dollars per Million Btu
1	Texas	11,501.0	Alaska	1,121.5	California	56,007	Wyoming	3,861	District of Columbia	13.23
2	California	8,375.4	Wyoming	879.4	Texas	54,085	Alaska	3,294	Hawaii	12.34
3	Ohio	4,323.4	Louisiana	826.9	New York	31,999	Louisiana	3,073	Connecticut	11.62
4	New York	4,283.0	North Dakota	577.1	Ohio	25,330	North Dakota	2,703	Vermont	11.56
5	Illinois	3,882.6	Texas	573.8	Florida	25,295	Texas	2,698	Arizona	11.23
6	Florida	3,852.9	Arkansas	471.8	Illinois	23,932	District of Columbia	2,526	New Hampshire	11.05
7	Pennsylvania	3,715.5	Montana	467.1	Pennsylvania	23,152	Indiana	2,385	Maryland	10.35
8	Louisiana	3,615.4	Kentucky	462.1	Michigan	19,786	Maine	2,384	Florida	10.27
9	Michigan	3,239.6	Indiana	460.3	New Jersey	17,716	Arkansas	2,348	Massachusetts	10.05
10	Georgia	2,798.1	Alabama	458.8	North Carolina	15,678	Montana	2,327	New York	10.00
11	Indiana	2,735.8	Mississippi	436.5	Georgia	15,524	Iowa	2,311	Nevada	9.89
12	New Jersey	2,588.7	Maine	421.9	Indiana	14,174	Alabama	2,306	North Carolina	9.76
13	North Carolina	2,446.9	Idaho	414.1	Louisiana	13,436	Kentucky	2,300	Delaware	9.54
14	Washington	2,240.8	Oklahoma	410.2	Virginia	13,248	Delaware	2,292	California	9.37
15	Virginia	2,227.3	West Virginia	407.0	Massachusetts	12,022	Kansas	2,273	New Mexico	8.99
16	Tennessee	2,070.5	Kansas	395.6	Tennessee	11,724	Vermont	2,263	South Carolina	8.96
17	Alabama	2,004.8	Iowa	390.9	Iowa	11,344	Ohio	2,250	New Jersey	8.92
18	Kentucky	1,830.2	Washington	389.3	Washington	10,702	Mississippi	2,200	Missouri	8.79
19	Wisconsin	1,810.5	South Carolina	384.2	Wisconsin	10,551	New Hampshire	2,190	Virginia	8.78
20	Missouri	1,768.0	Ohio	384.1	Alabama	10,076	Nevada	2,187	Pennsylvania	8.76
21	Minnesota	1,675.3	Tennessee	377.6	Maryland	9,885	New Jersey	2,175	Oregon	8.65
22	Massachusetts	1,569.1	Delaware	370.0	Minnesota	9,674	Connecticut	2,167	Tennessee	8.64
23	South Carolina	1,493.0	New Mexico	365.0	Kentucky	9,110	Nebraska	2,144	Colorado	8.63
24	Maryland	1,378.2	Nebraska	361.3	Arizona	9,012	South Carolina	2,139	Illinois	8.61
25	Oklahoma	1,377.5	Georgia	359.3	South Carolina	8,313	Tennessee	2,138	South Dakota	8.57
26	Arizona	1,219.8	Minnesota	350.8	Oklahoma	7,160	Oklahoma	2,132	Maine	8.56
27	Mississippi	1,208.5	Wisconsin	344.8	Connecticut	7,111	West Virginia	2,078	Ohio	8.54
28	Arkansas	1,203.7	Nevada	340.1	Colorado	7,002	Missouri	2,074	Kansas	8.43
29	Colorado	1,155.5	Oregon	334.5	Iowa	6,631	South Dakota	2,074	Rhode Island	8.37
30	Iowa	1,121.7	Michigan	328.4	Oregon	6,530	Idaho	2,055	Georgia	8.20
31	Oregon	1,109.2	District of Columbia	327.1	Mississippi	6,091	North Carolina	2,049	Michigan	8.19
32	Kansas	1,050.0	South Dakota	326.0	Kansas	6,033	Kansas	2,026	Minnesota	8.18
33	Connecticut	839.3	Utah	325.8	Arkansas	5,990	Wisconsin	2,009	Wisconsin	8.17
34	West Virginia	735.4	Virginia	324.1	Nevada	3,956	Michigan	2,006	Nebraska	8.05
35	Alaska	694.7	Missouri	323.3	West Virginia	3,754	Rhode Island	1,999	Mississippi	8.00
36	Utah	693.9	Illinois	320.1	Utah	3,669	Georgia	1,993	Iowa	7.88
37	New Mexico	635.0	North Carolina	319.8	Nebraska	3,571	New Mexico	1,983	Oklahoma	7.84
38	Nevada	615.3	New Jersey	317.9	New Mexico	3,450	Illinois	1,973	Alabama	7.83
39	Nebraska	602.0	Pennsylvania	309.8	Maine	2,987	Oregon	1,969	Montana	7.75
40	Maine	528.6	Colorado	284.9	New Hampshire	2,631	Massachusetts	1,947	Idaho	7.64
41	Idaho	518.3	New Hampshire	279.2	Idaho	2,572	Pennsylvania	1,930	West Virginia	7.52
42	Wyoming	421.8	Vermont	277.9	Hawaii	2,144	Virginia	1,928	Kentucky	7.48
43	Montana	412.4	Maryland	266.5	Montana	2,055	Maryland	1,911	Utah	7.44
44	North Dakota	365.7	Rhode Island	263.5	Alaska	2,040	Arizona	1,886	Arkansas	7.42
45	New Hampshire	335.4	Connecticut	255.7	Rhode Island	1,981	Washington	1,859	Washington	7.40
46	Delaware	278.8	Arizona	255.3	Wyoming	1,852	Hawaii	1,809	Indiana	7.14
47	Rhode Island	261.1	Florida	255.0	Delaware	1,727	New York	1,758	Texas	6.65
48	Hawaii	241.4	Massachusetts	254.1	North Dakota	1,713	Colorado	1,726	Wyoming	6.54
49	South Dakota	239.0	California	252.7	South Dakota	1,521	Utah	1,723	North Dakota	6.21
50	District of Columbia	169.8	New York	235.4	Vermont	1,344	California	1,690	Alaska	5.99
51	Vermont	165.0	Hawaii	203.7	District of Columbia	1,311	Florida	1,674	Louisiana	5.77
	<b>United States</b>	<b>195,682.4</b>	<b>United States</b>	<b>350.9</b>	<b>United States</b>	<b>2,558,742</b>	<b>United States</b>	<b>2,049</b>	<b>United States</b>	<b>8.41</b>

<sup>1</sup> Includes 57.7 trillion Btu of coal coke net imports, which are not allocated to the States. Does not include 1,042 trillion Btu of coal consumed by nonutility wholesale power producers and cogeneration plants and not reported in the end-use sectors.

<sup>2</sup> Includes \$140 million for coal coke net imports, which are not allocated to the States.

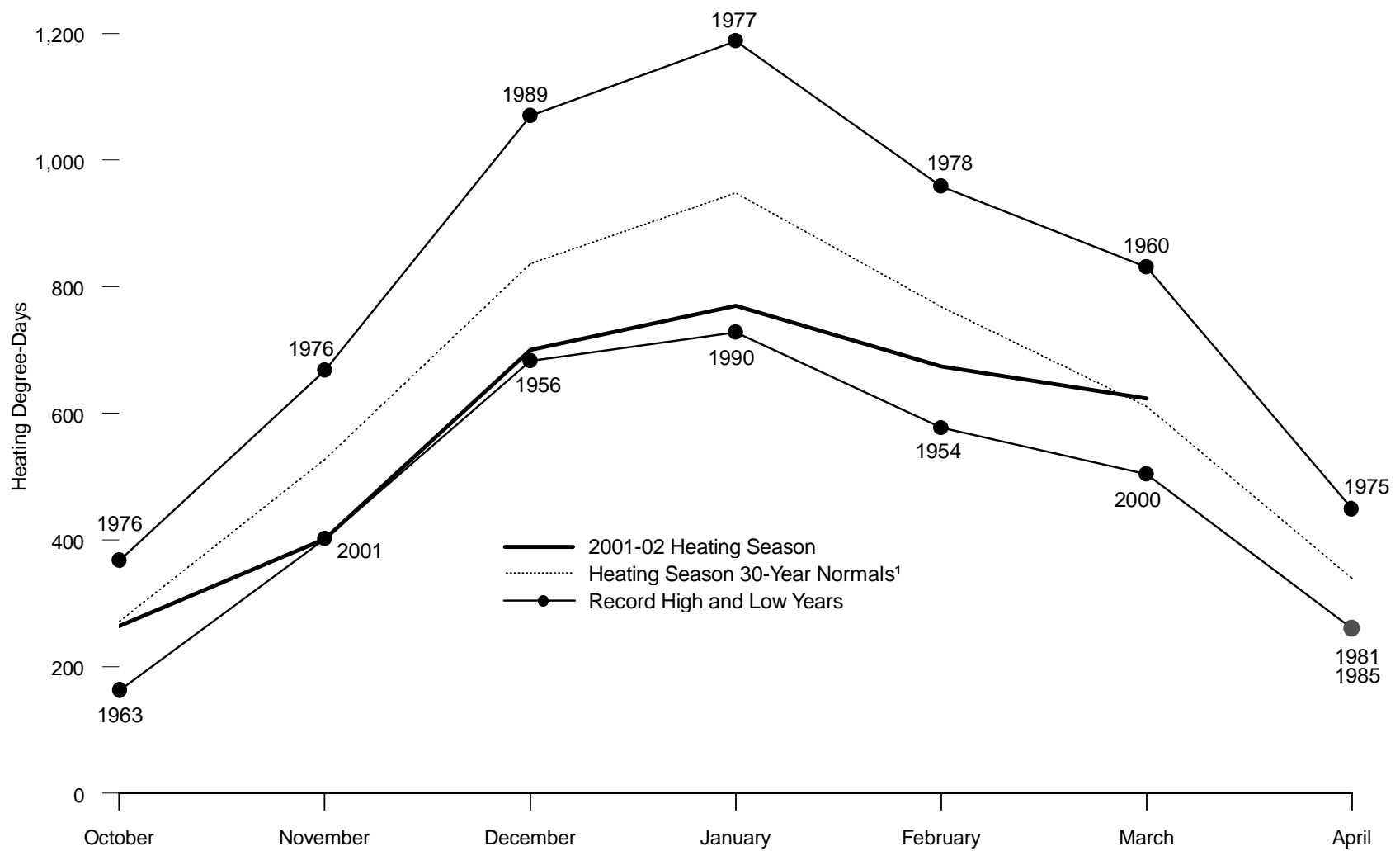
Note: Rankings based on unrounded data.

Web Page: [http://www.eia.doe.gov/emeu/states/\\_states.html](http://www.eia.doe.gov/emeu/states/_states.html).

Sources: **Consumption:** Energy Information Administration (EIA), *State Energy Data Report 1999, Consumption Estimates* (May 2001), Tables 9 and 10. **Expenditures and Prices:** EIA, *State Energy Price and Expenditure Report 1999* (November 2001), Table 1.

Both publications include State-level data by end-use sector and type of energy. Consumption estimates are annual 1960 through 1999, and price and expenditures estimates are annual 1970 through 1999.

**Figure 1.7 Heating Degree-Days by Month, 1949-2002**



<sup>1</sup> Based on calculations of data from 1961 through 1990.

Source: Table 1.7.

**Table 1.7 Heating Degree-Days by Month, 1949-2002**

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1949	858	701	611	330	128	21	7	9	94	209	503	763	4,234
1950	761	721	693	412	162	40	11	18	85	196	565	872	4,536
1951	863	724	632	359	135	45	8	17	74	231	645	814	4,547
1952	807	677	670	315	154	32	5	11	54	324	540	785	4,374
1953	754	667	557	378	142	33	5	11	51	208	492	765	4,063
1954	886	577	646	261	192	32	8	18	56	224	523	809	4,232
1955	927	759	600	272	121	48	9	6	56	237	600	886	4,521
1956	900	723	648	387	157	27	10	14	82	215	541	683	4,387
1957	977	628	610	308	148	23	6	16	61	315	536	711	4,339
1958	909	866	690	324	143	54	7	8	60	250	484	917	4,712
1959	944	762	619	305	112	26	4	6	48	249	594	734	4,403
1960	884	780	831	278	160	33	7	11	48	254	502	936	4,724
1961	982	670	565	413	199	29	5	7	48	238	532	852	4,540
1962	976	747	689	337	118	35	14	13	91	234	554	886	4,694
1963	1,061	841	562	325	163	35	8	18	76	162	471	1,012	4,734
1964	871	803	636	339	124	39	5	22	72	301	489	814	4,515
1965	907	780	738	355	114	48	11	14	78	271	494	739	4,549
1966	1,010	790	580	377	188	30	6	14	81	298	496	830	4,700
1967	816	820	600	352	229	34	8	17	82	270	588	793	4,609
1968	979	832	567	309	192	35	6	14	59	240	548	894	4,675
1969	939	778	735	307	134	47	7	9	60	296	564	860	4,736
1970	1,063	758	685	344	120	31	4	9	55	253	541	801	4,664
1971	976	760	681	375	194	29	10	12	47	187	553	723	4,547
1972	890	785	608	377	137	49	7	12	65	330	613	832	4,705
1973	893	772	504	356	182	22	6	9	61	212	497	799	4,313
1974	838	754	556	310	171	42	6	13	94	303	524	795	4,406
1975	821	742	686	449	117	37	5	13	100	235	462	805	4,472
1976	974	609	544	309	178	28	8	19	81	367	668	941	4,726
1977	1,188	751	529	270	119	38	6	13	59	295	493	844	4,605
1978	1,061	958	677	350	157	31	7	11	59	283	517	847	4,958
1979	1,079	950	575	364	148	37	6	15	58	271	528	750	4,781
1980	887	831	680	338	142	49	5	10	54	316	564	831	4,707
1981	984	689	620	260	165	25	6	11	76	327	504	845	4,512
1982	1,067	776	620	408	114	62	7	19	75	264	515	692	4,619
1983	874	706	588	421	189	35	6	5	53	251	509	990	4,627
1984	1,000	645	704	371	172	28	7	7	88	223	565	704	4,514
1985	1,057	807	557	260	123	47	5	17	69	243	506	951	4,642
1986	859	734	542	295	123	30	9	18	76	258	558	793	4,295
1987	920	714	573	309	107	20	8	13	61	345	491	773	4,334
1988	1,004	778	594	344	134	30	3	5	72	352	506	831	4,653
1989	789	832	603	344	163	32	5	14	73	259	542	1,070	4,726
1990	728	655	535	321	184	29	6	10	56	246	457	789	4,016
1991	921	639	564	287	98	30	6	7	69	242	586	751	4,200
1992	852	644	603	345	152	46	14	24	74	301	564	822	4,441
1993	860	827	664	368	128	38	11	9	89	302	580	824	4,700
1994	1,031	813	594	293	174	21	6	16	65	268	479	723	4,483
1995	847	750	556	375	174	31	4	7	77	233	605	872	4,531
1996	945	748	713	360	165	27	8	9	72	276	630	760	4,713
1997	932	672	552	406	198	31	7	16	63	273	592	800	4,542
1998	765	623	596	331	109	41	4	5	33	245	482	717	3,951
1999	861	647	645	319	139	31	5	12	62	275	413	760	4,169
2000	<sup>R</sup> 886	<sup>R</sup> 643	<sup>R</sup> 494	<sup>R</sup> 341	<sup>R</sup> 115	<sup>R</sup> 29	<sup>R</sup> 12	<sup>R</sup> 12	<sup>R</sup> 69	<sup>R</sup> 244	<sup>R</sup> 610	<sup>R</sup> 1,005	4,460
2001 <sup>P</sup>	915	<sup>R</sup> 720	658	310	113	29	6	4	76	264	402	700	4,197
2002 <sup>P</sup>	770	674	623	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Normals <sup>1</sup>	948	768	611	339	150	36	7	13	69	271	528	836	4,576

<sup>1</sup> Based on calculations of data from 1961 through 1990.

R=Revised. P=Preliminary. NA=Not available.

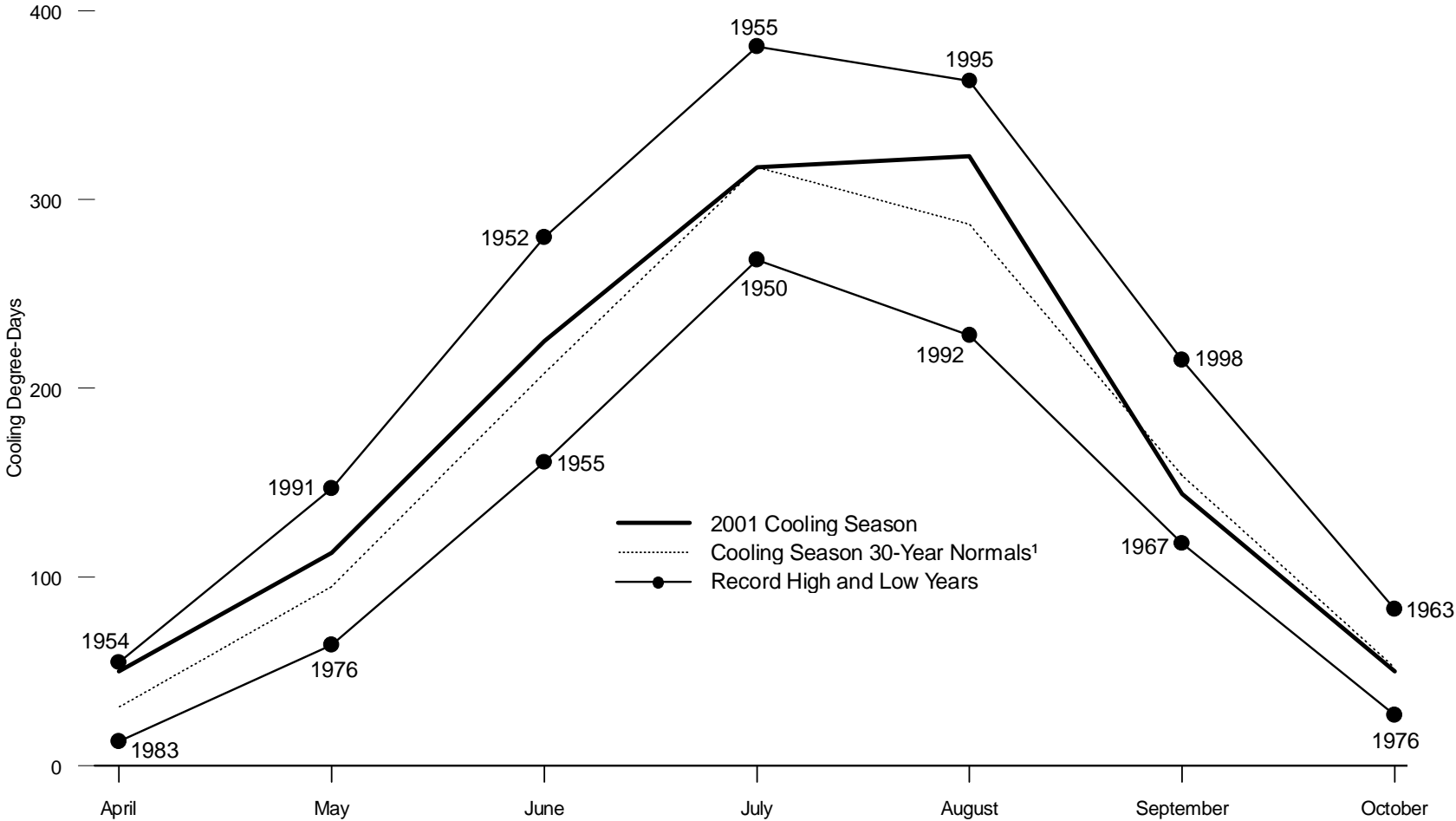
Notes: This table excludes Alaska and Hawaii. Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations below the mean daily temperature of 65 F. For example, a weather station recording a mean daily temperature of 40 F would report 25 heating degree-days. Temperature information recorded by weather stations is used to calculate State-wide degree-day averages based on resident State population estimated for 1990. The population-weighted

State figures are aggregated into Census divisions and the national average.

Sources: 1949-2000 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-1. 2001 and 2002—Energy Information Administration, *Monthly Energy Review*, June 2001-April 2002 issues, Table 1.11, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland.



**Figure 1.8 Cooling Degree-Days by Month, 1949-2001**



<sup>1</sup> Based on calculations of data from 1961 through 1990.

Source: Table 1.8.

**Table 1.8 Cooling Degree-Days by Month, 1949-2002**

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1949	16	14	14	27	110	253	367	294	131	70	12	10	1,318
1950	27	12	13	21	105	201	268	244	128	78	9	4	1,110
1951	8	5	15	22	95	198	318	293	158	65	7	11	1,195
1952	17	8	15	20	96	280	368	303	159	38	10	4	1,318
1953	12	8	26	25	118	263	338	292	168	58	11	7	1,326
1954	11	12	11	55	65	241	356	296	195	60	9	4	1,315
1955	6	7	20	45	121	161	381	355	182	50	10	6	1,344
1956	4	12	14	23	112	232	297	290	151	66	9	11	1,221
1957	12	17	13	33	96	243	337	275	155	30	13	6	1,230
1958	3	1	8	27	101	187	315	304	166	53	18	6	1,189
1959	6	12	13	31	129	228	325	344	179	64	12	5	1,348
1960	7	4	6	37	76	215	301	302	181	59	15	3	1,206
1961	5	9	23	20	71	195	306	287	186	47	12	7	1,168
1962	6	15	9	26	144	204	276	289	136	64	7	3	1,179
1963	5	5	22	42	94	213	308	266	153	83	11	2	1,204
1964	6	3	14	37	114	214	327	256	146	42	17	9	1,185
1965	9	7	10	42	125	179	280	273	155	48	19	6	1,153
1966	4	5	12	28	81	201	353	273	132	43	12	4	1,148
1967	9	5	24	48	70	206	278	253	118	45	12	9	1,077
1968	6	3	9	32	75	204	307	292	145	53	7	4	1,137
1969	7	4	4	33	94	200	331	304	153	48	8	4	1,190
1970	3	4	10	36	104	201	323	313	185	48	6	9	1,242
1971	8	7	10	22	68	244	288	269	182	77	12	17	1,204
1972	15	6	22	36	88	174	299	276	169	44	9	8	1,146
1973	7	3	24	18	75	236	318	303	166	66	21	4	1,241
1974	21	6	28	29	101	173	317	267	120	40	10	5	1,117
1975	14	11	14	24	117	203	301	296	120	55	12	5	1,172
1976	5	11	23	27	64	208	282	243	127	27	8	4	1,029
1977	2	5	21	35	121	212	351	293	180	44	15	6	1,285
1978	3	1	10	31	93	218	310	300	180	52	19	9	1,226
1979	4	4	13	32	82	187	295	266	160	53	11	6	1,113
1980	9	4	13	23	95	199	374	347	192	42	10	5	1,313
1981	3	6	10	52	75	257	333	275	138	43	12	5	1,209
1982	6	10	21	26	115	165	318	262	140	47	15	11	1,136
1983	6	5	9	13	72	193	353	362	172	58	12	5	1,260
1984	5	6	14	24	92	233	291	312	143	70	9	15	1,214
1985	3	5	22	39	108	193	313	269	145	68	25	4	1,194
1986	8	10	17	33	106	231	340	259	161	52	23	9	1,249
1987	5	7	13	23	127	244	334	298	156	40	14	8	1,269
1988	5	5	13	28	89	218	359	348	149	45	18	6	1,283
1989	15	7	19	36	88	208	312	266	138	49	16	2	1,156
1990	15	14	21	29	86	234	316	291	172	57	16	9	1,260
1991	10	9	19	42	147	235	336	305	149	62	8	9	1,331
1992	6	10	15	29	77	170	286	228	150	49	13	7	1,040
1993	13	5	11	19	91	207	347	317	146	47	11	4	1,218
1994	7	9	18	37	76	262	328	263	141	50	20	9	1,220
1995	7	7	18	29	91	202	348	363	150	61	12	5	1,293
1996	7	6	8	26	116	226	299	287	139	45	14	7	1,180
1997	8	11	31	19	81	189	315	268	171	48	10	5	1,156
1998	12	7	10	23	135	228	350	337	215	62	20	11	1,410
1999	12	11	12	40	94	219	374	305	152	55	17	6	1,297
2000	R10	R10	R25	R28	131	221	R284	R302	R156	R50	R8	4	R1,229
2001 <sup>P</sup>	R3	10	R10	50	113	225	317	323	144	50	19	11	1,275
2002 <sup>P</sup>	8	4	18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Normals <sup>1</sup>	7	7	16	31	95	208	317	287	154	52	13	7	1,193

<sup>1</sup> Based on calculations of data from 1961 through 1990.

R=Revised. P=Preliminary. NA=Not available.

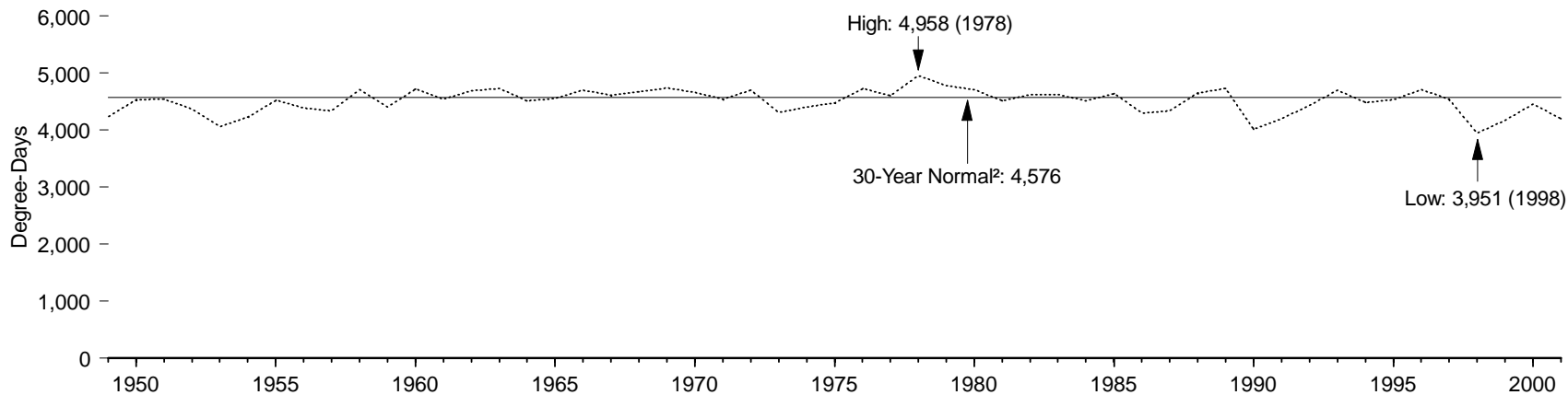
Notes: This table excludes Alaska and Hawaii. Degree-days are relative measurements of outdoor air temperature. Cooling degree-days are deviations above the mean daily temperature of 65 F. For example, a weather station recording a mean daily temperature of 78 F would report 13 cooling degree-days. Temperature information recorded by weather stations is used to calculate State-wide degree-day averages based on resident State population estimated for 1990. The population-weighted

State figures are aggregated into Census divisions and the national average.

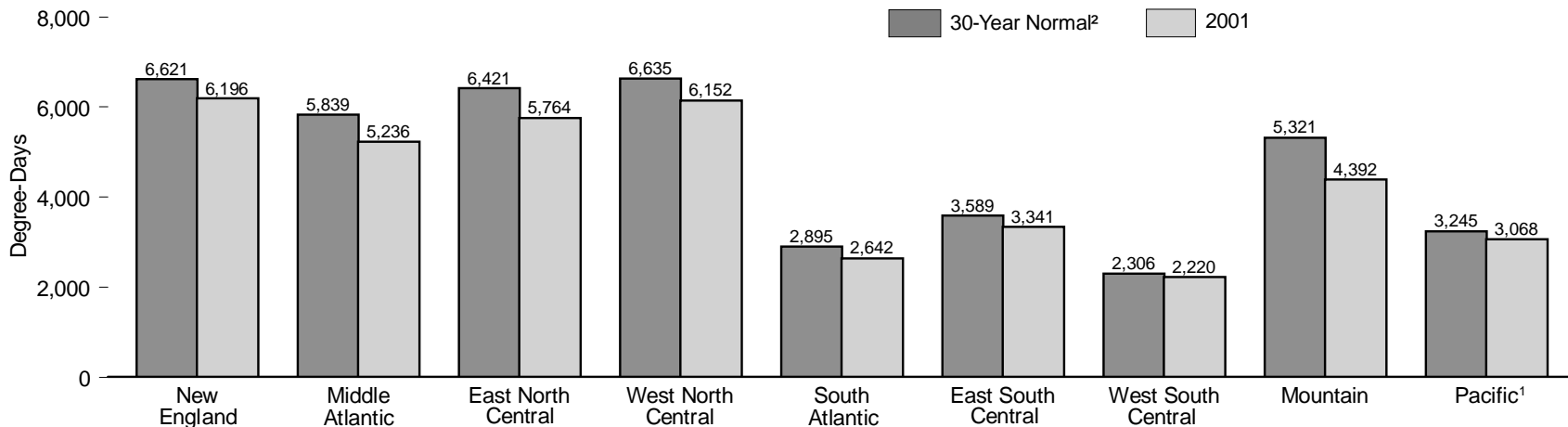
Sources: 1949-2000 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-2. 2001 and 2002—Energy Information Administration, *Monthly Energy Review*, June 2001-April 2002 issues, Table 1.12, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland.

**Figure 1.9 Heating Degree-Days by Census Division**

**U.S.<sup>1</sup> Heating Degree-Days, 1949-2001**



**Heating Degree-Days by Census Division, 2001**



<sup>1</sup> Excludes Alaska and Hawaii.

<sup>2</sup> Normals are based on calculations of data from 1961 through 1990.

Note: See Appendix D for Census Divisions.

Source: Table 1.9.

**Table 1.9 Heating Degree-Days by Census Division, 1949-2001**

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific <sup>1</sup>	United States <sup>1</sup>
1949	5,829	5,091	5,801	6,479	2,367	2,942	2,133	5,483	3,729	4,234
1950	6,470	5,765	6,619	7,136	2,713	3,315	1,974	4,930	3,355	4,536
1951	6,137	5,497	6,549	7,246	2,728	3,340	2,154	5,513	3,469	4,547
1952	6,180	5,443	5,977	6,386	2,684	3,276	2,074	5,404	3,586	4,374
1953	5,650	5,027	5,626	5,994	2,486	3,132	2,024	4,925	3,224	4,063
1954	6,291	5,473	5,841	6,063	2,713	3,211	1,876	4,679	3,296	4,232
1955	6,577	5,708	6,101	6,630	2,786	3,314	2,083	5,517	3,723	4,521
1956	6,702	5,731	6,019	6,408	2,642	3,113	2,032	5,146	3,382	4,387
1957	6,158	5,469	6,166	6,525	2,594	3,112	2,068	5,203	3,322	4,339
1958	6,907	6,237	6,585	6,585	3,271	4,004	2,590	4,929	2,819	4,712
1959	6,363	5,535	6,303	6,665	2,698	3,415	2,398	5,138	2,925	4,403
1960	6,561	5,901	6,544	6,884	3,147	3,958	2,551	5,328	3,309	4,724
1961	6,632	5,895	6,275	6,591	2,869	3,497	2,296	5,299	3,221	4,540
1962	6,981	6,089	6,545	6,691	3,022	3,627	2,264	5,165	3,400	4,694
1963	6,816	6,103	6,691	6,485	3,138	3,890	2,438	5,060	3,326	4,734
1964	6,594	5,694	6,030	6,303	2,828	3,462	2,272	5,769	3,583	4,515
1965	6,825	5,933	6,284	6,646	2,830	3,374	2,078	5,318	3,378	4,549
1966	6,662	6,012	6,606	6,872	3,118	3,758	2,416	5,275	3,170	4,700
1967	6,987	6,127	6,477	6,569	2,864	3,403	2,082	5,232	3,316	4,609
1968	6,800	5,981	6,331	6,556	3,160	3,927	2,522	5,415	3,198	4,675
1969	6,593	5,933	6,603	6,903	3,205	3,910	2,325	5,324	3,377	4,736
1970	6,839	5,943	6,455	6,835	2,997	3,685	2,396	5,436	3,257	4,664
1971	6,695	5,761	6,236	6,594	2,763	3,395	1,985	5,585	3,698	4,547
1972	7,001	6,064	6,772	7,094	2,759	3,438	2,259	5,352	3,376	4,705
1973	6,120	5,327	5,780	6,226	2,718	3,309	2,256	5,562	3,383	4,313
1974	6,621	5,670	6,259	6,478	2,551	3,171	2,080	5,281	3,294	4,406
1975	6,362	5,477	6,169	6,678	2,640	3,336	2,187	5,693	3,623	4,472
1976	6,839	6,097	6,768	6,670	3,040	3,881	2,446	5,303	3,115	4,726
1977	6,579	5,889	6,538	6,506	3,047	3,812	2,330	5,060	3,135	4,605
1978	7,061	6,330	7,095	7,324	3,187	4,062	2,764	5,370	3,168	4,958
1979	6,348	5,851	6,921	7,369	2,977	3,900	2,694	5,564	3,202	4,781
1980	6,900	6,143	6,792	6,652	3,099	3,855	2,378	5,052	2,986	4,707
1981	6,612	5,989	6,446	6,115	3,177	3,757	2,162	4,671	2,841	4,512
1982	6,697	5,866	6,542	7,000	2,721	3,357	2,227	5,544	3,449	4,619
1983	6,305	5,733	6,423	6,901	3,057	3,892	2,672	5,359	3,073	4,627
1984	6,442	5,777	6,418	6,582	2,791	3,451	2,194	5,592	3,149	4,514
1985	6,571	5,660	6,546	7,119	2,736	3,602	2,466	5,676	3,441	4,642
1986	6,517	5,665	6,150	6,231	2,686	3,294	2,058	4,870	2,807	4,295
1987	6,546	5,699	5,810	5,712	2,937	3,466	2,292	5,153	3,013	4,334
1988	6,715	6,088	6,590	6,634	3,122	3,800	2,346	5,148	2,975	4,653
1989	6,887	6,134	6,834	6,996	2,944	3,713	2,439	5,173	3,061	4,726
1990	5,848	4,998	5,681	6,011	2,230	2,929	1,944	5,146	3,148	4,016
1991	5,960	5,177	5,906	6,319	2,503	3,211	2,178	5,259	3,109	4,200
1992	6,844	5,964	6,297	6,262	2,852	3,498	2,145	5,054	2,763	4,441
1993	6,728	5,948	6,646	7,168	2,981	3,768	2,489	5,514	3,052	4,700
1994	6,672	5,934	6,378	6,509	2,724	3,394	2,108	5,002	3,155	4,483
1995	6,559	5,831	6,664	6,804	2,967	3,626	2,145	4,953	2,784	4,531
1996	6,679	5,986	6,947	7,345	3,106	3,782	2,285	5,011	2,860	4,713
1997	6,662	5,809	6,617	6,762	2,845	3,664	2,418	5,189	2,754	4,542
1998	5,680	4,812	5,278	5,774	2,429	3,025	2,021	5,059	3,255	3,951
1999	5,952	5,351	5,946	5,921	2,652	3,142	1,835	4,768	3,158	4,169
2000	<sup>R</sup> 6,489	<sup>R</sup> 5,774	<sup>R</sup> 6,284	<sup>R</sup> 6,456	<sup>R</sup> 2,959	<sup>R</sup> 3,548	<sup>R</sup> 2,194	<sup>R</sup> 4,881	<sup>R</sup> 3,012	4,460
2001 <sup>P</sup>	6,196	5,236	5,764	6,152	2,642	3,341	2,220	4,932	3,068	4,198
Normals <sup>2</sup>	6,621	5,839	6,421	6,635	2,895	3,589	2,306	5,321	3,245	4,576

<sup>1</sup> Excludes Alaska and Hawaii.

<sup>2</sup> Normals are based on calculations of data from 1961 through 1990.

R=Revised. P=Preliminary.

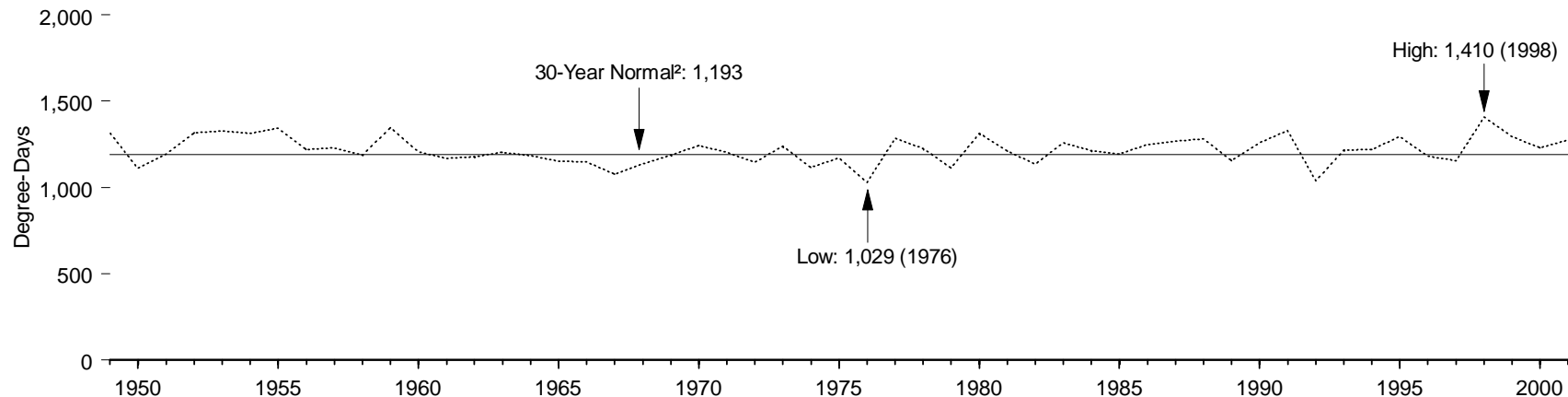
Notes: Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations below the mean daily temperature of 65 F. For example, a weather station recording a mean daily temperature of 40 F would report 25 heating degree-days. Temperature information recorded by weather stations is used to calculate State-wide degree-day averages based on resident State population estimated for 1990. The population-weighted State figures are aggregated into Census divisions and the

national average. See Appendix D for Census divisions.

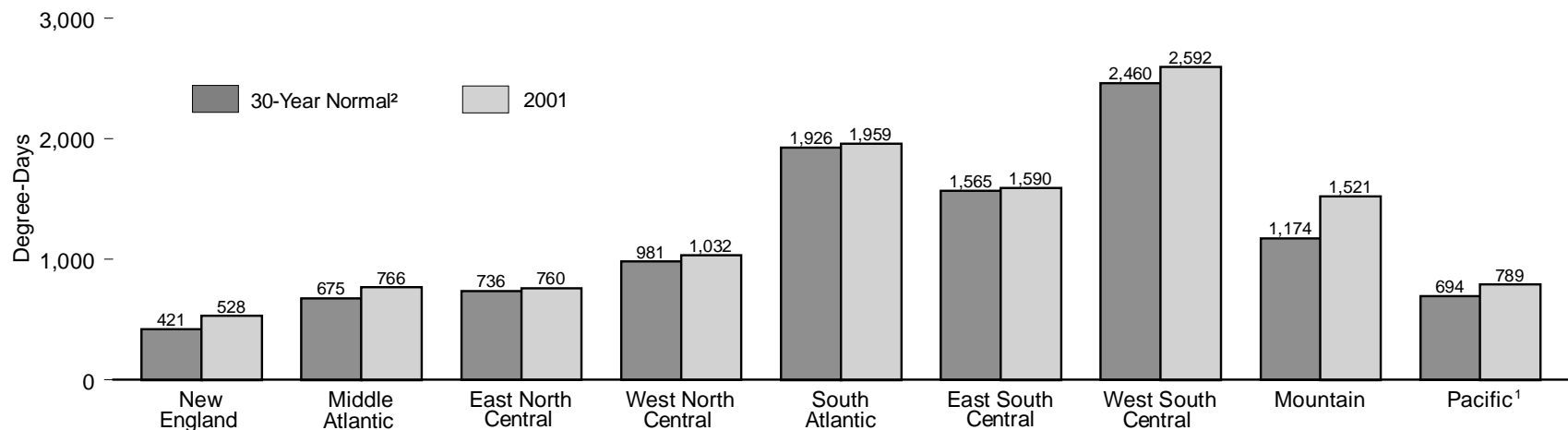
Sources: 1949-2000 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-1. 2001—Energy Information Administration, *Monthly Energy Review (MER)*, February 2001-January 2002 issues, Table 1.11, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland. Census Division data for 2001 are the sums of the current year monthly statistics shown in the cited issues of the *MER*. The U.S. total comes from Table 1.7.

**Figure 1.10 Cooling Degree-Days by Census Division**

**U.S.<sup>1</sup> Cooling Degree-Days, 1949-2001**



**Cooling Degree-Days by Census Division, 2001**



<sup>1</sup> Excludes Alaska and Hawaii.

<sup>2</sup> Normals are based on calculations from 1961 through 1990.

Note: See Appendix D for Census Divisions.

Source: Table 1.10.

**Table 1.10 Cooling Degree-Days by Census Division, 1949-2001**

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific <sup>1</sup>	United States <sup>1</sup>
1949	654	901	949	1,038	2,128	1,776	2,510	1,198	593	1,318
1950	353	542	602	729	1,919	1,568	2,473	1,120	597	1,110
1951	400	653	644	777	2,028	1,781	2,684	1,137	593	1,195
1952	581	825	897	1,109	2,097	1,864	2,543	1,278	657	1,318
1953	441	768	945	1,183	2,137	1,893	2,727	1,193	571	1,326
1954	303	646	858	1,250	2,082	1,998	2,907	1,292	590	1,315
1955	602	934	1,043	1,238	2,045	1,791	2,643	1,124	560	1,344
1956	336	566	750	1,155	1,913	1,685	2,833	1,247	596	1,221
1957	428	738	754	1,004	2,050	1,692	2,465	1,155	660	1,230
1958	344	592	638	878	1,922	1,582	2,517	1,328	836	1,189
1959	532	903	997	1,083	2,128	1,745	2,456	1,258	776	1,348
1960	368	640	722	961	1,926	1,613	2,492	1,308	770	1,206
1961	482	787	745	867	1,888	1,370	2,230	1,223	709	1,168
1962	264	561	742	974	1,908	1,738	2,700	1,147	559	1,179
1963	373	571	712	1,196	1,812	1,580	2,899	1,235	605	1,204
1964	312	634	787	1,030	1,905	1,591	2,608	1,095	574	1,185
1965	352	638	688	914	1,931	1,634	2,579	961	542	1,153
1966	421	731	724	919	1,788	1,440	2,309	1,239	680	1,148
1967	420	602	548	713	1,697	1,257	2,385	1,120	817	1,077
1968	410	725	740	902	1,842	1,517	2,247	1,015	632	1,137
1969	447	706	701	940	1,887	1,572	2,505	1,228	680	1,190
1970	479	779	827	1,066	2,007	1,662	2,375	1,163	689	1,242
1971	465	730	783	960	1,932	1,577	2,448	1,074	685	1,204
1972	364	614	643	908	1,843	1,525	2,513	1,141	698	1,146
1973	551	830	864	1,009	2,000	1,665	2,359	1,123	624	1,241
1974	393	614	626	878	1,842	1,382	2,342	1,188	690	1,117
1975	467	708	788	1,003	2,011	1,520	2,261	1,031	547	1,172
1976	402	597	619	939	1,675	1,232	2,035	1,058	620	1,029
1977	407	689	823	1,122	2,020	1,808	2,720	1,256	715	1,285
1978	378	615	741	1,027	1,972	1,685	2,638	1,174	738	1,226
1979	434	588	618	871	1,833	1,412	2,242	1,164	770	1,113
1980	487	793	816	1,217	2,075	1,834	2,734	1,202	658	1,313
1981	436	657	658	924	1,889	1,576	2,498	1,331	876	1,209
1982	321	541	643	859	1,958	1,537	2,502	1,121	619	1,136
1983	538	799	934	1,178	1,925	1,579	2,288	1,174	776	1,260
1984	468	649	724	955	1,865	1,508	2,469	1,190	956	1,214
1985	372	627	643	830	2,004	1,596	2,599	1,210	737	1,194
1986	301	626	738	1,021	2,149	1,792	2,618	1,188	664	1,249
1987	406	729	918	1,115	2,067	1,718	2,368	1,196	706	1,269
1988	545	782	975	1,230	1,923	1,582	2,422	1,320	729	1,283
1989	426	658	652	864	1,977	1,417	2,295	1,330	685	1,156
1990	477	656	647	983	2,143	1,622	2,579	1,294	827	1,260
1991	511	854	959	1,125	2,197	1,758	2,499	1,182	672	1,331
1992	276	460	449	637	1,777	1,293	2,201	1,206	905	1,040
1993	486	764	735	817	2,092	1,622	2,369	1,113	708	1,218
1994	548	722	664	887	2,005	1,448	2,422	1,436	801	1,220
1995	507	803	921	985	2,081	1,671	2,448	1,234	754	1,293
1996	400	623	629	821	1,867	1,474	2,515	1,381	856	1,180
1997	395	586	574	873	1,886	1,393	2,361	1,335	921	1,156
1998	505	788	889	1,138	2,277	1,928	3,026	1,271	732	1,410
1999	631	882	855	970	2,024	1,733	2,645	1,242	635	1,297
2000	R317	R542	R658	R1,023	R1,929	R1,736	R2,787	R1,488	R756	R1,229
2001 <sup>P</sup>	528	766	760	1,032	1,959	1,590	2,592	1,521	789	1,275
Normals <sup>2</sup>	421	675	736	981	1,926	1,565	2,460	1,174	694	1,193

<sup>1</sup> Excludes Alaska and Hawaii.

<sup>2</sup> Normals are based on calculations of data from 1961 through 1990.

R=Revised. P=Preliminary.

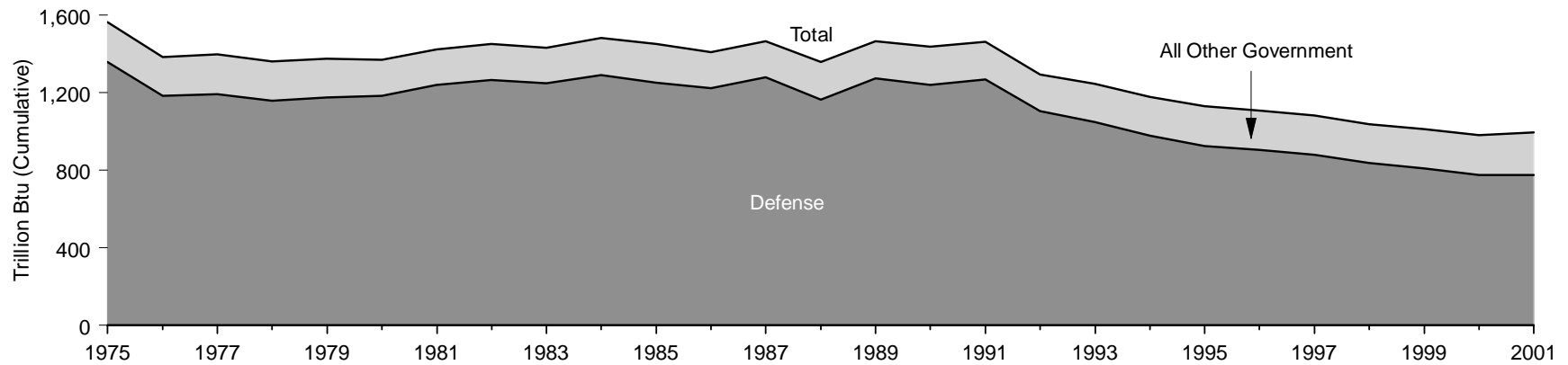
Notes: Degree-days are relative measurements of outdoor air temperature. Cooling degree-days are deviations above the mean daily temperature of 65 F. For example, a weather station recording a mean daily temperature of 78 F would report 13 cooling degree-days. Temperature information recorded by weather stations is used to calculate State-wide degree-day averages based on resident State population

estimated for 1990. The population-weighted State figures are aggregated into Census divisions and the national average. See Appendix D for Census divisions.

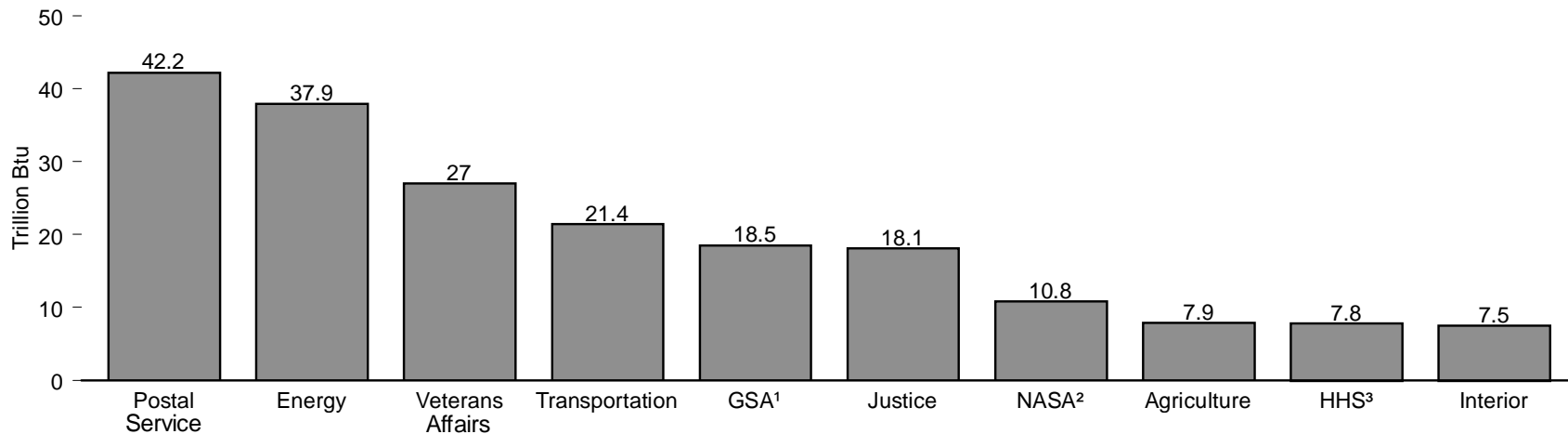
Sources: 1949-2000 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-2. 2001—Energy Information Administration, *Monthly Energy Review*, January 2002 issue, Table 1.12, which reports Census Division data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland. The U.S. total comes from Table 1.8.

**Figure 1.11 U.S. Government Energy Consumption by Agency**

**Total and U.S. Department of Defense, Fiscal Years 1975-2001**



**Selected Non-Defense Agencies, Fiscal Year 2001**



<sup>1</sup> General Services Administration.

<sup>2</sup> National Aeronautics and Space Administration.

<sup>3</sup> Health and Human Services.

Notes: The U.S. Government's fiscal year was October 1 through September 30, except in 1975 and 1976 when it was July 1 through June 30. Because vertical scales differ, graphs should not be compared.

Source: Table 1.11.

**Table 1.11 U.S. Government Energy Consumption by Agency, Fiscal Years 1975-2001**  
(Trillion Btu)

Year	Agencies												
	Agriculture	Defense	Energy	GSA <sup>1</sup>	HHS <sup>2</sup>	Interior	Justice	NASA <sup>3</sup>	Postal Service	Transportation	Veterans Affairs	Other <sup>4</sup>	Total
1975	9.5	1,360.2	50.4	22.3	6.5	9.4	5.9	13.4	30.5	19.3	27.1	10.5	1,565.0
1976	9.3	1,183.3	50.3	20.6	6.7	9.4	5.7	12.4	30.0	19.5	25.0	11.2	1,383.4
1977	8.9	1,192.3	51.6	20.4	6.9	9.5	5.9	12.0	32.7	20.4	25.9	11.9	1,398.5
1978	9.1	1,157.8	50.1	20.4	6.5	9.2	5.9	11.2	30.9	20.6	26.8	12.4	1,360.9
1979	9.2	1,175.8	49.6	19.6	6.4	10.4	6.4	11.1	29.3	19.6	25.7	12.3	1,375.4
1980	8.6	1,183.1	47.4	18.1	6.0	8.5	5.7	10.4	27.2	19.2	24.8	12.3	1,371.2
1981	7.9	1,239.5	47.3	18.0	6.7	7.6	5.4	10.0	27.9	18.8	24.0	11.1	1,424.2
1982	7.6	1,264.5	49.0	18.1	6.4	7.4	5.8	10.1	27.5	19.1	24.2	11.6	1,451.4
1983	7.4	1,248.3	49.5	16.1	6.2	7.7	5.5	10.3	26.5	19.4	24.1	10.8	1,431.8
1984	7.9	1,292.1	51.6	16.2	6.4	8.4	6.4	10.6	27.7	19.8	24.6	10.7	1,482.5
1985	8.4	1,250.6	<sup>R</sup> 52.2	<sup>R</sup> 19.3	6.0	7.8	8.2	<sup>R</sup> 10.9	27.8	<sup>R</sup> 19.6	25.1	<sup>R</sup> 15.5	<sup>R</sup> 1,451.3
1986	6.8	1,222.8	50.4	14.0	6.2	6.9	8.6	11.2	28.0	19.4	25.0	10.8	<sup>R</sup> 1,410.2
1987	7.3	1,280.5	48.6	13.1	6.6	6.6	8.1	<sup>R</sup> 11.3	28.5	19.0	24.9	11.9	<sup>R</sup> 1,466.4
1988	7.8	1,165.8	49.9	12.4	6.4	7.0	9.4	<sup>R</sup> 11.3	29.6	18.7	26.3	15.8	<sup>R</sup> 1,360.3
1989	8.7	1,274.4	44.3	12.7	6.7	7.1	7.7	<sup>R</sup> 12.4	30.3	18.5	26.2	15.6	<sup>R</sup> 1,464.7
1990	9.5	1,241.7	43.5	<sup>R</sup> 15.7	<sup>R</sup> 7.0	7.4	7.0	<sup>R</sup> 12.4	30.6	19.0	24.9	<sup>R</sup> 19.8	<sup>R</sup> 1,438.3
1991	9.6	1,269.3	42.2	14.0	<sup>R</sup> 6.2	7.1	8.0	12.5	30.8	19.0	25.1	18.0	<sup>R</sup> 1,461.7
1992	9.1	1,104.0	44.3	13.8	<sup>R</sup> 6.8	7.0	7.5	<sup>R</sup> 12.6	31.7	17.0	25.3	15.6	<sup>R</sup> 1,294.7
1993	9.3	1,048.8	43.7	14.1	<sup>R</sup> 7.2	7.5	9.1	12.4	33.7	19.4	25.7	16.1	<sup>R</sup> 1,247.0
1994	9.4	977.0	42.3	14.0	<sup>R</sup> 7.5	7.9	10.3	12.6	35.0	19.8	25.6	17.0	<sup>R</sup> 1,178.3
1995	9.7	926.0	47.1	13.7	6.1	6.4	10.2	12.4	36.2	18.7	25.4	17.0	1,129.7
1996	9.1	904.2	44.4	14.5	6.6	4.3	12.1	<sup>R</sup> 11.8	36.4	19.6	26.8	18.4	<sup>R</sup> 1,108.2
1997	7.4	880.0	33.9	14.4	7.9	6.6	12.0	12.0	40.8	19.1	27.3	21.8	1,083.1
1998	7.9	837.1	31.5	14.1	7.4	6.4	15.8	<sup>R</sup> 12.1	39.5	18.5	27.6	20.5	<sup>R</sup> 1,038.4
1999	7.8	810.7	30.4	<sup>R</sup> 14.4	<sup>R</sup> 7.1	7.5	15.4	11.4	39.8	20.5	27.5	<sup>R</sup> 20.8	<sup>R</sup> 1,013.2
2000	<sup>R</sup> 7.4	<sup>R</sup> 774.5	<sup>R</sup> 29.5	<sup>R</sup> 17.7	<sup>R</sup> 7.4	<sup>R</sup> 6.0	<sup>R</sup> 17.7	<sup>R</sup> 10.9	<sup>R</sup> 42.3	<sup>R</sup> 20.4	<sup>R</sup> 27.0	<sup>R</sup> 19.6	<sup>R</sup> 980.5
2001 <sup>P</sup>	7.9	774.5	37.9	18.5	7.8	7.5	18.1	10.8	42.2	21.4	27.0	20.5	994.2

<sup>1</sup> General Services Administration.

<sup>2</sup> Health and Human Services.

<sup>3</sup> National Aeronautics and Space Administration.

<sup>4</sup> Includes National Archives and Records Administration, U.S. Department of Commerce, Panama Canal Commission, Tennessee Valley Authority, U.S. Department of Labor, National Science Foundation, Federal Trade Commission, Federal Communications Commission, Environmental Protection Agency, U.S. Department of Housing and Urban Development, Railroad Retirement Board, Commodity Futures Trading Commission, Equal Employment Opportunity Commission, Nuclear Regulatory Commission, U.S. Department of State, U.S. Department of the Treasury, Small Business Administration, Office of Personnel Management, Federal Emergency Management Agency, Central Intelligence Agency, Social Security

Administration, and U.S. Information Agency (International Broadcasting Bureau).

R = Revised. P = Preliminary.

Notes: The U.S. Government's fiscal year was October 1 through September 30, except in 1975 and 1976, when it was July 1 through June 30. Data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. Government energy use for electricity generation and uranium enrichment is excluded.

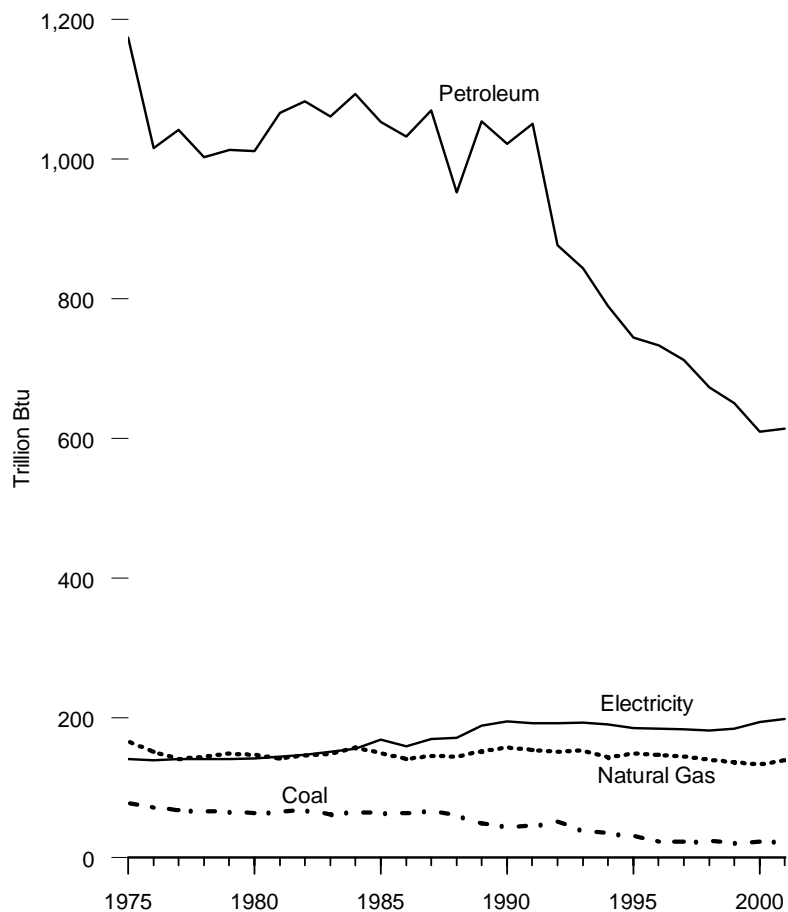
Totals may not equal sum of components due to independent rounding.

Source: U.S. Department of Energy, Energy Efficiency and Renewable Energy, Office of Federal Energy Management Programs.

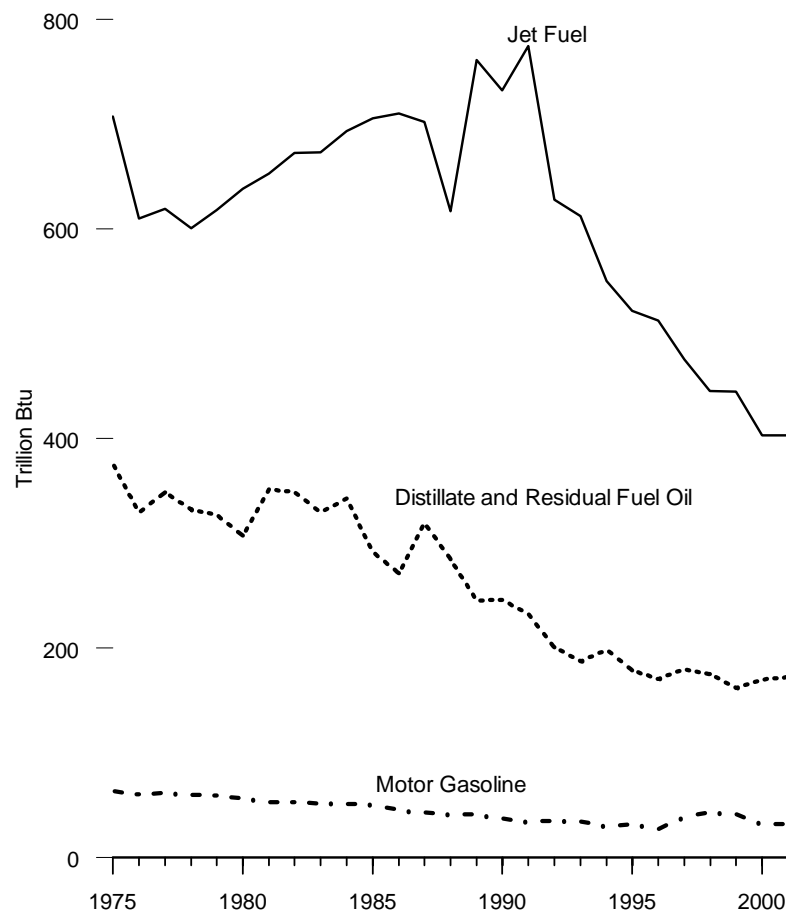


**Figure 1.12 U.S. Government Energy Consumption by Source, Fiscal Years 1975-2001**

**By Major Energy Source**



**By Petroleum Product**



Notes: The U.S. Government's fiscal year was October 1 through September 30, except in 1975 and 1976 when it was July 1 through June 30. Because vertical scales differ, graphs should not be compared.

Source: Table 1.12.

**Table 1.12 U.S. Government Energy Consumption by Source, Fiscal Years 1975-2001**  
(Trillion Btu)

Year	Coal	Natural Gas	Petroleum						Electricity	Purchased Steam	Total
			Aviation Gasoline	Distillate and Residual Fuel Oil	Jet Fuel	LPG <sup>1</sup> and Other	Motor Gasoline	Total			
1975	77.9	166.2	22.0	376.0	707.4	5.6	63.2	1,174.2	141.5	5.1	1,565.0
1976	71.3	151.8	11.6	329.7	610.0	4.7	60.4	1,016.4	139.3	4.6	1,383.4
1977	68.4	141.2	8.8	348.5	619.2	4.1	61.4	1,042.1	141.1	5.7	1,398.5
1978	66.0	144.7	6.2	332.3	601.1	3.0	60.1	1,002.9	141.0	6.4	1,360.9
1979	65.1	148.9	4.7	327.1	618.6	3.7	59.1	1,013.1	141.2	7.1	1,375.4
1980	63.5	147.3	4.9	307.7	638.7	4.0	56.5	1,011.8	141.9	6.8	1,371.2
1981	65.1	142.2	4.6	351.3	653.3	3.7	53.2	1,066.2	144.5	6.2	1,424.2
1982	68.6	146.2	3.6	349.4	672.7	3.9	53.1	1,082.8	147.5	6.2	1,451.4
1983	62.4	147.8	2.6	329.5	673.4	4.0	51.6	1,061.1	151.5	9.0	1,431.8
1984	65.3	157.4	1.9	342.9	693.7	4.1	51.2	1,093.8	155.9	10.1	1,482.5
1985	<sup>R</sup> 64.2	<sup>R</sup> 149.9	1.9	<sup>R</sup> 291.8	705.7	4.0	50.4	<sup>R</sup> 1,053.8	<sup>R</sup> 169.4	13.9	<sup>R</sup> 1,451.3
1986	63.8	140.9	1.4	271.6	710.2	3.9	45.3	1,032.4	159.2	13.7	<sup>R</sup> 1,410.2
1987	67.0	145.6	1.0	319.5	702.3	4.0	43.1	<sup>R</sup> 1,069.9	169.9	13.9	<sup>R</sup> 1,466.4
1988	60.2	144.6	6.0	<sup>R</sup> 284.8	617.2	3.2	41.2	<sup>R</sup> 952.4	171.2	32.0	<sup>R</sup> 1,360.3
1989	48.7	152.4	0.8	<sup>R</sup> 245.3	761.7	5.7	41.1	<sup>R</sup> 1,054.5	<sup>R</sup> 188.6	20.6	<sup>R</sup> 1,464.7
1990	44.2	157.8	0.5	<sup>R</sup> 245.9	732.4	<sup>R</sup> 6.4	37.2	<sup>R</sup> 1,022.4	<sup>R</sup> 194.8	<sup>R</sup> 19.1	<sup>R</sup> 1,438.3
1991	45.9	<sup>R</sup> 154.1	0.4	232.7	774.5	9.0	34.1	<sup>R</sup> 1,050.8	<sup>R</sup> 192.6	<sup>R</sup> 18.3	<sup>R</sup> 1,461.7
1992	51.7	<sup>R</sup> 151.2	1.0	<sup>R</sup> 200.6	628.2	11.4	35.6	876.8	<sup>R</sup> 192.4	<sup>R</sup> 22.5	<sup>R</sup> 1,294.7
1993	38.5	<sup>R</sup> 153.0	0.7	187.1	612.4	9.3	34.5	<sup>R</sup> 843.8	<sup>R</sup> 193.0	18.7	<sup>R</sup> 1,247.0
1994	35.0	<sup>R</sup> 143.9	0.6	<sup>R</sup> 198.5	550.7	10.9	29.5	<sup>R</sup> 790.2	<sup>R</sup> 190.9	<sup>R</sup> 18.2	<sup>R</sup> 1,178.3
1995	31.7	149.2	0.3	178.5	522.3	11.4	31.9	744.4	185.5	18.9	1,129.7
1996	23.3	147.4	0.2	170.6	513.0	21.7	27.6	733.2	<sup>R</sup> 184.6	19.8	<sup>R</sup> 1,108.2
1997	22.5	145.0	0.3	180.1	475.7	17.2	39.0	712.2	184.1	19.3	1,083.1
1998	23.9	140.5	0.2	175.1	445.5	9.4	43.1	673.2	<sup>R</sup> 182.2	18.5	<sup>R</sup> 1,038.4
1999	21.2	<sup>R</sup> 137.2	0.1	<sup>R</sup> 162.0	444.7	2.9	41.1	<sup>R</sup> 650.8	<sup>R</sup> 184.5	<sup>R</sup> 19.5	<sup>R</sup> 1,013.2
2000	<sup>R</sup> 22.7	<sup>R</sup> 133.5	0.2	<sup>R</sup> 170.0	<sup>R</sup> 403.1	<sup>R</sup> 4.7	<sup>R</sup> 31.9	<sup>R</sup> 609.8	<sup>R</sup> 194.0	<sup>R</sup> 20.4	<sup>R</sup> 980.5
2001 <sup>P</sup>	22.4	139.1	0.2	172.3	403.2	6.3	31.9	614.0	198.8	19.9	994.2

<sup>1</sup> Liquefied petroleum gases.

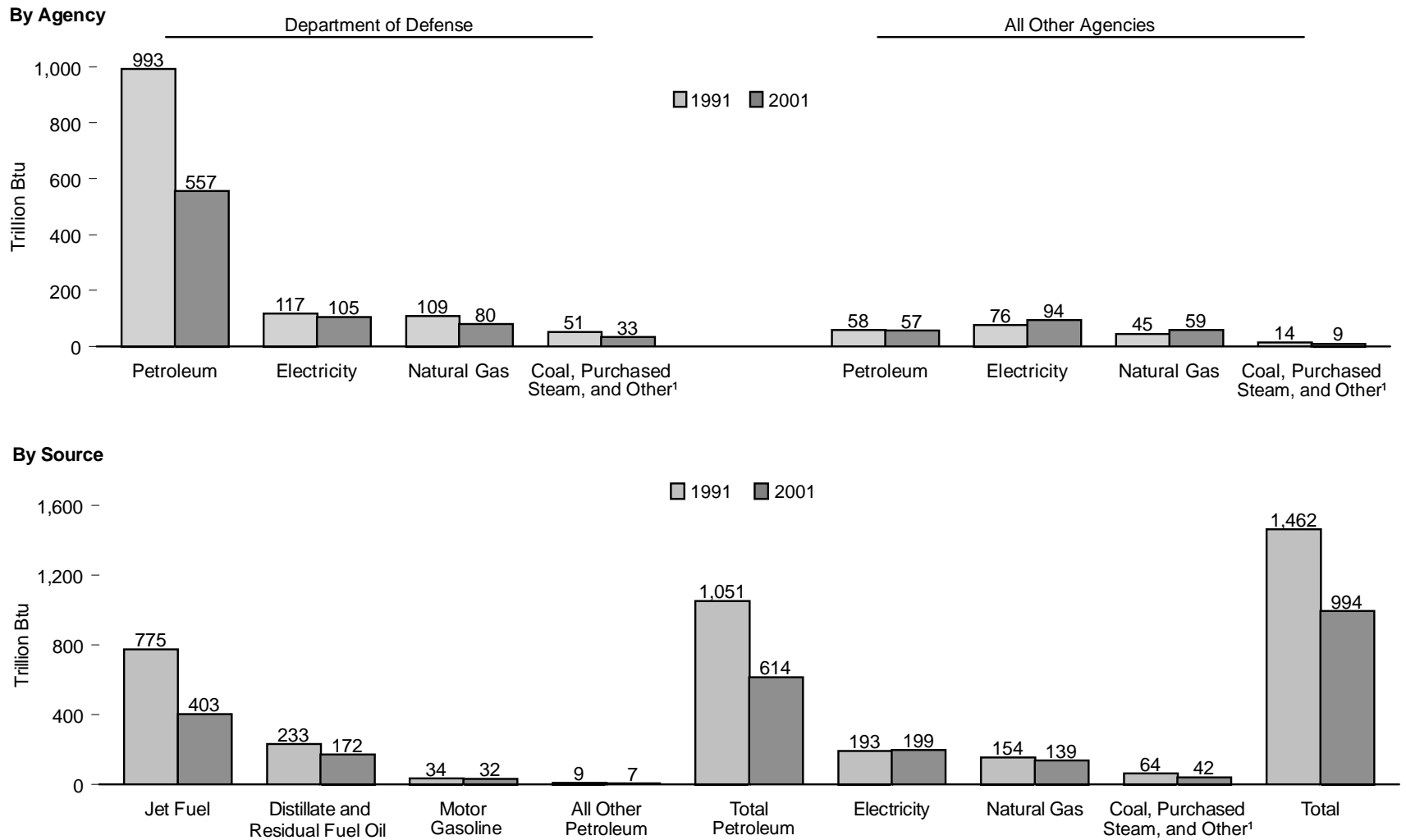
R = Revised. P = Preliminary.

Notes: The U.S. Government's fiscal year was October 1 through September 30, except in 1975 and 1976, when it was July 1 through June 30. This table uses a conversion factor for electricity of 3,412 Btu per kilowatt-hour and a conversion factor for purchased steam of 1,000 Btu per pound. Data include

energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. Government energy use for electricity generation and uranium enrichment is excluded. Totals may not equal sum of components due to independent rounding.

Source: U.S. Department of Energy, Energy Efficiency and Renewable Energy, Office of Federal Energy Management Programs.

**Figure 1.13 U.S. Government Energy Consumption by Agency and Source, Fiscal Years 1991 and 2001**



<sup>1</sup> Chilled water from district heating and cooling systems and any other energy type, such as renewable energy.

Notes: The U.S. Government's fiscal year runs from October 1 through September 30. Because vertical scales differ, graphs should not be compared.

Source: Table 1.13.

**Table 1.13 U.S. Government Energy Consumption by Agency and Source, Fiscal Years 1991 and 2001**  
(Trillion Btu)

Agency	Coal and Other <sup>2</sup>	Natural Gas	Petroleum					Electricity	Total	
			Aviation Gasoline	Distillate and Residual Fuel Oil	Jet Fuel	LPG <sup>1</sup> and Other	Motor Gasoline			Total
<b>Total, 1991</b> .....	<b>64.2</b>	<b>154.1</b>	<b>0.4</b>	<b>232.7</b>	<b>774.5</b>	<b>9.0</b>	<b>34.1</b>	<b>1,050.8</b>	<b>192.6</b>	<b>1,461.7</b>
Defense .....	50.7	109.0	0.0	214.1	765.2	1.7	12.0	993.0	116.6	1,269.3
Postal Service .....	0.5	4.6	0.0	4.2	0.0	0.2	9.0	13.4	12.3	30.8
Energy .....	8.6	10.3	0.0	3.2	0.4	0.3	1.2	5.0	18.2	42.2
Veterans Affairs .....	1.2	13.9	0.0	1.4	0.0	0.0	0.3	1.7	8.3	25.1
Transportation .....	0.1	0.9	0.1	1.4	6.3	5.4	0.7	13.8	4.2	19.0
General Services Administration .....	1.6	2.5	0.0	0.4	0.0	0.0	0.1	0.6	9.3	14.0
Justice .....	0.4	2.5	0.1	0.6	0.1	0.0	1.8	2.6	2.5	8.0
NASA .....	0.4	2.5	0.0	0.9	1.4	0.0	0.3	2.7	6.9	12.5
Agriculture .....	0.1	1.8	0.1	0.6	0.0	0.2	4.7	5.7	2.1	9.6
Health and Human Services .....	0.1	2.3	0.0	1.4	0.0	0.1	0.0	1.5	2.3	6.2
Interior .....	0.1	1.0	0.1	0.9	0.1	1.0	2.2	4.3	1.6	7.1
Other <sup>3</sup> .....	0.6	2.8	0.1	3.5	1.0	0.0	1.8	6.3	8.3	18.0
<b>Total, 2001 <sup>P</sup></b> .....	<b>42.3</b>	<b>139.1</b>	<b>0.2</b>	<b>172.3</b>	<b>403.2</b>	<b>6.3</b>	<b>31.9</b>	<b>614.0</b>	<b>198.8</b>	<b>994.2</b>
Defense .....	32.9	79.9	0.0	150.2	395.1	2.3	9.4	556.9	104.8	774.5
Postal Service .....	0.0	8.5	0.0	5.1	0.0	0.9	10.4	16.4	17.3	42.2
Energy .....	4.2	7.9	0.0	2.7	0.0	0.2	0.4	3.4	22.4	37.9
Veterans Affairs .....	1.5	14.2	0.0	1.2	0.0	0.0	0.7	1.9	9.3	27.0
Transportation .....	0.0	2.0	0.0	7.2	4.2	0.1	0.1	11.5	7.9	21.4
General Services Administration .....	1.7	6.5	0.0	0.5	0.0	0.0	0.1	0.6	9.7	18.5
Justice .....	0.4	5.8	0.1	0.6	1.6	0.0	5.4	7.8	4.3	18.1
NASA .....	0.2	3.1	0.0	0.4	1.1	0.0	0.1	1.6	5.7	10.8
Agriculture .....	0.2	2.5	0.0	0.4	0.0	0.4	2.5	3.4	1.9	7.9
Health and Human Services .....	0.3	3.5	0.0	0.7	0.0	0.1	0.1	0.9	3.0	7.8
Interior .....	0.0	1.3	0.0	1.0	0.1	2.1	0.9	4.1	2.0	7.5
Other <sup>4</sup> .....	0.7	3.8	0.0	2.3	1.1	0.1	1.8	5.3	10.6	20.5

<sup>1</sup> Liquefied petroleum gases.

<sup>2</sup> Purchased steam and other.

<sup>3</sup> Includes U.S. Department of Commerce, Panama Canal Commission, Tennessee Valley Authority, U.S. Department of Labor, U.S. Information Agency, U.S. Department of Housing and Urban Development, Federal Communications Commission, Office of Personnel Management, U.S. Department of State, Federal Emergency Management Agency, U.S. Department of the Treasury, National Archives and Records Administration, Nuclear Regulatory Commission, Railroad Retirement Board, Federal Trade Commission, Commodity Futures Trading Commission, Equal Employment Opportunity Commission, and Environmental Protection Agency.

<sup>4</sup> Includes National Archives and Records Administration, U.S. Department of Commerce, U.S. Department of Labor, U.S. Department of State, Environmental Protection Agency, Federal Communications Commission, Federal Trade Commission, Social Security Administration, International Broadcasting Bureau, Equal Employment Opportunity Commission, Nuclear Regulatory Commission, Office

of Personnel Management, U.S. Department of Housing and Urban Development, U.S. Department of the Treasury, Railroad Retirement Board, Tennessee Valley Authority, Federal Emergency Management Agency, Central Intelligence Agency, and National Science Foundation.

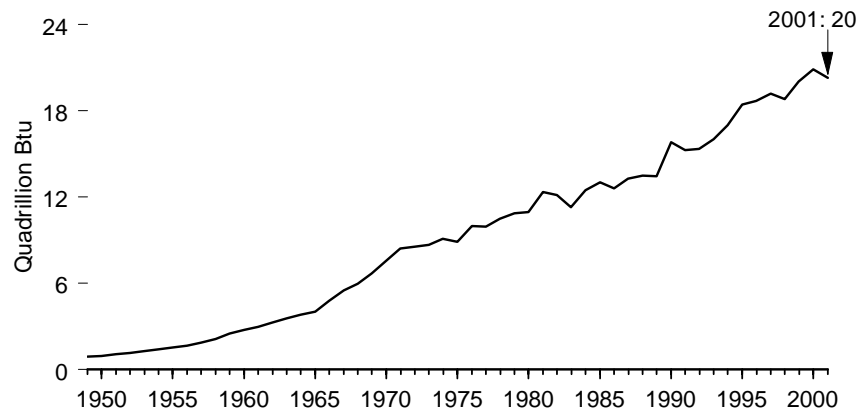
P=Preliminary.

Notes: This table uses a conversion factor for electricity of 3,412 Btu per kilowatt-hour and a conversion factor for purchased steam of 1,000 Btu per pound. Data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. Government energy use for electricity generation and uranium enrichment is excluded. The U.S. Government's fiscal year runs from October 1 through September 30. Totals may not equal sum of components due to independent rounding.

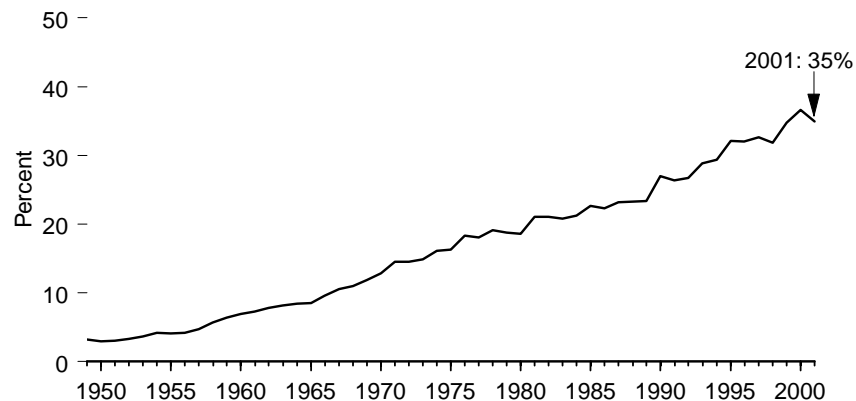
Source: U.S. Department of Energy, Energy Efficiency and Renewable Energy, Office of Federal Energy Management Programs.

**Figure 1.14 Fossil Fuel Production on Federally Administered Lands**

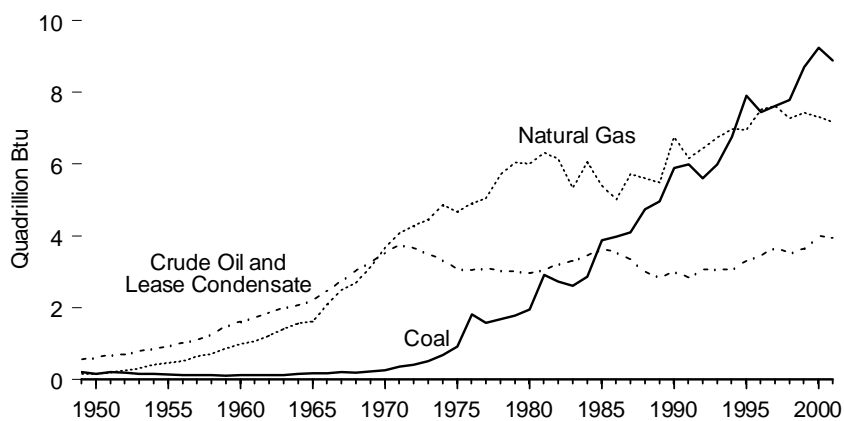
**Total, 1949-2001**



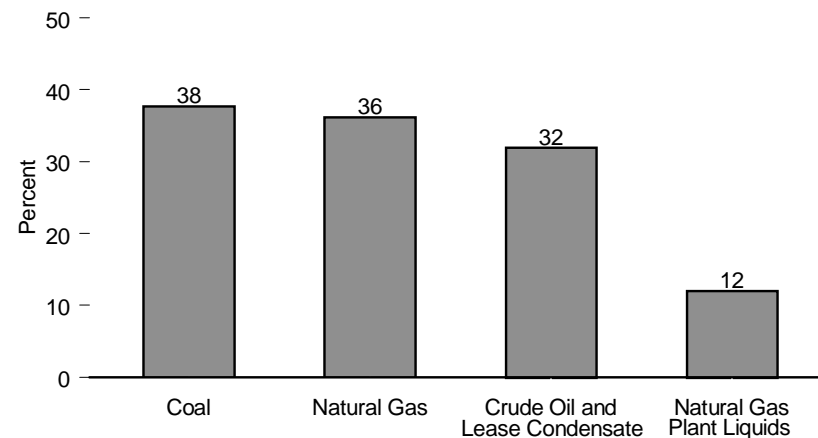
**Federal Lands Fossil Fuel Production as a Share of U.S. Fossil Fuel Production, 1949-2001**



**By Source, 1949-2001**



**Federal Lands Fossil Fuel Production as a Share of U.S. Fossil Fuel Production, By Source, 2001**



Notes: All data are on a calendar-year basis except 2001, which is on a fiscal-year basis (October 2000-September 2001). Federally Administered Lands include all classes of land owned by the Federal Government, including acquired military, Outer Continental Shelf, and public lands. Because vertical scales differ, graphs should not be compared.

Source: Table 1.14.

**Table 1.14 Fossil Fuel Production on Federally Administered Lands, 1949-2001**

Year	Crude Oil and Lease Condensate <sup>1</sup>			Natural Gas Plant Liquids <sup>2</sup>			Natural Gas <sup>3</sup>			Coal <sup>4</sup>			Fossil Fuels	
	Million Barrels	Quadrillion Btu	Percent U.S. Total <sup>5</sup>	Million Barrels	Quadrillion Btu	Percent U.S. Total <sup>5</sup>	Trillion Cubic Feet	Quadrillion Btu	Percent U.S. Total <sup>5</sup>	Million Short Tons	Quadrillion Btu	Percent U.S. Total <sup>5</sup>	Quadrillion Btu	Percent U.S. Total
1949	95.2	0.55	5.2	4.4	0.02	2.8	0.15	0.15	2.8	9.5	0.20	2.0	0.92	3.2
1950	105.9	0.61	5.4	4.4	0.02	2.4	0.14	0.15	2.4	7.7	0.16	1.4	0.94	2.9
1951	117.3	0.68	5.2	5.3	0.02	2.6	0.17	0.18	2.4	9.3	0.20	1.6	1.08	3.0
1952	118.7	0.69	5.2	5.5	0.02	2.5	0.25	0.25	3.2	8.7	0.18	1.7	1.15	3.3
1953	136.9	0.79	5.8	5.7	0.03	2.4	0.29	0.30	3.6	7.5	0.16	1.5	1.28	3.6
1954	146.5	0.85	6.3	6.1	0.03	2.4	0.39	0.40	4.6	7.4	0.16	1.8	1.43	4.2
1955	159.5	0.92	6.4	6.0	0.03	2.1	0.43	0.45	4.8	5.9	0.12	1.2	1.53	4.1
1956	174.1	1.01	6.7	6.4	0.03	2.2	0.49	0.51	5.1	5.8	0.12	1.1	1.67	4.2
1957	189.4	1.10	7.2	6.6	0.03	2.2	0.62	0.64	6.1	5.7	0.12	1.1	1.89	4.7
1958	216.8	1.26	8.9	8.0	0.04	2.7	0.69	0.71	6.5	5.3	0.11	1.2	2.11	5.7
1959	258.2	1.50	10.0	9.5	0.04	3.0	0.83	0.86	7.2	4.9	0.10	1.1	2.50	6.4
1960	277.3	1.61	10.8	11.6	0.05	3.4	0.95	0.98	7.8	5.2	0.11	1.2	2.75	6.9
1961	297.3	1.72	11.3	13.5	0.06	3.7	1.03	1.06	8.1	5.2	0.11	1.2	2.95	7.3
1962	321.7	1.87	12.0	15.3	0.07	4.1	1.18	1.22	8.9	5.8	0.12	1.3	3.27	7.8
1963	342.8	1.99	12.5	16.0	0.07	4.0	1.37	1.41	9.7	5.4	0.11	1.1	3.58	8.1
1964	356.0	2.07	12.8	15.5	0.07	3.7	1.51	1.55	10.2	7.1	0.15	1.4	3.84	8.4
1965	378.6	2.20	13.3	14.3	0.06	3.2	1.56	1.61	10.2	8.2	0.17	1.6	4.04	8.5
1966	426.7	2.47	14.1	15.2	0.06	3.2	2.02	2.09	12.3	8.3	0.17	1.5	4.80	9.6
1967	472.6	2.74	14.7	20.1	0.09	3.9	2.41	2.48	13.8	9.5	0.20	1.7	5.51	10.5
1968	523.7	3.04	15.7	13.7	0.06	2.5	2.61	2.69	14.1	9.1	0.19	1.6	5.97	11.0
1969	563.8	3.27	16.7	19.9	0.08	3.4	3.05	3.14	15.4	10.1	0.21	1.8	6.70	11.9
1970	605.6	3.51	17.2	40.6	0.17	6.7	3.56	3.67	16.9	12.0	0.25	2.0	7.60	12.8
1971	648.9	3.76	18.8	54.0	0.22	8.7	3.95	4.08	18.3	17.3	0.36	3.1	8.42	14.5
1972	630.5	3.66	18.2	56.7	0.23	8.9	4.17	4.28	19.3	19.0	0.40	3.1	8.56	14.5
1973	604.3	3.51	18.0	54.9	0.22	8.7	4.37	4.46	20.1	24.2	0.51	4.1	8.70	14.9
1974	570.2	3.31	17.8	61.9	0.25	10.1	4.75	4.87	22.9	32.1	0.67	5.3	9.10	16.1
1975	531.5	3.08	17.4	59.7	0.24	10.0	4.57	4.67	23.8	43.6	0.92	6.7	8.90	16.3
1976	525.7	3.05	17.7	57.2	0.23	9.7	4.81	4.91	25.2	86.4	1.82	12.6	10.00	18.3
1977	535.0	3.10	17.8	57.4	0.23	9.7	4.94	5.04	25.8	74.8	1.57	10.7	9.94	18.0
1978	523.6	3.04	16.5	25.9	0.10	4.5	5.60	5.71	29.3	79.2	1.66	11.8	10.51	19.1
1979	519.8	3.01	16.7	11.9	0.05	2.1	5.93	6.05	30.1	84.9	1.78	10.9	10.89	18.8
1980	510.4	2.96	16.2	10.5	0.04	1.8	5.85	6.01	30.2	92.9	1.95	11.2	10.96	18.6
1981	529.3	3.07	16.9	12.3	0.05	2.1	6.15	6.31	32.1	138.8	2.91	16.8	12.35	21.1
1982	552.3	3.20	17.5	15.0	0.06	2.7	5.97	6.14	33.5	130.0	2.73	15.5	12.13	21.1
1983	568.8	3.30	17.9	14.0	0.05	2.5	5.17	5.33	32.1	124.3	2.61	15.9	11.30	20.8
1984	595.8	3.46	18.3	25.4	0.10	4.3	5.88	6.07	33.7	136.3	2.86	15.2	12.48	21.2
1985	628.3	3.64	19.2	26.6	0.10	4.5	5.24	5.41	31.8	184.6	3.88	20.9	13.03	22.6
1986	608.4	3.53	19.2	23.3	0.09	4.1	4.87	5.01	30.3	189.7	3.98	21.3	12.61	22.3
1987	577.3	3.35	18.9	23.7	0.09	4.1	5.56	5.73	33.4	195.2	4.10	21.2	13.27	23.2
1988	516.3	2.99	17.3	37.0	0.14	6.2	5.45	5.61	31.9	225.4	4.73	23.7	13.48	23.3
1989	488.9	2.84	17.6	45.1	0.17	8.0	5.32	5.49	30.7	236.3	4.96	24.1	13.46	23.4
1990	515.9	2.99	19.2	50.9	0.19	8.9	6.55	6.75	36.8	280.6	5.89	27.3	15.83	27.0
1991	491.0	2.85	18.1	72.7	0.28	12.0	5.99	6.17	33.8	285.1	5.99	28.6	15.28	26.4
1992	529.1	3.07	20.2	70.7	0.27	11.4	6.25	6.43	35.0	266.7	5.60	26.7	15.37	26.7
1993	529.3	3.07	21.2	64.4	0.24	10.2	6.56	6.74	36.3	285.7	6.00	30.2	16.05	28.8
1994	527.7	3.06	21.7	60.0	0.23	9.5	6.78	6.97	36.0	321.4	6.75	31.1	17.01	29.4
1995	567.4	3.29	23.7	74.0	0.28	11.5	6.78	6.96	36.4	376.9	7.91	36.5	18.45	32.1
1996	596.5	3.46	25.2	71.2	0.27	10.6	7.31	7.51	38.8	354.5	7.44	33.3	18.68	32.0
1997	632.8	3.67	26.9	74.7	0.28	11.3	7.43	7.62	39.3	362.6	7.61	33.3	19.18	32.6
1998	606.3	3.52	26.6	60.3	0.23	9.4	6.06	6.27	37.1	371.1	7.79	33.2	18.81	31.8
1999	7628.9	73.65	729.3	766.5	70.25	79.9	77.24	77.44	738.4	414.5	8.70	37.7	20.04	734.8
2000	689.2	4.00	32.3	88.9	0.33	12.7	7.14	7.32	37.6	440.2	9.24	41.0	20.89	36.6
2001 <sup>8</sup>	681.1	3.95	31.9	82.0	0.31	12.0	7.00	7.17	36.2	422.9	8.88	37.7	20.31	34.9

<sup>1</sup> Production from Naval Petroleum Reserve No. 1 for 1974 and earlier years is for fiscal years (July through June).

<sup>2</sup> Includes only those quantities for which the royalties were paid on the basis of the value of the natural gas plant liquids produced. Additional quantities of natural gas plant liquids were produced; however, the royalties paid were based on the value of natural gas processed. These latter quantities are included with natural gas.

<sup>3</sup> Includes some quantities of natural gas processed into liquids at natural gas processing plants and fractionators.

<sup>4</sup> Converted to British thermal units (Btu) on the basis of an estimated heat content of coal produced on Federally administered lands of 21.0 million Btu per short ton.

<sup>5</sup> Based on physical units.

<sup>6</sup> There is a discontinuity in this time series between 1997 and 1998 due to the sale of "Elk Hills," Naval Petroleum Reserve No. 1.

<sup>7</sup> There is a discontinuity in this time series between 1998 and 1999; beginning in 1999 Naval Petroleum Reserve data have become insignificant and are no longer included.

<sup>8</sup> Fiscal-year data: October 2000-September 2001.

R=Revised.

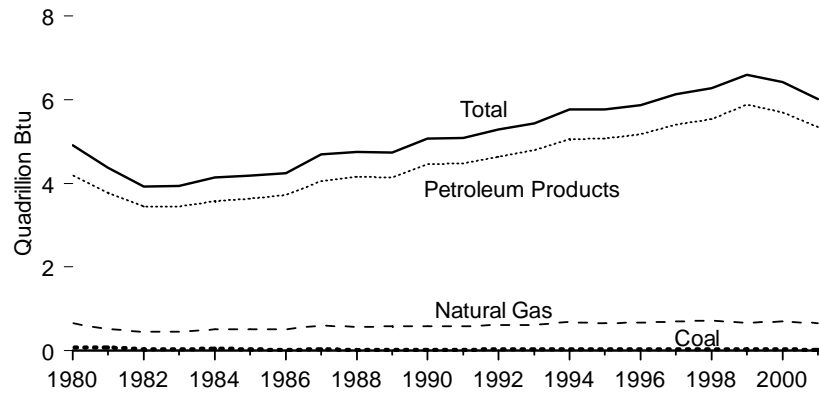
Note: Federally Administered Lands include all classes of land owned by the Federal Government, including acquired military, Outer Continental Shelf, and public lands.

Web Page: <http://www.mrm.mms.gov>.

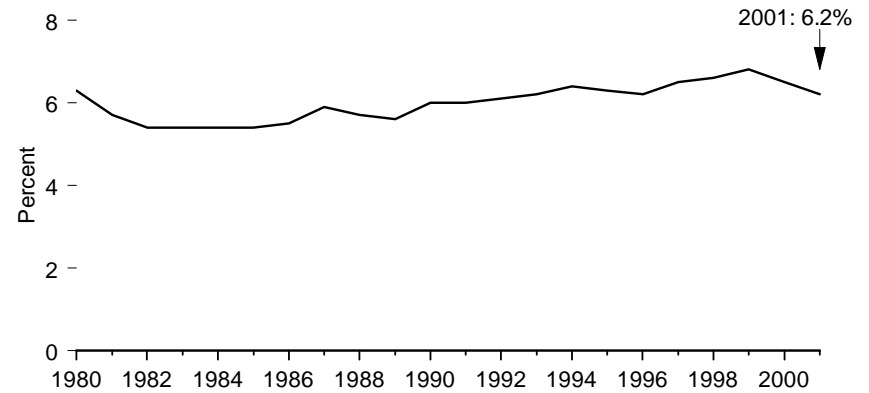
Sources: See end of section.

**Figure 1.15 Fossil Fuel Consumption for Nonfuel Use**

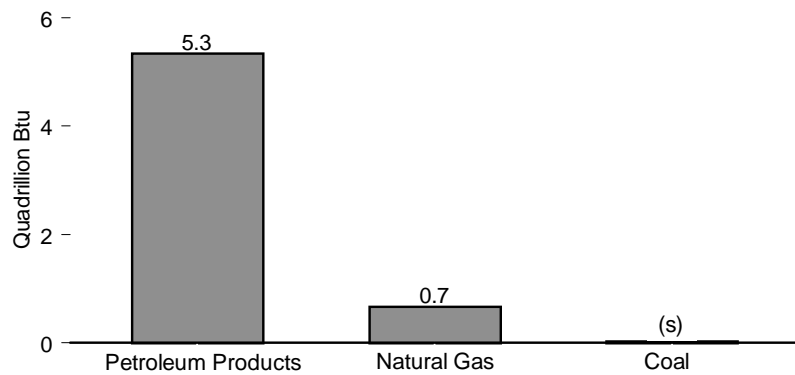
**Total, 1980-2001**



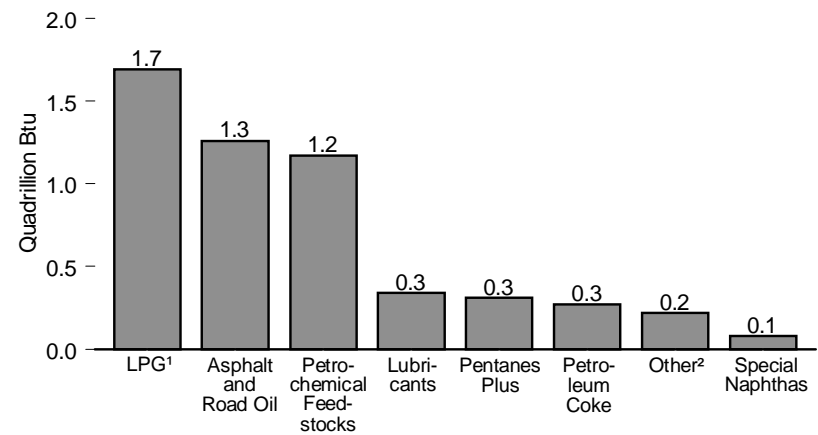
**As Share of Total Energy Consumption, 1980-2001**



**By Fuel, 2001**



**By Petroleum Product, 2001**



<sup>1</sup> Liquefied petroleum gases.

<sup>2</sup> Distillate fuel oil, residual fuel oil, waxes, and miscellaneous products.

(s) = less than 0.05 quadrillion Btu.

Notes: See Note 2 at end of section for a discussion of "nonfuel use." Because vertical scales differ, graphs should not be compared.

Source: Table 1.15.

**Table 1.15 Fossil Fuel Consumption for Nonfuel Use, 1980-2001**

Year	Petroleum Products									Natural Gas	Coal	Total	Percent of Total Energy Consumption
	Asphalt and Road Oil	Liquefied Petroleum Gases	Pentanes Plus	Lubricants	Petro-chemical Feedstocks	Petroleum Coke	Special Naphthas	Other <sup>1</sup>	Total				
Physical Units <sup>2</sup>													
1980	145	230	( <sup>3</sup> )	58	253	24	37	58	805	639	2.4	—	—
1981	125	229	( <sup>3</sup> )	56	216	29	27	54	736	507	2.1	—	—
1982	125	256	( <sup>3</sup> )	51	157	23	25	48	686	438	1.4	—	—
1983	136	264	( <sup>3</sup> )	53	151	10	30	45	689	441	1.2	—	—
1984	150	247	10	57	145	16	40	41	705	495	1.5	—	—
1985	156	265	13	53	144	15	30	41	718	500	1.1	—	—
1986	164	248	17	52	169	14	25	38	727	496	0.7	—	—
1987	170	303	12	59	170	24	28	36	802	578	0.8	—	—
1988	171	319	21	57	173	25	22	40	827	554	0.7	—	—
1989	165	332	17	58	172	23	20	39	827	563	0.6	—	—
1990	176	344	18	60	199	30	20	39	887	572	0.6	—	—
1991	162	394	10	53	200	27	17	44	907	573	0.6	—	—
1992	166	397	13	54	214	41	20	35	940	594	1.2	—	—
1993	174	389	60	55	216	27	20	33	976	596	0.9	—	—
1994	176	437	56	58	222	30	15	35	1,029	673	0.9	—	—
1995	178	450	66	57	215	32	13	26	1,037	647	0.9	—	—
1996	177	470	69	55	217	34	14	27	1,063	656	0.9	—	—
1997	184	473	65	58	250	29	14	27	1,102	<sup>R</sup> 678	0.9	—	—
1998	190	454	58	61	252	51	20	31	1,117	<sup>R</sup> 685	0.8	—	—
1999	200	512	72	62	<sup>R</sup> 238	62	28	28	<sup>R</sup> 1,201	<sup>R</sup> 666	0.8	—	—
2000	192	<sup>R</sup> 527	<sup>R</sup> 68	61	<sup>R</sup> 243	<sup>R</sup> 38	<sup>R</sup> 19	29	<sup>R</sup> 1,177	<sup>R</sup> 684	0.8	—	—
2001 <sup>P</sup>	190	479	66	56	211	45	16	31	1,093	645	0.8	—	—
Quadrillion Btu													
1980	0.96	0.78	( <sup>3</sup> )	0.35	1.43	0.14	0.19	0.34	4.19	0.65	0.08	4.92	6.3
1981	0.83	0.77	( <sup>3</sup> )	0.34	1.21	0.17	0.14	0.31	3.78	0.52	0.07	4.37	5.7
1982	0.83	0.87	( <sup>3</sup> )	0.31	0.88	0.14	0.13	0.28	3.44	0.45	0.04	3.93	5.4
1983	0.90	0.89	( <sup>3</sup> )	0.32	0.85	0.06	0.16	0.26	3.45	0.45	0.04	3.94	5.4
1984	0.99	0.84	0.05	0.35	0.82	0.09	0.21	0.24	3.58	0.51	0.05	4.14	5.4
1985	1.03	0.90	0.06	0.32	0.82	0.09	0.16	0.24	3.63	0.52	0.03	4.18	5.4
1986	1.09	0.85	0.08	0.31	0.95	0.08	0.13	0.22	3.72	0.51	0.02	4.25	5.5
1987	1.13	1.06	0.06	0.36	0.96	0.14	0.14	0.21	4.06	0.60	0.03	4.69	5.9
1988	1.14	1.11	0.10	0.34	0.97	0.15	0.11	0.23	4.16	0.57	0.02	4.75	5.7
1989	1.10	1.18	0.08	0.35	0.96	0.14	0.11	0.23	4.14	0.58	0.02	4.74	5.6
1990	1.17	1.20	0.08	0.36	1.12	0.18	0.11	0.23	4.46	0.59	0.02	5.07	6.0
1991	1.08	1.38	0.04	0.32	1.15	0.16	0.09	0.26	4.48	0.59	0.02	5.09	6.0
1992	1.10	1.39	0.06	0.33	1.20	0.25	0.10	0.20	4.64	0.61	0.04	5.29	<sup>R</sup> 6.1
1993	1.15	1.35	0.28	0.34	1.22	0.17	0.10	0.20	4.80	0.61	0.03	5.44	6.2
1994	1.17	1.55	0.26	0.35	1.26	0.18	0.08	0.20	5.05	0.69	0.03	5.77	<sup>R</sup> 6.4
1995	1.18	1.59	0.30	0.35	1.21	0.19	0.07	0.20	5.08	0.66	0.03	5.77	6.3
1996	1.18	1.65	0.32	0.34	1.21	0.21	0.07	0.19	5.17	0.67	0.03	5.87	6.2
1997	1.22	1.67	0.30	0.35	1.40	0.18	0.07	0.20	5.40	<sup>R</sup> 0.70	0.03	<sup>R</sup> 6.13	6.5
1998	1.26	1.60	0.27	0.37	1.40	0.31	0.11	0.22	5.54	0.71	0.03	6.28	6.6
1999	1.32	1.81	0.33	0.37	1.33	0.37	0.15	0.21	5.89	<sup>R</sup> 0.68	0.03	<sup>R</sup> 6.60	6.8
2000	<sup>R</sup> 1.28	<sup>R</sup> 1.86	0.31	0.37	<sup>R</sup> 1.35	0.23	<sup>R</sup> 0.10	0.21	<sup>R</sup> 5.70	<sup>R</sup> 0.70	0.03	<sup>R</sup> 6.43	6.5
2001 <sup>P</sup>	1.26	1.69	0.31	0.34	1.17	0.27	0.08	0.22	5.34	0.66	0.02	6.02	6.2

<sup>1</sup> Distillate fuel oil, residual fuel oil, waxes, and miscellaneous products.

<sup>2</sup> Petroleum - million barrels; natural gas - billion cubic feet; and coal - million short tons.

<sup>3</sup> Included in liquefied petroleum gases.

R=Revised. P=Preliminary. — = Not applicable.

Notes: See Note 2 at end of section for a discussion of "Nonfuel Use." Because of changes in methodology, data series may be revised annually. See Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States 2000* (November 2001), Appendix A, on the Web Page, for a discussion of the estimates in the table. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/environment.html>.

Sources: **Petroleum Products:** 1980—EIA, Energy Data Reports, *Petroleum Statement, Annual and Sales of Liquefied Petroleum Gases and Ethane in 1980*. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports, and unpublished data. 2001—EIA, *Petroleum Supply Monthly* (February 2002), and EIA estimates. **Natural Gas:** 1980—Bureau of the Census, 1980 Survey of Manufactures, *Hydrocarbon, Coal, and Coke Materials Consumed*. 1981 forward—U.S. Department of Commerce. **Coal:** 1960-1995—U.S. International Trade Commission, *Synthetic Organic Chemicals, United States Production and Sales, 1995* (January 1997). 1996 forward—Estimated because the data series has been discontinued. **Percent of Total Energy Consumption:** Derived by dividing total by total consumption on Table 1.3.



## Energy Overview

**Note 1.** Data on the generation of electricity in the United States represent net generation, which is gross output of electricity (measured at the generator terminals) minus power plant use. Nuclear electricity generation data identified by individual countries in Section 11 are gross outputs of electricity.

**Note 2.** Most fossil fuels consumed in the United States and elsewhere are combusted to produce heat and power. However, some are used directly for nonfuel use as construction materials, lubricants, chemical feedstocks, solvents, and waxes. For example, asphalt and road oil are used for roofing and paving; liquefied petroleum gases are used to create intermediate products that are used in making plastics; lubricants, including motor oil and greases, are used in vehicles and various industrial processes; petrochemical feedstocks are used to make plastics, synthetic fabrics, and related products; and natural gas is used to make nitrogenous fertilizers and as feedstock in the chemical industry.

### Table 1.14 Sources

- 1949-1980—U.S. Geological Survey, *Oil and Gas Production, Royalty Income, and Production, Royalty Income, and Related Statistics*, and *Coal, Phosphate, Potash, Sodium, and Other Mineral Production, Royalty Income, and Related Statistics* (June 1981); Department of Energy (DOE), Office of Naval Petroleum and Oil Shale Reserves (NPOSR), unpublished data; and U.S. Geological Survey, National Petroleum Reserve in Alaska, unpublished data.
- 1981-1983—U.S. Minerals Management Service, *Mineral Revenues Report on Receipts from Federal and Indian Leases*, (annual); DOE, Office of NPOSR, unpublished data; and U.S. Geological Survey, National Petroleum Reserve in Alaska, unpublished data.
- 1984-1998—U.S. Minerals Management Service, *Mineral Revenues Report on Receipts from Federal and Indian Leases*, annual reports; and DOE, Office of NPOSR, unpublished data.
- 1999-2000—U.S. Minerals Management Service, *Mineral Revenues Report on Receipts from Federal and American Indian Leases*, annual reports.
- 2001—<http://www.mrm.mms.gov/Stats/statsrm.htm>.

# 2

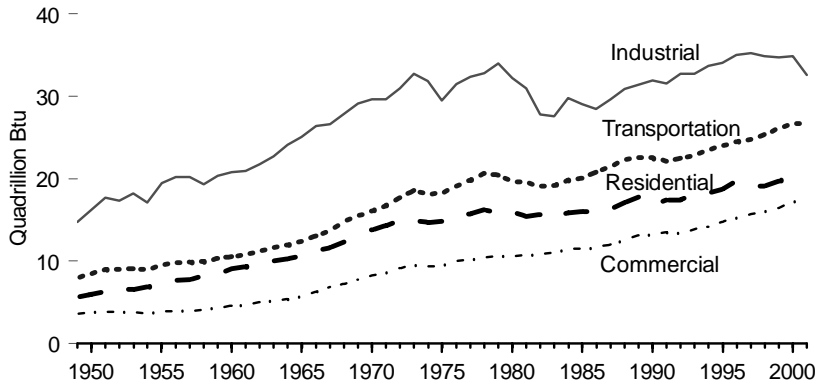
## Energy Consumption by Sector



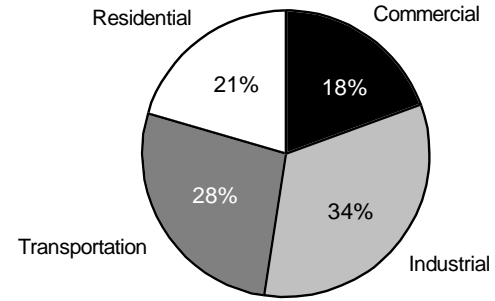
Office buildings, industries, residences, and transport systems, Baltimore, Maryland; east view from the Inner Harbor.  
Source: U.S. Department of Energy.

**Figure 2.1a Energy Consumption by Sector Overview**

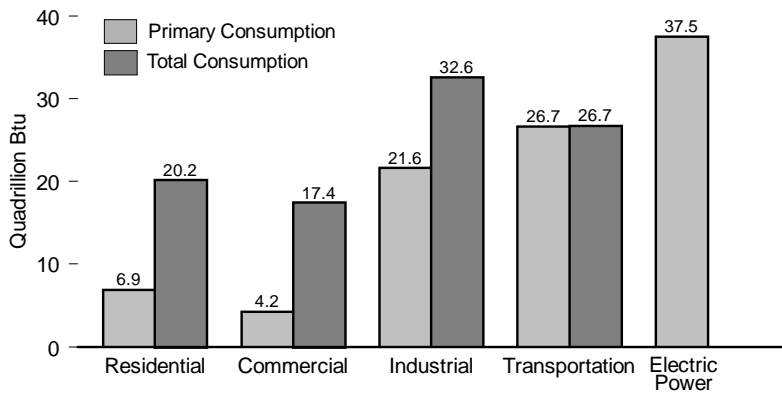
**Total Consumption by End-Use Sector, 1949-2001**



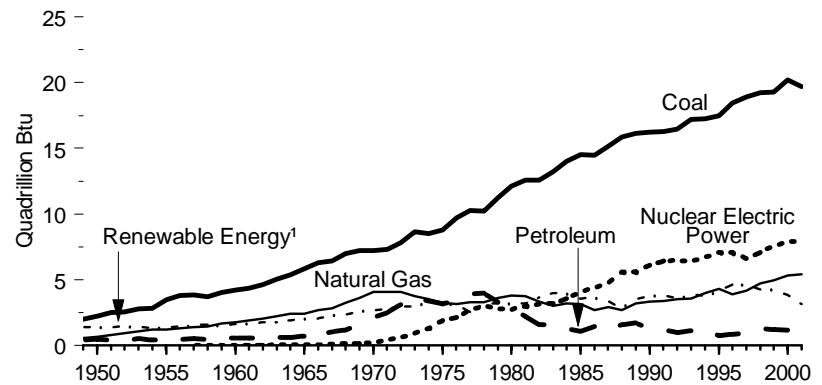
**End-Use Sector Shares of Total, 2001**



**Primary and Total Consumption by Sector, 2001**



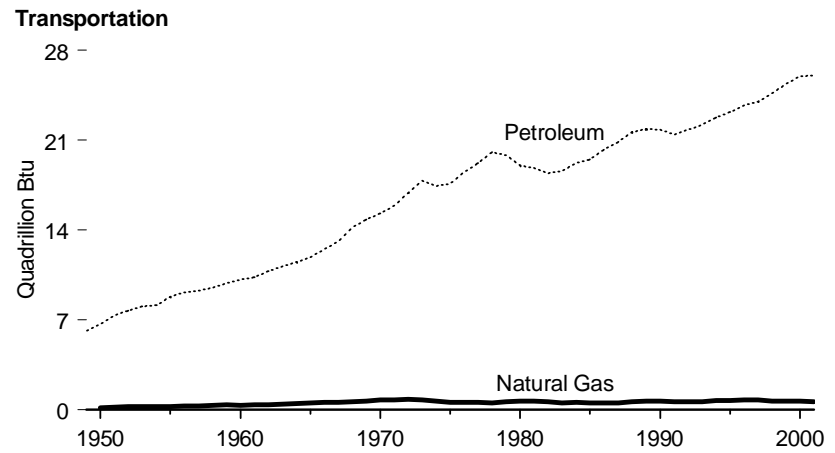
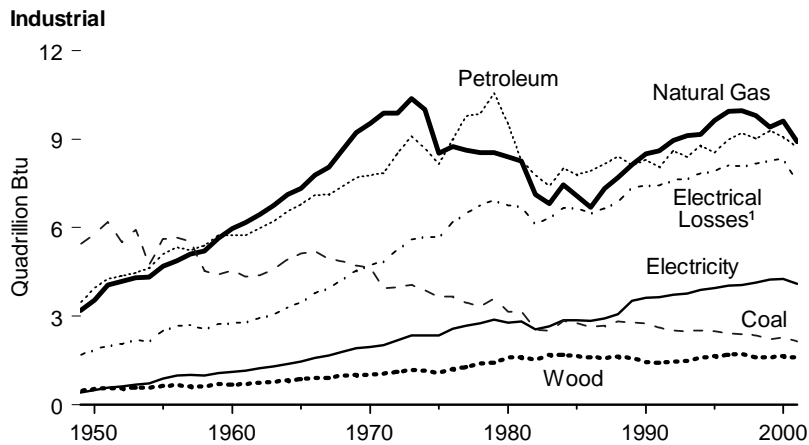
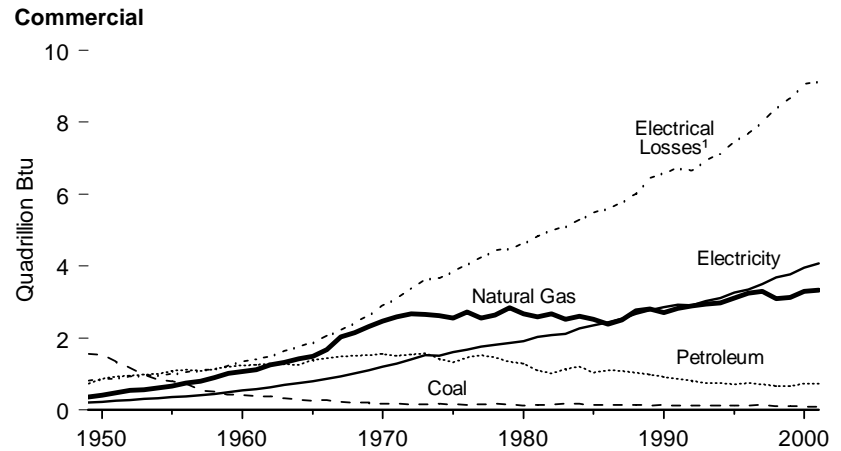
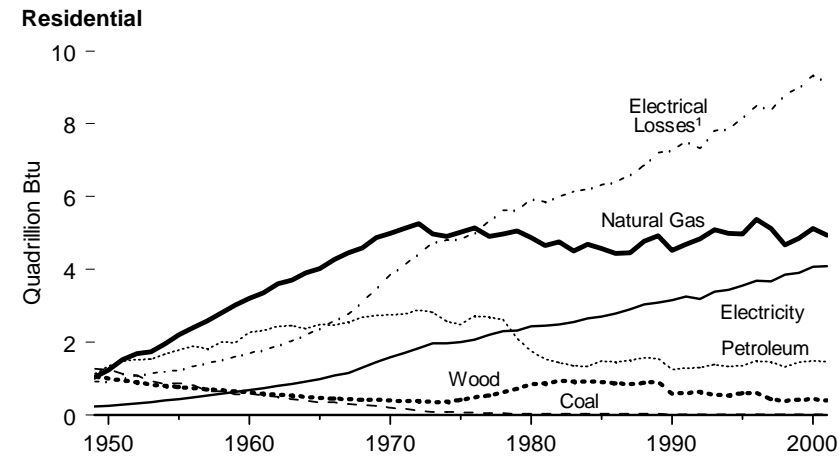
**Electric Power Sector, 1949-2001**



<sup>1</sup> Conventional hydroelectric power, wood, waste, geothermal, solar, and wind.  
Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 2.1.a and 2.1.f.

**Figure 2.1b Energy Consumption by End-Use Sector, 1949-2001**



<sup>1</sup> Electrical system energy losses associated with the generation, transmission, and distribution of energy in the form of electricity.

Note: Because vertical scales differ, graphs should not be compared.  
Sources: Tables 2.1b-2.1e.

**Table 2.1a Energy Consumption by Sector, 1949-2001**  
(Trillion Btu)

Year	End-Use Sectors								Electric Power Sector <sup>3,4</sup>	Adjustments <sup>5</sup>	Total
	Residential		Commercial <sup>1</sup>		Industrial <sup>2</sup>		Transportation				
	Primary	Total	Primary	Total	Primary	Total	Primary	Total			
1949	4,475	R5,619	2,661	R3,665	R12,627	R14,726	7,880	R7,991	4,358	(s)	32,000
1950	4,848	R6,012	2,824	R3,888	R13,881	R16,242	8,384	R8,493	4,698	(s)	34,635
1951	5,099	R6,381	R2,752	R3,892	R15,118	R17,680	8,934	R9,043	5,093	(s)	36,996
1952	5,179	R6,587	2,662	R3,867	R14,662	R17,313	8,907	R9,004	5,361	(s)	36,770
1953	5,056	R6,567	2,520	R3,782	R15,328	R18,211	9,031	R9,124	5,749	(s)	37,684
1954	5,286	R6,875	2,445	R3,725	R14,306	R17,156	8,823	R8,903	5,800	(s)	36,660
1955	5,633	R7,312	2,548	R3,888	R16,091	R19,490	R9,475	R9,551	6,495	(s)	40,242
1956	5,851	R7,684	2,608	R4,031	R16,562	R20,215	R9,791	R9,860	6,979	(s)	41,791
1957	5,772	R7,747	2,434	R3,952	R16,513	R20,219	9,837	9,897	7,260	(s)	41,816
1958	6,143	R8,226	2,553	R4,120	R15,798	R19,319	R9,953	10,005	7,223	(s)	41,670
1959	6,224	R8,455	2,630	R4,359	R16,519	R20,329	R10,298	R10,350	7,821	(s)	43,493
1960	6,689	R9,087	2,702	R4,597	R16,977	R20,839	R10,560	R10,597	8,192	(s)	45,120
1961	6,815	R9,330	2,744	R4,711	R16,993	R20,944	R10,735	R10,770	8,469	(s)	45,755
1962	7,113	R9,818	2,910	R5,024	R17,590	R21,770	R11,186	11,221	9,033	(s)	47,832
1963	7,135	R10,035	2,897	R5,227	R18,366	R22,730	11,621	11,655	9,628	(s)	49,647
1964	7,161	R10,295	2,949	R5,442	R19,427	R24,096	R11,965	11,998	10,330	(s)	51,831
1965	7,334	R10,695	3,144	R5,813	R20,124	R25,074	12,400	12,434	11,013	(s)	54,016
1966	7,549	R11,221	3,384	R6,301	R21,030	R26,401	13,069	13,102	11,993	(s)	57,024
1967	7,741	R11,669	3,738	R6,870	R21,013	R26,615	R13,718	R13,752	12,696	(s)	58,906
1968	7,968	R12,372	3,861	R7,291	R21,872	R27,886	R14,831	R14,866	13,882	(s)	62,415
1969	8,277	R13,208	4,046	R7,797	R22,654	R29,118	R15,471	R15,506	15,182	(s)	65,628
1970	8,353	R13,803	4,196	R8,311	R22,975	R29,647	R16,061	R16,098	16,273	(s)	67,858
1971	8,460	R14,290	4,279	R8,684	R22,732	R29,611	16,693	16,729	17,149	(s)	69,314
1972	8,655	R14,909	4,369	R9,159	R23,532	R30,974	R17,681	R17,716	18,520	(s)	72,758
1973	8,250	R14,963	4,381	R9,533	R24,741	R32,693	R18,576	R18,612	19,852	R7	75,808
1974	7,928	R14,714	4,221	R9,386	R23,816	R31,855	R18,086	R18,119	20,022	R7	74,080
1975	8,006	R14,856	4,023	R9,477	R21,454	R29,464	R18,209	R18,244	20,350	R1	72,042
1976	8,408	R15,460	4,333	R10,051	R22,685	R31,454	19,065	19,099	21,573	R8	76,072
1977	8,207	R15,729	4,217	R10,210	R23,193	R32,356	R19,784	R19,820	22,713	7	78,122
1978	8,272	R16,202	4,269	R10,517	R23,276	R32,788	R20,580	R20,615	23,724	R2	80,123
1979	7,934	R15,888	4,333	R10,664	R24,211	R34,019	R20,436	R20,471	24,128	R2	81,044
1980	7,504	R15,898	4,097	R10,633	R22,673	R32,209	R19,658	R19,696	24,505	R-1	78,435
1981	7,103	R15,431	3,831	R10,703	R21,404	R30,926	R19,469	R19,506	24,760	3	76,569
1982	7,163	R15,649	3,859	R10,940	R19,113	R27,778	R19,032	R19,069	24,270	R4	73,441
1983	6,834	R15,547	3,827	R11,024	R18,598	R27,602	R19,098	R19,141	24,956	R3	73,317
1984	6,990	R15,870	3,991	R11,546	R20,208	R29,745	R19,761	R19,809	26,020	R3	76,972
1985	6,988	R16,023	3,712	R11,554	R19,540	R29,062	R20,023	20,071	26,446	R-4	R76,705
1986	6,807	R16,009	3,652	R11,681	R19,133	R28,463	20,768	R20,817	26,611	R3	R76,974
1987	6,841	R16,341	3,743	R12,054	R20,046	R29,633	21,405	21,456	27,448	R-3	R79,481
1988	7,244	R17,140	3,953	R12,643	R20,958	R30,895	22,261	22,313	28,574	R3	R82,994
1989	7,492	R17,785	R3,954	R13,172	R20,886	R31,408	R22,497	R22,552	4P30,087	R10	R84,926
1990	R6,457	R16,878	R3,813	R13,267	R21,240	R31,904	R22,472	R22,526	P30,594	R-9	R84,567
1991	6,689	R17,453	R3,862	R13,498	R20,901	R31,566	R22,069	R22,122	P31,118	R1	R84,640
1992	R6,882	R17,401	R3,899	R13,453	R21,806	R32,738	R22,406	R22,459	P31,058	(s)	R86,051
1993	R7,121	R18,318	R3,894	R13,852	R21,740	R32,738	R22,829	R22,883	P32,207	R-10	R87,780
1994	R6,949	R18,246	R3,930	R14,159	R22,376	R33,668	R23,448	R23,503	P32,875	R-6	R89,571
1995	R7,022	R18,749	R4,032	R14,753	R22,643	R34,035	R23,904	R23,960	P33,896	R3	R91,501
1996	R7,556	R19,742	R4,218	R15,251	R23,376	R35,012	R24,456	R24,511	P34,912	R4	R94,521
1997	R7,088	R19,146	R4,248	R15,754	R23,619	R35,255	R24,752	R24,807	P35,256	R6	R94,969
1998	R6,462	R19,114	R3,961	R16,029	R23,080	R34,848	R25,295	R25,351	P36,543	R-3	R95,338
1999	R6,810	R19,702	R4,001	R16,430	R22,825	R34,740	R26,031	R26,089	P37,294	R6	R96,968
2000	R7,129	R20,517	R4,221	R17,237	R22,907	R34,855	R26,643	R26,704	P38,412	R2	R99,315
2001 <sup>P</sup>	6,899	20,157	4,240	17,443	21,630	32,604	26,682	26,746	37,499	(s)	96,950

<sup>1</sup> Commercial sector fuel use, including that at commercial combined-heat-and-power (CHP) and commercial electricity-only plants. See Appendix G for commercial sector NAICS codes.

<sup>2</sup> Industrial sector fuel use, including that at industrial combined-heat-and-power (CHP) and industrial electricity-only plants. See Appendix G for industrial sector NAICS codes.

<sup>3</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants.

<sup>4</sup> Through 1988, data are for consumption at electric utilities only. Beginning in 1989, data also include consumption at independent power producers.

<sup>5</sup> A balancing item. The sum of primary consumption in the five energy-use sectors equals the sum of total consumption in the four end-use sectors. However, total energy consumption does not equal the sum of the sectoral components due to the use of sector-specific conversion factors for natural gas and coal.

R=Revised. P=Preliminary. (s)=Less than 0.5 trillion Btu.

Notes: Primary consumption includes coal, natural gas, petroleum, nuclear electric power, hydroelectric power, wood, waste, alcohol fuels, geothermal, solar, wind, net imports of coal coke, and net imports of electricity. Total consumption includes primary consumption, electricity retail sales, and electrical system energy losses. Totals may not equal sum of components due to independent rounding.

Sources: Tables 2.1b-2.1f.

**Table 2.1b Residential Sector Energy Consumption, 1949-2001**  
(Trillion Btu)

Year	Primary Consumption									Electricity Retail Sales <sup>4</sup>	Electrical System Losses <sup>5</sup>	Total
	Fossil Fuels				Renewable Energy							
	Coal	Natural Gas <sup>1</sup>	Petroleum	Total	Wood	Geothermal <sup>2</sup>	Solar <sup>3</sup>	Total				
1949	1,272	1,027	1,121	3,420	1,055	NA	NA	1,055	4,475	228	R916	R5,619
1950	1,261	1,240	1,340	3,842	1,006	NA	NA	1,006	4,848	246	R918	R6,012
1951	1,134	1,526	1,481	4,141	958	NA	NA	958	5,099	284	R998	R6,381
1952	1,079	1,679	1,522	4,279	899	NA	NA	899	5,179	319	R1,089	R6,587
1953	946	1,744	1,533	4,224	832	NA	NA	832	5,056	355	R1,156	R6,567
1954	858	1,961	1,667	4,486	800	NA	NA	800	5,286	397	R1,193	R6,875
1955	867	2,198	1,792	4,858	775	NA	NA	775	5,633	438	R1,241	R7,312
1956	823	2,409	1,880	5,112	739	NA	NA	739	5,851	490	R1,343	R7,684
1957	654	2,588	1,828	5,070	702	NA	NA	702	5,772	535	R1,441	R7,747
1958	652	2,809	1,994	5,455	688	NA	NA	688	6,143	578	R1,504	R8,226
1959	573	3,015	1,989	5,577	647	NA	NA	647	6,224	630	R1,602	R8,455
1960	585	3,212	2,265	6,062	627	NA	NA	627	6,689	687	R1,711	R9,087
1961	534	3,362	2,332	6,228	627	NA	NA	587	6,815	732	R1,784	R9,330
1962	512	3,600	2,441	6,553	560	NA	NA	560	7,113	794	R1,910	R9,818
1963	438	3,700	2,459	6,598	537	NA	NA	537	7,135	856	R2,044	R10,035
1964	379	3,908	2,375	6,662	499	NA	NA	499	7,161	928	R2,206	R10,295
1965	358	4,028	2,481	6,866	468	NA	NA	468	7,334	993	R2,367	R10,695
1966	349	4,275	2,471	7,094	455	NA	NA	455	7,549	1,081	R2,590	R11,221
1967	299	4,451	2,557	7,307	434	NA	NA	434	7,741	1,160	R2,768	R11,669
1968	269	4,588	2,685	7,543	426	NA	NA	426	7,968	1,302	R3,102	R12,372
1969	248	4,875	2,739	7,862	415	NA	NA	415	8,277	1,456	R3,475	R13,208
1970	209	4,987	2,755	7,952	401	NA	NA	401	8,353	1,591	R3,859	R13,803
1971	175	5,126	2,777	8,078	382	NA	NA	382	8,460	1,704	R4,125	R14,290
1972	116	5,264	2,895	8,276	380	NA	NA	380	8,655	1,838	R4,416	R14,909
1973	94	4,977	2,825	7,896	354	NA	NA	354	8,250	1,976	R4,737	R14,963
1974	82	4,901	2,573	7,557	371	NA	NA	371	7,928	1,973	R4,813	R14,714
1975	63	5,023	2,495	7,580	425	NA	NA	425	8,006	2,007	R4,844	R14,856
1976	59	5,147	2,720	7,927	482	NA	NA	482	8,408	2,069	R4,983	R15,460
1977	57	4,913	2,695	7,666	542	NA	NA	542	8,207	2,202	R5,320	R15,729
1978	49	4,981	2,620	7,651	622	NA	NA	622	8,272	2,301	R5,628	R16,202
1979	37	5,055	2,114	7,206	728	NA	NA	728	7,934	2,330	R5,625	R15,888
1980	31	4,866	1,748	6,645	859	NA	NA	859	7,504	2,448	R5,947	R15,898
1981	30	4,660	1,543	6,234	869	NA	NA	869	7,103	2,464	R5,864	R15,431
1982	32	4,753	1,441	6,226	937	NA	NA	937	7,163	2,489	R5,997	R15,649
1983	31	4,516	1,362	5,909	925	NA	NA	925	6,834	2,562	R6,150	R15,547
1984	38	4,692	1,337	6,067	923	NA	NA	923	6,990	2,662	R6,218	R15,870
1985	35	4,571	1,483	6,089	899	NA	NA	899	6,988	2,709	R6,326	R16,023
1986	35	4,439	1,457	5,931	876	NA	NA	876	6,807	2,795	R6,407	R16,009
1987	32	4,449	1,508	5,989	852	NA	NA	852	6,841	2,902	R6,598	R16,341
1988	32	4,765	1,563	6,359	885	NA	NA	885	7,244	3,046	R6,850	R17,140
1989	28	4,929	1,560	R6,517	918	5	53	976	7,492	3,090	R7,204	R17,785
1990	R28	4,523	R1,263	R5,814	581	6	56	642	R6,457	3,153	R7,269	R16,878
1991	23	4,697	1,293	R6,012	613	6	58	677	6,689	3,260	R7,504	R17,453
1992	24	4,835	R1,311	R6,170	645	6	60	711	R6,882	3,193	R7,326	R17,401
1993	24	5,095	R1,385	R6,504	548	7	62	616	R7,121	3,394	R7,802	R18,318
1994	21	4,988	R1,333	R6,342	537	6	64	607	R6,949	3,441	R7,857	R18,246
1995	17	4,981	R1,356	R6,355	596	7	65	667	R7,022	3,557	R8,170	R18,749
1996	17	5,383	R1,489	R6,888	595	7	R65	R667	R7,556	3,694	R8,493	R19,742
1997	16	5,118	R1,448	R6,582	433	R8	65	506	R7,088	3,671	R8,387	R19,146
1998	R12	4,669	R1,322	R6,003	387	8	65	459	R6,462	3,856	R8,796	R19,114
1999	14	4,858	R1,452	R6,324	414	R9	64	486	R6,810	3,906	R8,985	R19,702
2000	R11	R5,121	R1,493	R6,626	433	9	R61	503	R7,129	R4,069	R9,319	R20,517
2001P	11	4,940	1,473	6,424	407	9	59	475	6,899	4,098	9,161	20,157

<sup>1</sup> Includes supplemental gaseous fuels.

<sup>2</sup> Geothermal heat pump and direct use energy.

<sup>3</sup> Solar thermal direct use and photovoltaic electricity generation. Includes small amounts of commercial sector use.

<sup>4</sup> Electricity retail sales to ultimate customers reported by electric utilities and other energy service providers.

<sup>5</sup> Total losses are calculated as the primary energy consumed by the electric power sector minus the energy content of electricity retail sales. Total losses are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales.

R=Revised, P=Preliminary, NA=Not available.

Note: Totals may not equal sum of components due to independent rounding.

Sources: Tables 2.1f, 5.12a, 6.5, 7.3, 8.5, 10.2a, A1, and A3-A6.

**Table 2.1c Commercial Sector Energy Consumption, 1949-2001**  
(Trillion Btu)

Year	Primary Consumption									Total Primary	Electricity Retail Sales <sup>4</sup>	Electrical System Energy Losses <sup>5</sup>	Total
	Fossil Fuels				Renewable Energy								
	Coal	Natural Gas <sup>1</sup>	Petroleum	Total	Hydropower <sup>2</sup>	Wood	Waste	Geothermal <sup>3</sup>	Total				
1949	1,554	360	727	2,641	NA	20	NA	NA	20	2,661	200	R804	R3,665
1950	1,542	401	862	2,805	NA	19	NA	NA	19	2,824	225	R838	R3,888
1951	1,331	481	R922	R2,734	NA	18	NA	NA	18	R2,752	252	R888	R3,892
1952	1,169	534	942	2,645	NA	17	NA	NA	17	2,662	273	R932	R3,867
1953	985	549	970	2,504	NA	16	NA	NA	16	2,520	297	R966	R3,782
1954	825	605	1,000	2,430	NA	15	NA	NA	15	2,445	319	R961	R3,725
1955	801	651	1,081	2,533	NA	15	NA	NA	15	2,548	350	R991	R3,888
1956	730	742	1,122	2,594	NA	14	NA	NA	14	2,608	380	R1,043	R4,031
1957	535	803	1,083	2,421	NA	13	NA	NA	13	2,434	411	R1,107	R3,952
1958	512	902	1,125	2,540	NA	13	NA	NA	13	2,553	435	R1,132	R4,120
1959	415	1,009	1,194	2,618	NA	12	NA	NA	12	2,630	488	R1,241	R4,359
1960	407	1,056	1,228	2,690	NA	12	NA	NA	12	2,702	543	R1,352	R4,597
1961	371	1,115	1,247	2,733	NA	11	NA	NA	11	2,744	572	R1,395	R4,711
1962	371	1,249	1,280	2,899	NA	11	NA	NA	11	2,910	621	R1,493	R5,024
1963	317	1,307	1,262	2,887	NA	10	NA	NA	10	2,897	688	R1,643	R5,227
1964	274	1,419	1,247	2,940	NA	9	NA	NA	9	2,949	738	R1,755	R5,442
1965	259	1,490	1,386	3,135	NA	9	NA	NA	9	3,144	789	R1,880	R5,813
1966	263	1,676	1,436	3,375	NA	9	NA	NA	9	3,384	859	R2,058	R6,301
1967	225	2,022	1,483	3,730	NA	8	NA	NA	8	3,738	925	R2,207	R6,870
1968	203	2,140	1,510	3,853	NA	8	NA	NA	8	3,861	1,014	R2,416	R7,291
1969	195	2,323	1,520	4,038	NA	8	NA	NA	8	4,046	1,108	R2,644	R7,797
1970	165	2,473	1,551	4,189	NA	8	NA	NA	8	4,196	1,201	R2,913	R8,311
1971	175	2,587	1,510	4,272	NA	7	NA	NA	7	4,279	1,288	R3,117	R8,684
1972	153	2,678	1,530	4,362	NA	7	NA	NA	7	4,369	1,408	R3,382	R9,159
1973	160	2,649	1,565	4,374	NA	7	NA	NA	7	4,381	1,517	R3,635	R9,533
1974	175	2,617	1,423	4,214	NA	7	NA	NA	7	4,221	1,501	R3,663	R9,386
1975	147	2,558	1,310	4,015	NA	8	NA	NA	8	4,023	1,598	R3,857	R9,477
1976	144	2,718	1,461	4,323	NA	9	NA	NA	9	4,333	1,678	R4,041	R10,051
1977	148	2,548	1,511	4,207	NA	10	NA	NA	10	4,217	1,754	R4,238	R10,210
1978	165	2,643	1,450	4,257	NA	12	NA	NA	12	4,269	1,813	R4,435	R10,517
1979	149	2,836	1,334	4,319	NA	14	NA	NA	14	4,333	1,854	R4,477	R10,664
1980	115	2,674	1,287	4,076	NA	21	NA	NA	21	4,097	1,906	R4,630	R10,633
1981	137	2,583	1,090	3,810	NA	21	NA	NA	21	3,831	2,033	R4,839	R10,703
1982	155	2,673	1,008	3,837	NA	22	NA	NA	22	3,859	2,077	R5,004	R10,940
1983	162	2,508	1,136	3,805	NA	22	NA	NA	22	3,827	2,116	R5,080	R11,024
1984	171	2,600	1,198	3,969	NA	22	NA	NA	22	3,991	2,264	R5,290	R11,546
1985	141	2,508	1,039	3,688	NA	24	NA	NA	24	3,712	2,351	R5,491	R11,554
1986	141	2,386	1,099	3,625	NA	27	NA	NA	27	3,652	2,439	R5,591	R11,681
1987	129	2,505	1,079	3,714	NA	29	NA	NA	29	3,743	2,539	R5,773	R12,054
1988	136	2,748	1,037	3,921	NA	32	NA	NA	32	3,953	2,675	R6,015	R12,643
1989	118	2,802	R973	R3,893	1	R36	22	3	R61	R3,954	2,767	R6,450	R13,172
1990	R128	2,701	R913	R3,742	1	R39	28	3	R71	R3,813	2,860	R6,594	R13,267
1991	118	2,813	R859	R3,791	1	R41	26	3	R72	R3,862	2,918	R6,717	R13,498
1992	118	2,890	R811	R3,818	1	R44	32	3	R81	R3,899	2,900	R6,653	R13,453
1993	119	2,942	R749	R3,810	1	R46	33	3	R84	R3,894	3,019	R6,939	R13,852
1994	118	2,979	R747	R3,844	1	R46	35	4	R86	R3,930	3,116	R7,114	R14,159
1995	117	3,113	R710	R3,940	1	R46	40	5	R92	R4,032	3,252	R7,470	R14,753
1996	122	3,244	R742	R4,108	1	R50	53	5	R110	R4,218	3,344	R7,689	R15,251
1997	129	3,302	R703	R4,135	1	R49	58	6	R113	R4,248	3,503	R8,004	R15,754
1998	R93	3,098	R658	R3,850	1	R48	54	7	R111	R3,961	3,678	R8,390	R16,029
1999	103	3,130	R655	R3,887	1	R52	54	7	R114	R4,001	3,766	R8,663	R16,430
2000	R92	R3,301	R719	R4,112	1	R53	47	8	R109	R4,221	R3,956	R9,060	R17,237
2001 <sup>P</sup>	92	3,331	718	4,141	1	43	46	8	98	4,240	4,081	9,122	17,443

<sup>1</sup> Includes supplemental gaseous fuels.

<sup>2</sup> Conventional hydroelectric power.

<sup>3</sup> Geothermal heat pump and direct use energy.

<sup>4</sup> Electricity retail sales to ultimate customers reported by electric utilities and other energy service providers.

<sup>5</sup> Total losses are calculated as the primary energy consumed by the electric power sector minus the energy content of electricity retail sales. Total losses are allocated to the end-use sectors in proportion to

each sector's share of total electricity retail sales.

R=Revised. P=Preliminary. NA=Not available.

Notes: The commercial sector includes commercial combined-heat-and-power (CHP) and commercial electricity-only plants. See Appendix G for commercial sector NAICS codes. Totals may not equal sum of components due to independent rounding.

Sources: Tables 2.1f, 5.12a, 6.5, 7.3, 8.5, 10.2a, A1, and A3-A6.



**Table 2.1d Industrial Sector Energy Consumption, 1949-2001**

(Trillion Btu)

Year	Primary Consumption										Total Primary	Electricity Retail Sales <sup>4</sup>	Electrical System Energy Losses <sup>5</sup>	Total
	Fossil Fuels					Renewable Energy								
	Coal	Coal Coke Net Imports	Natural Gas <sup>1</sup>	Petroleum	Total	Hydropower <sup>2</sup>	Wood	Waste	Geothermal <sup>3</sup>	Total				
1949	5,433	-7	3,188	R3,468	R12,083	76	468	NA	NA	R544	R12,627	418	R1,681	R14,726
1950	5,781	1	3,546	3,951	13,279	69	532	NA	NA	R602	R13,881	500	R1,862	R16,242
1951	6,202	-21	4,052	4,270	R14,502	63	553	NA	NA	R616	R15,118	567	R1,995	R17,680
1952	5,517	-12	4,181	R4,363	R14,049	62	552	NA	NA	R613	R14,662	601	R2,050	R17,313
1953	5,931	-9	4,304	R4,480	R14,706	57	566	NA	NA	R622	R15,328	678	R2,204	R18,211
1954	4,730	-7	4,319	4,632	13,674	56	576	NA	NA	R632	R14,306	711	R2,139	R17,156
1955	5,620	-10	4,701	R5,111	15,421	38	631	NA	NA	R669	R16,091	887	R2,512	R19,490
1956	5,667	-13	4,874	R5,336	R15,864	37	661	NA	NA	R698	R16,562	976	R2,677	R20,215
1957	5,536	-17	5,107	R5,235	R15,861	36	616	NA	NA	R652	R16,513	1,003	R2,703	R20,219
1958	4,533	-7	5,208	5,408	R15,141	37	620	NA	NA	R657	R15,798	978	R2,543	R19,319
1959	4,413	-8	5,647	R5,739	R15,790	37	692	NA	NA	R729	R16,519	1,075	R2,735	R20,329
1960	4,543	-6	5,973	R5,747	R16,258	39	680	NA	NA	R719	R16,977	1,107	R2,755	R20,839
1961	4,345	-8	6,170	R5,755	R16,262	36	695	NA	NA	R731	R16,993	1,149	R2,802	R20,944
1962	4,385	-6	6,451	5,996	16,826	36	728	NA	NA	R764	R17,590	1,228	R2,952	R21,770
1963	4,590	-7	6,748	R6,227	17,557	34	775	NA	NA	R809	R18,366	1,288	R3,076	R22,730
1964	4,915	-10	7,114	R6,548	R18,566	34	827	NA	NA	R861	R19,427	1,382	R3,287	R24,096
1965	5,127	-18	7,339	6,789	19,236	33	855	NA	NA	R888	R20,124	1,463	R3,488	R25,074
1966	5,215	-25	7,795	R7,110	R20,095	33	902	NA	NA	R935	R21,030	1,582	R3,789	R26,401
1967	4,934	-15	8,043	R7,120	R20,082	36	895	NA	NA	R930	R21,013	1,655	R3,947	R26,615
1968	4,855	-17	8,626	R7,391	R20,855	35	982	NA	NA	R1,017	R21,872	1,778	R4,236	R27,886
1969	4,712	-36	9,234	R7,696	R21,605	34	1,014	NA	NA	R1,048	R22,654	1,909	R4,555	R29,118
1970	4,656	-58	9,536	R7,787	R21,922	34	1,019	NA	NA	R1,053	R22,975	1,948	R4,724	R29,647
1971	3,944	-33	9,892	R7,856	R21,659	34	1,040	NA	NA	R1,074	R22,732	2,011	R4,867	R29,611
1972	3,993	-26	9,884	8,534	R22,385	34	1,113	NA	NA	R1,147	R23,532	2,187	R5,255	R30,974
1973	4,057	-7	10,388	R9,104	R23,541	35	1,165	NA	NA	R1,200	R24,741	2,341	R5,611	R32,693
1974	3,870	56	10,004	8,694	22,624	33	1,159	NA	NA	R1,192	R23,816	2,337	R5,701	R31,855
1975	3,667	14	8,532	R8,146	R20,359	32	1,063	NA	NA	R1,096	R21,454	2,346	R5,664	R29,464
1976	3,661	(s)	8,762	R9,010	R21,432	33	1,220	NA	NA	R1,253	R22,685	2,573	R6,196	R31,454
1977	3,454	15	8,635	R9,774	R21,879	33	1,281	NA	NA	R1,314	R23,193	2,682	R6,481	R32,356
1978	3,314	125	8,539	R9,867	R21,845	32	1,400	NA	NA	R1,432	R23,276	2,761	R6,751	R32,788
1979	3,593	63	8,549	R10,568	R22,773	34	1,405	NA	NA	R1,439	R24,211	2,873	R6,935	R34,019
1980	3,155	-35	8,395	R9,525	R21,040	33	1,600	NA	NA	R1,633	R22,673	2,781	R6,755	R32,209
1981	3,157	-16	8,257	R8,285	R19,682	33	1,602	87	NA	R1,722	R21,404	2,817	R6,705	R30,926
1982	2,552	-22	7,121	7,795	17,446	33	1,516	118	NA	R1,667	R19,113	2,542	R6,124	R27,778
1983	2,490	-11	6,826	R7,420	R16,720	33	1,690	155	NA	R1,879	R18,598	2,648	R6,356	R27,602
1984	2,842	-16	7,448	R8,014	R18,292	33	1,679	204	NA	R1,916	R20,208	2,859	R6,678	R29,745
1985	2,760	-13	7,080	R7,805	R17,632	33	1,645	230	NA	R1,908	R19,540	2,855	R6,667	R29,062
1986	2,641	-17	6,690	R7,920	R17,234	33	1,610	256	NA	R1,899	R19,133	2,834	R6,497	R28,463
1987	2,673	9	7,323	R8,151	R18,155	33	1,576	282	NA	R1,891	R20,046	2,928	R6,658	R29,633
1988	2,828	40	7,696	R8,430	R18,993	33	1,625	308	NA	R1,965	R20,958	3,059	R6,878	R30,895
1989	2,787	30	8,131	R8,126	R19,074	P26	R1,584	R200	2	R1,812	R20,886	3,158	R7,364	R31,408
1990	2,756	5	8,502	R8,306	R19,569	P28	R1,447	R194	2	R1,671	R21,240	3,226	R7,438	R31,904
1991	2,601	10	8,619	R8,047	R19,277	P28	R1,410	R185	2	R1,625	R20,901	3,230	R7,435	R31,566
1992	2,515	35	8,967	R8,617	R20,133	P31	R1,461	R179	2	R1,672	R21,806	3,319	R7,614	R32,738
1993	2,496	27	R9,120	R8,399	R20,042	P30	R1,484	R181	2	R1,697	R21,740	3,334	R7,664	R32,738
1994	2,510	58	R9,172	R8,792	R20,532	P62	R1,580	R199	3	R1,844	R22,376	3,439	R7,853	R33,668
1995	2,488	61	R9,637	R8,552	R20,739	P55	R1,652	R195	3	R1,905	R22,643	3,455	R7,936	R34,035
1996	2,434	R35	R9,947	R8,989	R21,405	P61	R1,683	R224	3	R1,971	R23,376	3,527	R8,110	R35,012
1997	2,395	R57	R9,976	R9,215	R21,643	P58	R1,731	R184	3	R1,976	R23,619	3,542	R8,094	R35,255
1998	2,335	R80	R9,806	R9,017	R21,238	P55	R1,603	R180	3	R1,841	R23,080	3,587	R8,182	R34,848
1999	R2,227	R70	R9,415	R9,284	R20,995	P49	R1,606	R171	4	R1,830	R22,825	3,611	R8,305	R34,740
2000	R2,256	R77	R9,628	R9,076	R21,038	P42	R1,636	R186	4	R1,869	R22,907	R3,631	R8,317	R34,855
2001 <sup>P</sup>	2,137	43	8,913	8,722	19,814	37	1,580	194	5	1,816	21,630	3,392	7,583	32,604

<sup>1</sup> Includes supplemental gaseous fuels.

<sup>2</sup> Conventional hydroelectric power.

<sup>3</sup> Geothermal heat pump and direct use energy.

<sup>4</sup> Electricity retail sales to ultimate customers reported by electric utilities and other energy service providers.

<sup>5</sup> Total losses are calculated as the primary energy consumed by the electric power sector minus the energy content of electricity retail sales. Total losses are allocated to the end-use sectors in proportion to

each sector's share of total electricity retail sales.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than +0.5 trillion Btu and greater than -0.5 trillion Btu.

Notes: The industrial sector includes industrial combined-heat-and-power (CHP) and industrial electricity-only plants. See Appendix G for industrial sector NAICS codes. Totals may not equal sum of components due to independent rounding.

Sources: Tables 2.1f, 5.12b, 6.5, 7.3, 8.5, 10.2a, A1, and A3-A6.



**Table 2.1e Transportation Sector Energy Consumption, 1949-2001**  
(Trillion Btu)

Year	Primary Consumption					Total Primary <sup>2</sup>	Electricity Retail Sales <sup>3</sup>	Electrical System Energy Losses <sup>4</sup>	Total <sup>2</sup>
	Fossil Fuels				Renewable Energy				
	Coal	Natural Gas <sup>1</sup>	Petroleum	Total	Alcohol Fuels <sup>2</sup>				
1949	1,727	NA	6,152	7,880	NA	7,880	22	R89	R7,991
1950	1,564	130	6,690	8,384	NA	8,384	23	R86	R8,493
1951	1,379	199	7,356	8,934	NA	8,934	24	R85	R9,043
1952	984	214	7,709	8,907	NA	8,907	22	R74	R9,004
1953	733	238	R8,059	9,031	NA	9,031	22	R71	R9,124
1954	461	239	8,123	8,823	NA	8,823	20	R60	R8,903
1955	421	254	R8,800	R9,475	NA	R9,475	20	R56	R9,551
1956	340	306	9,145	9,791	NA	9,791	19	51	R9,860
1957	241	310	9,286	9,837	NA	9,837	16	44	9,897
1958	115	323	9,514	R9,953	NA	R9,953	15	38	10,005
1959	88	362	9,849	R10,298	NA	R10,298	14	37	10,350
1960	75	359	R10,126	R10,560	NA	R10,560	10	26	R10,597
1961	19	391	R10,325	R10,735	NA	R10,735	10	25	10,770
1962	17	396	R10,773	R11,186	NA	R11,186	10	R24	11,221
1963	16	437	R11,168	11,621	NA	11,621	10	24	11,655
1964	17	450	R11,498	R11,965	NA	R11,965	10	24	11,998
1965	16	517	R11,868	12,400	NA	12,400	10	24	12,434
1966	15	553	12,501	13,069	NA	13,069	10	23	13,102
1967	11	594	R13,113	R13,718	NA	R13,718	10	24	R13,752
1968	10	609	R14,212	R14,831	NA	R14,831	10	24	R14,866
1969	7	651	R14,813	R15,471	NA	R15,471	10	25	R15,506
1970	7	745	R15,310	R16,061	NA	R16,061	11	26	R16,098
1971	5	766	15,923	16,693	NA	16,693	10	25	16,729
1972	4	787	R16,891	R17,681	NA	R17,681	10	25	R17,716
1973	3	743	R17,831	R18,576	NA	R18,576	11	25	R18,612
1974	2	685	R17,399	R18,086	NA	R18,086	10	24	R18,119
1975	1	595	R17,614	R18,209	NA	R18,209	10	R24	R18,244
1976	(s)	559	18,506	19,065	NA	19,065	10	24	19,099
1977	(s)	543	R19,241	R19,784	NA	R19,784	10	25	R19,820
1978	(s)	539	R20,041	R20,580	NA	R20,580	10	25	R20,615
1979	(s)	612	R19,825	R20,436	NA	R20,436	10	24	R20,471
1980	(s)	650	R19,008	R19,658	NA	R19,658	11	27	R19,696
1981	(s)	658	R18,811	R19,469	7	R19,469	11	26	R19,506
1982	(s)	612	R18,420	R19,032	19	R19,032	11	27	R19,069
1983	(s)	505	R18,593	R19,098	35	R19,098	13	30	R19,141
1984	(s)	545	R19,216	R19,761	43	R19,761	14	33	R19,809
1985	(s)	519	R19,504	R20,023	52	R20,023	14	33	20,071
1986	(s)	499	20,269	20,768	60	20,768	15	35	R20,817
1987	(s)	535	20,870	21,405	69	21,405	16	R35	21,456
1988	(s)	632	21,629	22,261	70	22,261	16	36	22,313
1989	(s)	649	R21,849	R22,497	71	R22,497	16	R38	R22,552
1990	(s)	680	R21,792	R22,472	63	R22,472	16	R37	R22,526
1991	(s)	620	R21,448	R22,069	73	R22,069	16	R37	R22,122
1992	(s)	R608	R21,798	R22,406	83	R22,406	16	R37	R22,459
1993	(s)	R644	R22,185	R22,829	97	R22,829	16	R37	R22,883
1994	(s)	R708	R22,739	R23,448	109	R23,448	17	R39	R23,503
1995	(s)	R723	R23,181	R23,904	117	R23,904	17	R39	R23,960
1996	(s)	R736	R23,719	R24,456	84	R24,456	17	R39	R24,511
1997	(s)	R779	R23,973	R24,752	106	R24,752	17	R38	R24,807
1998	(s)	R665	R24,630	R25,295	117	R25,295	17	R39	R25,351
1999	(s)	R674	R25,358	R26,031	122	R26,031	17	40	R26,089
2000	(s)	R672	R25,971	R26,643	139	R26,643	18	R42	R26,704
2001 <sup>P</sup>	(s)	642	26,040	26,682	147	26,682	20	44	26,746

<sup>1</sup> Natural gas consumed in the operation of pipelines (primarily in compressors) and small amounts consumed as vehicle fuel. See Table 6.5.

<sup>2</sup> Alcohol (ethanol blended into motor gasoline) is included in both "Petroleum" and "Alcohol Fuels," but is counted only once in both total primary consumption and total consumption.

<sup>3</sup> Electricity retail sales to ultimate customers reported by electric utilities and other energy service providers.

<sup>4</sup> Total losses are calculated as the primary energy consumed by the electric power sector minus the

energy content of electricity retail sales. Total losses are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales.

<sup>5</sup> Since 1978, the small amounts of coal consumed for transportation are reported as industrial sector consumption.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.

Note: Totals may not equal sum of components due to independent rounding.

Sources: Tables 2.1f, 5.12c, 6.5, 7.3, 8.5, 10.2a, A1, and A3-A6.

**Table 2.1f Electric Power Sector Energy Consumption, 1949-2001**  
(Trillion Btu)

Year	Primary Consumption														Total Primary
	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage <sup>3</sup>	Renewable Energy							
	Coal	Natural Gas <sup>1</sup>	Petroleum	Other <sup>2</sup>	Total			Conventional Hydroelectric Power <sup>4</sup>	Wood	Waste	Geothermal <sup>5</sup>	Solar	Wind	Total	
1949	1,995	569	415	(6)	2,979	0	(6)	1,373	6	NA	NA	NA	NA	R1,379	4,358
1950	2,199	651	472	(6)	3,322	0	(6)	1,371	5	NA	NA	NA	NA	R1,377	4,698
1951	2,507	791	400	(6)	3,697	0	(6)	1,391	5	NA	NA	NA	NA	R1,396	5,093
1952	2,557	942	420	(6)	3,920	0	(6)	1,435	6	NA	NA	NA	NA	R1,441	5,361
1953	2,777	1,070	514	(6)	4,362	0	(6)	1,382	5	NA	NA	NA	NA	R1,387	5,749
1954	2,841	1,206	417	(6)	4,464	0	(6)	1,333	3	NA	NA	NA	NA	R1,336	5,800
1955	3,458	1,194	471	(6)	5,123	0	(6)	1,369	3	NA	NA	NA	NA	R1,373	6,495
1956	3,790	1,283	455	(6)	5,527	0	(6)	1,450	2	NA	NA	NA	NA	R1,452	6,979
1957	3,855	1,383	498	(6)	5,737	(s)	(6)	1,521	2	NA	NA	NA	NA	R1,523	7,260
1958	3,721	1,421	486	(6)	5,628	2	(6)	1,592	2	NA	NA	NA	NA	R1,594	7,223
1959	4,029	1,686	552	(6)	6,267	2	(6)	1,550	2	NA	NA	NA	NA	R1,552	7,821
1960	4,228	1,785	553	(6)	6,565	6	(6)	1,618	2	NA	1	NA	NA	R1,620	8,192
1961	4,355	1,889	557	(6)	6,801	20	(6)	1,645	1	NA	2	NA	NA	R1,648	8,469
1962	4,622	2,035	560	(6)	7,217	26	(6)	1,786	1	NA	2	NA	NA	R1,789	9,033
1963	5,050	2,211	585	(6)	7,846	38	(6)	1,738	1	NA	4	NA	NA	R1,744	9,628
1964	5,380	2,397	634	(6)	8,411	40	(6)	1,873	2	NA	5	NA	NA	R1,879	10,330
1965	5,821	2,395	722	(6)	8,938	43	(6)	2,025	3	NA	4	NA	NA	R2,032	11,013
1966	6,302	2,696	883	(6)	9,881	64	(6)	2,040	3	NA	4	NA	NA	R2,047	11,993
1967	6,445	2,834	1,011	(6)	10,290	88	(6)	2,308	3	NA	7	NA	NA	R2,318	12,696
1968	6,994	3,245	1,181	(6)	11,421	142	(6)	2,307	4	NA	9	NA	NA	R2,320	13,882
1969	7,219	3,596	1,571	(6)	12,386	154	(6)	2,625	3	NA	13	NA	NA	R2,642	15,182
1970	7,227	4,054	2,117	(6)	13,399	239	(6)	2,620	1	2	11	NA	NA	R2,635	16,273
1971	7,299	4,099	2,495	(6)	13,893	413	(6)	2,827	1	2	12	NA	NA	R2,843	17,149
1972	7,811	4,084	3,097	(6)	14,992	584	(6)	2,909	1	2	31	NA	NA	R2,944	18,520
1973	8,658	3,748	3,515	(6)	15,921	910	(6)	2,975	1	2	43	NA	NA	R3,021	19,852
1974	8,534	3,519	3,365	(6)	15,418	1,272	(6)	3,276	1	2	53	NA	NA	R3,332	20,022
1975	8,786	3,240	3,166	(6)	15,191	1,900	(6)	3,187	(s)	2	70	NA	NA	R3,259	20,350
1976	9,720	3,152	3,477	(6)	16,349	2,111	(6)	3,032	1	2	78	NA	NA	R3,113	21,573
1977	10,262	3,284	3,901	(6)	17,446	2,702	(6)	2,482	3	2	77	NA	NA	R2,565	22,713
1978	10,238	3,297	3,987	(6)	17,522	3,024	(6)	3,110	2	1	64	NA	NA	R3,178	23,724
1979	11,260	3,613	3,283	(6)	18,156	2,776	(6)	3,107	3	2	84	NA	NA	R3,196	24,128
1980	12,123	3,810	2,634	(6)	18,567	2,739	(6)	3,085	3	2	110	NA	NA	R3,199	24,505
1981	12,583	3,768	2,202	(6)	18,553	3,008	(6)	3,072	3	1	123	NA	NA	R3,199	24,760
1982	12,582	3,342	1,568	(6)	17,491	3,131	(6)	3,539	2	1	105	NA	NA	R3,647	24,270
1983	13,213	2,998	1,544	(6)	17,754	3,203	(6)	3,866	2	2	129	NA	(s)	R3,999	24,956
1984	14,019	3,220	1,286	(6)	18,526	3,553	(6)	3,767	5	4	165	(s)	(s)	R3,941	26,020
1985	14,542	3,160	1,090	(6)	18,792	4,076	(6)	3,365	8	7	198	(s)	(s)	R3,578	26,446
1986	14,444	2,691	1,452	(6)	18,586	4,380	(6)	3,413	5	7	219	(s)	(s)	R3,645	26,611
1987	15,173	2,935	1,257	(6)	19,365	4,754	(6)	3,084	8	7	229	(s)	(s)	R3,329	27,448
1988	15,850	2,709	1,563	(6)	20,123	5,587	(6)	2,630	10	8	217	(s)	(s)	R2,864	28,574
1989 <sup>P,7</sup>	R16,118	3,192	1,703	-50	20,963	5,602	(6)	R2,961	100	132	R308	3	19	R3,522	30,087
1990 <sup>P</sup>	R16,245	3,321	1,278	-80	20,764	6,104	-36	R3,098	124	187	R327	4	24	R3,763	30,594
1991 <sup>P</sup>	R16,250	3,399	1,198	59	20,906	6,422	-47	R3,110	126	229	R340	5	27	R3,837	31,118
1992 <sup>P</sup>	R16,466	3,534	991	53	21,043	6,479	-43	R2,786	140	262	R356	4	30	R3,579	31,058
1993 <sup>P</sup>	R17,196	3,560	1,124	50	21,930	6,410	-42	R3,088	150	265	R369	5	31	R3,908	32,207
1994 <sup>P</sup>	R17,261	4,000	1,059	140	22,460	6,694	-35	R2,929	152	282	R352	5	36	R3,756	32,875
1995 <sup>P</sup>	R17,466	4,325	755	121	22,667	7,075	-28	R3,424	125	296	R298	5	33	R4,182	33,896
1996 <sup>P</sup>	R18,429	3,883	817	109	23,239	7,087	-32	R3,827	138	300	R314	5	33	R4,618	34,912
1997 <sup>P</sup>	R18,905	4,146	927	R107	24,085	6,597	-41	R3,821	137	309	R309	5	34	R4,615	35,256
1998 <sup>P</sup>	R19,216	4,698	1,306	R47	25,267	7,068	-46	R3,462	137	308	R311	5	31	R4,254	36,543
1999 <sup>P</sup>	R19,279	4,926	1,211	R91	25,507	7,610	-62	R3,422	138	315	R312	5	46	R4,239	37,294
2000 <sup>P</sup>	R20,220	5,316	1,144	R82	26,762	7,862	-57	R3,033	134	318	R296	5	57	R3,845	38,412
2001 <sup>P</sup>	19,689	5,397	1,280	49	26,415	8,028	-90	2,338	140	311	292	5	59	3,146	37,499

<sup>1</sup> Includes supplemental gaseous fuels.

<sup>2</sup> Electricity net imports from fossil fuels; may include some nuclear-generated electricity.

<sup>3</sup> Pumped storage facility production minus energy used for pumping.

<sup>4</sup> Through 1988, includes all electricity net imports. Beginning in 1989, includes electricity net imports derived from hydroelectric power only.

<sup>5</sup> Beginning in 1989, includes electricity imports from Mexico that are derived from geothermal energy.

<sup>6</sup> Included in "Conventional Hydroelectric Power."

<sup>7</sup> Through 1988, data are for consumption at electric utilities only. Beginning in 1989, data also include

consumption at independent power producers.

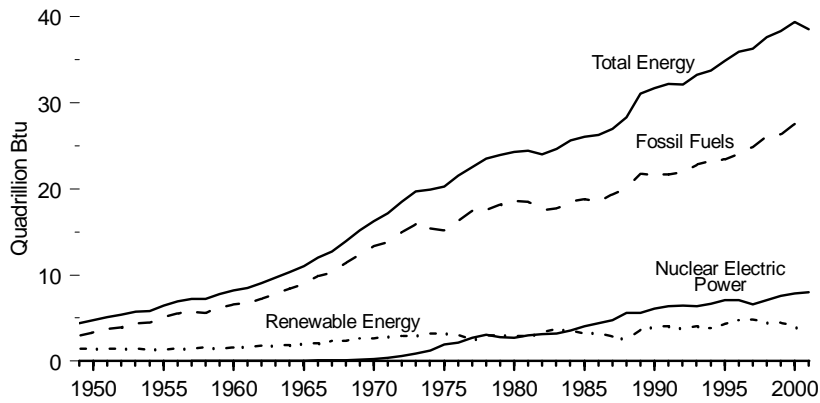
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.

Notes: Data are for fuels consumed to produce electricity and useful thermal output. The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants. Totals may not equal sum of components due to independent rounding.

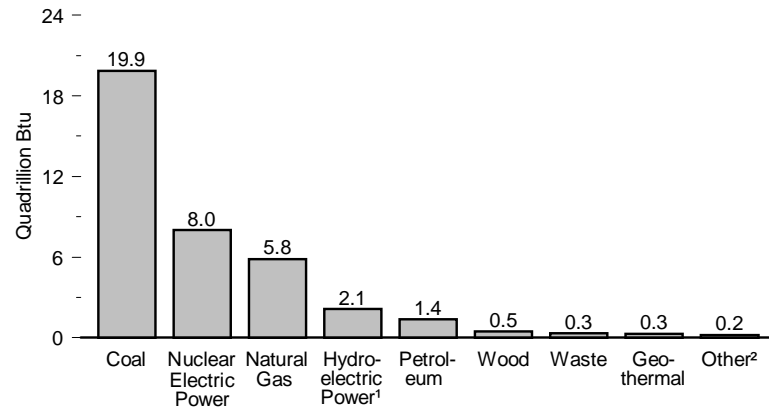
Sources: Tables 5.12d, 6.5, 7.3, 10.2b, A1, and A4-A6.

**Figure 2.2 Consumption for Electricity Generation**

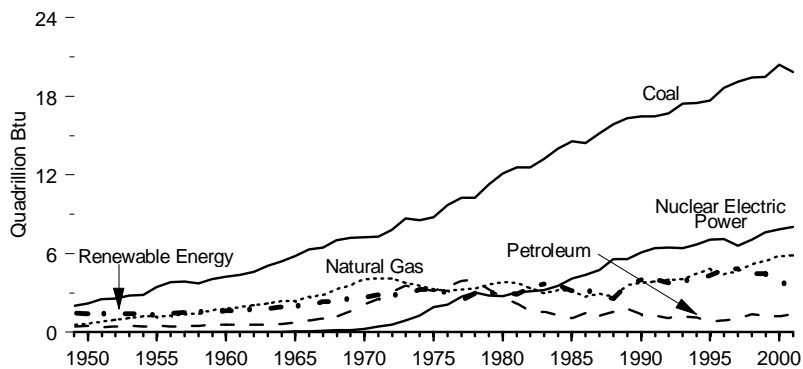
**Total and Energy Categories, 1949-2001**



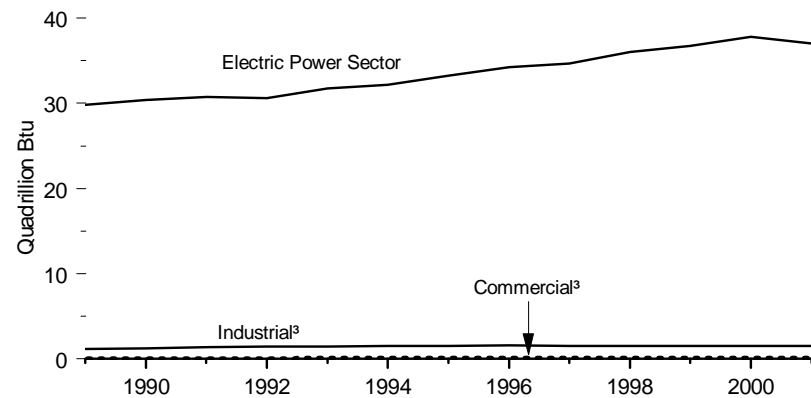
**By Major Fuel, 2001**



**By Major Fuel, 1949-2001**



**By Sector, 1989-2001**



<sup>1</sup> Conventional hydroelectric power and pumped storage.  
<sup>2</sup> Other gases, solar, wind, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
<sup>3</sup> Combined-heat-and-power plants and a small number of electricity-only plants.

Note: Because vertical scales differ, graphs should not be compared.  
 Sources: Tables 2.2a, 2.2b, and 2.2c.

**Table 2.2a Consumption for Electricity Generation: Total (All Sectors), 1949-2001**  
(Trillion Btu)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage <sup>5</sup>	Renewable Energy							Other <sup>9</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power	Wood <sup>6</sup>	Waste <sup>7</sup>	Geothermal	Solar <sup>8</sup>	Wind	Total		
1949	1,995	415	569	NA	2,979	0	( <sup>10</sup> )	1,425	6	NA	NA	NA	NA	1,431	NA	4,410
1950	2,199	472	651	NA	3,322	0	( <sup>10</sup> )	1,415	5	NA	NA	NA	NA	1,421	NA	4,743
1951	2,507	400	791	NA	3,697	0	( <sup>10</sup> )	1,424	5	NA	NA	NA	NA	1,429	NA	5,126
1952	2,557	420	942	NA	3,920	0	( <sup>10</sup> )	1,466	6	NA	NA	NA	NA	1,472	NA	5,392
1953	2,777	514	1,070	NA	4,362	0	( <sup>10</sup> )	1,413	5	NA	NA	NA	NA	1,418	NA	5,780
1954	2,841	417	1,206	NA	4,464	0	( <sup>10</sup> )	1,360	3	NA	NA	NA	NA	1,363	NA	5,827
1955	3,458	471	1,194	NA	5,123	0	( <sup>10</sup> )	1,360	3	NA	NA	NA	NA	1,363	NA	6,486
1956	3,790	455	1,283	NA	5,527	0	( <sup>10</sup> )	1,435	2	NA	NA	NA	NA	1,436	NA	6,964
1957	3,855	498	1,383	NA	5,737	(s)	( <sup>10</sup> )	1,516	2	NA	NA	NA	NA	1,518	NA	7,254
1958	3,721	486	1,421	NA	5,628	2	( <sup>10</sup> )	1,592	2	NA	NA	NA	NA	1,594	NA	7,224
1959	4,029	552	1,686	NA	6,267	2	( <sup>10</sup> )	1,548	2	NA	NA	NA	NA	1,550	NA	7,819
1960	4,228	553	1,785	NA	6,565	6	( <sup>10</sup> )	1,608	2	NA	1	NA	NA	1,610	NA	8,182
1961	4,355	557	1,889	NA	6,801	20	( <sup>10</sup> )	1,656	1	NA	2	NA	NA	1,660	NA	8,481
1962	4,622	560	2,035	NA	7,217	26	( <sup>10</sup> )	1,816	1	NA	2	NA	NA	1,820	NA	9,063
1963	5,050	585	2,211	NA	7,846	38	( <sup>10</sup> )	1,771	1	NA	4	NA	NA	1,776	NA	9,660
1964	5,380	634	2,397	NA	8,411	40	( <sup>10</sup> )	1,886	2	NA	5	NA	NA	1,892	NA	10,343
1965	5,821	722	2,395	NA	8,938	43	( <sup>10</sup> )	2,059	3	NA	4	NA	NA	2,066	NA	11,048
1966	6,302	883	2,696	NA	9,881	64	( <sup>10</sup> )	2,062	3	NA	4	NA	NA	2,069	NA	12,014
1967	6,445	1,011	2,834	NA	10,290	88	( <sup>10</sup> )	2,347	3	NA	7	NA	NA	2,357	NA	12,735
1968	6,994	1,181	3,245	NA	11,421	142	( <sup>10</sup> )	2,349	4	NA	9	NA	NA	2,362	NA	13,924
1969	7,219	1,571	3,596	NA	12,386	154	( <sup>10</sup> )	2,648	3	NA	13	NA	NA	2,665	NA	15,205
1970	7,227	2,117	4,054	NA	13,399	239	( <sup>10</sup> )	2,634	1	2	11	NA	NA	2,649	NA	16,287
1971	7,299	2,495	4,099	NA	13,893	413	( <sup>10</sup> )	2,824	1	2	12	NA	NA	2,839	NA	17,146
1972	7,811	3,097	4,084	NA	14,992	584	( <sup>10</sup> )	2,864	1	2	31	NA	NA	2,899	NA	18,475
1973	8,658	3,515	3,748	NA	15,921	910	( <sup>10</sup> )	2,861	1	2	43	NA	NA	2,907	NA	19,739
1974	8,534	3,365	3,519	NA	15,418	1,272	( <sup>10</sup> )	3,177	1	2	53	NA	NA	3,232	NA	19,923
1975	8,786	3,166	3,240	NA	15,191	1,900	( <sup>10</sup> )	3,155	(s)	2	70	NA	NA	3,227	NA	20,318
1976	9,720	3,477	3,152	NA	16,349	2,111	( <sup>10</sup> )	2,976	1	2	78	NA	NA	3,057	NA	21,517
1977	10,262	3,901	3,284	NA	17,446	2,702	( <sup>10</sup> )	2,333	3	2	77	NA	NA	2,416	NA	22,564
1978	10,238	3,987	3,297	NA	17,522	3,024	( <sup>10</sup> )	2,937	2	1	64	NA	NA	3,005	NA	23,551
1979	11,260	3,283	3,613	NA	18,156	2,776	( <sup>10</sup> )	2,931	3	2	84	NA	NA	3,020	NA	23,951
1980	12,123	2,634	3,810	NA	18,567	2,739	( <sup>10</sup> )	2,900	3	2	110	NA	NA	3,014	NA	24,320
1981	12,583	2,202	3,768	NA	18,553	3,008	( <sup>10</sup> )	2,758	3	1	123	NA	NA	2,885	NA	24,445
1982	12,582	1,568	3,342	NA	17,491	3,131	( <sup>10</sup> )	3,266	2	1	105	NA	NA	3,374	NA	23,996
1983	13,213	1,544	2,998	NA	17,754	3,203	( <sup>10</sup> )	3,527	2	2	129	NA	(s)	3,661	NA	24,618
1984	14,019	1,286	3,220	NA	18,526	3,553	( <sup>10</sup> )	3,386	5	4	165	(s)	(s)	3,560	NA	25,638
1985	14,542	1,090	3,160	NA	18,792	R4,076	( <sup>10</sup> )	2,970	8	7	198	(s)	(s)	3,183	NA	26,051
1986	14,444	1,452	2,691	NA	18,586	R4,380	( <sup>10</sup> )	3,071	5	7	219	(s)	(s)	3,303	NA	26,269
1987	15,173	1,257	2,935	NA	19,365	R4,754	( <sup>10</sup> )	2,635	8	7	229	(s)	(s)	2,879	NA	26,998
1988	15,850	1,563	2,709	NA	20,123	R5,587	( <sup>10</sup> )	2,334	10	8	217	(s)	(s)	2,569	NA	28,279
1989P <sup>11</sup>	R16,340	R1,756	R3,581	90	R21,768	R5,602	( <sup>10</sup> )	R2,828	345	151	R296	R3	R19	3,642	39	31,050
1990P	R16,443	R1,345	R3,752	106	R21,646	R6,104	-36	R3,030	402	210	R315	R4	R24	3,984	35	31,733
1991P	R16,460	R1,276	R3,861	125	R21,723	R6,422	-47	R3,001	425	247	R325	R5	R27	4,030	59	32,186
1992P	R16,686	R1,076	R3,999	141	R21,903	R6,479	-43	2,617	481	283	R338	R4	30	3,752	40	32,131
1993P	R17,424	R1,203	R4,027	136	R22,790	R6,410	-42	2,892	485	288	R351	R5	31	4,052	34	33,244
1994P	R17,485	R1,135	R4,476	136	R23,233	R6,694	-35	R2,683	498	301	R325	R5	36	3,848	40	33,780
1995P	R17,687	R813	R4,840	133	R23,473	R7,075	-28	R3,205	480	316	R280	R5	33	4,318	42	34,881
1996P	R18,650	R888	R4,400	159	R24,097	R7,087	-32	R3,590	513	324	R300	R5	R33	4,765	37	35,954
1997P	R19,128	R985	R4,658	119	R24,890	R6,597	R-41	R3,640	484	339	R309	R5	R34	4,811	36	36,294
1998P	R19,417	R1,378	R5,205	125	R26,124	R7,068	-46	R3,297	475	332	R311	R5	31	4,450	36	37,633
1999P	R19,467	R1,285	R5,441	126	R26,320	R7,610	R-62	R3,268	490	332	R312	R5	46	4,452	41	38,360
2000P	R20,411	R1,212	R5,818	126	R27,567	R7,862	R-57	R2,811	496	330	R296	R5	R57	3,995	46	39,414
2001E	19,875	1,352	5,840	127	27,193	8,028	-90	2,219	483	325	290	5	59	3,382	49	38,562

1 Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.  
2 Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.  
3 Natural gas, including a small amount of supplemental gaseous fuels.  
4 Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
5 Pumped storage facility production minus energy used for pumping.  
6 Wood, black liquor, and other wood waste.  
7 Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.  
8 Solar thermal and photovoltaic energy.  
9 Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
10 Included in "Conventional Hydroelectric Power."

11 Hydroelectric data through 1988 are for consumption at electric utilities and industrial plants only; beginning in 1989, data also include consumption at independent power producers and commercial plants. For all other series, data through 1988 are for consumption at electric utilities only; beginning in 1989, data also include consumption at independent power producers, commercial plants, and industrial plants.  
R=Revised. P=Preliminary. E=Estimate. NA=Not available. (s)=Less than 0.5 trillion Btu.  
Notes: Data are for fuels consumed to produce electricity; they exclude fuels consumed to produce useful thermal output. Consumption for electricity generation at combined-heat-and-power (CHP) plants is estimated. Totals may not equal sum of components due to independent rounding.  
Sources: Tables 2.2b, 2.2c, and 10.2a.

**Table 2.2b Consumption for Electricity Generation: Electric Power Sector, 1949-2001**  
(Trillion Btu)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage <sup>5</sup>	Renewable Energy							Other <sup>9</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power	Wood <sup>6</sup>	Waste <sup>7</sup>	Geothermal	Solar <sup>8</sup>	Wind	Total		
1949	1,995	415	569	NA	2,979	0	( <sup>10</sup> )	1,349	6	NA	NA	NA	NA	1,355	NA	4,334
1950	2,199	472	651	NA	3,322	0	( <sup>10</sup> )	1,346	5	NA	NA	NA	NA	1,351	NA	4,673
1951	2,507	400	791	NA	3,697	0	( <sup>10</sup> )	1,361	5	NA	NA	NA	NA	1,366	NA	5,063
1952	2,557	420	942	NA	3,920	0	( <sup>10</sup> )	1,404	6	NA	NA	NA	NA	1,411	NA	5,330
1953	2,777	514	1,070	NA	4,362	0	( <sup>10</sup> )	1,356	5	NA	NA	NA	NA	1,361	NA	5,724
1954	2,841	417	1,206	NA	4,464	0	( <sup>10</sup> )	1,304	3	NA	NA	NA	NA	1,307	NA	5,772
1955	3,458	471	1,194	NA	5,123	0	( <sup>10</sup> )	1,322	3	NA	NA	NA	NA	1,325	NA	6,448
1956	3,790	455	1,283	NA	5,527	0	( <sup>10</sup> )	1,398	2	NA	NA	NA	NA	1,400	NA	6,927
1957	3,855	498	1,383	NA	5,737	(s)	( <sup>10</sup> )	1,480	2	NA	NA	NA	NA	1,482	NA	7,219
1958	3,721	486	1,421	NA	5,628	2	( <sup>10</sup> )	1,555	2	NA	NA	NA	NA	1,557	NA	7,187
1959	4,029	552	1,686	NA	6,267	2	( <sup>10</sup> )	1,511	2	NA	NA	NA	NA	1,513	NA	7,782
1960	4,228	553	1,785	NA	6,565	6	( <sup>10</sup> )	1,569	2	NA	1	NA	NA	1,571	NA	8,143
1961	4,355	557	1,889	NA	6,801	20	( <sup>10</sup> )	1,621	1	NA	2	NA	NA	1,624	NA	8,445
1962	4,622	560	2,035	NA	7,217	26	( <sup>10</sup> )	1,780	1	NA	2	NA	NA	1,784	NA	9,027
1963	5,050	585	2,211	NA	7,846	38	( <sup>10</sup> )	1,737	1	NA	4	NA	NA	1,743	NA	9,627
1964	5,380	634	2,397	NA	8,411	40	( <sup>10</sup> )	1,853	2	NA	5	NA	NA	1,859	NA	10,309
1965	5,821	722	2,395	NA	8,938	43	( <sup>10</sup> )	2,026	3	NA	4	NA	NA	2,033	NA	11,015
1966	6,302	883	2,696	NA	9,881	64	( <sup>10</sup> )	2,028	3	NA	4	NA	NA	2,036	NA	11,981
1967	6,445	1,011	2,834	NA	10,290	88	( <sup>10</sup> )	2,311	3	NA	7	NA	NA	2,321	NA	12,699
1968	6,994	1,181	3,245	NA	11,421	142	( <sup>10</sup> )	2,313	4	NA	9	NA	NA	2,327	NA	13,889
1969	7,219	1,571	3,596	NA	12,386	154	( <sup>10</sup> )	2,614	3	NA	13	NA	NA	2,630	NA	15,170
1970	7,227	2,117	4,054	NA	13,399	239	( <sup>10</sup> )	2,600	1	2	11	NA	NA	2,615	NA	16,252
1971	7,299	2,495	4,099	NA	13,893	413	( <sup>10</sup> )	2,790	1	2	12	NA	NA	2,806	NA	17,112
1972	7,811	3,097	4,084	NA	14,992	584	( <sup>10</sup> )	2,829	1	2	31	NA	NA	2,864	NA	18,440
1973	8,658	3,515	3,748	NA	15,921	910	( <sup>10</sup> )	2,827	1	2	43	NA	NA	2,873	NA	19,704
1974	8,534	3,365	3,519	NA	15,418	1,272	( <sup>10</sup> )	3,143	1	2	53	NA	NA	3,199	NA	19,889
1975	8,786	3,166	3,240	NA	15,191	1,900	( <sup>10</sup> )	3,122	(s)	2	70	NA	NA	3,194	NA	20,286
1976	9,720	3,477	3,152	NA	16,349	2,111	( <sup>10</sup> )	2,943	1	2	78	NA	NA	3,024	NA	21,484
1977	10,262	3,901	3,284	NA	17,446	2,702	( <sup>10</sup> )	2,301	3	2	77	NA	NA	2,383	NA	22,531
1978	10,238	3,987	3,297	NA	17,522	3,024	( <sup>10</sup> )	2,905	2	1	64	NA	NA	2,973	NA	23,519
1979	11,260	3,283	3,613	NA	18,156	2,776	( <sup>10</sup> )	2,897	3	2	84	NA	NA	2,986	NA	23,917
1980	12,123	2,634	3,810	NA	18,567	2,739	( <sup>10</sup> )	2,867	3	2	110	NA	NA	2,982	NA	24,287
1981	12,583	2,202	3,768	NA	18,553	3,008	( <sup>10</sup> )	2,725	3	1	123	NA	NA	2,852	NA	24,412
1982	12,582	1,568	3,342	NA	17,491	3,131	( <sup>10</sup> )	3,233	2	1	105	NA	NA	3,341	NA	23,963
1983	13,213	1,544	2,998	NA	17,754	3,203	( <sup>10</sup> )	3,494	2	2	129	NA	(s)	3,627	NA	24,584
1984	14,019	1,286	3,220	NA	18,526	3,553	( <sup>10</sup> )	3,353	5	4	165	(s)	(s)	3,527	NA	25,605
1985	14,542	1,090	3,160	NA	18,792	R4,076	( <sup>10</sup> )	2,937	8	7	198	(s)	(s)	3,150	NA	26,018
1986	14,444	1,452	2,691	NA	18,586	R4,380	( <sup>10</sup> )	3,038	5	7	219	(s)	(s)	3,270	NA	26,236
1987	15,173	1,257	2,935	NA	19,365	R4,754	( <sup>10</sup> )	2,602	8	7	229	(s)	(s)	2,846	NA	26,965
1988	15,850	1,563	2,709	NA	20,123	R5,587	( <sup>10</sup> )	2,302	10	8	217	(s)	(s)	2,536	NA	28,246
1989 <sup>P,11</sup>	16,102	1,696	3,107	7	20,911	R5,602	( <sup>10</sup> )	2,801	75	126	R296	R3	R19	3,321	2	29,837
1990 <sup>P</sup>	16,222	1,271	3,224	6	20,723	R6,104	-36	3,000	101	179	R315	R4	R24	3,623	(s)	30,414
1991 <sup>P</sup>	16,223	1,199	3,296	6	20,725	R6,422	-47	2,972	104	217	R325	R5	R27	3,651	4	30,754
1992 <sup>P</sup>	16,431	990	3,407	12	20,840	R6,479	-43	2,586	120	252	R338	R4	30	3,329	3	30,608
1993 <sup>P</sup>	17,159	1,122	3,426	12	21,719	R6,410	-42	2,861	129	255	R351	R5	31	3,632	3	31,723
1994 <sup>P</sup>	17,215	1,056	3,851	12	22,134	R6,694	-35	2,620	134	269	R325	R5	36	3,389	2	32,184
1995 <sup>P</sup>	17,416	743	4,179	18	22,356	R7,075	-28	3,149	106	282	R280	R5	33	3,855	2	33,261
1996 <sup>P</sup>	18,375	810	3,730	16	22,930	R7,087	-32	3,528	117	280	R300	R5	R33	4,264	2	34,251
1997 <sup>P</sup>	18,855	917	3,981	14	23,768	R6,597	R-41	3,581	117	292	R309	R5	R34	4,337	1	34,661
1998 <sup>P</sup>	19,162	1,306	4,520	23	25,011	R7,068	-46	3,241	125	287	R311	R5	31	4,000	2	36,034
1999 <sup>P</sup>	19,214	1,211	4,742	14	25,181	R7,610	R-62	3,218	125	290	R312	R5	46	3,996	1	36,726
2000 <sup>P</sup>	20,153	1,145	5,120	19	26,438	R7,862	R-57	2,768	126	294	R296	R5	R57	3,547	1	37,792
2001 <sup>P</sup>	19,620	1,281	5,170	23	26,094	8,028	-90	2,181	130	288	290	5	59	2,953	5	36,990

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.  
<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.  
<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.  
<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
<sup>5</sup> Pumped storage facility production minus energy used for pumping.  
<sup>6</sup> Wood, black liquor, and other wood waste.  
<sup>7</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.  
<sup>8</sup> Solar thermal and photovoltaic energy.  
<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
<sup>10</sup> Included in "Conventional Hydroelectric Power."

<sup>11</sup> Through 1988, data are for consumption at electric utilities only. Beginning in 1989, data also include consumption at independent power producers.  
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.  
Notes: Data are for fuels consumed to produce electricity; they exclude fuels consumed to produce useful thermal output. Consumption for electricity generation at combined-heat-and-power (CHP) plants is estimated. The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants. Totals may not equal sum of components due to independent rounding.  
Sources: See sources for Tables 8.2b, 8.2c, 8.3b, 8.3c, and A3-A6.

**Table 2.2c Consumption for Electricity Generation: Commercial and Industrial Sectors, 1989-2001**  
(Trillion Btu)

Year	Fossil Fuels					Renewable Energy				Other <sup>7</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total	Conventional Hydroelectric Power	Wood <sup>5</sup>	Waste <sup>6</sup>	Total		
Commercial Sector <sup>8</sup>											
1989 <sup>P</sup>	9	7	18	1	36	1	2	9	12	0	47
1990 <sup>P</sup>	9	5	27	1	43	1	1	15	18	0	61
1991 <sup>P</sup>	9	3	28	1	41	1	2	15	18	(s)	59
1992 <sup>P</sup>	8	3	33	1	45	1	1	16	19	(s)	64
1993 <sup>P</sup>	9	4	38	1	53	1	1	16	18	0	71
1994 <sup>P</sup>	9	4	42	1	56	1	1	17	19	0	75
1995 <sup>P</sup>	12	4	44	0	60	1	1	21	23	(s)	83
1996 <sup>P</sup>	14	4	44	0	62	1	1	31	33	(s)	95
1997 <sup>P</sup>	14	5	40	(s)	59	1	1	34	35	0	94
1998 <sup>P</sup>	11	5	42	(s)	57	1	1	32	34	0	91
1999 <sup>P</sup>	12	6	40	0	57	1	(s)	33	35	0	92
2000 <sup>P</sup>	12	5	38	0	55	1	(s)	26	28	(s)	82
2001 <sup>E</sup>	12	4	36	0	52	1	(s)	26	27	0	79
Industrial Sector <sup>9</sup>											
1989 <sup>P</sup>	229	53	456	83	821	R26	267	15	309	37	1,166
1990 <sup>P</sup>	213	68	500	99	880	R28	299	16	344	35	1,259
1991 <sup>P</sup>	228	74	537	118	957	R28	318	14	361	55	1,372
1992 <sup>P</sup>	246	84	559	128	1,017	R31	359	15	405	37	1,459
1993 <sup>P</sup>	256	77	562	123	1,019	R30	355	17	401	31	1,451
1994 <sup>P</sup>	261	75	584	123	1,043	R62	364	14	440	38	1,521
1995 <sup>P</sup>	259	66	617	114	1,057	R55	373	13	440	40	1,537
1996 <sup>P</sup>	261	74	626	143	1,104	R61	394	13	468	35	1,607
1997 <sup>P</sup>	260	63	637	105	1,064	R58	367	14	439	36	1,538
1998 <sup>P</sup>	245	67	643	102	1,056	R55	349	13	417	35	1,508
1999 <sup>P</sup>	242	68	660	112	1,081	R49	364	8	422	39	1,542
2000 <sup>P</sup>	245	61	660	107	1,074	R42	369	10	421	45	1,540
2001 <sup>E</sup>	243	66	634	104	1,047	37	354	11	402	44	1,493

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Wood, black liquor, and other wood waste.

<sup>6</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>7</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>8</sup> Commercial combined-heat-and-power (CHP) and commercial electricity-only plants. See Appendix G

for commercial sector NAICS codes.

<sup>9</sup> Industrial combined-heat-and-power (CHP) and industrial electricity-only plants. See Appendix G for industrial sector NAICS codes.

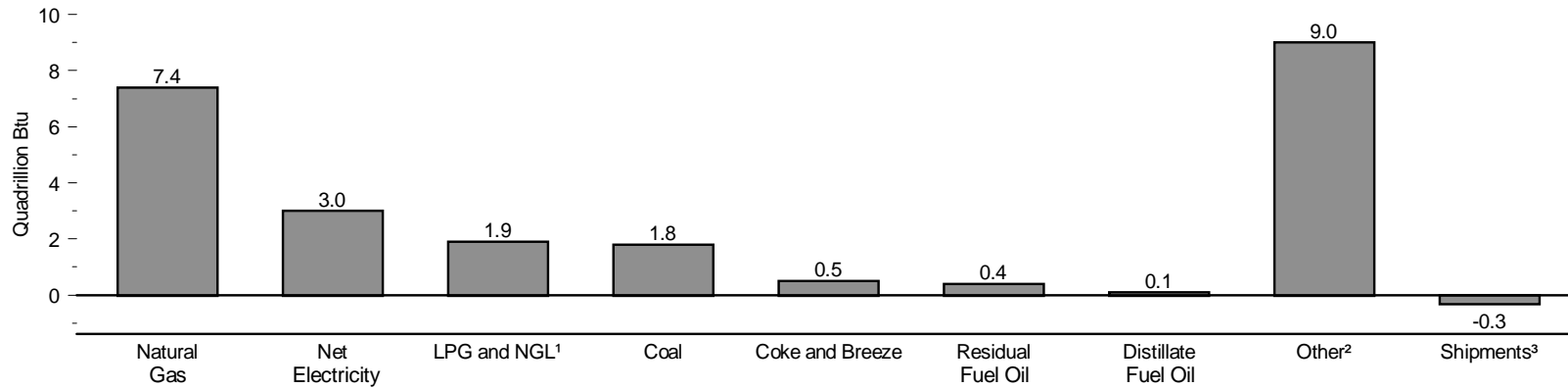
R=Revised. P=Preliminary. E=Estimate. (s)=Less than 0.5 trillion Btu.

Notes: Data are for fuels consumed to produce electricity; they exclude fuels consumed to produce useful thermal output. Consumption for electricity generation at combined-heat-and-power (CHP) plants is estimated. Totals may not equal sum of components due to independent rounding.

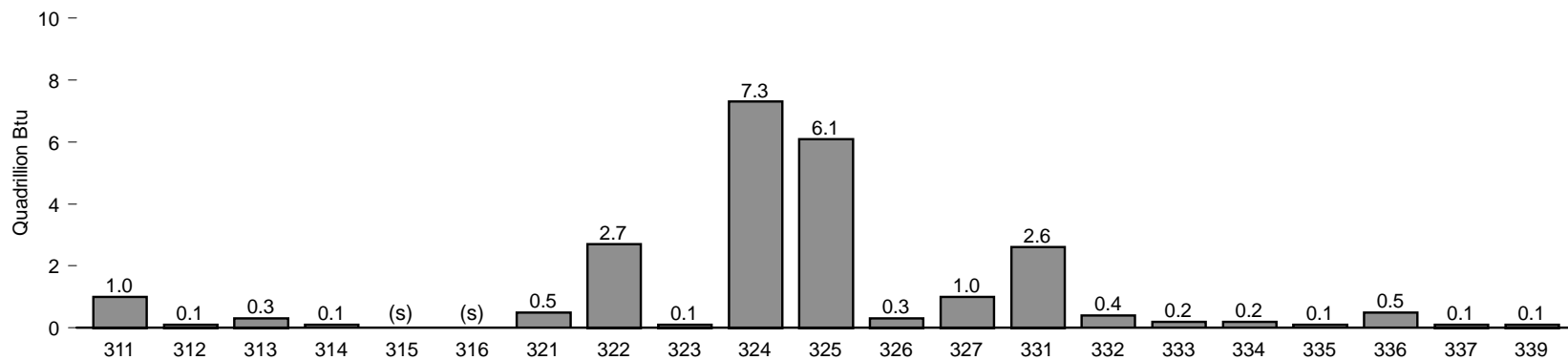
Sources: See sources for Tables 8.2c and 8.3c.

**Figure 2.3 Manufacturing Total First Use of Energy for All Purposes, 1998**

**By Energy Source**



**By North American Industry Classification System (NAICS) <sup>4</sup>**



<sup>1</sup> Liquefied petroleum gas and natural gas liquids.

<sup>2</sup> Includes all other types of energy that respondents indicated were consumed.

<sup>3</sup> Energy sources produced onsite from the use of other energy sources but sold to another entity.

<sup>4</sup> See Table 2.3 for Major Group titles of industries that correspond to the 3-digit NAICS codes.

(s) = Less than 0.5 quadrillion Btu.

Source: Table 2.3.

**Table 2.3 Manufacturing Total First Use of Energy for All Purposes, 1998**  
(Trillion Btu )

NAICS <sup>1</sup> Code	Major Group	Coal	Coke and Breeze	Natural Gas	Distillate Fuel Oil	LPG and NGL <sup>2</sup>	Residual Fuel Oil	Net Electricity <sup>3</sup>	Other <sup>4</sup>	Shipments of Energy Sources <sup>5</sup>	Total <sup>6</sup>
311	Food .....	129	2	568	16	5	14	213	97	0	1,044
312	Beverage and Tobacco Products .....	29	0	45	2	1	2	24	4	0	108
313	Textile Mills .....	20	0	103	4	2	12	102	14	0	256
314	Textile Product Mills .....	3	0	25	Q	(s)	3	18	(s)	0	50
315	Apparel .....	1	0	23	1	1	2	18	4	0	48
316	Leather and Allied Products .....	0	0	4	(s)	(s)	(s)	3	(s)	0	8
321	Wood Products .....	2	0	73	13	4	1	72	343	0	509
322	Paper .....	277	0	586	9	5	151	240	1,478	0	2,747
323	Printing and Related Support .....	(s)	0	44	(s)	1	(s)	51	2	0	98
324	Petroleum and Coal Products .....	12	0	1,007	28	39	72	126	6,082	47	7,320
325	Chemicals .....	300	7	2,709	10	1,796	98	577	677	110	6,064
326	Plastics and Rubber Products .....	3	0	126	1	5	5	183	5	0	328
327	Nonmetallic Mineral Products .....	284	11	444	17	3	4	134	82	0	979
331	Primary Metals .....	715	437	933	9	3	30	545	82	192	2,560
332	Fabricated Metal Products .....	3	3	241	6	5	2	176	10	0	445
333	Machinery .....	6	0	99	3	3	1	96	7	0	217
334	Computer and Electronic Products .....	(s)	0	64	1	(s)	1	137	1	0	205
335	Electrical Equipment, Appliances, and Components .....	1	(s)	53	1	2	1	55	30	0	143
336	Transportation Equipment .....	29	1	212	15	4	5	195	31	0	492
337	Furniture and Related Products .....	2	0	27	1	1	(s)	30	28	0	88
339	Miscellaneous .....	(s)	0	40	2	1	1	40	4	0	89
—	Total Manufacturing .....	1,814	461	7,426	142	1,882	406	3,035	8,980	349	23,796

<sup>1</sup> The Standard Industrial Classification (SIC) system has been replaced by the North American Industry Classification System (NAICS).

<sup>2</sup> Liquefied petroleum gases and natural gas liquids.

<sup>3</sup> "Net Electricity" is obtained by summing purchases, transfers in, and generation from noncombustible renewable resources, minus quantities sold and transferred out. It excludes electricity generated from combustible fuels.

<sup>4</sup> Includes all other types of energy that respondents indicated were consumed.

<sup>5</sup> Energy sources produced onsite from the use of other energy sources but sold or transferred to another entity.

<sup>6</sup> The sum of net electricity, residual and distillate fuel oil, natural gas, liquefied petroleum gas, natural gas liquids, coal, coke and breeze, and other, minus shipments of energy sources.

(s)=Less than 0.5 trillion Btu. Q=Data withheld because the relative standard error was greater than 50 percent.

Notes: "First Use" was "Primary Consumption" in previous releases of this table. The estimates are for the first use of energy for heat and power and as feedstocks or raw material inputs. First use is defined as the consumption of the energy that was originally produced offsite or was produced onsite from input materials not classified as energy. Totals may not equal sum of components due to independent rounding.

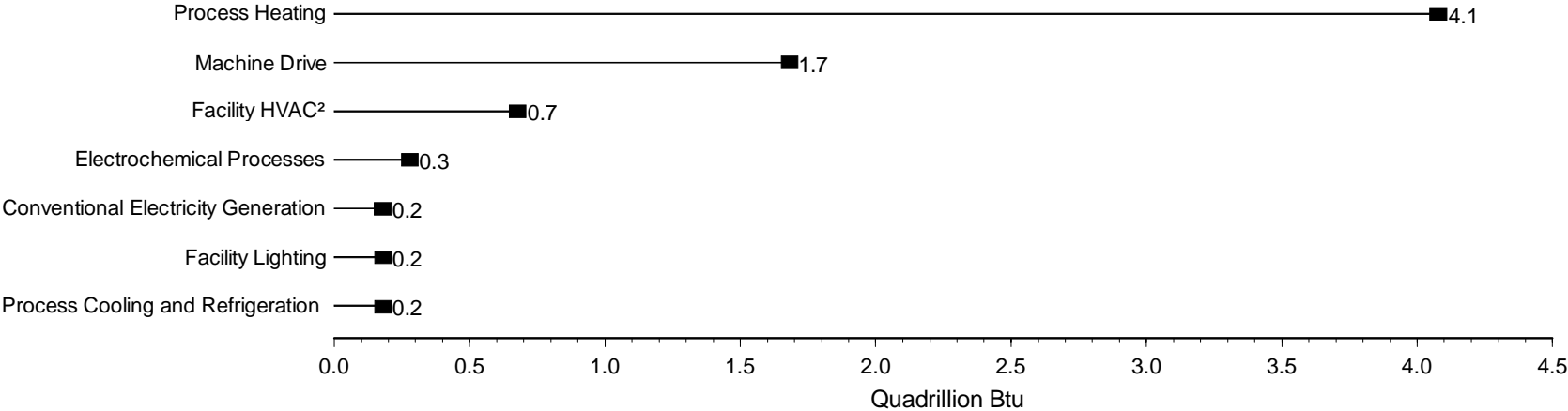
Web Page: <http://www.eia.doe.gov/emeu/mecs>.

Source: Energy Information Administration, Form EIA-846, "1998 Manufacturing Energy Consumption Survey."

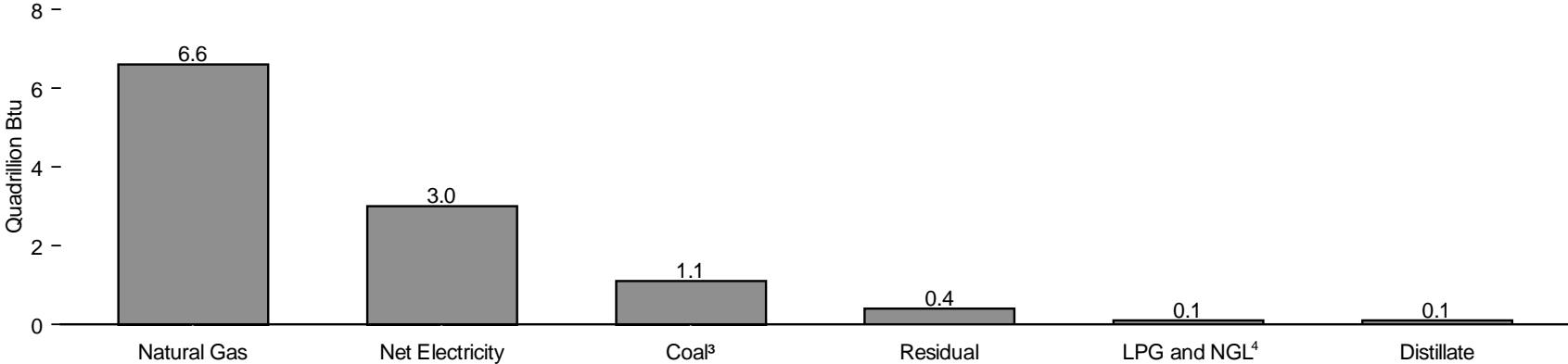


**Figure 2.4 Manufacturing Inputs for Heat, Power, and Electricity Generation, 1998**

**By Selected End Use<sup>1</sup>**



**By Energy Source**



<sup>1</sup> Excludes inputs of unallocated energy sources (6,248 trillion Btu).

<sup>2</sup> Heating, ventilation, and air conditioning.

<sup>3</sup> Excluding coal coke and breeze.

<sup>4</sup> Liquefied petroleum gases and natural gas liquids.

Source: Table 2.4.

**Table 2.4 Manufacturing Inputs for Heat, Power, and Electricity Generation by End Use, 1998**

End-Use Category	Net Electricity <sup>1</sup>	Residual Fuel Oil	Distillate Fuel Oil	Liquefied Petroleum Gases and Natural Gas Liquids	Natural Gas	Coal (Excluding Coal Coke and Breeze)	Total <sup>2</sup>
	Million Kilowatthours	Million Barrels			Billion Cubic Feet	Million Short Tons	
<b>Indirect End Use (Boiler Fuel)</b> .....	<b>5,568</b>	<b>39</b>	<b>6</b>	<b>7</b>	<b>2,471</b>	<b>35</b>	
<b>Direct End Use</b>							
<b>All Process Uses</b> .....	<b>705,697</b>	<b>16</b>	<b>6</b>	<b>22</b>	<b>3,272</b>	<b>15</b>	
Process Heating .....	103,299	15	3	19	3,104	15	
Process Cooling and Refrigeration .....	54,473	(s)	(s)	1	21	(s)	
Machine Drive .....	457,344	1	2	2	96	(s)	
Electrochemical Processes .....	87,200	—	—	—	—	—	
Other Process Uses .....	3,380	(s)	1	(s)	51	(s)	
<b>All Non-Process Uses</b> .....	<b>R 157,736</b>	<b>1</b>	<b>9</b>	<b>8</b>	<b>656</b>	<b>1</b>	
Facility Heating, Ventilation, and Air Conditioning <sup>3</sup> .....	R 79,355	1	1	1	393	(s)	
Facility Lighting .....	61,966	—	—	—	—	—	
Other Facility Support .....	R 14,338	(s)	1	(s)	39	(s)	
Onsite Transportation .....	1,380	—	6	7	5	—	
Conventional Electricity Generation .....	—	(s)	1	(s)	204	1	
Other Non-Process Use .....	696	(s)	(s)	(s)	Q	0	
<b>End Use Not Reported</b> .....	<b>R 20,473</b>	<b>(s)</b>	<b>1</b>	<b>1</b>	<b>70</b>	<b>(s)</b>	
<b>Total</b> .....	<b>R 889,474</b>	<b>57</b>	<b>23</b>	<b>38</b>	<b>6,469</b>	<b>51</b>	
Trillion Btu							
<b>Indirect End Use (Boiler Fuel)</b> .....	<b>19</b>	<b>246</b>	<b>38</b>	<b>24</b>	<b>2,538</b>	<b>770</b>	<b>3,635</b>
<b>Direct End Use</b>							
<b>All Process Uses</b> .....	<b>2,408</b>	<b>103</b>	<b>37</b>	<b>78</b>	<b>3,361</b>	<b>338</b>	<b>6,325</b>
Process Heating .....	352	97	20	68	3,187	331	4,055
Process Cooling and Refrigeration .....	186	(s)	(s)	2	22	(s)	210
Machine Drive .....	1,560	5	13	7	99	7	1,691
Electrochemical Processes .....	298	—	—	—	—	—	298
Other Process Uses .....	12	1	3	1	52	(s)	69
<b>All Non-Process Uses</b> .....	<b>538</b>	<b>8</b>	<b>52</b>	<b>29</b>	<b>673</b>	<b>30</b>	<b>1,330</b>
Facility Heating, Ventilation, and Air Conditioning <sup>3</sup> .....	271	4	6	4	403	4	692
Facility Lighting .....	211	—	—	—	—	—	211
Other Facility Support .....	49	1	6	(s)	40	(s)	96
Onsite Transportation .....	5	—	35	24	5	—	69
Conventional Electricity Generation .....	—	3	3	(s)	210	27	243
Other Non-Process Use .....	2	(s)	1	(s)	Q	0	3
<b>End Use Not Reported</b> .....	<b>70</b>	<b>1</b>	<b>7</b>	<b>4</b>	<b>72</b>	<b>3</b>	<b>157</b>
<b>Total</b> .....	<b>3,035</b>	<b>357</b>	<b>133</b>	<b>135</b>	<b>6,644</b>	<b>1,143</b>	<b>11,447</b>

<sup>1</sup> "Net Electricity" is obtained by summing purchases, transfers in, and generation from noncombustible renewable resources, minus quantities sold and transferred out.

<sup>2</sup> Total of listed energy sources. Excludes inputs of unallocated energy sources (6,248 trillion Btu). The top half of the "Total" column is blank because different physical units cannot be added.

<sup>3</sup> Excludes steam and hot water.

— = Not applicable. (s)=Estimate less than 0.5. Q=Withheld because relative standard error is greater than 50 percent.

Notes: Totals may not equal sum of components due to independent rounding. The estimates presented in this table are for the total consumption of energy for the production of heat, power, and

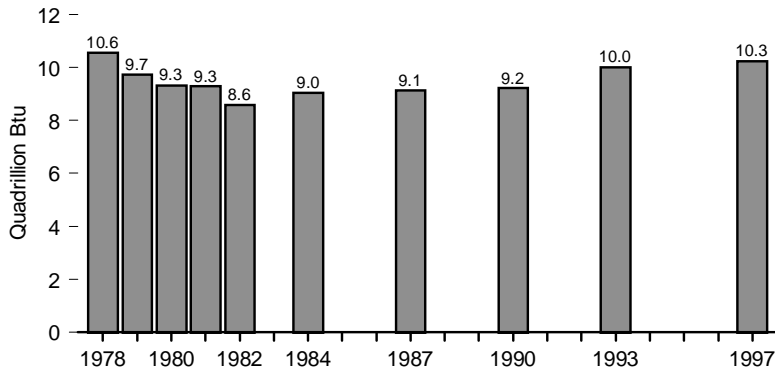
electricity generation, regardless of where the energy was produced. Specifically, the estimates include the quantities of energy that were originally produced onsite and purchased by or transferred to the establishment, plus those that were produced onsite from other energy or input materials not classified as energy, or were extracted from captive (onsite) mines or wells. Allocations to end uses are made on the basis of reasonable approximations by respondents.

Web Page: <http://www.eia.doe.gov/emeu/mecs>.

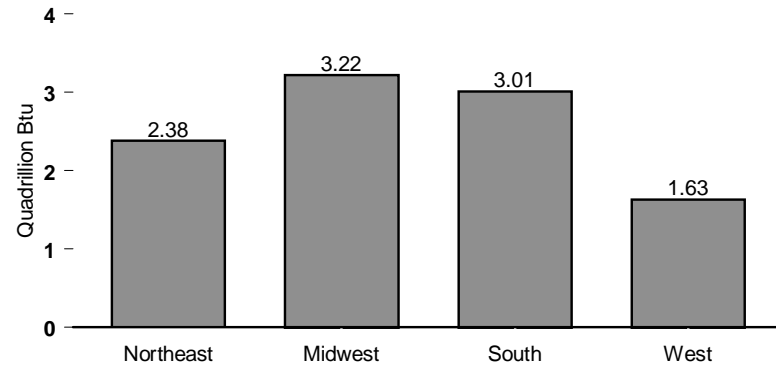
Source: Energy Information Administration, Form EIA-846, "1998 Manufacturing Energy Consumption Survey."

**Figure 2.5 Household Energy Consumption**

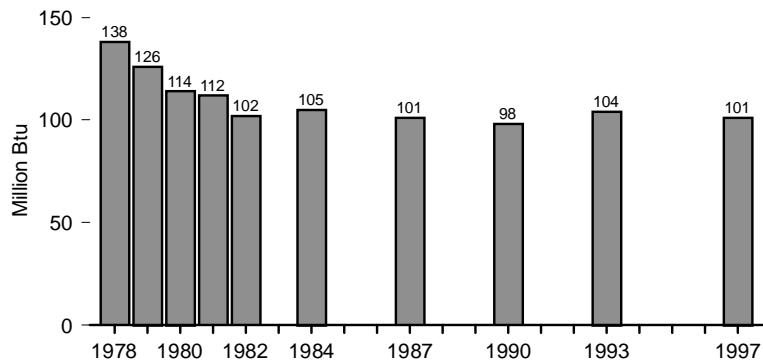
**Consumption by All Households, Selected Years, 1978-1997**



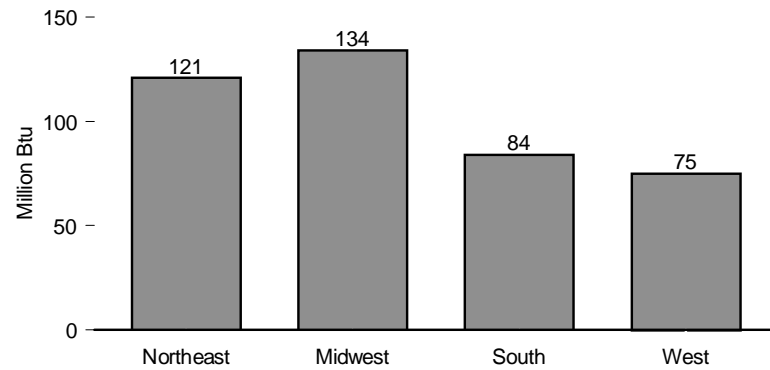
**Consumption by All Households, by Census Region, 1997**



**Consumption per Household, Selected Years, 1978-1997**



**Consumption per Household, by Census Region, 1997**



Notes: No data are available for years not shown. Data for 1978 through 1984 are for April of the year shown through March of the following year; data for 1987, 1990, 1993, and 1997 are for the calendar year. Because vertical scales differ, graphs should not be compared. See Appendix D for Census regions.

Source: Table 2.5.

**Table 2.5 Household Energy Consumption by Census Region, Selected Years, 1978-1997**  
(Quadrillion Btu, Except as Noted)

Census Region <sup>1</sup>	1978	1979	1980	1981	1982	1984	1987	1990	1993	1997
<b>Northeast</b> .....	<b>2.89</b>	<b>2.50</b>	<b>2.44</b>	<b>2.36</b>	<b>2.19</b>	<b>2.29</b>	<b>2.37</b>	<b>2.30</b>	<b>2.38</b>	<b>2.38</b>
Natural Gas .....	1.14	1.05	0.94	1.01	0.96	0.93	1.03	1.03	1.11	1.03
Electricity <sup>2</sup> .....	0.39	0.39	0.41	0.40	0.37	0.41	0.44	0.47	0.47	0.49
Distillate Fuel Oil and Kerosene .....	1.32	1.03	1.07	0.93	0.83	0.93	0.87	0.78	0.78	0.84
Liquefied Petroleum Gases .....	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.02	0.03	0.03
Consumption per Household (million Btu) .....	166	145	138	132	122	125	124	120	122	121
<b>Midwest</b> .....	<b>3.70</b>	<b>3.48</b>	<b>2.96</b>	<b>3.09</b>	<b>2.61</b>	<b>2.80</b>	<b>2.73</b>	<b>2.81</b>	<b>3.13</b>	<b>3.22</b>
Natural Gas .....	2.53	2.48	2.05	2.22	1.78	1.99	1.83	1.88	2.07	2.20
Electricity <sup>2</sup> .....	0.60	0.59	0.60	0.56	0.56	0.55	0.61	0.66	0.74	0.75
Distillate Fuel Oil and Kerosene .....	0.46	0.31	0.17	0.19	0.16	0.13	0.16	0.13	0.13	0.11
Liquefied Petroleum Gases .....	0.12	0.10	0.15	0.13	0.11	0.13	0.13	0.13	0.19	0.17
Consumption per Household (million Btu) .....	180	168	141	146	122	129	123	122	134	134
<b>South</b> .....	<b>2.43</b>	<b>2.30</b>	<b>2.57</b>	<b>2.41</b>	<b>2.45</b>	<b>2.50</b>	<b>2.61</b>	<b>2.60</b>	<b>2.95</b>	<b>3.01</b>
Natural Gas .....	0.96	0.91	1.12	1.15	1.14	1.15	1.09	1.03	1.18	1.13
Electricity <sup>2</sup> .....	1.00	0.97	1.06	1.01	1.01	1.06	1.22	1.36	1.51	1.67
Distillate Fuel Oil and Kerosene .....	0.32	0.28	0.25	0.14	0.18	0.16	0.17	0.11	0.13	0.10
Liquefied Petroleum Gases .....	0.15	0.14	0.14	0.12	0.12	0.12	0.12	0.10	0.13	0.12
Consumption per Household (million Btu) .....	99	92	95	87	87	85	84	81	88	84
<b>West</b> .....	<b>1.54</b>	<b>1.47</b>	<b>1.34</b>	<b>1.42</b>	<b>1.33</b>	<b>1.45</b>	<b>1.42</b>	<b>1.51</b>	<b>1.55</b>	<b>1.63</b>
Natural Gas .....	0.95	0.88	0.86	0.90	0.85	0.91	0.88	0.92	0.91	0.93
Electricity <sup>2</sup> .....	0.48	0.47	0.41	0.46	0.41	0.47	0.48	0.54	0.56	0.64
Distillate Fuel Oil and Kerosene .....	0.09	0.09	0.04	0.03	0.03	0.04	0.02	0.02	0.03	0.03
Liquefied Petroleum Gases .....	0.03	0.04	0.04	0.04	0.04	0.03	0.05	0.03	0.04	0.04
Consumption per Household (million Btu) .....	110	100	84	87	81	85	78	78	76	75
<b>United States</b> .....	<b>10.56</b>	<b>9.74</b>	<b>9.32</b>	<b>9.29</b>	<b>8.58</b>	<b>9.04</b>	<b>9.13</b>	<b>9.22</b>	<b>10.01</b>	<b>10.25</b>
Natural Gas .....	5.58	5.31	4.97	5.27	4.74	4.98	4.83	4.86	5.27	5.28
Electricity <sup>2</sup> .....	2.47	2.42	2.48	2.42	2.35	2.48	2.76	3.03	3.28	3.54
Distillate Fuel Oil and Kerosene .....	2.19	1.71	1.52	1.28	1.20	1.26	1.22	1.04	1.07	1.07
Liquefied Petroleum Gases .....	0.33	0.31	0.35	0.31	0.29	0.31	0.32	0.28	0.38	0.36
Consumption per Household (million Btu) .....	138	126	114	112	102	105	101	98	104	101

<sup>1</sup> See Appendix D for Census regions.

<sup>2</sup> Site electricity. One kilowatt-hour = 3,412 Btu.

Notes: This table shows major energy items only. No data are available for years not shown.

Data for 1978-1984 are for April of year shown through March of following year; data for 1987, 1990, 1993, and 1997 are for the calendar year. Totals may not equal sum of components due to independent

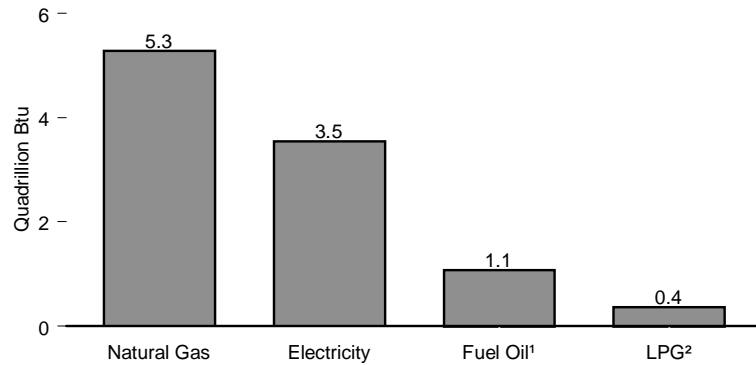
rounding.

Web Page: <http://www.eia.doe.gov/emeu/recs>.

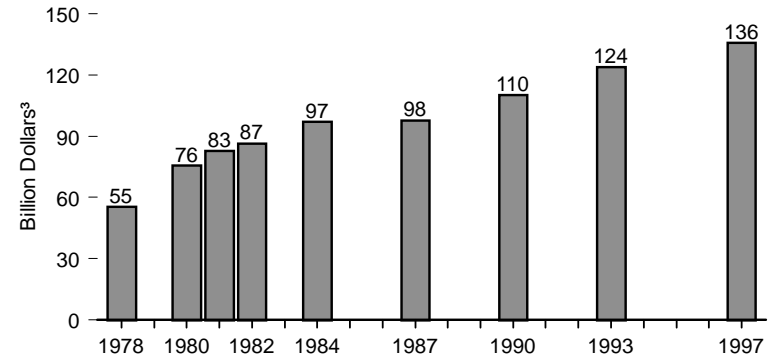
Sources: 1978 and 1979—Energy Information Administration (EIA), Form EIA-84, "Residential Energy Consumption Survey." 1980 forward—EIA, Form EIA-457, "Residential Energy Consumption Survey."

**Figure 2.6 Household Energy Consumption and Expenditures**

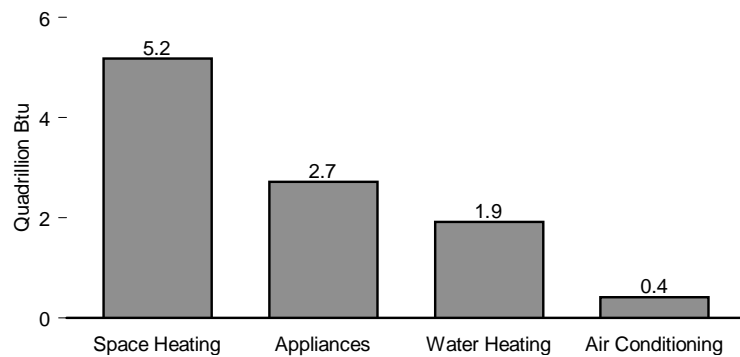
**Consumption by Energy Source, 1997**



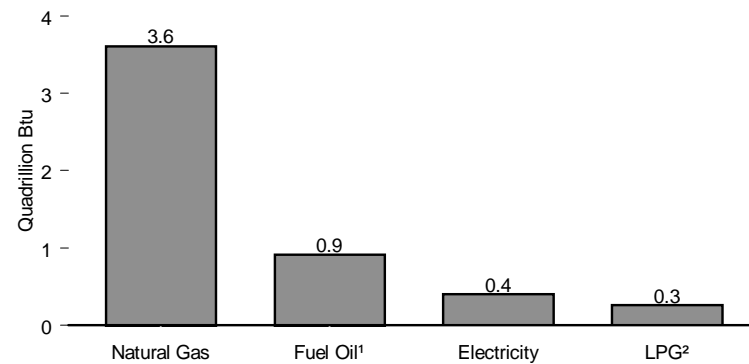
**Expenditures, Selected Years, 1978-1997**



**Consumption by End Use, 1997**



**Consumption for Space Heating, 1997**



<sup>1</sup> Distillate fuel oil and kerosene.

<sup>2</sup> Liquefied petroleum gases.

<sup>3</sup> Nominal dollars.

Notes: No data are available for years not shown. Because vertical scales differ, graphs should not be compared.

Source: Table 2.6.

**Table 2.6 Household Energy Consumption and Expenditures by End Use and Energy Source, Selected Years, 1978-1997**

Year	Space Heating				Air Conditioning <sup>1</sup>	Water Heating				Appliances <sup>2</sup>			Total <sup>1,2</sup>			
	Natural Gas	Electricity <sup>3</sup>	Fuel Oil <sup>4</sup>	LPG <sup>5</sup>	Electricity <sup>3</sup>	Natural Gas	Electricity <sup>3</sup>	Fuel Oil <sup>4</sup>	LPG <sup>5</sup>	Natural Gas	Electricity <sup>3</sup>	LPG <sup>5</sup>	Natural Gas	Electricity <sup>3</sup>	Fuel Oil <sup>4</sup>	LPG <sup>5</sup>
Consumption (quadrillion Btu)																
1978	4.26	0.40	2.05	0.23	0.32	1.04	0.29	0.14	0.06	0.28	1.45	0.03	5.58	2.47	2.19	0.33
1980	3.41	0.27	1.30	0.23	0.36	1.15	0.30	0.22	0.07	0.36	1.54	0.05	4.97	2.48	1.52	0.35
1981	3.69	0.26	1.06	0.21	0.34	1.13	0.30	0.22	0.06	0.43	1.52	0.05	5.27	2.42	1.28	0.31
1982	3.14	0.25	1.04	0.19	0.31	1.15	0.28	0.15	0.06	0.43	1.50	0.05	4.74	2.35	1.20	0.29
1984	3.51	0.25	1.11	0.21	0.32	1.10	0.32	0.15	0.06	0.35	1.59	0.04	4.98	2.48	1.26	0.31
1987	3.38	0.28	1.05	0.22	0.44	1.10	0.31	0.17	0.06	0.34	1.72	0.04	4.83	2.76	1.22	0.32
1990	3.37	0.30	0.93	0.19	0.48	1.16	0.34	0.11	0.06	0.33	1.91	0.03	4.86	3.03	1.04	0.28
1993	3.67	0.41	0.95	0.30	0.46	1.31	0.34	0.12	0.05	0.29	2.08	0.03	5.27	3.28	1.07	0.38
1997	3.61	0.40	0.91	0.26	0.42	1.29	0.39	0.16	0.08	0.37	2.33	0.02	5.28	3.54	1.07	0.36
Expenditures (billion dollars <sup>6</sup> )																
1978	11.49	3.53	8.06	1.05	4.12	2.88	3.14	0.56	0.36	0.93	19.10	0.25	15.30	29.89	8.62	1.66
1980	13.22	3.78	10.48	1.78	5.84	4.51	4.45	1.76	0.57	1.91	26.74	0.44	19.77	40.81	12.24	2.80
1981	16.62	3.93	9.44	1.78	6.23	5.13	4.94	1.94	0.51	2.17	29.70	0.52	24.03	44.80	11.29	2.81
1982	17.74	4.21	8.80	1.69	6.23	6.51	5.00	1.28	0.54	2.58	31.29	0.52	26.96	46.74	10.07	2.75
1984	20.66	4.62	8.51	2.00	7.06	6.63	6.44	1.09	0.58	2.31	36.36	0.54	29.78	54.48	9.60	3.12
1987	18.05	5.53	6.25	1.85	9.77	6.02	6.45	0.94	0.50	2.02	39.83	0.46	26.15	61.58	7.21	2.81
1990	18.59	6.16	7.42	2.01	11.23	6.59	7.21	0.83	0.65	2.03	46.95	0.48	27.26	71.54	8.25	3.14
1993	21.95	8.66	6.24	2.81	11.31	8.08	7.58	0.74	0.58	1.98	53.52	0.42	32.04	81.08	6.98	3.81
1997	24.11	8.56	6.57	2.79	10.20	8.84	8.99	1.04	0.89	2.86	60.57	0.36	35.81	88.33	7.61	4.04

<sup>1</sup> A small amount of natural gas used for air conditioning is included in "Natural Gas" under "Total."

<sup>2</sup> Includes refrigerators. A small amount of fuel oil or kerosene used for appliances is included in "Fuel Oil" under "Total."

<sup>3</sup> Site electricity. One kilowatthour = 3,412 Btu.

<sup>4</sup> Fuel oil is distillate fuel oil and kerosene.

<sup>5</sup> Liquefied petroleum gases.

<sup>6</sup> Nominal dollars.

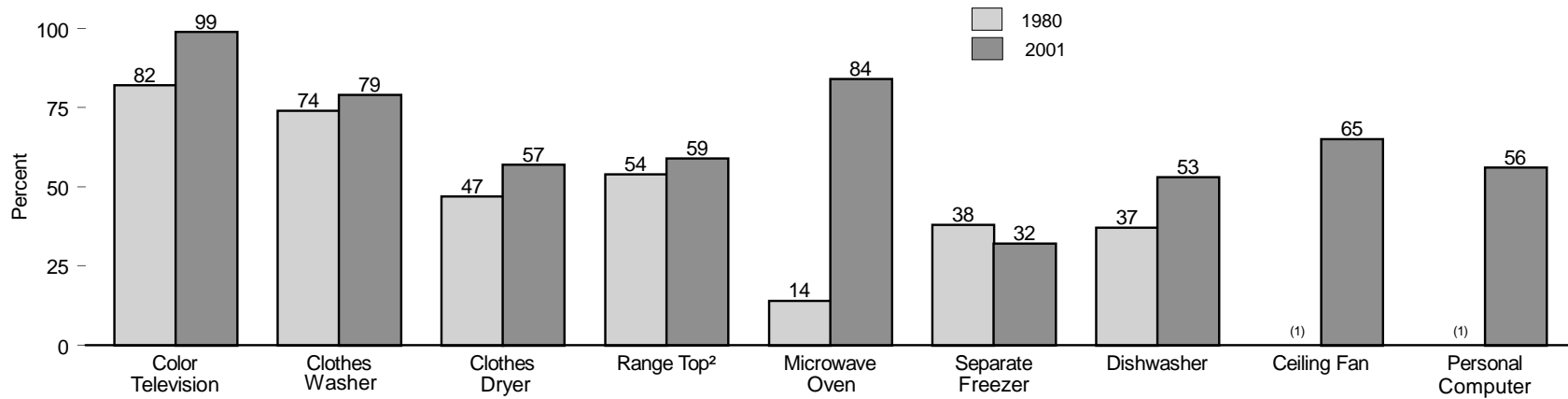
Notes: No data are available for years not shown. Consumption data by energy source for 1979 are available on Table 2.4. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/emeu/recs>.

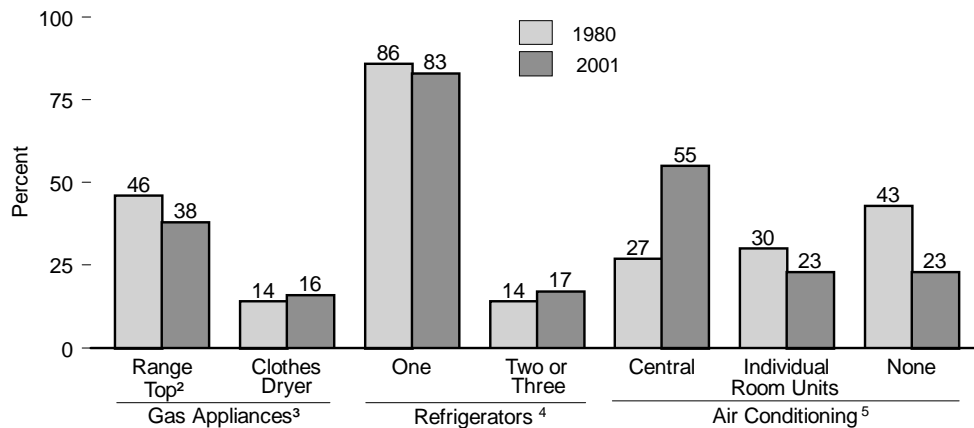
Sources: 1978—Energy Information Administration (EIA), Form EIA-84, "Residential Energy Consumption Survey." 1980 forward—EIA, Form EIA-457, "Residential Energy Consumption Survey."

**Figure 2.7 Households With Selected Appliances and Types of Main Heating Fuel**

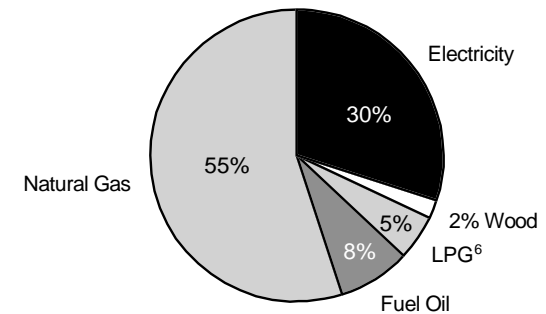
**Households With Selected Electric Appliances, 1980 and 2001**



**Households With Other Selected Appliances, 1980 and 2001**



**Type of Main Heating Fuel, 2001**



<sup>1</sup> Not collected in 1980.

<sup>2</sup> Or burners.

<sup>3</sup> Natural gas or liquified petroleum gases.

<sup>4</sup> Fewer than 0.5 percent of the households do not have a refrigerator.

<sup>5</sup> Households with both central and individual room units are counted only unless "Central."

<sup>6</sup> Liquefied Petroleum Gas.

Source: Table 2.7.

**Table 2.7 Households With Selected Appliances and Types of Main Heating Fuel, Selected Years, 1978-2001**

Appliance	Year											Change
	1978	1979	1980	1981	1982	1984	1987	1990	1993	1997	2001 <sup>P</sup>	1980 to 2001 <sup>P</sup>
<b>Total Households (millions)</b> .....	77	78	82	83	84	86	91	94	97	101	107	26
	Percent of Households											
<b>Type of Main Heating Fuel</b>												
Natural Gas .....	55	55	55	56	57	55	55	55	53	53	55	0
Electricity .....	16	17	18	17	16	17	20	23	26	29	30	12
Liquefied Petroleum Gas .....	4	5	5	4	5	5	5	5	5	5	5	0
Fuel Oil .....	20	17	15	14	13	12	12	11	11	9	8	-7
Wood .....	2	4	6	6	7	7	6	4	3	2	2	-4
<b>Type of Appliances</b>												
<b>Electric Appliances</b>												
Television Set (Color) .....	NA	NA	82	83	85	88	93	96	98	99	99	17
Television Set (B/W) .....	NA	NA	51	48	46	43	36	31	20	NA	NA	NA
Television Set (Any) .....	NA	NA	98	98	98	98	98	99	99	NA	NA	NA
Clothes Washer .....	74	NA	74	73	71	73	75	76	77	77	79	5
Range Top or Burners .....	53	NA	54	54	53	54	57	58	61	60	59	5
Oven, Microwave .....	8	NA	14	17	21	34	61	79	84	83	86	72
Clothes Dryer .....	45	NA	47	45	45	46	51	53	57	55	57	10
Separate Freezer .....	35	NA	38	38	37	37	34	34	35	33	32	-6
Dishwasher .....	35	NA	37	37	36	38	43	45	45	50	53	16
Dehumidifier .....	NA	NA	9	9	9	9	10	12	9	NA	11	2
Waterbed Heaters .....	NA	NA	NA	NA	NA	10	14	15	12	8	5	NA
Window or Ceiling Fan .....	NA	NA	NA	NA	28	35	46	51	60	NA	NA	NA
Ceiling Fan .....	NA	NA	NA	NA	NA	NA	NA	NA	54	61	65	NA
Whole House Fan .....	NA	NA	NA	NA	8	8	9	10	4	NA	NA	NA
Evaporative Cooler .....	NA	NA	4	4	4	4	3	4	3	NA	3	-1
Personal Computer .....	NA	NA	NA	NA	NA	NA	NA	16	23	35	56	NA
Pump for Well Water .....	NA	NA	NA	NA	NA	NA	NA	15	13	14	13	NA
Swimming-Pool Pump <sup>1</sup> .....	NA	NA	3	4	3	NA	NA	5	5	5	6	3
<b>Gas Appliances<sup>2</sup></b>												
Range Top or Burners .....	48	NA	46	46	47	45	43	42	38	39	38	-8
Clothes Dryer .....	14	NA	14	16	15	16	15	16	15	16	16	2
Outdoor Gas Grill .....	6	NA	9	9	11	13	20	26	29	NA	NA	NA
Outdoor Gas Light .....	2	NA	2	2	2	1	1	1	1	1	(s)	-2
Swimming Pool Heater <sup>3</sup> .....	NA	NA	(s)	(s)	(s)	1	1	1	1	1	1	0
<b>Refrigerators<sup>4</sup></b>												
One .....	86	NA	86	87	86	88	86	84	85	85	83	-3
Two or More .....	14	NA	14	13	13	12	14	15	15	15	17	2
<b>Air Conditioning (A/C)</b>												
Central <sup>5</sup> .....	23	24	27	27	28	30	34	39	44	47	55	28
Individual Room Units <sup>5</sup> .....	33	31	30	31	30	30	30	29	25	25	23	-7
None .....	44	45	43	42	42	40	36	32	32	28	23	-20
<b>Portable Kerosene Heaters</b> .....	(s)	NA	(s)	1	3	6	6	5	3	2	3	3

<sup>1</sup> All reported swimming pools were assumed to have an electric pump for filtering and circulating the water, except for 1993 and 1997, when a filtering system was made explicit.

<sup>2</sup> Includes natural gas or liquefied petroleum gases.

<sup>3</sup> In 1984 and 1987, also includes heaters for jacuzzis and hot tubs.

<sup>4</sup> Fewer than 0.5 percent of the households do not have a refrigerator.

<sup>5</sup> Households with both central and individual room units are counted only under "Central."

P=Preliminary. NA=Not available. (s)=Less than 0.5 percent.

Note: No data are available for years not shown.

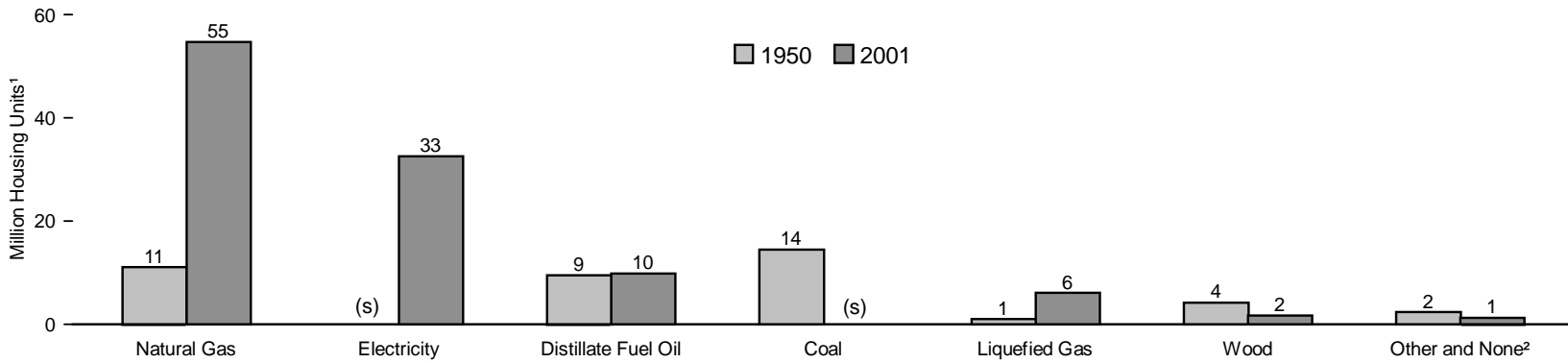
Web Page: <http://www.eia.doe.gov/emeu/recs>.

Sources: 1978 and 1979—Energy Information Administration (EIA), Form EIA-84, "Residential Energy Consumption Survey." 1980 forward—EIA, Form EIA-457, "Residential Energy Consumption Survey."

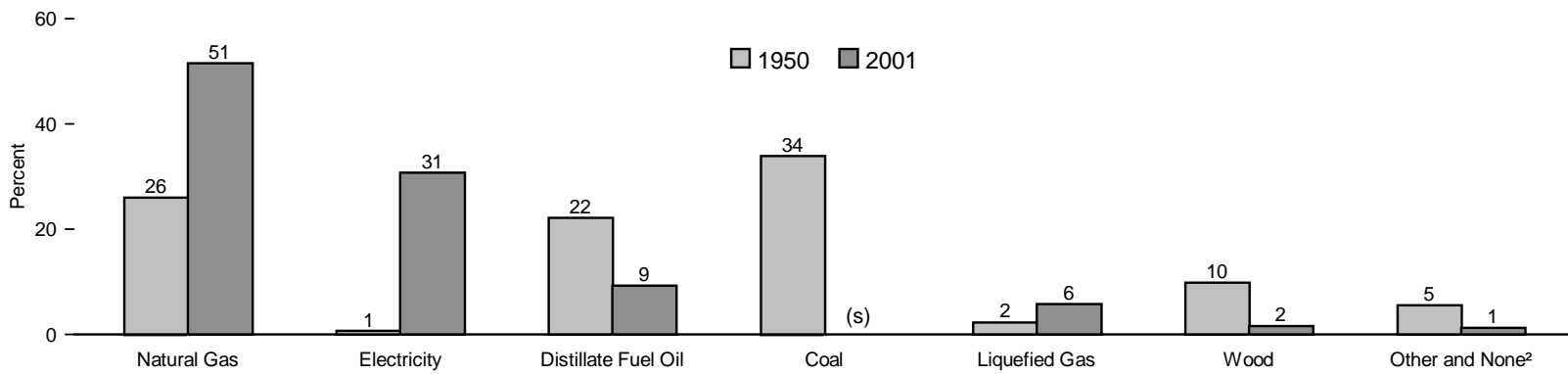


**Figure 2.8 Type of Heating in Occupied Housing Units, 1950 and 2001**

**By Fuel Type**



**By Fuel Type, Share of Total**



<sup>1</sup> Sum of components do not equal total due to independent rounding.

<sup>2</sup> Kerosene, solar, and other.

(s)=Less than 0.5.

Source: Table 2.8.

**Table 2.8 Type of Heating in Occupied Housing Units, Selected Years, 1950-2001**

Year	Coal <sup>1</sup>	Natural Gas	Liquefied Gas	Distillate Fuel Oil	Kerosene	Electricity	Wood	Solar	Other	None <sup>2</sup>	Total
Million											
1950	14.48	11.12	0.98	9.46	( <sup>3</sup> )	0.28	4.17	NA	0.77	1.57	42.83
1960	6.46	22.85	2.69	17.16	( <sup>3</sup> )	0.93	2.24	NA	0.22	0.48	53.02
1970	1.82	35.01	3.81	16.47	( <sup>3</sup> )	4.88	0.79	NA	0.27	0.40	63.45
1973	0.80	38.46	4.42	17.24	( <sup>3</sup> )	7.21	0.60	NA	0.15	0.45	69.34
1974	0.74	39.47	4.14	16.84	( <sup>3</sup> )	8.41	0.66	NA	0.09	0.48	70.83
1975	0.57	40.93	4.15	16.30	( <sup>3</sup> )	9.17	0.85	NA	0.08	0.47	72.52
1976	0.48	41.22	4.24	16.45	( <sup>3</sup> )	10.15	0.91	NA	0.09	0.46	74.01
1977	0.45	41.54	4.18	15.62	0.44	11.15	1.24	NA	0.15	0.51	75.28
1978	0.40	42.52	4.13	15.65	0.42	12.26	1.07	NA	0.12	0.60	77.17
1979	0.36	43.32	4.13	15.30	0.41	13.24	1.14	NA	0.10	0.57	78.57
1980	0.33	44.40	4.17	14.50	0.37	14.21	1.38	NA	0.11	0.61	80.07
1981	0.36	46.08	4.17	14.13	0.37	15.49	1.89	NA	0.10	0.59	83.18
1983 <sup>4</sup>	0.43	46.70	3.87	12.59	0.45	15.68	4.09	NA	0.16	0.68	84.64
1985	0.45	45.33	3.58	12.44	1.06	18.36	6.25	0.05	0.37	0.53	88.43
1987	0.41	45.96	3.66	12.74	1.08	20.61	5.45	0.05	0.28	0.66	90.89
1989	0.34	47.40	3.66	12.47	1.07	23.06	4.59	0.04	0.40	0.66	93.68
1991	0.32	47.02	3.88	11.47	0.99	23.71	4.44	0.03	0.41	0.86	93.15
1993	0.30	47.67	3.92	11.17	1.02	25.11	4.10	0.03	0.50	0.91	94.73
1995	0.21	49.20	4.25	10.98	1.06	26.77	3.53	0.02	0.64	1.04	97.69
1997	0.18	51.05	5.40	10.10	0.75	29.20	1.79	0.03	0.36	0.62	99.49
1999	0.17	52.37	5.91	10.03	0.72	31.14	1.70	0.02	0.21	0.54	102.80
2001	0.13	54.69	6.08	9.82	0.65	32.59	1.69	0.02	0.19	0.40	106.26
Percent											
1950	33.8	26.0	2.3	22.1	( <sup>3</sup> )	0.6	9.7	NA	1.8	3.7	100.0
1960	12.2	43.1	5.1	32.4	( <sup>3</sup> )	1.8	4.2	NA	0.4	0.9	100.0
1970	2.9	55.2	6.0	26.0	( <sup>3</sup> )	7.7	1.3	NA	0.4	0.6	100.0
1973	1.2	55.5	6.4	24.9	( <sup>3</sup> )	10.4	0.9	NA	0.2	0.7	100.0
1974	1.0	55.7	5.8	23.8	( <sup>3</sup> )	11.9	0.9	NA	0.1	0.7	100.0
1975	0.8	56.4	5.7	22.5	( <sup>3</sup> )	12.6	1.2	NA	0.1	0.6	100.0
1976	0.7	55.7	5.7	22.2	( <sup>3</sup> )	13.7	1.2	NA	0.1	0.6	100.0
1977	0.6	55.2	5.6	20.7	0.6	14.8	1.6	NA	0.2	0.7	100.0
1978	0.5	55.1	5.4	20.3	0.5	15.9	1.4	NA	0.2	0.8	100.0
1979	0.5	55.1	5.3	19.5	0.5	16.9	1.4	NA	0.1	0.7	100.0
1980	0.4	55.4	5.2	18.1	0.5	17.7	1.7	NA	0.1	0.8	100.0
1981	0.4	55.4	5.0	17.0	0.4	18.6	2.3	NA	0.1	0.7	100.0
1983 <sup>4</sup>	0.5	55.2	4.6	14.9	0.5	18.5	4.8	NA	0.2	0.8	100.0
1985	0.5	51.3	4.1	14.1	1.2	20.8	7.1	0.1	0.4	0.6	100.0
1987	0.4	50.6	4.0	14.0	1.2	22.7	6.0	0.1	0.3	0.7	100.0
1989	0.4	50.6	3.9	13.3	1.1	24.6	4.9	(s)	0.4	0.7	100.0
1991	0.3	50.5	4.2	12.3	1.1	25.5	4.8	(s)	0.4	0.9	100.0
1993	0.3	50.3	4.1	11.8	1.1	26.5	4.3	(s)	0.5	1.0	100.0
1995	0.2	50.4	4.4	11.2	1.1	27.4	3.6	(s)	0.7	1.1	100.0
1997	0.2	51.3	5.4	10.2	0.8	29.4	1.8	(s)	0.4	0.6	100.0
1999	0.2	50.9	5.7	9.8	0.7	30.3	1.7	(s)	0.2	0.5	100.0
2001	0.1	51.5	5.7	9.2	0.6	30.7	1.6	(s)	0.2	0.4	100.0

<sup>1</sup> Includes coal coke.

<sup>2</sup> Includes nonreporting units in 1950 and 1960, which totaled 997 and 2,000 units, respectively.

<sup>3</sup> Included in distillate fuel oil.

<sup>4</sup> Since 1983, the *American Housing Survey for the United States* has been a biennial survey.

NA=Not available. (s)=Less than 0.05 percent.

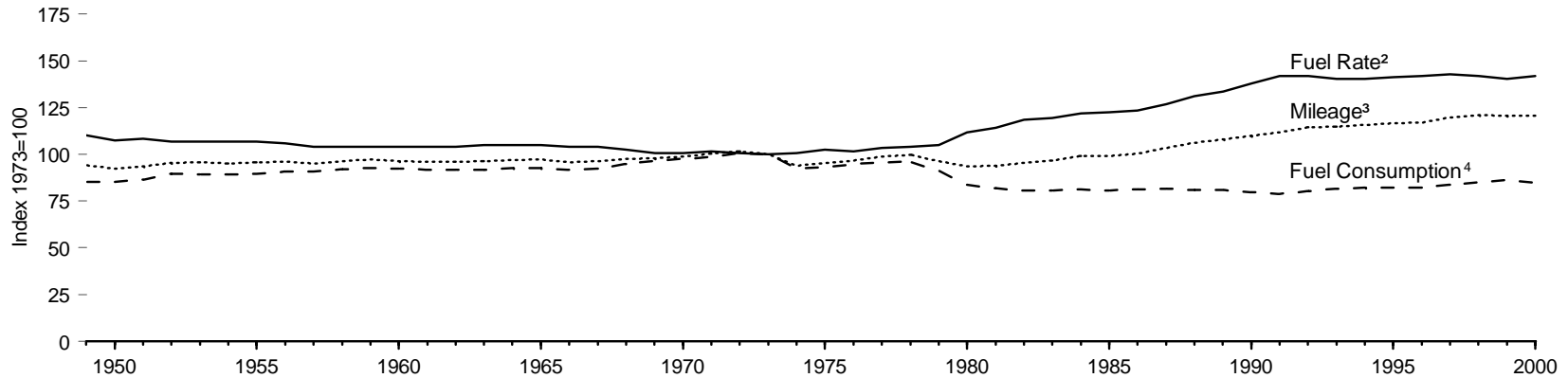
Notes: Includes mobile homes and individual housing units in apartment buildings. Housing units with

more than one type of heating system are classified according to the principal type of heating system. Totals may not equal sum of components due to independent rounding.

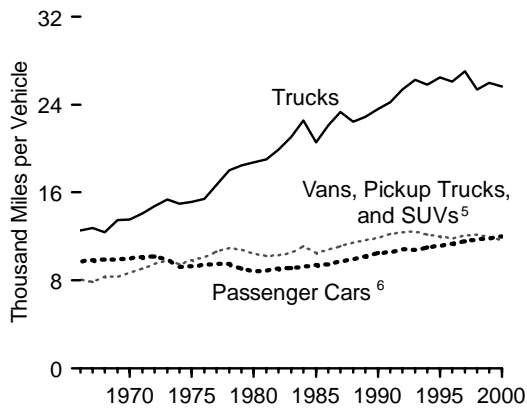
Sources: 1950, 1960, and 1970—Bureau of the Census, *Census of Population and Housing*. 1973 forward—Bureau of the Census, *American Housing Survey for the United States*, biennial surveys, Table 2-5.

**Figure 2.9 Motor Vehicle Mileage, Fuel Consumption, and Fuel Rates**

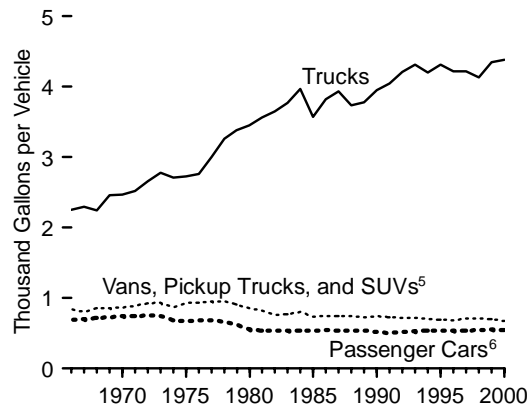
**All Motor Vehicles,<sup>1</sup> 1949-2000**



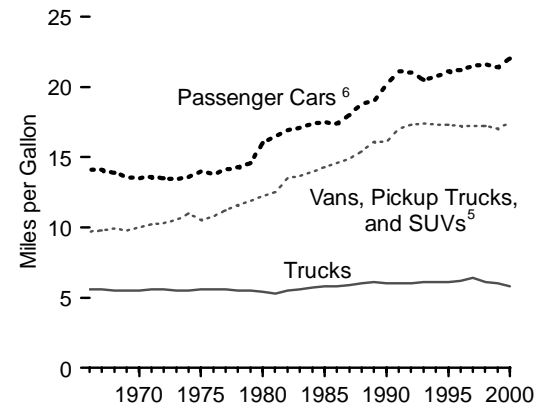
**Mileage, 1966-2000**



**Fuel Consumption, 1966-2000**



**Fuel Rates, 1966-2000**



<sup>1</sup> Passenger cars, motorcycles, vans, pickup trucks, sport utility vehicles, trucks, and buses.

<sup>2</sup> Miles per gallon.

<sup>3</sup> Miles per vehicle.

<sup>4</sup> Gallons per vehicle.

<sup>5</sup> Sport utility vehicles.

<sup>6</sup> Motorcycles are included with passenger cars through 1989.

Source: Table 2.9.

**Table 2.9 Motor Vehicle Mileage, Fuel Consumption, and Fuel Rates, 1949-2000**

Year	Passenger Cars			Vans, Pickup Trucks, and Sport Utility Vehicles <sup>1</sup>			Trucks <sup>2</sup>			All Motor Vehicles <sup>3</sup>		
	Mileage (miles per vehicle)	Fuel Consumption (gallons per vehicle)	Fuel Rate (miles per gallon)	Mileage (miles per vehicle)	Fuel Consumption (gallons per vehicle)	Fuel Rate (miles per gallon)	Mileage (miles per vehicle)	Fuel Consumption (gallons per vehicle)	Fuel Rate (miles per gallon)	Mileage (miles per vehicle)	Fuel Consumption (gallons per vehicle)	Fuel Rate (miles per gallon)
1949	49,388	4627	415.0	(5)	(5)	(5)	69,712	61,080	69.0	9,498	726	13.1
1950	49,060	4603	415.0	(5)	(5)	(5)	610,316	61,229	68.4	9,321	725	12.8
1951	49,186	4614	415.0	(5)	(5)	(5)	610,545	61,242	68.5	9,460	735	12.9
1952	49,360	4639	414.7	(5)	(5)	(5)	610,769	61,288	68.4	9,642	762	12.7
1953	49,377	4640	414.6	(5)	(5)	(5)	610,963	61,283	68.5	9,684	760	12.7
1954	49,349	4641	414.6	(5)	(5)	(5)	610,682	61,281	68.3	9,605	758	12.7
1955	49,447	4645	414.6	(5)	(5)	(5)	610,576	61,293	68.2	9,661	761	12.7
1956	49,496	4654	414.5	(5)	(5)	(5)	610,511	61,309	68.0	9,688	771	12.6
1957	49,348	4658	414.2	(5)	(5)	(5)	610,774	61,304	68.3	9,609	773	12.4
1958	49,500	4670	414.2	(5)	(5)	(5)	610,768	61,303	68.3	9,732	782	12.4
1959	49,615	4674	414.3	(5)	(5)	(5)	610,702	61,328	68.1	9,817	789	12.4
1960	49,518	4668	414.3	(5)	(5)	(5)	610,693	61,333	68.0	9,732	784	12.4
1961	49,521	4663	414.4	(5)	(5)	(5)	610,537	61,341	67.9	9,708	781	12.4
1962	49,494	4662	414.3	(5)	(5)	(5)	610,554	61,337	67.9	9,687	779	12.4
1963	49,587	4655	414.6	(5)	(5)	(5)	610,395	61,380	67.5	9,737	780	12.5
1964	49,665	4661	414.6	(5)	(5)	(5)	610,408	61,389	67.5	9,805	787	12.5
1965	49,603	4661	414.5	(5)	(5)	(5)	610,851	61,387	67.8	9,826	787	12.5
1966	49,733	4688	414.1	8,077	833	9.7	12,537	2,250	5.6	9,675	780	12.4
1967	49,849	4699	414.1	7,877	801	9.8	12,789	2,294	5.6	9,751	786	12.4
1968	49,922	4714	413.9	8,376	849	9.9	12,402	2,240	5.5	9,864	805	12.2
1969	49,921	4727	413.6	8,355	851	9.8	13,484	2,459	5.5	9,885	821	12.0
1970	49,989	4737	413.5	8,676	866	10.0	13,565	2,467	5.5	9,976	830	12.0
1971	410,097	4743	413.6	9,082	888	10.2	14,117	2,519	5.6	10,133	839	12.1
1972	410,171	4754	413.5	9,534	922	10.3	14,780	2,657	5.6	10,279	857	12.0
1973	49,884	4737	413.4	9,779	931	10.5	15,370	2,775	5.5	10,099	850	11.9
1974	49,221	4677	413.6	9,452	862	11.0	14,995	2,708	5.5	9,493	788	12.0
1975	49,309	4665	414.0	9,829	934	10.5	15,167	2,722	5.6	9,627	790	12.2
1976	49,418	4681	413.8	10,127	934	10.8	15,438	2,764	5.6	9,774	806	12.1
1977	49,517	4676	414.1	10,607	947	11.2	16,700	3,002	5.6	9,978	814	12.3
1978	49,500	4665	414.3	10,968	948	11.6	18,045	3,263	5.5	10,077	816	12.4
1979	49,062	4620	414.6	10,802	905	11.9	18,502	3,380	5.5	9,722	776	12.5
1980	48,813	4551	416.0	10,437	854	12.2	18,736	3,447	5.4	9,458	712	13.3
1981	48,873	4538	416.5	10,244	819	12.5	19,016	3,565	5.3	9,477	697	13.6
1982	49,050	4535	416.9	10,276	762	13.5	19,931	3,647	5.5	9,644	686	14.1
1983	49,118	4534	417.1	10,497	767	13.7	21,083	3,769	5.6	9,760	686	14.2
1984	49,248	4530	417.4	11,151	797	14.0	22,550	3,967	5.7	10,017	691	14.5
1985	49,419	4538	417.5	10,506	735	14.3	20,597	3,570	5.8	10,020	685	14.6
1986	49,464	4543	417.4	10,764	738	14.6	22,143	3,821	5.8	10,143	692	14.7
1987	49,720	4539	418.0	11,114	744	14.9	23,349	3,937	5.9	10,453	694	15.1
1988	49,972	4531	418.8	11,465	745	15.4	22,485	3,736	6.0	10,721	688	15.6
1989	410,157	4533	419.0	11,676	724	16.1	22,926	3,776	6.1	10,932	688	15.9
1990	10,504	520	20.2	11,902	738	16.1	23,603	3,953	6.0	11,107	677	16.4
1991	10,571	501	21.1	12,245	721	17.0	24,229	4,047	6.0	11,294	669	16.9
1992	10,857	517	21.0	12,381	717	17.3	25,373	4,210	6.0	11,558	683	16.9
1993	10,804	527	20.5	12,430	714	17.4	26,262	4,309	6.1	11,595	693	16.7
1994	10,992	531	20.7	12,156	701	17.3	25,838	4,202	6.1	11,683	698	16.7
1995	11,203	530	21.1	12,018	694	17.3	26,514	4,315	6.1	11,793	700	16.8
1996	11,330	534	21.2	11,811	685	17.2	26,092	4,221	6.2	11,813	700	16.9
1997	11,581	539	21.5	12,115	703	17.2	27,032	4,218	6.4	12,107	711	17.0
1998	11,754	544	21.6	12,173	707	17.2	25,397	4,135	6.1	12,211	721	16.9
1999	R11,848	R553	21.4	R11,957	R701	17.0	R26,014	R4,352	R6.0	R12,206	R732	R16.7
2000 <sup>P</sup>	11,988	546	22.0	11,684	668	17.5	25,651	4,387	5.8	12,177	719	16.9

<sup>1</sup> Includes a small number of trucks with 2 axles and 4 tires, such as step vans.

<sup>2</sup> Single-unit trucks with 2 axles and 6 or more tires, and combination trucks.

<sup>3</sup> Includes buses and motorcycles, which are not shown separately.

<sup>4</sup> Includes motorcycles.

<sup>5</sup> Included in "Trucks."

<sup>6</sup> Includes vans, pickup trucks, and sport utility vehicles.

R=Revised. P=Preliminary.

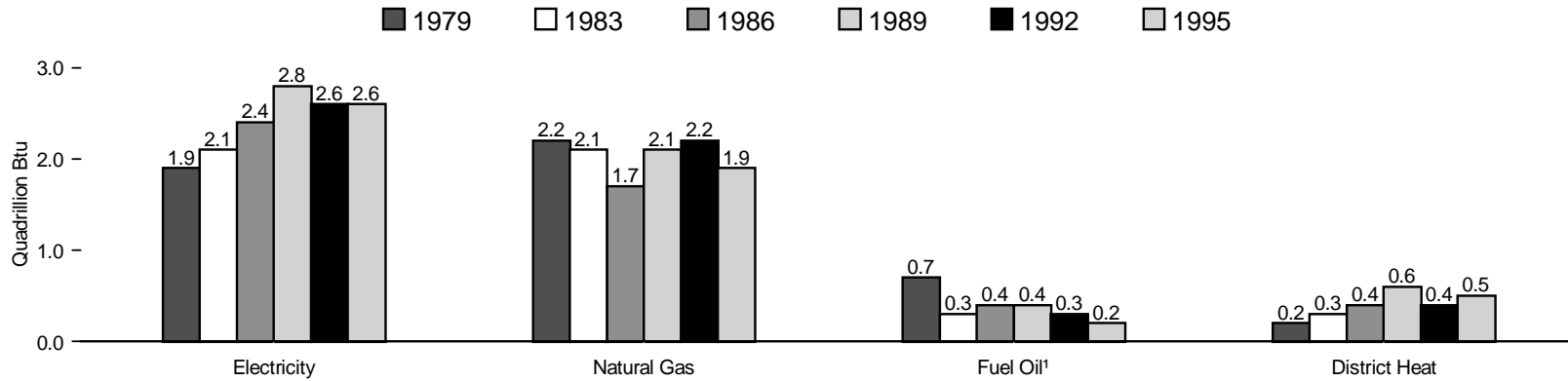
Note: For vehicle registrations data see the "Sources" or the "Web Page."

Web Page: <http://www.fhwa.dot.gov/ohim>.

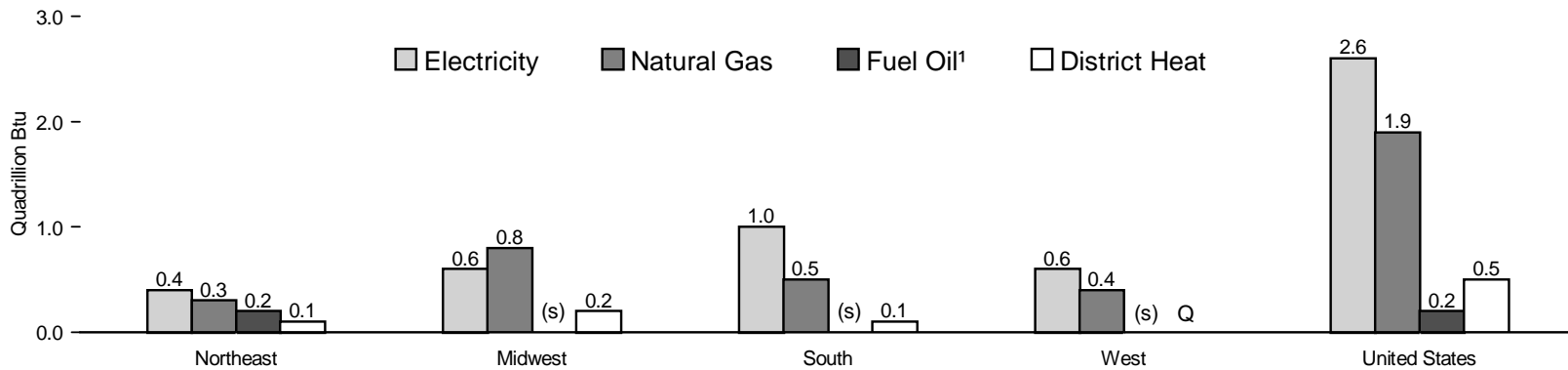
Sources: **Passenger Cars:** 1990-1994—U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 1998*, Table 4-13. **All Other Data:** 1949-1994—Federal Highway Administration (FHWA), *Highway Statistics Summary to 1995*, Table VM-201A. 1995 forward—FHWA, *Highway Statistics*, annual reports, Table VM-1.

**Figure 2.10 Commercial Buildings Consumption by Energy Source**

**By Survey Year**



**By Census Region, 1995**



<sup>1</sup> Distillate fuel oil, residual fuel oil, and kerosene.

Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.

(s)=Less than 0.05 quadrillion Btu.

Note: See Appendix D for Census regions.

Source: Table 2.10.

**Table 2.10 Commercial Buildings Consumption by Energy Source, Selected Years, 1979-1995**  
(Trillion Btu)

Energy Source and Year	Square Footage Category			Principal Building Activity								Census Region <sup>1</sup>				All Buildings
	1,001 to 10,000	10,001 to 100,000	Over 100,000	Education	Food Sales	Food Service	Health Care	Lodging	Mercantile and Service	Office	All Other	Northeast	Midwest	South	West	
<b>Major Sources <sup>2</sup></b>																
1979 .....	1,255	2,202	1,508	511	( <sup>3</sup> )	336	469	278	894	861	1,616	1,217	1,826	1,395	526	4,965
1983 .....	1,242	1,935	1,646	480	( <sup>3</sup> )	414	463	362	812	1,018	1,274	858	1,821	1,462	682	4,823
1986 .....	1,273	2,008	1,696	633	147	247	456	299	985	1,008	1,202	1,037	1,585	1,459	896	4,977
1989 .....	1,259	2,402	2,127	704	139	255	449	425	1,048	1,230	1,538	1,354	1,659	1,648	1,126	5,788
1992 .....	1,258	2,301	1,932	637	137	307	403	463	892	1,247	1,404	1,090	1,578	1,825	998	5,490
1995 <sup>4</sup> .....	1,332	2,152	1,838	614	137	332	561	461	973	1,019	1,225	1,035	1,497	1,684	1,106	5,321
<b>Electricity</b>																
1979 .....	429	872	608	163	( <sup>3</sup> )	171	129	119	361	424	543	425	593	662	227	1,908
1983 .....	469	903	758	152	( <sup>3</sup> )	212	147	151	426	509	532	324	673	801	331	2,129
1986 .....	654	927	809	179	99	121	132	120	536	641	563	430	584	867	510	2,390
1989 .....	572	1,145	1,056	217	105	113	154	138	550	781	715	586	609	975	604	2,773
1992 .....	586	991	1,033	235	113	138	138	189	444	704	649	419	622	1,002	566	2,609
1995 <sup>4</sup> .....	618	1,064	926	221	119	166	211	187	508	676	521	436	558	1,027	587	2,608
<b>Natural Gas</b>																
1979 .....	646	996	532	214	( <sup>3</sup> )	145	221	115	422	272	784	443	1,007	470	255	2,174
1983 .....	684	809	597	246	( <sup>3</sup> )	188	218	170	327	365	576	278	978	523	311	2,091
1986 .....	485	715	523	254	45	114	205	105	332	258	409	244	742	426	311	1,723
1989 .....	568	836	670	323	27	128	186	187	417	238	566	353	831	498	391	2,073
1992 .....	572	1,017	586	291	24	157	189	193	381	388	552	354	747	697	376	2,174
1995 <sup>4</sup> .....	535	830	580	245	18	158	258	213	395	239	420	297	750	528	371	1,946
<b>Fuel Oil <sup>5</sup></b>																
1979 .....	177	272	231	107	( <sup>3</sup> )	15	97	20	103	107	232	285	133	237	26	681
1983 .....	85	140	90	61	( <sup>3</sup> )	Q	28	18	43	75	79	172	28	104	Q	314
1986 .....	114	206	121	103	Q	Q	Q	20	105	39	130	270	63	86	23	442
1989 .....	101	170	86	71	Q	Q	17	10	76	43	122	237	61	50	Q	357
1992 .....	86	111	75	62	Q	Q	21	16	55	47	67	194	26	48	Q	272
1995 <sup>4</sup> .....	71	104	60	57	Q	Q	21	Q	49	28	70	168	16	45	7	235
<b>District Heat <sup>6</sup></b>																
1979 .....	Q	61	136	27	( <sup>3</sup> )	Q	22	24	Q	58	57	64	93	Q	Q	201
1983 .....	Q	83	202	21	( <sup>3</sup> )	Q	70	22	Q	68	87	84	141	34	30	289
1986 .....	Q	159	243	97	Q	Q	80	Q	12	71	99	94	196	81	51	422
1989 .....	19	252	315	Q	Q	Q	92	Q	Q	167	134	179	159	126	121	585
1992 .....	Q	182	238	49	NC	Q	55	65	Q	109	135	123	183	78	51	435
1995 <sup>4</sup> .....	Q	154	271	91	Q	Q	70	57	Q	75	214	135	173	83	Q	533
<b>Propane</b>																
1979 .....	23	15	5	2	( <sup>3</sup> )	8	Q	Q	10	Q	18	Q	16	15	10	43
1983 .....	20	12	2	2	( <sup>3</sup> )	8	Q	Q	6	Q	14	Q	7	21	Q	34
1986 .....	44	18	1	3	Q	12	Q	12	17	Q	13	9	19	26	Q	63

<sup>1</sup> See Appendix D for Census regions.

<sup>2</sup> Includes electricity, natural gas, fuel oil, and district heat. Propane consumption statistics were collected in 1979, 1983, and 1986 but are not included in the Major Sources.

<sup>3</sup> Included in Food Service.

<sup>4</sup> Beginning with the 1995 survey, commercial buildings on multibuilding manufacturing facilities, and parking garages were excluded.

<sup>5</sup> Distillate fuel oil, residual fuel oil, and kerosene.

<sup>6</sup> For 1979 and 1983, includes only purchased steam. Beginning with the 1986 survey, includes purchased and nonpurchased steam and purchased and nonpurchased hot water.

Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled. NC=No cases in the sample.

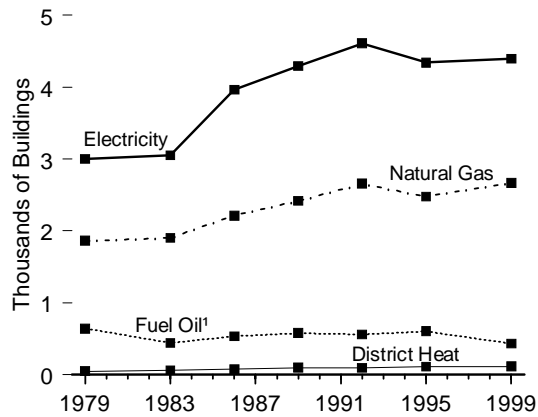
Note: Statistics for individual fuels are for all buildings using each fuel. Statistics for major sources are for the sum of electricity, natural gas, fuel oil, and district heat, across all buildings using any of those fuels.

Web Page: <http://www.eia.doe.gov/emeu/cbecs>.

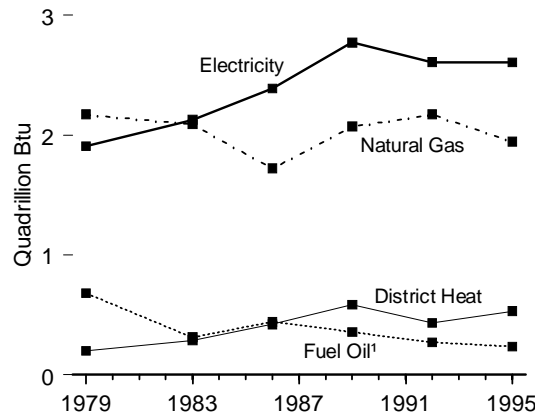
Sources: 1979—Energy Information Administration (EIA), Form EIA-143, "Nonresidential Buildings Energy Consumption Survey." 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." 1989, 1992, and 1995—EIA, Form EIA-871A-F, "Commercial Buildings Energy Consumption Survey."

**Figure 2.11 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years**

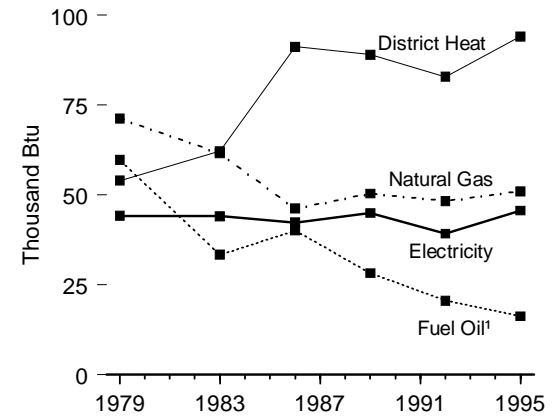
**Buildings by Energy Source Used, 1979-1999**



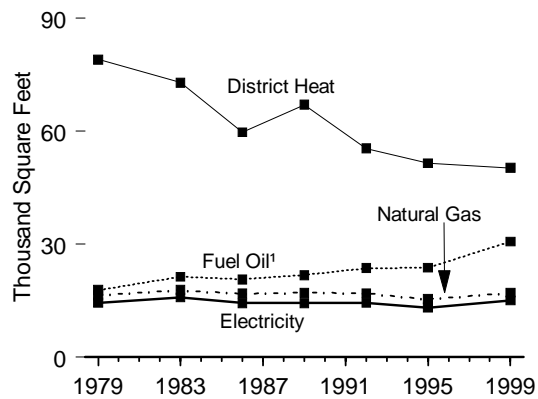
**Consumption, 1979-1995**



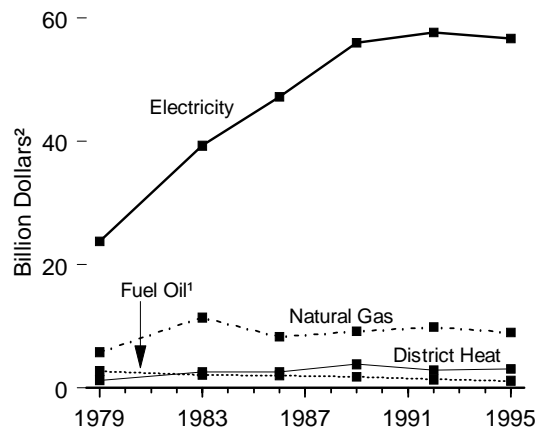
**Consumption per Square Foot, 1979-1995**



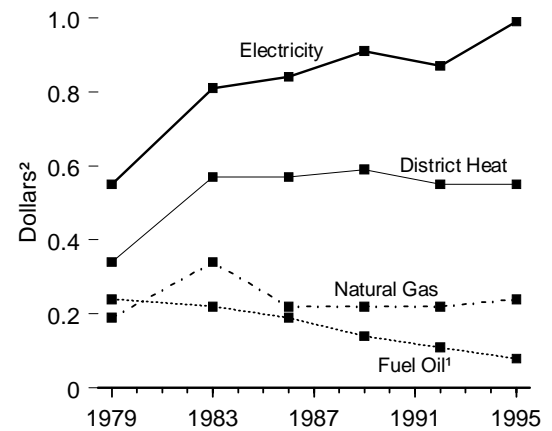
**Square Footage per Building by Energy Source Used, 1979-1999**



**Expenditures, 1979-1995**



**Expenditures per Square Foot, 1979-1995**



<sup>1</sup> Distillate fuel oil, residual fuel oil, and kerosene.

<sup>2</sup> Nominal dollars.

Note: No data are available for years not shown. Because vertical scales differ, graphs should not be compared.

Source: Table 2.11.

**Table 2.11 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years, 1979-1999**

Energy Source and Year	Building Characteristics			Energy Consumption				Energy Expenditures			
	Number of Buildings (thousand)	Total Square Feet (million)	Square Feet per Building (thousand)	Total (trillion Btu)	Per Building (million Btu)	Per Square Foot (thousand Btu)	Per Employee (million Btu)	Total (million dollars <sup>1</sup> )	Per Building (thousand dollars <sup>1</sup> )	Per Square Foot (dollars <sup>1</sup> )	Per Million Btu (dollars <sup>1</sup> )
<b>Major Sources <sup>2</sup></b>											
1979 .....	3,073	43,546	14.2	5,008	1,630	115.0	85.0	33,821	11.0	0.78	6.75
1983 .....	3,185	49,471	15.5	4,856	1,525	98.2	65.7	55,764	17.5	1.13	11.48
1986 .....	4,154	58,199	14.0	5,040	1,213	86.6	68.6	60,762	14.6	1.04	12.06
1989 .....	4,528	63,184	14.0	5,788	1,278	91.6	81.9	70,826	15.6	1.12	12.24
1992 .....	4,806	67,876	14.1	5,490	1,142	80.9	77.1	71,821	14.9	1.06	13.08
1995 <sup>3</sup> .....	4,579	58,772	12.8	5,321	1,162	90.5	69.3	69,918	15.3	1.19	13.14
1999 .....	R4,657	R67,338	R14.5	NA	NA	NA	NA	NA	NA	NA	NA
<b>Electricity</b>											
1979 .....	3,001	43,153	14.4	1,908	636	44.2	32.4	23,751	7.9	0.55	12.45
1983 .....	3,052	48,327	15.8	2,129	697	44.1	28.9	39,279	12.9	0.81	18.45
1986 .....	3,965	56,508	14.3	2,390	603	42.3	32.7	47,186	11.9	0.84	19.74
1989 .....	4,294	61,563	14.3	2,773	646	45.0	39.3	55,943	13.0	0.91	20.17
1992 .....	4,611	66,525	14.4	2,609	566	39.2	36.6	57,619	12.5	0.87	22.09
1995 <sup>3</sup> .....	4,343	57,076	13.1	2,608	600	45.7	34.1	56,621	13.0	0.99	21.71
1999 .....	R4,395	R65,716	R15.0	NA	NA	NA	NA	NA	NA	NA	NA
<b>Natural Gas</b>											
1979 .....	1,864	30,477	16.4	2,174	1,167	71.3	52.5	5,814	3.1	0.19	2.67
1983 .....	1,904	33,935	17.8	2,091	1,098	61.6	40.6	11,443	6.0	0.34	5.47
1986 .....	2,214	37,263	16.8	1,723	778	46.2	35.2	8,355	3.8	0.22	4.85
1989 .....	2,420	41,143	17.0	2,073	857	50.4	43.2	9,204	3.8	0.22	4.44
1992 .....	2,657	44,994	16.9	2,174	818	48.3	42.5	9,901	3.7	0.22	4.55
1995 <sup>3</sup> .....	2,478	38,145	15.4	1,946	785	51.0	38.7	9,018	3.6	0.24	4.63
1999 .....	R2,670	R45,525	17.1	NA	NA	NA	NA	NA	NA	NA	NA
<b>Fuel Oil <sup>4</sup></b>											
1979 .....	641	11,397	17.8	681	1,063	59.7	40.5	2,765	4.3	0.24	4.06
1983 .....	441	9,409	21.3	314	714	33.4	19.8	2,102	4.8	0.22	6.68
1986 .....	534	11,005	20.6	442	827	40.1	27.7	2,059	3.9	0.19	4.66
1989 .....	581	12,600	21.7	357	614	28.3	21.0	1,822	3.1	0.14	5.11
1992 .....	560	13,215	23.6	272	487	20.6	15.1	1,400	2.5	0.11	5.14
1995 <sup>3</sup> .....	607	14,421	23.7	235	387	16.3	10.2	1,175	1.9	0.08	5.00
1999 .....	434	R13,285	30.6	NA	NA	NA	NA	NA	NA	NA	NA
<b>District Heat <sup>5</sup></b>											
1979 .....	47	3,722	79.0	201	4,267	54.0	26.5	1,267	26.9	0.34	6.30
1983 .....	64	4,643	72.9	289	4,530	62.1	34.4	2,627	41.2	0.57	9.10
1986 .....	77	4,625	59.7	422	5,446	91.2	52.4	2,620	33.8	0.57	6.21
1989 .....	98	6,578	67.0	585	5,964	89.0	56.5	3,857	39.3	0.59	6.59
1992 .....	95	5,245	55.4	435	4,596	82.9	60.9	2,901	30.7	0.55	6.67
1995 <sup>3</sup> .....	110	5,658	51.5	533	4,849	94.1	51.2	3,103	28.3	0.55	5.83
1999 .....	117	5,891	50.2	NA	NA	NA	NA	NA	NA	NA	NA
<b>Propane</b>											
1979 .....	214	2,797	13.1	43	202	15.5	12.9	225	1.1	0.08	5.19
1983 .....	191	2,562	13.4	34	176	13.1	8.5	313	1.6	0.12	9.29
1986 .....	344	3,213	9.3	63	184	19.7	17.6	543	1.6	0.17	8.59
1989 .....	348	4,695	13.5	NA	NA	NA	NA	NA	NA	NA	NA
1992 .....	337	3,393	10.1	NA	NA	NA	NA	NA	NA	NA	NA
1995 .....	589	5,344	9.1	NA	NA	NA	NA	NA	NA	NA	NA
1999 .....	451	R 6,290	R14.0	NA	NA	NA	NA	NA	NA	NA	NA

<sup>1</sup> Nominal dollars.

<sup>2</sup> Includes electricity, natural gas, fuel oil, and district heat. Propane consumption statistics were collected in 1979, 1983, and 1986, but are not included in the Major Sources.

<sup>3</sup> Beginning with the 1995 survey, commercial buildings on multibuilding manufacturing facilities and parking garages were excluded.

<sup>4</sup> Distillate fuel oil, residual fuel oil, and kerosene.

<sup>5</sup> For 1979 and 1983, includes only purchased steam. Beginning with the 1986 survey, includes purchased and nonpurchased steam and purchased and nonpurchased hot water.

R=Revised. NA=Not available.

Note: Statistics for individual fuels are for all buildings using each fuel. Statistics for major sources are for all buildings, even buildings using no major fuel.

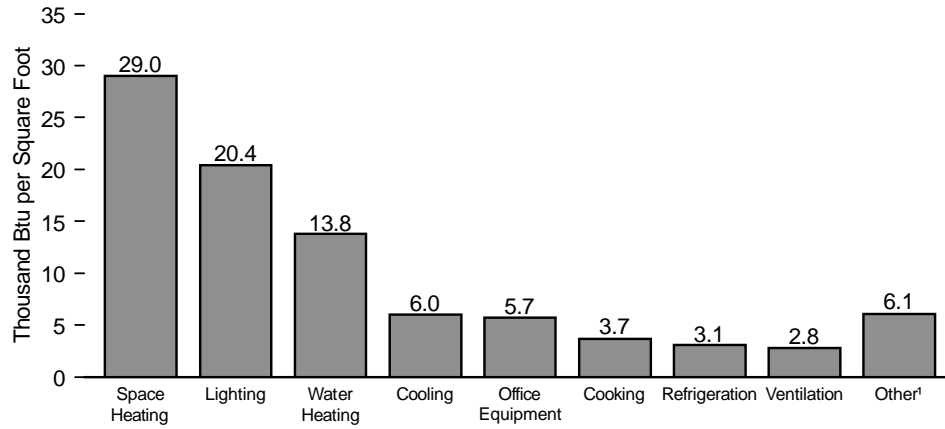
Web Page: <http://www.eia.doe.gov/emeu/cbecs>.

Sources: 1979—Energy Information Administration (EIA), Form EIA-143, "Nonresidential Buildings Energy Consumption Survey." 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." 1989, 1992, 1995, and 1999—EIA, Form EIA-871A-F, "Commercial Buildings Energy Consumption Survey."

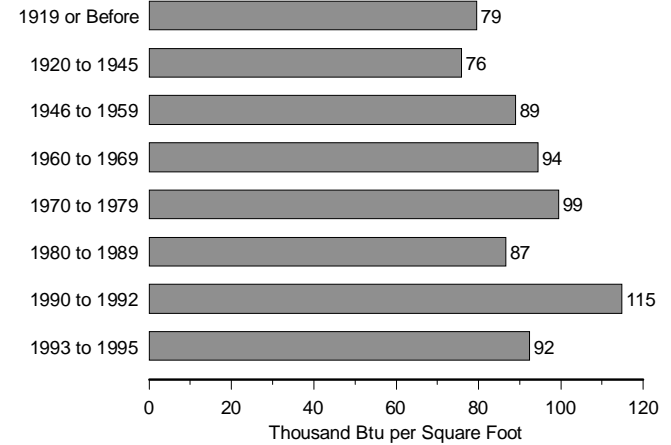


**Figure 2.12 Commercial Buildings Energy Intensities by Building Characteristic, 1995**

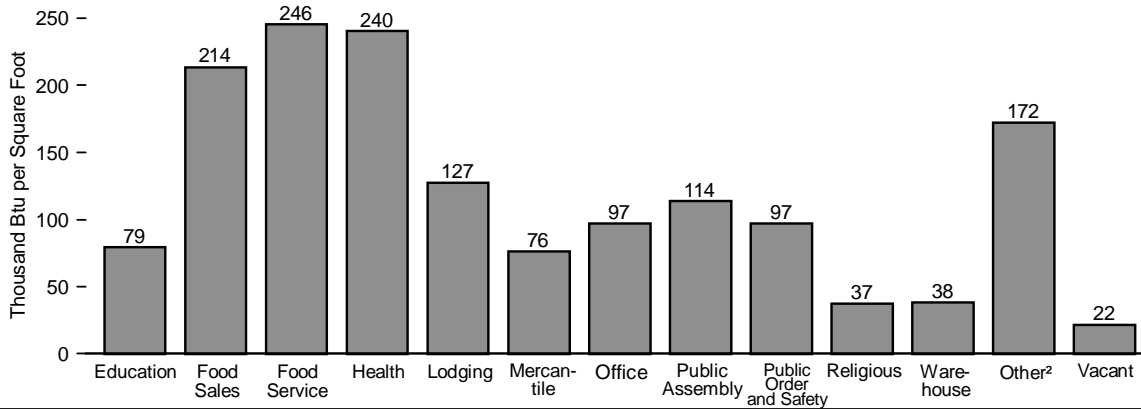
**By End Use**



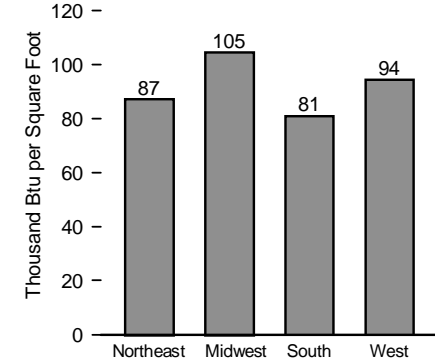
**By Year Constructed**



**By Principal Building Activity**



**By Census Region**



<sup>1</sup> See Table 2.12, footnote 1, for description of "Other."

<sup>2</sup> Includes buildings that do not fit into any of the other categories.

Source: Table 2.12

Notes: See Appendix D for Census Regions. Because vertical scales differ, graphs should not be compared.

**Table 2.12 Commercial Buildings Energy Intensities by Building Characteristic, 1995**  
(Thousand Btu per Square Foot)

Building Characteristic	Space Heating	Cooling	Ventilation	Water Heating	Lighting	Cooking	Refrigeration	Office Equipment	Other <sup>1</sup>	All End Uses
<b>All Buildings</b> .....	<b>29.0</b>	<b>6.0</b>	<b>2.8</b>	<b>13.8</b>	<b>20.4</b>	<b>3.7</b>	<b>3.1</b>	<b>5.7</b>	<b>6.1</b>	<b>90.5</b>
<b>Building Floorspace (square feet)</b>										
1,001 to 5,000 .....	39.5	7.0	2.9	9.7	22.7	8.9	10.4	5.4	5.1	111.7
5,001 to 10,000 .....	38.5	4.4	1.7	11.1	13.6	4.3	2.5	3.8	2.9	82.8
10,001 to 25,000 .....	27.4	4.8	1.7	9.1	14.7	2.6	2.5	4.3	3.7	70.9
25,001 to 50,000 .....	28.2	6.7	2.1	11.6	18.5	2.1	2.5	5.0	5.2	82.0
50,001 to 100,000 .....	27.0	7.0	3.2	12.9	21.3	2.0	2.1	6.1	6.0	87.6
100,001 to 200,000 .....	26.6	6.2	3.3	19.6	25.0	3.1	1.4	7.2	8.9	101.4
200,001 to 500,000 .....	24.0	6.7	4.5	25.2	27.4	4.6	1.6	8.5	11.9	114.6
Over 500,000 .....	18.5	6.0	3.9	18.0	28.6	3.5	2.2	7.0	9.1	96.8
<b>Principal Building Activity</b>										
Education .....	32.8	4.8	1.6	17.4	15.8	1.4	1.0	1.5	2.9	79.3
Food Sales .....	27.5	13.4	4.4	9.1	33.9	5.6	110.9	1.3	7.4	213.5
Food Service .....	30.9	19.5	5.3	27.5	37.0	77.5	31.6	2.6	13.7	245.5
Health Care .....	55.2	9.9	7.2	63.0	39.3	11.2	4.7	15.5	34.4	240.4
Lodging .....	22.7	8.1	1.7	51.4	23.2	6.6	2.3	3.8	7.5	127.3
Mercantile and Service .....	30.6	5.8	2.5	5.1	23.4	1.5	0.9	2.9	3.7	76.4
Office .....	24.3	9.1	5.2	8.7	28.1	1.1	0.4	15.1	5.2	97.2
Public Assembly .....	53.6	6.3	3.5	17.5	21.9	2.8	1.8	2.4	3.8	113.7
Public Order and Safety .....	27.8	6.1	2.3	23.4	16.4	Q	0.2	5.8	12.7	97.2
Religious Worship .....	23.7	1.9	0.9	3.2	5.0	0.5	0.6	0.4	1.1	37.4
Warehouse and Storage .....	15.7	0.9	0.3	2.0	9.8	0.0	1.7	4.4	3.4	38.3
Other <sup>2</sup> .....	59.6	9.3	8.3	15.3	26.7	Q	0.7	15.2	35.9	172.2
Vacant .....	11.9	0.6	0.3	2.4	3.6	Q	0.2	0.5	1.9	21.5
<b>Year Constructed</b>										
1919 or Before .....	34.2	2.6	1.6	10.0	14.9	4.0	1.3	3.2	7.5	79.4
1920 to 1945 .....	37.0	3.4	1.6	10.7	12.3	1.8	1.6	3.3	4.1	75.7
1946 to 1959 .....	37.2	4.4	2.1	14.1	15.5	3.0	2.7	4.6	5.2	88.9
1960 to 1969 .....	30.2	5.7	2.7	16.8	20.4	4.0	3.0	5.3	6.1	94.3
1970 to 1979 .....	26.0	7.2	3.6	15.8	25.6	3.2	3.7	6.7	7.5	99.3
1980 to 1989 .....	19.8	7.8	3.2	11.5	23.5	4.2	3.0	7.6	5.9	86.5
1990 to 1992 .....	26.6	8.4	3.5	17.2	28.7	9.3	5.6	7.9	7.4	114.6
1993 to 1995 .....	24.3	7.9	3.2	11.7	22.7	3.3	7.4	4.9	6.8	92.2
<b>Census Region <sup>3</sup></b>										
Northeast .....	32.4	4.0	2.0	14.2	17.7	2.7	3.0	4.5	6.4	87.1
Midwest .....	46.7	4.3	2.5	15.6	18.8	3.5	2.4	5.1	5.6	104.5
South .....	18.0	8.4	3.2	10.5	21.3	4.0	3.4	5.9	6.0	80.8
West .....	23.4	5.5	3.1	17.0	23.6	4.3	3.4	7.2	6.5	94.2

<sup>1</sup> Examples of "other" include medical, electronic, and testing equipment; conveyors, wrappers, hoists, and compactors; washers, disposals, dryers and cleaning equipment; escalators, elevators, dumb waiters, and window washers; shop tools and electronic testing equipment; sign motors, time clocks, vending machines, phone equipment, and sprinkler controls; scoreboards, fire alarms, intercoms, television sets, radios, projectors, and door operators.

<sup>2</sup> Includes buildings that do not fit into any of the other named categories.

<sup>3</sup> See Appendix D for Census regions.

Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.

Web Page: <http://www.eia.doe.gov/emeu/cbecs>.

Source: Energy Information Administration, *A Look at Commercial Buildings in 1995: Characteristics, Energy Consumption, and Energy Expenditures* (October 1998), Table EU-2.



# 3

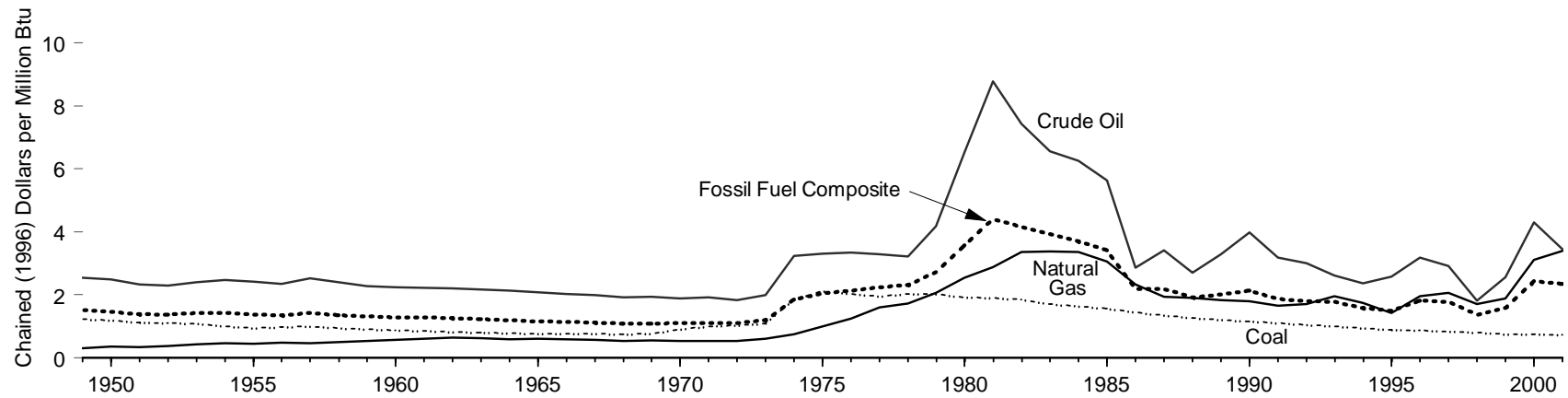
## Financial Indicators



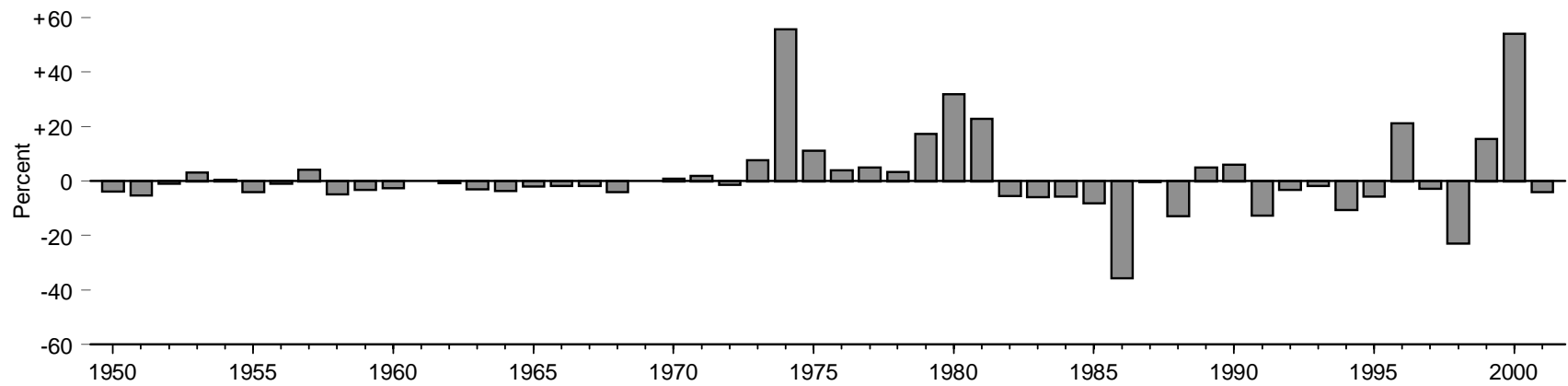
Gas Station, North Carolina, April 1999.

**Figure 3.1 Fossil Fuel Production Prices**

**Prices, 1949-2001**



**Fossil Fuel Composite Price, Change From Previous Year, 1950-2001**



Note: Prices are in chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

Source: Table 3.1.

**Table 3.1 Fossil Fuel Production Prices, 1949-2001**

(Dollars per Million Btu)

Year	Coal <sup>1</sup>		Natural Gas <sup>2</sup>		Crude Oil <sup>3</sup>		Fossil Fuel Composite <sup>4</sup>		
	Nominal	Real <sup>5</sup>	Nominal	Real <sup>5</sup>	Nominal	Real <sup>5</sup>	Nominal	Real <sup>5</sup>	Percent Change <sup>6</sup>
1949	0.21	1.22	0.05	0.31	0.44	2.54	0.26	1.52	—
1950	0.21	1.19	0.06	0.36	0.43	2.48	0.26	1.46	-3.8
1951	0.21	1.13	0.06	0.34	0.44	2.33	0.26	1.38	-5.3
1952	0.21	1.11	0.07	0.38	0.44	2.30	0.26	1.37	-0.7
1953	0.21	1.08	0.08	0.42	0.46	2.40	0.27	1.42	3.2
1954	0.19	0.99	0.09	0.46	0.48	2.46	0.28	1.43	0.5
1955	0.19	0.94	0.09	0.45	0.48	2.42	0.27	1.37	-3.9
1956	0.20	0.97	0.10	0.48	0.48	2.35	0.28	1.36	-0.8
1957	0.21	0.99	0.10	0.47	0.53	2.52	0.30	1.42	4.1
1958	0.20	0.94	0.11	0.50	0.52	2.40	0.29	1.35	-4.7
1959	0.20	0.91	0.12	0.54	0.50	2.29	0.29	1.31	-3.1
1960	0.19	0.87	0.13	0.57	0.50	2.24	0.28	1.28	-2.4
1961	0.19	0.85	0.14	0.60	0.50	2.22	0.29	1.28	0.0
1962	0.19	0.82	0.15	0.64	0.50	2.20	0.29	1.27	-0.7
1963	0.18	0.80	0.15	0.63	0.50	2.17	0.28	1.23	-2.8
1964	0.19	0.79	0.14	0.58	0.50	2.13	0.28	1.19	-3.5
1965	0.18	0.77	0.15	0.61	0.49	2.07	0.28	1.17	-1.9
1966	0.19	0.77	0.15	0.59	0.50	2.03	0.28	1.15	-1.7
1967	0.19	0.76	0.15	0.58	0.50	2.00	0.28	1.13	-1.6
1968	0.19	0.74	0.14	0.54	0.51	1.93	0.29	1.08	-3.8
1969	0.21	0.76	0.15	0.56	0.53	1.93	0.30	1.08	0.0
1970	0.27	0.92	0.15	0.53	0.55	1.89	0.32	1.09	0.9
1971	0.30	1.00	0.16	0.53	0.58	1.91	0.34	1.11	1.8
1972	0.33	1.04	0.17	0.54	0.58	1.84	0.35	1.10	-1.3
1973	0.37	1.09	0.20	0.60	0.67	2.00	0.40	1.19	7.7
1974	0.69	1.87	0.27	0.75	1.18	3.23	0.68	1.85	55.8
1975	0.85	2.11	0.40	1.00	1.32	3.30	0.82	2.05	11.1
1976	0.86	2.02	0.53	1.26	1.41	3.34	0.90	2.13	3.9
1977	0.88	1.96	0.72	1.61	1.48	3.28	1.01	2.24	5.0
1978	0.98	2.04	0.84	1.73	1.55	3.22	1.12	2.31	3.3
1979	1.06	2.03	1.08	2.07	2.18	4.17	1.42	2.71	17.3
1980	1.10	1.93	1.45	2.54	3.72	6.53	2.04	3.58	32.0
1981	1.18	1.90	1.80	2.88	5.48	8.78	2.75	4.40	22.9
1982	1.23	1.85	2.22	3.35	4.92	7.42	2.76	4.16	-5.4
1983	1.18	1.71	2.32	3.37	4.52	6.56	2.70	3.92	-5.8
1984	1.16	1.63	2.40	3.36	4.46	6.25	2.65	3.70	-5.5
1985	1.15	1.56	2.26	3.06	4.15	5.64	2.51	3.41	-8.0
1986	1.09	1.44	1.75	2.32	2.16	2.86	1.65	2.20	-35.6
1987	1.05	1.36	1.50	1.94	2.66	3.42	1.70	2.19	-0.2
1988	1.01	1.26	1.52	1.90	2.17	2.70	1.53	1.91	-12.8
1989	1.00	1.21	1.53	1.83	2.73	3.28	1.67	2.01	5.0
1990	1.00	1.15	1.55	1.79	3.45	3.99	1.84	2.13	6.1
1991	0.99	1.11	1.48	1.65	2.85	3.18	1.67	1.86	-12.5
1992	0.97	1.06	1.57	1.71	2.76	3.00	1.66	1.81	-3.1
1993	0.93	0.99	1.84	1.96	2.46	2.61	1.67	1.78	-1.6
1994	0.91	0.95	1.67	1.74	2.27	2.37	1.53	1.59	-10.5
1995	0.88	0.90	1.40	1.43	2.52	2.57	1.47	1.50	-5.5
1996	0.87	0.87	1.96	1.96	3.18	3.18	1.82	1.82	21.3
1997	0.85	0.84	2.10	2.06	2.97	2.91	1.81	1.77	-2.7
1998	0.83	0.80	R1.77	R1.71	1.87	1.82	R1.41	R1.37	R-22.9
1999	R0.79	R0.75	R1.98	R1.89	2.68	2.56	R1.65	R1.58	15.5
2000	0.80	0.74	R3.33	R3.11	4.61	R4.30	R2.60	R2.43	R54.1
2001 <sup>P</sup>	0.80	0.73	3.72	3.40	3.77	3.45	2.56	2.34	-3.8

<sup>1</sup> Bituminous coal, subbituminous coal, and lignite prices are based on the value of coal produced at free-on-board (f.o.b.) mines; anthracite prices through 1978 are f.o.b. preparation plants and for 1979 forward are f.o.b. mines.

<sup>2</sup> Wellhead prices.

<sup>3</sup> Domestic first purchase prices.

<sup>4</sup> Derived by multiplying the price per Btu of each fossil fuel by the total Btu content of the production of each fossil fuel and dividing this accumulated value of total fossil fuel production by the accumulated Btu

content of total fossil fuel production.

<sup>5</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>6</sup> Based on real values.

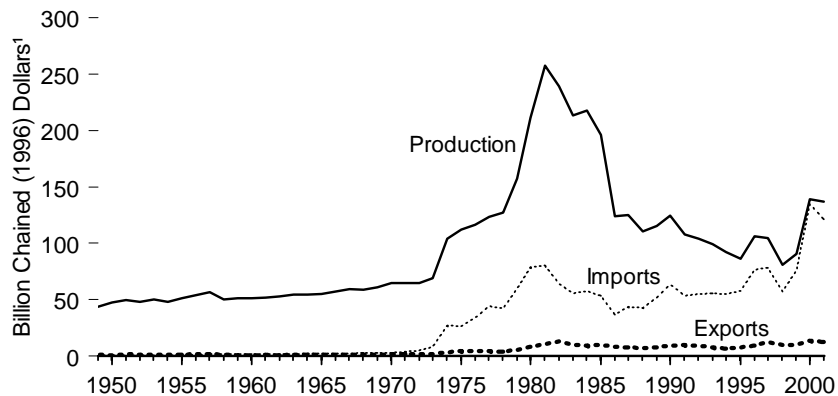
<sup>7</sup> Calculated using the 2000 coal price for the 2001 value.

R=Revised. P=Preliminary. — = Not applicable.

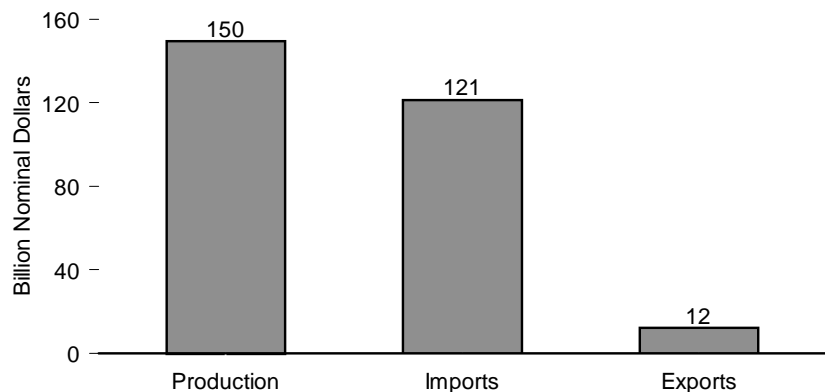
Sources: Tables 5.16, 6.7, 7.8, A2, A4, and A5.

**Figure 3.2 Value of Fossil Fuel Production**

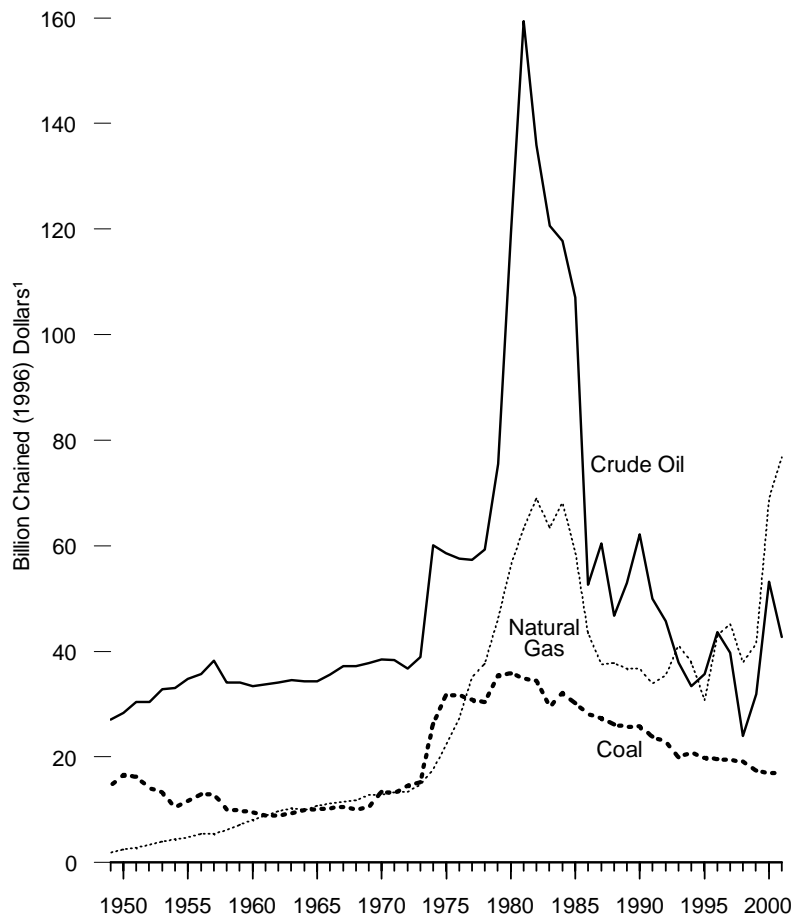
**Overview, 1949-2001**



**Overview, 2001**



**Production by Fuel, 1949-2001**



<sup>1</sup> Prices are in chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 3.2, 3.5, and 3.6.

**Table 3.2 Value of Fossil Fuel Production, 1949-2001**  
(Billion Dollars)

Year	Coal		Natural Gas <sup>1</sup>		Crude Oil <sup>2</sup>		Total	
	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>
1949	2.52	14.60	0.33	1.91	4.68	27.11	7.53	43.62
1950	2.91	16.68	0.44	2.52	4.95	28.37	8.30	47.57
1951	3.05	16.30	0.52	2.78	5.69	30.41	9.26	49.49
1952	2.67	14.05	0.64	3.37	5.79	30.47	9.10	47.89
1953	2.55	13.25	0.76	3.95	6.32	32.83	9.63	50.03
1954	2.02	10.39	0.87	4.48	6.44	33.13	9.33	48.00
1955	2.30	11.63	0.94	4.75	6.88	34.78	10.12	51.16
1956	2.65	12.96	1.11	5.43	7.30	35.70	11.06	54.09
1957	2.74	12.97	1.17	5.54	8.09	38.29	12.00	56.80
1958	2.19	10.12	1.32	6.10	7.37	34.06	10.88	50.28
1959	2.14	9.78	1.57	7.18	7.47	34.14	11.18	51.10
1960	2.10	9.46	1.79	8.07	7.42	33.44	11.31	50.97
1961	1.99	8.87	1.99	8.87	7.58	33.78	11.56	51.52
1962	2.03	8.93	2.22	9.76	7.76	34.12	12.01	52.81
1963	2.17	9.43	2.36	10.26	7.96	34.61	12.49	54.30
1964	2.32	9.94	2.33	9.98	8.03	34.40	12.68	54.32
1965	2.40	10.09	2.57	10.81	8.15	34.27	13.12	55.17
1966	2.53	10.34	2.75	11.24	8.72	35.65	14.00	57.23
1967	2.65	10.51	2.91	11.54	9.39	37.25	14.95	59.30
1968	2.64	10.04	3.09	11.75	9.79	37.22	15.52	59.01
1969	2.90	10.51	3.52	12.76	10.42	37.77	16.84	61.04
1970	3.88	13.35	3.73	12.84	11.19	38.51	18.80	64.70
1971	4.01	13.14	4.05	13.27	11.71	38.37	19.77	64.78
1972	4.65	14.61	4.28	13.45	11.71	36.80	20.64	64.86
1973	5.14	15.30	4.98	14.82	13.07	38.90	23.19	69.02
1974	9.65	26.35	6.48	17.70	22.00	60.08	38.13	104.13
1975	12.67	31.65	8.85	22.11	23.45	58.58	44.97	112.34
1976	13.40	31.68	11.57	27.35	24.37	57.61	49.34	116.64
1977	13.91	30.90	15.82	35.14	25.79	57.29	55.52	123.33
1978	14.65	30.38	18.18	37.69	28.60	59.30	61.43	127.37
1979	18.55	35.50	24.16	46.24	39.45	75.50	82.16	157.24
1980	20.45	35.85	32.09	56.26	67.93	119.09	120.47	211.20
1981	21.75	34.87	39.51	63.35	99.40	159.37	160.66	257.59
1982	22.84	34.48	45.71	69.00	90.03	135.89	158.58	239.37
1983	20.32	29.50	43.73	63.49	83.05	120.57	147.10	213.56
1984	22.94	32.11	48.69	68.16	84.10	117.72	155.73	217.99
1985	22.27	30.22	43.35	58.83	78.88	107.04	144.50	196.09
1986	21.18	28.12	32.71	43.43	39.63	52.62	93.52	124.17
1987	21.20	27.33	29.11	37.52	46.93	60.49	97.24	125.34
1988	20.97	26.14	30.28	37.75	37.48	46.73	88.73	110.62
1989	21.40	25.70	30.58	36.72	44.07	52.92	96.05	115.34
1990	22.39	25.88	31.80	36.76	53.77	62.15	107.96	124.79
1991	21.40	23.87	30.39	33.89	44.77	49.93	96.56	107.69
1992	20.98	22.84	32.56	35.45	41.97	45.70	95.51	103.99
1993	18.77	19.96	38.72	41.17	35.61	37.86	93.10	98.99
1994	20.06	20.89	36.46	37.98	32.07	33.40	88.59	92.27
1995	19.45	19.83	30.24	30.83	35.00	35.68	84.69	86.34
1996	19.68	19.68	42.99	42.99	43.68	43.68	106.35	106.35
1997	19.77	19.39	46.09	45.21	40.57	39.79	106.43	104.39
1998	19.75	<sup>R</sup> 19.14	<sup>R</sup> 39.12	<sup>R</sup> 37.91	24.80	24.03	<sup>R</sup> 83.67	<sup>R</sup> 81.08
1999	<sup>R</sup> 18.30	<sup>R</sup> 17.49	<sup>R</sup> 43.37	<sup>R</sup> 41.44	33.40	<sup>R</sup> 31.92	<sup>R</sup> 95.07	<sup>R</sup> 90.85
2000	<sup>R</sup> 18.02	<sup>R</sup> 16.83	<sup>R</sup> 73.81	<sup>R</sup> 68.96	<sup>R</sup> 56.93	<sup>R</sup> 53.19	<sup>R</sup> 148.76	<sup>R</sup> 138.98
2001 <sup>P</sup>	<sup>4</sup> 18.82	<sup>4</sup> 17.21	84.01	76.81	46.70	42.70	<sup>4</sup> 149.53	<sup>4</sup> 136.72

<sup>1</sup> Marketed production.

<sup>2</sup> Includes lease condensate.

<sup>3</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>4</sup> Calculated using the 2000 coal price for the 2001 value.

R=Revised. P=Preliminary.

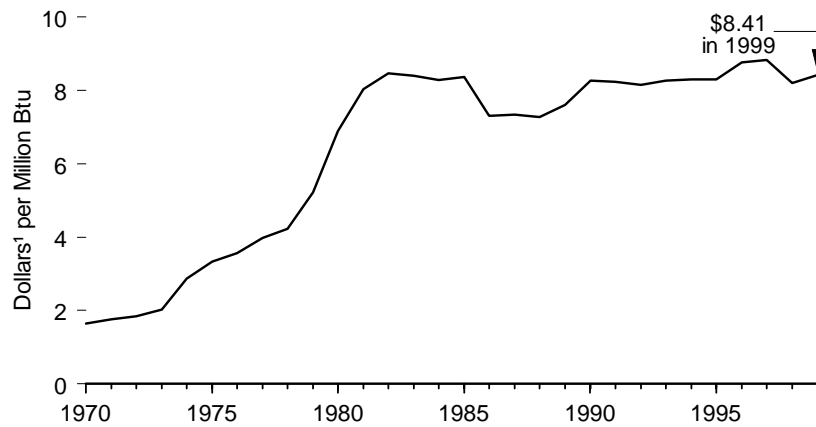
Note: Value is based on fuel prices taken as closely as possible to the point of production.

Sources: Tables 5.1, 5.16, 6.2, 6.7, 7.2, and 7.8.

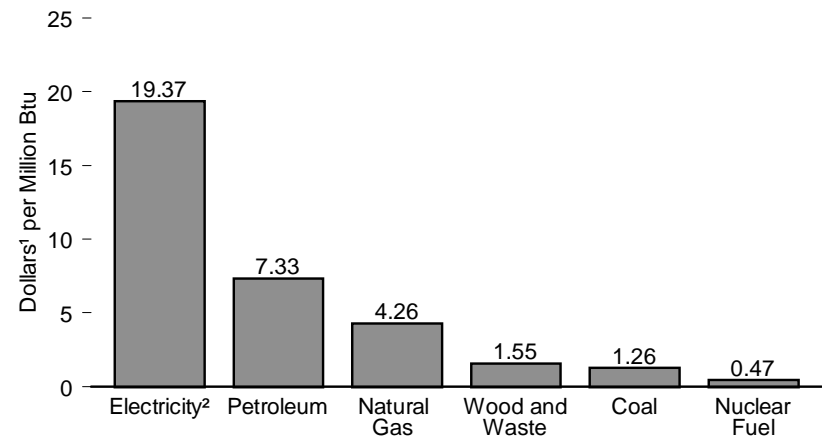


**Figure 3.3 Consumer Price Estimates for Energy**

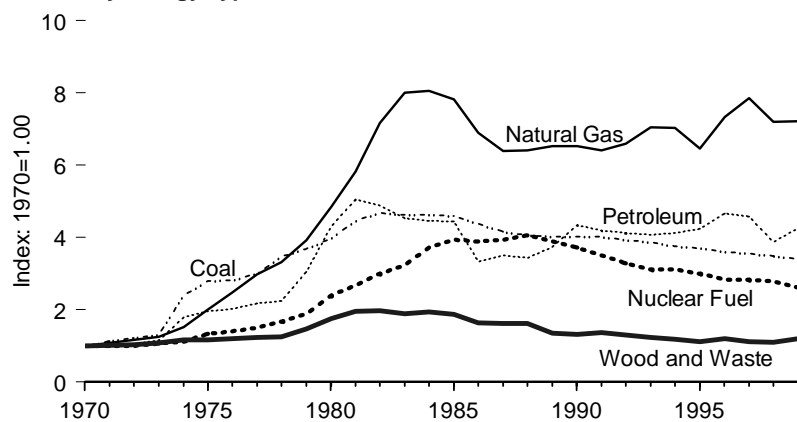
**Total Energy, 1970-1999**



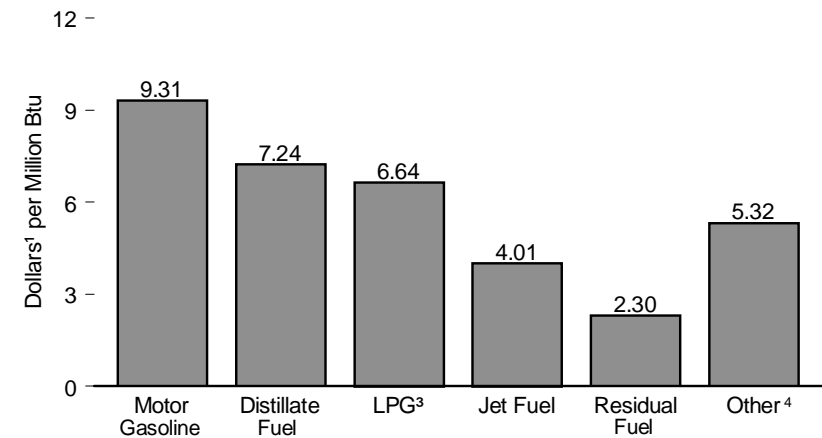
**By Energy Type, 1999**



**Prices¹ by Energy Type, Indexed, 1970-1999**



**By Petroleum Product, 1999**



<sup>1</sup> Nominal dollars.

<sup>2</sup> Electricity purchased by end users.

<sup>3</sup> Liquefied petroleum gases.

<sup>4</sup> Consumption-weighted average price for asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum coke, special naphthas, waxes, and miscellaneous petroleum products.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 3.3.

**Table 3.3 Consumer Price Estimates for Energy, 1970-1999**  
(Nominal Dollars per Million Btu)

Year	Primary Energy <sup>1</sup>												Electric Utility Fuel	Electricity Purchased by End-Users	Total Energy <sup>4</sup>
	Coal	Natural Gas	Petroleum							Nuclear Fuel	Wood and Waste	Total <sup>4</sup>			
			Distillate Fuel	Jet Fuel	LPG <sup>2</sup>	Motor Gasoline	Residual Fuel	Other <sup>3</sup>	Total						
1970	0.37	0.59	1.16	0.73	1.46	2.85	0.42	1.38	1.72	0.18	1.29	1.08	0.32	4.98	1.65
1971	0.42	0.63	1.22	0.77	1.49	2.90	0.58	1.44	1.79	0.18	1.31	1.15	0.38	5.30	1.76
1972	0.45	0.68	1.22	0.79	1.52	2.88	0.62	1.49	1.78	0.18	1.33	1.18	0.41	5.54	1.84
1973	0.48	0.73	1.46	0.92	2.02	3.10	0.75	1.57	1.97	0.19	1.39	1.29	0.46	5.86	2.02
1974	0.88	0.89	2.44	1.58	2.81	4.32	1.82	2.59	3.06	0.20	1.50	1.94	0.86	7.42	2.87
1975	1.03	1.18	2.60	2.05	2.97	4.65	1.93	2.92	3.35	0.24	1.50	2.19	0.96	8.61	3.33
1976	1.04	1.46	2.77	2.25	3.21	4.84	1.90	3.07	3.47	0.25	1.53	2.34	1.02	9.13	3.57
1977	1.11	1.76	3.11	2.59	3.65	5.13	2.14	3.25	3.73	0.27	1.58	2.57	1.16	10.11	3.98
1978	1.28	1.95	3.26	2.87	3.60	5.24	2.08	3.44	3.84	0.30	1.61	2.71	1.25	10.92	4.23
1979	1.36	2.31	4.69	3.90	4.50	7.11	2.83	4.69	5.23	0.34	1.88	3.47	1.48	11.78	5.21
1980	1.47	2.86	6.70	6.36	5.64	9.84	3.88	7.02	7.40	0.43	2.26	4.57	1.75	13.95	6.89
1981	1.65	3.43	8.03	7.57	6.18	10.94	4.91	8.63	8.68	0.48	2.53	5.24	2.00	16.14	8.03
1982	1.73	4.23	7.78	7.23	6.66	10.39	4.65	7.83	8.39	0.54	2.54	5.32	2.01	18.16	8.46
1983	1.71	4.72	7.32	6.53	7.17	9.12	4.50	7.58	7.77	0.58	2.43	5.11	1.98	18.62	8.39
1984	1.71	4.75	7.36	6.25	6.93	8.89	4.75	7.64	7.67	0.67	2.50	5.02	1.97	18.50	8.28
1985	1.70	4.61	7.18	5.91	6.54	9.01	4.30	7.52	7.62	0.71	R2.41	4.90	1.85	19.05	8.36
1986	1.62	4.07	5.66	3.92	6.42	6.79	2.37	5.77	5.72	0.70	R2.10	3.95	1.55	19.05	7.30
1987	1.54	3.77	5.94	4.03	6.06	R7.23	2.86	5.59	6.03	0.71	R2.07	3.97	1.51	18.74	7.33
1988	1.50	3.78	5.80	3.80	5.86	R7.33	2.35	5.23	5.90	0.73	R2.08	3.87	1.45	18.68	7.26
1989	1.49	3.85	6.45	4.39	5.53	R8.02	2.72	5.47	R6.43	0.70	R1.74	4.09	1.48	18.98	R7.60
1990	1.49	3.85	7.70	5.68	6.75	9.12	3.16	5.80	7.47	0.67	R1.70	R4.49	1.46	19.33	R8.27
1991	1.49	3.78	7.28	4.83	6.79	8.93	2.62	5.72	7.19	0.63	R1.76	4.32	1.37	19.85	R8.23
1992	1.45	3.89	7.11	4.52	6.19	8.96	2.27	5.49	7.07	0.59	R1.67	R4.28	1.34	20.06	R8.15
1993	1.43	4.16	7.10	4.29	6.20	R8.83	2.25	5.47	7.01	0.56	R1.59	R4.30	1.35	20.38	R8.26
1994	1.39	4.15	7.03	3.95	6.61	R8.96	2.32	5.46	R7.07	0.56	R1.51	R4.31	1.30	20.34	R8.29
1995	1.37	3.81	7.02	4.00	6.54	R9.22	2.46	5.72	R7.29	0.54	R1.44	4.29	1.23	20.30	8.29
1996	1.33	4.33	7.90	4.82	R8.01	R9.85	2.79	6.22	R8.02	0.51	R1.53	4.70	1.28	20.17	R8.76
1997	1.31	R4.63	7.70	4.53	7.42	R9.81	R2.93	R5.91	R7.87	0.51	R1.43	R4.73	1.30	20.15	8.82
1998	1.29	4.25	6.63	3.35	5.99	8.45	2.15	5.06	6.65	0.50	1.42	4.14	1.24	19.82	8.19
1999	1.26	4.26	7.24	4.01	6.64	9.31	2.30	5.32	7.33	0.47	1.55	4.44	1.21	19.37	8.41

<sup>1</sup> Primary energy is all energy, including that consumed to produce electricity but excluding the electricity produced.

<sup>2</sup> Liquefied petroleum gases.

<sup>3</sup> Consumption-weighted average price for asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum coke, special naphthas, waxes, and miscellaneous petroleum products.

<sup>4</sup> The "Primary Energy Total" and "Total Energy" prices include consumption-weighted average prices

for coal coke imports and coal coke exports that are not shown in the other columns. In 1999, coal coke imports averaged 2.83 dollars per million Btu and coal coke exports averaged 3.88 dollars per million Btu.

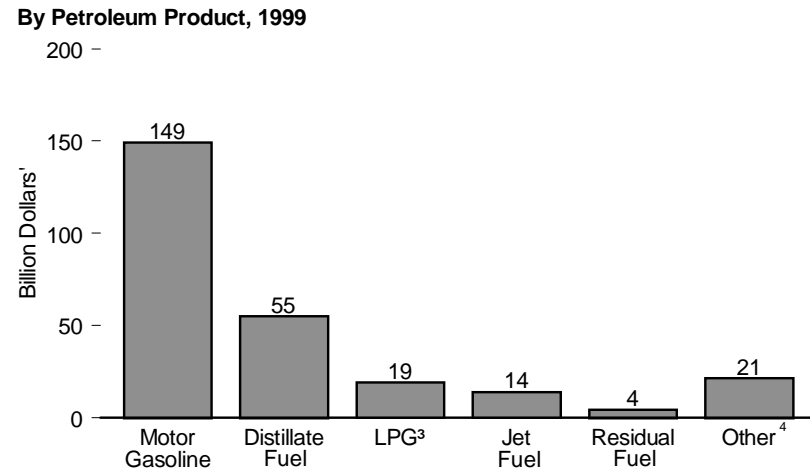
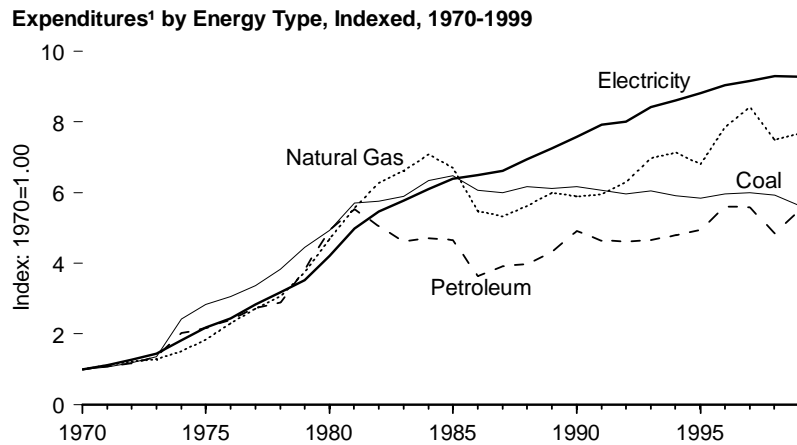
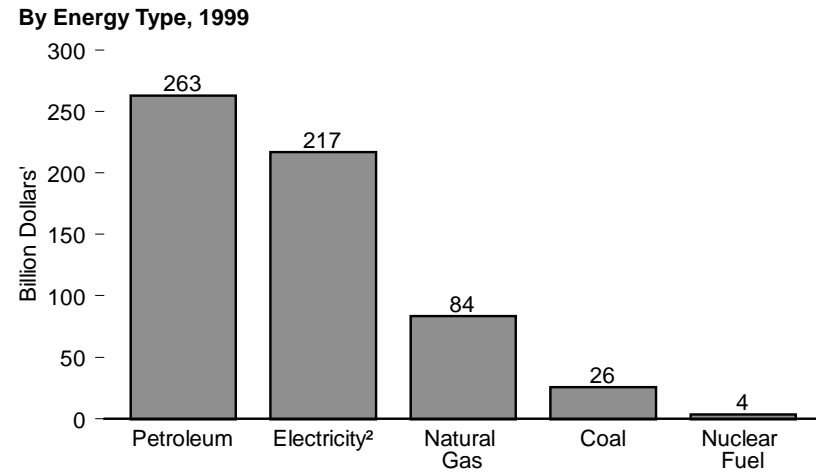
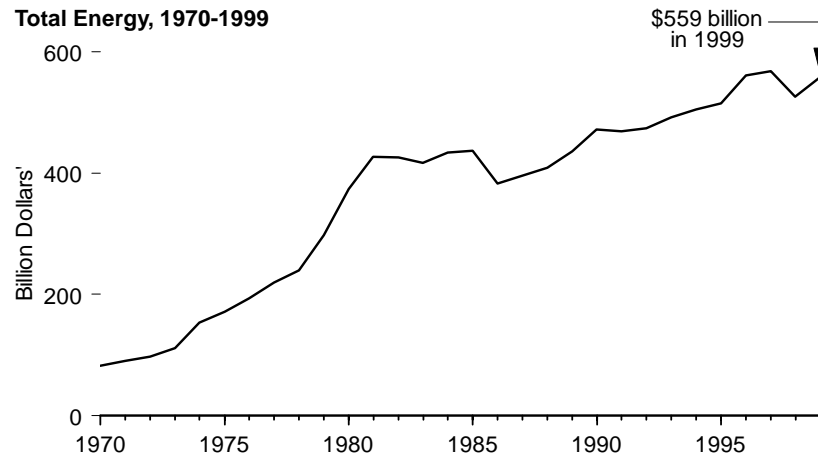
R=Revised.

Note: There are no direct fuel costs for hydroelectric, geothermal, wind, or solar energy.

Web Page: <http://www.eia.doe.gov/emeu/seper/contents.html>.

Source: Energy Information Administration (EIA), *State Energy Price and Expenditure Report 1999* (November 2001), Table 5.

**Figure 3.4 Consumer Expenditure Estimates for Energy**



<sup>1</sup> Nominal dollars.

<sup>2</sup> Electricity purchased by end users.

<sup>3</sup> Liquefied petroleum gases.

<sup>4</sup> Asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum coke, special naphthas, waxes, and miscellaneous petroleum products.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 3.4.

**Table 3.4 Consumer Expenditure Estimates for Energy, 1970-1999**  
(Million Nominal Dollars)

Year	Primary Energy <sup>1</sup>													Electric Utility Fuel	Electricity Purchased by End-Users	Total Energy
	Coal	Net Imports of Coal Coke <sup>2</sup>	Natural Gas	Petroleum							Nuclear Fuel	Wood and Waste	Total			
				Distillate Fuel	Jet Fuel	LPG <sup>3</sup>	Motor Gasoline	Residual Fuel	Other <sup>4</sup>	Total						
1970	4,594	-75	10,891	6,253	1,441	2,446	31,596	2,046	R4,159	47,942	44	438	63,833	-4,316	23,345	82,862
1971	4,883	-40	12,065	6,890	1,582	2,531	33,478	R2,933	4,429	51,844	73	446	69,271	-5,441	26,202	90,032
1972	5,412	-26	13,198	7,552	1,682	2,889	35,346	3,458	R4,756	55,682	104	476	74,845	-6,473	29,712	98,084
1973	6,251	7	13,933	9,524	2,001	3,933	39,667	4,667	R5,300	65,091	R177	502	85,961	-7,817	33,774	111,918
1974	11,145	150	16,380	R15,217	3,208	5,273	54,194	R10,547	R8,264	96,704	259	544	125,182	-14,391	42,586	153,377
1975	13,047	82	20,061	15,680	4,193	5,231	59,446	10,374	8,448	103,372	448	534	137,544	-16,396	50,680	171,828
1976	14,079	44	25,097	18,402	4,567	5,993	64,977	11,648	R9,880	115,468	520	622	155,830	-18,923	56,972	193,880
1977	15,448	67	29,602	22,004	5,517	6,824	70,591	14,381	11,719	131,036	743	694	177,590	-23,392	66,225	220,423
1978	17,595	362	33,185	23,587	6,205	6,621	74,513	13,747	13,294	137,967	915	782	190,806	-25,746	74,159	239,219
1979	20,421	259	40,785	32,854	8,603	9,383	95,916	17,656	R18,760	183,173	941	964	246,543	-31,031	82,051	297,563
1980	22,648	-78	51,061	40,797	13,923	10,926	124,408	21,573	26,001	237,628	1,189	R1,252	R313,700	-37,435	98,095	R374,360
1981	26,231	-31	60,544	48,200	15,607	11,900	138,138	22,668	R28,445	264,957	1,436	1,452	354,589	-43,275	116,455	427,769
1982	26,426	-52	68,292	44,087	14,974	12,925	130,305	17,632	R22,355	242,279	1,684	1,475	R340,104	-41,311	127,393	426,187
1983	27,051	-44	72,000	41,846	13,979	14,083	R115,803	14,099	21,536	R221,345	1,859	1,504	R323,715	-41,336	134,731	R417,111
1984	29,093	-22	77,169	44,580	15,097	14,143	R114,429	14,410	R22,576	R225,234	2,384	1,552	R335,408	-43,378	142,420	R434,450
1985	29,723	-34	72,938	43,759	14,747	13,545	R118,048	11,493	22,004	R223,597	2,930	R1,493	R330,647	-42,558	149,233	R437,321
1986	27,895	-40	59,702	34,995	10,505	12,694	R91,529	7,486	17,579	R174,788	3,125	R1,319	R266,788	-35,793	151,793	R382,789
1987	27,566	7	58,019	37,587	11,448	12,859	R99,864	8,062	17,581	R187,400	3,486	R1,299	R277,778	-36,692	154,685	R395,770
1988	28,365	116	61,089	38,593	11,318	12,775	R103,323	7,259	R16,674	R189,941	4,111	R1,358	R284,980	-37,435	162,063	R409,608
1989	28,105	137	65,383	43,246	13,434	12,154	R112,720	8,354	16,965	R206,872	3,992	R1,656	R306,245	-38,995	169,332	R436,582
1990	28,372	22	64,102	49,430	17,784	13,680	R126,558	8,707	19,169	R235,328	4,142	R1,678	R333,528	R-38,325	176,737	R471,940
1991	27,871	R44	64,697	45,181	14,609	14,922	R123,118	6,786	18,160	R222,776	R4,173	R1,782	R321,424	R-36,581	184,814	R469,656
1992	27,409	R126	68,400	45,110	13,559	14,161	R125,249	5,575	R18,267	R221,923	3,878	R1,792	R323,598	R-35,836	186,954	R474,717
1993	27,763	R96	75,941	45,885	13,002	13,961	R126,560	5,439	R18,250	R223,096	3,658	R1,673	R332,295	R-36,719	196,579	R492,156
1994	27,186	R214	77,716	47,240	12,474	16,253	R130,068	5,288	R18,654	R229,976	3,858	R1,893	R341,026	R-36,138	200,883	R505,771
1995	26,861	R234	74,150	47,845	12,525	16,250	R136,647	4,667	19,175	R237,110	3,865	R1,877	R344,246	R-34,820	205,932	R515,358
1996	R27,369	R156	85,634	56,675	15,770	R21,159	R148,344	5,297	R21,202	R268,447	3,666	R2,059	R387,469	R-36,677	211,011	R561,803
1997	R27,523	R170	R91,736	56,199	15,000	R19,861	R149,668	R5,211	R21,683	R267,621	3,396	R1,817	R392,405	R-37,808	213,645	R568,242
1998	27,195	188	81,628	48,763	11,239	15,343	132,730	4,288	20,004	232,367	3,613	1,813	346,869	-37,573	216,928	526,224
1999	25,920	140	83,512	54,996	13,878	19,147	149,260	4,300	21,332	262,912	3,617	2,341	378,554	-36,550	216,737	558,742

<sup>1</sup> Primary energy is all energy, including that consumed to produce electricity but excluding the electricity produced.

<sup>2</sup> Values derive from U.S. Department of Commerce, Bureau of the Census, "Monthly Report IM-145" and "Monthly Report IM-545," and may differ slightly from those shown on Table 3.7, which derive from Bureau of the Census, *U.S. International Trade in Goods and Services*. FT600 series.

<sup>3</sup> Liquefied petroleum gases.

<sup>4</sup> Asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum

coke, special naphthas, waxes, and miscellaneous petroleum products.

R=Revised.

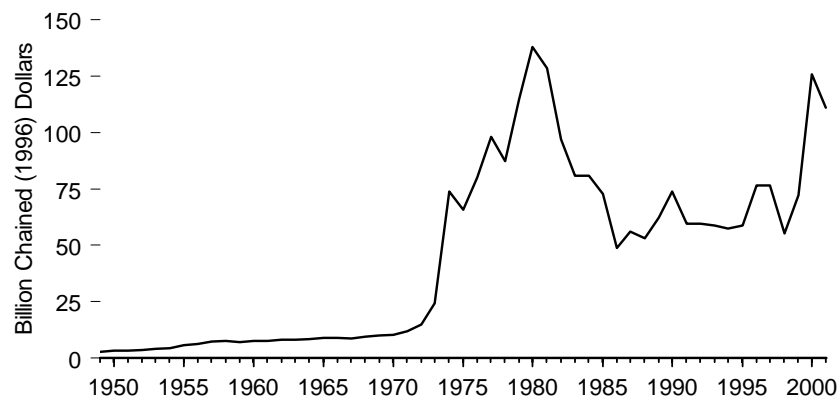
Notes: There are no direct fuel costs for hydroelectric, geothermal, wind, or solar energy. Totals may not equal the sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/emeu/seper/contents.html>

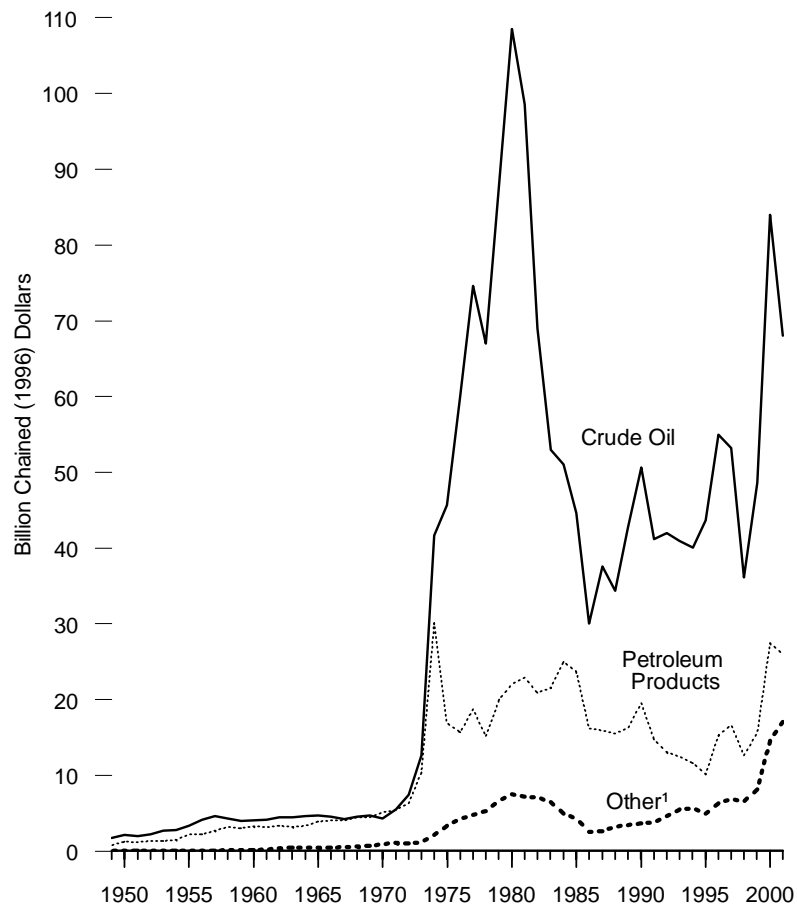
Source: Energy Information Administration (EIA), *State Energy Price and Expenditure Report 1999* (November 2001), Table 5.

**Figure 3.5 Value of Fossil Fuel Imports**

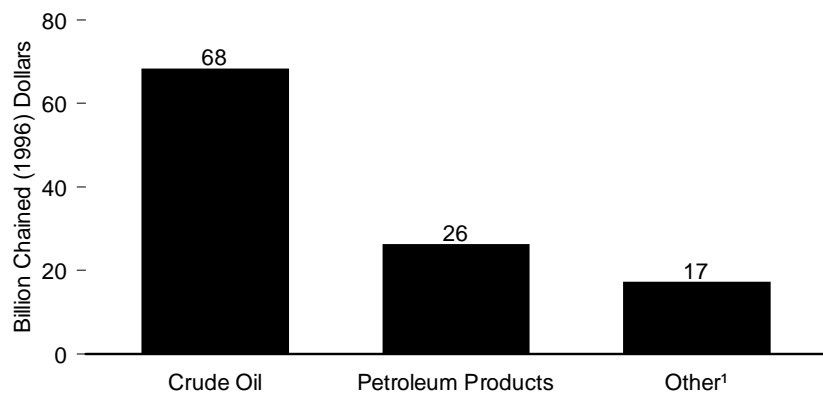
**Total, 1949-2001**



**By Fuel, 1949-2001**



**By Fuel, 2001**



¹ Natural gas, coal, and coal coke.

Notes: Prices are in chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1. Because vertical scales differ, graphs should not be compared.

Source: Table 3.5.

**Table 3.5 Value of Fossil Fuel Imports, 1949-2001**  
(Billion Dollars)

Year	Coal		Coal Coke		Natural Gas		Crude Oil <sup>1</sup>		Petroleum Products <sup>2</sup>		Total		
	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>	
1949	(s)	0.01	(s)	0.02	0.00	0.00	0.30	1.77	0.14	0.79	0.45	2.60	
1950	(s)	0.02	0.01	0.03	0.00	0.00	0.37	2.12	0.21	1.23	0.59	3.39	
1951	(s)	0.01	(s)	0.01	0.00	0.00	(s)	0.37	2.00	0.23	1.21	0.61	3.24
1952	(s)	0.01	(s)	0.02	(s)	(s)	0.42	2.23	0.25	1.33	0.68	3.60	
1953	(s)	0.01	(s)	0.01	(s)	0.01	0.51	2.65	0.25	1.31	0.77	3.98	
1954	(s)	0.01	(s)	0.01	(s)	(s)	0.54	2.80	0.28	1.46	0.83	4.28	
1955	(s)	0.01	(s)	0.01	(s)	0.01	0.65	3.31	0.44	2.23	1.10	5.57	
1956	(s)	0.01	(s)	0.01	(s)	0.01	0.84	4.10	0.45	2.19	1.29	6.31	
1957	(s)	0.01	(s)	0.01	(s)	0.02	0.98	4.64	0.57	2.69	1.56	7.36	
1958	(s)	0.01	(s)	0.01	0.02	0.10	0.94	4.34	0.68	3.16	1.65	7.63	
1959	(s)	0.01	(s)	0.01	0.03	0.12	0.87	3.99	0.66	3.03	1.57	7.16	
1960	(s)	0.01	(s)	0.01	0.03	0.13	0.90	4.03	0.73	3.30	1.66	7.47	
1961	(s)	0.01	(s)	0.01	0.04	0.20	0.93	4.16	0.71	3.16	1.69	7.54	
1962	(s)	0.01	(s)	0.01	0.09	0.38	1.01	4.45	0.75	3.31	1.86	8.16	
1963	(s)	0.01	(s)	0.01	0.10	0.43	1.03	4.46	0.74	3.21	1.87	8.11	
1964	(s)	0.01	(s)	0.01	0.10	0.43	1.08	4.63	0.78	3.35	1.97	8.43	
1965	(s)	0.01	(s)	0.01	0.11	0.44	1.12	4.71	0.92	3.88	2.15	9.05	
1966	(s)	0.01	(s)	0.01	0.11	0.43	1.12	4.56	0.99	4.04	2.21	9.04	
1967	(s)	0.01	(s)	0.01	0.13	0.51	1.06	4.22	1.02	4.03	2.21	8.78	
1968	(s)	0.01	(s)	0.01	0.15	0.56	1.18	4.50	1.16	4.43	2.50	9.50	
1969	(s)	(s)	(s)	0.01	0.20	0.71	1.30	4.71	1.24	4.49	2.74	9.92	
1970	(s)	(s)	(s)	0.01	0.26	0.89	1.26	4.34	1.48	5.10	3.00	10.34	
1971	(s)	0.01	0.01	0.02	0.31	1.02	1.69	5.53	1.66	5.43	3.66	12.00	
1972	(s)	(s)	(s)	0.01	0.31	0.99	2.37	7.45	1.99	6.25	4.68	14.70	
1973	(s)	(s)	0.04	0.12	0.36	1.08	4.24	12.62	3.50	10.41	8.14	24.23	
1974	0.06	0.16	0.19	0.53	0.53	1.45	15.25	41.65	11.01	30.07	27.05	73.86	
1975	0.02	0.05	0.16	0.39	1.15	2.88	18.29	45.69	6.77	16.91	26.39	65.92	
1976	0.02	0.04	0.11	0.26	1.66	3.92	25.46	60.18	6.65	15.72	33.90	80.13	
1977	0.04	0.09	0.13	0.29	2.00	4.44	33.59	74.61	8.42	18.70	44.18	98.13	
1978	0.07	0.15	0.41	0.85	2.06	4.27	32.30	66.97	7.30	15.14	42.15	87.38	
1979	0.05	0.10	0.34	0.65	3.13	5.98	46.06	88.15	10.45	20.00	60.03	114.88	
1980	0.03	0.05	0.05	0.09	4.21	7.39	61.90	108.52	12.54	21.99	78.74	138.04	
1981	0.03	0.05	0.04	0.07	4.41	7.07	61.46	98.54	14.30	22.92	80.24	128.65	
1982	0.02	0.03	0.01	0.01	4.69	7.09	45.72	69.02	13.86	20.92	64.31	97.08	
1983	0.04	0.06	(s)	(s)	4.39	6.37	36.49	52.98	14.84	21.55	55.77	80.96	
1984	0.05	0.06	0.05	0.07	3.44	4.81	36.44	51.01	17.87	25.01	57.84	80.96	
1985	0.07	0.10	0.04	0.06	3.05	4.14	32.90	44.65	17.47	23.70	53.53	72.64	
1986	0.08	0.11	0.03	0.03	1.82	2.42	22.61	30.02	12.18	16.18	36.72	48.75	
1987	0.06	0.07	0.05	0.07	1.93	2.49	29.13	37.55	12.37	15.94	43.54	56.12	
1988	0.06	0.08	0.19	0.24	2.38	2.97	27.55	34.34	12.43	15.50	42.62	53.13	
1989	0.10	0.12	0.22	0.26	2.51	3.01	35.53	42.67	13.50	16.21	51.85	62.26	
1990	0.09	0.11	0.07	0.08	2.97	3.44	43.78	50.61	16.90	19.54	63.83	73.78	
1991	0.11	0.13	0.09	0.10	3.24	3.61	36.90	41.16	13.17	14.69	53.51	59.68	
1992	0.13	0.14	0.14	0.16	3.96	4.31	38.55	41.98	11.98	13.05	54.77	59.63	
1993	0.25	0.27	0.17	0.18	4.77	5.07	38.47	40.90	11.74	12.48	55.40	58.90	
1994	0.27	0.28	0.27	0.29	4.90	5.11	38.48	40.08	11.14	11.61	55.07	57.36	
1995	0.32	0.33	0.33	0.33	4.23	4.31	42.81	43.64	9.95	10.14	57.64	58.75	
1996	0.27	0.27	0.24	0.24	5.79	5.79	54.93	54.93	15.27	15.27	76.51	76.51	
1997	0.26	0.25	0.25	0.25	6.50	6.37	54.23	53.19	R,416.93	R,416.60	78.16	76.66	
1998	0.28	0.27	0.29	0.28	6.21	6.02	37.25	R36.10	13.01	12.61	57.05	R55.28	
1999	0.28	0.27	0.23	0.22	8.03	R7.68	50.89	R48.63	16.28	R15.56	75.71	R72.35	
2000	0.38	0.35	0.25	0.23	R14.94	R13.95	R89.88	R83.96	R29.38	R27.44	R134.81	R125.95	
2001 <sup>P</sup>	0.67	0.62	0.17	0.16	17.77	16.25	74.43	68.05	28.44	26.00	121.48	111.08	

<sup>1</sup> Includes imports into the Strategic Petroleum Reserve, which began in 1977.

<sup>2</sup> Includes petroleum preparations; liquefied propane; and butane; and since 1997 other mineral fuels.

<sup>3</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>4</sup> There is a discontinuity in this time series between 1996 and 1997 due to the addition of the commodity category "other mineral fuels."

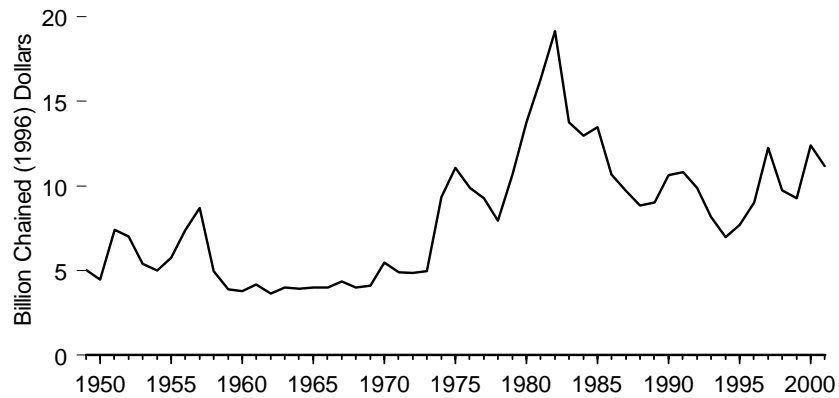
R=Revised. P=Preliminary. (s)=Less than 0.005 billion.

Notes: Includes value of imports into Puerto Rico from foreign countries; excludes receipts into the 50 States and the District of Columbia from the Virgin Islands and Puerto Rico. Totals may not equal sum of components due to independent rounding.

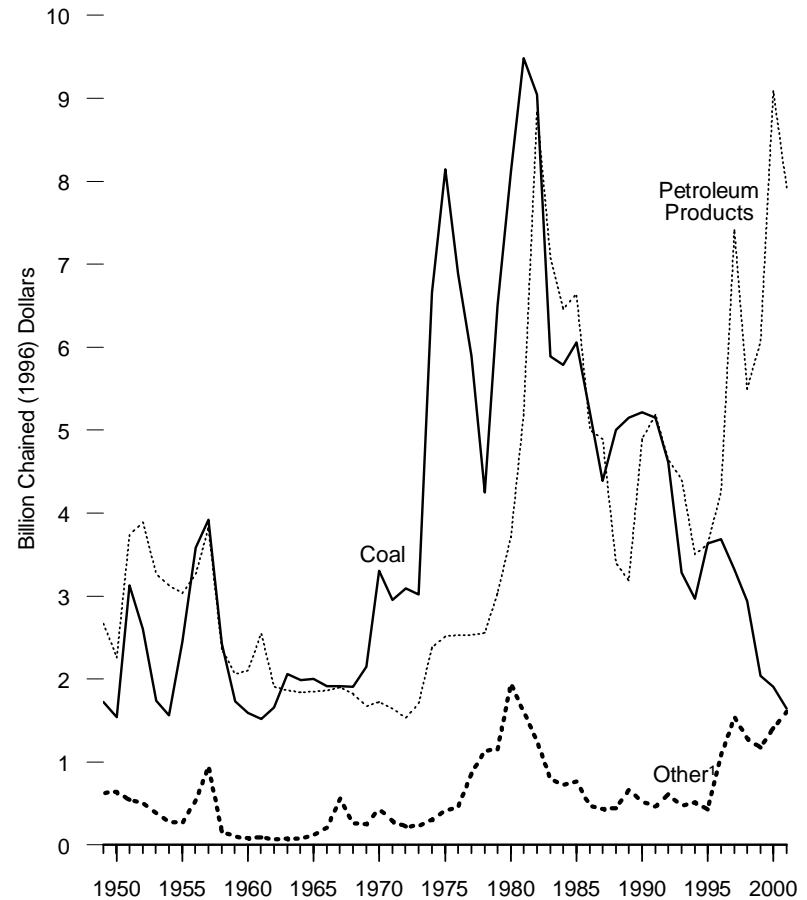
Sources: See end of section.

**Figure 3.6 Value of Fossil Fuel Exports**

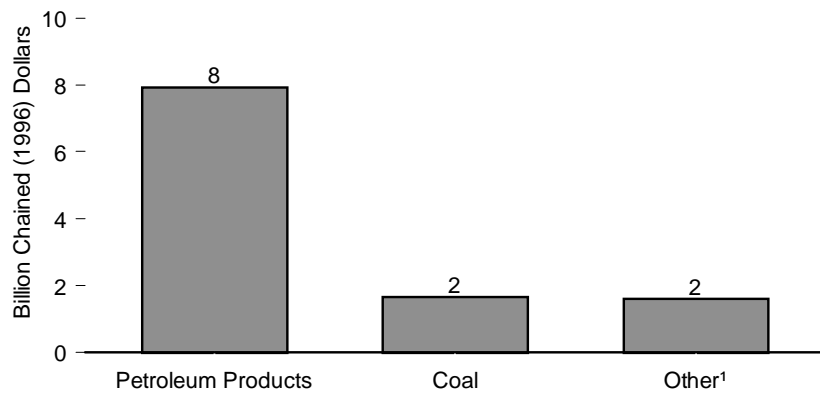
**Total, 1949-2001**



**By Fuel, 1949-2001**



**By Fuel, 2001**



<sup>1</sup> Natural gas, crude oil, and coal coke.

Notes: Prices are in chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1. Because vertical scales differ, graphs should not be compared.

Source: Table 3.6.

**Table 3.6 Value of Fossil Fuel Exports, 1949-2001**  
(Billion Dollars)

Year	Coal		Coal Coke		Natural Gas		Crude Oil		Petroleum Products <sup>1</sup>		Total	
	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>
1949	0.30	1.72	0.01	0.05	(s)	0.01	0.10	0.57	0.46	2.67	0.87	5.02
1950	0.27	1.54	0.01	0.04	(s)	0.02	0.10	0.59	0.39	2.26	0.78	4.45
1951	0.59	3.13	0.02	0.09	(s)	0.02	0.08	0.44	0.70	3.74	1.39	7.42
1952	0.49	2.60	0.01	0.07	(s)	0.02	0.08	0.41	0.74	3.89	1.33	7.00
1953	0.34	1.74	0.01	0.05	(s)	0.02	0.06	0.31	0.63	3.27	1.04	5.39
1954	0.30	1.57	0.01	0.03	(s)	0.02	0.05	0.23	0.61	3.13	0.97	4.98
1955	0.48	2.45	0.01	0.04	0.01	0.03	0.04	0.20	0.60	3.03	1.14	5.75
1956	0.73	3.58	0.01	0.06	0.01	0.04	0.09	0.44	0.67	3.26	1.51	7.38
1957	0.83	3.92	0.01	0.07	0.01	0.06	0.17	0.82	0.81	3.82	1.84	8.69
1958	0.53	2.43	0.01	0.03	0.01	0.07	0.01	0.07	0.51	2.36	1.07	4.96
1959	0.38	1.73	0.01	0.04	0.01	0.03	0.01	0.03	0.45	2.06	0.85	3.89
1960	0.35	1.59	0.01	0.03	(s)	0.02	0.01	0.04	0.47	2.10	0.84	3.78
1961	0.34	1.52	0.01	0.04	(s)	0.02	0.01	0.04	0.57	2.55	0.93	4.16
1962	0.38	1.66	0.01	0.03	(s)	0.02	0.01	0.02	0.43	1.90	0.83	3.63
1963	0.47	2.06	0.01	0.04	(s)	0.02	0.01	0.02	0.43	1.86	0.92	4.00
1964	0.46	1.98	0.01	0.04	(s)	0.02	(s)	0.02	0.43	1.84	0.91	3.90
1965	0.48	2.01	0.02	0.07	0.01	0.03	(s)	0.02	0.44	1.85	0.95	3.97
1966	0.47	1.91	0.02	0.10	0.02	0.07	0.01	0.04	0.46	1.86	0.97	3.99
1967	0.48	1.91	0.02	0.07	0.03	0.13	0.09	0.37	0.48	1.90	1.10	4.37
1968	0.50	1.91	0.02	0.07	0.04	0.15	0.01	0.04	0.48	1.83	1.05	4.00
1969	0.59	2.15	0.04	0.14	0.03	0.09	0.01	0.02	0.46	1.68	1.13	4.08
1970	0.96	3.31	0.08	0.27	0.03	0.10	0.02	0.06	0.50	1.73	1.59	5.47
1971	0.90	2.95	0.04	0.15	0.04	0.13	0.01	0.02	0.50	1.65	1.49	4.89
1972	0.98	3.09	0.03	0.10	0.04	0.12	(s)	0.01	0.49	1.54	1.55	4.86
1973	1.01	3.02	0.03	0.10	0.04	0.12	(s)	0.01	0.57	1.70	1.66	4.95
1974	2.44	6.65	0.04	0.12	0.05	0.15	0.01	0.04	0.87	2.38	3.42	9.34
1975	3.26	8.14	0.07	0.19	0.09	0.23	(s)	(s)	1.01	2.52	4.43	11.07
1976	2.91	6.88	0.07	0.16	0.10	0.24	0.03	0.06	1.07	2.53	4.17	9.87
1977	2.66	5.90	0.07	0.16	0.11	0.24	0.02	0.46	1.14	2.53	4.18	9.29
1978	2.05	4.25	0.05	0.10	0.11	0.23	0.39	0.81	1.23	2.56	3.83	7.95
1979	3.40	6.50	0.08	0.15	0.13	0.24	0.39	0.75	1.58	3.03	5.58	10.69
1980	4.63	8.11	0.13	0.23	0.23	0.40	0.75	1.32	2.12	3.72	7.86	13.78
1981	5.92	9.49	0.07	0.12	0.35	0.56	0.58	0.92	3.24	5.19	10.16	16.28
1982	5.99	9.04	0.06	0.09	0.30	0.45	0.47	0.71	5.86	8.85	12.68	19.14
1983	4.06	5.89	0.05	0.07	0.28	0.40	0.22	0.33	4.88	7.08	9.48	13.77
1984	4.13	5.78	0.07	0.10	0.27	0.38	0.19	0.26	4.62	6.46	9.27	12.98
1985	4.47	6.06	0.08	0.10	0.26	0.36	0.23	0.31	4.90	6.64	9.93	13.47
1986	3.93	5.22	0.07	0.09	0.17	0.23	0.12	0.16	3.77	5.00	8.05	10.69
1987	3.40	4.39	0.05	0.06	0.17	0.21	0.13	0.16	3.80	4.89	7.54	9.72
1988	4.01	5.00	0.08	0.10	0.20	0.25	0.08	0.10	2.72	3.40	7.09	8.84
1989	4.29	5.15	0.08	0.10	0.27	0.32	0.21	0.25	2.65	3.19	7.49	9.00
1990	4.51	5.21	0.05	0.06	0.27	0.31	0.14	0.16	4.23	4.89	9.20	10.63
1991	4.62	5.15	0.05	0.06	0.33	0.37	0.03	0.04	4.65	5.19	9.69	10.81
1992	4.24	4.61	0.04	0.05	0.49	0.53	0.03	0.04	4.27	4.65	9.07	9.88
1993	3.09	3.28	0.06	0.06	0.36	0.39	0.02	0.02	4.15	4.41	7.68	8.16
1994	2.85	2.97	0.04	0.04	0.40	0.42	0.05	0.05	3.36	3.50	6.71	6.98
1995	3.57	3.63	0.05	0.05	0.37	0.38	0.01	0.01	3.56	3.63	7.55	7.70
1996	3.69	3.69	0.06	0.06	0.46	0.46	0.56	0.56	4.25	4.25	9.02	9.02
1997	3.39	3.32	0.05	0.05	0.47	0.47	1.04	1.02	<sup>3</sup> 7.55	<sup>3</sup> 7.41	12.51	12.27
1998	3.04	2.94	0.04	0.04	0.39	0.38	0.90	0.87	5.68	5.50	10.04	9.73
1999	2.13	2.04	0.03	0.03	0.43	0.41	0.77	0.74	6.35	6.06	9.71	<sup>R</sup> 9.28
2000	2.04	1.91	0.05	0.05	<sup>R</sup> 1.00	<sup>R</sup> 0.93	<sup>R</sup> 0.46	<sup>R</sup> 0.43	<sup>R</sup> 9.73	<sup>R</sup> 9.09	<sup>R</sup> 13.28	<sup>R</sup> 12.41
2001 <sup>P</sup>	1.80	1.64	0.04	0.04	1.54	1.41	0.18	0.16	8.67	7.92	12.22	11.17

<sup>1</sup> Includes petroleum preparations, liquefied propane and butane and since 1997 other mineral fuels.

<sup>2</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>3</sup> There is a discontinuity in this time series between 1996 and 1997 due to the addition of the commodity category "other mineral fuels."

R=Revised. P=Preliminary. (s)=Less than 0.005 billion.

Notes: Includes value of exports from Puerto Rico to foreign countries; excludes shipments from the 50 States and the District of Columbia to the Virgin Islands and Puerto Rico. Totals may not equal sum of components due to independent rounding.

Sources: **Natural Gas:** 1949-1971—Bureau of the Census, *U.S. Exports*, FT410. 1972 and

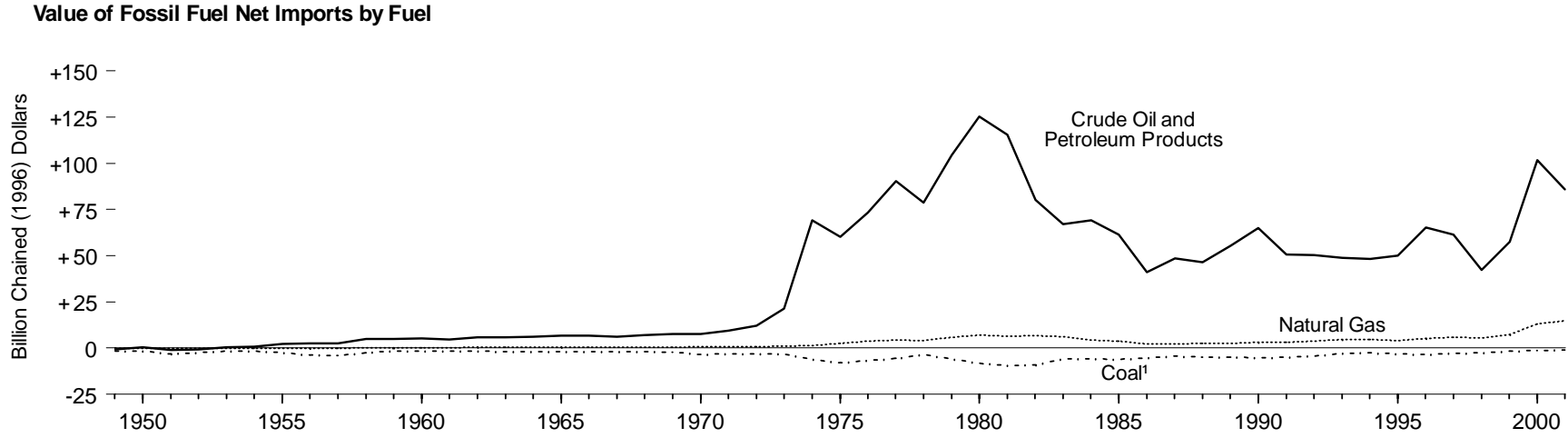
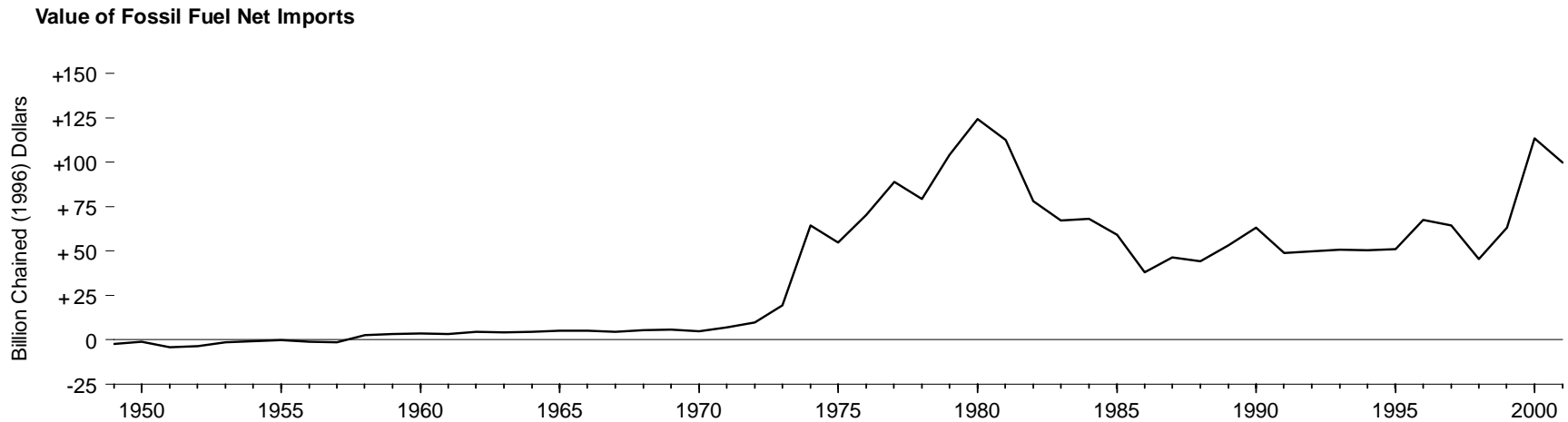
1973—Federal Power Commission, *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG*. 1974-1977—Federal Power Commission, *United States Imports and Exports of Natural Gas*, annual reports.

1978-1981—Energy Information Administration (EIA), *U.S. Imports and Exports of Natural Gas*, annual reports. 1982-1998—EIA, *Natural Gas Monthly*, monthly reports. 1999-2000—EIA, *Natural Gas Monthly* (August 2001).

2001—Calculated from EIA, *Natural Gas Monthly*, (March 2002), Tables 5 and 6. **Crude Oil and Petroleum Products:** 1949-1988—Bureau of the Census, *U.S. Exports*, FT410. 1989 imports—Bureau of the Census, Foreign Trade Division, *U.S. Merchandise Trade*, FT900. "Exports and Imports of Goods by Principal SITC Commodity Groupings," December issues. **Coal:** Bureau of the Census, Foreign Trade Division, unpublished data.



**Figure 3.7 Value of Fossil Fuel Net Imports, 1949-2001**



<sup>1</sup> Includes small amounts of coal coke.

Source: Table 3.7.

Notes: Negative net imports are net exports. Prices are in chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

**Table 3.7 Value of Fossil Fuel Net Imports, 1949-2001**  
(Billion Dollars)

Year	Coal		Coal Coke		Natural Gas		Crude Oil		Petroleum Products <sup>1</sup>		Total	
	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>
1949	-0.29	-1.71	(s)	-0.03	(s)	-0.01	0.21	1.19	-0.32	-1.88	-0.42	-2.43
1950	-0.27	-1.53	(s)	(s)	(s)	-0.02	0.27	1.53	-0.18	-1.03	-0.18	-1.05
1951	-0.58	-3.12	-0.02	-0.08	(s)	-0.02	0.29	1.57	-0.47	-2.53	-0.78	-4.18
1952	-0.49	-2.59	-0.01	-0.05	(s)	-0.02	0.34	1.82	-0.49	-2.56	-0.65	-3.40
1953	-0.33	-1.73	-0.01	-0.04	(s)	-0.02	0.45	2.34	-0.38	-1.96	-0.27	-1.41
1954	-0.30	-1.56	(s)	-0.03	(s)	-0.02	0.50	2.57	-0.32	-1.67	-0.14	-0.70
1955	-0.48	-2.44	-0.01	-0.03	-0.01	-0.03	0.62	3.11	-0.16	-0.80	-0.04	-0.18
1956	-0.73	-3.57	-0.01	-0.05	-0.01	-0.04	0.75	3.65	-0.22	-1.07	-0.22	-1.07
1957	-0.83	-3.91	-0.01	-0.06	-0.01	-0.04	0.81	3.82	-0.24	-1.14	-0.28	-1.33
1958	-0.52	-2.42	-0.01	-0.03	0.01	0.03	0.92	4.27	0.17	0.80	0.58	2.67
1959	-0.38	-1.72	-0.01	-0.03	0.02	0.09	0.87	3.96	0.21	0.97	0.71	3.26
1960	-0.35	-1.59	-0.01	-0.02	0.02	0.11	0.89	4.00	0.26	1.19	0.82	3.69
1961	-0.34	-1.52	-0.01	-0.03	0.04	0.18	0.92	4.12	0.14	0.61	0.76	3.37
1962	-0.38	-1.65	-0.01	-0.02	0.08	0.36	1.01	4.43	0.32	1.41	1.03	4.52
1963	-0.47	-2.05	-0.01	-0.03	0.09	0.41	1.02	4.44	0.31	1.35	0.95	4.11
1964	-0.46	-1.98	-0.01	-0.04	0.10	0.41	1.08	4.61	0.35	1.51	1.06	4.52
1965	-0.48	-2.00	-0.01	-0.06	0.10	0.41	1.11	4.69	0.48	2.03	1.21	5.07
1966	-0.47	-1.91	-0.02	-0.09	0.09	0.36	1.11	4.52	0.53	2.17	1.24	5.06
1967	-0.48	-1.91	-0.01	-0.06	0.10	0.39	0.97	3.86	0.54	2.13	1.11	4.41
1968	-0.50	-1.90	-0.02	-0.06	0.11	0.41	1.17	4.46	0.68	2.60	1.45	5.50
1969	-0.59	-2.15	-0.04	-0.13	0.17	0.61	1.29	4.68	0.78	2.82	1.61	5.84
1970	-0.96	-3.31	-0.08	-0.26	0.23	0.78	1.24	4.27	0.98	3.38	1.41	4.87
1971	-0.90	-2.95	-0.04	-0.13	0.27	0.90	1.68	5.51	1.15	3.78	2.17	7.11
1972	-0.98	-3.09	-0.03	-0.08	0.28	0.87	2.37	7.44	1.50	4.71	3.13	9.85
1973	-1.01	-3.01	0.01	0.02	0.32	0.95	4.24	12.61	2.93	8.71	6.48	19.28
1974	-2.38	-6.50	0.15	0.41	0.48	1.30	15.24	41.61	10.14	27.69	23.63	64.52
1975	-3.24	-8.09	0.08	0.20	1.06	2.65	18.29	45.69	5.76	14.39	21.96	54.85
1976	-2.89	-6.84	0.04	0.10	1.56	3.69	25.43	60.12	5.58	13.20	29.72	70.26
1977	-2.62	-5.81	0.06	0.13	1.89	4.21	33.38	74.15	7.28	16.17	40.00	88.84
1978	-1.98	-4.10	0.36	0.75	1.95	4.04	31.91	66.16	6.07	12.59	38.31	79.44
1979	-3.35	-6.40	0.26	0.50	3.00	5.74	45.66	87.40	8.87	16.97	54.44	104.20
1980	-4.60	-8.06	-0.08	-0.14	3.98	6.99	61.15	107.20	10.42	18.27	70.88	124.26
1981	-5.89	-9.44	-0.03	-0.05	4.06	6.51	60.88	97.61	11.06	17.73	70.09	112.37
1982	-5.97	-9.01	-0.05	-0.08	4.39	6.63	45.25	68.31	8.00	12.08	51.63	77.93
1983	-4.01	-5.83	-0.04	-0.06	4.11	5.97	36.27	52.65	9.96	14.47	46.28	67.20
1984	-4.09	-5.72	-0.02	-0.03	3.17	4.44	36.26	50.75	13.25	18.55	48.57	67.98
1985	-4.39	-5.96	-0.03	-0.05	2.79	3.78	32.68	44.34	12.57	17.06	43.60	59.17
1986	-3.85	-5.11	-0.04	-0.05	1.65	2.19	22.49	29.86	8.42	11.17	28.67	38.06
1987	-3.35	-4.32	0.01	0.01	1.76	2.27	29.00	37.39	8.57	11.05	36.00	46.40
1988	-3.95	-4.92	0.12	0.15	2.18	2.72	27.47	34.25	9.71	12.11	35.53	44.29
1989	-4.19	-5.03	0.14	0.16	2.24	2.69	35.32	42.42	10.85	13.02	44.35	53.27
1990	-4.42	-5.11	0.02	0.03	2.71	3.13	43.65	50.45	12.67	14.65	54.63	63.15
1991	-4.51	-5.03	0.04	0.05	2.90	3.23	36.87	41.12	8.52	9.50	43.82	48.88
1992	-4.11	-4.48	0.10	0.11	3.47	3.78	38.52	41.94	7.72	8.40	45.70	49.76
1993	-2.83	-3.01	0.11	0.11	4.41	4.69	38.45	40.88	7.59	8.07	47.72	50.74
1994	-2.58	-2.68	0.23	0.24	4.50	4.68	38.43	40.03	7.78	8.10	48.37	50.38
1995	-3.24	-3.31	0.27	0.28	3.86	3.93	42.81	43.64	6.39	6.51	50.09	51.06
1996	-3.41	-3.41	0.18	0.18	5.33	5.33	54.37	54.37	11.01	11.01	67.49	67.49
1997	-3.13	-3.07	0.20	0.19	6.02	5.91	53.19	52.17	<sup>9</sup> 9.37	<sup>9</sup> 9.19	65.65	64.39
1998	-2.75	-2.67	0.25	0.24	5.82	5.64	36.36	<sup>R</sup> 35.23	7.33	<sup>R</sup> 7.11	47.00	45.54
1999	-1.85	-1.77	0.20	0.19	7.61	<sup>R</sup> 7.27	50.12	<sup>R</sup> 47.89	9.94	<sup>R</sup> 9.50	66.00	<sup>R</sup> 63.07
2000	-1.66	-1.56	0.20	0.19	<sup>R</sup> 13.94	<sup>R</sup> 13.02	<sup>R</sup> 89.41	<sup>R</sup> 83.53	<sup>R</sup> 19.65	<sup>R</sup> 18.35	<sup>R</sup> 121.53	<sup>R</sup> 113.54
2001 <sup>P</sup>	-1.13	-1.03	0.13	0.12	16.23	14.84	74.25	67.89	19.78	18.08	109.26	99.90

<sup>1</sup> Includes petroleum preparations, liquefied propane and butane and since 1997 other mineral fuels.

<sup>2</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>3</sup> There is a discontinuity in this time series between 1996 and 1997 due to the addition of the commodity category "other mineral fuels."

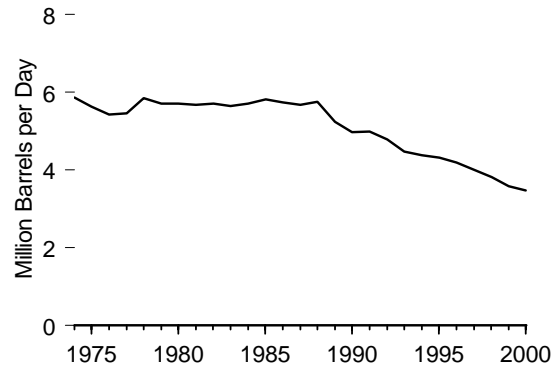
R=Revised. P=Preliminary. (s)=Less than 0.005 billion.

Notes: Net imports = imports minus exports. Totals may not equal sum of components due to independent rounding. Data on this table may not equal data on Table 3.5 minus data on Table 3.6 due to independent rounding.

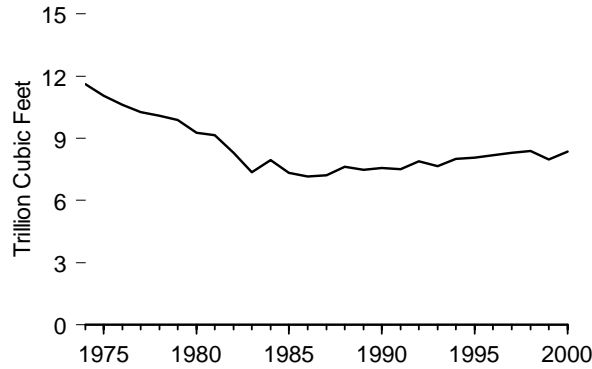
Sources: Tables 3.5 and 3.6.

**Figure 3.8 Major U.S. Energy Companies' Domestic Production and Refining, 1974-2000**

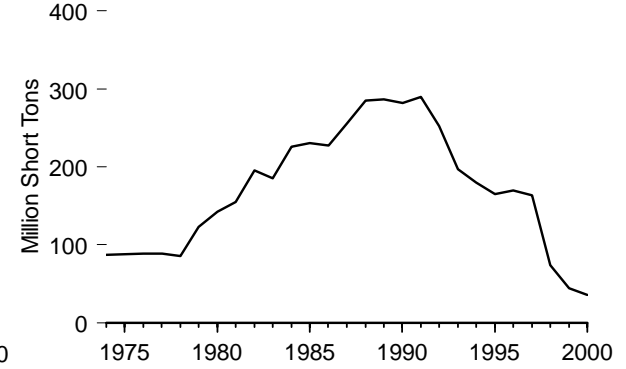
**Crude Oil and Natural Gas Liquids Production by Major Energy Companies**



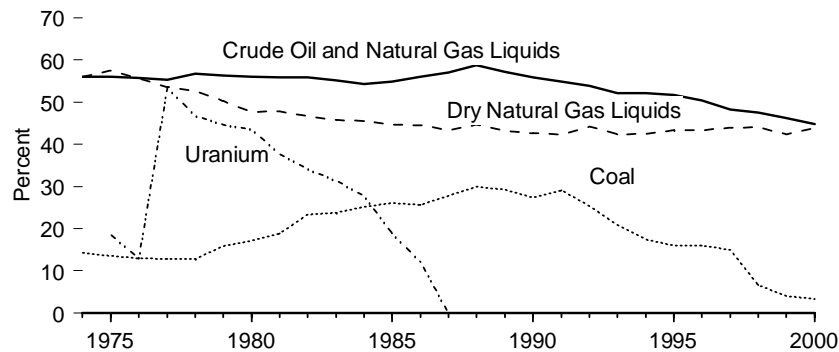
**Dry Natural Gas Production by Major Energy Companies**



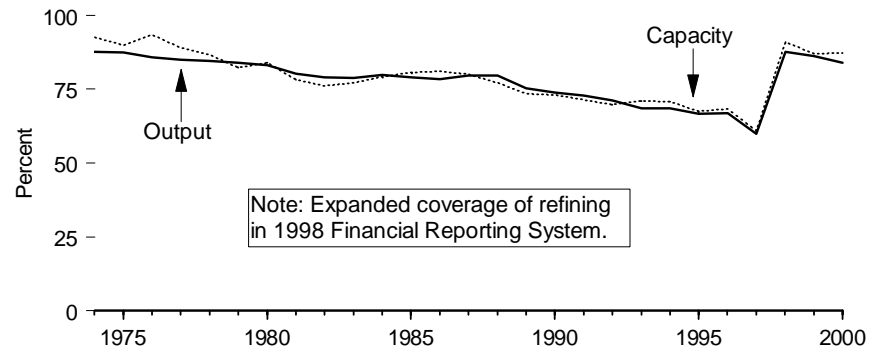
**Coal Production by Major Energy Companies**



**Major Energy Companies' Shares of U.S. Total Production**



**Major Energy Companies' Shares of U.S. Refining Capacity and Output**



Notes: Major U.S. Energy Companies are the top publicly-owned crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12. Because vertical scales differ, graphs should not be compared.

Source: Table 3.8.

**Table 3.8 Major U.S. Energy Companies' Domestic Production and Refining, 1974-2000**

Year	Production				Refining	
	Crude Oil and Natural Gas Liquids (million barrels per day)	Dry Natural Gas (trillion cubic feet)	Coal <sup>1</sup> (million short tons)	Uranium (million pounds U <sub>3</sub> O <sub>8</sub> )	Capacity <sup>2,3</sup> (million barrels per day)	Output <sup>3</sup> (million barrels per day)
1974	5.9	11.6	87.4	NA	13.3	11.8
1975	5.6	11.0	88.1	4.3	13.4	12.0
1976	5.4	10.6	89.0	3.3	14.2	12.6
1977	5.5	10.3	89.1	16.0	14.6	13.5
1978	5.8	10.1	85.5	17.3	14.8	13.5
1979	5.7	9.9	123.3	16.7	14.4	13.2
1980	5.7	9.3	142.3	19.0	15.1	12.2
1981	5.7	9.2	154.8	14.5	14.6	11.2
1982	5.7	8.3	195.2	9.2	13.6	10.6
1983	5.6	7.4	185.2	6.6	13.0	10.3
1984	5.7	7.9	226.0	4.1	12.8	10.9
1985	5.8	7.3	230.4	2.1	12.6	10.8
1986	5.7	7.1	227.6	1.6	12.5	11.4
1987	5.7	7.2	255.3	0.0	12.5	11.7
1988	5.7	7.6	285.3	0.0	12.3	12.0
1989	5.2	7.5	286.9	0.0	11.5	11.4
1990	5.0	7.6	282.0	0.0	11.4	11.3
1991	5.0	7.5	289.6	0.0	11.2	11.1
1992	4.8	7.9	251.9	0.0	11.0	11.0
1993	4.5	7.7	197.3	0.0	10.7	10.8
1994	4.4	8.0	179.7	0.0	10.6	10.8
1995	4.3	8.1	165.4	0.0	10.4	10.7
1996	4.2	8.2	169.4	0.0	10.5	11.0
1997	4.0	8.3	163.3	0.0	9.4	10.0
1998	3.8	8.4	73.9	0.0	<sup>4</sup> 14.3	<sup>4</sup> 14.9
1999	3.6	8.0	44.0	0.0	14.2	14.6
2000	3.5	8.4	35.5	0.0	14.4	14.5
Percent of U.S. Total						
1974	56.0	56.1	14.3	NA	92.5	87.6
1975	56.1	57.4	13.5	18.6	89.8	87.4
1976	55.7	55.6	13.0	13.0	93.4	85.9
1977	55.3	53.6	12.8	53.4	89.0	85.0
1978	56.8	52.7	12.8	46.8	86.7	84.5
1979	56.3	50.3	15.8	44.7	82.4	83.9
1980	56.1	47.7	17.2	43.5	83.9	83.1
1981	55.8	47.8	18.8	37.7	78.2	80.3
1982	55.9	46.7	23.3	34.2	76.2	79.0
1983	55.1	45.8	23.7	31.4	77.2	78.7
1984	54.3	45.5	25.2	27.8	79.1	79.8
1985	54.9	44.6	26.1	18.9	80.6	78.9
1986	56.0	44.5	25.6	12.1	81.0	78.5
1987	57.0	43.4	27.8	0.0	80.1	79.7
1988	58.8	44.6	30.0	0.0	77.2	79.7
1989	57.2	43.2	29.3	0.0	73.4	75.2
1990	55.8	42.6	27.4	0.0	73.0	74.0
1991	54.9	42.4	29.1	0.0	71.5	72.9
1992	53.9	44.2	25.3	0.0	69.8	71.2
1993	52.1	42.3	20.9	0.0	70.9	68.6
1994	52.1	42.5	17.4	0.0	70.8	68.5
1995	51.7	43.3	16.0	0.0	67.6	66.6
1996	50.5	43.4	15.9	0.0	68.3	66.9
1997	48.3	43.9	15.0	0.0	60.9	59.9
1998	47.5	<sup>R</sup> 44.1	6.6	0.0	<sup>4</sup> 90.9	<sup>4</sup> 87.7
1999	46.3	<sup>R</sup> 42.4	4.0	0.0	87.1	86.2
2000	44.8	44.0	3.3	0.0	87.2	83.9

<sup>1</sup> Bituminous coal, subbituminous coal, and lignite.

<sup>2</sup> Operable capacity as of January 1 of the following year.

<sup>3</sup> Includes Puerto Rico and the Virgin Islands.

<sup>4</sup> There is a discontinuity in this time series between 1997 and 1998 due to the expanded coverage of the Financial Reporting System (FRS).

NA=Not available.

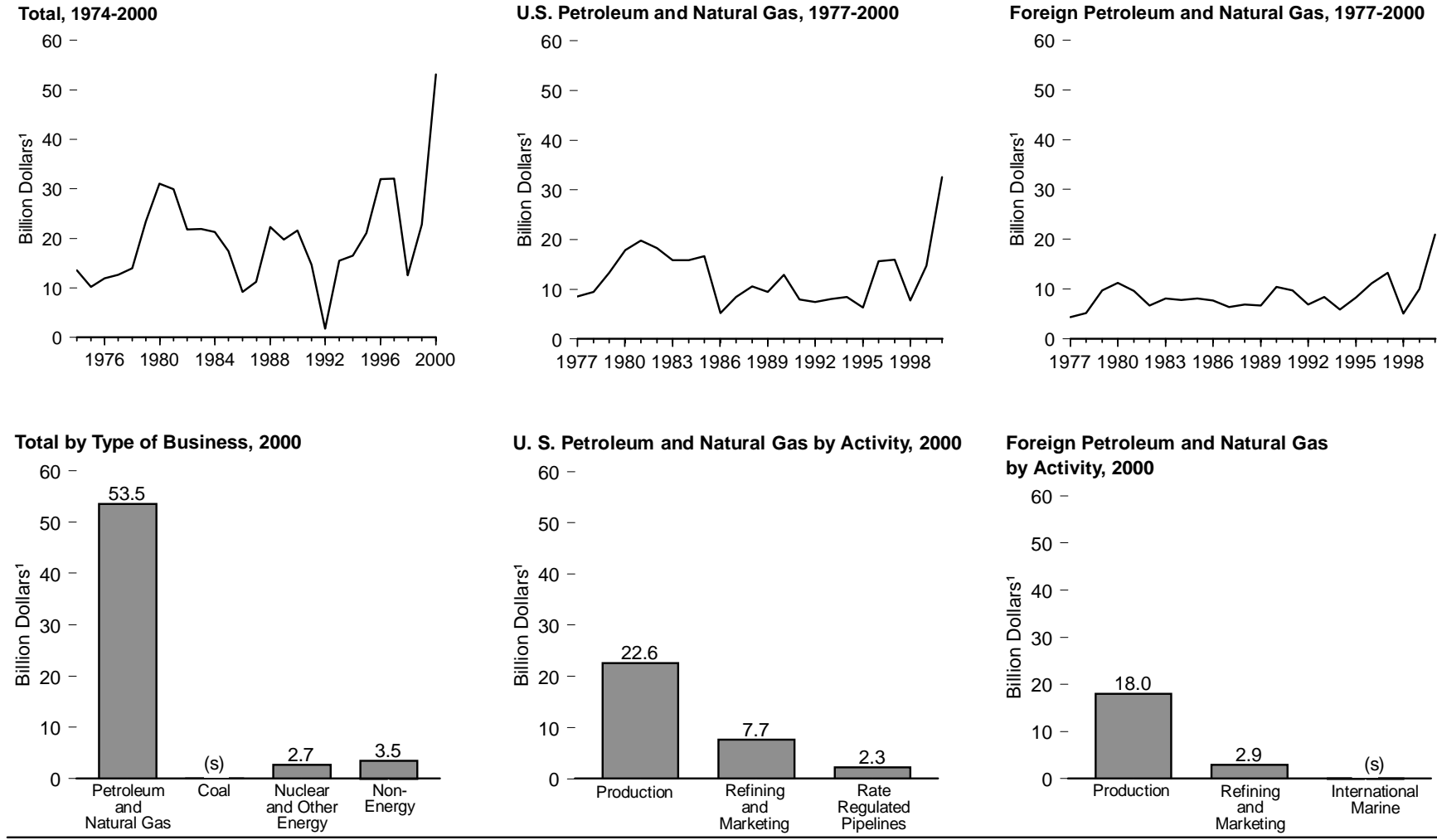
Notes: Major U.S. Energy Companies are the top publicly-owned, U.S.-based crude oil and natural

gas producers and petroleum refiners that form the FRS. See Table 3.12. FRS Crude Oil and Natural Gas Liquids and Dry Natural Gas production are on a net ownership interest basis (see Glossary).

Web Page: <http://www.eia.doe.gov/emeu/finance>.

Sources: **Production and Refining:** 1974-1976—Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System" database, November 1998. 1977 forward—EIA, *Performance Profiles of Major Energy Producers*, annual reports. **Percent of U.S. Total:** Tables 5.1, 5.8, 5.9, 6.1, 7.1, and 9.3.

**Figure 3.9 Major U.S. Energy Companies' Net Income**



<sup>1</sup> Nominal dollars.  
(s)=Less than 0.05 billion.

Note: Major U.S. Energy Companies are the top publicly-owned crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12.  
Source: Table 3.9.

**Table 3.9 Major U.S. Energy Companies' Net Income, 1974-2000**  
(Billion Dollars<sup>1</sup>)

Year	U.S. Petroleum and Natural Gas				Foreign Petroleum and Natural Gas				Type of Business				
	Production	Refining and Marketing	Rate Regulated Pipelines	Total <sup>2</sup>	Production	Refining and Marketing	International Marine	Total <sup>2</sup>	Petroleum and Natural Gas	Coal	Nuclear and Other Energy	Non-energy	Total <sup>2</sup>
1974	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13.6
1975	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.3
1976	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12.0
1977	6.4	1.5	0.8	8.6	3.6	0.7	0.1	4.4	13.0	0.2	(s)	1.7	12.7
1978	6.7	1.6	1.2	9.5	3.5	1.8	-0.1	5.2	14.7	0.1	-0.1	1.8	13.9
1979	9.4	2.3	1.7	13.4	5.2	4.3	0.1	9.7	23.0	0.3	-0.1	2.8	23.5
1980	13.8	2.5	1.7	17.9	6.9	4.3	0.1	11.2	29.1	0.3	(s)	2.3	31.0
1981	16.8	1.3	1.8	19.9	8.0	1.6	-0.1	9.6	29.5	0.4	-0.3	1.6	30.0
1982	14.1	1.9	2.3	18.3	6.1	0.8	-0.3	6.7	25.0	0.4	-0.3	0.4	21.8
1983	12.2	1.6	2.0	15.9	7.2	1.3	-0.5	8.2	24.0	0.5	(s)	1.8	21.9
1984	13.3	0.1	2.5	15.8	7.5	0.7	-0.4	7.8	23.6	0.6	-0.1	2.9	21.3
1985	12.1	2.3	2.3	16.7	8.0	0.5	-0.4	8.1	24.8	0.4	-0.3	2.5	17.4
1986	0.9	1.6	2.6	5.2	4.7	2.9	0.1	7.7	12.9	0.2	(s)	2.8	9.2
1987	4.7	1.1	2.6	8.4	5.4	1.0	-0.1	6.4	14.8	0.4	(s)	7.1	11.3
1988	3.2	5.4	2.0	10.6	4.3	2.4	0.1	6.9	17.5	0.6	-0.1	10.8	22.3
1989	3.1	4.5	1.9	9.5	4.7	1.8	0.2	6.7	16.2	0.4	-0.1	8.7	19.8
1990	8.7	2.2	2.1	12.9	7.4	2.8	0.2	10.5	23.4	0.3	0.1	4.3	21.6
1991	5.1	0.9	2.0	7.9	5.4	4.1	0.3	9.8	17.7	0.6	0.1	1.6	14.7
1992	5.6	-0.2	2.1	7.5	4.7	2.2	(s)	6.9	14.4	-0.5	0.1	1.2	1.8
1993	4.8	1.7	1.6	8.1	5.2	3.2	(s)	8.4	16.5	0.4	0.1	2.7	15.5
1994	4.8	1.8	1.8	8.5	4.0	2.0	(s)	5.9	14.4	0.2	0.2	6.2	16.5
1995	3.7	0.5	2.2	6.4	5.9	2.4	(s)	8.3	14.7	0.3	0.2	12.6	21.1
1996	11.8	2.3	1.6	15.7	9.2	2.0	(s)	11.2	26.9	0.5	0.2	8.0	32.0
1997	11.6	3.1	1.3	16.0	9.6	3.6	0.1	13.3	29.3	0.3	0.3	6.3	32.1
1998	0.5	5.9	1.4	7.8	2.0	2.9	0.1	5.1	12.8	0.5	0.9	1.8	12.5
1999	7.4	4.9	2.4	14.8	8.2	1.9	(s)	10.1	24.8	0.2	0.7	2.8	22.9
2000	22.6	7.7	2.3	32.6	18.0	2.9	(s)	21.0	53.5	(s)	2.7	3.5	53.2

<sup>1</sup> Nominal dollars.

<sup>2</sup> Total is sum of components shown, plus eliminations and nontraceables, which are defined in the glossary.

NA=Not available. (s)=Less than 0.05 billion and greater than -0.05 billion.

Note: Major U.S. Energy Companies are the top publicly-owned, U.S.-based crude oil and natural gas

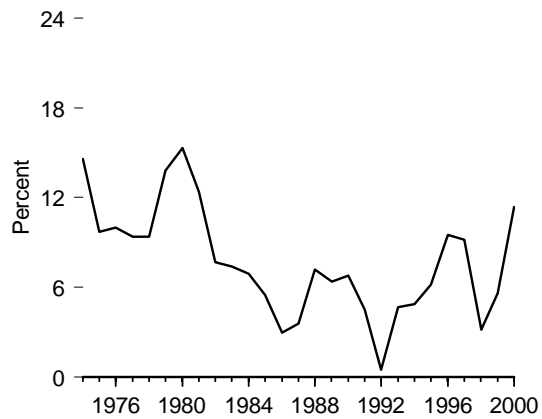
producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12.

Web Page: <http://www.eia.doe.gov/finance>.

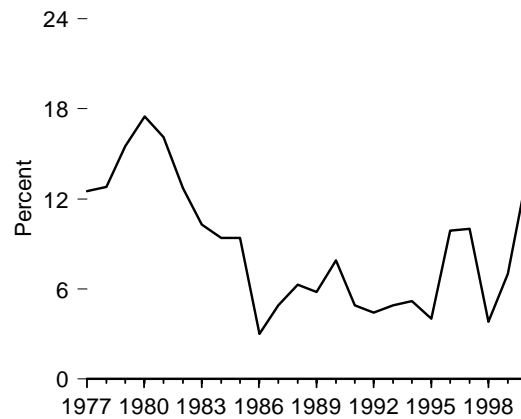
Sources: 1974-1976—Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System" database, November 1997. 1977 forward—EIA, *Performance Profiles of Major Energy Producers*, annual reports.

**Figure 3.10 Major U.S. Energy Companies' Profitability**

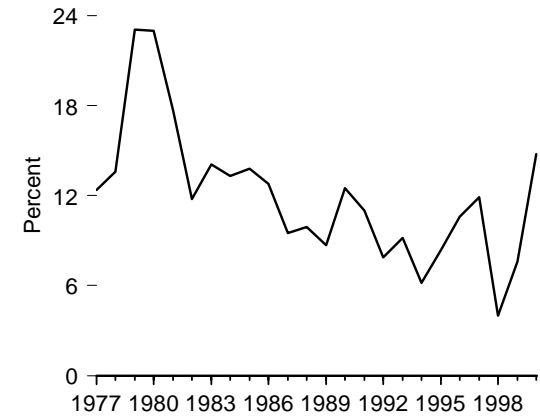
**Total, 1974-2000**



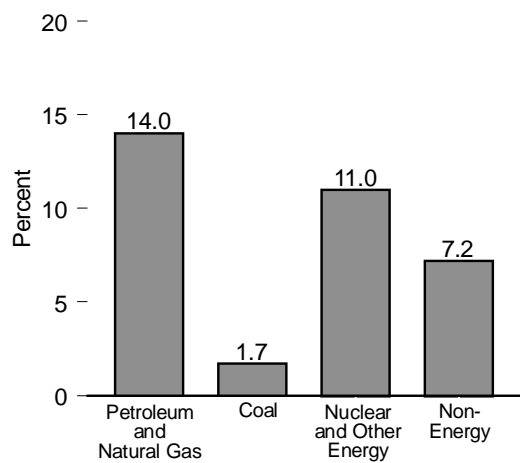
**U. S. Petroleum and Natural Gas, 1977-2000**



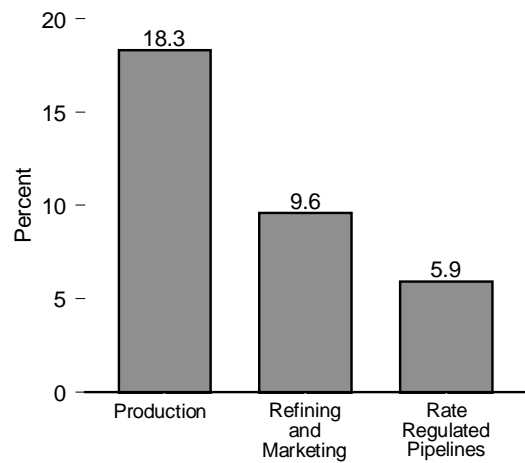
**Foreign Petroleum and Natural Gas, 1977-2000**



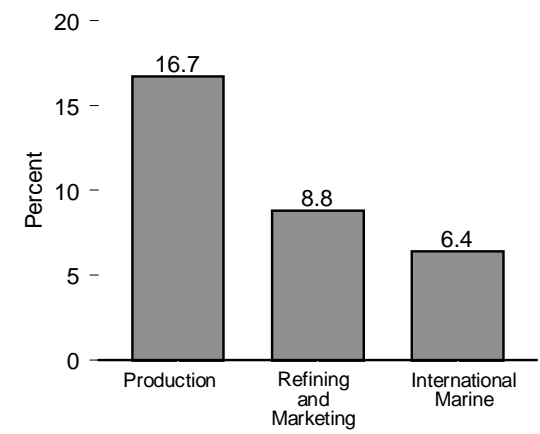
**Total by Type of Business, 2000**



**U. S. Petroleum and Natural Gas by Activity, 2000**



**Foreign Petroleum and Natural Gas by Activity, 2000**



Notes: Major U.S. Energy Companies are the top publicly-owned crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12. Because vertical scales differ, graphs should not be compared.

Source: Table 3.10.

**Table 3.10 Major U.S. Energy Companies' Profitability, 1974-2000**  
(Percent)

Year	U.S. Petroleum and Natural Gas				Foreign Petroleum and Natural Gas				Type of Business				
	Production	Refining and Marketing	Rate Regulated Pipelines	Total	Production	Refining and Marketing	International Marine	Total	Petroleum and Natural Gas	Coal	Nuclear and Other Energy	Non-energy	Total
1974	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14.6
1975	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.7
1976	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.0
1977	17.5	7.2	7.3	12.5	21.8	5.1	2.6	12.4	12.5	8.8	-2.6	7.1	9.4
1978	16.4	7.5	10.9	12.8	18.2	12.7	-1.0	13.6	13.1	4.1	-4.2	6.5	9.4
1979	18.2	9.8	15.1	15.5	23.8	29.1	2.6	23.1	18.0	6.3	-3.7	8.8	13.8
1980	20.9	9.8	15.1	17.5	25.1	26.4	2.4	23.0	19.2	5.6	-0.7	5.9	15.3
1981	20.2	4.4	15.6	16.1	25.5	9.0	-1.1	17.7	16.6	6.1	-6.8	3.5	12.4
1982	14.0	6.0	20.8	12.7	17.4	4.7	-6.3	11.8	12.5	4.4	-5.2	0.6	7.7
1983	11.3	4.8	16.6	10.3	19.6	7.7	-13.2	14.1	11.3	5.0	0.5	2.9	7.4
1984	10.8	0.3	20.8	9.4	18.8	4.5	-14.0	13.3	10.4	6.2	-1.8	4.8	6.9
1985	9.5	6.5	15.0	9.4	20.0	3.3	-19.0	13.8	10.5	4.6	-8.4	4.2	5.5
1986	0.8	4.5	13.2	3.0	11.6	16.3	5.3	12.8	5.5	2.7	-0.8	5.1	3.0
1987	4.1	2.9	12.8	4.9	12.4	4.7	-3.6	9.5	6.2	5.1	0.5	12.2	3.6
1988	2.8	14.7	9.6	6.3	9.2	11.6	6.8	9.9	7.3	6.7	-2.5	20.3	7.2
1989	2.9	11.5	10.2	5.8	8.9	8.0	12.4	8.7	6.7	5.0	-2.3	17.3	6.4
1990	8.5	5.1	11.2	7.9	13.1	11.2	11.7	12.5	9.5	3.3	2.6	7.8	6.8
1991	5.1	2.0	10.7	4.9	9.1	14.6	15.6	11.0	7.0	8.7	2.8	2.9	4.5
1992	5.9	-0.4	8.4	4.4	8.2	7.8	-1.2	7.9	5.6	-9.3	1.8	2.1	0.5
1993	5.3	3.4	6.4	4.9	8.6	10.6	1.2	9.2	6.4	7.6	4.1	4.7	4.7
1994	5.5	3.6	7.6	5.2	6.5	6.1	-2.0	6.2	5.6	4.0	4.8	10.5	4.9
1995	4.4	1.0	9.1	4.0	9.3	7.2	-2.5	8.4	5.7	6.9	6.1	19.4	6.2
1996	14.1	4.4	6.9	9.9	12.8	6.0	2.2	10.6	10.1	9.9	7.9	15.0	9.5
1997	12.5	6.6	6.7	10.0	12.5	10.5	11.8	11.9	10.8	7.2	7.0	10.9	9.2
1998	0.5	7.9	4.4	3.8	2.2	8.2	8.9	4.0	3.9	26.4	13.2	4.5	3.2
1999	7.6	6.5	6.4	7.0	8.5	5.1	0.8	7.6	7.2	9.5	7.6	5.8	5.6
2000	18.3	9.6	5.9	13.5	16.7	8.8	6.4	14.8	14.0	1.7	11.0	7.2	11.4

NA=Not available.

Notes: Major U.S. Energy Companies are the top publicly-owned, U.S.-based crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12. Profitability measured as contribution to net income/net investment in place.

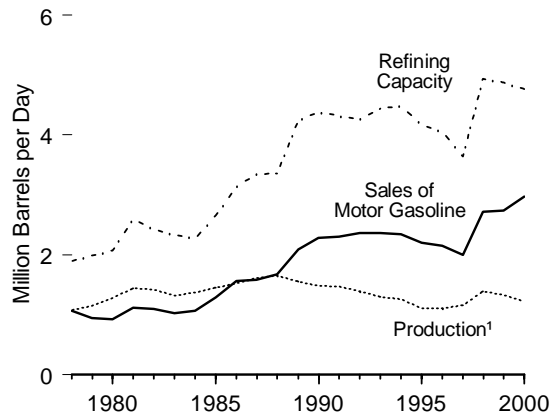
Web Page: <http://www.eia.doe.gov/emeu/finance>.

Sources: 1974-1976—Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System" database, October 1996. 1977 forward—EIA, *Performance Profiles of Major Energy Producers*, annual reports.

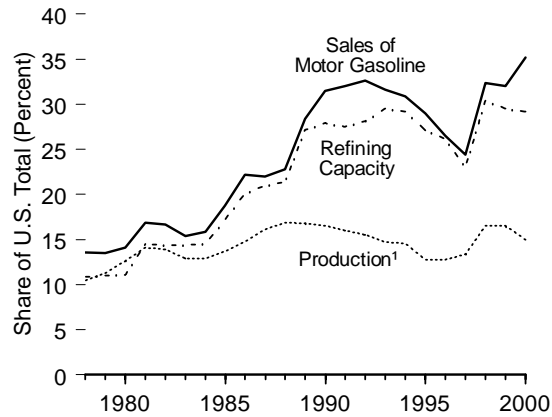


**Figure 3.11 U.S. Energy Activities by Foreign-Affiliated Companies, 1978-2000**

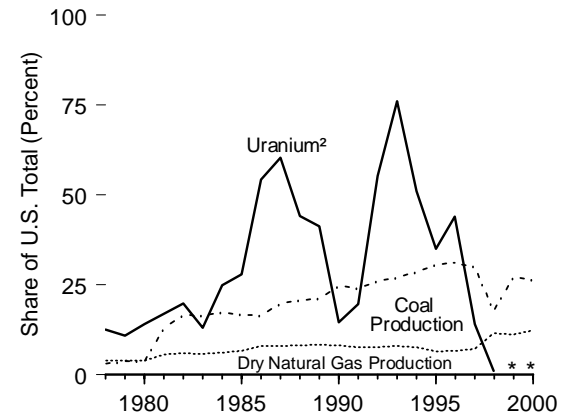
**Petroleum Activities**



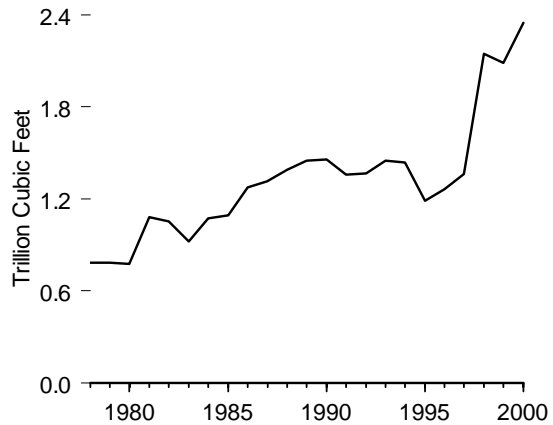
**Petroleum Activities**



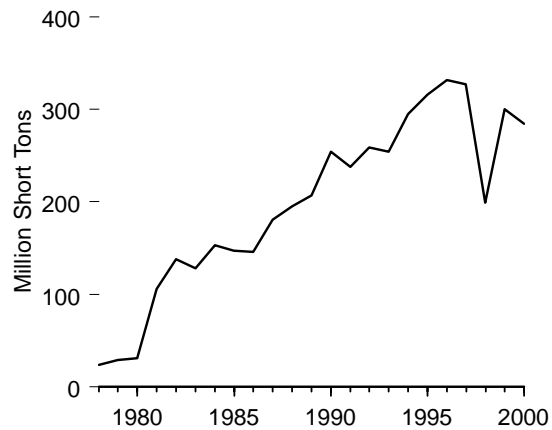
**Natural Gas, Coal, and Uranium Activities**



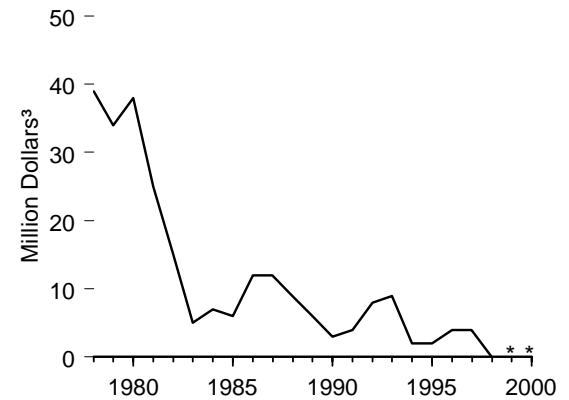
**Dry Natural Gas Production**



**Coal Production**



**Expenditures for Exploration and Development of Uranium**



<sup>1</sup> Crude oil and natural gas liquids.

<sup>2</sup> Expenditures for exploration and development of uranium.

<sup>3</sup> Nominal dollars.

\* 1999 and 2000 uranium values are withheld to avoid disclosure of individual company data.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 3.11.

**Table 3.11 U.S. Energy Activities by Foreign-Affiliated Companies, 1978-2000**

Year	Production				Refining Capacity	Sales of Motor Gasoline	Expenditures for Exploration and Development of Uranium
	Crude Oil and Natural Gas Liquids	Dry Natural Gas	Coal	Uranium <sup>1</sup>			
	Thousand Barrels per Day	Billion Cubic Feet	Million Short Tons	Thousand Pounds			
	Thousand Barrels per Day				Million Dollars <sup>2</sup>		
1978	1,076	783	24	0	1,895	1,066	39
1979	1,145	786	29	0	1,984	948	34
1980	1,280	776	31	0	2,066	926	38
1981	1,438	1,080	106	0	2,595	1,114	25
1982	1,421	1,055	138	0	2,423	1,092	15
1983	1,325	924	128	0	2,337	1,022	5
1984	1,365	1,075	153	0	2,276	1,066	7
1985	1,455	1,093	147	0	2,656	1,285	6
1986	1,523	1,276	146	0	3,133	1,565	12
1987	1,614	1,318	181	0	3,342	1,586	12
1988	1,659	1,392	195	0	3,356	1,673	9
1989	1,553	1,452	207	0	4,243	2,084	6
1990	1,481	1,457	254	0	4,379	2,282	3
1991	1,469	1,360	238	0	4,312	2,299	4
1992	1,392	1,368	259	0	4,256	2,369	8
1993	1,299	1,451	254	0	4,440	2,362	9
1994	1,261	1,439	295	0	4,479	2,346	2
1995	1,103	1,191	316	0	4,164	2,204	2
1996	1,105	1,265	332	0	4,050	2,145	4
1997	1,154	1,361	327	0	3,637	1,998	4
1998	1,389	R <sup>2</sup> 1,149	R <sup>1</sup> 199	0	R <sup>4</sup> 4,940	2,721	(s)
1999	1,334	2,089	300	<sup>3</sup> 3,703	4,877	2,737	W
2000	1,214	2,349	284	2,941	4,763	2,971	W
Share of U.S. Total (Percent)							
1978	10.5	3.9	3.1	0.0	10.9	13.6	12.5
1979	11.3	4.0	3.8	0.0	11.0	13.5	10.8
1980	12.6	4.0	3.8	0.0	11.1	14.1	14.1
1981	14.1	5.6	12.9	0.0	14.5	16.9	17.0
1982	13.9	5.9	16.6	0.0	14.4	16.7	19.8
1983	12.9	5.8	16.5	0.0	14.4	15.4	13.0
1984	12.9	6.2	17.3	0.0	14.5	15.9	24.9
1985	13.7	6.7	16.8	0.0	17.2	18.8	27.9
1986	14.8	8.0	16.5	0.0	20.1	22.2	54.3
1987	16.1	8.0	19.8	0.0	21.0	22.0	60.4
1988	16.9	8.1	20.6	0.0	21.4	22.8	44.2
1989	16.8	8.4	21.2	0.0	27.2	28.4	41.2
1990	16.5	8.2	24.7	0.0	27.9	31.5	14.6
1991	16.0	7.7	24.0	0.0	27.5	32.0	19.7
1992	15.5	7.7	26.0	0.0	28.1	32.6	55.2
1993	14.7	8.0	27.0	0.0	29.5	31.6	76.0
1994	14.6	7.7	28.6	0.0	29.2	30.9	51.0
1995	12.8	6.4	30.7	0.0	27.1	29.0	35.0
1996	12.8	6.7	31.2	0.0	26.2	26.5	44.0
1997	13.4	7.2	30.0	0.0	23.0	24.4	14.0
1998	R <sup>1</sup> 16.5	R <sup>1</sup> 11.5	R <sup>1</sup> 17.8	0.0	R <sup>3</sup> 30.4	32.4	1.0
1999	16.5	11.2	27.2	<sup>3</sup> 80.3	29.5	32.0	W
2000	15.0	12.4	26.4	74.3	29.2	35.2	W

<sup>1</sup> The uranium share is a percent of U.S. total uranium concentrate production.

<sup>2</sup> Nominal dollars.

<sup>3</sup> Includes a small amount produced by a U.S. company, which left the industry by the close of 1999.

R=Revised. (s)=Less than 0.5 million dollars. W=Value withheld to avoid disclosure of individual company data.

Web Page: <http://www.eia.doe.gov/emeu/finance>.

Sources: **Uranium Production:** Energy Information Administration (EIA), *Uranium Industry Annual 2001* (May 2002), Table 5, and analysis by the Office of Energy Markets and End Use, Financial Analysis Team. **All Other Data:** 1978-1992—EIA, *Profiles of Foreign Direct Investment in U.S. Energy*, annual report. 1993—EIA, *Profiles of Foreign Direct Investment in U.S. Energy 1993* (May 1995), Tables 7, 9, 10, 11, and 12. 1994-1997—EIA, *Performance Profiles of Major Energy Producers*, annual reports. 1998-2000—EIA, *Profiles of Foreign Direct Investment in U.S. Energy in 2000* (August 2002).

**Table 3.12 Companies Reporting to the Financial Reporting System, 1974-2000**

Company	1974-1981	1982	1983-84	1985-86	1987	1988	1989-90	1991	1992-93	1994-96	1997	1998	1999	2000
Amerada Hess Corporation	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American Petrofina Holding Company <sup>1</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American Petrofina Inc. <sup>1</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Anadarko Petroleum Corporation							X	X	X			X	X	X
Apache Corporation														X
Ashland Oil, Inc. <sup>2</sup>	X	X	X	X	X	X	X	X	X	X	X			
Atlantic Richfield Co. (ARCO)	X	X	X	X	X	X	X	X	X	X	X	X	X	
BP America, Inc. <sup>3,4</sup>					X	X	X	X	X	X	X	X	X	
BP Amoco, Inc. <sup>3,5</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Burlington Northern Inc. <sup>6</sup>	X	X	X	X	X									
Burlington Resources Inc. <sup>6</sup>						X	X	X	X	X	X	X	X	X
Chevron Corporation <sup>7,8</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Citgo Petroleum Corporation												X	X	X
Cities Service <sup>9</sup>	X	X												
The Coastal Corporation	X	X	X	X	X	X	X	X	X	X	X	X	X	
Conoco <sup>10,11</sup>	X											X	X	X
Devon Energy Corporation														X
Dominion Resources														X
E.I. du Pont de Nemours and Co. <sup>10,11</sup>		X	X	X	X	X	X	X	X	X	X			
El Paso Energy Corporation													X	X
Enron Corporation									X	X	X	X	X	X
EOG Resources														X
Equilon Enterprises, LLC <sup>12</sup>												X	X	X
Exxon Mobil Corporation <sup>13</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Getty Oil <sup>14</sup>	X	X	X											
Gulf Oil <sup>8</sup>	X	X	X											
Kerr-McGee Corporation <sup>15</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LYONDELL-CITGO Refining, LP <sup>16</sup>												X	X	X
Marathon <sup>17</sup>	X													
Mobil Corporation <sup>13,18</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Motiva Enterprises, LLC <sup>19</sup>												X	X	X
Nerco, Inc. <sup>20</sup>									X					
Occidental Petroleum Corporation <sup>9</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Oryx Energy Company <sup>15,21</sup>						X	X	X	X	X	X			
Phillips Petroleum Company	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Premcor Refining Group <sup>22</sup>												X	X	X
Shell Oil Company	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sonat Inc.											X	X		
Standard Oil Co. (Ohio) (Sohio) <sup>5</sup>	X	X	X	X										
Sunoco <sup>21,23</sup>	X	X	X	X	X	X	X	X	X	X		X	X	X
Superior Oil <sup>18</sup>	X	X	X											
Tenneco Inc. <sup>24</sup>	X	X	X	X	X	X								
Tesoro Petroleum Corporation												X	X	X
Texaco Inc. <sup>14</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tosco Corporation												X	X	X
Total Petroleum (North America) Ltd. <sup>25</sup>							X	X						
Ultramar Diamond Shamrock Corporation												X	X	X
Union Pacific Resources Group, Inc. <sup>26</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Unocal Corporation	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USX Corporation <sup>17</sup>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Valero Energy Corporation												X	X	X
The Williams Companies, Inc.												X	X	X

Footnotes: See the following page.

Note: "X" indicates that the company was included in the Financial Reporting System for the year indicated.

Web Page: <http://www.eia.doe.gov/emeu/finance>.

Source: Energy Information Administration, Form EIA-28, "Financial Reporting System."

## Footnotes for Table 3.12

<sup>1</sup>American Petrofina, Inc. changed its name to Fina, Inc., effective April 17, 1991.

<sup>2</sup>Ashland was dropped from the Financial Reporting System (FRS) for 1998 after spinning off downstream and coal operations and disposing of upstream operations.

<sup>3</sup>Amoco merged with British Petroleum plc and became BP Amoco plc on December 31, 1998. BP America was renamed BP Amoco, Inc. The companies reported separately for 1998.

<sup>4</sup>In 1987, British Petroleum acquired all shares in Standard Oil Company (Ohio) that it did not already control and renamed its U.S. affiliate, BP America, Inc.

<sup>5</sup>Formerly Standard Oil Company (Indiana).

<sup>6</sup>Burlington Resources was added to the FRS and Burlington Northern was dropped for 1988. Data for Burlington Resources covers the full year 1988 even though that company was not created until May of that year.

<sup>7</sup>Formerly Standard Oil Company of California.

<sup>8</sup>Chevron acquired Gulf Oil in 1984, but separate data for Gulf continued to be available for the full 1984 year.

<sup>9</sup>Occidental acquired Cities Service in 1982. Separate financial reports were available for 1982, so each company continued to be treated separately until 1983.

<sup>10</sup>DuPont acquired Conoco in 1981. Separate data for Conoco were available for 1981; DuPont was included in the FRS in 1982.

<sup>11</sup>Dupont was dropped from the FRS when Conoco was spun-off in 1998. Conoco began reporting separately again in 1998.

<sup>12</sup>Equilon is a joint venture combining Shell's and Texaco's western and midwestern U.S. refining and marketing businesses and nationwide trading transportation and lubricants businesses. Net income is duplicated in the FRS system since Shell and Texaco account for this investment using the equity method.

<sup>13</sup>In December 1998, Exxon and Mobil agreed to merge. Both companies reported separately for 1998.

<sup>14</sup>Texaco acquired Getty in 1984; however, Getty was treated as a separate FRS company for that year.

<sup>15</sup>In 1998, Kerr-McGee and Oryx merged. The financial reporting for both was consolidated under Kerr-McGee for 1998.

<sup>16</sup>LYONDELL-CITGO is a limited partnership owned by Lyondell Chemical Company and Citgo. There will be some duplication of net income since Citgo accounts for its investment using the equity method.

<sup>17</sup>U.S. Steel (now USX) acquired Marathon in 1982.

<sup>18</sup>Mobil acquired Superior in 1984, but both companies were treated separately for that year.

<sup>19</sup>Motiva is a joint venture approximately equally owned by Shell, Texaco and Saudi Refining, Inc. The joint venture combines the company's Gulf and east coast refining and marketing businesses. Duplication exists for the net income related to Shell's and Texaco's interests, which are accounted for under the equity method.

<sup>20</sup>RTZ America acquired the common stock of Nerco, Inc., on Feb. 17, 1994. In Sept. 1993, Nerco, Inc. sold Nerco Oil & Gas, Inc., its subsidiary. Nerco's 1993 submission includes operations of Nerco Oil & Gas, Inc., through Sept. 28, 1993.

<sup>21</sup>Sun Company spun off Sun Exploration and Development Company (later renamed Oryx Energy Company) during 1988. Both companies were included in the FRS for 1988; therefore, some degree of duplication exists for that year.

<sup>22</sup>In May 2000 Clark Refining and Marketing, Inc. changed its name to Premcor Refining Group.

<sup>23</sup>Sun company withdrew from oil and gas exploration and production in 1996. Sun's 1996 submission includes oil and gas exploration and production activities through September 30, 1996. Refining/marketing activities are included for the entire 1996 calendar year.

<sup>24</sup>Tenneco sold its worldwide oil and gas assets and its refining and marketing assets in 1988. Other FRS companies purchased approximately 70 percent of Tenneco's assets.

<sup>25</sup>Effective June 1, 1991, Total's exploration, production, and marketing operations in Canada were spun off to Total Oil & Gas, a new public entity.

<sup>26</sup>Effective October 15, 1996, Union Pacific Corporation distributed its ownership in the Union Pacific Resources Group, Inc. to its shareholders. Prior to 1996, the FRS included Union Pacific Corporation. The FRS includes only Union Pacific Resources Group, Inc. for 1996.

## Energy Resources

### Table 3.5 Sources

**Natural Gas:** • 1949-1962—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT110. • 1963—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT125. • 1964-1971—Bureau of the Census, *U.S. Imports for Consumption and General Imports*, FT246. • 1972 and 1973—Federal Power Commission, *Pipeline Imports and Exports of Natural Gas-Imports and Exports of LNG*. • 1974-1977—Federal Power Commission, *United States Imports and Exports of Natural Gas*, annual reports. • 1978-1981—Energy Information Administration (EIA), *U.S. Imports and Exports of Natural Gas*, annual reports. • 1982-1998—EIA, *Natural Gas*

*Monthly*, monthly reports. 1999-2000—EIA, *Natural Gas Monthly*, (August 2001). • 2001—Calculated from EIA, *Natural Gas Monthly*, (March 2002), Tables 5 and 6. **Crude Oil and Petroleum Products:** • 1949-1962—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT110. • 1963—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT125. • 1964-1988—Bureau of the Census, *U.S. Imports for Consumption*, FT135. • 1989 forward—Bureau of the Census, Foreign Trade Division, *U.S. Merchandise Trade*, FT900, “Exports and Imports of Goods by Principal SITC Commodity Groupings,” December issues. **Coal:** Bureau of the Census, Foreign Trade Division, unpublished data.

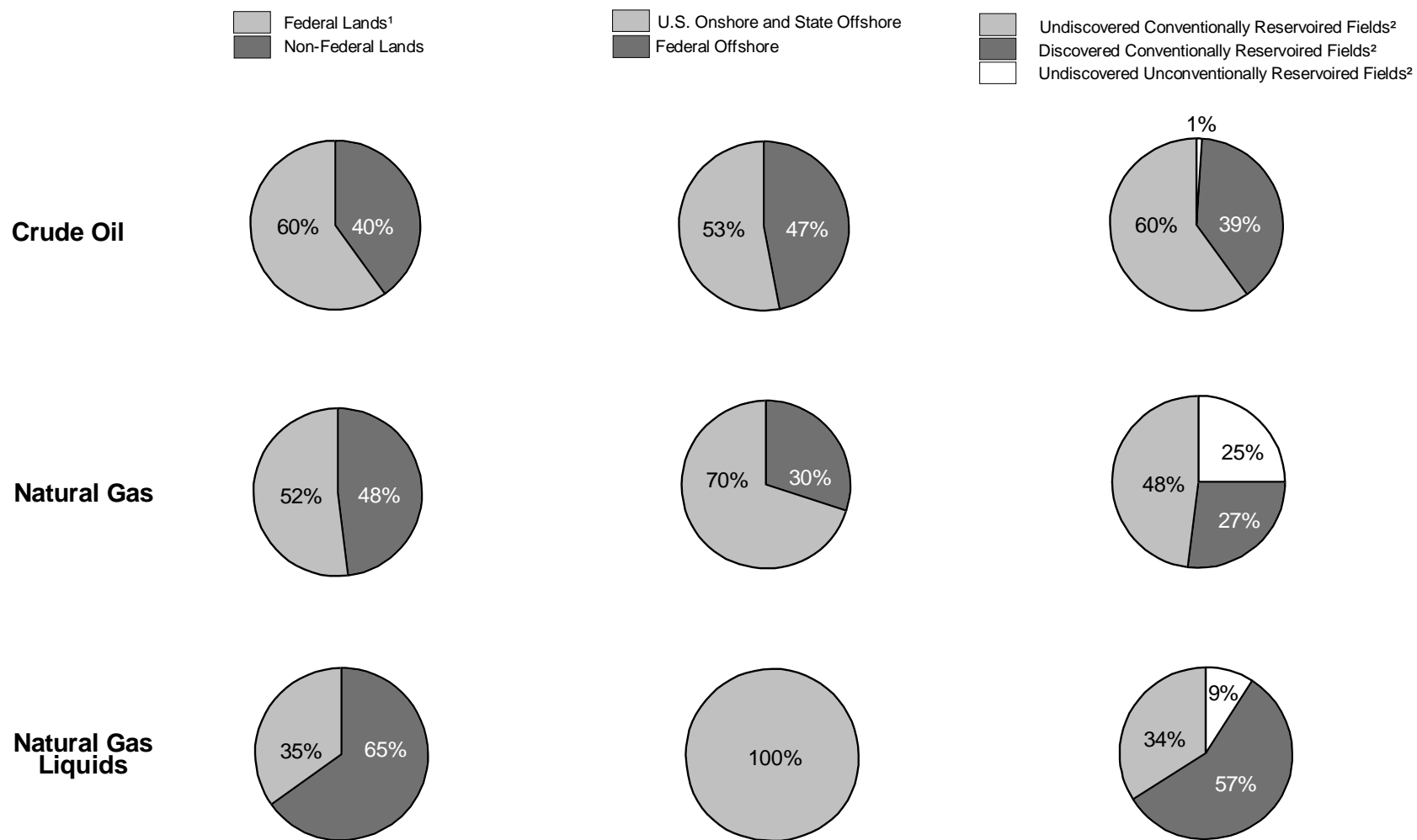
# 4

## Energy Resources



Semisubmersible drilling rig in the Gulf of Mexico. Source: U.S. Department of Energy.

**Figure 4.1 Technically Recoverable Petroleum Resource Estimates as of 2001**



<sup>1</sup> Lands owned or under the jurisdiction of the Federal government.

<sup>2</sup> See Note 1 at end of section.

Source: Table 4.1.

**Table 4.1 Technically Recoverable Petroleum Resource Estimates as of 2001**

Region	Crude Oil (billion barrels)			Natural Gas (Dry) (trillion cubic feet)			Natural Gas Liquids (billion barrels)		
	Federal Lands <sup>1</sup>	Non-Federal Lands	Total	Federal Lands <sup>1</sup>	Non-Federal Lands	Total	Federal Lands <sup>1</sup>	Non-Federal Lands	Total
<b>Undiscovered Conventionally Reservoired Fields</b> .....	<b>82.54</b>	<b>22.51</b>	<b>105.05</b>	<b>420.14</b>	<b>261.78</b>	<b>681.92</b>	<b>1.80</b>	<b>6.25</b>	<b>8.05</b>
Alaska Onshore and State Offshore .....	3.75	4.68	8.43	33.97	95.37	129.34	0.54	0.61	1.15
Alaska Federal Offshore .....	24.90	—	24.90	122.60	—	122.60	0.00	—	0.00
48 States Onshore and State Offshore .....	3.79	17.83	21.62	23.97	166.41	190.38	1.26	5.64	6.90
48 States Federal Offshore .....	50.10	—	50.10	239.60	—	239.60	0.00	—	0.00
<b>Discovered Conventionally Reservoired Fields (Ultimate Recovery Appreciation)<sup>2</sup></b> .....	<b>22.03</b>	<b>45.67</b>	<b>67.70</b>	<b>186.70</b>	<b>203.30</b>	<b>390.00</b>	<b>4.94</b>	<b>8.46</b>	<b>13.40</b>
U.S. Onshore and State Offshore .....	14.33	45.67	60.00	118.70	203.30	322.00	4.94	8.46	13.40
U.S. Federal Offshore .....	7.70	—	7.70	68.00	—	68.00	0.00	—	0.00
<b>Undiscovered Unconventionally Reservoired Fields (Continuous-Type Deposits (all onshore))</b> .....	<b>0.32</b>	<b>1.75</b>	<b>2.07</b>	<b>143.16</b>	<b>215.55</b>	<b>358.71</b>	<b>1.45</b>	<b>0.67</b>	<b>2.12</b>
<b>U.S. Total</b> .....	<b>104.89</b>	<b>69.93</b>	<b>174.82</b>	<b>750.00</b>	<b>680.63</b>	<b>1,430.63</b>	<b>8.19</b>	<b>15.38</b>	<b>23.57</b>
U.S. Onshore and State Offshore .....	22.19	69.93	92.12	319.80	680.63	1,000.43	8.19	15.38	23.57
Federal Offshore .....	82.70	—	82.70	430.20	—	430.20	0.00	—	0.00

<sup>1</sup> Lands owned or under the jurisdiction of the Federal government.

<sup>2</sup> Proved Reserves are excluded from these estimates.

— = Not applicable.

Notes: See Note 1 at end of section. Resource estimates are as of the latest estimates generated by the U.S. Department of the Interior, U.S. Geological Survey (USGS) and the Minerals Management Service (MMS). They were not necessarily generated in the current year. Onshore indicates estimates for all Onshore plus State Offshore waters (near-shore, shallow-water areas under State jurisdiction).

Federal Onshore excludes Indian and Native lands even when Federally managed in trust. The estimates of ultimate recovery appreciation for Onshore and State Offshore lands were imputed by

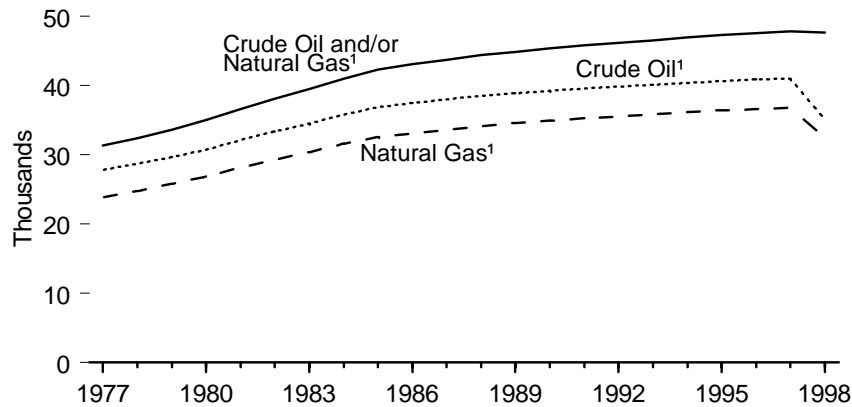
assuming that the total estimates reported by the USGS could be apportioned according to the ratio of 1996 production from onshore Federal lands to total U.S. production. Federal Offshore indicates MMS estimates for Federal Offshore jurisdictions (Outer Continental Shelf and deeper water areas seaward of State Offshore). A value of zero indicates either that none exists in this area or that no estimate of this resource has been made for this area.

Source: Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 2000 Annual Report* (December 2001), Table G1, which in turn is based on the latest resource estimates generated by the U.S. Department of the Interior, U.S. Geological Survey and the Minerals Management Service.

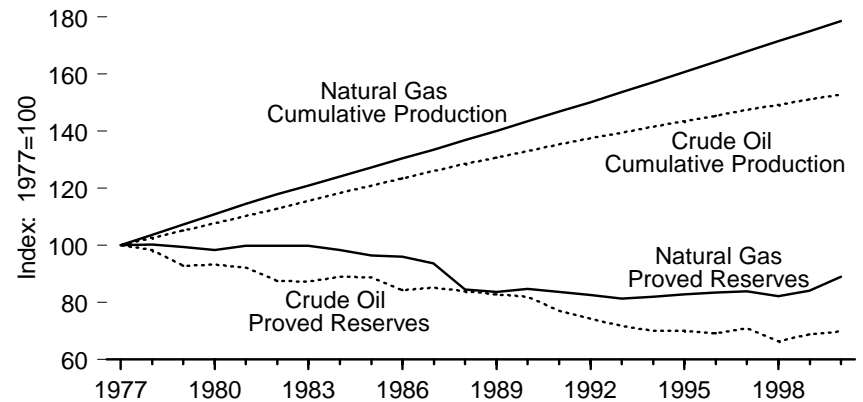


**Figure 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery**

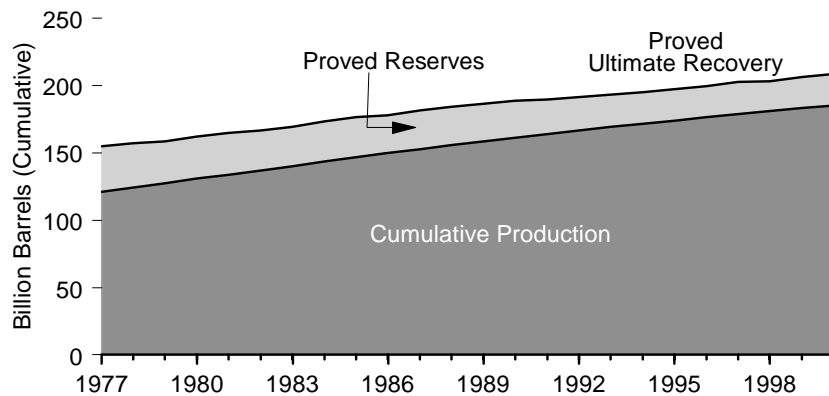
**Cumulative Number of Fields, 1977-1998**



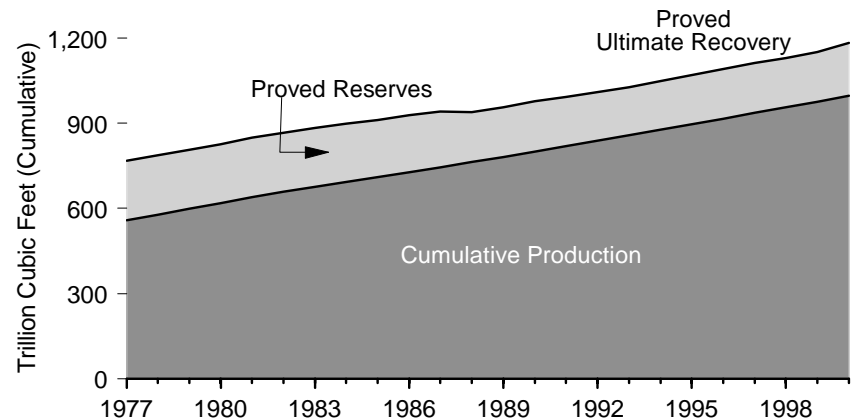
**Cumulative Production and Proved Reserves, Indexed, 1977-2000**



**Crude Oil, 1977-2000**



**Natural Gas, 1977-2000**



<sup>1</sup> There is a discontinuity in this time series between 1997 and 1998 due to the absence of updates for a subset of the data used in the past.

Notes: Data are at end of year. Crude oil includes lease condensate. Natural gas is wet, after lease separation.

Source: Table 4.2.

**Table 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery, 1977-2000**

Year	Cumulative Number of Fields with Crude Oil and/or Natural Gas	Cumulative Number of Fields with Crude Oil	Crude Oil and Lease Condensate (billion barrels)			Cumulative Number of Fields with Natural Gas	Natural Gas <sup>1</sup> (trillion cubic feet)		
			Cumulative Production	Proved Reserves	Proved Ultimate Recovery		Cumulative Production	Proved Reserves	Proved Ultimate Recovery
1977	31,360	27,835	121.4	33.6	155.0	23,883	558.3	209.5	767.8
1978	32,430	28,683	124.6	33.1	157.6	24,786	578.4	210.1	788.5
1979	33,644	29,671	127.7	31.2	158.9	25,823	599.1	208.3	807.4
1980	34,999	30,766	130.8	31.3	162.2	26,919	619.4	206.3	825.6
1981	36,621	32,111	133.9	31.0	165.0	28,213	639.4	209.4	848.9
1982	38,123	33,375	137.1	29.5	166.6	29,375	658.1	209.3	867.4
1983	39,489	34,495	140.3	29.3	169.6	30,419	675.1	209.0	884.1
1984	41,038	35,784	143.5	30.0	173.5	31,595	693.5	206.0	899.5
1985	42,317	36,849	146.8	29.9	176.7	32,595	710.9	202.2	913.1
1986	43,076	37,464	150.0	28.3	178.3	33,151	727.8	201.1	928.9
1987	43,742	37,982	153.0	28.7	181.7	33,657	745.4	196.4	941.8
1988	44,414	38,506	156.0	28.2	184.2	34,196	763.4	177.0	940.4
1989	44,883	38,858	158.8	27.9	186.7	34,579	781.7	175.4	957.1
1990	45,385	39,244	161.5	27.6	189.0	34,975	800.4	177.6	978.0
1991	45,776	39,558	164.2	25.9	190.1	35,254	819.1	175.3	994.4
1992	46,149	39,843	166.8	25.0	191.8	35,539	838.0	173.3	1,011.3
1993	46,513	40,124	169.3	24.1	193.4	35,798	857.2	170.5	1,027.7
1994	46,922	40,417	171.7	23.6	195.3	36,142	877.1	171.9	1,049.1
1995	47,296	40,694	174.1	23.5	197.7	36,433	896.9	173.5	1,070.4
1996	47,557	40,875	176.5	23.3	199.8	36,612	917.0	175.1	1,092.1
1997	47,854	40,977	178.9	23.9	202.8	36,830	937.1	175.7	1,112.8
1998	<sup>2</sup> 47,664	<sup>2</sup> 35,143	181.2	22.4	203.5	<sup>2</sup> 32,458	957.0	172.4	1,129.4
1999	NA	NA	183.3	23.2	206.5	NA	976.8	176.2	1,153.0
2000	NA	NA	185.4	23.5	208.9	NA	997.0	186.5	1,183.5

<sup>1</sup> Wet, after lease separation.

<sup>2</sup> There is a discontinuity in this time series between 1997 and 1998 due to the absence of updates for a subset of the data used in the past.

NA=Not available.

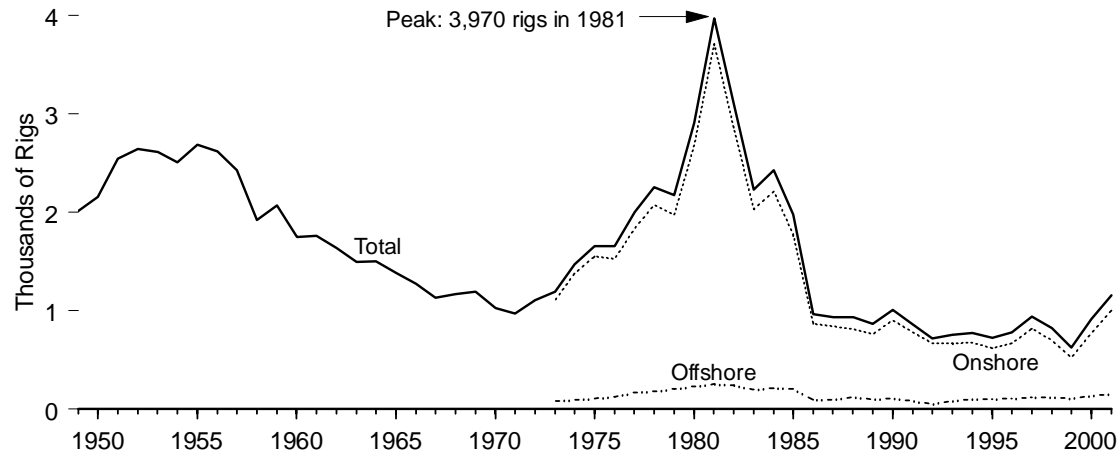
Note: Data are at end of year.

Web Page: [http://www.eia.doe.gov/oil\\_gas/natural\\_gas/nat\\_frame.html](http://www.eia.doe.gov/oil_gas/natural_gas/nat_frame.html).

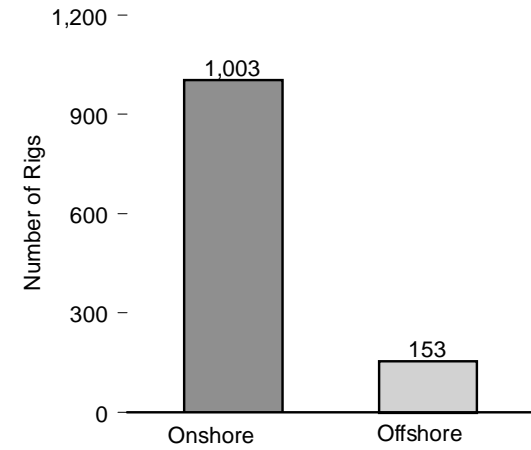
Sources: **Cumulative Production:** Calculated from Energy Information Administration (EIA), *Petroleum Supply Annual*, annual reports and *Natural Gas Annual*, annual reports. **Proved Reserves:** 1977-1999—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, annual reports. 2000—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves* (December 2001), Tables 6, 9, and 15. **Field Counts:** EIA, *Oil and Gas Field Code Master List*, annual reports, and EIA, Office of Oil and Gas, Oil and Gas Integrated Field File.

**Figure 4.3 Crude Oil and Natural Gas Rotary Rigs in Operation**

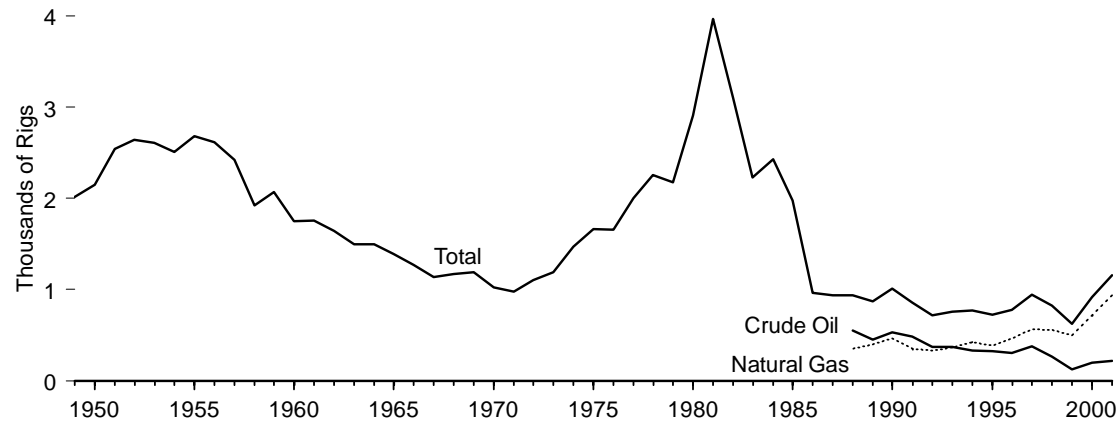
**By Site, 1949-2001**



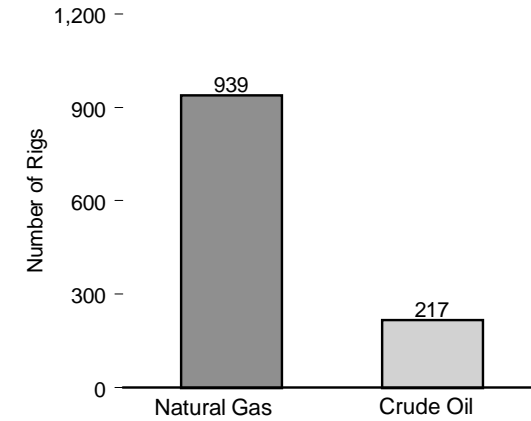
**By Site, 2001**



**By Type, 1949-2001**



**By Type, 2001**



Source: Table 4.3.

**Table 4.3 Crude Oil and Natural Gas Rotary Rigs in Operation, 1949-2001**

Year	By Site		By Objective		Total <sup>1</sup>
	Onshore	Offshore	Crude Oil	Natural Gas	
1949	NA	NA	NA	NA	2,017
1950	NA	NA	NA	NA	2,154
1951	NA	NA	NA	NA	2,543
1952	NA	NA	NA	NA	2,641
1953	NA	NA	NA	NA	2,613
1954	NA	NA	NA	NA	2,508
1955	NA	NA	NA	NA	2,686
1956	NA	NA	NA	NA	2,620
1957	NA	NA	NA	NA	2,426
1958	NA	NA	NA	NA	1,922
1959	NA	NA	NA	NA	2,071
1960	NA	NA	NA	NA	1,748
1961	NA	NA	NA	NA	1,761
1962	NA	NA	NA	NA	1,641
1963	NA	NA	NA	NA	1,499
1964	NA	NA	NA	NA	1,501
1965	NA	NA	NA	NA	1,388
1966	NA	NA	NA	NA	1,272
1967	NA	NA	NA	NA	1,135
1968	NA	NA	NA	NA	1,169
1969	NA	NA	NA	NA	1,194
1970	NA	NA	NA	NA	1,028
1971	NA	NA	NA	NA	976
1972	NA	NA	NA	NA	1,107
1973	1,110	84	NA	NA	1,194
1974	1,378	94	NA	NA	1,472
1975	1,554	106	NA	NA	1,660
1976	1,529	129	NA	NA	1,658
1977	1,834	167	NA	NA	2,001
1978	2,074	185	NA	NA	2,259
1979	1,970	207	NA	NA	2,177
1980	2,678	231	NA	NA	2,909
1981	3,714	256	NA	NA	3,970
1982	2,862	243	NA	NA	3,105
1983	2,033	199	NA	NA	2,232
1984	2,215	213	NA	NA	2,428
1985	1,774	206	NA	NA	1,980
1986	865	99	NA	NA	964
1987	841	95	NA	NA	936
1988	813	123	554	354	936
1989	764	105	453	401	869
1990	902	108	532	464	1,010
1991	779	81	482	351	860
1992	669	52	373	331	721
1993	672	82	373	364	754
1994	673	102	335	427	775
1995	622	101	323	385	723
1996	671	108	306	464	779
1997	821	122	376	564	943
1998	703	123	264	560	827
1999	519	106	128	496	625
2000	778	140	197	720	918
2001	1,003	153	217	939	1,156

<sup>1</sup> Sum of rigs drilling for crude oil, rigs drilling for natural gas, and other rigs (not shown) drilling for miscellaneous purposes such as service wells, injection wells, and stratigraphic tests.

NA=Not available.

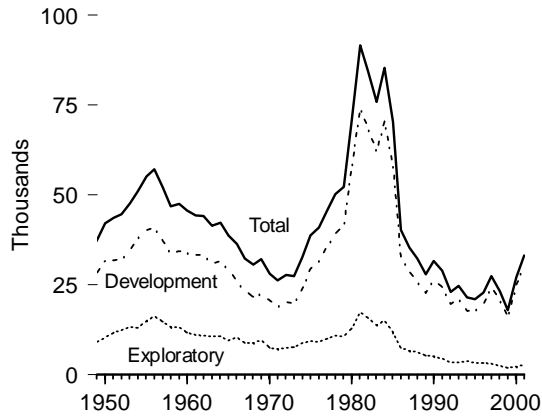
Notes: Data are not for the exact calendar year but are an average for the 52 or 53 consecutive whole

weeks that most nearly coincide with the calendar year. Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components due to independent rounding.

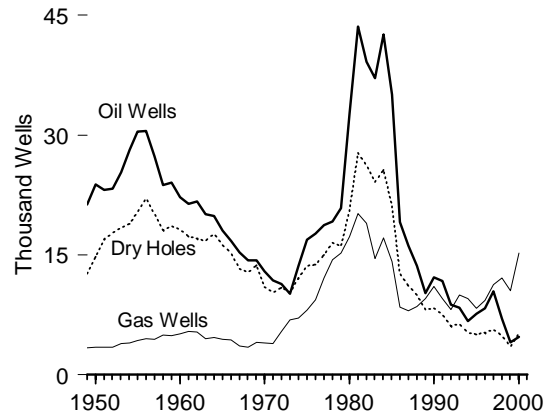
Source: Baker Hughes, Inc., Houston, Texas, *Rotary Rigs Running—By State*.

**Figure 4.4 Crude Oil and Natural Gas Exploratory and Development Wells**

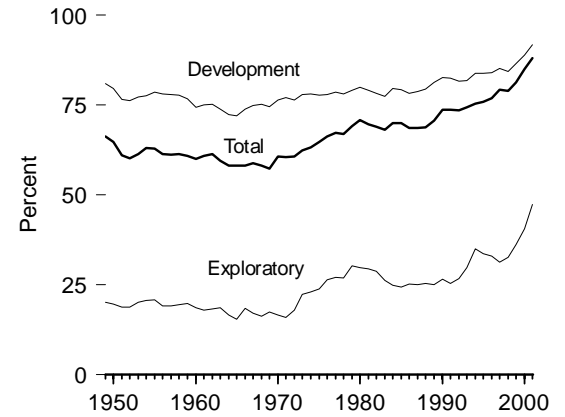
**Total Wells Drilled, 1949-2001**



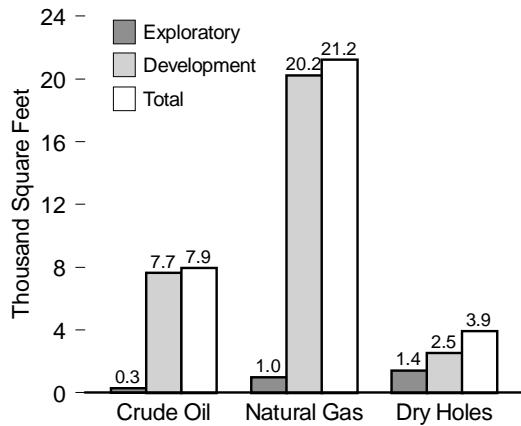
**Wells Drilled by Type, 1949-2001**



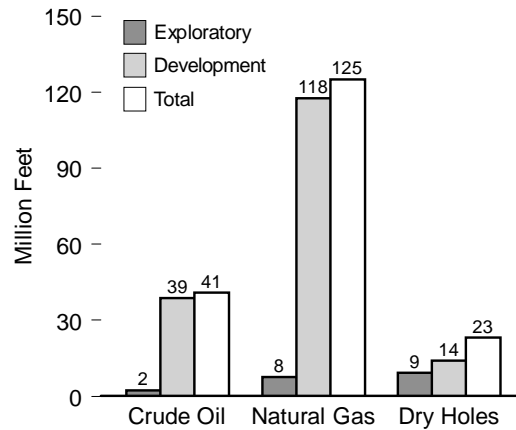
**Successful Wells, 1949-2001**



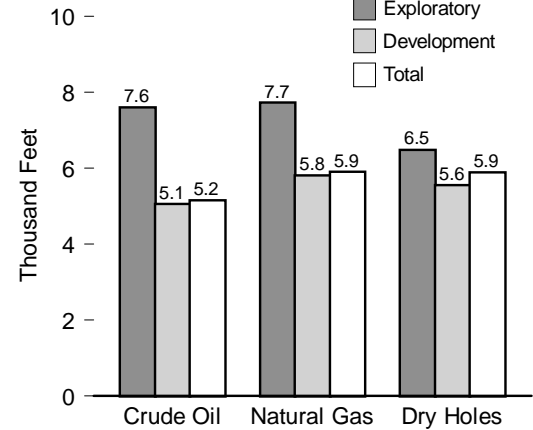
**Wells Drilled, 2001**



**Footage Drilled, 2001**



**Average Depth, 2001**



Sources: Tables 4.4-4.6.

**Table 4.4 Crude Oil and Natural Gas Exploratory and Development Wells, 1949-2001**

Year	Wells Drilled				Successful Wells (percent)	Footage Drilled (thousand feet)				Average Depth (feet per well)			
	Crude Oil	Natural Gas	Dry Holes	Total		Crude Oil	Natural Gas	Dry Holes	Total	Crude Oil	Natural Gas	Dry Holes	Total
1949	21,352	3,363	12,597	37,312	66.2	79,428	12,437	43,754	135,619	3,720	3,698	3,473	3,635
1950	23,812	3,439	14,799	42,050	64.8	92,695	13,685	50,977	157,358	3,893	3,979	3,445	3,742
1951	23,179	3,438	17,026	43,643	61.0	95,106	13,947	63,093	172,146	4,103	4,056	3,706	3,944
1952	23,290	3,514	17,759	44,563	60.1	98,148	15,257	70,730	184,133	4,214	4,342	3,983	4,132
1953	25,323	3,968	18,449	47,740	61.4	102,136	18,248	73,862	194,245	4,033	4,599	4,004	4,069
1954	28,141	4,038	18,930	51,109	63.0	113,362	18,857	75,790	208,009	4,028	4,670	4,004	4,070
1955	30,432	4,266	20,452	55,150	62.9	121,148	19,930	85,103	226,182	3,981	4,672	4,161	4,101
1956	30,528	4,531	22,111	57,170	61.3	120,352	22,738	90,190	233,280	3,942	5,018	4,079	4,080
1957	27,364	4,475	20,156	51,995	61.2	110,043	23,836	83,167	217,045	4,021	5,326	4,126	4,174
1958	23,774	5,005	18,162	46,941	61.3	93,105	25,555	74,643	193,304	3,916	5,106	4,110	4,118
1959	24,043	4,931	18,589	47,563	60.9	94,611	26,606	79,476	200,694	3,935	5,396	4,275	4,220
1960	22,258	5,149	18,212	45,619	60.1	86,568	28,246	77,361	192,176	3,889	5,486	4,248	4,213
1961	21,437	5,486	17,331	44,254	60.8	85,626	29,292	74,716	189,633	3,994	5,339	4,311	4,285
1962	21,727	5,353	17,078	44,158	61.3	88,431	28,949	77,253	194,634	4,070	5,408	4,524	4,408
1963	20,135	4,570	16,762	41,467	59.6	81,809	24,533	76,307	182,649	4,063	5,368	4,552	4,405
1964	19,905	4,694	17,694	42,293	58.2	80,463	25,598	81,360	187,420	4,042	5,453	4,598	4,431
1965	18,065	4,482	16,226	38,773	58.2	73,322	24,931	76,629	174,882	4,059	5,562	4,723	4,510
1966	16,780	4,377	15,227	36,384	58.1	67,340	25,948	69,636	162,924	4,013	5,928	4,573	4,478
1967	15,329	3,659	13,246	32,234	58.9	58,634	21,581	61,142	141,357	3,825	5,898	4,616	4,385
1968	14,331	3,456	12,812	30,599	58.1	59,517	20,716	64,737	144,970	4,153	5,994	5,053	4,738
1969	14,368	4,083	13,736	32,187	57.3	61,582	24,162	71,364	157,108	4,286	5,918	5,195	4,881
1970	12,968	4,011	11,031	28,010	60.6	56,859	23,623	58,074	138,556	4,385	5,860	5,265	4,943
1971	11,853	3,971	10,309	26,133	60.6	49,109	23,460	54,685	127,253	4,126	5,890	5,305	4,858
1972	11,378	5,440	10,891	27,709	60.7	49,269	30,006	58,556	137,831	4,330	5,516	5,377	4,974
1973	10,167	6,933	10,320	27,420	62.4	44,416	38,045	55,761	138,223	4,369	5,488	5,403	5,041
1974	13,647	7,138	12,116	32,901	63.2	52,025	38,449	62,899	153,374	3,812	5,387	5,191	4,662
1975	16,948	8,127	13,646	38,721	64.8	66,819	44,454	69,220	180,494	3,943	5,470	5,073	4,661
1976	17,688	9,409	13,758	40,855	66.3	68,892	49,113	68,977	186,982	3,895	5,220	5,014	4,577
1977	18,745	12,122	14,985	45,852	67.3	75,451	63,686	76,728	215,866	4,025	5,254	5,120	4,708
1978	19,181	14,413	16,551	50,145	67.0	R77,041	R75,841	R85,788	238,669	R4,017	5,262	5,183	4,760
1979	20,851	15,254	16,099	52,204	69.2	82,688	80,468	81,642	244,798	3,966	5,275	5,071	4,689
1980	32,639	17,333	20,638	70,610	70.8	R124,350	R91,484	R98,820	314,654	R3,810	5,278	R4,788	4,456
1981	43,598	20,166	27,789	91,553	69.6	R171,241	R107,758	R134,113	413,112	R3,928	R5,344	R4,826	4,512
1982	39,199	18,979	26,219	84,397	68.9	R148,881	R106,627	R122,787	378,295	R3,798	R5,618	4,683	4,482
1983	37,120	14,564	24,153	75,837	68.2	R136,078	R77,530	R104,378	317,986	R3,666	R5,323	R4,322	4,193
1984	42,605	17,127	25,681	85,413	69.9	R161,770	R90,578	R119,044	371,392	R3,797	5,289	R4,635	4,348
1985	35,118	14,168	21,056	70,342	70.1	R137,366	R75,862	R99,816	313,045	R3,912	R5,355	R4,740	4,450
1986	19,097	8,516	12,678	40,291	68.5	R76,622	R44,727	R60,507	181,856	R4,012	R5,252	R4,773	4,514
1987	16,164	8,055	11,112	35,331	68.5	R66,317	R42,479	R53,382	162,178	4,103	R5,274	R4,804	4,590
1988	13,636	8,555	10,041	32,232	68.8	R58,660	R45,320	R52,375	156,354	R4,302	R5,297	R5,216	4,851
1989	10,204	9,539	8,188	27,931	70.7	R43,287	R49,169	R41,983	134,439	R4,242	R5,154	R5,127	4,813
1990	12,198	11,044	8,313	31,555	73.7	R54,480	R55,869	R43,352	153,701	R4,466	R5,059	R5,215	4,871
1991	11,770	9,526	7,596	28,892	73.7	R54,283	R49,737	R39,001	143,021	R4,612	R5,221	R5,134	4,950
1992	8,757	8,209	6,118	23,084	73.5	R44,183	R45,728	R31,213	121,124	R5,045	R5,571	R5,102	5,247
1993	8,407	10,017	6,328	24,752	74.4	R42,895	R59,720	R32,503	135,118	R5,102	R5,962	R5,136	5,459
1994	6,721	9,538	5,307	21,566	75.4	R36,090	R59,412	R29,306	124,809	R5,370	R6,229	R5,522	5,787
1995	7,627	8,354	5,075	21,056	75.9	R38,024	R51,415	R28,393	117,832	R4,985	R6,154	R5,595	5,596
1996	8,314	9,302	5,282	22,898	76.9	R40,849	R58,062	R30,133	129,045	R4,913	R6,242	R5,705	5,636
1997 <sup>E</sup>	10,436	11,327	5,702	27,465	79.2	R52,098	R70,477	R34,086	156,661	R4,992	R6,222	R5,978	5,704
1998 <sup>E</sup>	7,064	R11,308	4,913	R23,285	R78.9	R38,423	R76,654	R32,259	R147,335	R5,439	R6,779	R6,566	R6,327
1999 <sup>E</sup>	R4,136	R10,411	R3,364	R17,911	R81.2	R19,925	R58,621	R20,864	R99,410	R4,817	R5,631	R6,202	R5,550
2000 <sup>E</sup>	R7,358	R15,598	R4,025	R26,981	R85.1	R34,357	R83,616	R21,975	R139,949	R4,669	R5,361	R5,460	R5,187
2001 <sup>E</sup>	7,949	21,224	3,949	33,122	88.1	41,009	125,287	23,295	189,591	5,159	5,903	5,899	5,724

R=Revised. E=Estimate.

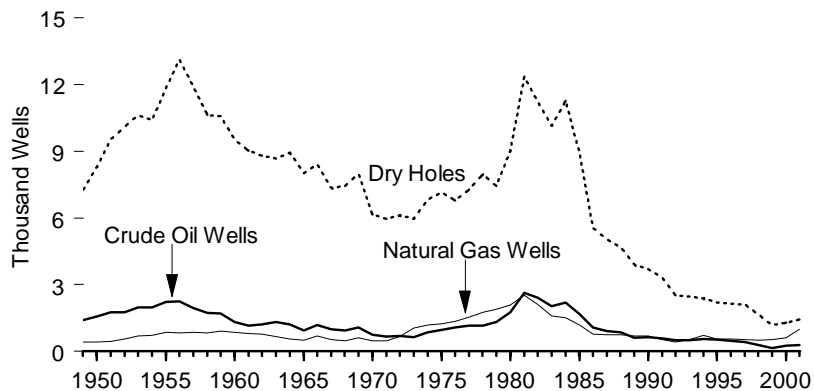
Notes: This table depicts all wells; see Table 4.5 for exploratory wells and Table 4.6 for development wells. Service wells, stratigraphic tests, and core tests are excluded. For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. See Note 2 at end of section. Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent

rounding.

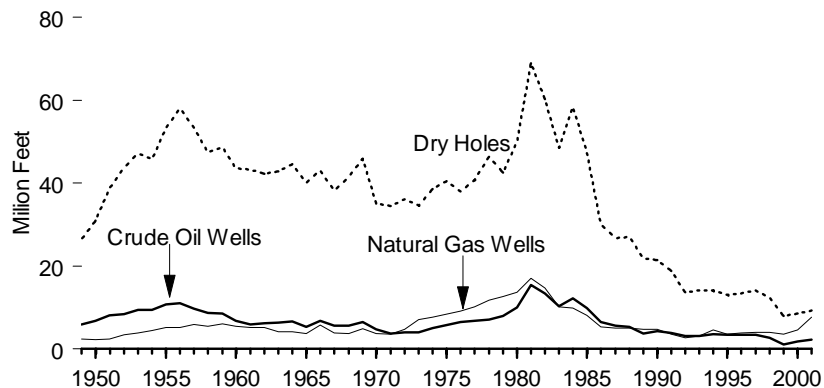
Sources: 1949-1965—Gulf Publishing Company, *World Oil*, "Forecast-Review" issue. 1966-1969—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. 1970-1994—Energy Information Administration (EIA) computations based on well reports submitted to the American Petroleum Institute. 1995 forward—EIA computations based on well reports submitted to the Information Handling Services Energy Group, Inc. For current data see the EIA, *Monthly Energy Review*, Section 5.

**Figure 4.5 Crude Oil and Natural Gas Exploratory Wells, 1949–2001**

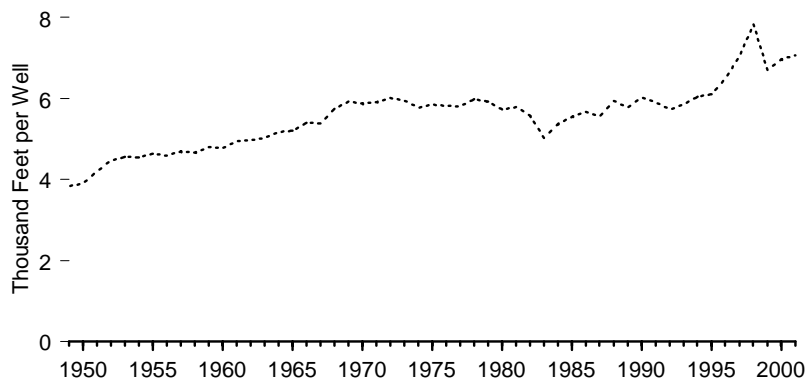
**Exploratory Wells Drilled by Well Type**



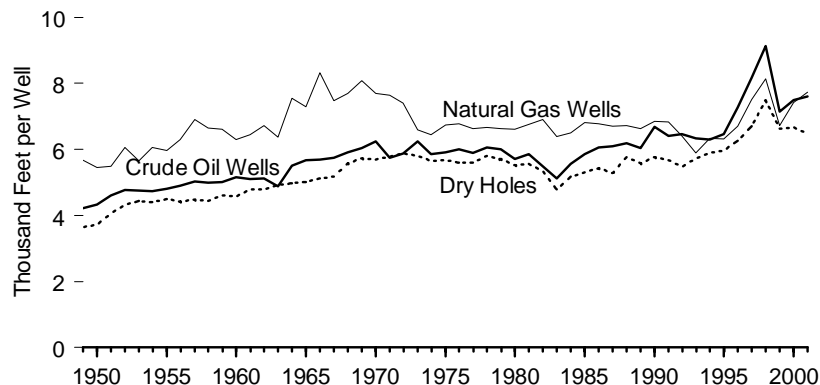
**Exploratory Footage Drilled by Well Type**



**Exploratory Wells Average Depth, All Wells**



**Exploratory Wells Average Depth by Well Type**



Note: This figure depicts exploratory wells only; see Figure 4.4 for all wells and Figure 4.6 for development wells only.

Source: Table 4.5.

**Table 4.5 Crude Oil and Natural Gas Exploratory Wells, 1949-2001**

Year	Wells Drilled				Successful Wells (percent)	Footage Drilled (thousand feet)				Average Depth (feet per well)			
	Crude Oil	Natural Gas	Dry Holes	Total		Crude Oil	Natural Gas	Dry Holes	Total	Crude Oil	Natural Gas	Dry Holes	Total
1949	1,406	424	7,228	9,058	20.2	5,950	2,409	26,439	34,798	4,232	5,682	3,658	3,842
1950	1,583	431	8,292	10,306	19.5	6,862	2,356	30,957	40,175	4,335	5,466	3,733	3,898
1951	1,763	454	9,539	11,756	18.9	8,125	2,496	38,723	49,344	4,609	5,497	4,059	4,197
1952	1,776	559	10,090	12,425	18.8	8,491	3,394	43,731	55,615	4,781	6,071	4,334	4,476
1953	1,981	699	10,633	13,313	20.1	9,432	3,952	47,280	60,664	4,761	5,654	4,447	4,557
1954	1,985	726	10,389	13,100	20.7	9,409	4,399	45,792	59,601	4,740	6,059	4,408	4,550
1955	2,236	874	11,832	14,942	20.8	10,774	5,212	53,220	69,206	4,819	5,964	4,498	4,632
1956	2,267	822	13,118	16,207	19.1	11,111	5,179	58,047	74,337	4,901	6,301	4,425	4,587
1957	1,945	865	11,904	14,714	19.1	9,794	5,967	53,420	69,181	5,036	6,898	4,488	4,702
1958	1,745	822	10,632	13,199	19.4	8,712	5,472	47,300	61,484	4,993	6,657	4,449	4,658
1959	1,702	912	10,577	13,191	19.8	8,545	6,031	48,676	63,253	5,021	6,613	4,602	4,795
1960	1,321	868	9,515	11,704	18.7	6,829	5,466	43,535	55,831	5,170	6,298	4,575	4,770
1961	1,157	813	9,022	10,992	17.9	5,900	5,250	43,293	54,442	5,099	6,457	4,799	4,953
1962	1,211	771	8,815	10,797	18.4	6,205	5,187	42,223	53,616	5,124	6,728	4,790	4,966
1963	1,314	664	8,686	10,664	18.5	6,409	4,230	42,847	53,485	4,878	6,370	4,933	5,016
1964	1,219	557	8,951	10,727	16.6	6,715	4,204	44,578	55,497	5,509	7,547	4,980	5,174
1965	946	515	8,005	9,466	15.4	5,366	3,757	40,081	49,204	5,672	7,295	5,007	5,198
1966	1,196	698	8,419	10,313	18.4	6,817	5,808	43,084	55,709	5,700	8,321	5,117	5,402
1967	986	532	7,360	8,878	17.1	5,678	3,979	38,182	47,839	5,758	7,478	5,188	5,388
1968	954	486	7,439	8,879	16.2	5,642	3,741	41,575	50,958	5,914	7,697	5,589	5,739
1969	1,084	616	8,001	9,701	17.5	6,563	4,985	45,918	57,466	6,054	8,092	5,739	5,924
1970	757	477	6,162	7,396	16.7	4,729	3,678	35,123	43,530	6,247	7,695	5,700	5,885
1971	659	470	5,952	7,081	15.9	3,786	3,610	34,499	41,895	5,745	7,649	5,796	5,915
1972	685	656	6,134	7,475	17.9	4,028	4,847	36,081	44,956	5,880	7,400	5,882	6,015
1973	642	1,067	5,952	7,661	22.3	4,008	7,038	34,571	45,618	6,243	6,596	5,808	5,955
1974	859	1,190	6,833	8,882	23.1	5,029	7,683	38,603	51,315	5,855	6,456	5,649	5,777
1975	982	1,248	7,129	9,359	23.8	5,806	8,422	40,448	54,677	5,913	6,748	5,674	5,842
1976	1,086	1,346	6,772	9,204	26.4	6,527	9,121	37,969	53,617	6,010	6,777	5,607	5,825
1977	1,164	1,548	7,283	9,995	27.1	6,870	10,255	40,823	57,949	5,902	6,625	5,605	5,798
1978	1,171	1,771	7,965	10,907	27.0	7,105	11,798	R46,295	R65,197	6,067	6,662	R5,812	5,978
1979	1,321	1,907	7,437	10,665	30.3	7,941	12,643	42,512	63,096	6,011	6,630	5,716	5,916
1980	1,764	2,081	9,039	12,884	29.8	R10,086	R13,763	R49,971	R73,820	R5,718	R6,614	R5,528	R5,730
1981	2,636	2,514	12,349	17,499	29.4	R15,437	R16,983	R68,877	R101,297	R5,856	R6,755	R5,578	R5,789
1982	2,431	2,125	11,247	15,803	28.8	R13,349	R14,694	R60,217	R88,260	R5,491	R6,915	R5,354	R5,585
1983	2,023	1,593	10,148	13,764	26.3	R10,384	R10,193	R48,590	R69,166	R5,133	R6,398	4,788	5,025
1984	2,198	1,521	11,278	14,997	24.8	R12,236	R9,889	R58,373	R80,498	R5,567	R6,502	5,176	5,368
1985	1,679	1,190	8,924	11,793	24.3	R9,847	R8,117	R47,421	R65,386	R5,865	R6,821	R5,314	R5,544
1986	1,084	793	5,549	7,426	25.3	R6,573	R5,372	30,137	R42,082	R6,063	R6,774	5,431	R5,667
1987	925	754	5,049	6,728	25.0	R5,639	R5,055	R26,698	R37,392	R6,096	R6,704	R5,288	R5,558
1988	855	R743	4,693	R6,291	R25.4	R5,294	R5,000	R27,047	R37,340	R6,192	R6,729	R5,763	R5,936
1989	607	705	3,924	5,236	25.1	R3,670	R4,678	R21,908	R30,256	R6,046	R6,635	R5,583	5,778
1990	654	689	3,715	5,058	26.6	R4,375	R4,716	R21,433	R30,525	R6,690	R6,845	R5,769	R6,035
1991	592	534	3,314	4,440	25.4	R3,799	R3,654	R18,792	R26,244	R6,417	R6,842	R5,671	R5,911
1992	493	423	2,513	3,429	26.7	R3,190	R2,712	R13,761	R19,663	R6,470	R6,412	R5,476	R5,734
1993	502	548	2,469	3,519	29.8	R3,179	R3,226	R14,169	R20,574	R6,332	R5,887	R5,739	R5,847
1994	570	726	2,405	3,701	35.0	R3,595	R4,601	R14,204	R22,401	R6,308	R6,338	R5,906	R6,053
1995	542	570	2,198	3,310	33.6	R3,505	R3,604	R13,117	R20,225	R6,466	R6,322	R5,968	R6,110
1996	483	570	2,136	3,189	33.0	R3,514	R3,819	R13,379	R20,712	R7,276	R6,700	R6,264	R6,495
1997 <sup>E</sup>	428	536	2,110	3,074	31.4	R3,502	R4,026	R14,139	R21,668	R8,183	R7,511	R6,701	R7,049
1998 <sup>E</sup>	R291	R504	R1,647	R2,442	R32.6	R2,657	R4,107	R12,362	R19,125	R9,129	R8,149	R7,506	R7,832
1999 <sup>E</sup>	R154	R524	R1,195	R1,873	R36.2	R1,100	R3,523	R7,929	R12,552	R6,723	R6,635	R6,702	R6,702
2000 <sup>E</sup>	R253	R625	R1,288	R2,166	R40.5	R1,896	R4,635	R8,587	R15,119	R7,494	R7,417	R6,667	R6,980
2001 <sup>E</sup>	295	990	1,428	2,713	47.4	2,245	7,662	9,267	19,174	7,611	7,739	6,490	7,067

R=Revised. E=Estimate.

Notes: This table depicts exploratory wells only; see Table 4.4 for all wells and Table 4.6 for development wells only. For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. See Note 2 at end of section.

Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

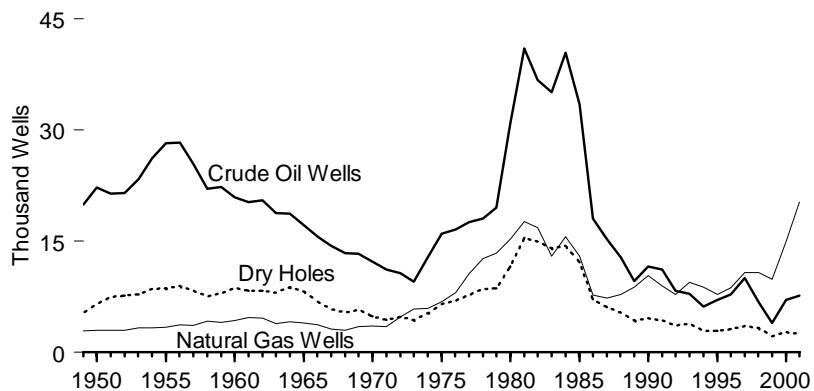
Sources: 1949-1960—American Association of Petroleum Geologists, *Statistics on Exploratory Drilling*

in the United States, 1940 through 1960 (1962), pp. 4-19. 1961-1965—*Bulletin of the American Association of Petroleum Geologists*, "North American Developments" issue. 1966-1969—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. 1970-1994—Energy Information Administration (EIA) computations based on well reports submitted to the American Petroleum Institute. 1995 forward—EIA computations based on well reports submitted to the Information Handling Services Energy Group, Inc. For current data see the *EIA Monthly Energy Review*, Section 5.

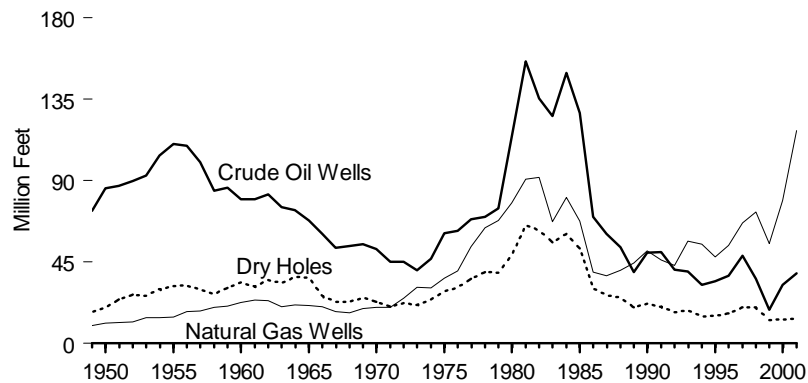


**Figure 4.6 Crude Oil and Natural Gas Development Wells, 1949–2001**

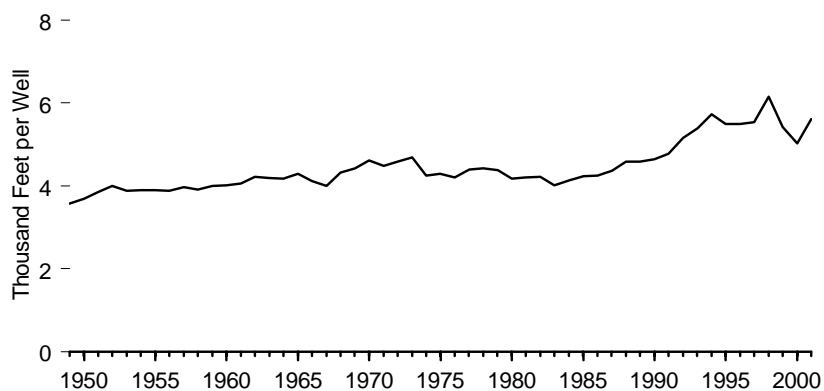
**Development Wells Drilled by Well Type**



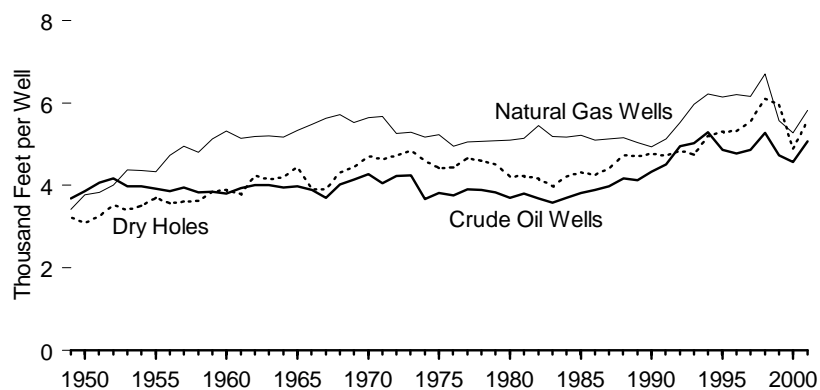
**Development Footage Drilled by Well Type**



**Development Wells Average Depth, All Wells**



**Development Wells Average Depth by Well Type**



Note: These figures depict developed wells only; see Figure 4.4 for all wells and Figure 4.5 for exploratory wells only.

Source: Table 4.6.

**Table 4.6 Crude Oil and Natural Gas Development Wells, 1949-2001**

Year	Wells Drilled				Successful Wells (percent)	Footage Drilled (thousand feet)				Average Depth (feet per well)			
	Crude Oil	Natural Gas	Dry Holes	Total		Crude Oil	Natural Gas	Dry Holes	Total	Crude Oil	Natural Gas	Dry Holes	Total
1949	19,946	2,939	5,369	28,254	81.0	73,478	10,028	17,315	100,821	3,684	3,412	3,225	3,568
1950	22,229	3,008	6,507	31,744	79.5	85,833	11,329	20,020	117,183	3,861	3,766	3,077	3,691
1951	21,416	2,984	7,487	31,887	76.5	86,981	11,451	24,370	122,802	4,061	3,837	3,255	3,851
1952	21,514	2,955	7,669	32,138	76.1	89,657	11,863	26,999	128,518	4,167	4,015	3,520	3,999
1953	23,342	3,269	7,816	34,427	77.3	92,704	14,296	26,582	133,581	3,972	4,373	3,401	3,880
1954	26,156	3,312	8,541	38,009	77.5	103,953	14,458	29,998	148,408	3,974	4,365	3,512	3,905
1955	28,196	3,392	8,620	40,208	78.6	110,374	14,718	31,883	156,976	3,915	4,339	3,699	3,904
1956	28,261	3,709	8,993	40,963	78.0	109,241	17,559	32,143	158,943	3,865	4,734	3,574	3,880
1957	25,419	3,610	8,252	37,281	77.9	100,249	17,869	29,747	147,864	3,944	4,950	3,605	3,966
1958	22,029	4,183	7,530	33,742	77.7	84,393	20,083	27,343	131,820	3,831	4,801	3,631	3,907
1959	22,341	4,019	8,012	34,372	76.7	86,066	20,575	30,800	137,441	3,852	5,120	3,844	3,999
1960	20,937	4,281	8,697	33,915	74.4	79,739	22,780	33,826	136,345	3,809	5,321	3,889	4,020
1961	20,280	4,673	8,309	33,262	75.0	79,726	24,042	31,423	135,191	3,931	5,145	3,782	4,064
1962	20,516	4,582	8,263	33,361	75.2	82,226	23,762	35,030	141,018	4,008	5,186	4,239	4,227
1963	18,821	3,906	8,076	30,803	73.8	75,400	20,303	33,460	129,164	4,006	5,198	4,143	4,193
1964	18,686	4,137	8,743	31,566	72.3	73,748	21,394	36,782	131,923	3,947	5,171	4,207	4,179
1965	17,119	3,967	8,221	29,307	71.9	67,956	21,174	36,548	125,678	3,970	5,337	4,446	4,288
1966	15,584	3,679	6,808	26,071	73.9	60,523	20,140	26,552	107,215	3,884	5,474	3,900	4,112
1967	14,343	3,127	5,886	23,356	74.8	52,956	17,602	22,960	93,518	3,692	5,629	3,901	4,004
1968	13,377	2,970	5,373	21,720	75.3	53,875	16,975	23,162	94,012	4,027	5,716	4,311	4,328
1969	13,284	3,467	5,735	22,486	74.5	55,019	19,177	25,446	99,642	4,142	5,531	4,437	4,431
1970	12,211	3,534	4,869	20,614	76.4	52,130	19,945	22,951	95,026	4,269	5,644	4,714	4,610
1971	11,194	3,501	4,357	19,052	77.1	45,323	19,850	20,186	85,358	4,049	5,670	4,633	4,480
1972	10,693	4,784	4,757	20,234	76.5	45,241	25,159	22,475	92,875	4,231	5,259	4,725	4,590
1973	9,525	5,866	4,368	19,759	77.9	40,408	31,007	21,190	92,605	4,242	5,286	4,851	4,687
1974	12,788	5,948	5,283	24,019	78.0	46,996	30,766	24,296	102,059	3,675	5,173	4,599	4,249
1975	15,966	6,879	6,517	29,362	77.8	61,013	36,032	28,772	125,817	3,821	5,238	4,415	4,285
1976	16,602	8,063	6,986	31,651	77.9	62,365	39,992	31,008	133,365	3,756	4,960	4,439	4,214
1977	17,581	10,574	7,702	35,857	78.5	68,581	53,431	35,905	157,917	3,901	5,053	4,662	4,404
1978	18,010	12,642	8,586	39,238	78.1	R69,936	R64,043	R39,493	R173,472	3,883	5,066	4,600	4,421
1979	19,530	13,347	8,662	41,539	79.1	74,747	67,825	39,130	181,702	3,827	5,082	4,517	4,374
1980	30,875	15,252	11,599	57,726	79.9	R114,264	R77,721	R48,849	R240,834	R3,701	R5,096	4,211	R4,172
1981	40,962	17,652	15,440	74,054	79.2	R155,804	R90,775	R65,236	R311,815	R3,804	R5,142	R4,225	R4,211
1982	36,768	16,854	14,972	68,594	78.2	R135,532	R91,933	R62,570	R290,035	R3,686	R5,455	R4,179	4,228
1983	35,097	12,971	14,005	62,073	77.4	R125,694	R67,337	R55,788	R248,820	R3,581	R5,191	R3,983	4,009
1984	40,407	15,606	14,403	70,416	79.5	R149,534	R80,689	R60,671	R290,894	3,701	R5,170	R4,212	4,131
1985	33,439	12,978	12,132	58,549	79.3	R127,519	R67,745	R52,395	R247,659	3,813	R5,220	R4,319	4,230
1986	18,013	7,723	7,129	32,865	78.3	R70,049	R39,355	R30,370	R139,774	3,889	5,096	R4,260	4,253
1987	15,239	7,301	6,063	28,603	78.8	R60,678	R37,424	R26,684	R124,786	3,982	R5,126	R4,401	R4,363
1988	12,781	R7,812	5,348	R25,941	79.4	R53,366	R40,320	R25,328	R119,014	R4,175	R5,161	R4,736	4,588
1989	9,597	8,834	4,264	22,695	81.2	R39,617	R44,491	R20,075	R104,183	R4,128	R5,036	R4,708	4,591
1990	11,544	10,355	4,598	26,497	82.6	R50,105	R51,153	R21,919	R123,176	R4,340	R4,940	R4,767	R4,649
1991	11,178	8,992	4,282	24,452	82.5	R50,484	R46,083	R20,209	R116,777	R4,516	R5,125	R4,720	4,776
1992	8,264	7,786	3,605	19,655	81.7	R40,993	R43,016	R17,452	R101,461	R4,960	R5,525	R4,841	R5,162
1993	7,905	9,469	3,859	21,233	81.8	R39,716	R56,494	R18,334	R114,544	R5,024	R5,966	R4,751	R5,395
1994	6,151	8,812	2,902	17,865	83.8	R32,495	R54,811	R15,102	R102,408	R5,283	R6,220	R5,204	R5,732
1995	7,085	7,784	2,877	17,746	83.8	R34,519	R47,811	R15,276	R97,607	R4,872	R6,142	R5,310	R5,500
1996	7,831	8,732	3,146	19,709	84.0	R37,335	R54,243	R16,754	R108,333	R4,768	R6,212	R5,325	R5,497
1997 <sup>E</sup>	10,008	10,791	3,592	24,391	85.3	R48,596	R66,451	R19,947	R134,993	R4,856	R6,158	R5,553	R5,535
1998 <sup>E</sup>	R6,773	R10,804	R3,266	R20,843	R84.3	R35,766	R72,547	R19,897	R128,210	R5,281	R6,715	R6,092	R6,151
1999 <sup>E</sup>	R3,982	R9,887	R2,169	R16,038	R86.5	R18,825	R55,098	R12,935	R86,858	R4,728	R5,573	R5,963	R5,416
2000 <sup>E</sup>	R7,105	R14,973	R2,737	R24,815	R89.0	R32,461	R78,981	R13,388	R124,830	R4,569	R5,275	R4,892	R5,030
2001 <sup>E</sup>	7,654	20,234	2,521	30,409	91.7	38,764	117,625	14,028	170,417	5,065	5,813	5,565	5,604

R=Revised. E=Estimate.

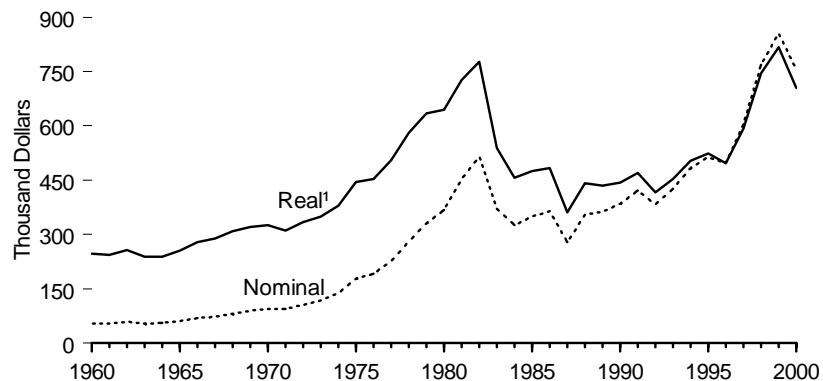
Notes: This table depicts development wells only; see Table 4.4 for all wells and Table 4.5 for exploratory wells only. Service wells, stratigraphic tests, and core tests are excluded. For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. See Note 2 at end of section. Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to

independent rounding.

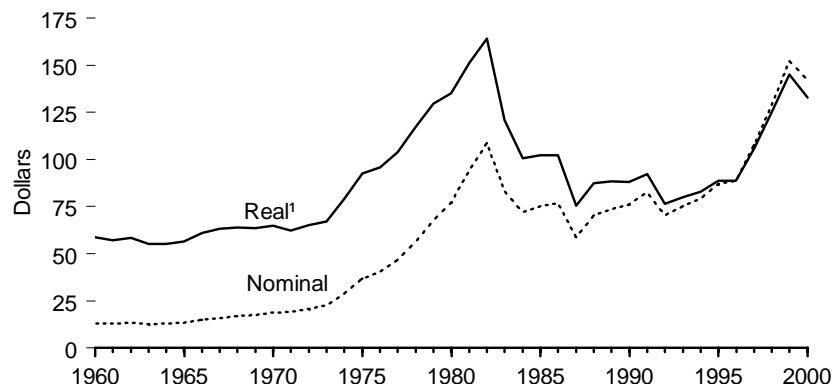
Sources: 1949-1965—Gulf Publishing Company, *World Oil*, "Forecast-Review" issue. 1966-1969—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. 1970-1994—Energy Information Administration (EIA) computations based on well reports submitted to the American Petroleum Institute. 1995 forward—EIA computations based on well reports submitted to the Information Handling Services Energy Group, Inc. For current data see the EIA *Monthly Energy Review*, Section 5.

**Figure 4.7 Costs of Crude Oil and Natural Gas Wells Drilled**

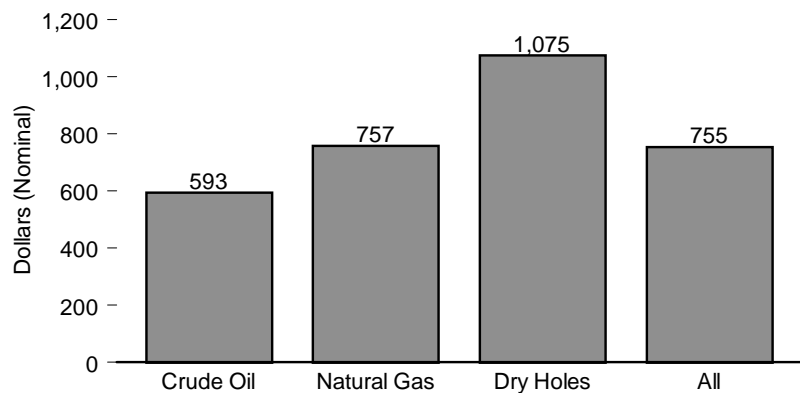
**Costs per Well, All Wells, 1960-2000**



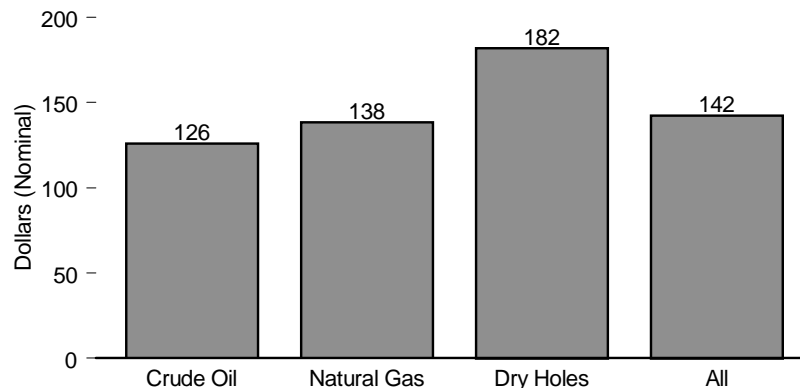
**Costs per Foot, All Wells, 1960-2000**



**Cost per Well by Well Type, 2000**



**Cost per Foot by Well Type, 2000**



<sup>1</sup>In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

Note: Because vertical scales differ, graphs should not be compared.  
Source: Table 4.7.

**Table 4.7 Costs of Crude Oil and Natural Gas Wells Drilled, 1960-2000**

Year	Costs per Well (thousand dollars)					Costs per Foot (dollars)				
	Crude Oil (nominal)	Natural Gas (nominal)	Dry Holes (nominal)	All		Crude Oil (nominal)	Natural Gas (nominal)	Dry Holes (nominal)	All	
				(nominal)	(real) <sup>1</sup>				(nominal)	(real) <sup>1</sup>
1960	52.2	102.7	44.0	54.9	247.6	13.22	18.57	10.56	13.01	58.63
1961	51.3	94.7	45.2	54.5	243.0	13.11	17.65	10.56	12.85	57.26
1962	54.2	97.1	50.8	58.6	257.9	13.41	18.10	11.20	13.31	58.53
1963	51.8	92.4	48.2	55.0	239.2	13.20	17.19	10.58	12.69	55.17
1964	50.6	104.8	48.5	55.8	239.2	13.12	18.57	10.64	12.86	55.10
1965	56.6	101.9	53.1	60.6	255.0	13.94	18.35	11.21	13.44	56.52
1966	62.2	133.8	56.9	68.4	279.6	15.04	21.75	12.34	14.95	61.12
1967	66.6	141.0	61.5	72.9	289.2	16.61	23.05	12.87	15.97	63.35
1968	79.1	148.5	66.2	81.5	309.7	18.63	24.05	12.88	16.83	63.99
1969	86.5	154.3	70.2	88.6	321.0	19.28	25.58	13.23	17.56	63.65
1970	86.7	160.7	80.9	94.9	326.5	19.29	26.75	15.21	18.84	64.83
1971	78.4	166.6	86.8	94.7	310.3	18.41	27.70	16.02	19.03	62.35
1972	93.5	157.8	94.9	106.4	334.5	20.77	27.78	17.28	20.76	65.24
1973	103.8	155.3	105.8	117.2	348.7	22.54	27.46	19.22	22.50	66.96
1974	110.2	189.2	141.7	138.7	378.8	27.82	34.11	26.76	28.93	79.00
1975	138.6	262.0	177.2	177.8	444.1	34.17	46.23	33.86	36.99	92.41
1976	151.1	270.4	190.3	191.6	453.0	37.35	49.78	36.94	40.46	95.65
1977	170.0	313.5	230.2	227.2	504.6	41.16	57.57	43.49	46.81	103.98
1978	208.0	374.2	281.7	280.0	580.4	49.72	68.37	52.55	56.63	117.42
1979	243.1	443.1	339.6	331.4	634.2	58.29	80.66	64.60	67.70	129.57
1980	272.1	536.4	376.5	367.7	644.6	66.36	95.16	73.70	77.02	135.03
1981	336.3	698.6	464.0	453.7	727.4	80.40	122.17	90.03	94.30	151.19
1982	347.4	864.3	515.4	514.4	776.4	86.34	146.20	104.09	108.73	164.12
1983	283.8	608.1	366.5	371.7	539.7	72.65	108.37	79.10	83.34	120.99
1984	262.1	489.8	329.2	326.5	457.0	66.32	88.80	67.18	71.90	100.64
1985	270.4	508.7	372.3	349.4	474.1	66.78	93.09	73.69	75.35	102.25
1986	284.9	522.9	389.2	364.6	484.1	68.35	93.02	76.53	76.88	102.08
1987	246.0	380.4	259.1	279.6	360.4	58.35	69.55	51.05	58.71	75.68
1988	279.4	460.3	366.4	354.7	442.2	62.28	84.65	66.96	70.23	87.56
1989	282.3	457.8	355.4	362.2	435.0	64.92	86.86	67.61	73.55	88.33
1990	321.8	471.3	367.5	383.6	443.4	69.17	90.73	67.49	76.07	87.93
1991	346.9	506.6	441.2	421.5	470.1	73.75	93.10	83.05	82.64	92.17
1992	362.3	426.1	357.6	382.6	416.6	69.50	72.83	67.82	70.27	76.51
1993	356.6	521.2	387.7	426.8	453.8	67.52	83.15	72.56	75.30	80.06
1994	409.5	535.1	491.5	483.2	503.3	70.57	81.90	86.60	79.49	82.79
1995	415.8	629.7	481.2	513.4	523.4	78.09	95.97	84.60	87.22	88.91
1996	341.0	616.0	541.0	496.1	496.1	70.60	98.67	95.74	88.92	88.92
1997	445.6	728.6	655.6	603.9	592.4	90.48	117.55	115.09	107.83	105.77
1998	566.0	815.6	973.2	769.1	<sup>R</sup> 745.2	108.88	127.94	157.79	128.97	<sup>R</sup> 124.97
1999	783.0	798.4	1,115.5	856.1	<sup>R</sup> 818.1	156.45	138.42	182.99	152.02	<sup>R</sup> 145.27
2000	593.4	756.9	1,075.4	754.6	704.9	125.96	138.39	181.83	142.16	132.81

<sup>1</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

R=Revised.

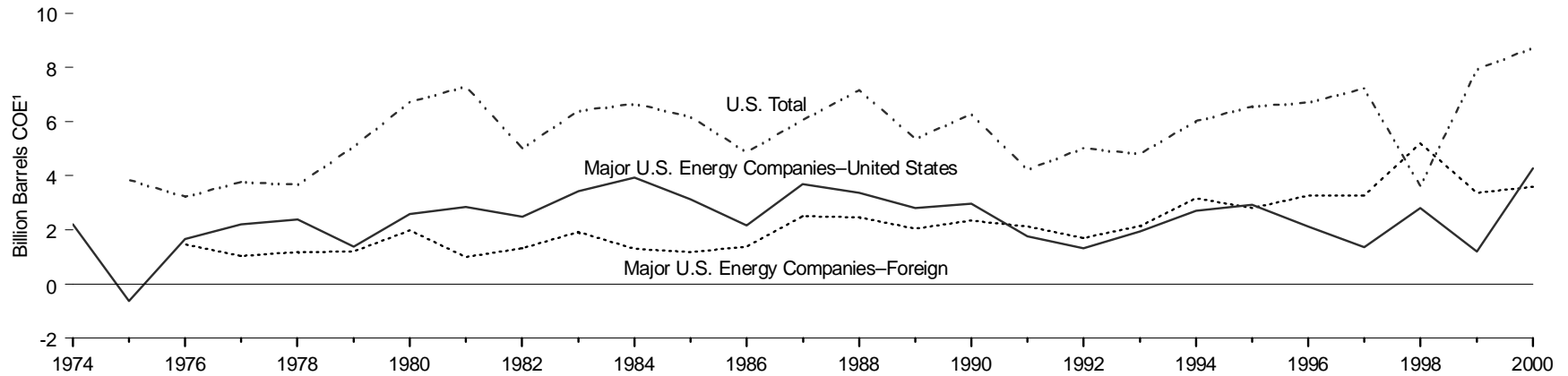
Notes: The information reported for 1965 and prior years is not strictly comparable to that in the more recent surveys. Average cost is the arithmetic mean and includes all costs for drilling and equipping

wells and for surface-producing facilities. Wells drilled include exploratory and development wells; excludes service wells, stratigraphic tests, and core tests.

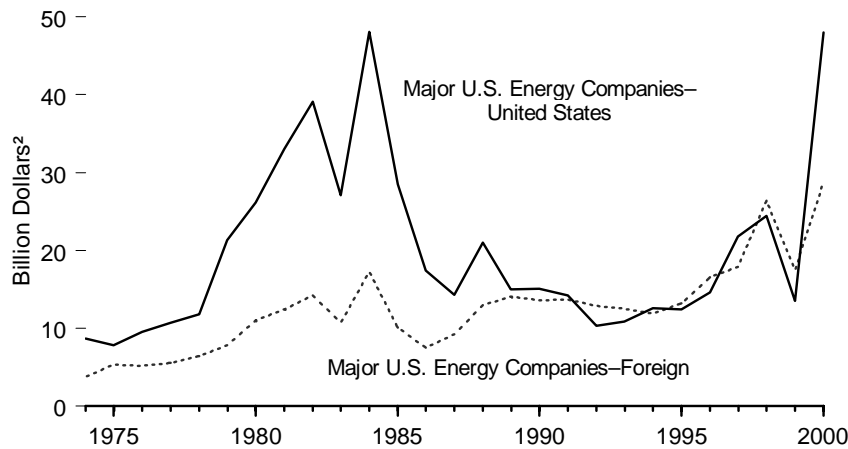
Source: American Petroleum Institute, Independent Petroleum Association of America, Mid-Continent Oil and Gas Association, 2001 Joint Association Survey on Drilling Costs.

**Figure 4.8 Gross Additions to Proved Reserves and Exploration and Development Expenditures by Geographic Area**

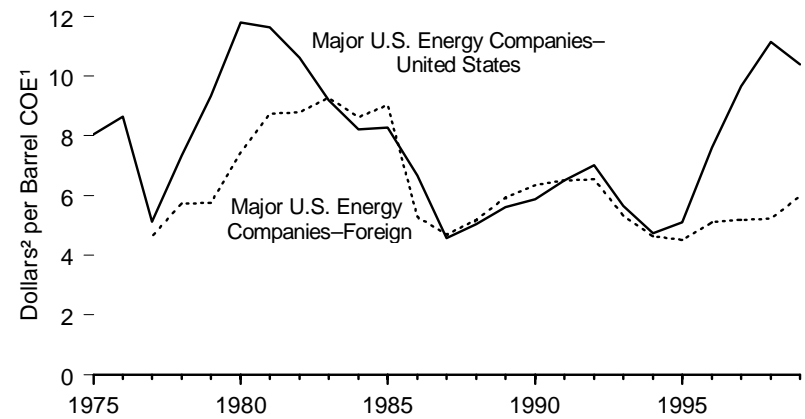
**Gross Additions to Proved Reserves of Liquid and Gaseous Hydrocarbons, 1974-2000**



**Exploration and Development Expenditures, 1974-2000**



**Expenditures per Barrel of Reserve Additions, 1975-1999**  
**Three-Year Moving Average**



<sup>1</sup> Crude oil equivalent.  
<sup>2</sup> Nominal dollars.

Note: Major U.S. Energy Companies are the top publicly-owned crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12.

Source: Table 4.8.

**Table 4.8 Gross Additions to Proved Reserves and Exploration and Development Expenditures by Geographic Area, 1974-2000**

Year	Gross Additions to Proved Reserves <sup>1</sup> of Liquid and Gaseous Hydrocarbons <sup>2</sup> (million barrels COE <sup>3</sup> )		Exploration and Development Expenditures (billion dollars <sup>4</sup> )		Expenditures per Barrel of Reserve Additions, Three-Year Moving Average (dollars <sup>4</sup> per barrel COE <sup>3</sup> )		
	U.S. Total	Major U.S. Energy Companies <sup>5</sup>		Major U.S. Energy Companies <sup>5</sup>		Major U.S. Energy Companies <sup>5</sup>	
		United States	Foreign	United States	Foreign	United States	Foreign
1974	NA	2,205	NA	8.7	3.8	NA	NA
1975	3,846	-634	NA	7.8	5.3	8.05	NA
1976	3,224	1,663	1,459	9.5	5.2	8.64	NA
1977	3,765	2,210	1,055	10.7	5.6	5.12	4.64
1978	3,679	2,383	1,191	11.8	6.4	7.34	5.73
1979	5,071	1,378	<sup>6</sup> 1,208	21.3	7.8	9.34	<sup>6</sup> 5.75
1980	6,723	2,590	1,977	26.2	11.0	11.80	7.45
1981	7,304	2,848	1,006	33.0	12.4	11.63	8.74
1982	5,030	2,482	1,332	<sup>R</sup> 39.1	14.2	<sup>7</sup> 10.62	<sup>7</sup> 8.78
1983	6,412	3,427	1,918	27.1	10.7	9.20	9.28
1984	6,653	3,941	1,298	<sup>R</sup> 48.1	17.3	<sup>7</sup> 8.21	<sup>7</sup> 8.63
1985	6,190	<sup>8</sup> 3,129	1,192	28.5	10.1	<sup>8</sup> 8.27	9.03
1986	4,866	2,178	<sup>6</sup> 1,375	17.4	7.5	6.67	<sup>6</sup> 5.28
1987	6,059	<sup>8</sup> 3,698	2,516	<sup>R</sup> 14.3	9.2	<sup>8</sup> 4.58	4.69
1988	7,156	3,359	2,460	<sup>R</sup> 21.0	13.0	5.05	5.18
1989	5,385	2,798	2,043	15.0	14.1	5.62	5.94
1990	6,275	2,979	2,355	15.1	13.6	5.87	6.34
1991	4,227	1,772	2,135	14.2	13.7	6.52	6.50
1992	5,006	1,332	1,694	10.3	12.9	7.02	6.55
1993	4,814	1,945	2,147	10.9	12.5	5.66	5.33
1994	6,021	2,703	3,173	12.6	11.9	4.74	4.63
1995	6,558	2,929	2,799	12.4	13.2	5.11	4.51
1996	6,707	2,131	3,280	14.6	16.6	7.61	5.10
1997	7,233	1,367	3,279	21.8	17.9	9.67	5.18
1998	3,628	2,798	5,206	24.4	26.4	11.15	<sup>R</sup> 5.22
1999	7,929	1,197	3,360	13.5	<sup>R</sup> 17.5	<sup>R</sup> 10.39	<sup>R</sup> 5.98
2000	8,725	4,278	3,593	48.0	28.8	NA	NA

<sup>1</sup> Gross additions to proved reserves equal annual change in proved reserves plus annual production.

<sup>2</sup> Liquid and gaseous hydrocarbons include crude oil, natural gas liquids, and natural gas.

<sup>3</sup> Crude oil equivalent: converted to Btu on the basis of annual average conversion factors. See Appendix A.

<sup>4</sup> Nominal dollars.

<sup>5</sup> Major U.S. Energy Companies are the top publicly-owned, U.S.-based crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS) (see Table 3.12).

<sup>6</sup> Data for 1979 exclude downward revisions of 1,225 million barrels COE due to Iranian policies. Data for 1986 exclude downward revisions due to Libyan sanctions.

<sup>7</sup> Data for 1982 and 1984 are adjusted to exclude purchases of proved reserves associated with mergers among the Financial Reporting System companies.

<sup>8</sup> Data for 1985 and 1987 exclude downward revisions of 1,477 million barrels COE and 2,396 million

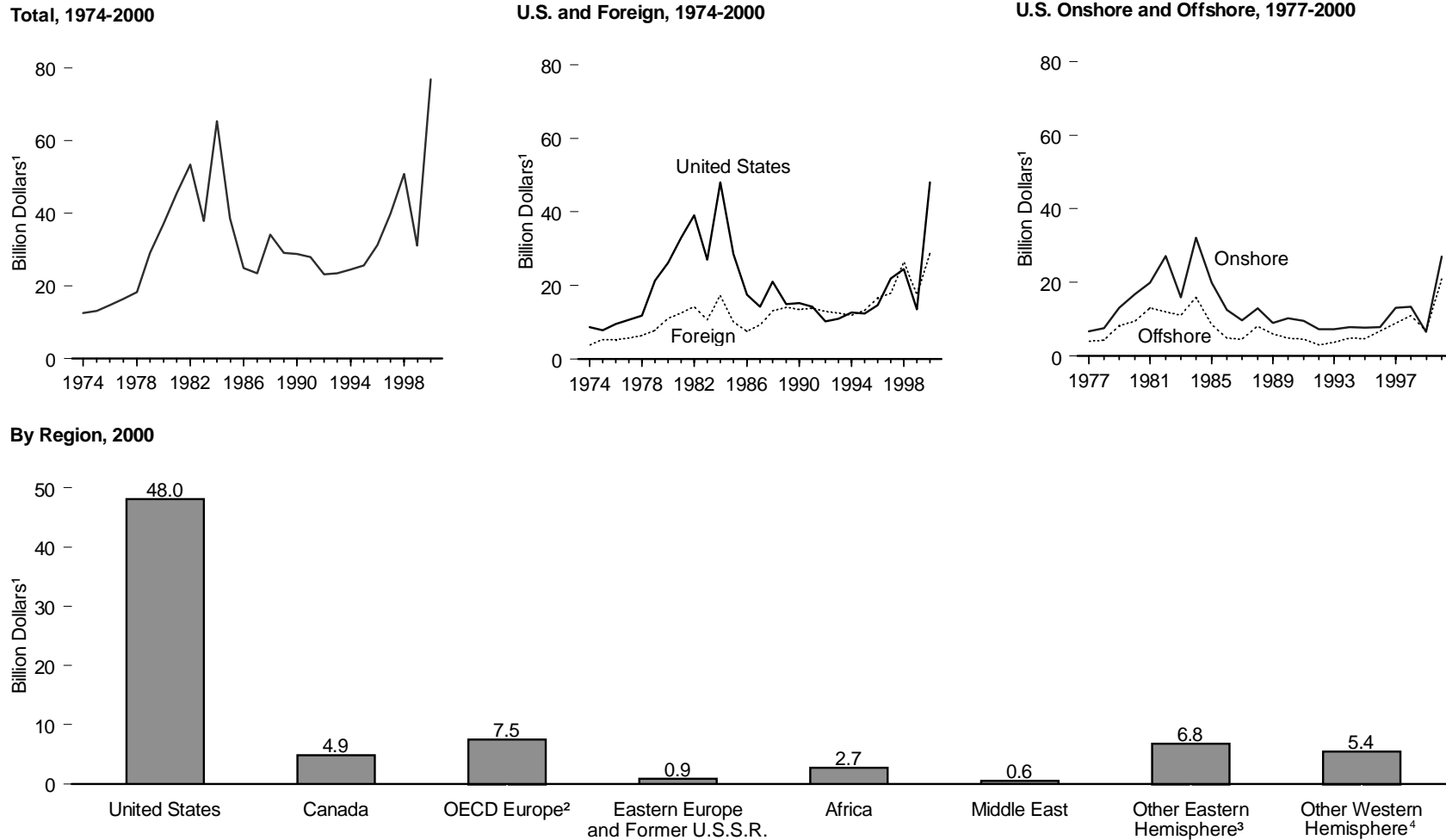
barrels COE, respectively, of Alaska North Slope natural gas reserves.

R=Revised. NA=Not available.

Web Page: <http://www.eia.doe.gov/emeu/finance>.

Sources: **Major U.S. Energy Companies:** 1974-1976—Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System" database, November 1997. 1977 forward—EIA, *Performance Profiles of Major Energy Producers*, annual reports. **U.S. Total, Gross Additions to Proved Reserves of Liquid and Gaseous Hydrocarbons:** 1975-1979—American Gas Association, American Petroleum Institute, and Canadian Petroleum Association (published jointly), *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada as of December 31, 1979*, Volume 34, June 1980. 1980 forward—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, annual reports.

**Figure 4.9 Major U.S. Energy Companies' Expenditures for Crude Oil and Natural Gas Exploration and Development by Region**



<sup>1</sup> Nominal dollars.

<sup>2</sup> Organization for Economic Cooperation and Development. See OECD Europe in Glossary.

<sup>3</sup> This region includes areas that are eastward of the Greenwich prime meridian to 180° longitude and that are not included in other specific domestic or foreign classifications.

<sup>4</sup> This region includes areas that are westward of the Greenwich prime meridian to 180° longitude and that are not included in other specific domestic or foreign classifications.

Notes: Major U.S. Energy Companies are the top publicly-owned crude oil producers that form the Financial Reporting System (FRS). See Table 3.12. Because vertical scales differ, graphs should not be compared.

Source: Table 4.9.

**Table 4.9 Major U.S. Energy Companies' Expenditures for Crude Oil and Natural Gas Exploration and Development by Region, 1974-2000**  
(Billion Dollars<sup>1</sup>)

Year	United States			Foreign								Total
	Onshore	Offshore	Total	Canada	OECD <sup>2</sup> Europe	Eastern Europe and Former U.S.S.R.	Africa	Middle East	Other Eastern Hemisphere <sup>3</sup>	Other Western Hemisphere <sup>4</sup>	Total	
1974	NA	NA	8.7	NA	NA	—	NA	NA	NA	NA	3.8	12.5
1975	NA	NA	7.8	NA	NA	—	NA	NA	NA	NA	5.3	13.1
1976	NA	NA	9.5	NA	NA	—	NA	NA	NA	NA	5.2	14.7
1977	6.7	4.0	10.7	1.5	2.5	—	0.7	0.2	0.3	0.4	5.6	16.3
1978	7.5	4.3	11.8	1.6	2.6	—	0.8	0.3	0.4	0.6	6.4	18.2
1979	13.0	8.3	21.3	2.3	3.0	—	0.8	0.2	0.5	0.8	7.8	29.1
1980	16.8	9.4	26.2	3.1	4.3	—	1.4	0.2	0.8	1.0	11.0	37.2
1981	19.9	13.0	33.0	1.8	5.0	—	2.1	0.3	1.9	1.3	12.4	45.4
1982	27.2	11.9	39.1	1.9	6.3	—	2.1	0.4	2.4	1.1	14.2	53.3
1983	16.0	11.1	27.1	1.6	4.3	—	1.7	0.5	2.0	0.6	10.7	37.7
1984	32.1	16.0	48.1	5.4	5.5	—	3.4	0.5	2.0	0.5	17.3	65.3
1985	20.0	8.5	28.5	1.9	3.7	—	1.6	0.9	1.3	0.7	10.1	38.6
1986	12.5	4.9	17.4	1.1	3.2	—	1.1	0.3	1.2	0.6	7.5	24.9
1987	9.7	4.5	14.3	1.9	3.0	—	0.8	0.4	2.8	0.5	9.2	23.5
1988	12.9	8.1	21.0	5.4	4.3	—	0.8	0.4	1.4	0.7	13.0	34.1
1989	9.0	6.0	15.0	6.3	3.5	—	1.0	0.4	2.3	0.6	14.1	29.1
1990	10.2	4.9	15.1	1.8	6.6	—	1.4	0.6	2.4	0.7	13.6	28.7
1991	9.6	4.6	14.2	1.7	6.8	—	1.5	0.5	2.4	0.7	13.7	27.9
1992	7.3	3.0	10.3	1.1	6.8	—	1.4	0.6	2.4	0.6	12.9	23.2
1993	7.2	3.7	10.9	1.6	5.5	0.3	1.5	0.7	2.5	0.6	12.5	23.5
1994	7.8	4.8	12.6	1.8	4.4	0.3	1.4	0.4	2.8	0.7	11.9	24.5
1995	7.7	4.7	12.4	1.9	5.2	0.4	2.0	0.4	2.4	0.9	13.2	25.6
1996	7.9	6.7	14.6	1.6	5.6	0.5	2.8	0.5	4.1	1.6	16.6	31.3
1997	13.0	8.8	21.8	2.0	7.1	0.6	3.0	0.6	3.0	1.6	17.9	39.8
1998	13.5	11.0	24.4	4.8	8.6	1.3	3.1	0.9	3.9	3.7	26.4	50.8
1999	6.6	6.9	13.5	<sup>R</sup> 2.1	4.1	0.6	3.1	0.4	3.4	3.8	<sup>R</sup> 17.5	<sup>R</sup> 31.0
2000	27.1	21.0	48.0	4.9	7.5	0.9	2.7	0.6	6.8	5.4	28.8	76.8

<sup>1</sup> Nominal dollars.

<sup>2</sup> Organization for Economic Cooperation and Development. See OECD Europe in Glossary.

<sup>3</sup> This region includes areas that are eastward of the Greenwich prime meridian to 180 longitude and that are not included in other domestic or foreign classifications.

<sup>4</sup> This region includes areas that are westward of the Greenwich prime meridian to 180 longitude and that are not included in other domestic or foreign classifications.

R=Revised. NA=Not available. — = Not applicable.

Notes: Major U.S. Energy Companies are the top publicly-owned, U.S.-based crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12. Totals may not equal sum of components due to independent rounding.

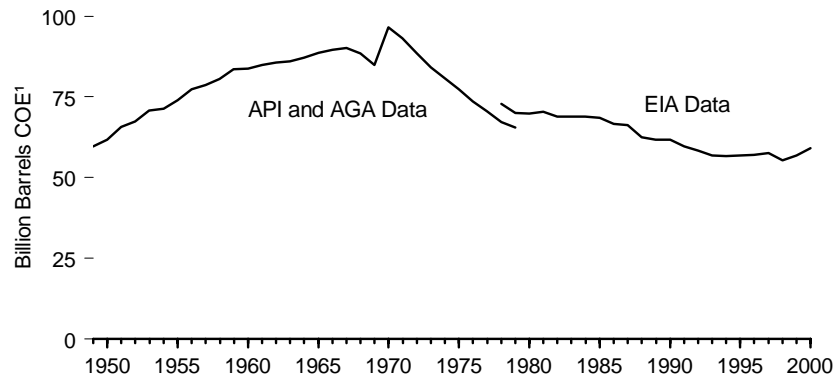
Web Page: <http://www.eia.doe.gov/emeu/finance>.

Sources: 1974-1976—Energy Information Administration (EIA), Office of Energy Markets and End Use, Financial Reporting System Database, November 1997. 1977 forward—EIA, *Performance Profiles of Major Energy Producers*, annual reports.

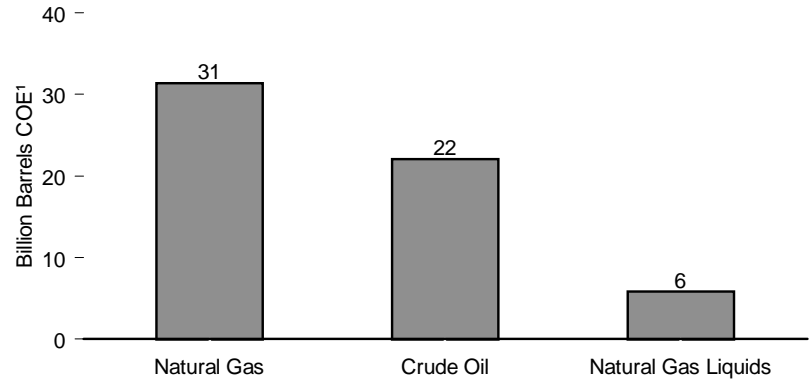


**Figure 4.10 Liquid and Gaseous Hydrocarbon Proved Reserves**

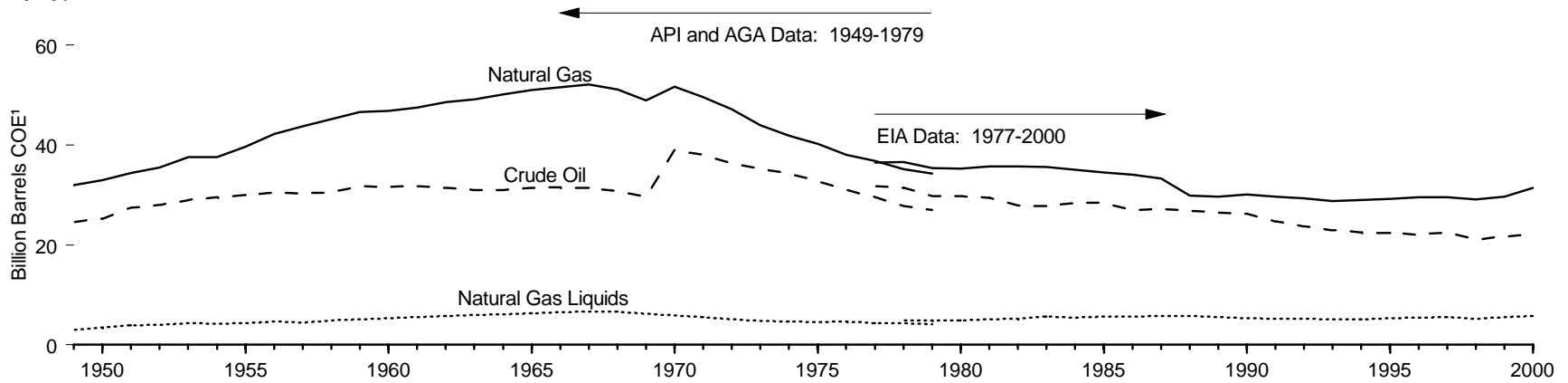
**Total, 1949-2000**



**By Type, 2000**



**By Type, 1949-2000**



<sup>1</sup> COE=crude oil equivalent.

Notes: Data are at end of year. API=American Petroleum Institute. AGA=American Gas Association. EIA=Energy Information Administration.

Because vertical scales differ, graphs should not be compared.

Source: Table 4.10.

**Table 4.10 Liquid and Gaseous Hydrocarbon Proved Reserves, 1949-2000**

Year	Crude Oil	Natural Gas		Natural Gas Liquids		Total
	Billion Barrels	Trillion Cubic Feet <sup>1</sup>	Billion Barrels COE <sup>2</sup>	Billion Barrels	Billion Barrels COE <sup>2</sup>	Billion Barrels COE <sup>2</sup>
American Petroleum Institute and American Gas Association Data						
1949	24.6	179.4	32.0	3.7	3.1	59.7
1950	25.3	184.6	32.9	4.3	3.5	61.7
1951	27.5	192.8	34.4	4.7	3.9	65.7
1952	28.0	198.6	35.4	5.0	4.1	67.5
1953	28.9	210.3	37.5	5.4	4.4	70.9
1954	29.6	210.6	37.6	5.2	4.2	71.3
1955	30.0	222.5	39.7	5.4	4.4	74.1
1956	30.4	236.5	42.2	5.9	4.7	77.3
1957	30.3	245.2	43.8	5.7	4.5	78.6
1958	30.5	252.8	45.1	6.2	5.0	80.6
1959	31.7	261.2	46.6	6.5	5.2	83.5
1960	31.6	262.3	46.8	6.8	5.4	83.8
1961	31.8	266.3	47.5	7.0	5.6	84.8
1962	31.4	272.3	48.6	7.3	5.8	85.7
1963	31.0	276.2	49.1	7.7	6.0	86.1
1964	31.0	281.3	50.0	7.7	6.1	87.1
1965	31.4	286.5	51.0	8.0	6.3	88.6
1966	31.5	289.3	51.5	8.3	6.5	89.5
1967	31.4	292.9	52.1	8.6	6.7	90.2
1968	30.7	287.3	51.1	8.6	6.7	88.5
1969	29.6	275.1	48.9	8.1	6.3	84.8
1970	39.0	290.7	51.7	7.7	5.9	96.6
1971	38.1	278.8	49.6	7.3	5.5	93.2
1972	36.3	266.1	47.1	6.8	5.1	88.5
1973	35.3	250.0	44.0	6.5	4.8	84.1
1974	34.2	237.1	41.9	6.4	4.7	80.8
1975	32.7	228.2	40.2	6.3	4.6	77.5
1976	30.9	216.0	38.0	6.4	4.7	73.6
1977	29.5	208.9	36.8	6.0	4.4	70.6
1978	27.8	200.3	35.2	5.9	4.3	67.3
1979	27.1	194.9	34.3	5.7	4.1	65.5
Energy Information Administration Data						
1977	31.8	207.4	36.5	NA	NA	NA
1978	31.4	208.0	36.5	6.8	4.9	72.8
1979	29.8	201.0	35.4	6.6	4.8	70.0
1980	29.8	199.0	35.2	6.7	4.9	69.9
1981	29.4	201.7	35.7	7.1	5.2	70.3
1982	27.9	201.5	35.7	7.2	5.2	68.8
1983	27.7	200.2	35.6	7.9	5.7	69.0
1984	28.4	197.5	35.1	7.6	5.5	69.0
1985	28.4	193.4	34.4	7.9	5.6	68.5
1986	26.9	191.6	34.0	8.2	5.7	66.6
1987	27.3	187.2	33.3	8.1	5.8	66.3
1988	26.8	168.0	29.8	8.2	5.8	62.5
1989	26.5	167.1	29.7	7.8	5.5	61.7
1990	26.3	169.3	30.1	7.6	5.4	61.7
1991	24.7	167.1	29.7	7.5	5.3	59.6
1992	23.7	165.0	29.3	7.5	5.2	58.3
1993	23.0	162.4	28.8	7.2	5.1	56.8
1994	22.5	163.8	29.0	7.2	5.1	56.6
1995	22.4	165.1	29.2	7.4	5.3	56.9
1996	22.0	166.5	29.5	7.8	5.5	57.0
1997	22.5	167.2	29.6	8.0	5.6	57.7
1998	21.0	164.0	29.2	7.5	5.3	55.5
1999	21.8	167.4	29.6	7.9	5.5	56.9
2000	22.0	177.4	31.4	8.3	5.8	59.2

<sup>1</sup> The American Gas Association estimates of natural gas proved reserves include volumes of gas held in underground storage. In 1979, this volume amounted to 4.9 trillion cubic feet. Energy Information Administration (EIA) data do not include gas in underground storage.

<sup>2</sup> Crude oil equivalent. Natural gas and natural gas liquids are converted to Btu on the basis of annual average conversion factors. See Appendix A.

NA=Not available.

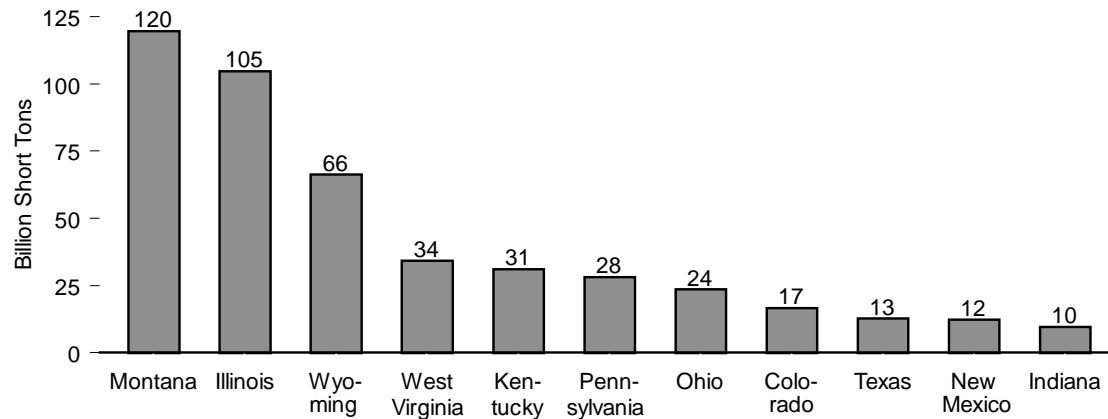
Note: Data are at end of year.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/pet\\_frame.html](http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html).

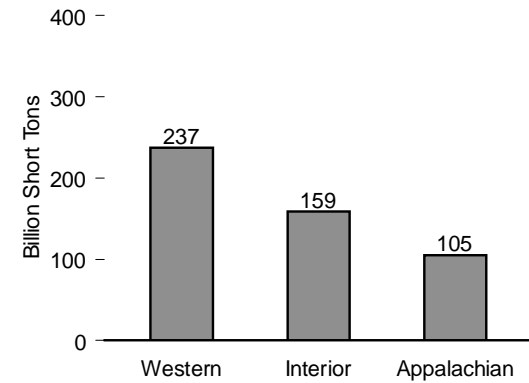
Sources: **API/AGA Data:** American Gas Association, American Petroleum Institute, and Canadian Petroleum Association (published jointly). *Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the United States and Canada as of December 31, 1979*. Volume 34, June 1980. **EIA Data:** 1977-1989—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, annual reports. 1990 forward—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report 2000* (December 2001), Table 1.

**Figure 4.11 Coal Demonstrated Reserve Base, January 1, 2001**

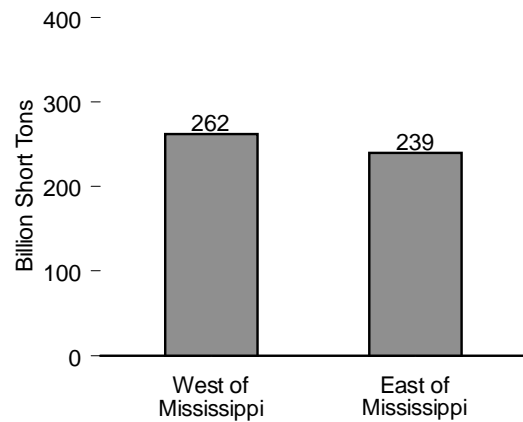
**By Key State**



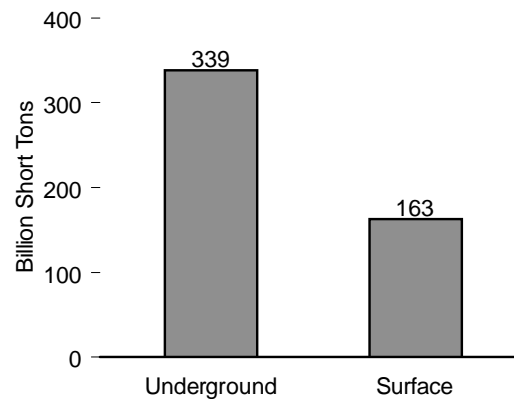
**By Region**



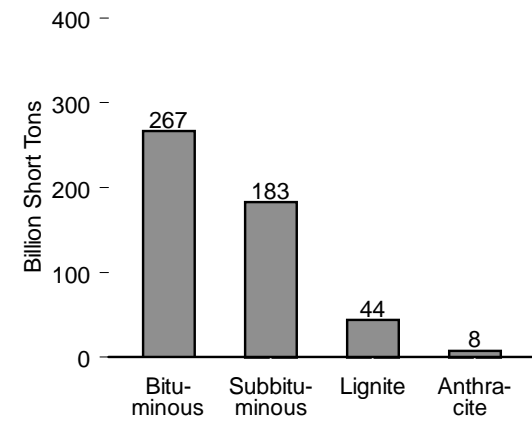
**West and East of Mississippi**



**By Mining Method**



**By Rank**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 4.11.

**Table 4.11 Coal Demonstrated Reserve Base, January 1, 2001**  
(Billion Short Tons)

Region and State	Anthracite	Bituminous Coal		Subbituminous Coal		Lignite	Total		
		Underground	Surface	Underground	Surface	Surface <sup>1</sup>	Underground	Surface	Total
<b>Appalachian</b> .....	<b>7.3</b>	<b>72.9</b>	<b>23.7</b>	<b>0.0</b>	<b>0.0</b>	<b>1.1</b>	<b>76.9</b>	<b>28.1</b>	<b>105.0</b>
Alabama .....	0.0	1.2	2.1	0.0	0.0	1.1	1.2	3.2	4.4
Kentucky, Eastern .....	0.0	1.7	9.6	0.0	0.0	0.0	1.7	9.6	11.3
Ohio .....	0.0	17.7	5.8	0.0	0.0	0.0	17.7	5.8	23.5
Pennsylvania .....	7.2	19.9	1.0	0.0	0.0	0.0	23.8	4.3	28.1
Virginia .....	0.1	1.2	0.6	0.0	0.0	0.0	1.3	0.6	2.0
West Virginia .....	0.0	30.1	4.1	0.0	0.0	0.0	30.1	4.1	34.2
Other <sup>2</sup> .....	0.0	1.1	0.4	0.0	0.0	0.0	1.1	0.4	1.5
<b>Interior</b> .....	<b>0.1</b>	<b>117.8</b>	<b>27.5</b>	<b>0.0</b>	<b>0.0</b>	<b>13.1</b>	<b>117.9</b>	<b>40.7</b>	<b>158.6</b>
Illinois .....	0.0	88.2	16.6	0.0	0.0	0.0	88.2	16.6	104.8
Indiana .....	0.0	8.8	0.9	0.0	0.0	0.0	8.8	0.9	9.7
Iowa .....	0.0	1.7	0.5	0.0	0.0	0.0	1.7	0.5	2.2
Kentucky, Western .....	0.0	16.1	3.7	0.0	0.0	0.0	16.1	3.7	19.7
Missouri .....	0.0	1.5	4.5	0.0	0.0	0.0	1.5	4.5	6.0
Oklahoma .....	0.0	1.2	0.3	0.0	0.0	0.0	1.2	0.3	1.6
Texas .....	0.0	0.0	0.0	0.0	0.0	12.7	0.0	12.7	12.7
Other <sup>3</sup> .....	0.1	0.3	1.1	0.0	0.0	0.5	0.4	1.6	2.0
<b>Western</b> .....	<b>(s)</b>	<b>22.3</b>	<b>2.3</b>	<b>121.3</b>	<b>61.8</b>	<b>29.6</b>	<b>143.7</b>	<b>93.7</b>	<b>237.4</b>
Alaska .....	0.0	0.6	0.1	4.8	0.6	(s)	5.4	0.7	6.1
Colorado .....	(s)	8.0	0.6	3.8	0.0	4.2	11.8	4.8	16.6
Montana .....	0.0	1.4	0.0	69.6	32.8	15.8	71.0	48.5	119.5
New Mexico .....	(s)	2.7	0.9	3.5	5.2	0.0	6.2	6.1	12.3
North Dakota .....	0.0	0.0	0.0	0.0	0.0	9.2	0.0	9.2	9.2
Utah .....	0.0	5.4	0.3	0.0	0.0	0.0	5.4	0.3	5.6
Washington .....	0.0	0.3	0.0	1.0	(s)	(s)	1.3	0.0	1.4
Wyoming .....	0.0	3.8	0.5	38.7	23.2	0.0	42.5	23.7	66.2
Other <sup>4</sup> .....	0.0	0.1	0.0	(s)	(s)	0.4	0.1	0.4	0.5
<b>U.S. Total</b> .....	<b>7.5</b>	<b>213.1</b>	<b>53.5</b>	<b>121.3</b>	<b>61.8</b>	<b>43.8</b>	<b>338.5</b>	<b>162.5</b>	<b>501.1</b>
States East of the Mississippi River .....	7.3	186.1	44.8	0.0	0.0	1.1	190.1	49.3	239.4
States West of the Mississippi River .....	0.1	27.0	8.7	121.3	61.8	42.7	148.4	113.3	261.7

<sup>1</sup> Lignite resources are not mined underground in the United States.

<sup>2</sup> Georgia, Maryland, North Carolina, and Tennessee.

<sup>3</sup> Arkansas, Kansas, Louisiana, and Michigan.

<sup>4</sup> Arizona, Idaho, Oregon, and South Dakota.

(s)=Less than 0.05 billion short tons.

Notes: See *U.S. Coal Reserves: 1997 Update* on the Web Page for a description of the methodology used to produce these data. Data represent known measured and indicated coal resources meeting

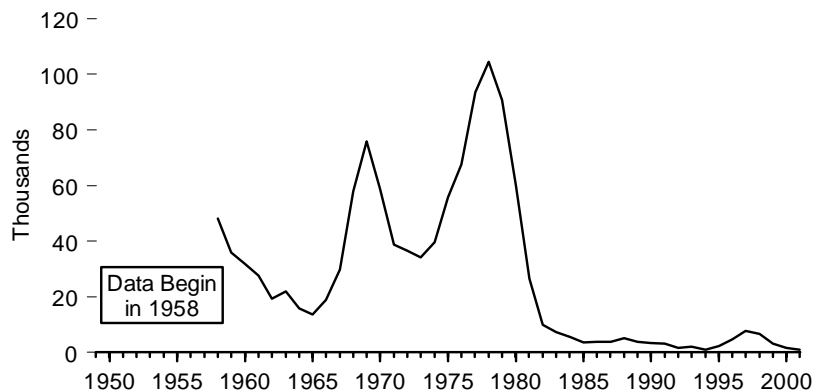
minimum seam and depth criteria, in the ground as of January 1, 2001. These coal resources are not totally recoverable. Net recoverability ranges from 0 percent to more than 90 percent. Fifty-four percent of the demonstrated reserve base of coal in the United States is estimated to be recoverable. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelcoal.html>.

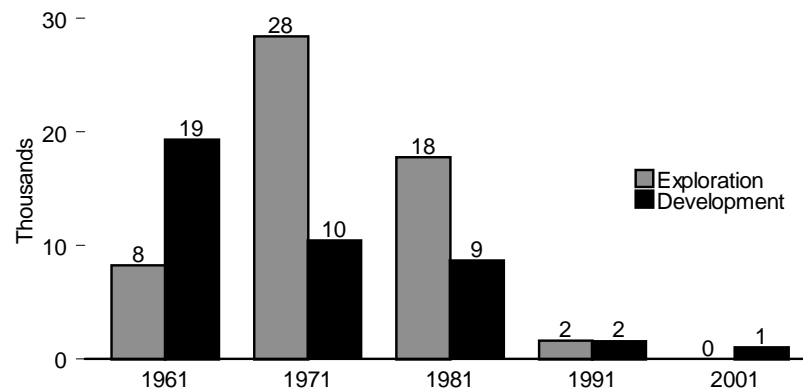
Source: Energy Information Administration, Coal Reserves Database.

**Figure 4.12 Uranium Exploration and Development Drilling**

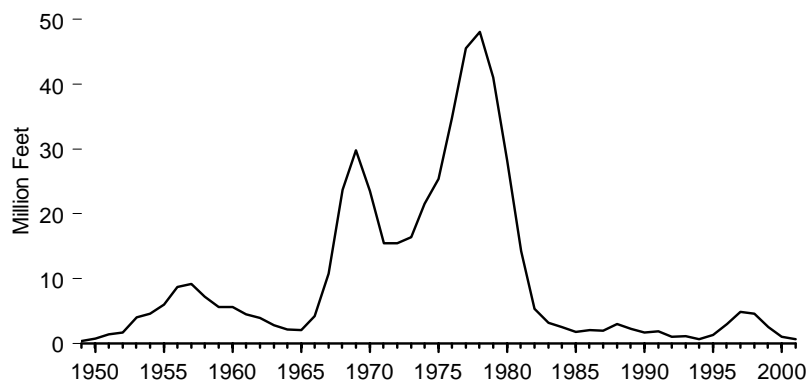
**Total Holes Drilled, 1958-2001**



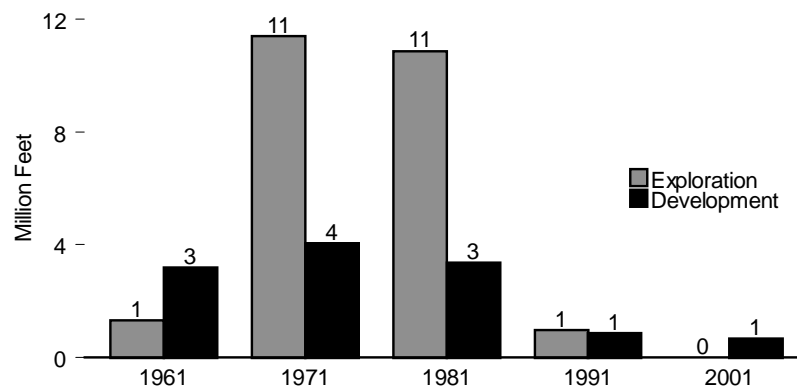
**Holes Drilled, Selected Years**



**Total Footage Drilled, 1949-2001**



**Footage Drilled, Selected Years**



Source: Table 4.12.

**Table 4.12 Uranium Exploration and Development Drilling, 1949-2001**

Year	Exploration <sup>1</sup>		Development <sup>2</sup>		Total	
	Holes Drilled (thousands)	Footage Drilled (million feet)	Holes Drilled (thousands)	Footage Drilled (million feet)	Holes Drilled (thousands)	Footage Drilled (million feet)
1949	NA	0.36	NA	0.05	NA	0.41
1950	NA	0.57	NA	0.21	NA	0.78
1951	NA	1.08	NA	0.35	NA	1.43
1952	NA	1.36	NA	0.30	NA	1.66
1953	NA	3.65	NA	0.37	NA	4.02
1954	NA	4.06	NA	0.55	NA	4.61
1955	NA	5.27	NA	0.76	NA	6.03
1956	NA	7.29	NA	1.50	NA	8.79
1957	NA	7.35	NA	1.85	NA	9.20
1958	25.32	3.76	22.93	3.49	48.25	7.25
1959	16.25	2.37	19.59	3.28	35.84	5.65
1960	7.34	1.40	24.40	4.21	31.73	5.61
1961	8.26	1.32	19.31	3.19	27.57	4.51
1962	6.44	1.48	12.87	2.43	19.31	3.91
1963	8.47	0.88	13.53	1.98	22.01	2.86
1964	5.97	0.97	9.91	1.25	15.88	2.21
1965	6.23	1.16	7.33	0.95	13.56	2.11
1966	5.75	1.80	13.18	2.40	18.93	4.20
1967	12.79	5.44	16.95	5.33	29.74	10.76
1968	38.47	16.23	19.53	7.53	58.00	23.75
1969	47.85	20.47	28.01	9.39	75.86	29.86
1970	43.98	17.98	14.87	5.55	58.85	23.53
1971	28.42	11.40	10.44	4.05	38.86	15.45
1972	26.91	11.82	9.71	3.61	36.62	15.42
1973	22.56	10.83	11.70	5.59	34.26	16.42
1974	27.40	14.72	12.30	6.84	39.70	21.56
1975	34.29	15.69	21.60	9.73	55.89	25.42
1976	40.41	20.36	27.23	14.44	67.64	34.80
1977	62.60	27.96	30.86	17.62	93.45	45.58
1978	75.07	28.95	29.29	19.15	104.35	48.10
1979	60.46	28.07	30.19	13.01	90.65	41.08
1980	39.61	19.60	20.19	8.59	59.80	28.19
1981	17.75	10.87	8.67	3.35	26.42	14.22
1982	6.97	4.23	3.00	1.13	9.97	5.36
1983	4.29	2.09	3.01	1.08	7.30	3.17
1984	4.80	2.26	0.72	0.29	5.52	2.55
1985	2.88	1.42	0.77	0.34	3.65	1.76
1986	1.99	1.10	1.85	0.97	3.83	2.07
1987	1.82	1.11	1.99	0.86	3.81	1.97
1988	2.03	1.28	3.18	1.73	5.21	3.01
1989	2.09	1.43	1.75	0.80	3.84	2.23
1990	1.51	0.87	1.91	0.81	3.42	1.68
1991	1.62	0.97	1.57	0.87	3.20	1.84
1992	0.94	0.56	0.83	0.50	1.77	1.06
1993	0.36	0.22	1.67	0.89	2.02	1.11
1994	0.52	0.34	0.48	0.32	1.00	0.66
1995	0.58	0.40	1.73	0.95	2.31	1.35
1996	1.12	0.88	3.58	2.16	4.70	3.05
1997	1.94	1.33	5.86	3.56	7.79	4.88
1998	1.37	0.89	5.23	3.75	6.60	4.64
1999	0.27	0.18	2.91	2.33	3.18	2.50
2000	W	W	W	W	1.55	1.02
2001	0.00	0.00	1.02	0.66	1.02	0.66

<sup>1</sup> Includes surface drilling in search of new ore deposits or extensions of known deposits and drilling at the location of a discovery up to the time the company decides sufficient ore reserves are present to justify commercial exploitation.

<sup>2</sup> Includes all surface drilling on an ore deposit to determine more precisely size, grade, and configuration subsequent to the time that commercial exploitation is deemed feasible.

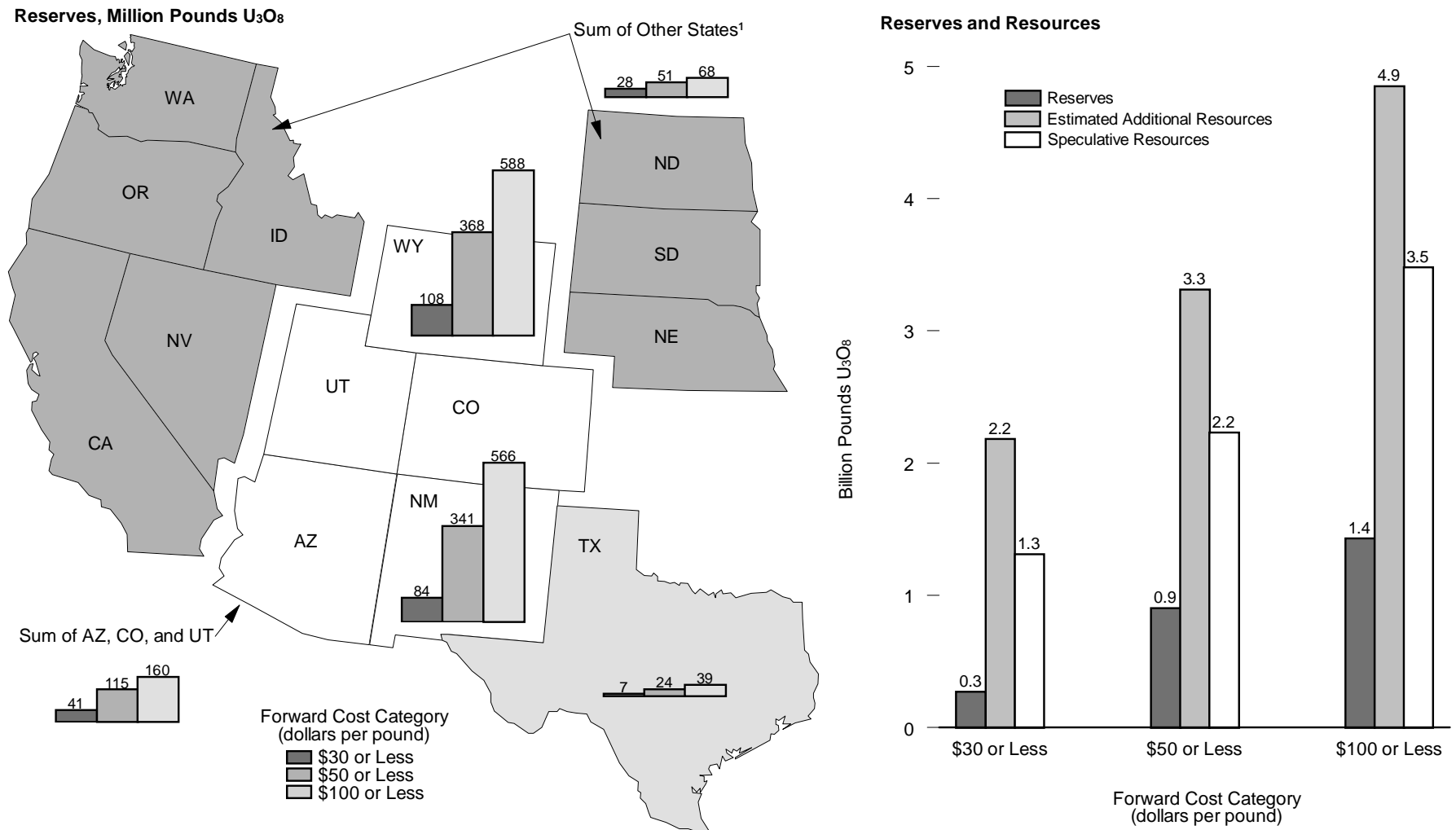
NA=Not available. W=Value withheld to avoid disclosure of individual company data.

Note: Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelnuclear.html>.

Sources: 1949-1981—U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry*, January 1, 1983, Report No. GJO-100 (1983), Table VIII-5. 1982 forward—Energy Information Administration, *Uranium Industry Annual*, annual reports.

**Figure 4.13 Uranium Reserves and Resources, 2001**



<sup>1</sup>California, Idaho, Nebraska, Nevada, North Dakota, Oregon, South Dakota, Washington, and undisclosed.

Source: Table 4.13.

Notes: Data are at end of year.

**Table 4.13 Uranium Reserves and Resources, 2001**  
(Million Pounds U<sub>3</sub>O<sub>8</sub>)

Resource Category and State	Forward Cost Category (dollars per pound) <sup>1</sup>		
	\$30 or Less	\$50 or Less	\$100 or Less
<b>Reserves</b> <sup>2</sup>	<b>268</b>	<b>899</b>	<b>1,422</b>
New Mexico	84	341	566
Wyoming	108	368	588
Texas	7	24	39
Arizona, Colorado, Utah	41	115	160
Others <sup>3</sup>	28	51	68
<b>Potential Resources</b> <sup>4</sup>			
Estimated Additional Resources	2,180	3,310	4,850
Speculative Resources	1,310	2,230	3,480

<sup>1</sup> Forward costs are all operating and capital costs (in current dollars) yet to be incurred in the production of uranium from estimated resources. Excluded are previous expenditures (such as exploration and land acquisitions), taxes, profit, and the cost of money. Generally, forward costs are lower than market prices. Resource values in forward-cost categories are cumulative; that is, the quantity at each level of forward-cost includes all reserves/resources at the lower cost in that category.

<sup>2</sup> The Energy Information Administration category of uranium reserves is equivalent to the internationally reported category of Reasonably Assured Resources (RAR).

<sup>3</sup> California, Idaho, Nebraska, Nevada, North Dakota, Oregon, South Dakota, Washington, and

undisclosed.

<sup>4</sup> Shown are the mean values for the distribution of estimates for each forward-cost category, rounded to the nearest million pounds U<sub>3</sub>O<sub>8</sub>.

Note: Data are at end of year.

Web Page: <http://www.eia.doe.gov/fuelnuclear.html>.

Sources: Forward Costs \$30 or Less and \$50 or Less—Energy Information Administration (EIA), *Uranium Industry Annual 2001* (May 2002), Tables B1 and B4. Forward Costs \$100 or Less—EIA, Office of Coal, Nuclear, Electric and Alternate Fuels database as of December 31, 2001.



## Energy Resources

**Note 1.** These volumes are the sum of the respective mean estimates in United States Geological Survey, *1995 National Assessment of United States Oil and Gas Resources*, Circular 1118 (Washington DC, 1995), pp. 2 and 17-19, for the onshore United States and State jurisdiction offshore waters, and in Minerals Management Services, *Outer Continental Shelf Petroleum Assessment, 2000* (Washington DC, 2001), for the Federal jurisdiction offshore (<http://www.mms.gov/revaldiv/RedNatAssessment.htm>).

Conventionally reservoired deposits are discrete subsurface accumulations of crude oil or natural gas usually defined, controlled, or limited by hydrocarbon/water contacts. Unconventionally reservoired deposits (continuous-type accumulations) are geographically extensive subsurface accumulations of crude oil or natural gas that generally lack well-defined hydrocarbon/water contacts. Examples include coalbed methane, “tight gas,” and auto-sourced oil- and gas-shale reservoirs. Ultimate recovery appreciation (reserve growth) is the volume by which the estimate of total recovery from a known oil or gas reservoir or aggregation of such reservoirs

is expected to increase during the time between discovery and permanent abandonment.

For purposes of comparison, the Potential Gas Committee, an industry-sponsored group of experts, biennially provides another geologically-based estimate of the Nation’s natural gas resources. The latest mean estimate, published in “Potential Supply of Natural Gas in the United States,” December 31, 2000, is 1,091 trillion cubic feet. This volume includes undiscovered conventionally reservoired deposits, expected ultimate recovery appreciation, coalbed methane, and tight gas where it is believed to be technically recoverable and marketable at reasonable costs.

**Note 2.** For 1970 forward, annual well completions are estimated by EIA based on individual well reports submitted to the American Petroleum Institute (1970-1994) and to Petroleum Information/Dwights LLC (1995 forward). The as-received well completion data for recent years are incomplete due to delays in the reporting of wells drilled. EIA therefore statistically imputes the missing data to provided estimates of total well completions and footage where necessary.

# 5

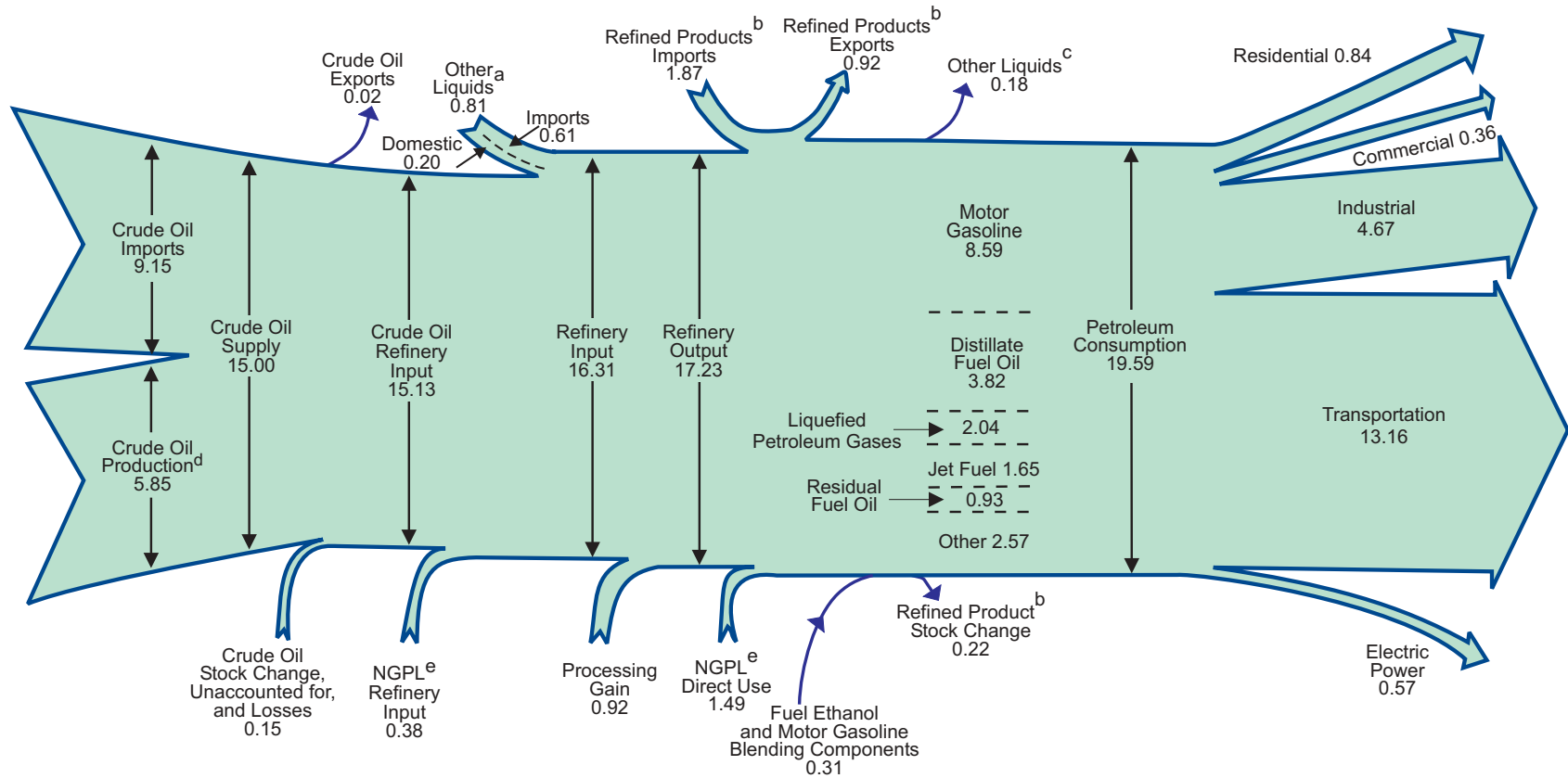
# Petroleum



Oil pumping unit and drilling rig, Texas. Source: U.S. Department of Energy.



**Diagram 2. Petroleum Flow, 2001**  
(Million Barrels per Day)



<sup>a</sup> Unfinished oils, motor gasoline blending components, aviation gasoline blending components, and other hydrocarbons and oxygenates.

<sup>b</sup> Finished petroleum products, liquefied petroleum gases, pentanes plus, and other liquids.

<sup>c</sup> Unfinished oils requiring further refinery processing, and aviation blending components.

<sup>d</sup> Includes lease condensate.

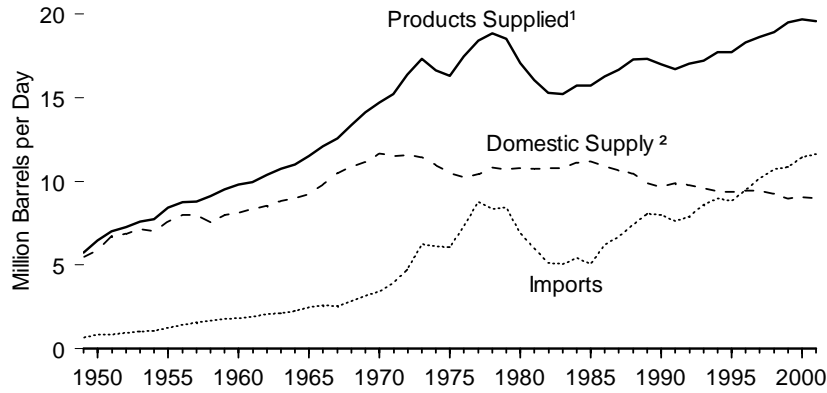
<sup>e</sup> Natural gas plant liquids.

Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.

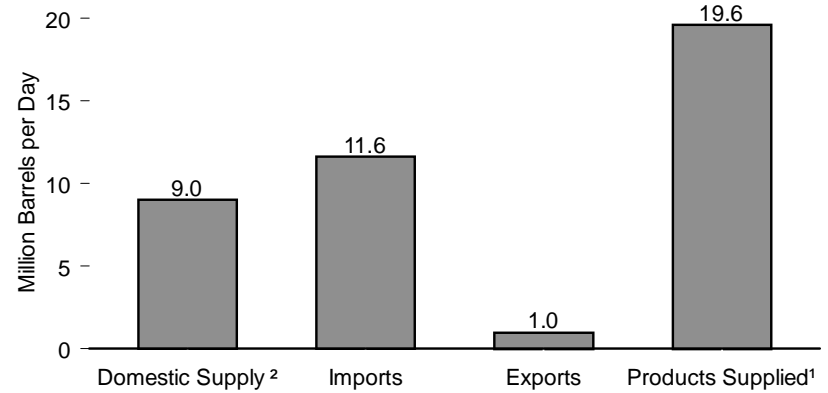
Sources: Tables 5.1, 5.3, 5.5, 5.8, 5.11, 5.12a-5.12d, 5.14, and *Petroleum Supply Monthly*, February 2002, Table 3.

# Figure 5.1 Petroleum Overview

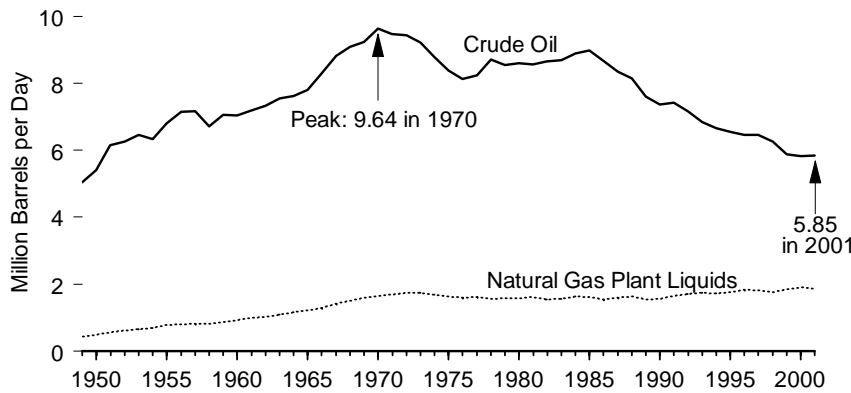
Overview, 1949-2001



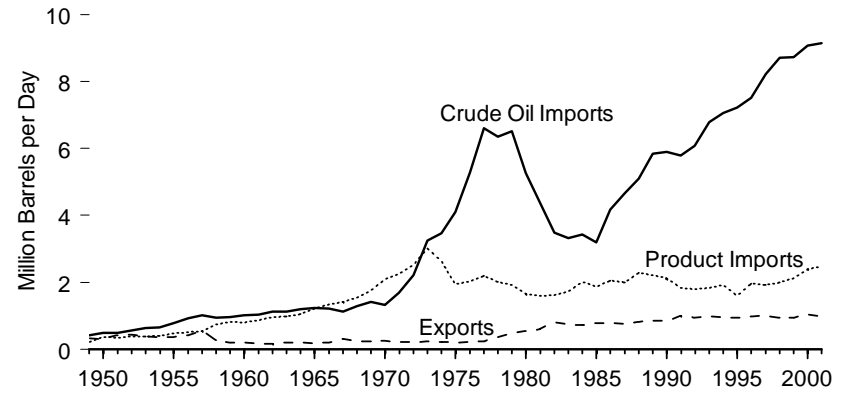
Overview, 2001



Crude Oil and Natural Gas Plant Liquids Production, 1949-2001



Trade, 1949-2001



<sup>1</sup> Approximate representation of petroleum consumption.

<sup>2</sup> Crude oil and natural gas plant liquids production; refinery processing gains; and field production of other hydrocarbons, hydrogen, oxygenates (ethers and alcohols), gasoline blending components, and finished petroleum products.

Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 5.1 and 5.3.

**Table 5.1 Petroleum Overview, 1949-2001**  
(Thousand Barrels per Day)

Year	Production					Other Domestic Supply <sup>2</sup>	Trade			Stock Change <sup>3</sup>	Crude Oil Losses and Unaccounted for <sup>4</sup>	Petroleum Products Supplied
	Crude Oil			Natural Gas Plant Liquids	Total		Imports	Exports	Net Imports			
	48 States <sup>1</sup>	Alaska	Total									
1949	5,046	0	5,046	430	5,477	-2	645	327	318	-8	38	5,763
1950	5,407	0	5,407	499	5,906	2	850	305	545	-56	51	6,458
1951	6,158	0	6,158	561	6,719	7	844	422	422	101	31	7,016
1952	6,256	0	6,256	611	6,867	7	952	432	520	108	16	7,270
1953	6,458	0	6,458	654	7,111	20	1,034	402	633	142	22	7,600
1954	6,342	0	6,342	691	7,033	23	1,052	355	696	-29	26	7,756
1955	6,807	0	6,807	771	7,578	R <sup>34</sup>	1,248	368	880	(s)	37	8,455
1956	7,151	0	7,151	800	7,951	43	1,436	430	1,006	179	46	8,775
1957	7,170	0	7,170	808	7,978	42	1,574	568	1,007	167	50	8,809
1958	6,710	0	6,710	808	7,517	64	1,700	276	1,425	-140	27	9,118
1959	7,053	1	7,054	879	7,932	86	1,780	211	1,569	51	10	9,527
1960	7,034	2	7,035	929	7,965	146	1,815	202	1,613	-83	8	9,797
1961	7,166	17	7,183	991	8,174	179	1,917	174	1,743	111	9	9,976
1962	7,304	28	7,332	1,021	8,353	175	2,082	168	1,913	32	9	10,400
1963	7,512	29	7,542	1,098	8,640	202	2,123	208	1,915	3	10	10,743
1964	7,584	30	7,614	1,154	8,769	217	2,259	202	2,057	10	10	11,023
1965	7,774	30	7,804	1,210	9,014	220	2,468	187	2,281	-8	10	11,512
1966	8,256	39	8,295	1,284	9,579	245	2,573	198	2,375	104	10	12,084
1967	8,730	80	8,810	1,409	10,220	292	2,537	307	2,230	173	9	12,560
1968	8,915	181	9,096	1,504	10,599	R <sup>319</sup>	2,840	231	2,609	152	-17	13,393
1969	9,035	203	9,238	1,590	10,827	R <sup>335</sup>	3,166	233	2,933	-48	7	14,137
1970	9,408	229	9,637	1,660	11,297	R <sup>359</sup>	3,419	259	3,161	103	16	14,697
1971	9,245	218	9,463	1,693	11,155	R <sup>382</sup>	3,926	224	3,701	71	-45	15,212
1972	9,242	199	9,441	1,744	11,185	R <sup>388</sup>	4,741	222	4,519	-232	-43	16,367
1973	9,010	198	9,208	1,738	10,946	R <sup>483</sup>	6,256	231	6,025	135	11	17,308
1974	8,581	193	8,774	1,688	10,462	R <sup>516</sup>	6,112	221	5,892	179	38	16,653
1975	8,183	191	8,375	1,633	10,008	R <sup>497</sup>	6,056	209	5,846	32	-3	16,322
1976	7,958	173	8,132	1,604	9,736	R <sup>515</sup>	7,313	223	7,090	-58	-63	17,461
1977	7,781	464	8,245	1,618	9,862	R <sup>575</sup>	8,807	243	8,565	548	22	18,431
1978	7,478	1,229	8,707	1,567	10,275	R <sup>549</sup>	8,363	362	8,002	-94	73	18,847
1979	7,151	1,401	8,552	1,584	10,135	R <sup>571</sup>	8,456	471	7,985	173	6	18,513
1980	6,980	1,617	8,597	1,573	10,170	R <sup>641</sup>	6,909	544	6,365	140	-20	17,056
1981	6,962	1,609	8,572	1,609	10,180	R <sup>558</sup>	5,996	595	5,401	160	-78	16,058
1982	6,953	1,696	8,649	1,550	10,199	R <sup>583</sup>	5,113	815	4,298	-147	-68	15,296
1983	6,974	1,714	8,688	1,559	10,246	R <sup>541</sup>	5,051	739	4,312	-20	-112	15,231
1984	7,157	1,722	8,879	1,630	10,509	R <sup>599</sup>	5,437	722	4,715	280	-183	15,726
1985	7,146	1,825	8,971	1,609	10,581	R <sup>612</sup>	5,067	781	4,286	-103	-145	15,726
1986	6,814	1,867	8,680	1,551	10,231	R <sup>674</sup>	6,224	785	5,439	202	-139	16,281
1987	6,387	1,962	8,349	1,595	9,944	R <sup>703</sup>	6,678	764	5,914	41	-145	16,665
1988	6,123	2,017	8,140	1,625	9,765	R <sup>708</sup>	7,402	815	6,587	-28	-196	17,283
1989	5,739	1,874	7,613	1,546	9,159	R <sup>722</sup>	8,061	859	7,202	-43	-200	17,325
1990	5,582	1,773	7,355	1,559	8,914	R <sup>763</sup>	8,018	857	7,161	107	-257	16,988
1991	5,618	1,798	7,417	1,659	9,076	R <sup>807</sup>	7,627	1,001	6,626	-10	-195	16,714
1992	5,457	1,714	7,171	1,697	8,868	R <sup>900</sup>	7,888	950	6,938	-68	-258	17,033
1993	5,264	1,582	6,847	1,736	8,582	R <sup>1,020</sup>	8,620	1,003	7,618	151	-168	17,237
1994	5,103	1,559	6,662	1,727	8,388	R <sup>1,025</sup>	8,996	942	8,054	15	-266	17,718
1995	5,076	1,484	6,560	1,762	8,322	R <sup>1,078</sup>	8,835	949	7,886	-246	-193	17,725
1996	5,071	1,393	6,465	1,830	8,295	R <sup>1,150</sup>	9,478	981	8,498	-151	-215	18,309
1997	5,156	1,296	6,452	1,817	8,269	R <sup>1,192</sup>	10,162	1,003	9,158	143	-145	18,620
1998	5,077	1,175	6,252	1,759	8,011	R <sup>1,267</sup>	10,708	945	9,764	239	-115	18,917
1999	4,832	1,050	5,881	1,850	7,731	R <sup>1,262</sup>	10,852	940	9,912	-422	-191	19,519
2000	R <sup>4,851</sup>	970	R <sup>5,822</sup>	1,911	R <sup>7,733</sup>	R <sup>1,325</sup>	R <sup>11,459</sup>	1,040	R <sup>10,419</sup>	R <sup>-69</sup>	-155	R <sup>19,701</sup>
2001 <sup>P</sup>	4,884	968	5,853	1,864	7,716	1,305	11,619	982	10,637	309	-244	19,593

<sup>1</sup> United States excluding Alaska and Hawaii.

<sup>2</sup> Refinery processing gains and field production of other hydrocarbons, hydrogen, oxygenates (ethers and alcohols), gasoline blending components, and finished petroleum products.

<sup>3</sup> A negative number indicates a decrease in stocks and a positive number indicates an increase. Distillate stocks in the "Northeast Heating Oil Reserve" are not included.

<sup>4</sup> "Unaccounted for" represents the difference between crude oil supply and disposition.

R=Revised. P=Preliminary. (s)=Less than 500 barrels per day.

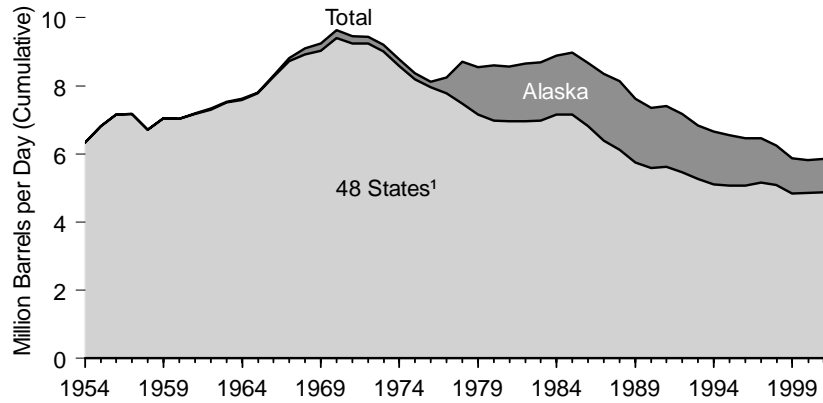
Notes: Crude oil includes lease condensate. For the definition of petroleum products supplied, see

Notes 1, 2, and 3 at end of section. Totals may not equal sum of components due to independent rounding.

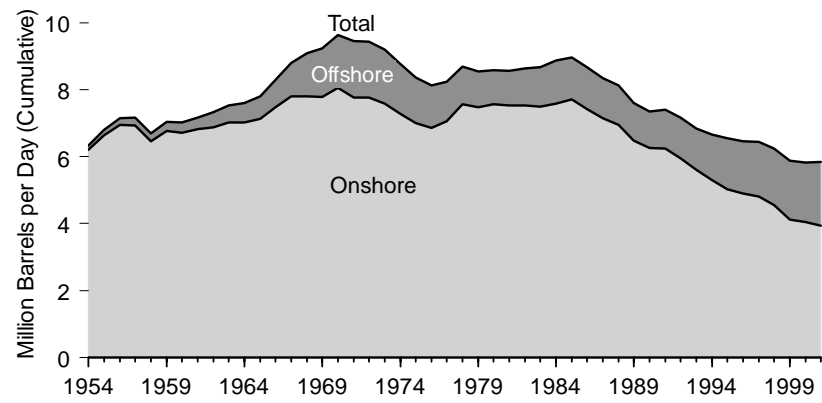
Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).  
Sources: 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. 1976-1980—Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual*, annual reports. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, *Petroleum Supply Monthly* (February 2002).

**Figure 5.2 Crude Oil Production and Oil Well Productivity, 1954-2001**

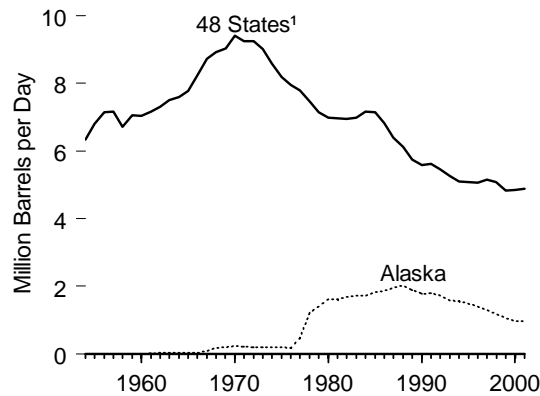
**By Geographic Location**



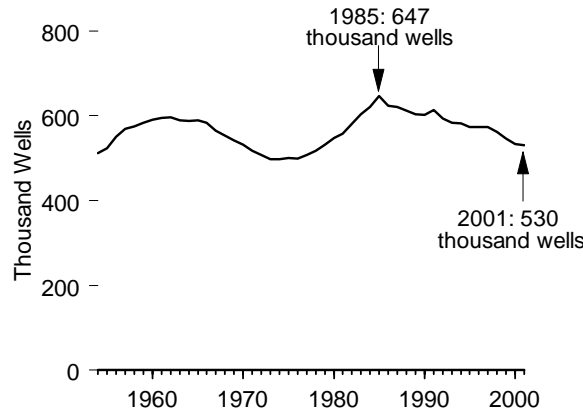
**By Site**



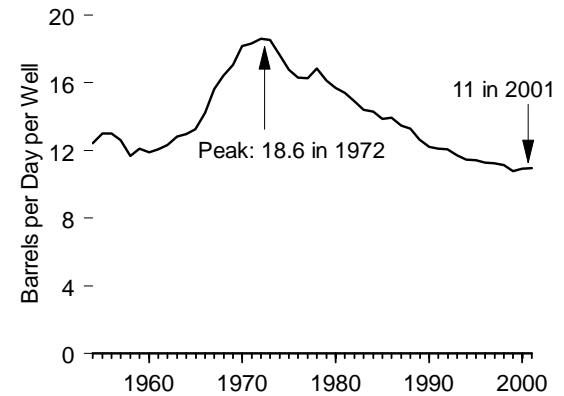
**48 States¹ and Alaska**



**Number of Producing Wells**



**Average Productivity**



<sup>1</sup> United States excluding Alaska and Hawaii.  
Note: Crude oil includes lease condensate.

Source: Table 5.2.

**Table 5.2 Crude Oil Production and Oil Well Productivity, 1954-2001**

(Thousand Barrels per Day, Except as Noted)

Year	Geographic Location		Site		Type		Total Production	Oil Well Productivity	
	48 States <sup>1</sup>	Alaska	Onshore	Offshore	Crude Oil	Lease Condensate		Producing Wells <sup>2</sup> (thousands)	Average Productivity <sup>3</sup> (barrels per day per well)
1954	6,342	0	6,209	133	6,342	( <sup>4</sup> )	6,342	511	12.4
1955	6,807	0	6,645	162	6,807	( <sup>4</sup> )	6,807	524	13.0
1956	7,151	0	6,951	201	7,151	( <sup>4</sup> )	7,151	551	13.0
1957	7,170	0	6,940	229	7,170	( <sup>4</sup> )	7,170	569	12.6
1958	6,710	0	6,473	236	6,710	( <sup>4</sup> )	6,710	575	11.7
1959	7,053	1	6,779	274	7,054	( <sup>4</sup> )	7,054	583	12.1
1960	7,034	2	6,716	319	7,035	( <sup>4</sup> )	7,035	591	11.9
1961	7,166	17	6,817	365	7,183	( <sup>4</sup> )	7,183	595	12.1
1962	7,304	28	6,888	444	7,332	( <sup>4</sup> )	7,332	596	12.3
1963	7,512	29	7,026	515	7,542	( <sup>4</sup> )	7,542	589	12.8
1964	7,584	30	7,027	587	7,614	( <sup>4</sup> )	7,614	588	12.9
1965	7,774	30	7,140	665	7,804	( <sup>4</sup> )	7,804	589	13.2
1966	8,256	39	7,473	823	8,295	( <sup>4</sup> )	8,295	583	14.2
1967	8,730	80	7,802	1,009	8,810	( <sup>4</sup> )	8,810	565	15.6
1968	8,915	181	7,808	1,287	8,660	436	9,096	554	16.4
1969	9,035	203	7,797	1,441	8,778	460	9,238	542	17.0
1970	9,408	229	8,060	1,577	9,180	457	9,637	531	18.1
1971	9,245	218	7,779	1,684	9,032	431	9,463	517	18.3
1972	9,242	199	7,780	1,660	8,998	443	9,441	508	18.6
1973	9,010	198	7,592	1,616	8,784	424	9,208	497	18.5
1974	8,581	193	7,285	1,489	8,375	399	8,774	498	17.6
1975	8,183	191	7,012	1,362	8,007	367	8,375	500	16.8
1976	7,958	173	6,868	1,264	7,776	356	8,132	499	16.3
1977	7,781	464	7,069	1,176	7,875	370	8,245	507	16.3
1978	7,478	1,229	7,571	1,136	8,353	355	8,707	517	16.8
1979	7,151	1,401	7,485	1,067	8,181	371	8,552	531	16.1
1980	6,980	1,617	7,562	1,034	8,210	386	8,597	548	15.7
1981	6,962	1,609	7,537	1,034	8,176	395	8,572	557	15.4
1982	6,953	1,696	7,538	1,110	8,261	387	8,649	580	14.9
1983	6,974	1,714	7,492	1,196	8,688	( <sup>4</sup> )	8,688	603	14.4
1984	7,157	1,722	7,596	1,283	8,879	( <sup>4</sup> )	8,879	621	14.3
1985	7,146	1,825	7,722	1,250	8,971	( <sup>4</sup> )	8,971	647	13.9
1986	6,814	1,867	7,426	1,254	8,680	( <sup>4</sup> )	8,680	623	13.9
1987	6,387	1,962	7,153	1,196	8,349	( <sup>4</sup> )	8,349	620	13.5
1988	6,123	2,017	6,949	1,191	8,140	( <sup>4</sup> )	8,140	612	13.3
1989	5,739	1,874	6,486	1,127	7,613	( <sup>4</sup> )	7,613	603	12.6
1990	5,582	1,773	6,273	1,082	7,355	( <sup>4</sup> )	7,355	602	12.2
1991	5,618	1,798	6,245	1,172	7,417	( <sup>4</sup> )	7,417	614	12.1
1992	5,457	1,714	5,953	1,218	7,171	( <sup>4</sup> )	7,171	594	12.1
1993	5,264	1,582	5,606	1,241	6,847	( <sup>4</sup> )	6,847	584	11.7
1994	5,103	1,559	5,291	1,370	6,662	( <sup>4</sup> )	6,662	582	11.4
1995	5,076	1,484	5,035	1,525	6,560	( <sup>4</sup> )	6,560	574	11.4
1996	5,071	1,393	4,902	1,562	6,465	( <sup>4</sup> )	6,465	574	11.3
1997	5,156	1,296	4,803	1,648	6,452	( <sup>4</sup> )	6,452	573	11.3
1998	5,077	1,175	4,560	1,692	6,252	( <sup>4</sup> )	6,252	562	11.1
1999	4,832	1,050	4,132	1,750	5,881	( <sup>4</sup> )	5,881	546	10.8
2000	R4,851	970	R4,049	R1,773	R5,822	( <sup>4</sup> )	R5,822	534	10.9
2001	P4,884	P968	E3,947	E1,905	P5,853	( <sup>4</sup> )	P5,853	P530	P11.0

<sup>1</sup> United States excluding Alaska and Hawaii.

<sup>2</sup> As of December 31.

<sup>3</sup> For 1954-1976, average productivity is based on the average number of producing wells. For 1977 forward, average productivity is based on the number of wells producing at end of year.

<sup>4</sup> Included in crude oil.

R=Revised. P=Preliminary. E=Estimate.

Note: Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

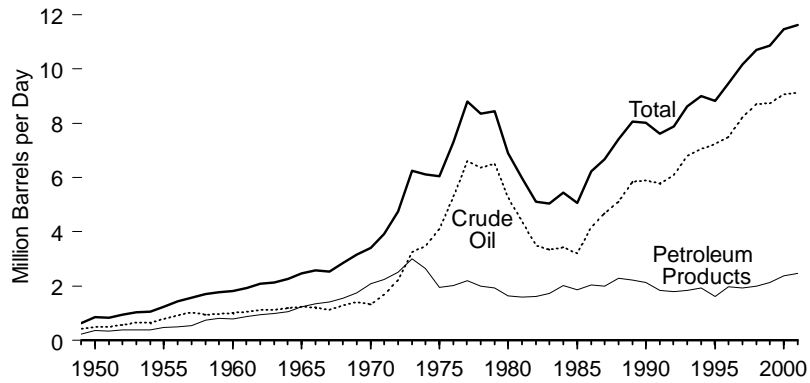
Sources: **Offshore:** 1954-1969—U.S. Geological Survey, *Outer Continental Shelf Statistics*, June 1979. 1970-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual*, annual reports. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports.

2001—EIA estimates. **Onshore:** 1954-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual*, annual reports. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA estimates. **Producing Wells:** 1954-1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual*, annual reports. 1981-1994—Independent Petroleum Association of America, *The Oil Producing Industry in Your State*. 1995 forward—Gulf Publishing Co., *World Oil*, February issue. **All Other Data:** 1954-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual*, annual reports. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, *Petroleum Supply Monthly* (February 2002).

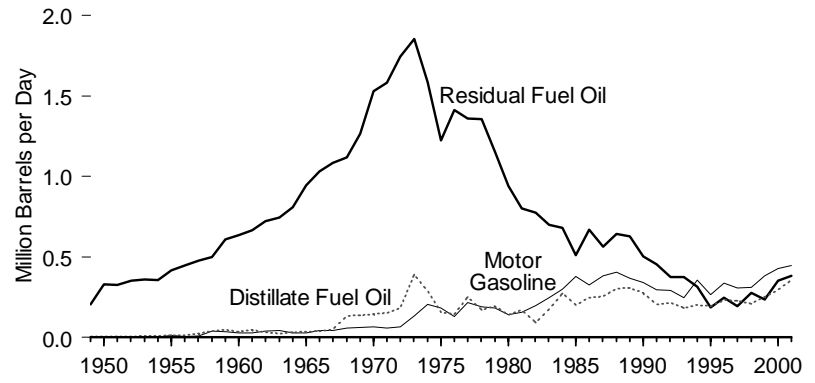


**Figure 5.3 Petroleum Imports by Type**

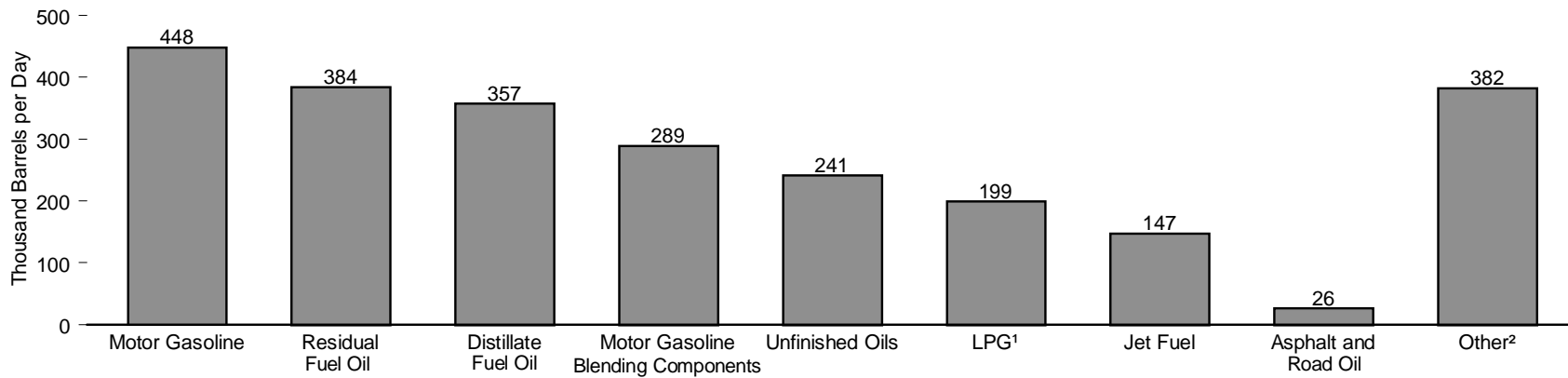
**Total, 1949-2001**



**By Selected Product, 1949-2001**



**By Product, 2001**



<sup>1</sup> Liquefied petroleum gases.

<sup>2</sup> Aviation gasoline and blending components, other hydrocarbons/oxygenates (ethers and alcohols), kerosene, lubricants, pentanes plus, petrochemical feedstocks, petroleum coke, special naphthas, wax, and miscellaneous products.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.3.

**Table 5.3 Petroleum Imports by Type, 1949-2001**  
(Thousand Barrels per Day)

Year	Petroleum Products												Total Petroleum
	Crude Oil <sup>1</sup>	Asphalt and Road Oil	Distillate Fuel Oil	Jet Fuel <sup>2</sup>	Liquefied Petroleum Gases		Motor Gasoline <sup>4</sup>	Motor Gasoline Blending Components	Residual Fuel Oil	Unfinished Oils	Other Products <sup>5</sup>	Total	
					Propane <sup>3</sup>	Total							
1949	421	3	5	(6)	0	0	0	0	206	10	0	224	645
1950	487	5	7	(6)	0	0	(s)	(7)	329	21	1	363	850
1951	491	7	5	(6)	0	0	1	(7)	326	14	0	354	844
1952	573	7	7	(6)	0	0	5	(7)	351	9	0	380	952
1953	648	7	9	(6)	0	0	1	(7)	360	9	0	386	1,034
1954	656	9	9	(6)	0	0	3	(7)	354	21	(s)	396	1,052
1955	782	9	12	(6)	0	0	13	(7)	417	15	0	466	1,248
1956	934	10	14	21	0	0	5	(7)	445	7	(s)	502	1,436
1957	1,023	18	23	25	0	0	8	(7)	475	3	(s)	552	1,574
1958	953	20	41	57	0	0	38	(7)	499	92	(s)	747	1,700
1959	965	19	48	37	0	0	37	(7)	610	63	(s)	814	1,780
1960	1,015	17	35	34	NA	4	27	(7)	637	45	(s)	799	1,815
1961	1,045	18	48	28	NA	5	29	(7)	666	69	8	872	1,917
1962	1,126	18	32	30	NA	6	38	(7)	724	89	18	955	2,082
1963	1,131	17	25	41	NA	7	44	(7)	747	87	24	992	2,123
1964	1,198	16	32	33	NA	11	29	(7)	808	89	42	1,060	2,259
1965	1,238	17	36	81	NA	21	28	(7)	946	92	10	1,229	2,468
1966	1,225	17	38	86	NA	29	43	(7)	1,032	97	7	1,348	2,573
1967	1,128	18	51	89	11	27	42	(7)	1,085	97	2	1,409	2,537
1968	1,291	17	132	105	15	32	59	(7)	1,120	80	4	1,549	2,840
1969	1,409	13	139	125	14	35	62	(7)	1,265	106	12	1,757	3,166
1970	1,324	17	147	144	26	52	67	(7)	1,528	108	32	2,095	3,419
1971	1,681	20	153	180	32	70	59	(7)	1,583	124	56	2,245	3,926
1972	2,216	25	182	194	43	89	68	(7)	1,742	125	101	2,525	4,741
1973	3,244	23	392	212	71	132	134	(7)	1,853	137	129	3,012	6,256
1974	3,477	31	289	163	59	123	204	(7)	1,587	121	117	2,635	6,112
1975	4,105	14	155	133	60	112	184	(7)	1,223	36	95	1,951	6,056
1976	5,287	11	146	76	68	130	131	(7)	1,413	32	87	2,026	7,313
1977	6,615	4	250	75	86	161	217	(7)	1,359	31	95	2,193	8,807
1978	6,356	2	173	86	57	123	190	(7)	1,355	27	50	2,008	8,363
1979	6,519	4	193	78	88	217	181	(7)	1,151	59	54	1,937	8,456
1980	5,263	4	142	80	69	216	140	(7)	939	55	72	1,646	6,909
1981	4,396	4	173	38	70	244	157	24	800	112	48	1,599	5,996
1982	3,488	5	93	29	63	226	197	42	776	174	84	1,625	5,113
1983	3,329	7	174	29	44	190	247	47	699	234	94	1,722	5,051
1984	3,426	18	272	62	67	195	299	83	681	231	171	2,011	5,437
1985	3,201	35	200	39	67	187	381	67	510	318	130	1,866	5,067
1986	4,178	29	247	57	110	242	326	72	669	250	153	2,045	6,224
1987	4,674	36	255	67	88	190	384	60	565	299	146	2,004	6,678
1988	5,107	31	302	90	106	209	405	57	644	360	196	2,295	7,402
1989	5,843	31	306	106	111	181	369	66	629	348	183	2,217	8,061
1990	5,894	32	278	108	115	188	342	62	504	413	198	2,123	8,018
1991	5,782	28	205	67	91	147	297	36	453	413	198	1,844	7,627
1992	6,083	27	216	82	85	131	294	41	375	443	195	1,805	7,888
1993	6,787	32	184	100	103	160	247	27	373	491	219	1,833	8,620
1994	7,063	37	203	117	124	183	356	20	314	413	291	1,933	8,996
1995	7,230	36	193	106	102	146	265	48	187	349	276	1,605	8,835
1996	7,508	27	230	111	119	166	336	166	248	367	319	1,971	9,478
1997	8,225	32	228	91	113	169	309	200	194	353	360	1,936	10,162
1998	8,706	28	210	124	137	194	311	209	275	302	350	2,002	10,708
1999	8,731	34	250	128	122	182	382	217	237	317	375	2,122	10,852
2000	R9,071	28	R295	R162	R161	R215	R427	R223	R352	R274	R414	R2,389	R11,459
2001P	9,146	26	357	147	139	199	448	289	384	241	382	2,473	11,619

<sup>1</sup> Includes any imports for the Strategic Petroleum Reserve, which began in 1977.

<sup>2</sup> Prior to 1965, imports of kerosene-type jet fuel were included with kerosene, which is listed under "Other Products."

<sup>3</sup> Includes propylene.

<sup>4</sup> Prior to 1964, motor gasoline data were for total gasoline, including motor gasoline, aviation gasoline, and special naphthas. After 1980, excludes motor gasoline blending components.

<sup>5</sup> Aviation gasoline, aviation gasoline blending components, other hydrocarbons/oxygenates (ethers and alcohols), kerosene, lubricants, pentanes plus, petrochemical feedstocks, petroleum coke, special naphthas, wax, and miscellaneous products.

<sup>6</sup> Included in motor gasoline.

<sup>7</sup> If applicable, included in motor gasoline.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 500 barrels per day.

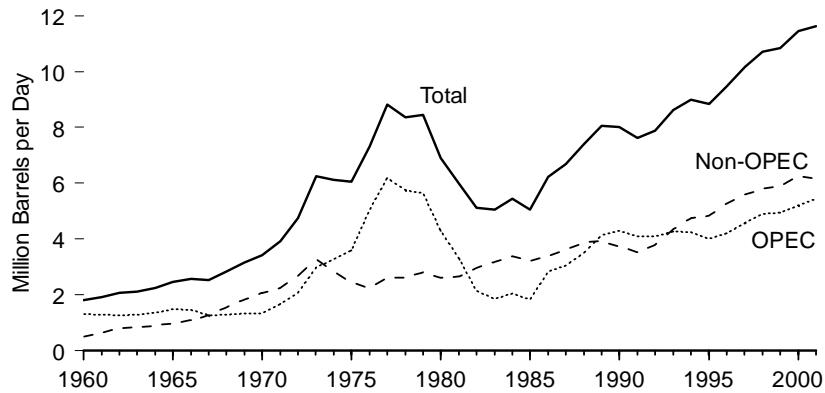
Notes: Includes imports from U.S. possessions and territories. Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

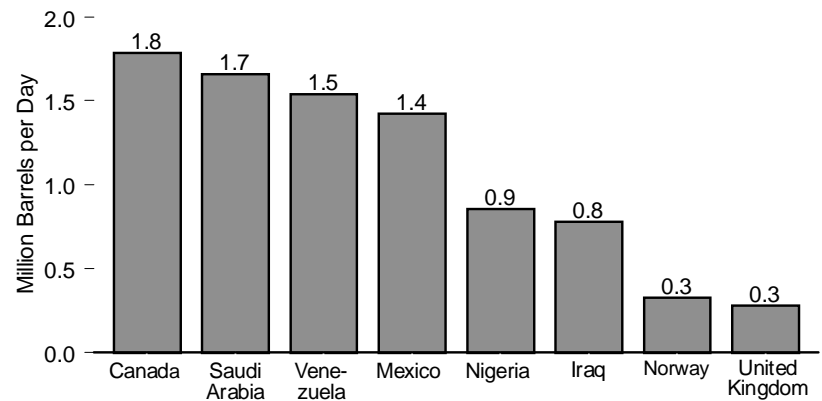
Sources: 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual, annual reports.* 1976-1980—Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual, annual reports.* 1981-2000—EIA, *Petroleum Supply Annual, annual reports.* 2001—EIA, *Petroleum Supply Monthly* (February 2002).

**Figure 5.4 Petroleum Imports by Country of Origin**

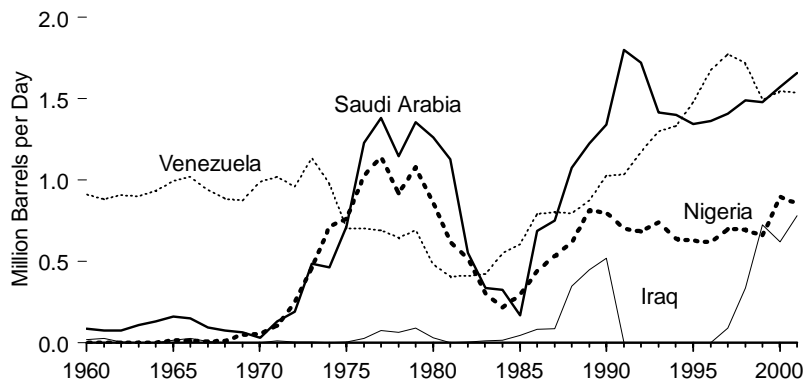
**Total, OPEC, and Non-OPEC, 1960-2001**



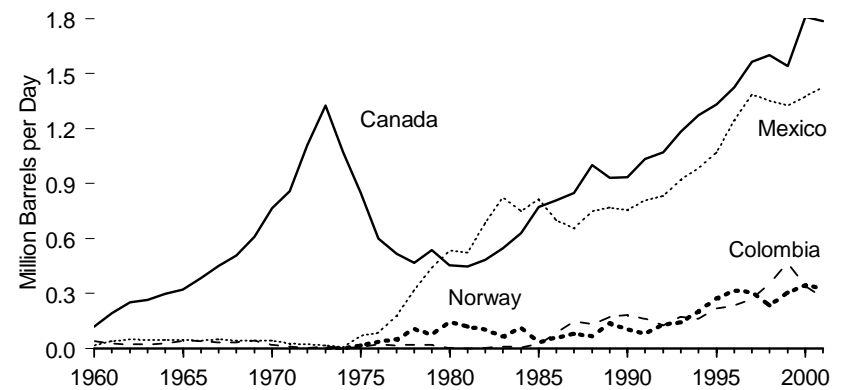
**Selected Countries, 2001**



**Selected OPEC Countries, 1960-2001**



**Selected Non-OPEC Countries, 1960-2001**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.4.

**Table 5.4 Petroleum Imports by Country of Origin, 1960-2001**

Year	Persian Gulf Nations <sup>2</sup>	Selected OPEC <sup>1</sup> Countries					Selected Non-OPEC Countries						Total Imports	Imports From Persian Gulf Nations as Share of Total Imports	Imports From OPEC as Share of Total Imports
		Iraq	Nigeria	Saudi Arabia	Venezuela	Total OPEC <sup>3</sup>	Canada	Colombia	Mexico	Norway	United Kingdom	Total Non-OPEC			
Thousand Barrels per Day													Percent		
1960	NA	17	0	84	911	1,314	120	40	16	0	(s)	500	1,815	NA	72.4
1961	346	<sup>R</sup> 25	0	73	879	1,286	190	28	40	0	1	631	1,917	18.0	67.1
1962	272	2	0	74	906	1,265	250	24	49	0	2	816	2,082	13.0	60.8
1963	303	1	0	108	900	1,283	265	23	48	0	3	839	2,123	14.3	60.5
1964	315	0	0	131	933	1,361	299	26	47	0	(s)	898	2,259	13.9	60.2
1965	345	16	15	158	994	1,476	323	42	48	0	(s)	992	2,468	14.0	59.8
1966	306	26	11	147	1,018	1,471	384	40	45	0	6	1,102	2,573	11.9	57.2
1967	198	5	5	92	938	1,259	450	32	49	0	11	1,278	2,537	7.8	49.6
1968	202	0	9	74	886	1,302	506	33	45	0	28	1,538	2,840	7.1	45.9
1969	179	0	49	65	875	1,336	608	43	43	0	20	1,830	3,166	5.7	42.2
1970	121	0	50	30	989	1,343	766	20	42	0	11	2,076	3,419	3.5	39.3
1971	299	11	102	128	1,020	1,673	857	9	27	0	10	2,253	3,926	7.6	42.6
1972	471	4	251	190	959	2,063	1,108	5	21	0	9	2,678	4,741	9.9	43.5
1973	848	4	459	486	1,135	2,993	1,325	9	16	1	15	3,263	6,256	13.6	47.8
1974	1,039	0	713	461	979	3,280	1,070	5	8	1	8	2,832	6,112	17.0	53.7
1975	1,165	2	762	715	702	3,601	846	9	71	17	14	2,454	6,056	19.2	59.5
1976	1,840	26	1,025	1,230	700	5,066	599	21	87	36	31	2,247	7,313	25.2	69.3
1977	2,448	74	1,143	1,380	690	6,193	517	17	179	50	126	2,614	8,807	27.8	70.3
1978	2,219	62	919	1,144	646	5,751	467	20	318	104	180	2,612	8,363	26.5	68.8
1979	2,069	88	1,080	1,356	690	5,637	538	18	439	75	202	2,819	8,456	24.5	66.7
1980	1,519	28	857	1,261	481	4,300	455	4	533	144	176	2,609	6,909	22.0	62.2
1981	1,219	(s)	620	1,129	406	3,323	447	1	522	119	375	2,672	5,996	20.3	55.4
1982	696	3	514	552	412	2,146	482	5	685	102	456	2,968	5,113	13.6	42.0
1983	442	10	302	337	422	1,862	547	10	826	66	382	3,189	5,051	8.8	36.9
1984	506	12	216	325	548	2,049	630	8	748	114	402	3,388	5,437	9.3	37.7
1985	311	46	293	168	605	1,830	770	23	816	32	310	3,237	5,067	6.1	36.1
1986	912	81	440	685	793	2,837	807	87	699	60	350	3,387	6,224	14.7	45.6
1987	1,077	83	535	751	804	3,060	848	148	655	80	352	3,617	6,678	16.1	45.8
1988	1,541	345	618	1,073	794	3,520	999	134	747	67	315	3,882	7,402	20.8	47.6
1989	1,861	449	815	1,224	873	4,140	931	172	767	138	215	3,921	8,061	23.1	51.4
1990	1,966	518	800	1,339	1,025	4,296	934	182	755	102	189	3,721	8,018	24.5	53.6
1991	1,845	0	703	1,802	1,035	4,092	1,033	163	807	82	138	3,535	7,627	24.2	53.7
1992	1,778	0	681	1,720	1,170	4,092	1,069	126	830	127	230	3,796	7,888	22.5	51.9
1993	1,782	0	740	1,414	1,300	4,273	1,181	171	919	142	350	4,347	8,620	20.7	49.6
1994	1,728	0	637	1,402	1,334	4,247	1,272	161	984	202	458	4,749	8,996	19.2	47.2
1995	1,573	0	627	1,344	1,480	4,002	1,332	219	1,068	273	383	4,833	8,835	17.8	45.3
1996	1,604	1	617	1,363	1,676	4,211	1,424	234	1,244	313	308	5,267	9,478	16.9	44.4
1997	1,755	89	698	1,407	1,773	4,569	1,563	271	1,385	309	226	5,593	10,162	17.3	45.0
1998	2,136	336	696	1,491	1,719	4,905	1,598	354	1,351	236	250	5,803	10,708	19.9	45.8
1999	2,464	725	657	1,478	1,493	4,953	1,539	468	1,324	304	365	5,899	10,852	22.7	45.6
2000	<sup>R</sup> 2,487	<sup>R</sup> 620	<sup>R</sup> 896	<sup>R</sup> 1,572	<sup>R</sup> 1,546	<sup>R</sup> 5,203	<sup>R</sup> 1,807	<sup>R</sup> 342	<sup>R</sup> 1,373	<sup>R</sup> 343	<sup>R</sup> 366	<sup>R</sup> 6,257	<sup>R</sup> 11,459	<sup>R</sup> 21.7	<sup>R</sup> 45.4
2001 <sup>P</sup>	2,731	778	854	1,657	1,538	5,447	1,786	280	1,423	327	306	6,172	11,619	23.5	46.9

<sup>1</sup> Organization of Petroleum Exporting Countries. See Glossary for current membership.

<sup>2</sup> Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and United Arab Emirates.

<sup>3</sup> Ecuador withdrew from OPEC on December 31, 1992. Beginning in 1993, imports from Ecuador appear under "Non-OPEC." Gabon withdrew from OPEC on December 31, 1994. Beginning in 1995, imports from Gabon appear under "Non-OPEC."

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 500 barrels per day.

Notes: The country of origin for refined petroleum products may not be the country of origin for the crude oil from which the refined products were produced. For example, refined products imported from

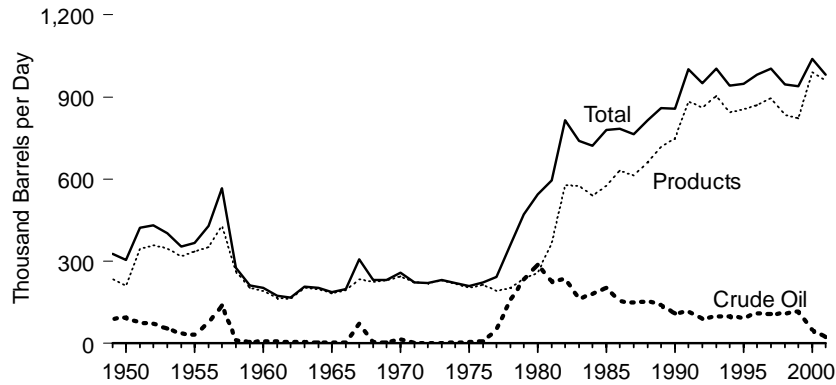
refineries in the Caribbean may have been produced from Middle East crude oil. Data include any imports for the Strategic Petroleum Reserve, which began in 1977. Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

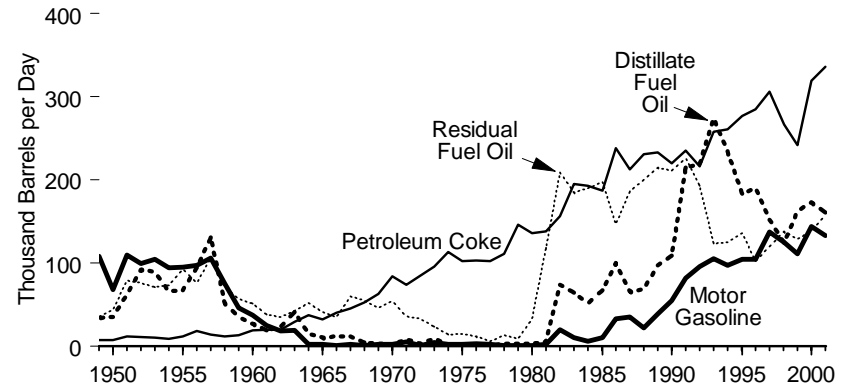
Sources: 1960-1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. 1976-1980—Energy Information Administration (EIA), *Energy Data Reports, P.A.D. Districts Supply/Demand, Annual*, annual reports. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, *Petroleum Supply Monthly* (February 2002).

**Figure 5.5 Petroleum Exports by Type**

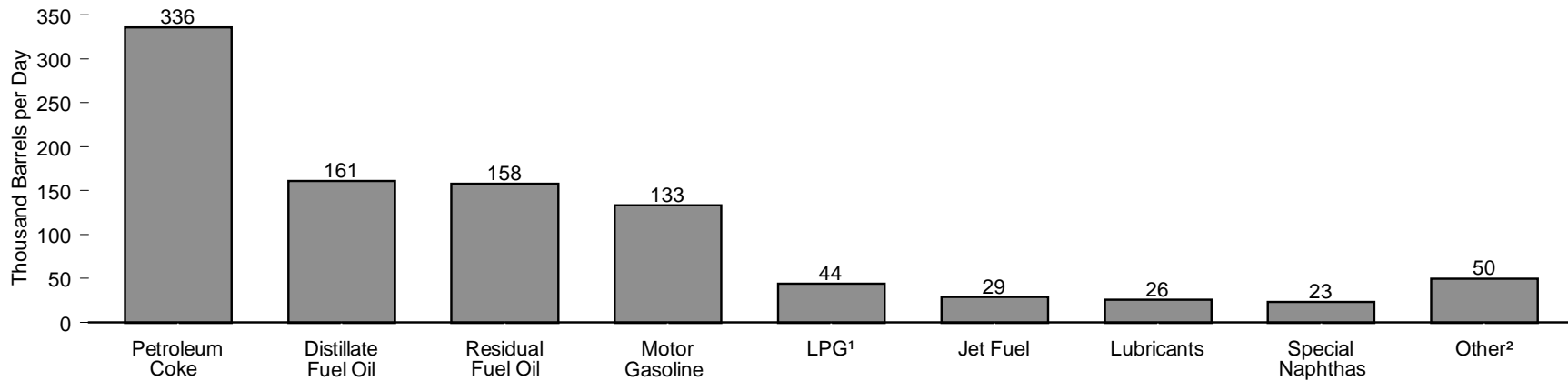
**Total, 1949-2001**



**By Selected Product, 1949-2001**



**By Product, 2001**



<sup>1</sup> Liquefied petroleum gases.

<sup>2</sup> Asphalt and road oil, aviation gasoline, kerosene, motor gasoline blending components, pentanes plus, wax, and miscellaneous products.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.5.

**Table 5.5 Petroleum Exports by Type, 1949-2001**  
(Thousand Barrels per Day)

Year	Crude Oil	Petroleum Products											Total Petroleum	
		Distillate Fuel Oil	Jet Fuel	Liquefied Petroleum Gases		Lubricants	Motor Gasoline <sup>2</sup>	Petroleum Coke	Petrochemical Feedstocks	Residual Fuel Oil	Special Naphthas	Other Products <sup>3</sup>		Total
				Propane <sup>1</sup>	Total									
1949	91	34	( 4 )	NA	4	35	108	7	0	35	NA	15	236	327
1950	95	35	( 4 )	NA	4	39	68	7	0	44	NA	12	210	305
1951	78	62	( 4 )	NA	6	48	110	12	0	79	NA	27	344	422
1952	73	92	( 4 )	NA	7	44	99	11	0	76	NA	31	359	432
1953	55	89	( 1 )	NA	8	36	104	10	0	71	NA	28	347	402
1954	37	66	( s )	NA	11	41	94	9	0	73	NA	23	318	355
1955	32	67	( s )	NA	12	39	95	12	0	93	NA	18	336	368
1956	78	94	( 1 )	NA	12	38	97	18	0	76	NA	16	352	430
1957	138	131	( s )	NA	12	38	106	14	0	106	NA	23	430	568
1958	12	52	( 1 )	NA	8	36	75	12	0	71	NA	10	264	276
1959	7	35	( 1 )	NA	6	38	46	13	0	57	NA	8	204	211
1960	8	27	( s )	NA	8	43	37	19	0	51	NA	9	193	202
1961	9	19	( s )	NA	10	47	25	20	0	38	NA	7	165	174
1962	5	23	( s )	NA	11	48	18	20	0	35	NA	8	163	168
1963	5	41	( 1 )	NA	13	50	19	29	0	42	NA	8	203	208
1964	4	15	( s )	NA	15	50	2	37	0	52	5	23	198	202
1965	3	10	( 3 )	NA	21	45	2	32	5	41	4	20	184	187
1966	4	12	( 5 )	NA	22	47	1	40	7	35	6	19	194	198
1967	73	12	( 6 )	5	25	51	2	45	8	60	5	20	234	307
1968	5	4	( 6 )	7	29	49	1	53	8	55	7	15	226	231
1969	4	3	( 5 )	7	35	45	2	63	11	46	6	13	229	233
1970	14	2	( 6 )	6	27	44	2	84	10	54	4	10	245	259
1971	1	8	( 4 )	13	26	43	5	74	14	36	4	9	223	224
1972	1	3	( 3 )	18	31	41	1	85	13	33	4	8	222	222
1973	2	9	( 4 )	15	27	35	4	96	19	23	5	8	229	231
1974	3	2	( 3 )	14	25	33	2	113	15	14	4	7	218	221
1975	6	1	( 2 )	13	26	25	2	102	22	15	3	6	204	209
1976	8	1	( 2 )	13	25	26	3	103	30	12	7	6	215	223
1977	50	1	( 2 )	10	18	26	2	102	24	6	4	7	193	243
1978	158	3	( 1 )	9	20	27	1	111	23	13	2	2	204	362
1979	235	3	( 1 )	8	15	23	( s )	146	31	9	5	3	236	471
1980	287	3	( 1 )	10	21	23	1	136	29	33	5	4	258	544
1981	228	5	( 2 )	18	42	19	2	138	26	118	11	4	367	595
1982	236	74	( 6 )	31	65	16	20	156	24	209	5	4	579	815
1983	164	64	( 6 )	43	73	16	10	195	20	185	3	3	575	739
1984	181	51	( 9 )	30	48	15	6	193	21	190	2	6	541	722
1985	204	67	( 13 )	48	62	15	10	187	19	197	1	4	577	781
1986	154	100	( 18 )	28	42	23	33	238	22	147	1	8	631	785
1987	151	66	( 24 )	24	38	23	35	213	20	186	2	7	613	764
1988	155	69	( 28 )	31	49	26	22	231	23	200	7	6	661	815
1989	142	97	( 27 )	24	35	19	39	233	26	215	12	15	717	859
1990	109	109	( 43 )	28	40	20	55	220	26	211	11	13	748	857
1991	116	215	( 43 )	28	41	18	82	235	0	226	15	9	885	1,001
1992	89	219	( 43 )	33	49	16	96	216	0	193	14	16	861	950
1993	98	274	( 59 )	26	43	19	105	258	0	123	4	20	904	1,003
1994	99	234	( 20 )	24	38	22	97	261	0	125	20	26	843	942
1995	95	183	( 26 )	38	58	25	104	277	0	136	21	25	855	949
1996	110	190	( 48 )	28	51	34	104	285	0	102	21	36	871	981
1997	108	152	( 35 )	32	50	31	137	306	0	120	22	44	896	1,003
1998	110	124	( 26 )	25	42	25	125	267	0	138	18	70	835	945
1999	118	162	( 32 )	33	R50	28	111	242	0	129	16	R52	822	940
2000	50	173	( 32 )	53	R74	26	144	319	0	139	20	R64	990	1,040
2001P	23	161	( 29 )	31	44	26	133	336	0	158	23	50	959	982

<sup>1</sup> Includes propylene.

<sup>2</sup> Includes aviation gasoline for the years 1949-1963.

<sup>3</sup> Asphalt and road oil, aviation gasoline, kerosene, motor gasoline blending components, other hydrocarbons/oxygenates (ethers and alcohols), pentanes plus, wax, and miscellaneous products.

<sup>4</sup> Included in the products from which jet fuel was blended.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 500 barrels per day.

Notes: Includes exports to U.S. possessions and territories. Totals may not equal sum of

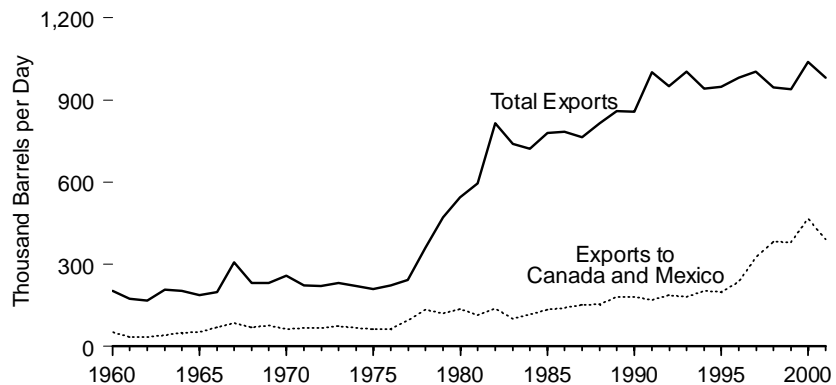
components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

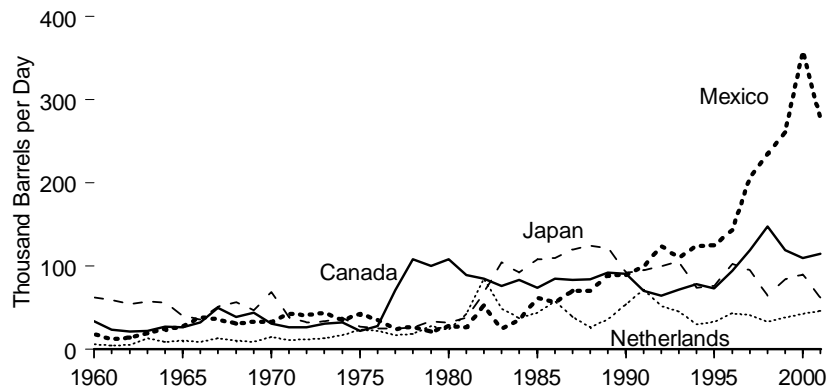
Sources: 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual, annual reports.* 1976-1980—Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual, annual reports.* 1981-2000—EIA, *Petroleum Supply Annual, annual reports.* 2001—EIA, *Petroleum Supply Monthly* (February 2002).

**Figure 5.6 Petroleum Exports by Country of Destination**

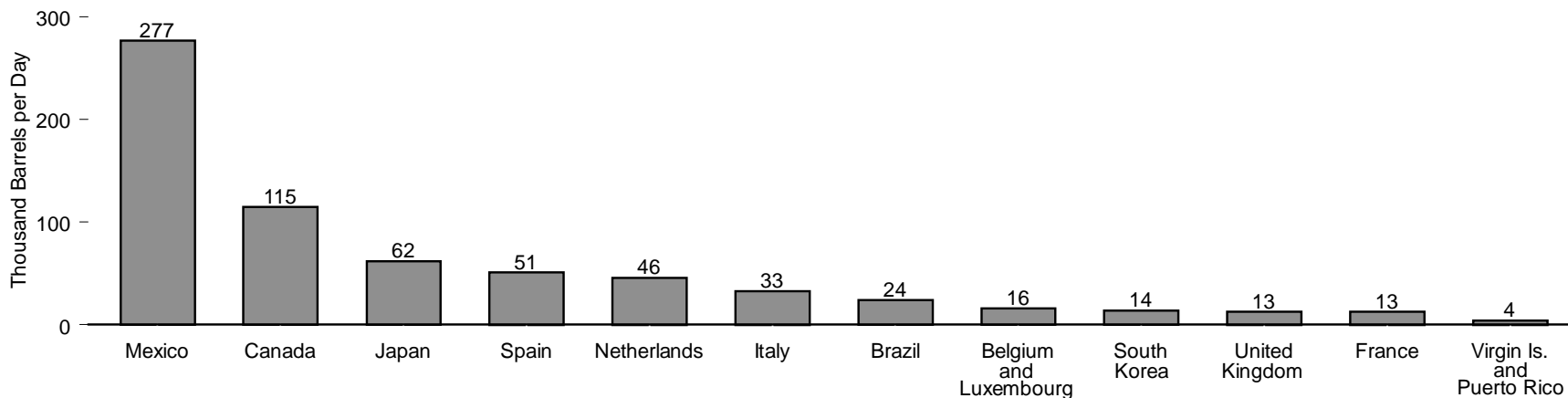
**Total Exports and Exports to Canada and Mexico, 1960-2001**



**By Selected Country, 1960-2001**



**By Selected Country, 2001**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.6.

**Table 5.6 Petroleum Exports by Country of Destination, 1960-2001**  
(Thousand Barrels per Day)

Year	Belgium and Luxembourg	Brazil	Canada	France	Italy	Japan	Mexico	Netherlands	South Korea	Spain	United Kingdom	U.S. Virgin Islands and Puerto Rico	Other	Total
1960	3	4	34	4	6	62	18	6	NA	NA	12	1	52	202
1961	4	4	23	4	5	59	12	4	NA	NA	10	1	48	174
1962	3	5	21	3	5	54	14	5	NA	NA	8	1	50	168
1963	9	4	22	4	8	58	19	13	NA	NA	11	1	59	208
1964	4	4	27	4	8	56	24	9	NA	NA	10	2	55	202
1965	3	3	26	3	7	40	27	10	NA	NA	12	1	54	187
1966	3	4	32	4	7	36	39	9	NA	NA	12	3	49	198
1967	5	6	50	3	9	51	36	13	NA	NA	62	7	65	307
1968	4	8	39	4	8	56	31	10	NA	NA	14	2	55	231
1969	4	7	44	4	9	47	33	9	NA	NA	13	2	59	233
1970	5	7	31	5	10	69	33	15	NA	NA	12	2	71	259
1971	7	9	26	5	8	39	42	11	NA	NA	9	3	67	224
1972	13	9	26	5	9	32	41	12	NA	4	10	4	59	222
1973	15	8	31	5	9	34	44	13	NA	4	9	3	56	231
1974	13	9	32	4	9	38	35	17	NA	4	6	6	48	221
1975	9	6	22	6	10	27	42	23	NA	4	7	12	40	209
1976	12	7	28	6	10	25	35	22	NA	4	13	22	39	223
1977	16	6	71	9	10	25	24	17	NA	5	9	11	39	243
1978	15	8	108	9	10	26	27	18	NA	5	7	86	42	362
1979	19	7	100	13	15	34	21	28	2	9	7	170	45	471
1980	20	4	108	11	14	32	28	23	2	8	7	220	70	544
1981	12	1	89	15	22	38	26	42	10	18	5	220	97	595
1982	17	8	85	24	32	68	53	85	28	24	14	212	165	815
1983	22	2	76	23	35	104	24	49	15	34	8	144	202	739
1984	21	1	83	18	39	92	35	37	17	29	14	152	182	722
1985	26	3	74	11	30	108	61	44	27	28	14	162	193	781
1986	30	3	85	11	39	110	56	58	12	39	8	113	222	785
1987	17	2	83	12	42	120	70	39	25	31	6	136	179	764
1988	25	3	84	12	29	124	70	26	24	36	9	147	226	815
1989	23	5	92	11	37	122	89	36	17	28	9	141	249	859
1990	20	2	91	17	48	92	89	54	60	33	11	101	240	857
1991	22	13	70	27	55	95	99	72	66	23	13	117	330	1,001
1992	22	20	64	9	38	100	124	52	80	21	12	95	315	950
1993	21	16	72	8	34	105	110	45	74	30	10	108	370	1,003
1994	26	15	78	11	35	74	124	30	66	30	10	104	338	942
1995	21	16	73	11	46	76	125	33	57	38	14	123	317	949
1996	27	29	94	18	32	102	143	43	60	34	9	72	318	981
1997	21	15	119	11	30	95	207	41	50	42	12	18	340	1,003
1998	14	18	148	8	30	64	235	33	33	30	11	4	317	945
1999	11	27	119	7	25	84	261	38	49	26	9	8	276	940
2000	14	28	110	10	34	90	358	42	20	40	10	10	277	1,040
2001 <sup>P</sup>	16	24	115	13	33	62	277	46	14	51	13	4	314	982

P=Preliminary. NA=Not available.

Note: Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

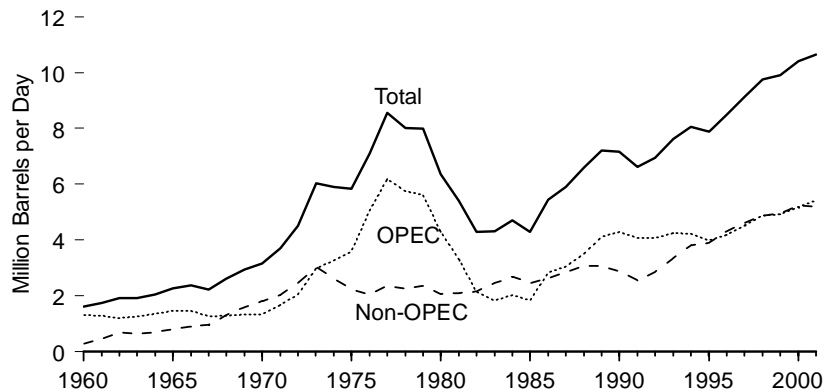
Sources: 1960-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*,

annual reports. 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual*, annual reports. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, *Petroleum Supply Monthly* (February 2002).

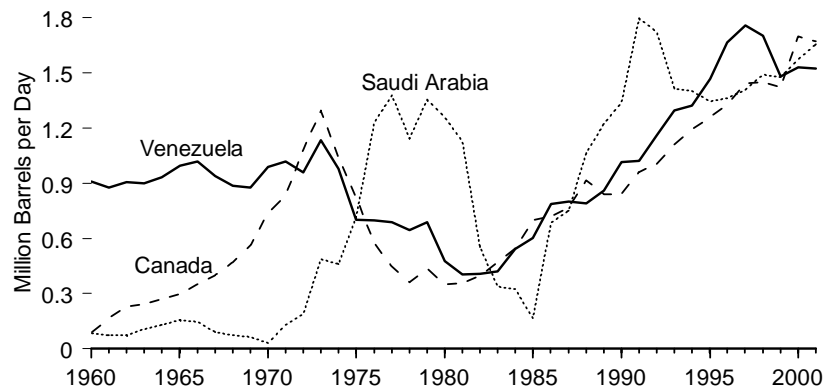


**Figure 5.7 Petroleum Net Imports by Country of Origin, 1960-2001**

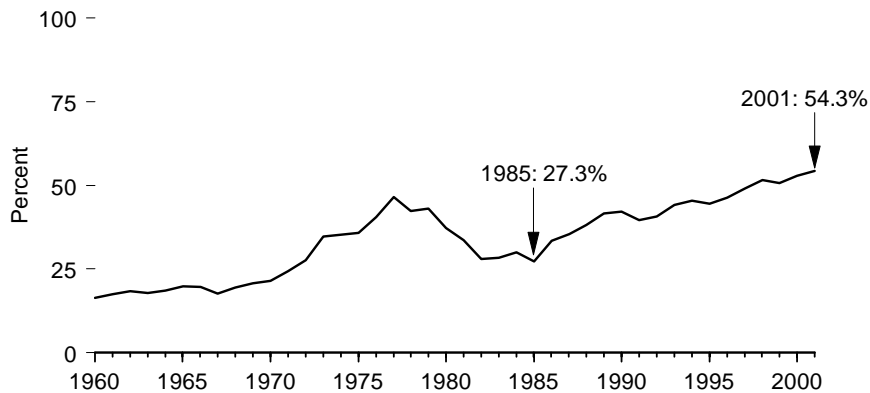
**Total, OPEC, and Non-OPEC**



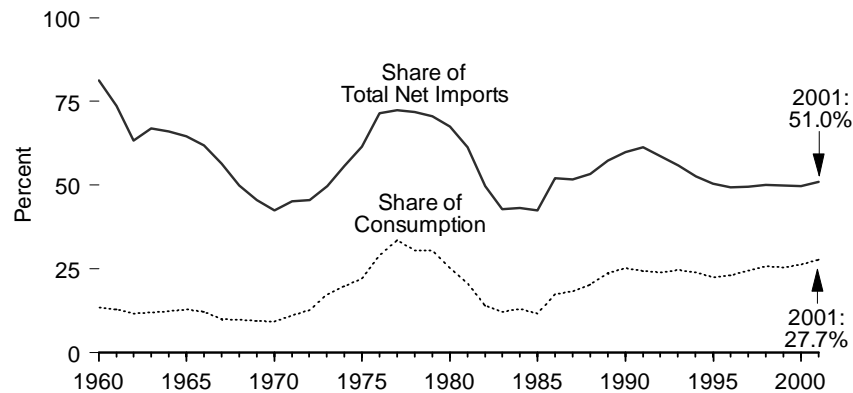
**By Selected Country**



**Total Net Imports as Share of Consumption**



**Net Imports from OPEC**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.7.

**Table 5.7 Petroleum Net Imports by Country of Origin, 1960-2001**

Year	Persian Gulf Nations <sup>2</sup>	Selected OPEC <sup>1</sup> Countries					Selected Non-OPEC Countries					Total Net Imports	Total Net Imports as Share of Consumption <sup>3</sup>	Net Imports From OPEC	
		Algeria	Nigeria	Saudi Arabia	Venezuela	Total OPEC	Canada	Mexico	United Kingdom	U.S. Virgin Islands and Puerto Rico	Total Non-OPEC			Share of Total Net Imports <sup>4</sup>	Share of Consumption <sup>5</sup>
Thousand Barrels per Day												Percent			
1960	NA	NA	0	84	910	1,311	86	-2	-12	34	302	1,613	16.5	81.3	13.4
1961	NA	NA	0	73	878	1,283	167	27	-10	42	460	1,743	17.5	73.6	12.9
1962	NA	NA	0	74	905	1,210	229	35	-6	40	703	1,913	18.4	63.3	11.6
1963	NA	NA	0	108	899	1,282	243	29	-7	43	632	1,915	17.8	67.0	11.9
1964	NA	NA	0	131	932	1,359	272	23	-9	45	698	2,057	18.7	66.1	12.3
1965	NA	NA	15	158	994	1,475	297	21	-11	45	806	2,281	19.8	64.7	12.8
1966	NA	NA	11	147	1,018	1,470	352	6	-6	58	904	2,375	19.7	61.9	12.2
1967	NA	NA	5	92	937	1,258	400	13	-51	89	972	2,230	17.8	56.4	10.0
1968	NA	NA	9	74	886	1,302	468	15	13	143	1,307	2,609	19.5	49.9	9.7
1969	NA	NA	49	65	875	1,336	564	10	7	186	1,598	2,933	20.8	45.5	9.5
1970	NA	NA	50	30	989	1,343	736	9	-1	270	1,817	3,161	21.5	42.5	9.1
1971	NA	NA	102	128	1,019	1,671	831	-14	1	365	2,030	3,701	24.3	45.2	11.0
1972	NA	NA	251	189	959	2,061	1,082	-20	-1	428	2,458	4,519	27.6	45.6	12.6
1973	NA	NA	459	485	1,134	2,991	1,294	-28	6	426	3,034	6,025	34.8	49.6	17.3
1974	NA	NA	713	461	978	3,277	1,038	-27	1	475	2,615	5,892	35.4	55.6	19.7
1975	NA	NA	762	714	702	3,599	824	29	7	484	2,248	5,846	35.8	61.6	22.1
1976	NA	NA	1,025	1,229	699	5,063	571	53	19	488	2,027	7,090	40.6	71.4	29.0
1977	NA	NA	1,143	1,379	689	6,190	446	155	117	560	2,375	8,565	46.5	72.3	33.6
1978	NA	NA	919	1,142	644	5,747	359	291	173	436	2,255	8,002	42.5	71.8	30.5
1979	NA	NA	1,080	1,354	688	5,633	438	418	196	353	2,352	7,985	43.1	70.5	30.4
1980	NA	NA	857	1,259	478	4,293	347	506	169	256	2,071	6,365	37.3	67.5	25.2
1981	1,215	311	620	1,128	403	3,315	358	497	370	169	2,086	5,401	33.6	61.4	20.6
1982	692	170	512	551	409	2,136	397	632	442	154	2,163	4,298	28.1	49.7	14.0
1983	439	240	299	336	420	1,843	471	802	374	178	2,469	4,312	28.3	42.7	12.1
1984	502	323	215	324	544	2,037	547	714	388	184	2,679	4,715	30.0	43.2	13.0
1985	309	187	293	167	602	1,821	696	755	295	114	2,465	4,286	27.3	42.5	11.6
1986	909	271	440	685	788	2,828	721	642	342	152	2,611	5,439	33.4	52.0	17.4
1987	1,074	295	535	751	801	3,055	765	585	346	158	2,859	5,914	35.5	51.7	18.3
1988	1,529	300	618	1,064	790	3,513	916	677	306	117	3,074	6,587	38.1	53.3	20.3
1989	1,858	269	815	1,224	861	4,124	839	678	206	212	3,078	7,202	41.6	57.3	23.8
1990	1,962	280	800	1,339	1,016	4,285	843	666	179	213	2,876	7,161	42.2	59.8	25.2
1991	1,833	253	703	1,796	1,020	4,065	963	707	125	153	2,561	6,626	39.6	61.3	24.3
1992	1,773	196	680	1,720	1,161	4,071	1,005	706	219	180	2,867	6,938	40.7	58.7	23.9
1993	1,774	219	736	1,413	1,296	4,253	1,109	809	340	175	3,365	7,618	44.2	55.8	24.7
1994	1,723	243	637	1,402	1,322	4,233	1,194	860	448	246	3,822	8,054	45.5	52.6	23.9
1995	1,563	234	626	1,343	1,468	3,980	1,260	943	369	170	3,906	7,886	44.5	50.5	22.5
1996	1,596	256	616	1,362	1,667	4,193	1,330	1,101	299	262	4,305	8,498	46.4	49.3	22.9
1997	1,747	285	693	1,407	1,758	4,542	1,444	1,178	214	298	4,616	9,158	49.2	49.6	24.4
1998	2,132	290	693	1,491	1,700	4,880	1,451	1,116	239	305	4,884	9,764	51.6	50.0	25.8
1999	2,459	259	655	1,478	1,480	4,934	1,421	1,063	356	284	4,978	9,912	50.8	49.8	25.3
2000	R2,483	R225	R896	R1,571	R1,530	R5,181	R1,697	R1,015	R356	R297	R5,238	R10,419	R52.9	R49.7	26.3
2001 <sup>P</sup>	2,730	275	853	1,656	1,524	5,428	1,671	1,146	292	266	5,209	10,637	54.3	51.0	27.7

<sup>1</sup> Organization of Petroleum Exporting Countries. See Glossary for membership.

<sup>2</sup> Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and United Arab Emirates.

<sup>3</sup> Calculated by dividing total net petroleum imports by total U.S. petroleum products supplied (consumption).

<sup>4</sup> Calculated by dividing net petroleum imports from OPEC countries by total net petroleum imports.

<sup>5</sup> Calculated by dividing net petroleum imports from OPEC countries by total U.S. petroleum product supplied (consumption).

R=Revised. P=Preliminary. NA=Not available.

Notes: The country of origin for refined petroleum products may not be the country of origin for the crude oil from which the refined products were produced. For example, refined products imported from

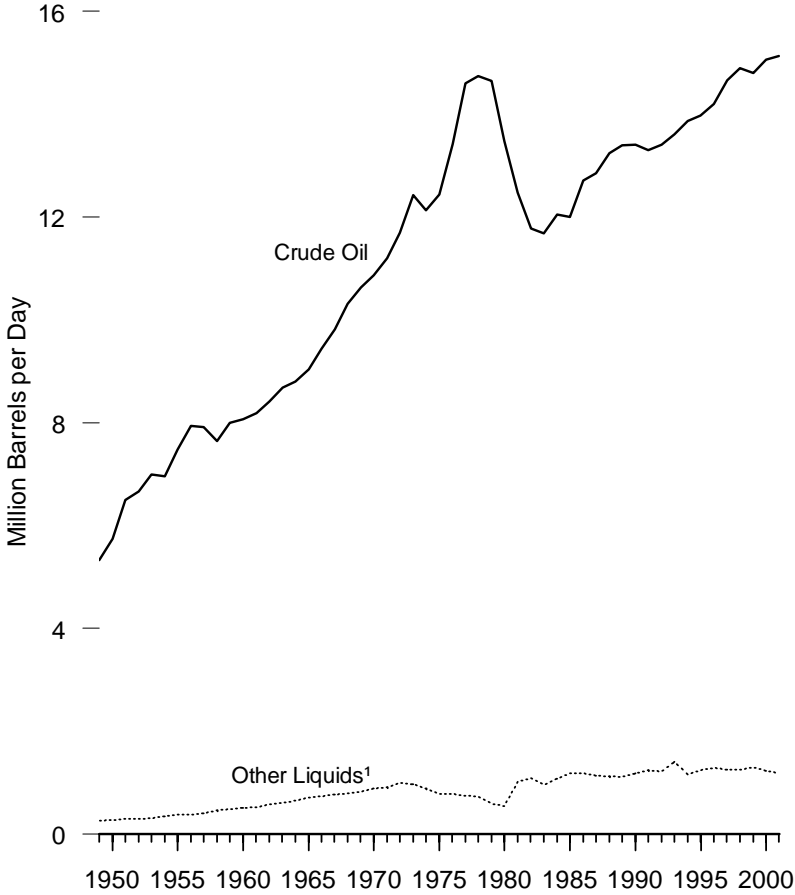
refineries in the Caribbean may have been produced from Middle East crude oil. Net imports are imports minus exports; negative numbers indicate that exports exceed imports. Data include any imports for the Strategic Petroleum Reserve, which began in 1977. Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

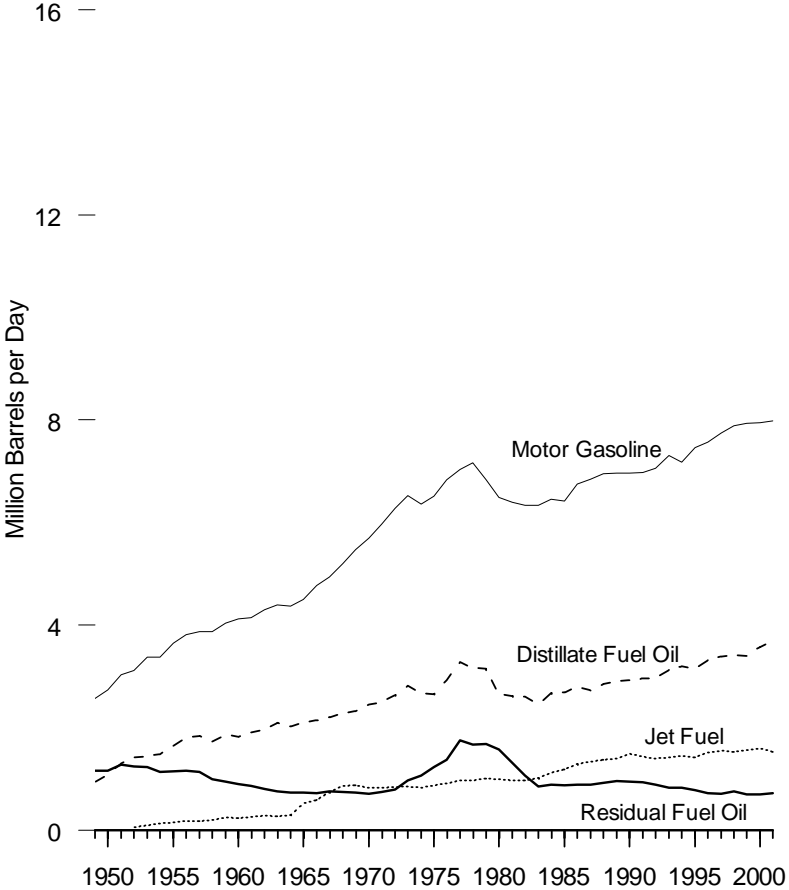
Sources: 1960-1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. 1976-1980—Energy Information Administration (EIA), *Energy Data Reports, P.A.D. Districts Supply/Demand, Annual*, annual reports. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, *Petroleum Supply Monthly* (February 2002).

**Figure 5.8 Refinery Input and Output, 1949-2001**

**Input**



**Output of Selected Products**



<sup>1</sup> Includes natural gas plant liquids and other liquids.

Source: Table 5.8.

**Table 5.8 Refinery Input and Output, 1949-2001**

(Million Barrels per Day)

Year	Input				Output										Processing Gain
	Crude Oil	Natural Gas Plant Liquids	Other Liquids <sup>1</sup>	Total Input	Asphalt and Road Oil	Distillate Fuel Oil	Jet Fuel	Liquefied Petroleum Gases	Motor Gasoline <sup>2</sup>	Petroleum Coke	Residual Fuel Oil	Still Gas	Other Products <sup>3</sup>	Total Output	
1949	5.33	0.23	0.03	5.59	0.16	0.93	( <sup>4</sup> )	0.06	2.57	0.05	1.16	0.23	0.42	5.59	(s)
1950	5.74	0.26	0.02	6.02	0.18	1.09	( <sup>4</sup> )	0.08	2.74	0.05	1.16	0.23	0.49	6.02	(s)
1951	6.49	0.27	0.03	6.80	0.20	1.30	( <sup>4</sup> )	0.09	3.04	0.05	1.29	0.26	0.57	6.80	0.01
1952	6.67	0.28	0.01	6.97	0.21	1.42	0.06	0.08	3.12	0.05	1.24	0.26	0.54	6.97	0.01
1953	7.00	0.30	(s)	7.31	0.22	1.45	0.10	0.09	3.38	0.06	1.23	0.28	0.52	7.33	0.02
1954	6.96	0.32	0.02	7.30	0.23	1.49	0.13	0.09	3.38	0.07	1.14	0.28	0.53	7.32	0.02
1955	7.48	0.34	0.03	7.86	0.25	1.65	0.16	0.12	3.65	0.08	1.15	0.32	0.52	7.89	0.03
1956	7.94	0.37	0.01	8.32	0.27	1.82	0.18	0.14	3.82	0.08	1.17	0.33	0.55	8.36	0.04
1957	7.92	0.41	(s)	8.33	0.25	1.83	0.17	0.15	3.88	0.09	1.14	0.34	0.51	8.37	0.04
1958	7.64	0.37	0.09	8.11	0.26	1.73	0.20	0.16	3.87	0.10	1.00	0.35	0.51	8.17	0.06
1959	7.99	0.42	0.07	8.48	0.29	1.86	0.25	0.19	4.04	0.11	0.95	0.35	0.53	8.57	0.09
1960	8.07	0.45	0.06	8.58	0.29	1.82	0.24	0.21	4.13	0.16	0.91	0.35	0.62	8.73	0.15
1961	8.18	0.46	0.06	8.71	0.29	1.91	0.26	0.22	4.15	0.21	0.86	0.35	0.64	8.89	0.18
1962	8.41	0.50	0.08	8.99	0.32	1.97	0.28	0.21	4.30	0.22	0.81	0.36	0.69	9.16	0.18
1963	8.69	0.52	0.09	9.30	0.33	2.09	0.27	0.26	4.39	0.22	0.76	0.38	0.80	9.50	0.20
1964	8.81	0.58	0.07	9.46	0.33	2.03	0.29	0.29	4.37	0.23	0.73	0.38	1.03	9.68	0.22
1965	9.04	0.62	0.09	9.75	0.36	2.10	<sup>5</sup> 0.52	0.29	4.51	0.24	0.74	0.39	0.83	9.97	0.22
1966	9.44	0.65	0.09	10.18	0.37	2.15	0.59	0.29	4.77	0.24	0.72	0.40	0.89	10.43	0.25
1967	9.82	0.67	0.09	10.58	0.37	2.20	0.75	0.31	4.94	0.25	0.76	0.41	0.89	10.87	0.29
1968	10.31	0.71	0.08	11.10	0.39	2.29	0.86	0.32	5.20	0.26	0.75	0.44	0.91	11.42	0.32
1969	10.63	0.72	0.11	11.46	0.40	2.32	0.88	0.34	5.47	0.28	0.73	0.47	0.91	11.79	0.34
1970	10.87	0.76	0.12	11.75	0.43	2.45	0.83	0.35	5.70	0.30	0.71	0.48	0.88	12.11	0.36
1971	11.20	0.78	0.14	12.12	0.45	2.50	0.83	0.36	5.97	0.30	0.75	0.47	0.86	12.50	0.38
1972	11.70	0.83	0.17	12.69	0.45	2.63	0.85	0.36	6.28	0.33	0.80	0.51	0.89	13.08	0.39
1973	12.43	0.82	0.15	13.40	0.48	2.82	0.86	0.37	6.53	0.36	0.97	0.52	0.94	13.85	0.45
1974	12.13	0.75	0.14	13.02	0.47	2.67	0.84	0.34	6.36	0.34	1.07	0.52	0.90	13.50	0.48
1975	12.44	0.71	0.07	13.23	0.41	2.65	0.87	0.31	6.52	0.35	1.24	0.52	0.81	13.68	0.46
1976	13.42	0.73	0.06	14.20	0.39	2.92	0.92	0.34	6.84	0.36	1.38	0.54	0.99	14.68	0.48
1977	14.60	0.67	0.07	15.35	0.43	3.28	0.97	0.35	7.03	0.37	1.75	0.57	1.11	15.87	0.52
1978	14.74	0.64	0.09	15.47	0.48	3.17	0.97	0.35	7.17	0.37	1.67	0.60	1.19	15.97	0.50
1979	14.65	0.51	0.08	15.24	0.47	3.15	1.01	0.34	6.84	0.38	1.69	0.60	1.30	15.76	0.53
1980	13.48	0.46	0.08	14.02	0.39	2.66	1.00	0.33	6.49	0.37	1.58	0.60	1.22	14.62	0.60
1981	12.47	0.52	0.49	13.48	0.34	2.61	0.97	0.31	6.40	0.39	1.32	0.57	1.08	13.99	0.51
1982	11.77	0.52	0.57	12.86	0.33	2.61	0.98	0.27	6.34	0.41	1.07	0.55	0.84	13.39	0.53
1983	11.69	0.46	0.50	12.65	0.37	2.46	1.02	0.33	6.34	0.42	0.85	0.55	0.80	13.14	0.49
1984	12.04	0.50	0.58	13.13	0.39	2.68	1.13	0.36	6.45	0.44	0.89	0.56	0.78	13.68	0.55
1985	12.00	0.51	0.68	13.19	0.40	2.69	1.19	0.39	6.42	0.45	0.88	0.58	0.74	13.75	0.56
1986	12.72	0.48	0.71	13.91	0.41	2.80	1.29	0.42	6.75	0.51	0.89	0.64	0.82	14.52	0.62
1987	12.85	0.47	0.67	13.99	0.43	2.73	1.34	0.45	6.84	0.51	0.89	0.64	0.79	14.63	0.64
1988	13.25	0.51	0.61	14.37	0.44	2.86	1.37	0.50	6.96	0.54	0.93	0.67	0.76	15.02	0.66
1989	13.40	0.50	0.61	14.51	0.42	2.90	1.40	0.55	6.96	0.54	0.95	0.68	0.75	15.17	0.66
1990	13.41	0.47	0.71	14.59	0.45	2.92	1.49	0.50	6.96	0.55	0.95	0.67	0.78	15.27	0.68
1991	13.30	0.47	0.77	14.54	0.43	2.96	1.44	0.54	6.98	0.57	0.93	0.65	0.76	15.26	0.71
1992	13.41	0.47	0.75	14.63	0.42	2.97	1.40	0.61	7.06	0.60	0.89	0.66	0.80	15.40	0.77
1993	13.61	0.49	0.92	15.02	0.45	3.13	1.42	0.59	7.30	0.62	0.84	0.65	0.78	15.79	0.77
1994	13.87	0.47	0.69	15.02	0.45	3.20	1.45	0.61	7.18	0.62	0.83	0.66	0.79	15.79	0.77
1995	13.97	0.47	0.78	15.22	0.47	3.16	1.42	0.65	7.46	0.63	0.79	0.65	0.78	15.99	0.77
1996	14.19	0.45	0.84	15.49	0.46	3.32	1.52	0.66	7.56	0.66	0.73	0.65	0.76	16.32	0.84
1997	14.66	0.42	0.83	15.91	0.48	3.39	1.55	0.69	7.74	0.69	0.71	0.66	0.84	16.76	0.85
1998	14.89	0.40	0.85	16.14	0.50	3.42	1.53	0.67	7.89	0.71	0.76	0.66	0.89	17.03	0.89
1999	14.80	0.37	0.93	16.10	0.50	3.40	1.57	0.68	7.93	0.71	0.70	0.66	0.83	16.99	0.89
2000	<sup>R</sup> 15.07	<sup>R</sup> 0.38	0.85	16.30	0.53	3.58	1.61	0.70	7.95	0.73	<sup>R</sup> 0.70	0.66	<sup>R</sup> 0.79	<sup>R</sup> 17.24	0.95
2001 <sup>P</sup>	15.13	0.38	0.81	16.31	0.49	3.69	1.53	0.66	7.98	0.77	0.72	0.67	0.73	17.23	0.92

<sup>1</sup> Prior to 1981, included unfinished oils (net), hydrogen, and hydrocarbons not included elsewhere; 1981 forward, included unfinished oils (net), motor gasoline blending components (net), aviation gasoline blending components (net), hydrogen, other hydrocarbons, and alcohol. See Note 1 at end of section.

<sup>2</sup> Prior to 1964, motor gasoline data were for total gasoline, including motor gasoline, aviation gasoline, and special naphthas.

<sup>3</sup> Kerosene, petrochemical feedstocks (excluding still gas), lubricants, wax, and miscellaneous products. Since 1964, aviation gasoline and special naphthas have been included.

<sup>4</sup> Included in the products from which jet fuel was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel.

<sup>5</sup> Prior to 1965, kerosene-type jet fuel was included in kerosene.

R=Revised. P=Preliminary. (s)=Less than 0.005 million barrels per day.

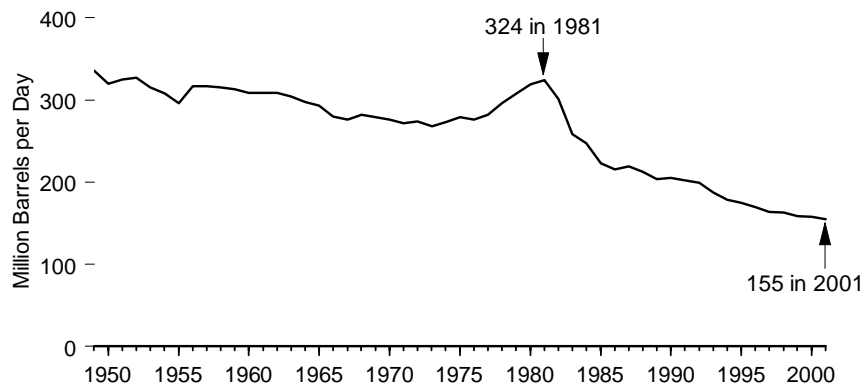
Note: Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

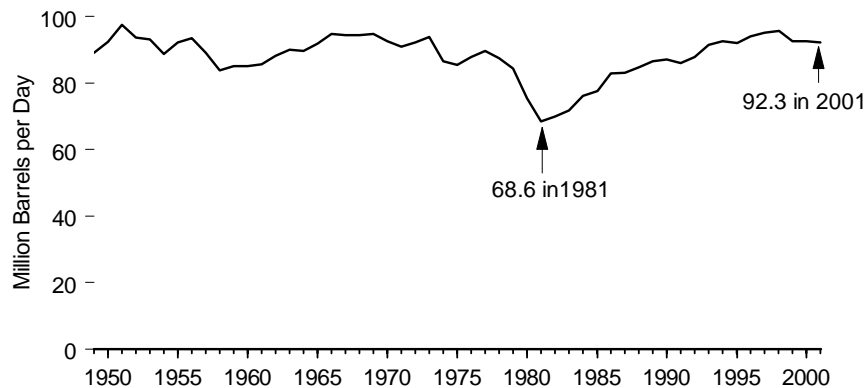
Sources: 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual, annual reports.* 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual, annual reports.* 1981-2000—EIA, *Petroleum Supply Annual, annual reports.* 2001—EIA, *Petroleum Supply Monthly, monthly reports.*

**Figure 5.9 Refinery Capacity and Utilization, 1949-2001**

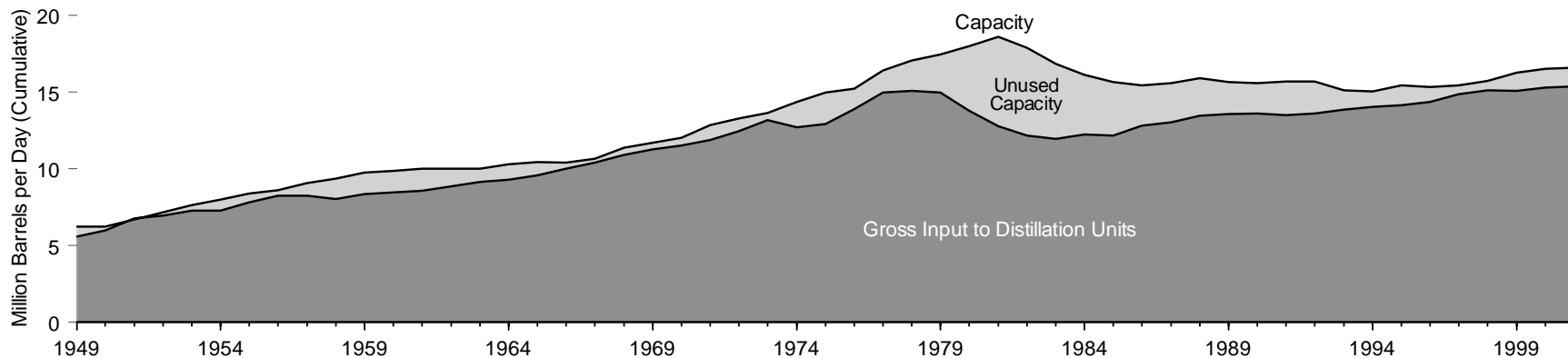
**Number of Operable Refineries**



**Utilization**



**Unused Capacity**



Source: Table 5.9.

**Table 5.9 Refinery Capacity and Utilization, 1949-2001**

Year	Operable Refineries		Gross Input to Distillation Units <sup>3</sup> (million barrels per day)	Utilization <sup>4</sup> (percent)
	Number <sup>1</sup>	Capacity <sup>2</sup> (million barrels per day)		
1949	336	6.23	5.56	89.2
1950	320	6.22	5.98	92.5
1951	325	6.70	6.76	97.5
1952	327	7.16	6.93	93.8
1953	315	7.62	7.26	93.1
1954	308	7.98	7.27	88.8
1955	296	8.39	7.82	92.2
1956	317	8.58	8.25	93.5
1957	317	9.07	8.22	89.2
1958	315	9.36	8.02	83.9
1959	313	9.76	8.36	85.2
1960	309	9.84	8.44	85.1
1961	309	10.00	8.57	85.7
1962	309	10.01	8.83	88.2
1963	304	10.01	9.14	90.0
1964	298	10.31	9.28	89.6
1965	293	10.42	9.56	91.8
1966	280	10.39	9.99	94.9
1967	276	10.66	10.39	94.4
1968	282	11.35	10.89	94.5
1969	279	11.70	11.25	94.8
1970	276	12.02	11.52	92.6
1971	272	12.86	11.88	90.9
1972	274	13.29	12.43	92.3
1973	268	13.64	13.15	93.9
1974	273	14.36	12.69	86.6
1975	279	14.96	12.90	85.5
1976	276	15.24	13.88	87.8
1977	282	16.40	14.98	89.6
1978	296	17.05	15.07	87.4
1979	308	17.44	14.96	84.4
1980	319	17.99	13.80	75.4
1981	324	18.62	12.75	68.6
1982	301	17.89	12.17	69.9
1983	258	16.86	11.95	71.7
1984	247	16.14	12.22	76.2
1985	223	15.66	12.17	77.6
1986	216	15.46	12.83	82.9
1987	219	15.57	13.00	83.1
1988	213	15.92	13.45	84.7
1989	204	15.65	13.55	86.6
1990	205	15.57	13.61	87.1
1991	202	15.68	13.51	86.0
1992	199	15.70	13.60	87.9
1993	187	15.12	13.85	91.5
1994	179	15.03	14.03	92.6
1995	175	15.43	14.12	92.0
1996	170	15.33	14.34	94.1
1997	164	15.45	14.84	95.2
1998	163	15.71	15.11	95.6
1999	159	16.26	15.08	92.6
2000	158	16.51	<sup>R</sup> 15.30	92.6
2001 <sup>P</sup>	155	16.60	15.37	92.3

<sup>1</sup> Prior to 1956, the number of refineries included only those in operation on January 1. For 1957 forward, the number of refineries has included all operable refineries on January 1. See Glossary.

<sup>2</sup> Capacity in million barrels per calendar day on January 1.

<sup>3</sup> See Note 4 at end of section.

<sup>4</sup> For 1949-1980, utilization is derived by dividing gross input to distillation units by one-half of the current year January 1 capacity and the following year January 1 capacity. Percentages were derived from unrounded numbers. For 1981 forward, utilization is derived by averaging reported monthly utilization.

R=Revised. P=Preliminary.

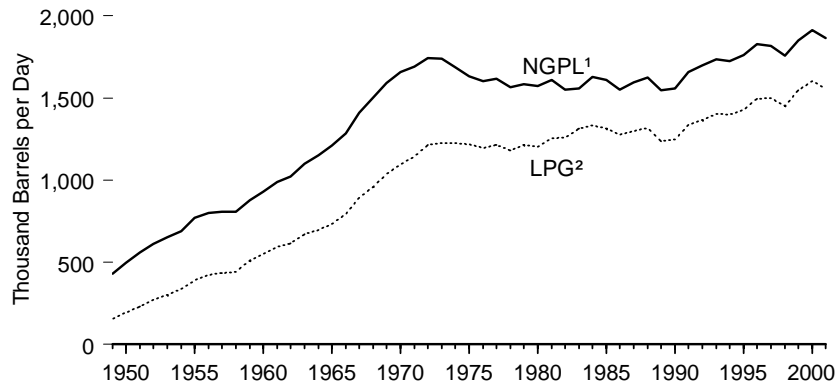
Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

Sources: **Operable Refineries:** 1949-1961—Bureau of Mines Information Circular, "Petroleum Refineries, Including Cracking Plants in the United States." 1962-1977—Bureau of Mines, Mineral

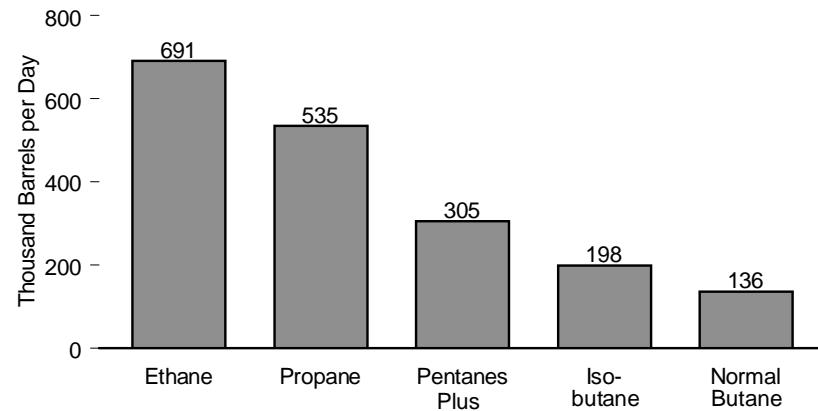
Industry Surveys, *Petroleum Refineries, Annual*, annual reports. 1978-1981—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Refineries in the United States*. 1982-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, *Petroleum Supply Monthly* (January 2001). **Gross Input to Distillation Units:** 1949-1966—Bureau of Mines, *Minerals Yearbook*, "Natural Gas Liquids" and "Crude Petroleum and Petroleum Products" chapters. 1967-1977—Bureau of Mines, Mineral Industry Surveys, *Petroleum Refineries, Annual*, annual reports. 1978-1980—EIA, Energy Data Reports, *Petroleum Refineries in the United States and U.S. Territories*. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, *Petroleum Supply Monthly* (January-December 2001 issues). **Utilization:** 1949-1980—Calculated. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, Calculated.

**Figure 5.10 Natural Gas Plant Liquids Production**

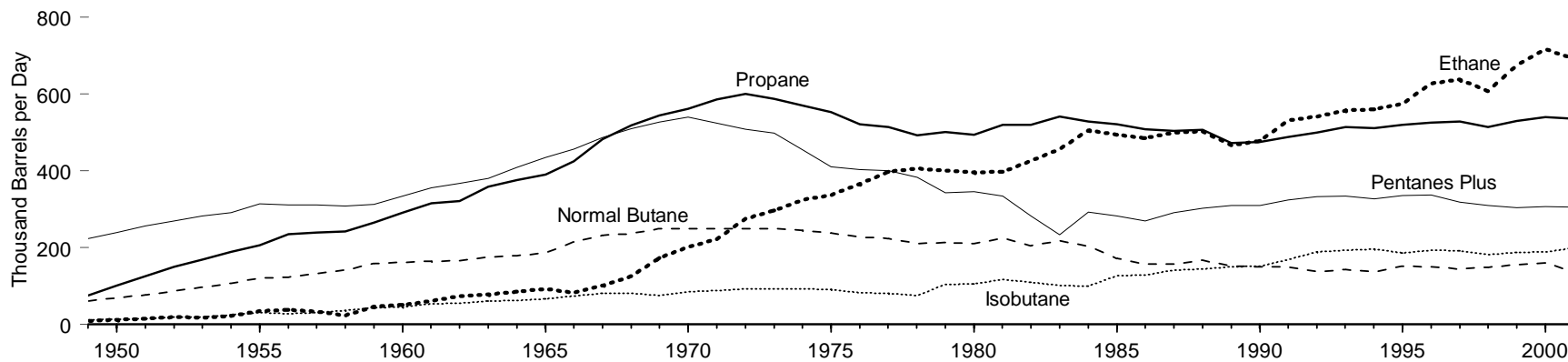
**Total, 1949-2001**



**By Product, 2001**



**By Selected Product, 1949-2001**



<sup>1</sup> Natural gas plant liquids.  
<sup>2</sup> Liquefied petroleum gases.

Note: Because vertical scales differ, graphs should not be compared.  
 Source: Table 5.10.

**Table 5.10 Natural Gas Plant Liquids Production, 1949-2001**  
(Thousand Barrels per Day)

Year	Finished Petroleum Products <sup>1</sup>	Liquefied Petroleum Gases					Pentanes Plus <sup>4</sup>	Total
		Ethane <sup>2</sup>	Isobutane	Normal Butane <sup>3</sup>	Propane <sup>2,3</sup>	Total		
1949	53	8	11	61	74	155	223	430
1950	66	12	13	69	101	195	238	499
1951	73	15	15	77	125	232	256	561
1952	70	19	18	86	150	273	269	611
1953	71	17	19	97	169	301	282	654
1954	61	22	24	106	188	339	290	691
1955	68	34	30	120	205	390	313	771
1956	68	37	27	123	235	422	310	800
1957	63	33	30	132	239	434	311	808
1958	58	23	36	141	242	442	307	808
1959	54	46	43	159	265	514	312	879
1960	47	51	45	161	291	549	333	929
1961	43	61	53	164	315	593	355	991
1962	41	73	55	165	321	614	367	1,021
1963	47	78	61	175	358	672	380	1,098
1964	48	84	62	178	375	699	408	1,154
1965	41	92	67	185	390	734	434	1,210
1966	37	82	73	214	424	792	456	1,284
1967	29	101	80	232	482	895	486	1,409
1968	35	125	81	236	517	960	509	1,504
1969	27	173	74	248	543	1,037	526	1,590
1970	25	201	84	248	561	1,095	540	1,660
1971	25	221	88	249	586	1,144	523	1,693
1972	21	275	92	249	600	1,215	507	1,744
1973	16	296	92	249	587	1,225	497	1,738
1974	7	323	92	244	569	1,227	454	1,688
1975	7	337	90	237	552	1,217	409	1,633
1976	6	365	82	227	521	1,195	403	1,604
1977	5	397	81	223	513	1,214	399	1,618
1978	3	406	75	210	491	1,182	382	1,567
1979	26	400	104	212	500	1,216	342	1,584
1980	23	396	105	210	494	1,205	345	1,573
1981	18	397	117	224	519	1,256	334	1,609
1982	11	426	109	204	519	1,258	282	1,550
1983	12	456	100	217	541	1,314	233	1,559
1984	4	505	99	203	527	1,334	292	1,630
1985	14	493	127	171	521	1,313	282	1,609
1986	4	485	128	157	508	1,277	269	1,551
1987	4	499	141	157	503	1,300	291	1,595
1988	4	501	144	167	506	1,319	302	1,625
1989	(5)	466	149	151	471	1,237	309	1,546
1990	(5)	477	151	149	474	1,250	309	1,559
1991	(5)	530	169	150	487	1,336	324	1,659
1992	(5)	541	189	137	499	1,365	332	1,697
1993	(5)	556	192	142	513	1,402	334	1,736
1994	(5)	559	195	136	510	1,400	326	1,727
1995	(5)	573	185	151	519	1,428	335	1,762
1996	(5)	627	192	150	525	1,494	336	1,830
1997	(5)	637	191	144	528	1,499	318	1,817
1998	(5)	607	181	148	513	1,450	309	1,759
1999	(5)	675	187	155	529	1,547	303	1,850
2000	(5)	R <sup>7</sup> 17	R <sup>1</sup> 88	160	R <sup>5</sup> 39	R <sup>1</sup> 605	306	R <sup>1</sup> 911
2001 <sup>P</sup>	(5)	691	198	136	535	1,559	305	1,864

<sup>1</sup> Motor gasoline, aviation gasoline, special naphthas, distillate fuel oil, and miscellaneous products.

<sup>2</sup> Reported production of ethane-propane mixtures has been allocated 70 percent ethane and 30 percent propane.

<sup>3</sup> Reported production of butane-propane mixtures has been allocated 60 percent butane and 40 percent propane.

<sup>4</sup> Prior to 1984, this category was reported separately as natural gasoline, isopentane, and plant condensate.

<sup>5</sup> Beginning in 1989, data on finished petroleum products production from natural gas processing plants were no longer available.

R=Revised. P=Preliminary.

Note: Totals may not equal sum of components due to independent rounding.

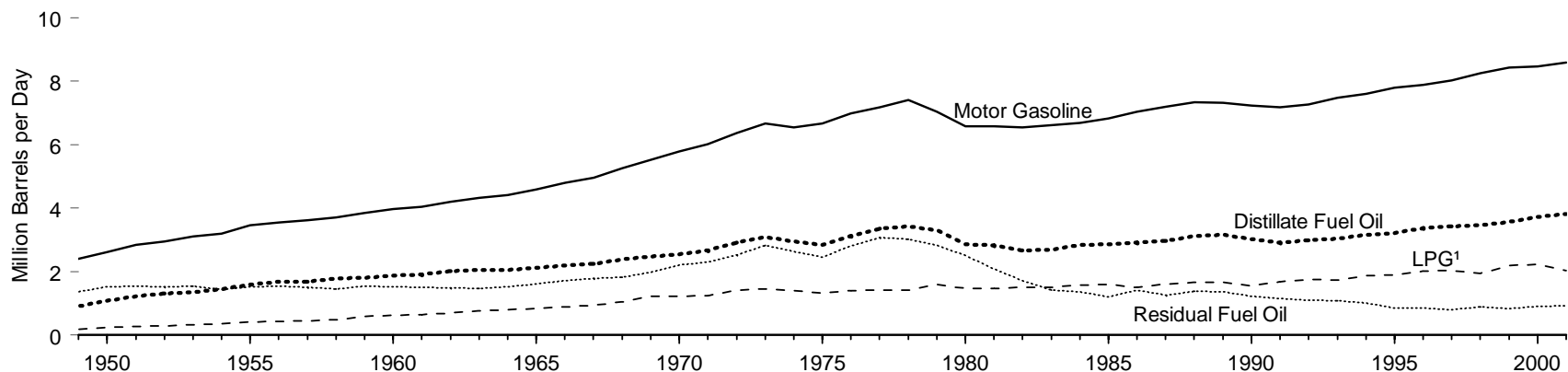
Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

Sources: 1949-1968—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. 1969-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. 1976-1980—Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual*, annual reports. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, *Petroleum Supply Monthly* (February 2002).

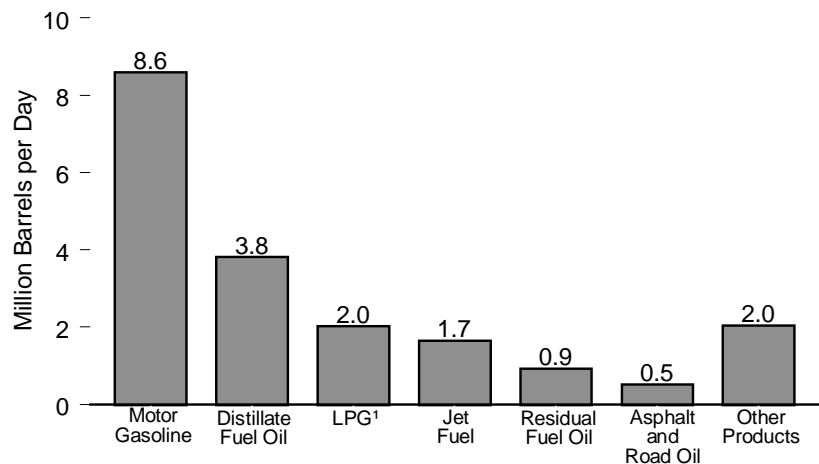


**Figure 5.11 Petroleum Products Supplied by Type**

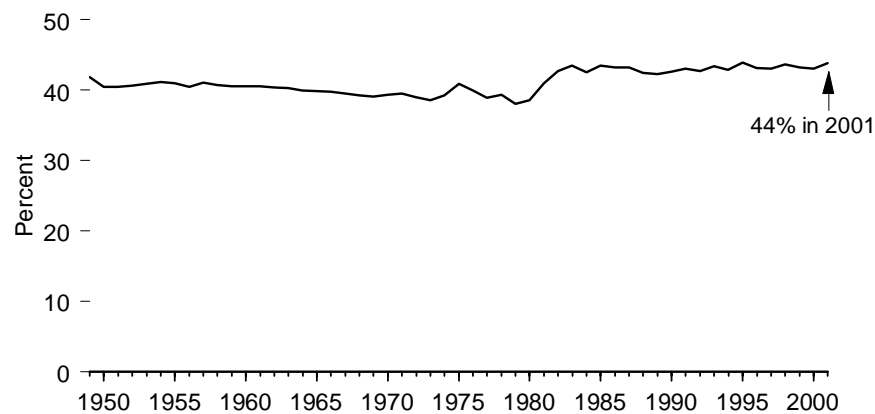
**By Selected Product, 1949-2001**



**By Product, 2001**



**Motor Gasoline's Share of Total Petroleum Products Supplied, 1949-2001**



<sup>1</sup> Liquefied petroleum gases.

Source: Table 5.11.

**Table 5.11 Petroleum Products Supplied by Type, 1949-2001**  
(Thousand Barrels per Day)

Year	Asphalt and Road Oil	Aviation Gasoline	Distillate Fuel Oil	Jet Fuel	Kerosene	Liquefied Petroleum Gases		Lubricants	Motor Gasoline	Petroleum Coke	Residual Fuel Oil	Other <sup>2</sup>	Total	Percentage Change From Previous Year <sup>3</sup>
						Propane <sup>1</sup>	Total							
1949	157	93	902	( <sup>4</sup> )	281	NA	187	91	R <sub>2</sub> 410	40	1,359	243	5,763	—
1950	180	108	1,082	( <sup>4</sup> )	323	NA	234	106	R <sub>2</sub> 616	41	1,517	250	6,458	12.1
1951	198	145	1,225	( <sup>4</sup> )	338	NA	277	116	R <sub>2</sub> 840	40	1,546	291	7,016	8.6
1952	213	169	1,303	55	331	NA	296	104	R <sub>2</sub> 954	38	1,517	289	7,270	3.9
1953	216	194	1,337	94	314	NA	325	111	R <sub>3</sub> 110	48	1,536	315	7,600	4.3
1954	230	178	1,442	126	324	NA	352	106	R <sub>3</sub> 194	54	1,431	320	7,756	2.1
1955	254	192	1,592	154	320	NA	404	116	R <sub>3</sub> 463	67	1,526	366	8,455	9.0
1956	272	204	1,683	197	321	NA	441	120	R <sub>3</sub> 548	68	1,538	384	8,775	4.1
1957	263	201	1,688	R <sub>2</sub> 16	279	NA	453	113	R <sub>3</sub> 615	74	1,504	403	8,809	0.1
1958	280	223	1,790	R <sub>2</sub> 75	294	NA	487	108	R <sub>3</sub> 711	85	1,455	410	9,118	3.5
1959	298	209	1,808	R <sub>3</sub> 25	262	NA	582	117	R <sub>3</sub> 860	97	1,544	424	9,527	4.5
1960	302	161	1,872	R <sub>3</sub> 71	271	NA	621	117	R <sub>3</sub> 969	149	1,529	435	9,797	3.1
1961	311	158	1,902	R <sub>4</sub> 15	266	NA	641	114	R <sub>4</sub> 043	184	1,503	439	9,976	1.5
1962	332	143	2,007	R <sub>4</sub> 89	269	NA	700	119	R <sub>4</sub> 199	194	1,495	454	10,400	4.2
1963	340	137	2,047	R <sub>5</sub> 22	266	NA	757	119	R <sub>4</sub> 334	190	1,477	554	10,743	3.3
1964	346	127	2,050	R <sub>5</sub> 58	253	NA	806	125	4,403	192	1,515	646	11,023	2.9
1965	368	120	2,126	602	267	NA	841	129	4,593	202	1,608	657	11,512	4.2
1966	386	105	2,185	670	277	NA	887	134	4,808	202	1,716	714	12,084	5.0
1967	379	90	2,242	824	274	618	944	121	4,958	206	1,786	737	12,560	3.9
1968	405	84	2,389	955	281	692	1,054	132	5,261	209	1,826	798	13,393	6.9
1969	417	70	2,466	991	275	784	1,221	134	5,526	221	1,978	838	14,137	5.3
1970	447	55	2,540	967	263	776	1,224	136	5,785	212	2,204	866	14,697	4.0
1971	458	49	2,661	1,010	249	794	1,251	135	6,014	219	2,296	870	15,212	3.5
1972	468	46	2,913	1,045	235	893	1,420	144	6,376	241	2,529	949	16,367	7.9
1973	522	45	3,092	1,059	216	872	1,449	162	6,674	261	2,822	1,005	17,308	5.5
1974	481	44	2,948	993	176	830	1,406	155	6,537	239	2,639	1,034	16,653	-3.8
1975	419	39	2,851	1,001	159	783	1,333	137	6,675	247	2,462	1,001	16,322	-2.0
1976	411	37	3,133	987	169	830	1,404	152	6,978	243	2,801	1,145	17,461	7.3
1977	436	38	3,352	1,039	175	821	1,422	160	7,177	268	3,071	1,294	18,431	5.3
1978	479	39	3,432	1,057	175	778	1,413	172	7,412	256	3,023	1,391	18,847	2.3
1979	476	38	3,311	1,076	188	849	1,592	180	7,034	246	2,826	1,546	18,513	-1.8
1980	396	35	2,866	1,068	158	754	1,469	159	6,579	237	2,508	1,581	17,056	-7.6
1981	342	31	2,829	1,007	127	773	1,466	153	6,588	252	2,088	1,176	16,058	-6.1
1982	342	25	2,671	1,013	129	798	1,499	140	6,539	248	1,716	973	15,296	-4.7
1983	373	26	2,690	1,046	127	751	1,509	146	6,622	229	1,421	1,042	15,231	-0.4
1984	408	24	2,845	1,175	115	833	1,572	156	6,693	247	1,369	1,120	15,726	3.5
1985	425	27	2,868	1,218	114	883	1,599	145	6,831	264	1,202	1,032	15,726	-0.3
1986	448	32	2,914	1,307	98	831	1,512	142	7,034	268	1,418	1,105	16,281	3.5
1987	467	25	2,976	1,385	95	924	1,612	161	7,206	299	1,264	1,176	16,665	2.4
1988	468	27	3,122	1,449	96	923	1,656	155	7,336	312	1,378	1,286	17,283	4.0
1989	453	26	3,157	1,489	84	990	1,668	159	7,328	307	1,370	1,284	17,325	-0.0
1990	483	24	3,021	1,522	43	917	1,556	164	7,235	339	1,229	1,373	16,988	-1.9
1991	444	23	2,921	1,471	46	982	1,689	146	7,188	328	1,158	1,299	16,714	-1.6
1992	454	22	2,979	1,454	41	1,032	1,755	149	7,268	382	1,094	1,434	17,033	2.2
1993	474	21	3,041	1,469	50	1,006	1,734	152	7,476	366	1,080	1,373	17,237	0.9
1994	484	21	3,162	1,527	49	1,082	1,880	159	7,601	361	1,021	1,454	17,718	2.8
1995	486	21	3,207	1,514	54	1,096	1,899	156	7,789	365	852	1,381	17,725	0.0
1996	484	20	3,365	1,578	62	1,136	2,012	151	7,891	379	848	1,518	18,309	3.6
1997	505	22	3,435	1,599	66	1,170	2,038	160	8,017	377	797	1,605	18,620	1.4
1998	521	19	3,461	1,622	78	1,120	1,952	168	8,253	447	887	1,508	18,917	1.6
1999	547	21	3,572	1,673	73	1,246	2,195	169	8,431	477	830	1,532	19,519	3.2
2000	R <sub>5</sub> 25	20	R <sub>3</sub> 722	R <sub>1</sub> 725	67	R <sub>1</sub> 235	R <sub>2</sub> 31	166	R <sub>8</sub> 472	406	R <sub>9</sub> 09	1,458	R <sub>19</sub> 701	R <sub>1</sub> 2
2001 <sup>P</sup>	519	19	3,820	1,654	73	1,129	2,035	153	8,586	432	932	1,370	19,593	-0.8

<sup>1</sup> Includes propylene.

<sup>2</sup> Still gas (refinery gas), petrochemical feedstocks, waxes, natural gasoline, pentanes plus, and miscellaneous products. Beginning in 1964, includes special naphthas. Beginning in 1981, also includes negative barrels per day of distillate and residual fuel oil reclassified as unfinished oils, and other products (from both primary and secondary supply) reclassified as gasoline blending components. Beginning in 1983, also includes crude oil burned as fuel.

<sup>3</sup> Percent change from previous year calculated from data in thousand barrels per year.

<sup>4</sup> Included in the products from which jet fuel was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel.

R=Revised. P=Preliminary. NA=Not available. — = Not applicable.

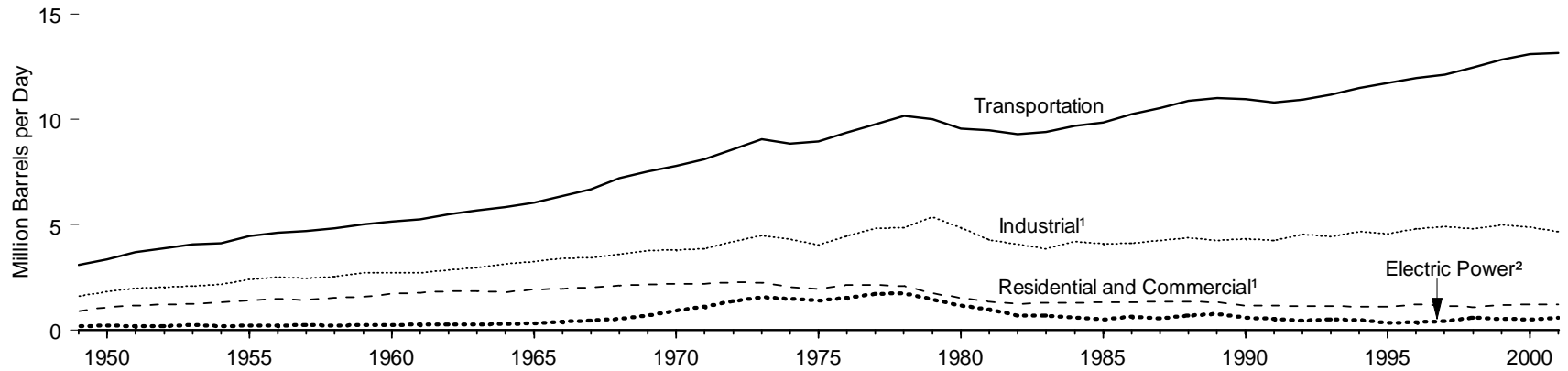
Notes: For the definition of petroleum products supplied, see Notes 1, 2, and 3 at end of section. Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

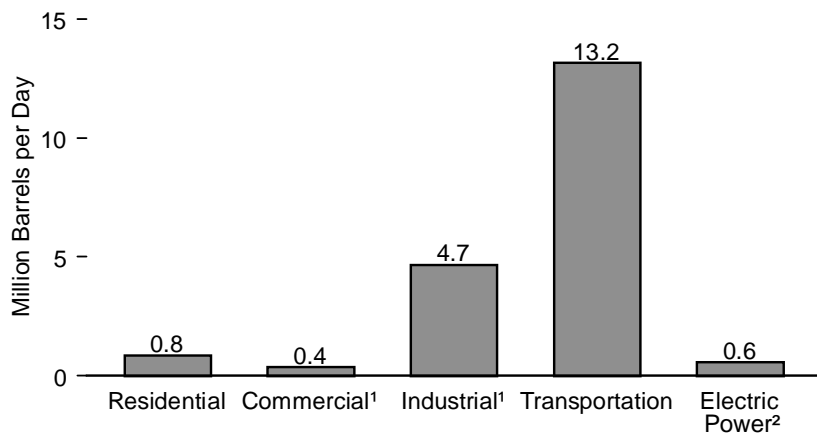
Sources: 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual, annual reports.* 1976-1980—Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual, annual reports.* 1981-2000—EIA, *Petroleum Supply Annual, annual reports.* 2001—EIA, *Petroleum Supply Monthly* (February 2002).

**Figure 5.12a Petroleum Consumption by Sector**

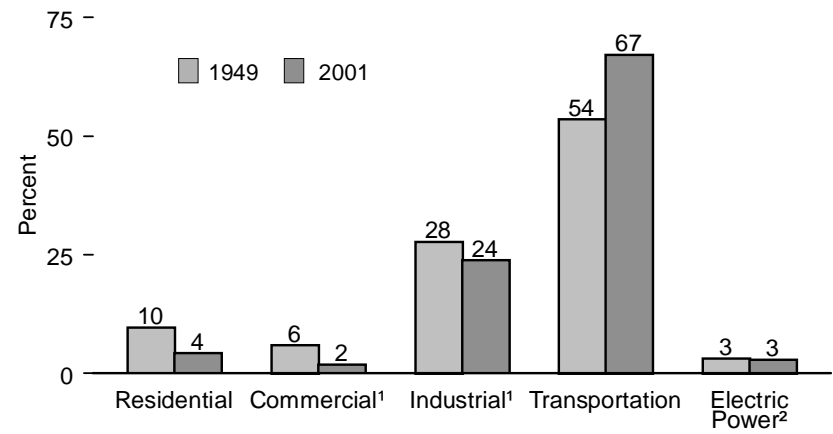
**By Sector, 1949-2001**



**By Sector, 2001**



**End Use and Electric Power Shares, 1949 and 2001**



<sup>1</sup> Includes combined-heat-and-power plants and a small number of electricity-only plants.

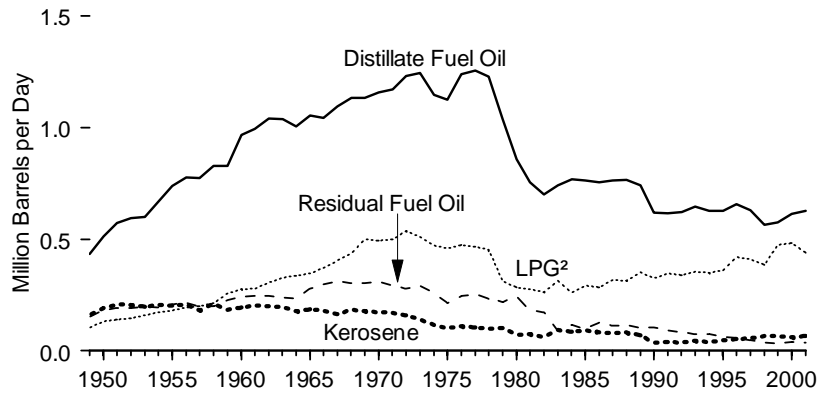
<sup>2</sup> Electricity-only and combined-heat-and-power plants whose primary business is to sell electricity, or electricity and heat, to the public.

Note: See related Figure 5.12b.

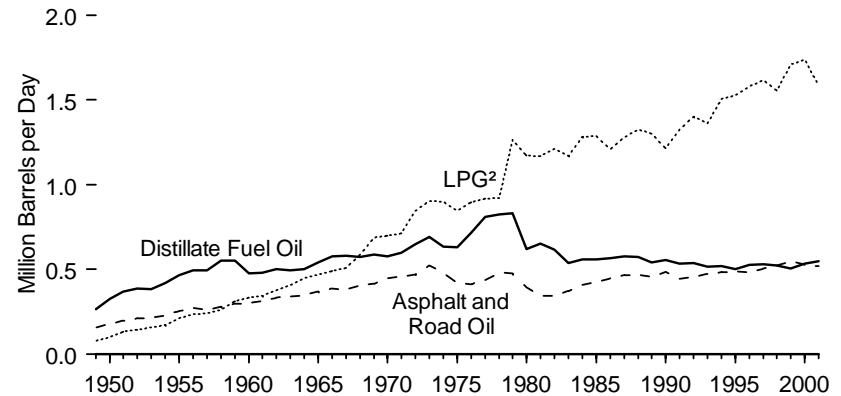
Sources: Tables 5.12a-5.12d.

**Figure 5.12b Petroleum Consumption by Product by Sector, 1949-2001**

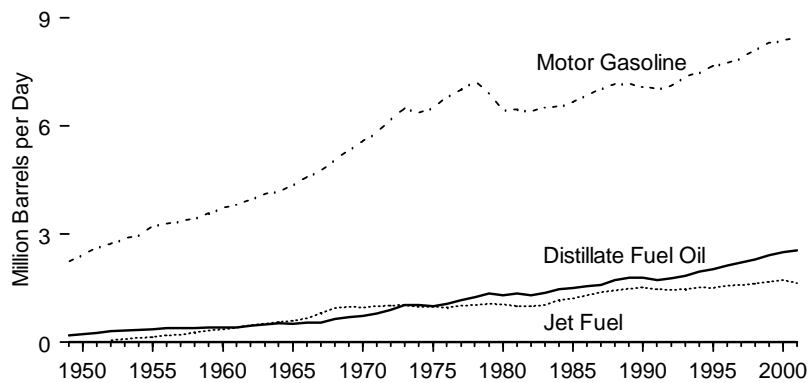
**Residential and Commercial<sup>1</sup> Sectors, Selected Products**



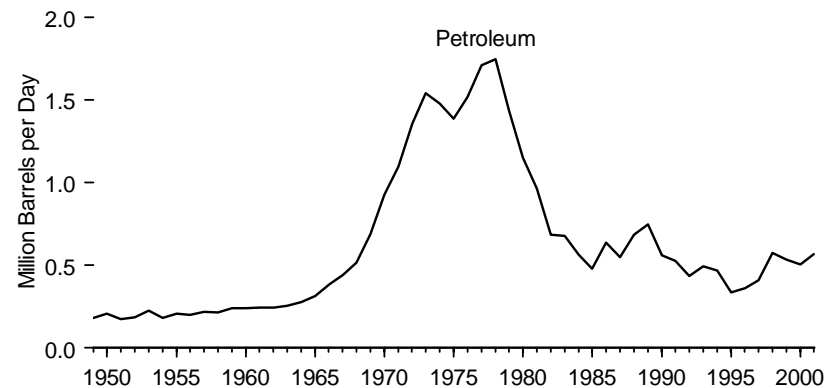
**Industrial<sup>1</sup> Sector, Selected Products**



**Transportation Sector, Selected Products**



**Electric Power Sector<sup>3</sup>**



<sup>1</sup> Includes combined-heat-and-power plants and a small number of electricity-only plants.

<sup>2</sup> Liquefied petroleum gases.

<sup>3</sup> Electricity-only and combined-heat-and-power plants whose primary business is to sell electricity, or electricity and heat, to the public.

Notes: See related Figure 5.12a. Because vertical scales differ, graphs should not be compared.

Sources: Tables 5.12a-5.12d.

**Table 5.12a Petroleum Consumption: Residential and Commercial Sectors, 1949-2001**

(Thousand Barrels per Day)

Year	End-Use Sectors													
	Residential Sector				Commercial Sector									
	Distillate Fuel Oil	Kerosene	Liquefied Petroleum Gases	Total	Distillate Fuel Oil			Kerosene	Liquefied Petroleum Gases	Motor Gasoline	Residual Fuel Oil			Total
					CHP <sup>1</sup>	Other <sup>2</sup>	Total				CHP <sup>1</sup>	Other <sup>2</sup>	Total	
1949	329	140	90	559	(3)	104	104	19	16	48	(3)	153	153	340
1950	390	168	112	670	(3)	123	123	23	20	52	(3)	185	185	403
1951	436	183	120	739	(3)	138	138	25	21	57	(3)	191	191	431
1952	452	181	125	758	(3)	143	143	25	22	59	(3)	192	192	440
1953	456	174	137	768	(3)	144	144	24	24	62	(3)	200	200	455
1954	508	180	146	834	(3)	161	161	25	26	64	(3)	195	195	470
1955	562	179	155	896	(3)	177	177	24	27	69	(3)	209	209	508
1956	591	182	166	938	(3)	187	187	25	29	71	(3)	214	214	526
1957	588	159	170	917	(3)	186	186	22	30	72	(3)	201	201	511
1958	631	186	183	1,000	(3)	199	199	25	32	74	(3)	200	200	531
1959	629	161	218	1,008	(3)	199	199	22	39	77	(3)	227	227	564
1960	736	171	234	1,140	(3)	232	232	23	41	35	(3)	243	243	573
1961	757	180	239	1,176	(3)	237	237	23	42	36	(3)	246	246	585
1962	794	179	261	1,234	(3)	247	247	22	46	38	(3)	248	248	601
1963	792	177	280	1,249	(3)	246	246	22	49	38	(3)	239	239	594
1964	766	155	286	1,207	(3)	239	239	23	51	38	(3)	236	236	586
1965	805	161	296	1,263	(3)	251	251	26	52	40	(3)	281	281	651
1966	796	153	315	1,264	(3)	249	249	29	56	41	(3)	299	299	674
1967	836	143	345	1,324	(3)	260	260	22	61	43	(3)	312	312	698
1968	866	154	371	1,392	(3)	269	269	29	66	43	(3)	305	305	712
1969	865	150	425	1,439	(3)	270	270	30	75	44	(3)	304	304	722
1970	883	144	420	1,447	(3)	276	276	30	74	45	(3)	311	311	736
1971	892	143	425	1,460	(3)	280	280	27	75	44	(3)	293	293	718
1972	936	131	456	1,523	(3)	296	296	27	81	45	(3)	280	280	729
1973	942	110	435	1,487	(3)	303	303	31	77	45	(3)	290	290	746
1974	867	89	401	1,357	(3)	280	280	26	71	43	(3)	259	259	679
1975	850	78	389	1,316	(3)	276	276	24	69	46	(3)	214	214	629
1976	932	89	404	1,425	(3)	308	308	21	71	50	(3)	247	247	697
1977	938	81	397	1,416	(3)	318	318	25	70	52	(3)	256	256	722
1978	917	74	386	1,377	(3)	313	313	26	68	56	(3)	232	232	695
1979	765	64	264	1,093	(3)	274	274	38	47	54	(3)	220	220	634
1980	617	51	242	911	(3)	243	243	20	43	56	(3)	245	245	606
1981	540	41	234	815	(3)	215	215	34	41	48	(3)	182	182	519
1982	494	46	224	764	(3)	207	207	15	40	46	(3)	174	174	480
1983	435	41	267	743	(3)	306	306	54	47	53	(3)	91	91	552
1984	450	42	220	712	(3)	319	319	45	39	56	(3)	115	115	574
1985	469	77	249	795	(3)	294	294	16	44	50	(3)	99	99	503
1986	476	59	243	778	(3)	280	280	24	43	55	(3)	126	126	529
1987	484	57	269	811	(3)	279	279	24	48	58	(3)	114	114	522
1988	499	69	267	834	(3)	269	269	13	47	57	(3)	115	115	501
1989	490	57	299	R845	P3	249	252	13	53	53	P2	101	R103	R475
1990	R392	31	276	R699	P3	226	R228	6	49	58	P2	103	R105	R445
1991	R391	35	295	721	P2	224	226	6	52	44	P2	91	92	421
1992	R405	31	288	R725	P1	216	217	5	51	41	P2	80	R82	R397
1993	R428	37	303	R768	P2	216	R218	7	53	15	P2	73	R75	R369
1994	R410	31	298	R740	P3	214	R217	9	53	13	P2	73	R75	R367
1995	R413	36	306	R754	P2	213	R215	11	54	10	P1	61	R62	R351
1996	R435	43	358	R835	P2	221	R222	10	63	14	P1	58	R60	R369
1997	R421	45	349	R815	P3	206	R209	12	62	22	P1	47	R48	R353
1998	R367	52	329	R748	P2	196	198	15	58	23	P3	35	R37	R331
1999	R380	54	404	R838	P2	193	R195	13	71	24	P2	30	R32	R335
2000	R398	50	R411	R858	P2	213	R216	12	R73	R24	P2	38	R40	R364
2001 <sup>E</sup>	408	53	375	836	2	220	221	13	66	25	2	36	38	363

<sup>1</sup> Commercial combined-heat-and-power (CHP) and a small number of commercial electricity-only plants. See Appendix G for commercial sector NAICS codes.

<sup>2</sup> All commercial sector fuel use other than that in "CHP."

<sup>3</sup> Included in "Other."

P=Preliminary. E=Estimate.

Notes: See Notes 1, 2, and 3 at end of section for comments on the calculation of consumption. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/emeu/sedr/contents.html>.

Sources: **Distillate Fuel Oil, CHP and Residual Fuel Oil, CHP:** Table 8.3e. **Distillate Fuel Oil, Total and Residual Fuel Oil, Total:** 1989-2001—Energy Information Administration (EIA), Office of Energy Markets and End Use, unpublished data based on EIA, Form EIA-821, "Fuel Oil and Kerosene Sales Report." **All Other Data:** 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports, and EIA estimates. 1960-1999—EIA, *State Energy Data Report 1999* (May 2001). 2000 forward—EIA, Integrated Modeling Data System output for the *Monthly Energy Review* (March 2001).

**Table 5.12b Petroleum Consumption: Industrial Sector, 1949-2001**

(Thousand Barrels per Day)

Year	End-Use Sectors															
	Industrial Sector															
	Asphalt and Road Oil	Distillate Fuel Oil			Kerosene	Liquefied Petroleum Gases	Lubricants	Motor Gasoline	Petroleum Coke			Residual Fuel Oil			Other Petroleum <sup>3</sup>	Total
CHP <sup>1</sup>		Other <sup>2</sup>	Total	CHP <sup>1</sup>					Other <sup>2</sup>	Total	CHP <sup>1</sup>	Other <sup>2</sup>	Total			
1949	157	(4)	265	265	123	80	36	121	(4)	40	40	(4)	534	534	R243	1,598
1950	180	(4)	328	328	132	100	43	131	(4)	41	41	(4)	617	617	R250	1,822
1951	198	(4)	369	369	130	132	46	142	(4)	40	40	(4)	631	631	R291	1,979
1952	213	(4)	386	386	126	143	42	148	(4)	38	38	(4)	634	634	R289	2,018
1953	216	(4)	384	384	115	156	44	155	(4)	48	48	(4)	647	647	R315	2,082
1954	230	(4)	418	418	119	173	42	160	(4)	54	54	(4)	641	641	R320	2,157
1955	254	(4)	466	466	116	212	47	173	(4)	67	67	(4)	686	686	R366	2,387
1956	272	(4)	493	493	114	235	48	177	(4)	68	68	(4)	699	699	R384	2,490
1957	263	(4)	493	493	99	241	45	181	(4)	74	74	(4)	657	657	R403	2,456
1958	280	(4)	551	551	82	260	43	186	(4)	85	85	(4)	644	644	R410	2,541
1959	298	(4)	552	552	79	313	47	193	(4)	97	97	(4)	703	703	R424	2,706
1960	302	(4)	476	476	78	333	48	198	(4)	149	149	(4)	689	689	R435	2,708
1961	311	(4)	479	479	64	344	47	190	(4)	184	184	(4)	662	662	R439	2,720
1962	332	(4)	501	501	68	376	54	193	(4)	194	194	(4)	669	669	R454	2,840
1963	340	(4)	496	496	66	409	54	185	(4)	190	190	(4)	667	667	R554	2,962
1964	346	(4)	502	502	75	449	56	177	(4)	192	192	(4)	677	677	R646	3,123
1965	368	(4)	541	541	80	470	62	179	(4)	202	202	(4)	689	689	R657	3,247
1966	386	(4)	575	575	95	491	64	168	(4)	202	202	(4)	709	709	R714	3,404
1967	379	(4)	580	580	110	510	60	158	(4)	206	206	(4)	693	693	R737	3,433
1968	405	(4)	574	574	99	586	65	159	(4)	209	209	(4)	682	682	R798	3,576
1969	417	(4)	586	586	95	689	69	154	(4)	221	221	(4)	695	695	R838	3,764
1970	447	(4)	577	577	89	699	70	150	(4)	203	203	(4)	708	708	R866	3,808
1971	458	(4)	596	596	80	715	69	143	(4)	211	211	(4)	705	705	R870	3,845
1972	468	(4)	648	648	77	846	73	132	(4)	233	233	(4)	765	765	R949	4,191
1973	522	(4)	691	691	75	902	88	133	(4)	254	254	(4)	809	809	R1,005	4,479
1974	481	(4)	633	633	61	901	85	123	(4)	230	230	(4)	753	753	R1,034	4,301
1975	419	(4)	630	630	58	844	68	116	(4)	246	246	(4)	658	658	R1,001	4,038
1976	411	(4)	717	717	59	895	75	110	(4)	242	242	(4)	792	792	R1,145	4,447
1977	436	(4)	809	809	69	918	82	102	(4)	266	266	(4)	844	844	R1,294	4,821
1978	479	(4)	823	823	75	921	88	93	(4)	250	250	(4)	748	748	R1,391	4,867
1979	476	(4)	830	830	86	1,266	92	84	(4)	243	243	(4)	721	721	R1,546	5,343
1980	396	(4)	621	621	87	1,172	82	82	(4)	234	234	(4)	586	586	R1,581	4,842
1981	342	(4)	653	653	52	1,166	79	83	(4)	250	250	(4)	471	471	R1,176	4,273
1982	342	(4)	617	617	68	1,211	72	72	(4)	246	246	(4)	456	456	R973	4,058
1983	373	(4)	537	537	32	1,166	75	59	(4)	225	225	(4)	345	345	R1,042	3,854
1984	408	(4)	559	559	28	1,283	80	83	(4)	244	244	(4)	386	386	R1,120	4,193
1985	425	(4)	558	558	21	1,285	75	114	(4)	261	261	(4)	326	326	R1,032	4,097
1986	448	(4)	565	565	16	1,207	73	108	(4)	264	264	(4)	321	321	R1,105	4,106
1987	467	(4)	577	577	14	1,279	83	107	(4)	294	294	(4)	253	253	R1,176	4,251
1988	468	(4)	573	573	14	1,326	80	100	(4)	306	306	(4)	237	237	R1,286	4,390
1989	453	P5	535	540	14	1,300	82	104	P5	295	300	P58	119	R177	R1,284	R4,254
1990	483	P6	547	R554	6	1,215	84	97	P21	304	325	P55	124	R179	R1,373	R4,317
1991	444	P12	523	535	6	1,326	75	101	P22	293	315	P55	91	R146	R1,299	R4,248
1992	454	P10	526	R536	5	1,402	77	101	P26	336	362	P59	109	R168	R1,434	R4,538
1993	474	P10	506	R516	6	1,363	78	94	P22	308	330	P65	129	R194	R1,373	R4,429
1994	484	P10	509	R518	8	1,505	82	101	P25	304	329	P69	113	R183	R1,454	R4,663
1995	486	P6	496	R502	7	1,527	80	105	P26	302	328	P60	87	R147	R1,381	R4,565
1996	484	P8	519	R527	9	1,580	78	105	P27	317	343	P66	80	R146	R1,518	R4,789
1997	505	P8	522	R530	9	R1,617	82	111	P37	294	331	P56	71	R127	R1,605	R4,918
1998	521	P16	507	R523	11	1,553	86	105	P29	362	390	P60	40	R100	R1,508	R4,798
1999	547	P16	490	R506	6	1,709	87	80	P31	395	426	P52	38	R90	R1,532	R4,982
2000	R525	P10	523	R533	6	R1,737	86	R80	P19	342	361	P48	57	R105	R1,458	R4,889
2001 <sup>E</sup>	519	11	536	546	6	1,585	79	81	20	362	382	54	45	99	1,370	4,667

<sup>1</sup> Industrial combined-heat-and-power (CHP) and a small number of industrial electricity-only plants. See Appendix G for industrial sector NAICS codes.

<sup>2</sup> All industrial sector fuel use other than that in "CHP."

<sup>3</sup> Still gas (refinery gas), petrochemical feedstocks, special naphthas, waxes, natural gasoline, pentanes plus, crude oil, and miscellaneous products.

<sup>4</sup> Included in "Other."

R=Revised. P=Preliminary. E=Estimate.

Notes: See Notes 1, 2, and 3 at end of section for comments on the calculation of consumption. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/emeu/sedr/contents.html>.

Sources: **Distillate Fuel Oil, CHP and Residual Fuel Oil, CHP:** Table 8.3e. **Distillate Fuel Oil, Total and Residual Fuel Oil, Total:** 1989-2001— Energy Information Administration (EIA), Office of Energy Markets and End Use, unpublished data based on EIA, Form EIA-821, "Fuel Oil and Kerosene Sales Report." **All Other Data:** 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports, and EIA estimates. 1960-1999—EIA, *State Energy Data Report 1999* (May 2001). 2000 forward—EIA, Integrated Modeling Data System output for the *Monthly Energy Review* (March 2001).

**Table 5.12c Petroleum Consumption: Transportation Sector and End-Use Total, 1949-2001**  
(Thousand Barrels per Day)

Year	End-Use Sectors									
	Transportation									End-Use Total
	Aviation Gasoline	Distillate Fuel Oil	Jet Fuel		Liquefied Petroleum Gases	Lubricants	Motor Gasoline <sup>1</sup>	Residual Fuel Oil	Total	
			Kerosene Type	Total						
1949	93	190	0	( <sup>2</sup> )	1	54	2,241	504	3,084	5,581
1950	108	226	0	( <sup>2</sup> )	2	64	2,433	524	3,356	6,251
1951	145	271	0	( <sup>2</sup> )	4	70	2,641	562	3,692	6,841
1952	169	310	0	55	5	63	2,747	521	3,870	7,086
1953	194	336	0	94	7	67	2,892	479	4,069	7,374
1954	178	342	0	126	8	63	2,970	426	4,112	7,573
1955	192	372	0	154	9	70	3,221	440	4,458	8,249
1956	204	398	0	197	11	72	3,299	440	4,622	8,577
1957	201	405	16	216	12	68	3,362	444	4,707	8,591
1958	223	394	17	275	12	65	3,451	414	4,833	8,905
1959	209	411	40	325	13	70	3,590	389	5,007	9,285
1960	161	418	91	371	13	68	3,736	367	5,135	9,556
1961	158	419	129	415	15	67	3,817	361	5,252	9,733
1962	143	454	181	489	16	66	3,968	344	5,480	10,155
1963	137	502	206	522	18	66	4,112	326	5,683	10,488
1964	127	532	234	558	20	69	4,187	338	5,830	10,746
1965	120	514	334	602	23	67	4,374	336	6,036	11,197
1966	105	547	391	670	26	70	4,599	340	6,357	11,698
1967	90	545	518	824	28	61	4,757	359	6,663	12,118
1968	84	653	609	955	31	67	5,059	350	7,198	12,877
1969	70	705	694	991	33	65	5,328	332	7,524	13,449
1970	55	738	718	967	32	66	5,589	332	7,778	13,769
1971	49	800	751	1,010	37	67	5,827	305	8,095	14,118
1972	46	910	779	1,021	38	71	6,199	280	8,566	15,009
1973	45	1,045	825	1,042	35	74	6,496	317	9,054	15,766
1974	44	1,036	757	979	33	71	6,372	304	8,838	15,175
1975	39	998	782	992	31	70	6,512	310	8,951	14,934
1976	37	1,073	777	976	33	77	6,817	358	9,372	15,941
1977	38	1,171	814	1,022	36	78	7,022	396	9,761	16,721
1978	39	1,260	845	1,044	38	83	7,264	431	10,160	17,099
1979	38	1,366	867	1,067	16	87	6,896	535	10,005	17,075
1980	35	1,311	845	1,062	13	77	6,441	608	9,546	15,905
1981	31	1,365	808	1,006	24	74	6,456	531	9,487	15,094
1982	25	1,312	803	1,011	24	68	6,421	444	9,307	14,609
1983	26	1,367	839	1,046	29	71	6,510	358	9,406	14,555
1984	24	1,475	953	1,175	30	76	6,554	351	9,684	15,163
1985	27	1,507	1,005	1,218	21	71	6,667	342	9,854	15,248
1986	32	1,554	1,105	1,307	19	69	6,871	379	10,232	15,645
1987	25	1,594	1,181	1,385	15	78	7,041	392	10,530	16,114
1988	27	1,730	1,236	1,449	17	75	7,179	399	10,875	16,600
1989	26	R1,804	1,284	1,489	16	77	7,171	R420	R11,004	R16,577
1990	24	1,801	1,340	1,522	16	80	7,080	R442	R10,966	R16,428
1991	23	R1,729	1,296	1,471	15	71	7,042	R447	R10,799	R16,188
1992	22	R1,786	1,310	1,454	14	72	7,125	R465	R10,939	R16,599
1993	21	R1,838	1,357	1,469	14	74	7,367	R393	R11,177	R16,743
1994	21	R1,960	1,480	1,527	24	77	7,487	R385	R11,481	R17,251
1995	21	R2,025	1,497	1,514	13	76	7,674	R397	R11,721	R17,390
1996	20	R2,130	1,575	1,578	11	73	7,772	R370	R11,955	R17,948
1997	22	R2,224	1,598	1,599	10	78	7,883	R310	R12,125	R18,211
1998	19	2,309	1,623	1,622	13	81	8,126	R294	R12,464	R18,341
1999	21	R2,426	1,675	1,673	10	82	8,327	R290	R12,829	R18,984
2000	R20	R2,494	1,725	R1,725	10	R81	R8,368	R386	R13,084	R19,196
2001 <sup>E</sup>	19	2,560	1,654	1,654	9	74	8,481	364	13,161	19,027

<sup>1</sup> Includes ethanol blended into motor gasoline.

<sup>2</sup> Included in the products from which jet fuel was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel.

R=Revised. E=Estimate.

Notes: See Notes 1, 2, and 3 at end of section for comments on the calculation of consumption. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/emeu/sedr/contents.html>.

Sources: **Distillate Fuel Oil** and **Residual Fuel Oil:** 1989-2001— Energy Information Administration (EIA), Office of Energy Markets and End Use, unpublished data based on EIA, Form EIA-821, "Fuel Oil and Kerosene Sales Report." 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports, and EIA estimates. 1960-1999—EIA, *State Energy Data Report 1999* (May 2001). 2000 forward—EIA, Integrated Modeling Data System output for the *Monthly Energy Review* (March 2001).

**Table 5.12d Petroleum Consumption: Electric Power Sector and Total, 1949-2001**  
(Thousand Barrels per Day)

Year	Electric Power Sector <sup>1,2</sup>												Total Consumption
	Electricity Only				CHP				Total				
	Distillate Fuel Oil <sup>3</sup>	Petroleum Coke	Residual Fuel Oil <sup>4</sup>	Total	Distillate Fuel Oil	Petroleum Coke	Residual Fuel Oil	Total	Distillate Fuel Oil	Petroleum Coke	Residual Fuel Oil	Total	
1949	13	NA	169	182	(5)	NA	(5)	(5)	13	NA	169	182	5,763
1950	15	NA	192	207	(5)	NA	(5)	(5)	15	NA	192	207	6,458
1951	13	NA	163	175	(5)	NA	(5)	(5)	13	NA	163	175	7,016
1952	13	NA	170	184	(5)	NA	(5)	(5)	13	NA	170	184	7,270
1953	16	NA	209	225	(5)	NA	(5)	(5)	16	NA	209	225	7,600
1954	13	NA	170	183	(5)	NA	(5)	(5)	13	NA	170	183	7,756
1955	15	NA	191	206	(5)	NA	(5)	(5)	15	NA	191	206	8,455
1956	14	NA	184	199	(5)	NA	(5)	(5)	14	NA	184	199	8,775
1957	16	NA	203	218	(5)	NA	(5)	(5)	16	NA	203	218	8,809
1958	15	NA	197	213	(5)	NA	(5)	(5)	15	NA	197	213	9,118
1959	17	NA	224	242	(5)	NA	(5)	(5)	17	NA	224	242	9,527
1960	10	NA	231	241	(5)	NA	(5)	(5)	10	NA	231	241	9,797
1961	10	NA	233	244	(5)	NA	(5)	(5)	10	NA	233	244	9,976
1962	11	NA	234	245	(5)	NA	(5)	(5)	11	NA	234	245	10,400
1963	12	NA	244	256	(5)	NA	(5)	(5)	12	NA	244	256	10,743
1964	12	NA	265	276	(5)	NA	(5)	(5)	12	NA	265	276	11,023
1965	14	NA	302	316	(5)	NA	(5)	(5)	14	NA	302	316	11,512
1966	17	NA	369	386	(5)	NA	(5)	(5)	17	NA	369	386	12,084
1967	20	NA	422	442	(5)	NA	(5)	(5)	20	NA	422	442	12,560
1968	27	NA	489	515	(5)	NA	(5)	(5)	27	NA	489	515	13,393
1969	41	NA	647	688	(5)	NA	(5)	(5)	41	NA	647	688	14,137
1970	66	9	853	928	(5)	(5)	(5)	(5)	66	9	853	928	14,697
1971	94	8	992	1,095	(5)	(5)	(5)	(5)	94	8	992	1,095	15,212
1972	146	9	1,203	1,358	(5)	(5)	(5)	(5)	146	9	1,203	1,358	16,367
1973	129	7	1,406	1,542	(5)	(5)	(5)	(5)	129	7	1,406	1,542	17,308
1974	146	9	1,324	1,478	(5)	(5)	(5)	(5)	146	9	1,324	1,478	16,653
1975	107	1	1,280	1,388	(5)	(5)	(5)	(5)	107	1	1,280	1,388	16,322
1976	114	1	1,405	1,520	(5)	(5)	(5)	(5)	114	1	1,405	1,520	17,461
1977	134	1	1,575	1,710	(5)	(5)	(5)	(5)	134	1	1,575	1,710	18,431
1978	130	5	1,612	1,747	(5)	(5)	(5)	(5)	130	5	1,612	1,747	18,847
1979	84	4	1,350	1,437	(5)	(5)	(5)	(5)	84	4	1,350	1,437	18,513
1980	79	2	1,069	1,151	(5)	(5)	(5)	(5)	79	2	1,069	1,151	17,056
1981	58	2	904	964	(5)	(5)	(5)	(5)	58	2	904	964	16,058
1982	42	2	642	686	(5)	(5)	(5)	(5)	42	2	642	686	15,296
1983	45	4	627	676	(5)	(5)	(5)	(5)	45	4	627	676	15,231
1984	42	3	517	562	(5)	(5)	(5)	(5)	42	3	517	562	15,726
1985	40	3	435	478	(5)	(5)	(5)	(5)	40	3	435	478	15,726
1986	39	4	592	636	(5)	(5)	(5)	(5)	39	4	592	636	16,281
1987	42	5	504	551	(5)	(5)	(5)	(5)	42	5	504	551	16,665
1988	51	6	627	683	(5)	(5)	(5)	(5)	51	6	627	683	17,283
1989	2,P70	2,P7	2,P663	2,P740	5,P2	5,P0	5,P6	5,P8	2,P72	2,P7	2,P669	2,P748	17,325
1990	P41	P13	P497	P551	5,P4	5,P0	5,P6	5,P10	P45	P13	P502	P561	16,988
1991	P38	P13	P469	P520	5,P1	5,P0	5,P4	5,P5	P39	P13	P473	P526	16,714
1992	P33	P18	P371	P422	5,P2	5,P2	5,P8	5,P12	P34	P20	P379	P434	17,033
1993	P37	P21	P409	P467	5,P4	5,P15	5,P9	5,P27	P41	P36	P418	P494	17,237
1994	P46	P16	P369	P431	5,P11	5,P15	5,P10	5,P36	P56	P32	P379	P467	17,718
1995	P44	P15	P237	P296	5,P7	5,P22	5,P9	5,P38	P51	P37	P247	P334	17,725
1996	P47	P14	P263	P325	5,P4	5,P22	5,P10	5,P36	P51	P36	P273	P360	18,309
1997	P48	P23	P301	P373	5,P4	5,P23	5,P10	5,P37	P52	P46	P311	P410	18,620
1998	P61	P30	P448	P539	5,P3	5,P26	5,P8	5,P37	P64	P56	P456	P576	18,917
1999	P63	P26	P409	P497	5,P3	5,P25	5,P9	5,P38	P66	P51	P418	P535	19,519
2000	P77	P20	P370	P466	5,P6	5,P25	5,P8	5,P39	P82	P45	P378	P505	19,701
2001	P77	P26	P425	P528	5,E7	5,E24	5,E6	5,E38	P85	P50	P431	P566	P19,593

<sup>1</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants.

<sup>2</sup> Through 1988, data are for consumption at electric utilities only. Beginning in 1989, data also include consumption at independent power producers.

<sup>3</sup> For 1949-1979, gas turbine and internal combustion plant use of petroleum. For 1980-2001, electric utility data are for light oil (fuel oil nos. 1 and 2, and small amounts of kerosene and jet fuel).

<sup>4</sup> For 1949-1979, steam plant use of petroleum. For 1980-2001, electric utility data are for heavy oil

(fuel oil nos. 5 and 6, and small amounts of fuel oil no. 4).

<sup>5</sup> Electric utility CHP plants are included in "Electricity Only."

P=Preliminary. E=Estimate. NA=Not available.

Notes: See Notes 1, 2, and 3 at end of section for comments on the calculation of consumption. Totals may not equal sum of components due to independent rounding.

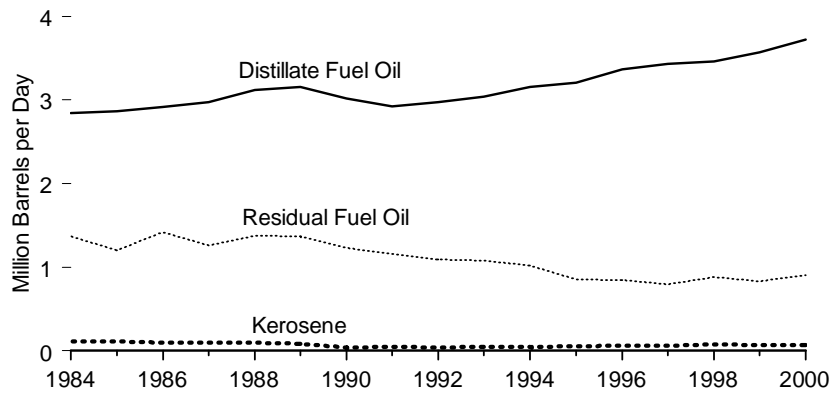
Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

Sources: **Electric Power Sector:** Tables 8.3b-8.3e. **Total Consumption:** Table 5.11, data for "Total."

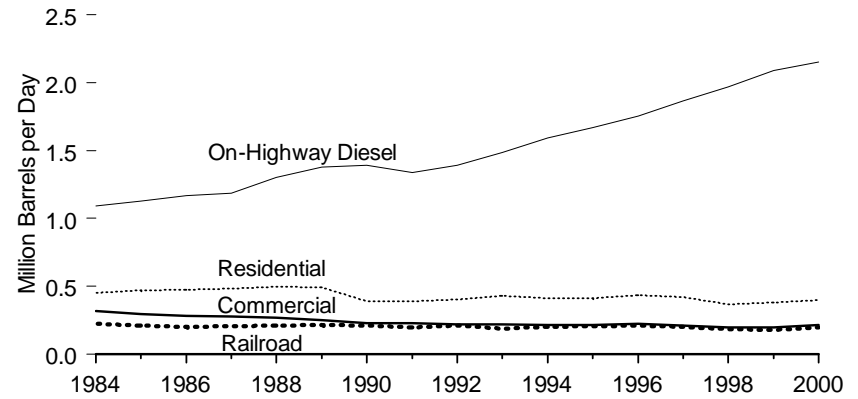


**Figure 5.13 Fuel Oil and Kerosene Adjusted Sales, 1984-2000**

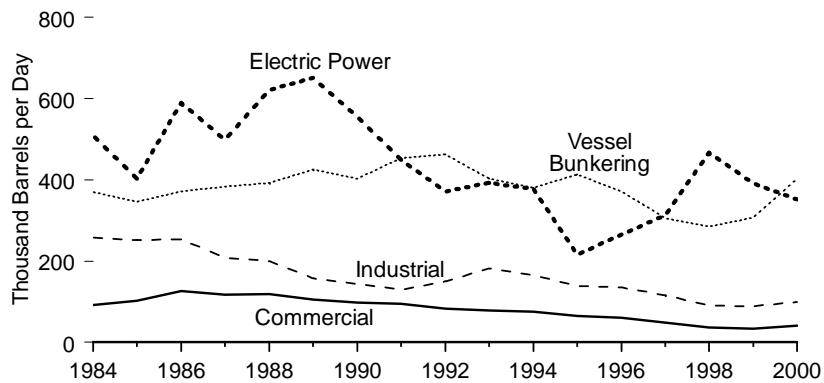
**Total by Fuel**



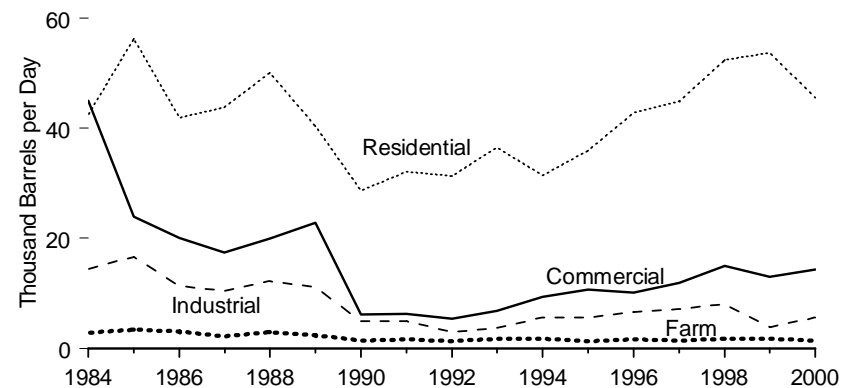
**Distillate Fuel Oil, Major End Uses**



**Residual Fuel, Major End Uses**



**Kerosene, Major End Uses**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.13.

**Table 5.13 Fuel Oil and Kerosene Adjusted Sales, 1984-2000**  
(Thousand Barrels per Day)

Year	Residential	Commercial	Industrial	Oil Company	Farm	Electric Power <sup>1</sup>	Railroad	Vessel Bunkering	On-Highway Diesel	Military	Off-Highway Diesel	Other	Total
Distillate Fuel Oil													
1984	450	319	153	59	193	45	225	110	1,093	45	109	44	2,845
1985	471	294	169	57	216	34	209	124	1,127	50	105	12	2,868
1986	476	280	175	49	220	40	202	133	1,169	50	111	9	2,914
1987	484	279	190	58	211	42	205	145	1,185	58	113	5	2,976
1988	498	269	170	57	223	52	212	150	1,304	64	119	4	3,122
1989	R490	252	R168	55	209	RP68	213	154	1,378	61	107	2	3,157
1990	R391	228	R159	63	R214	RP52	209	143	1,393	51	116	(s)	3,021
1991	391	226	152	59	214	P39	197	141	1,336	54	110	(s)	2,921
1992	R405	R217	144	51	228	RP33	209	146	1,391	42	113	(s)	2,979
1993	R428	218	128	50	211	RP41	R189	133	1,485	31	127	(s)	3,041
1994	R410	R216	136	46	R208	RP59	R199	R131	1,594	34	R129	(s)	3,162
1995	R413	R215	R131	36	R210	RP47	R207	R128	1,668	24	126	—	3,207
1996	R435	R222	R136	41	R216	RP51	R212	R141	1,754	24	134	—	3,365
1997	R421	R209	R140	41	R214	RP53	R199	R136	1,867	22	R135	—	3,435
1998	367	R198	147	37	R197	RP66	R184	R138	1,967	18	142	—	3,461
1999	R380	R195	R141	38	R188	RP66	R181	R134	2,091	19	R139	—	3,572
2000	398	216	138	44	203	P74	197	133	2,155	15	149	—	3,722
Residual Fuel Oil													
1984	—	92	258	76	—	509	( <sup>2</sup> )	370	—	14	—	50	1,369
1985	—	103	252	71	—	403	( <sup>2</sup> )	346	—	13	—	15	1,202
1986	—	126	254	51	—	590	( <sup>2</sup> )	371	—	E12	—	15	1,418
1987	—	118	208	42	—	498	( <sup>2</sup> )	383	—	12	—	3	1,264
1988	—	119	200	34	—	621	( <sup>2</sup> )	392	—	9	—	4	1,378
1989	—	R106	R158	22	—	RP651	( <sup>2</sup> )	R425	—	7	—	2	1,370
1990	—	R97	R144	R20	—	RP556	( <sup>2</sup> )	R404	—	5	—	2	1,229
1991	—	R95	R130	20	—	RP450	( <sup>2</sup> )	R454	—	8	—	1	1,158
1992	—	R83	R150	19	—	RP372	( <sup>2</sup> )	R463	—	R6	—	1	1,094
1993	—	R78	R181	R20	—	RP392	( <sup>2</sup> )	R403	—	6	—	(s)	1,080
1994	—	R75	R165	17	—	RP378	( <sup>2</sup> )	R381	—	4	—	(s)	1,021
1995	—	R65	R139	15	—	RP216	( <sup>2</sup> )	R413	—	4	—	(s)	852
1996	—	R60	R136	11	—	RP266	( <sup>2</sup> )	R371	—	4	—	1	848
1997	—	R48	R116	10	—	RP314	( <sup>2</sup> )	R306	—	3	—	(s)	797
1998	—	R36	R91	R6	—	RP468	( <sup>2</sup> )	R284	—	2	—	(s)	887
1999	—	R34	R89	R7	—	RP391	( <sup>2</sup> )	R307	—	R1	—	(s)	830
2000	—	42	100	10	—	P352	( <sup>2</sup> )	403	—	2	—	(s)	909
Kerosene													
1984	42	45	14	—	3	—	—	—	—	—	—	11	115
1985	56	24	17	—	3	—	—	—	—	—	—	14	114
1986	42	20	11	—	2	—	—	—	—	—	—	22	98
1987	44	17	10	—	3	—	—	—	—	—	—	21	95
1988	50	20	12	—	3	—	—	—	—	—	—	11	96
1989	40	23	11	—	2	—	—	—	—	—	—	8	84
1990	29	6	5	—	1	—	—	—	—	—	—	1	43
1991	32	6	5	—	2	—	—	—	—	—	—	1	46
1992	31	5	3	—	1	—	—	—	—	—	—	(s)	41
1993	37	7	4	—	2	—	—	—	—	—	—	1	50
1994	31	9	6	—	2	—	—	—	—	—	—	1	49
1995	36	11	6	—	1	—	—	—	—	—	—	(s)	54
1996	43	10	7	—	2	—	—	—	—	—	—	(s)	62
1997	45	12	7	—	1	—	—	—	—	—	—	(s)	66
1998	52	15	8	—	2	—	—	—	—	—	—	1	78
1999	54	13	4	—	2	—	—	—	—	—	—	1	73
2000	46	14	6	—	2	—	—	—	—	—	—	(s)	67

<sup>1</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants. Through 1988, data are for electric utilities only.

<sup>2</sup> Included in "Other."

R=Revised. P=Preliminary. E = Annual estimate based on eleven months of data. — = Not applicable. (s)=Less than 0.5 thousand barrels per day.

Notes: Sales data are adjusted to equal the Energy Information Administration (EIA) volume estimate of products supplied in the U.S. marketplace (see Table 5.11). Distillate Fuel Oil is adjusted at the

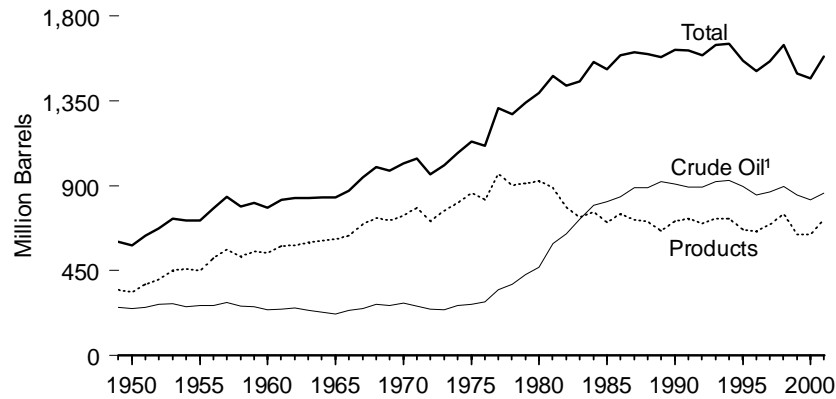
Petroleum Administration for Defense (PAD) district level. Residual Fuel Oil from 1984-1989 is adjusted at the PAD district level. From 1990 forward it is adjusted at the national level. Kerosene from 1984-1991 is adjusted at the PAD district level. From 1992 forward it is adjusted at the national level. Additional information is available in EIA's report *Fuel Oil and Kerosene Sales*. Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

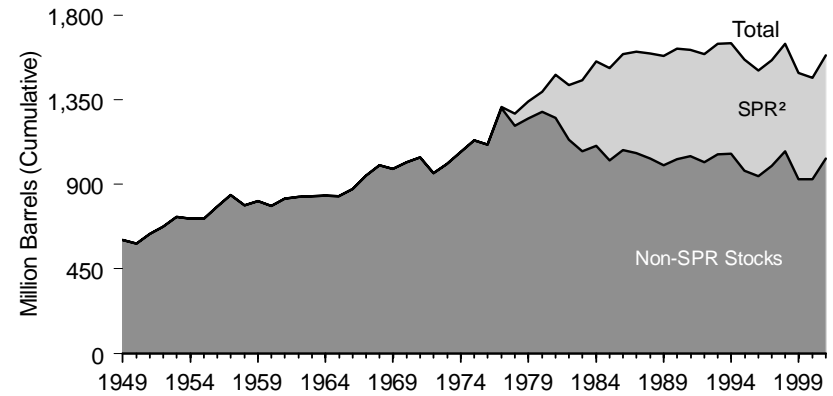
Sources: See sources at end of section.

**Figure 5.14 Petroleum Primary Stocks by Type**

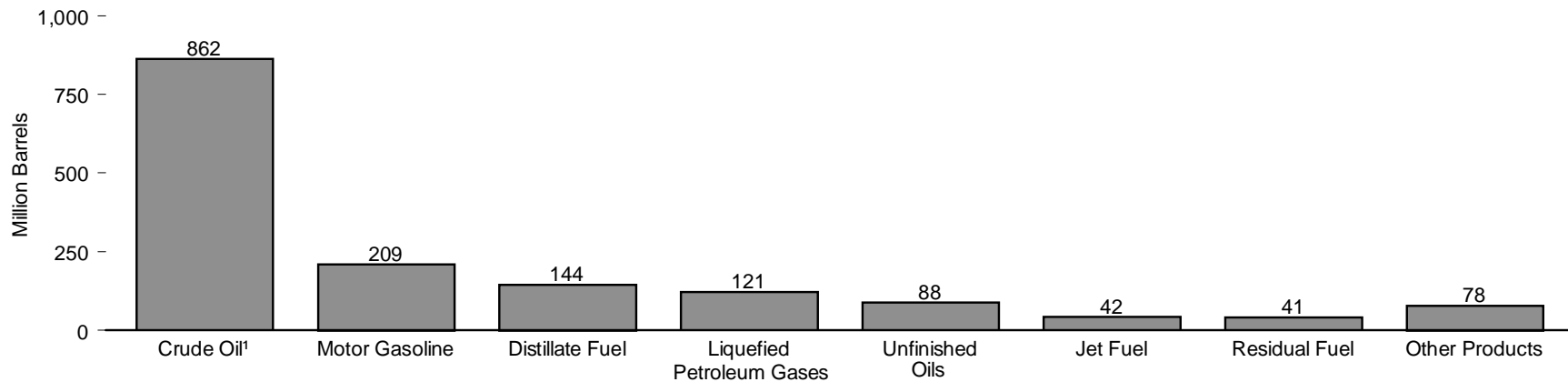
**Total, Products, and Crude Oil,<sup>1</sup> 1949-2001**



**SPR,<sup>2</sup> Non-SPR, and Total Stocks, 1949-2001**



**By Type, 2001**



<sup>1</sup> Includes lease condensate and crude oil stored in the Strategic Petroleum Reserve (SPR).

<sup>2</sup> See Figure 5.15 for additional Strategic Petroleum Reserve information.

Notes: Stocks are at end of year. Because vertical scales differ, graphs should not be compared.

Sources: Tables 5.14 and 5.15.

**Table 5.14 Petroleum Primary Stocks by Type, 1949-2001**

(Million Barrels)

Year	Crude Oil and Lease Condensate			Petroleum Products										Total Petroleum
	Strategic Petroleum Reserve	Other Primary	Total	Distillate Fuel Oil		Jet Fuel	Liquefied Petroleum Gases		Motor Gasoline <sup>3</sup>	Residual Fuel Oil	Unfinished Oils	Other Products <sup>4</sup>	Total Products	
				Low Sulfur <sup>1</sup>	Total		Propane <sup>2</sup>	Total						
1949	0	253	253	NA	75	(5)	(6)	1	110	60	66	37	350	603
1950	0	248	248	NA	72	(5)	(6)	2	116	41	70	34	334	583
1951	0	256	256	NA	87	(5)	(6)	2	135	43	67	45	378	634
1952	0	272	272	NA	99	2	(6)	3	135	49	62	53	402	674
1953	0	274	274	NA	112	3	(6)	4	158	49	69	56	451	726
1954	0	258	258	NA	108	3	(6)	7	155	52	74	57	457	715
1955	0	266	266	NA	111	3	(6)	7	165	39	68	55	449	715
1956	0	266	266	NA	134	5	(6)	14	187	44	67	63	514	780
1957	0	282	282	NA	149	5	(6)	14	197	60	69	66	560	841
1958	0	263	263	NA	125	6	(6)	16	187	60	70	63	526	789
1959	0	257	257	NA	151	8	(6)	19	188	54	67	66	552	809
1960	0	240	240	NA	138	7	(6)	23	195	45	62	76	545	785
1961	0	245	245	NA	152	8	(6)	31	184	45	79	81	580	825
1962	0	252	252	NA	144	10	(6)	25	189	50	82	83	582	834
1963	0	237	237	NA	157	9	(6)	28	191	48	82	85	598	836
1964	0	230	230	NA	156	19	(6)	30	186	40	87	92	609	839
1965	0	220	220	NA	155	19	(6)	30	175	56	89	92	616	836
1966	0	238	238	NA	154	19	(6)	35	186	61	89	91	636	874
1967	0	249	249	NA	160	22	(6)	64	200	66	90	93	695	944
1968	0	272	272	NA	173	24	(6)	76	204	67	93	89	727	1,000
1969	0	265	265	NA	172	28	(6)	60	211	58	98	88	715	980
1970	0	276	276	NA	195	28	(6)	67	209	54	99	89	741	1,018
1971	0	260	260	NA	191	28	(6)	95	219	60	101	92	784	1,044
1972	0	246	246	NA	154	25	(6)	86	213	55	95	84	713	959
1973	0	242	242	NA	196	29	65	99	209	53	99	80	766	1,008
1974	0	265	265	NA	200	29	69	113	218	60	106	82	809	1,074
1975	0	271	271	NA	209	30	82	125	235	74	106	82	862	1,133
1976	0	285	285	NA	186	32	74	116	231	72	110	78	826	1,112
1977	7	340	348	NA	250	35	81	136	258	90	113	82	964	1,312
1978	67	309	376	NA	216	34	87	132	238	90	109	82	901	1,278
1979	91	339	430	NA	229	39	64	111	237	96	118	82	911	1,341
1980	108	358	466	NA	205	42	65	120	261	92	124	82	926	1,392
1981	230	363	594	NA	192	41	76	135	253	78	111	80	890	1,484
1982	294	350	644	NA	179	37	54	94	235	66	105	70	786	1,430
1983	379	344	723	NA	140	39	48	101	222	49	108	72	731	1,454
1984	451	345	796	NA	161	42	58	101	243	53	94	67	760	1,556
1985	493	321	814	NA	144	40	39	74	223	50	107	67	705	1,519
1986	512	331	843	NA	155	50	63	103	233	47	94	68	750	1,593
1987	541	349	890	NA	134	50	48	97	226	47	93	70	718	1,607
1988	560	330	890	NA	124	44	50	97	228	45	100	70	707	1,597
1989	580	341	921	NA	106	41	32	80	213	44	106	70	660	1,581
1990	586	323	908	NA	132	52	49	98	220	49	99	63	712	1,621
1991	569	325	893	NA	144	49	48	92	219	50	98	72	724	1,617
1992	575	318	893	NA	141	43	39	89	216	43	95	73	699	1,592
1993	587	335	922	64	141	40	51	106	226	44	88	78	725	1,647
1994	592	337	929	73	145	47	46	99	215	42	91	84	724	1,653
1995	592	303	895	67	130	40	43	93	202	37	86	79	668	1,563
1996	566	284	850	68	127	40	43	86	195	46	88	76	658	1,507
1997	563	305	868	68	138	44	44	89	210	40	89	81	692	1,560
1998	571	324	895	77	156	45	65	115	216	45	91	85	752	1,647
1999	567	284	852	69	125	41	43	89	193	36	86	70	641	1,493
2000	541	R286	R826	72	118	45	41	R83	R196	36	87	77	R641	R1,468
2001P	550	312	862	81	144	42	66	121	209	41	88	78	723	1,585

<sup>1</sup> Sulfur content of 0.05 percent or less by weight.

<sup>2</sup> Includes propylene.

<sup>3</sup> Prior to 1964, motor gasoline data were for total gasoline, which included motor gasoline, aviation gasoline, and special naphthas. For 1981 forward, data include motor gasoline blending components.

<sup>4</sup> Kerosene, petrochemical feedstocks, lubricants, wax, petroleum coke, asphalt, road oil, pentanes plus, and miscellaneous products. Since 1964, aviation gasoline and special naphthas have been included. For 1981 forward, includes aviation gasoline blending components, hydrogen, other hydrocarbons, and alcohol.

<sup>5</sup> Included in the products from which jet fuel was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel.

<sup>6</sup> Included in liquefied petroleum gases total.

R=Revised. P=Preliminary. NA=Not available.

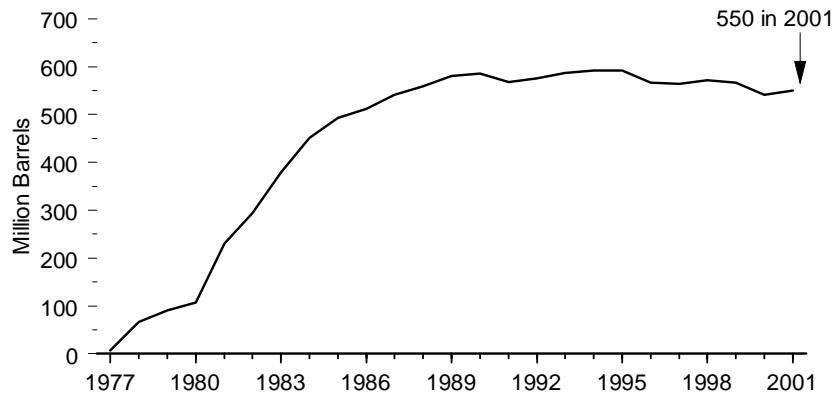
Notes: Stocks are at end of year. Distillate stocks in the "Northeast Heating Oil Reserve" are not included. Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

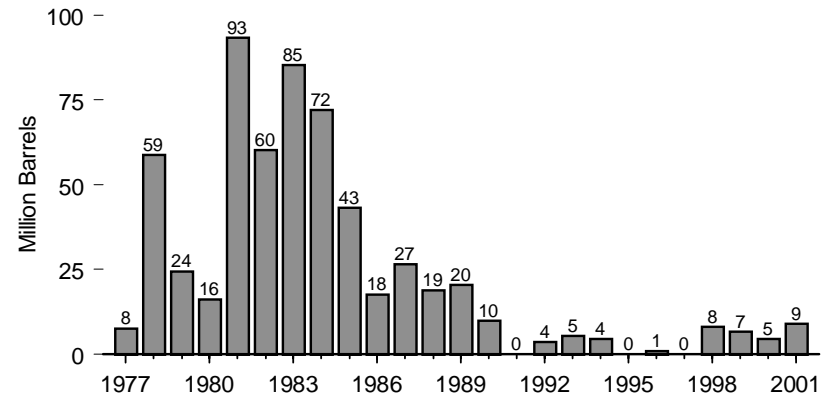
Sources: 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. 1976-1980—Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual*, annual reports. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, *Petroleum Supply Monthly* (February 2002).

**Figure 5.15 Strategic Petroleum Reserve, 1977-2001**

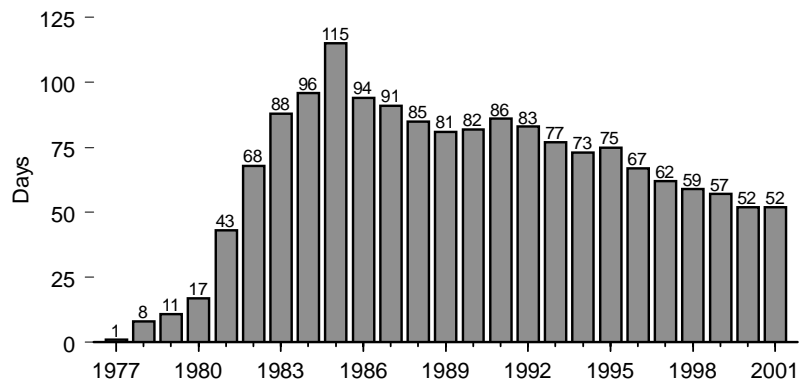
**End-of-Year Stocks in SPR**



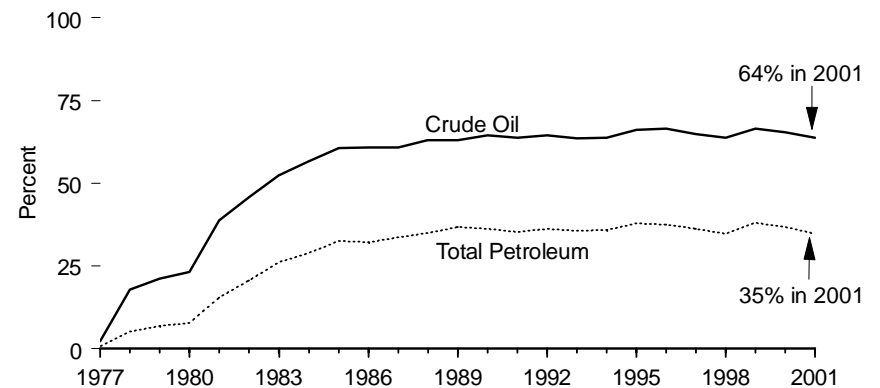
**Crude Oil Imports for SPR<sup>1</sup>**



**SPR Stocks as Days of Net Imports<sup>2</sup>**



**SPR as Share of Domestic Stocks**



<sup>1</sup> Imported by SPR and imported by others for SPR.

<sup>2</sup> Derived by dividing end-of-year SPR stocks by annual average daily net imports of all petroleum.

Notes: SPR=Strategic Petroleum Reserve. Because vertical scales differ, graphs should not be compared.

Source: Table 5.15.

**Table 5.15 Strategic Petroleum Reserve, 1977-2001**  
(Million Barrels, Except as Noted)

Year	Foreign Crude Oil Receipts		Domestic Crude Oil Receipts		Withdrawals		End-of-Year Stocks			Days of Net Petroleum Imports <sup>5</sup>
	Imported by SPR	Imported by Others <sup>1,2</sup>	Purchases	Exchanges <sup>2</sup>	Sales	Exchanges	Quantity <sup>3</sup>	Share of Crude Oil <sup>4</sup> (percent)	Share of Total Petroleum Stocks (percent)	
1977	7.54	0.00	<sup>6</sup> 0.37	0.00	0.00	0.00	7.46	2.1	0.6	1
1978	58.80	0.00	0.00	0.00	0.00	0.00	66.86	17.8	5.2	8
1979	24.43	0.00	(s)	0.00	0.00	0.00	91.19	21.2	6.8	11
1980	16.07	0.00	1.30	0.00	0.00	0.00	107.80	23.1	7.7	17
1981	93.30	0.00	28.79	0.00	0.00	0.00	230.34	38.8	15.5	43
1982	60.19	0.00	3.79	0.00	0.00	0.00	293.83	45.7	20.5	68
1983	85.29	0.00	0.42	0.00	0.00	0.00	379.09	52.4	26.1	88
1984	72.04	0.00	0.05	0.00	0.00	0.00	450.51	56.6	28.9	96
1985	43.12	0.00	0.17	0.00	0.00	0.00	493.32	60.6	32.5	115
1986	17.56	0.00	1.21	0.00	0.00	0.00	511.57	60.7	32.1	94
1987	26.52	0.00	2.69	0.00	0.00	0.00	540.65	60.8	33.6	91
1988	18.76	0.00	0.01	0.00	0.00	0.00	559.52	62.9	35.0	85
1989	20.35	0.00	0.00	0.00	0.00	0.00	579.86	62.9	36.7	81
1990	9.77	0.00	0.00	0.00	3.91	0.00	585.69	64.5	36.1	82
1991	0.00	0.00	0.00	0.00	17.22	0.00	568.51	63.7	35.2	86
1992	3.59	0.00	2.60	0.00	0.00	0.00	574.72	64.4	36.1	83
1993	5.37	0.00	6.96	0.00	0.00	0.00	587.08	63.6	35.6	77
1994	4.49	0.00	0.11	0.00	0.00	0.00	591.67	63.7	35.8	73
1995	0.00	0.00	0.00	0.00	0.00	0.00	591.64	66.1	37.9	75
1996	0.00	0.90	0.00	0.00	25.82	0.90	565.82	66.6	37.5	67
1997	0.00	0.00	0.00	0.00	2.33	0.00	563.43	64.9	36.1	62
1998	0.00	7.98	0.00	0.00	0.00	0.00	571.41	63.8	34.7	59
1999	3.04	3.60	0.00	1.42	0.00	10.75	567.24	66.6	38.0	<sup>R</sup> 57
2000	3.01	1.50	0.00	2.29	0.00	<sup>T</sup> 33.35	540.68	<sup>R</sup> 65.4	<sup>R</sup> 36.8	<sup>R</sup> 52
2001	3.91	5.07	0.58	0.00	0.00	0.00	550.24	63.8	34.7	52

<sup>1</sup> Represents volumes of imported crude oil received at SPR storage facilities for which the costs associated with the importation and delivery of crude oil are the responsibility of the commercial importer under contract to supply the SPR.

<sup>2</sup> The values shown for 1998-1999 represent an exchange agreement in which SPR received approximately 8.5 million barrels of high quality oil in exchange for approximately 11 million barrels of lower quality crude oil shipped from SPR during 1999-2000. Also, starting in 1999 a portion of the crude oil in-kind royalties from Federal leases in the Gulf of Mexico was transferred to the Department of Energy and exchanged with commercial entities for crude oil to fill the SPR. Crude oil exchange barrels delivered to SPR could be either domestic or imported as long as the crude oil met the specification requirements of SPR. All exchange barrels of imported crude oil are shown in the column "Foreign Crude Oil, Imported by Others," while exchange barrels of domestic crude oil are shown under the column "Domestic Crude Oil Receipts, Exchanges."

<sup>3</sup> Stocks do not include imported quantities in transit to Strategic Petroleum Reserve terminals, pipeline fill, and above-ground storage.

<sup>4</sup> Including lease condensate stocks.

<sup>5</sup> Derived by dividing end-of-year Strategic Petroleum Reserve stocks by annual average daily net imports of all petroleum. Calculated prior to rounding.

<sup>6</sup> The quantity of domestic fuel oil which was in storage prior to injection of foreign crude oil.

<sup>7</sup> Includes 30 million barrels released to increase heating oil stocks in exchange for a like quantity plus a bonus percentage to be returned in 2001-2002, as well as additional barrels to create a Northeast Home Heating Oil Reserve.

SPR=Strategic Petroleum Reserve. R=Revised. (s)=Less than 0.005 million barrels.

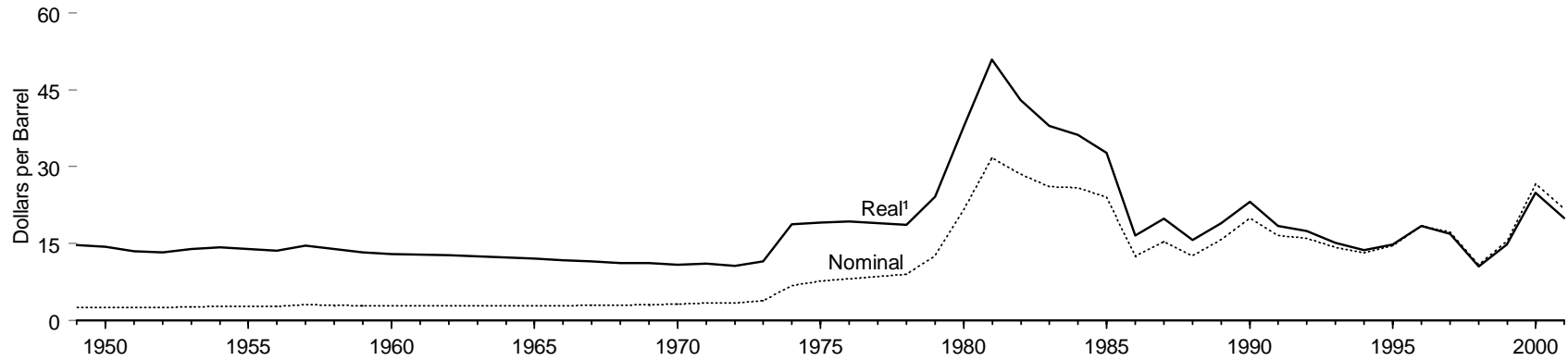
Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

Sources: **Domestic Crude Oil Deliveries and Domestic Crude Oil Sales:** U.S. Department of Energy, Assistant Secretary for Fossil Energy, unpublished data. **All Other Data:** 1977-1980—Energy Information Administration (EIA), Energy Data Report, *Petroleum Statement, Annual*, annual reports.

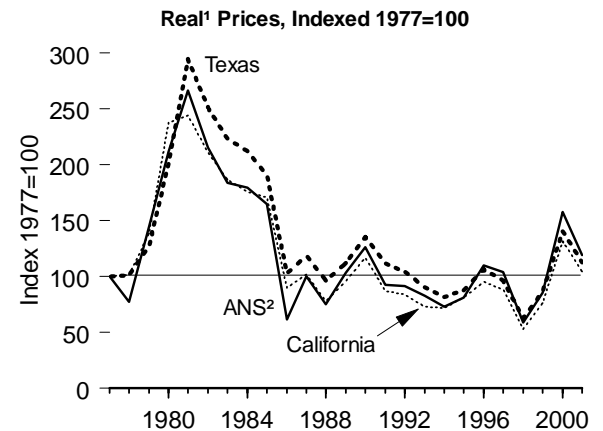
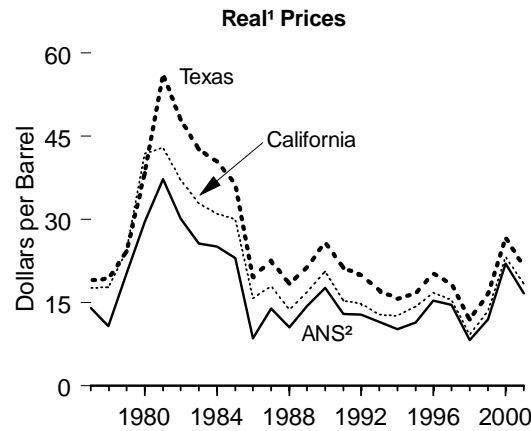
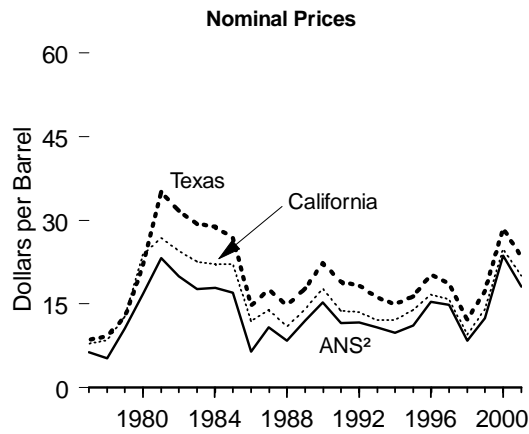
1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, *Petroleum Supply Monthly* (February 2002).

**Figure 5.16 Crude Oil Domestic First Purchase Prices**

**U.S. Average Real<sup>1</sup> and Nominal Prices, 1949-2001**



**Alaska North Slope, California, and Texas, 1977-2001**



<sup>1</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>2</sup> Alaska North Slope.

Note: Because vertical scales differ, graphs should not be compared.  
Source: Table 5.16.

**Table 5.16 Crude Oil Domestic First Purchase Prices, 1949-2001**  
(Dollars per Barrel)

Year	Alaska North Slope		California		Texas		U.S. Average	
	Nominal	Real <sup>1</sup>	Nominal	Real <sup>1</sup>	Nominal	Real <sup>1</sup>	Nominal	Real <sup>1</sup>
1949	—	—	—	—	—	—	2.54	14.72
1950	—	—	—	—	—	—	2.51	14.38
1951	—	—	—	—	—	—	2.53	13.52
1952	—	—	—	—	—	—	2.53	13.32
1953	—	—	—	—	—	—	2.68	13.92
1954	—	—	—	—	—	—	2.78	14.30
1955	—	—	—	—	—	—	2.77	14.00
1956	—	—	—	—	—	—	2.79	13.64
1957	—	—	—	—	—	—	3.09	14.62
1958	—	—	—	—	—	—	3.01	13.91
1959	—	—	—	—	—	—	2.90	13.25
1960	—	—	—	—	—	—	2.88	12.98
1961	—	—	—	—	—	—	2.89	12.88
1962	—	—	—	—	—	—	2.90	12.75
1963	—	—	—	—	—	—	2.89	12.57
1964	—	—	—	—	—	—	2.88	12.34
1965	—	—	—	—	—	—	2.86	12.03
1966	—	—	—	—	—	—	2.88	11.77
1967	—	—	—	—	—	—	2.92	11.58
1968	—	—	—	—	—	—	2.94	11.18
1969	—	—	—	—	—	—	3.09	11.20
1970	—	—	—	—	—	—	3.18	10.94
1971	—	—	—	—	—	—	3.39	11.11
1972	—	—	—	—	—	—	3.39	10.65
1973	—	—	—	—	—	—	3.89	11.58
1974	—	—	—	—	—	—	6.87	18.76
1975	—	—	—	—	—	—	7.67	19.16
1976	—	—	—	—	—	—	8.19	19.36
1977	<sup>2</sup> 6.29	<sup>2</sup> 13.97	7.92	17.59	8.58	19.06	8.57	19.04
1978	5.21	10.80	8.58	17.79	9.29	19.26	9.00	18.66
1979	10.57	20.23	12.78	24.46	12.65	24.21	12.64	24.19
1980	16.87	29.58	23.87	41.85	21.84	38.29	21.59	37.85
1981	23.23	37.25	26.80	42.97	35.06	56.21	31.77	50.94
1982	19.92	30.07	24.58	37.10	31.77	47.95	28.52	43.05
1983	17.69	25.68	22.61	32.83	29.35	42.61	26.19	38.02
1984	17.91	25.07	22.09	30.92	28.87	40.41	25.88	36.23
1985	16.98	23.04	22.14	30.04	26.80	36.37	24.09	32.69
1986	6.45	8.56	11.90	15.80	14.73	19.56	12.51	16.61
1987	10.83	13.96	13.92	17.94	17.55	22.62	15.40	19.85
1988	8.43	10.51	10.97	13.68	14.71	18.34	12.58	15.68
1989	12.00	14.41	14.06	16.88	17.81	21.39	15.86	19.05
1990	15.23	17.60	17.81	20.59	22.37	25.86	20.03	23.15
1991	11.57	12.90	13.72	15.30	19.04	21.24	16.54	18.45
1992	11.73	12.77	13.55	14.75	18.32	19.95	15.99	17.41
1993	10.84	11.53	12.11	12.88	16.19	17.21	14.25	15.15
1994	9.77	10.18	12.12	12.62	14.98	15.60	13.19	13.74
1995	11.12	11.34	14.00	14.27	16.38	16.70	14.62	14.90
1996	15.32	15.32	16.72	16.72	20.31	20.31	18.46	18.46
1997	14.84	14.56	15.78	15.48	18.66	18.30	17.23	16.90
1998	8.47	8.21	9.55	9.25	12.28	11.90	10.87	10.53
1999	12.46	<sup>R</sup> 11.91	14.08	<sup>R</sup> 13.45	17.29	<sup>R</sup> 16.52	15.56	<sup>R</sup> 14.87
2000	23.62	<sup>R</sup> 22.07	<sup>R</sup> 24.82	<sup>R</sup> 23.19	<sup>R</sup> 28.60	<sup>R</sup> 26.72	<sup>R</sup> 26.72	<sup>R</sup> 24.96
2001 <sup>P</sup>	18.18	16.62	20.11	18.39	23.45	21.44	21.86	19.99

<sup>1</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>2</sup> Average for July through December only.

<sup>R</sup>=Revised. <sup>P</sup>=Preliminary. — = Not applicable.

Note: For the definition of crude oil domestic first purchase prices, see Note 5 at end of section.

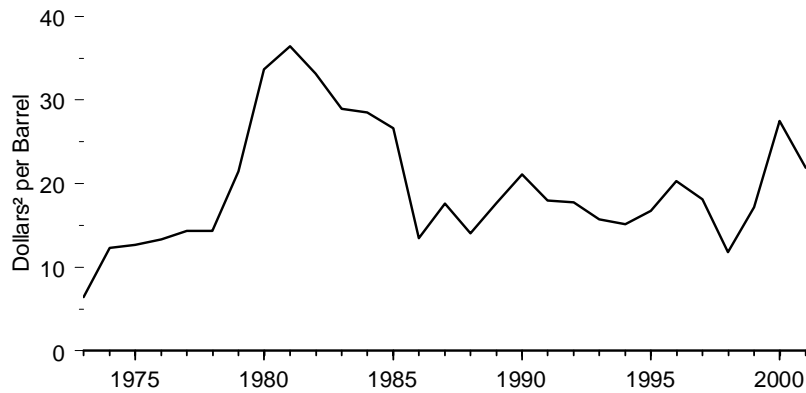
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Sources: 1949-1973—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. 1974 through January 1976—Federal Energy Administration (FEA), Form FEA-90, "Crude Petroleum Production Monthly Report." February 1976 through 1977—FEA, Form FEA-P-124, "Domestic Crude Oil Purchaser's Monthly Report." 1978 forward—Energy Information Administration, *Petroleum Marketing Monthly* (March 2002), Table 21.

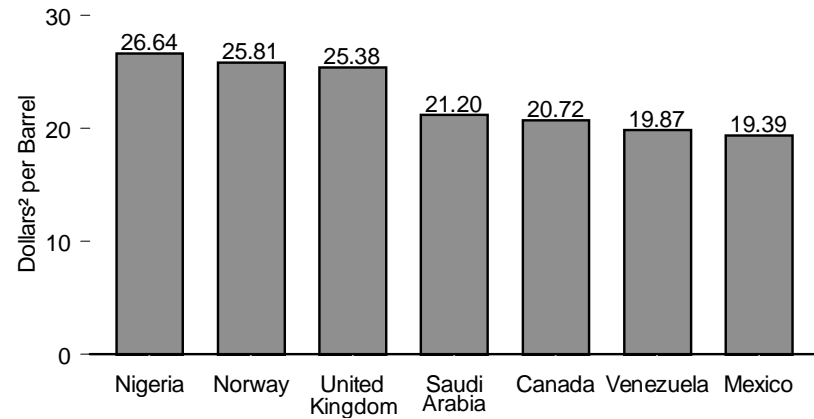


**Figure 5.17 Landed Costs of Crude Oil Imports From Selected Countries**

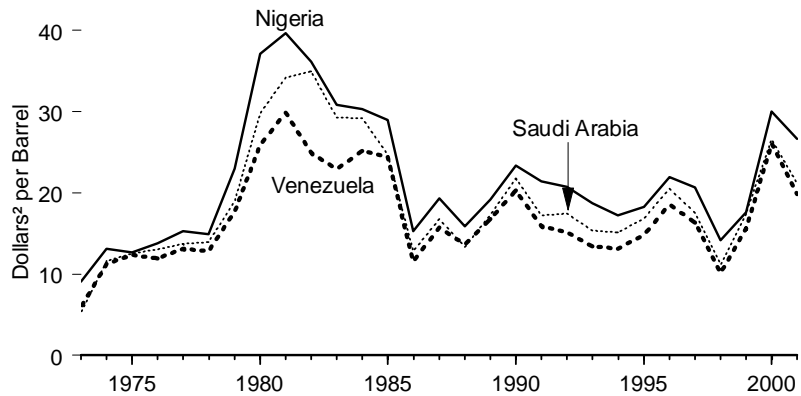
**Total, 1973<sup>1</sup>-2001**



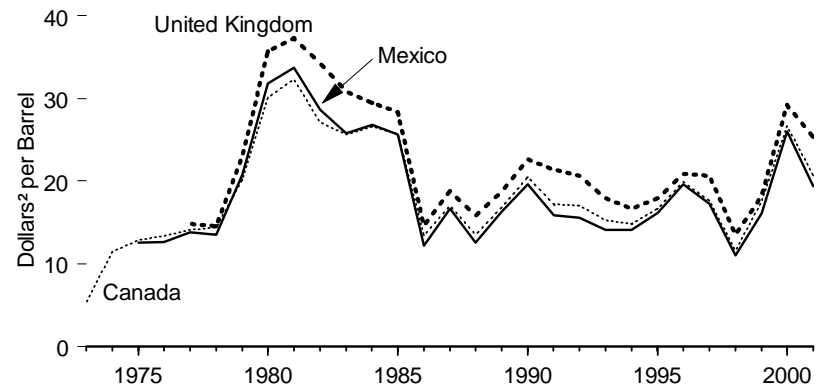
**By Selected Country, 2001**



**By Selected OPEC Country, 1973<sup>1</sup>-2001**



**By Selected Non-OPEC Country, 1973<sup>1</sup>-2001**



<sup>1</sup> Based on October, November, and December data only.

<sup>2</sup> Nominal dollars.

Source: Table 5.17.

**Table 5.17 Landed Costs of Crude Oil Imports From Selected Countries, 1973-2001**

(Dollars<sup>1</sup> per Barrel)

Year	Persian Gulf Nations	Selected OPEC <sup>2</sup> Countries					Selected Non-OPEC Countries						Total	
		Kuwait	Nigeria	Saudi Arabia	Venezuela	Total OPEC <sup>3</sup>	Angola	Canada	Colombia	Mexico	Norway	United Kingdom		Total Non-OPEC
1973 <sup>4</sup>	5.91	W	9.08	5.37	5.99	6.85	W	5.33	W	NA	NA	NA	5.64	6.41
1974	12.21	W	13.16	11.63	11.25	12.49	12.48	11.48	W	W	NA	NA	11.81	12.32
1975	12.64	W	12.70	12.50	12.36	12.70	11.81	12.84	( <sup>5</sup> )	12.61	12.80	NA	12.70	12.70
1976	13.03	W	13.81	13.06	11.89	13.32	12.71	13.36	( <sup>5</sup> )	12.64	13.74	W	13.35	13.32
1977	13.85	W	15.29	13.69	13.11	14.35	14.04	14.13	( <sup>5</sup> )	13.82	14.93	14.83	14.42	14.36
1978	14.01	W	14.88	13.94	12.84	14.34	14.07	14.41	( <sup>5</sup> )	13.56	14.68	14.53	14.38	14.35
1979	20.42	W	22.97	18.95	17.65	21.29	21.06	20.22	( <sup>5</sup> )	20.77	22.55	22.97	22.10	21.45
1980	30.59	W	37.15	29.80	25.92	33.56	34.76	30.11	W	31.77	36.82	35.68	33.99	33.67
1981	34.61	NA	39.66	34.20	29.91	36.60	36.84	32.32	( <sup>5</sup> )	33.70	38.70	37.29	36.14	36.47
1982	34.94	NA	36.16	34.99	24.93	34.81	33.08	27.15	( <sup>5</sup> )	28.63	34.70	34.25	31.47	33.18
1983	29.37	NA	30.85	29.27	22.94	29.84	29.31	25.63	( <sup>5</sup> )	25.78	30.72	30.87	28.08	28.93
1984	29.07	W	30.36	29.20	25.19	29.06	28.49	26.56	( <sup>5</sup> )	26.85	30.05	29.45	28.14	28.54
1985	25.50	NA	28.96	24.72	24.43	26.86	27.39	25.71	( <sup>5</sup> )	25.63	28.32	28.36	26.53	26.67
1986	12.92	11.70	15.29	12.84	11.52	13.46	14.09	13.43	12.85	12.17	15.98	14.63	13.52	13.49
1987	17.47	18.14	19.32	16.81	15.76	17.64	18.20	17.04	18.43	16.69	19.10	18.78	17.66	17.65
1988	13.51	12.84	15.88	13.37	13.66	14.18	14.48	13.50	14.47	12.58	15.43	15.82	13.96	14.08
1989	17.37	16.90	19.19	17.34	16.78	17.78	18.36	16.81	18.10	16.35	19.06	18.74	17.54	17.68
1990	20.55	17.01	23.33	21.82	20.31	21.23	21.51	20.48	22.34	19.64	21.11	22.65	20.98	21.13
1991	17.34	18.48	21.39	17.22	15.92	18.08	19.90	17.16	19.55	15.89	21.44	21.37	17.93	18.02
1992	17.58	16.99	20.78	17.48	15.13	17.81	19.36	17.04	18.46	15.60	20.90	20.63	17.67	17.75
1993	15.26	14.23	18.73	15.40	13.39	15.68	17.40	15.27	16.54	14.11	18.99	17.92	15.78	15.72
1994	15.00	14.49	17.21	15.11	13.12	15.08	16.36	14.83	15.80	14.09	17.09	16.64	15.29	15.18
1995	16.78	16.47	18.25	16.84	14.81	16.61	17.66	16.65	17.45	16.19	18.06	17.91	16.95	16.78
1996	20.44	20.32	21.95	20.49	18.59	20.14	21.86	19.94	22.02	19.64	21.34	20.88	20.47	20.31
1997	17.44	17.03	20.64	17.52	16.35	17.73	20.24	17.63	19.71	17.30	20.26	20.64	18.45	18.11
1998	11.18	11.00	14.14	11.16	10.16	11.46	13.37	11.62	13.26	11.04	13.83	13.55	12.22	11.84
1999	17.37	16.77	17.63	17.48	15.58	16.94	18.37	17.54	18.09	16.12	19.06	18.26	17.51	17.23
2000	R <sup>26.77</sup>	R <sup>26.28</sup>	R <sup>30.04</sup>	R <sup>26.58</sup>	R <sup>26.05</sup>	R <sup>27.29</sup>	R <sup>29.57</sup>	R <sup>26.69</sup>	R <sup>29.68</sup>	R <sup>26.03</sup>	R <sup>30.13</sup>	R <sup>29.26</sup>	27.80	R <sup>27.53</sup>
2001 <sup>P</sup>	20.92	20.06	26.64	21.20	19.87	21.67	25.48	20.72	25.88	19.39	25.81	25.38	22.20	21.92

<sup>1</sup> Nominal dollars.

<sup>2</sup> Organization of Petroleum Exporting Countries. See Glossary for current membership.

<sup>3</sup> Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. In June 1996, OPEC retroactively ended Gabon's membership in OPEC effective December 31, 1994. However, data for Gabon are still included here for 1995.

<sup>4</sup> Based on October, November, and December data only.

<sup>5</sup> No data reported.

R=Revised. P=Preliminary. NA=Not available. W=Value withheld to avoid disclosure of individual company data.

Notes: This table reports landed costs of crude oil imports only; it does not account for refined

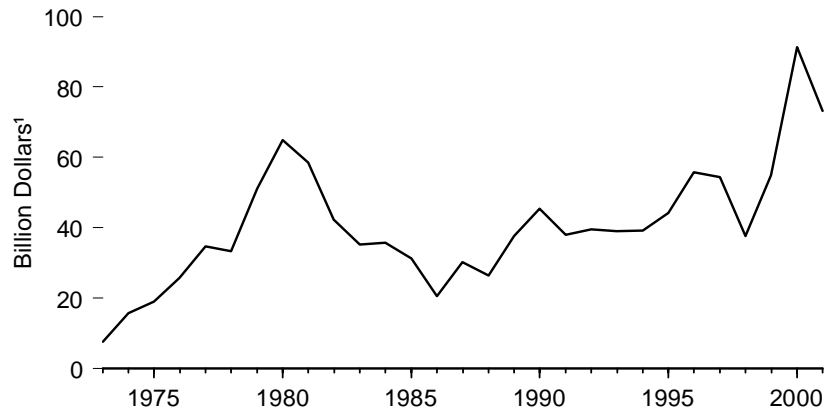
petroleum products imported into the United States. Data include any imports for the Strategic Petroleum Reserve, which began in 1977. Totals may not equal sum of components due to independent rounding.

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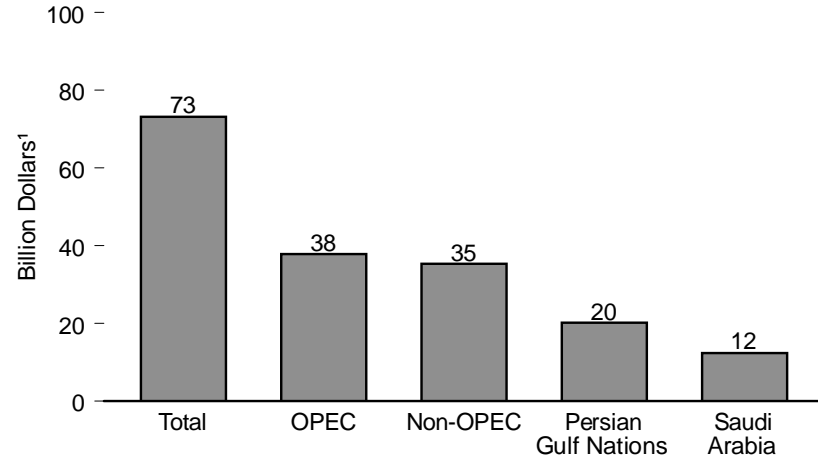
Sources: 1973 through September 1977—Federal Energy Administration, Form FEA-F701-M-0, "Transfer Pricing Report." October 1977 through January 1979—Energy Information Administration (EIA), Form FEA-F701-M-0, "Transfer Pricing Report." February 1979 through September 1982—EIA, Form ERA-51, "Transfer Pricing Report." October 1982 through June 1984—EIA, Form EP-51, "Monthly Foreign Crude Oil Transaction Report." July 1984 forward—EIA, Form EIA-856, "Monthly Foreign Crude Oil Acquisition Report."

**Figure 5.18 Value of Crude Oil Imports**

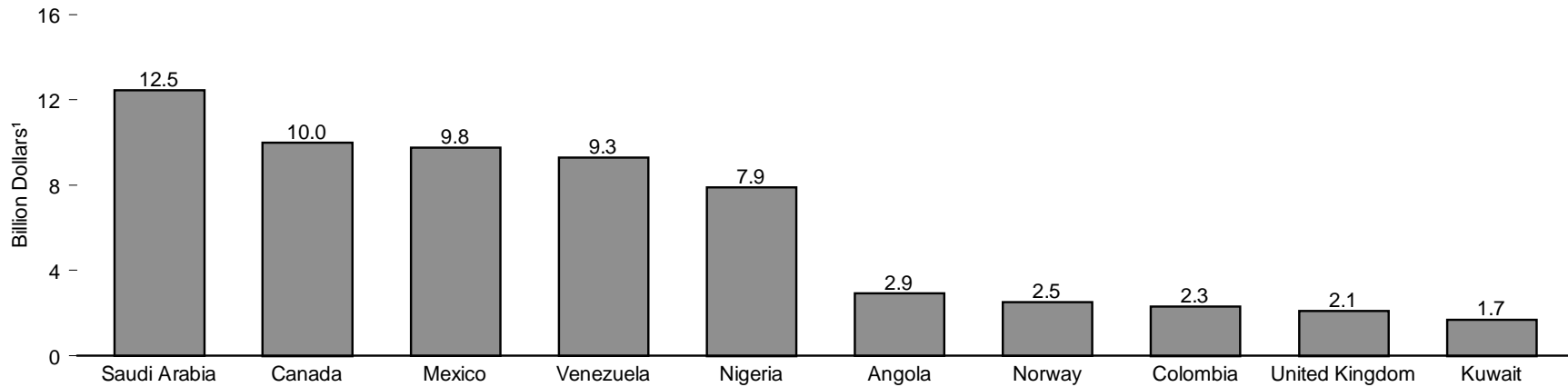
**Total, 1973-2001**



**Totals, 2001**



**By Selected Country, 2001**



<sup>1</sup>Nominal Dollars.

Notes: OPEC = Organization of Petroleum Exporting Countries. Because vertical scales differ, graphs should not be compared.

Source: Table 5.18.

**Table 5.18 Value of Crude Oil Imports From Selected Countries, 1973-2001**  
(Billion Dollars<sup>1</sup>)

Year	Persian Gulf Nations	Selected OPEC <sup>2</sup> Countries					Selected Non-OPEC Countries						Total <sup>4</sup>	
		Kuwait	Nigeria	Saudi Arabia	Venezuela	Total OPEC <sup>3</sup>	Angola	Canada	Colombia	Mexico	Norway	United Kingdom		Total Non-OPEC
1973	1.7	W	1.5	0.9	0.8	5.2	W	1.9	W	W	NA	NA	2.4	7.6
1974	4.4	W	3.3	1.9	1.3	11.6	0.2	3.3	NA	W	W	NA	4.1	15.6
1975	5.2	W	3.5	3.2	1.8	14.9	0.3	2.8	NA	0.3	0.1	W	4.1	19.0
1976	8.7	W	5.1	5.8	1.0	22.2	(s)	1.8	W	0.4	0.2	W	3.6	25.8
1977	12.2	W	6.3	6.9	1.2	29.6	0.1	1.4	NA	0.9	0.3	0.5	5.1	34.7
1978	11.3	W	4.9	5.8	0.8	27.1	(s)	1.3	NA	1.6	0.6	0.9	6.2	33.3
1979	15.3	W	9.0	9.3	1.9	39.7	0.3	2.0	NA	3.3	0.6	1.7	11.3	51.0
1980	16.9	W	11.4	13.6	1.5	47.5	0.5	2.2	NA	5.9	1.9	2.3	17.4	64.9
1981	15.1	NA	8.8	13.9	1.6	39.0	0.6	1.9	NA	5.8	1.6	5.0	19.5	58.5
1982	8.4	W	6.7	6.8	1.4	22.0	0.5	2.1	NA	6.7	1.3	5.5	20.2	42.2
1983	4.3	W	3.4	3.4	1.4	16.1	0.8	2.6	NA	7.2	0.7	4.1	19.1	35.2
1984	4.8	W	2.3	3.3	2.3	16.1	0.9	3.3	NA	6.5	1.2	4.1	19.7	35.8
1985	2.3	W	3.0	1.2	2.7	12.9	1.0	4.4	NA	6.7	0.3	2.9	18.3	31.2
1986	3.8	0.1	2.4	2.9	1.8	10.4	0.5	2.8	0.3	2.8	0.3	1.7	10.2	20.6
1987	6.0	0.5	3.7	3.9	2.8	15.5	1.2	3.8	0.8	3.7	0.5	2.1	14.7	30.1
1988	6.7	0.4	3.5	4.4	2.2	14.0	1.1	3.4	0.6	3.1	0.3	1.5	12.3	26.3
1989	11.0	1.0	5.6	7.1	3.0	21.9	1.9	3.9	0.9	4.3	0.9	1.1	15.8	37.7
1990	13.5	0.5	6.7	9.5	4.9	27.2	1.9	4.8	1.1	4.9	0.7	1.3	18.2	45.5
1991	11.0	(s)	5.3	10.7	3.9	22.3	1.8	4.7	0.9	4.4	0.6	0.8	15.7	38.0
1992	10.5	0.2	5.1	10.2	4.6	22.2	2.4	5.0	0.7	4.5	0.9	1.5	17.3	39.5
1993	9.1	1.8	4.9	7.2	4.9	20.7	2.1	5.0	0.9	4.4	0.9	2.0	18.3	38.9
1994	8.8	1.6	3.9	7.2	5.0	19.7	1.9	5.3	0.8	4.8	1.2	2.4	19.4	39.1
1995	9.1	1.3	4.1	7.7	6.2	21.6	2.3	6.3	1.3	6.1	1.7	2.2	22.6	44.3
1996	11.1	1.8	4.8	9.4	8.9	25.3	2.8	7.8	1.8	8.7	2.3	1.6	30.5	55.8
1997	10.4	1.6	5.2	8.3	8.3	24.4	3.1	7.7	1.9	8.6	2.1	1.3	29.9	54.4
1998	8.3	1.2	3.6	5.7	5.1	17.4	2.3	5.4	1.7	5.3	1.1	0.8	20.2	37.6
1999	15.0	1.5	4.0	8.8	6.5	26.1	2.4	7.5	3.0	7.4	1.8	1.9	28.8	54.9
2000	<sup>R</sup> 23.6	2.5	9.6	14.8	11.7	<sup>R</sup> 45.4	3.2	<sup>R</sup> 13.2	<sup>R</sup> 3.5	<sup>R</sup> 12.5	<sup>R</sup> 3.3	<sup>R</sup> 3.1	<sup>R</sup> 46.0	<sup>R</sup> 91.4
2001 <sup>P</sup>	20.2	1.7	7.9	12.5	9.3	37.9	2.9	10.0	2.3	9.8	2.5	2.1	35.3	73.2

<sup>1</sup> Nominal dollars.

<sup>2</sup> Organization of Petroleum Exporting Countries. See Glossary for current membership.

<sup>3</sup> Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. In June 1996, OPEC retroactively ended Gabon's membership in OPEC effective December 31, 1994. However, data for Gabon are still included here for 1995.

<sup>4</sup> Data shown here represent landed value; they differ from data in Table 3.5, which are data from U.S. Customs that represent crude oil value at the port of loading.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than \$0.05 billion. W=Value withheld to avoid disclosure of individual company data.

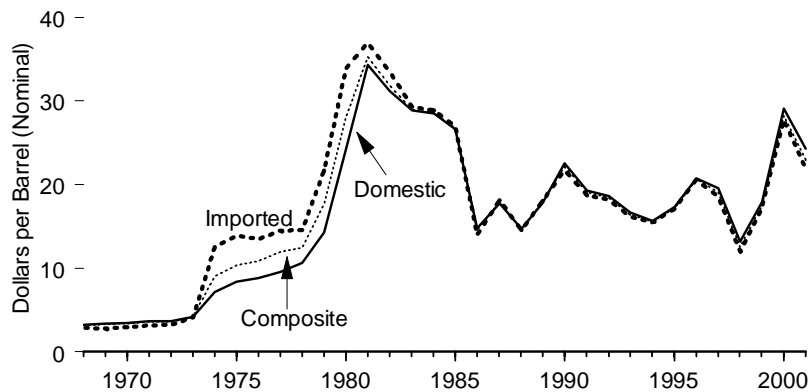
Notes: Crude oil import volumes used to calculate values in this table are for the 50 states and the District of Columbia. Totals may not equal sum of components due to independent rounding.

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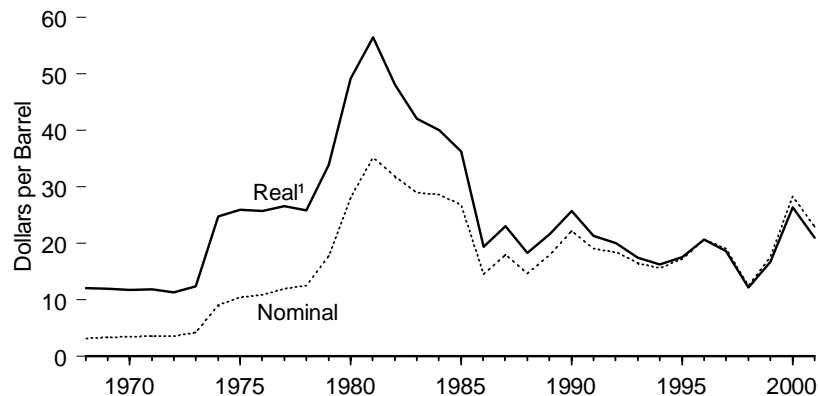
Sources: Calculated by using prices on Table 5.17 and volume data as follows: 1973-1975—U.S. Department of the Interior, Bureau of Mines, *Petroleum Statement, Annual*, annual reports. 1976-1980—Energy Information Administration (EIA), *Petroleum Statement, Annual*, annual reports. 1981-2000—EIA, *Petroleum Supply Annual*, annual reports. 2001—EIA, *Petroleum Supply Monthly* (February 2002).

**Figure 5.19 Crude Oil Refiner Acquisition Costs, 1968-2001**

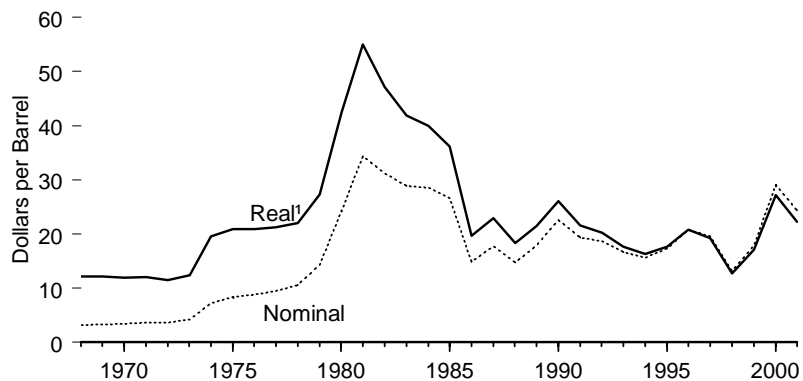
**Summary**



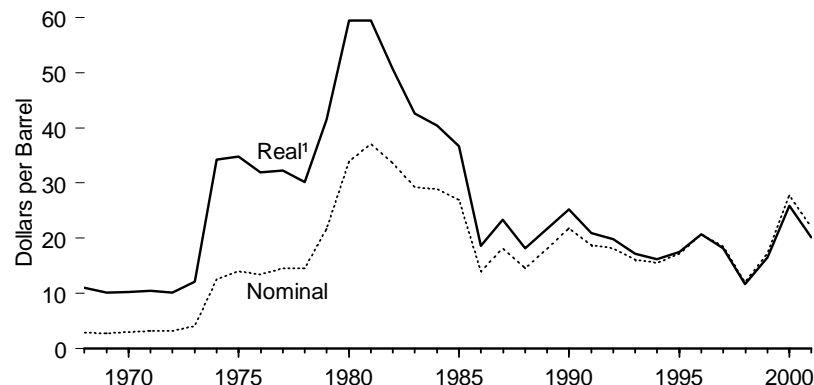
**Composite Costs**



**Domestic Costs**



**Imported Costs**



<sup>1</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

Note: Because vertical scales differ, graphs should not be compared.  
Source: Table 5.19.

**Table 5.19 Crude Oil Refiner Acquisition Costs, 1968-2001**  
(Dollars per Barrel)

Year	Domestic		Imported		Composite	
	Nominal	Real <sup>1</sup>	Nominal	Real <sup>1</sup>	Nominal	Real <sup>1</sup>
1968	3.21	12.21	2.90	11.03	3.17	12.05
1969	3.37	12.21	2.80	10.15	3.29	11.92
1970	3.46	11.91	2.96	10.19	3.40	11.70
1971	3.68	12.06	3.17	10.39	3.60	11.80
1972	3.67	11.53	3.22	10.12	3.58	11.25
1973	4.17	12.41	4.08	12.14	4.15	12.35
1974	7.18	19.61	12.52	34.19	9.07	24.77
1975	8.39	20.96	13.93	34.80	10.38	25.93
1976	8.84	20.90	13.48	31.87	10.89	25.74
1977	9.55	21.21	14.53	32.27	11.96	26.57
1978	10.61	22.00	14.57	30.21	12.46	25.83
1979	14.27	27.31	21.67	41.47	17.72	33.91
1980	24.23	42.48	33.89	59.41	28.07	49.21
1981	34.33	55.04	37.05	59.40	35.24	56.50
1982	31.22	47.12	33.55	50.64	31.87	48.11
1983	28.87	41.91	29.30	42.54	28.99	42.09
1984	28.53	39.94	28.88	40.43	28.63	40.08
1985	26.66	36.18	26.99	36.63	26.75	36.30
1986	14.82	19.68	14.00	18.59	14.55	19.32
1987	17.76	22.89	18.13	23.37	17.90	23.07
1988	14.74	18.38	14.56	18.15	14.67	18.29
1989	17.87	21.46	18.08	21.71	17.97	21.58
1990	22.59	26.11	21.76	25.15	22.22	25.68
1991	19.33	21.56	18.70	20.86	19.06	21.26
1992	18.63	20.29	18.20	19.82	18.43	20.07
1993	16.67	17.72	16.14	17.16	16.41	17.45
1994	15.67	16.32	15.51	16.15	15.59	16.24
1995	17.33	17.67	17.14	17.47	17.23	17.56
1996	20.77	20.77	20.64	20.64	20.71	20.71
1997	19.61	19.23	18.53	18.18	19.04	18.68
1998	13.18	12.77	12.04	<sup>R</sup> 11.67	12.52	12.13
1999	17.90	<sup>R</sup> 17.10	17.26	<sup>R</sup> 16.49	17.51	<sup>R</sup> 16.73
2000	<sup>R</sup> 29.11	<sup>R</sup> 27.20	<sup>R</sup> 27.70	<sup>R</sup> 25.88	<sup>R</sup> 28.26	26.40
2001 <sup>P</sup>	24.34	22.25	22.01	20.12	22.96	20.99

<sup>1</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

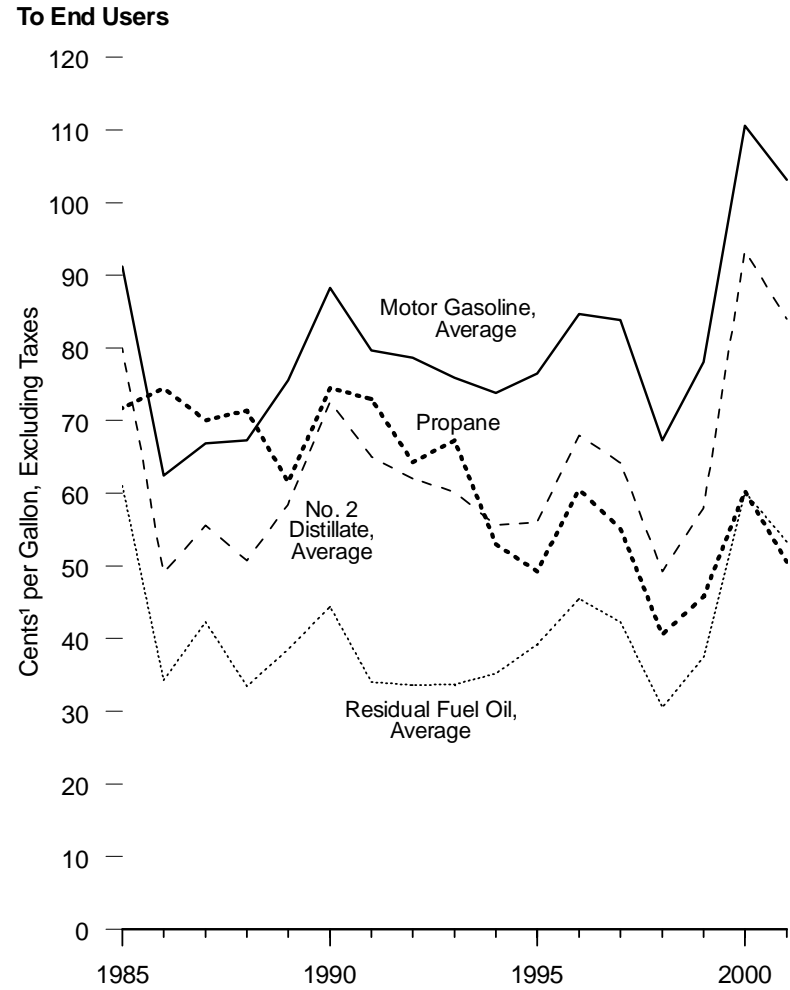
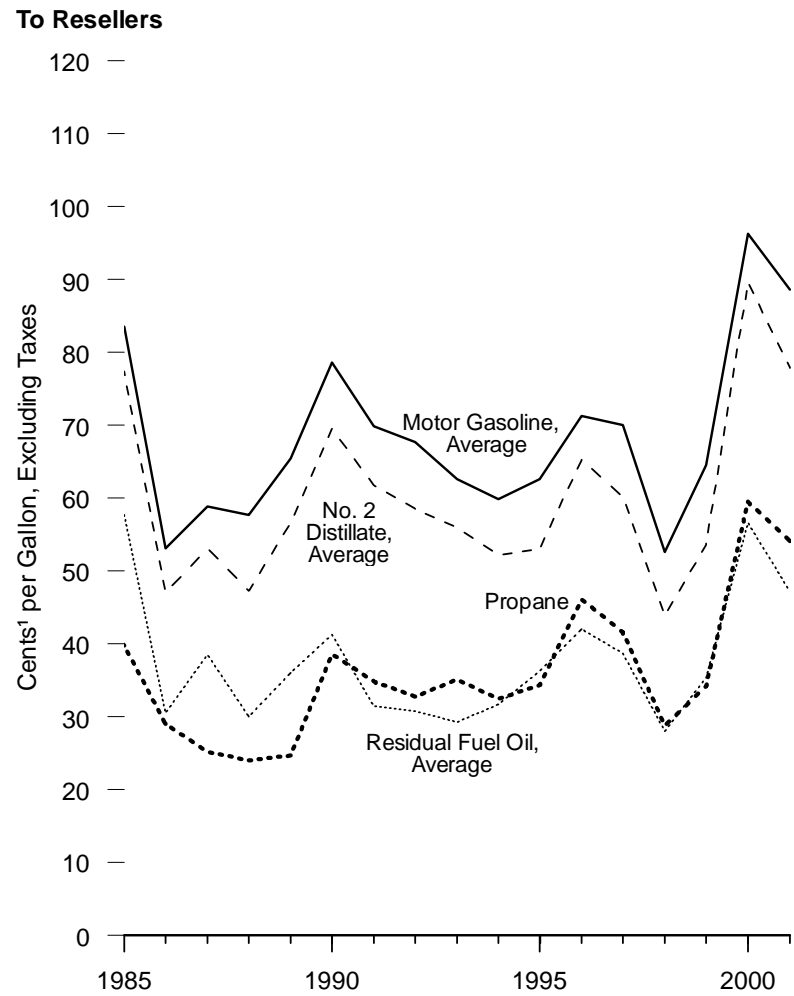
R=Revised. P=Preliminary.

Note: Refiner acquisition cost of crude oil for each category and for the composite is derived by dividing the sum of the total purchasing (acquisition) costs of all refiners by the total volume of all refiners' purchases.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

Sources: 1968-1973—Estimated. See Note 6 at end of section. 1974 through January 1976—Federal Energy Administration (FEA), Form FEA-96, "Monthly Cost Allocation Report." February 1976 through December 1977—FEA, Form FEA-P110-M-1, "Refiners' Monthly Cost Allocation Report." 1978 forward—EIA, *Petroleum Marketing Monthly* (March 2002), Table 1.

**Figure 5.20 Refiner Sales Prices for Selected Petroleum Products, 1985-2001**



<sup>1</sup> Nominal value.

Source: Table 5.20.

**Table 5.20 Refiner Sales Prices and Refiner Margins for Selected Petroleum Products, 1985-2001**

(Cents<sup>1</sup> per Gallon, Excluding Taxes)

Product	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001 <sup>P</sup>
<b>Sales Prices to Resellers:<sup>2</sup></b>																	
Aviation Gasoline .....	113.0	91.2	85.9	85.0	95.0	106.3	100.1	99.1	96.5	93.3	97.5	105.5	106.5	91.2	100.7	R <sup>1</sup> 33.0	125.9
Motor Gasoline .....	83.5	53.1	58.9	57.7	65.4	78.6	69.9	67.7	62.6	59.9	62.6	71.3	70.0	52.6	64.5	R <sup>96.3</sup>	88.6
Leaded Regular .....	79.3	50.1	56.5	54.8	63.1	75.4	65.7	69.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unleaded Regular .....	84.3	52.2	56.9	54.8	61.8	75.8	67.2	64.5	59.3	56.6	59.3	68.5	67.3	49.9	62.0	R <sup>94.2</sup>	86.5
Unleaded Midgrade .....	NA	NA	NA	NA	68.6	81.4	73.3	70.8	66.0	63.8	67.0	75.9	74.9	57.6	69.6	R <sup>101.3</sup>	94.5
Premium .....	92.2	61.0	67.1	67.2	74.9	87.4	79.2	77.4	72.2	69.5	72.2	80.3	79.2	61.7	72.6	R <sup>105.5</sup>	98.2
Kerosene .....	87.4	60.6	59.2	54.9	66.9	83.9	72.2	63.2	60.4	61.8	58.0	71.4	65.3	46.5	55.0	R <sup>96.9</sup>	82.4
Jet Fuel, Kerosene-Type .....	79.4	49.5	53.8	49.5	58.3	77.3	65.0	60.5	57.7	53.4	53.9	64.6	61.3	45.0	53.3	R <sup>88.0</sup>	76.3
No. 1 Distillate .....	86.3	57.9	59.9	54.9	66.8	83.8	73.0	65.2	64.6	61.5	62.5	75.1	72.3	51.3	63.4	R <sup>101.9</sup>	88.7
No. 2 Distillate .....	77.4	47.0	53.1	47.3	56.6	69.5	61.8	58.5	55.9	52.2	53.0	65.3	60.2	43.9	53.6	R <sup>89.6</sup>	77.9
No. 2 Fuel Oil .....	77.6	48.6	52.7	47.3	56.5	69.7	62.2	57.9	54.4	50.6	51.1	63.9	59.0	42.2	49.3	R <sup>88.6</sup>	75.6
No. 2 Diesel Fuel .....	77.2	45.2	53.4	47.3	56.7	69.4	61.5	59.1	57.0	52.9	53.8	65.9	60.6	44.4	54.6	R <sup>89.8</sup>	78.4
No. 4 Fuel <sup>3</sup> .....	67.2	40.9	46.2	42.5	48.0	59.0	55.6	49.5	48.8	46.2	46.3	60.3	55.1	38.3	43.0	R <sup>77.8</sup>	69.7
Residual Fuel Oil .....	57.7	30.5	38.5	30.0	36.0	41.3	31.4	30.8	29.3	31.7	36.3	42.0	38.7	28.0	35.4	R <sup>56.6</sup>	47.2
1% or Less Sulfur Content .....	61.0	32.8	41.2	33.3	40.7	47.2	36.4	35.1	33.7	34.5	38.3	45.6	41.5	29.9	38.2	R <sup>62.7</sup>	51.7
Greater Than 1% Sulfur Content ..	56.0	28.9	36.2	27.1	33.1	37.2	29.2	28.6	25.6	28.7	33.8	38.9	36.6	26.9	32.9	R <sup>51.2</sup>	42.8
Propane (Consumer Grade) .....	39.8	29.0	25.2	24.0	24.7	38.6	34.9	32.8	35.1	32.4	34.4	46.1	41.6	28.8	34.2	R <sup>59.5</sup>	54.1
<b>Sales Prices to End Users:<sup>2</sup></b>																	
Aviation Gasoline .....	120.1	101.1	90.7	89.1	99.5	112.0	104.7	102.7	99.0	95.7	100.5	111.6	112.8	97.5	105.9	R <sup>130.6</sup>	132.2
Motor Gasoline .....	91.2	62.4	66.9	67.3	75.6	88.3	79.7	78.7	75.9	73.8	76.5	84.7	83.9	67.3	78.1	R <sup>110.6</sup>	103.2
Leaded Regular .....	84.2	57.3	61.8	61.9	71.0	83.1	71.5	78.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unleaded Regular .....	91.7	61.6	65.0	64.1	71.4	84.9	76.1	74.3	71.2	68.9	71.7	80.7	79.8	63.0	74.2	R <sup>107.3</sup>	99.7
Unleaded Midgrade .....	NA	NA	NA	NA	79.2	92.1	84.3	82.7	80.5	78.5	80.8	89.6	89.5	72.8	83.5	R <sup>116.8</sup>	109.9
Premium .....	102.3	73.7	78.4	78.8	86.7	98.5	90.7	91.4	88.9	86.5	89.0	97.2	97.3	80.5	90.6	R <sup>124.2</sup>	117.4
Kerosene .....	103.0	79.0	77.0	73.8	70.9	92.3	83.8	78.8	75.4	66.0	58.9	74.0	74.5	50.1	60.5	R <sup>112.3</sup>	105.1
Jet Fuel, Kerosene-Type .....	79.6	52.9	54.3	51.3	59.2	76.6	65.2	61.0	58.0	53.4	54.0	65.1	61.3	45.2	54.3	R <sup>89.9</sup>	77.6
No. 1 Distillate .....	88.0	62.0	60.4	56.4	66.1	81.9	74.0	66.6	66.6	64.0	62.0	72.6	68.9	55.1	62.1	R <sup>98.8</sup>	90.2
No. 2 Distillate .....	79.9	49.1	55.6	50.7	58.5	72.6	65.0	62.0	60.2	55.6	56.0	68.0	64.2	49.2	58.0	R <sup>93.4</sup>	84.0
No. 2 Fuel Oil .....	84.9	56.0	58.1	54.4	58.7	73.4	66.5	62.7	60.2	57.2	56.2	67.3	63.6	48.2	55.8	R <sup>92.7</sup>	82.9
No. 2 Diesel Fuel .....	78.9	47.8	55.1	50.0	58.5	72.5	64.8	61.9	60.2	55.4	56.0	68.1	64.2	49.4	58.4	R <sup>93.5</sup>	84.2
No. 4 Fuel <sup>3</sup> .....	77.3	48.9	51.3	46.1	51.2	62.2	58.0	52.6	50.1	50.1	50.5	60.3	56.5	42.8	47.4	R <sup>76.9</sup>	67.9
Residual Fuel Oil .....	61.0	34.3	42.3	33.4	38.5	44.4	34.0	33.6	33.7	35.2	39.2	45.5	42.3	30.5	37.4	R <sup>60.2</sup>	53.3
1% or Less Sulfur Content .....	64.4	37.2	44.7	37.2	43.6	50.5	40.2	38.9	39.7	40.1	43.6	52.6	48.8	35.4	40.5	R <sup>70.8</sup>	64.1
Greater Than 1% Sulfur Content ..	58.2	31.7	39.6	30.0	34.4	40.0	30.6	31.2	30.3	33.0	37.7	43.3	40.3	28.7	36.2	R <sup>56.6</sup>	49.3
Propane (Consumer Grade) .....	71.7	74.5	70.1	71.4	61.5	74.5	73.0	64.3	67.3	53.0	49.2	60.5	55.2	40.5	45.8	R <sup>60.3</sup>	50.6
<b>Refiner Margins<sup>4</sup></b>																	
Motor Gasoline .....	19.8	18.4	16.3	22.8	22.6	25.7	24.5	23.8	23.5	22.8	21.6	22.0	24.7	22.8	22.8	29.0	33.9
Jet Fuel, Kerosene-Type .....	15.8	14.9	11.2	14.6	15.5	24.4	19.6	16.5	18.6	16.3	12.9	15.3	16.0	15.2	11.6	20.7	21.6
No. 2 Distillate .....	13.8	12.4	10.4	12.4	13.8	16.6	16.4	14.6	16.8	15.1	12.0	16.0	14.9	14.1	11.9	22.3	23.2
Residual Fuel Oil .....	-6.0	-4.1	-4.1	-5.0	-6.8	-11.6	-14.0	-13.2	-9.8	-5.4	-4.8	-7.2	-6.6	-1.8	-6.3	R <sup>-10.7</sup>	-7.5
Composite <sup>5</sup> .....	17.0	15.8	13.8	18.7	18.8	22.1	20.7	19.8	19.0	19.8	18.1	19.4	20.0	19.5	18.9	R <sup>26.1</sup>	29.7

<sup>1</sup> Nominal value.

<sup>2</sup> Sales for resale (wholesale sales) are those made to purchasers who are other than ultimate consumers. Sales to end users are those made directly to the ultimate consumer, including bulk customers, such as agriculture, industry, and utilities, as well as residential and commercial customers.

<sup>3</sup> Includes No. 4 fuel oil and No. 4 diesel fuel.

<sup>4</sup> In this table, refiner margin is the difference between the composite refiner acquisition price of crude oil and the price to resellers.

<sup>5</sup> Composite of aviation gasoline, kerosene-type jet fuel, kerosene, motor gasoline, distillate fuel nos. 1, 2, and 4, and residual fuel.

R=Revised. P=Preliminary. NA=Not available.

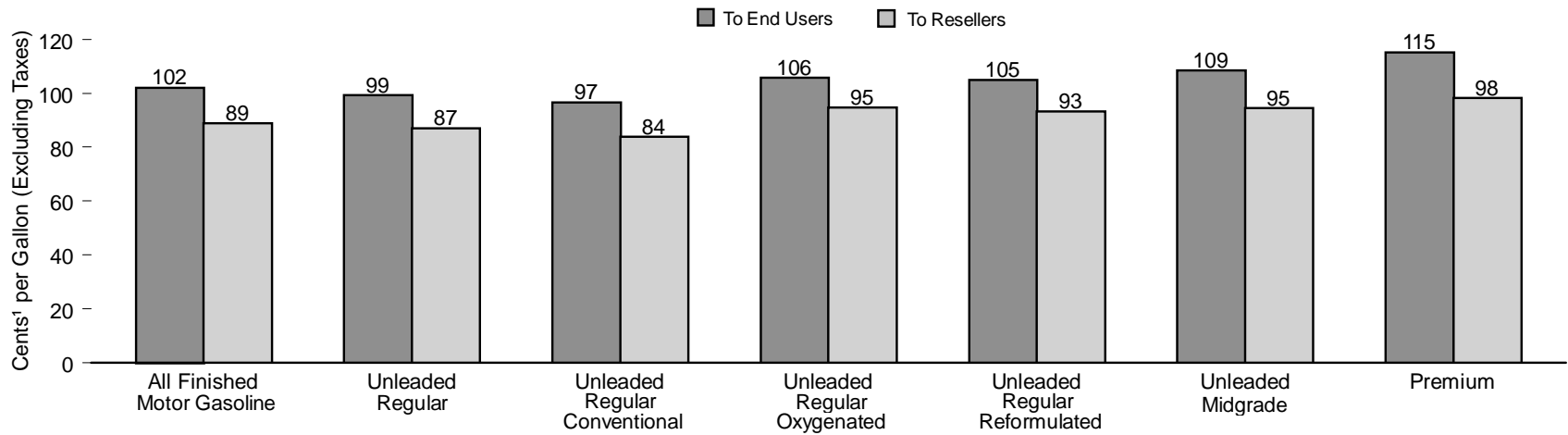
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Sources: 1985-2000—EIA, *Petroleum Marketing Annual*, annual reports. 2001—EIA, *Petroleum Marketing Monthly* (March 2002).

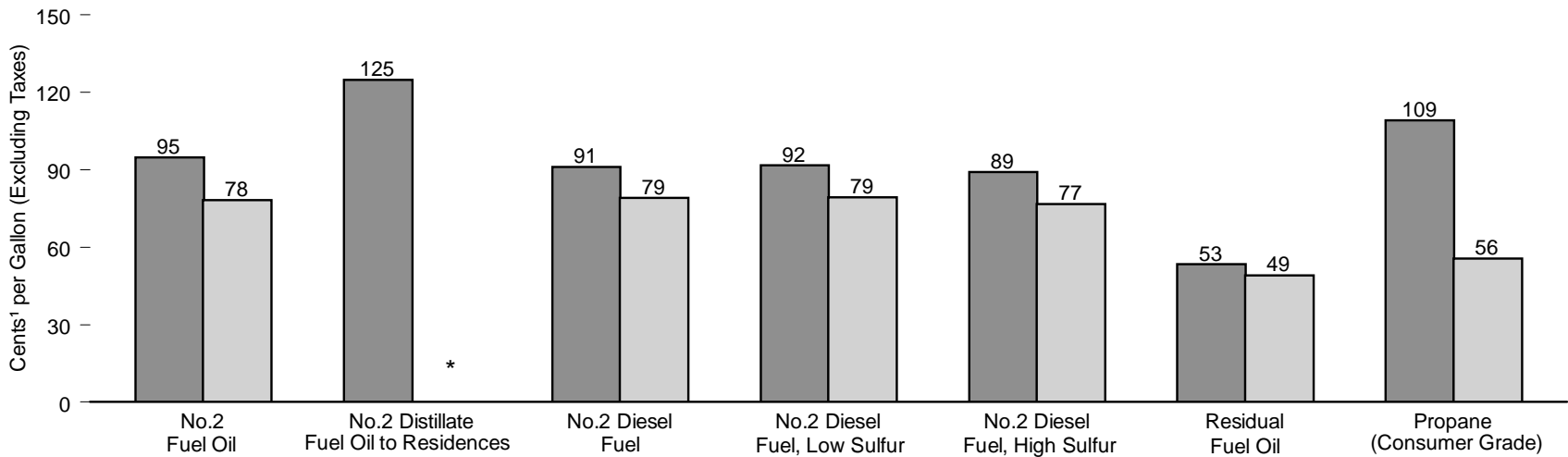


**Figure 5.21 All Sellers Sales Prices for Selected Petroleum Products, 2001**

**Motor Gasoline, Selected Grades**



**Distillate Fuel Oil, Residual Fuel Oil, and Propane**



<sup>1</sup> Nominal value.  
\* Not applicable.

Notes: Data are preliminary. Because vertical scales differ, graphs should not be compared.

Source: Table 5.21.

**Table 5.21 All Sellers Sales Prices for Selected Petroleum Products, 1985-2001**  
(Cents<sup>1</sup> per Gallon, Excluding Taxes)

Product	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001 <sup>P</sup>
<b>Sales Prices to Resellers<sup>2</sup></b>																	
Motor Gasoline .....	84.1	53.8	59.2	58.0	65.8	78.9	70.8	68.0	62.8	60.2	63.0	71.5	70.3	53.0	64.5	R96.6	88.9
Unleaded Regular .....	84.9	52.9	57.2	55.1	62.3	76.2	68.2	64.9	59.7	57.1	59.9	68.9	67.7	50.4	62.1	R94.6	86.9
Conventional .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	56.5	58.3	67.2	65.8	48.4	59.6	R91.8
Oxygenated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	62.7	66.2	74.5	75.4	57.5	69.0	R101.6
Reformulated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63.2	64.6	73.3	72.5	55.1	67.6	R100.6
Unleaded Midgrade .....	NA	NA	NA	NA	69.1	82.3	74.4	71.3	66.4	64.1	67.3	76.0	75.1	57.9	69.4	R101.4	94.5
Conventional .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63.3	65.1	73.7	72.3	55.0	65.8	R97.7
Oxygenated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	68.9	71.1	78.9	79.1	59.9	69.5	R102.1
Reformulated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	72.2	71.9	80.2	80.1	63.2	75.8	R108.0
Premium .....	92.8	61.7	67.4	67.5	75.2	87.7	80.0	77.6	72.2	69.6	72.4	80.4	79.4	61.8	72.4	R105.5	98.2
Conventional .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	68.6	69.5	77.7	76.4	58.7	68.8	R101.3
Oxygenated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75.7	78.7	85.1	85.6	67.4	77.9	R111.9
Reformulated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.9	77.9	85.1	84.5	67.1	78.7	R111.7
No. 2 Distillate .....	78.1	48.0	53.5	48.2	57.2	70.6	62.7	59.1	56.6	52.9	53.6	66.0	61.1	45.0	53.8	R90.1	78.4
No. 2 Diesel Fuel .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53.8	54.6	66.7	61.6	45.4	55.2	R90.4
Low Sulfur .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	54.2	55.1	67.3	61.9	45.7	55.7	R90.9
High Sulfur .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	51.9	52.4	63.9	60.2	43.7	51.9	R87.5
Residual Fuel Oil .....	58.2	31.5	39.9	31.5	37.8	43.4	33.0	32.6	30.1	32.2	36.6	42.7	39.6	28.4	35.5	R57.9	49.2
1% or Less Sulfur Content .....	60.6	33.6	42.0	34.1	41.5	48.1	37.9	36.8	34.1	35.0	38.3	46.1	42.4	30.5	38.2	R63.8	54.0
Greater Than 1% Sulfur Content ..	56.1	29.5	38.1	28.2	34.0	38.8	29.7	30.0	27.2	29.8	34.4	39.7	37.5	27.1	33.3	R52.3	44.3
Propane (Consumer Grade) .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	33.6	35.4	47.1	42.6	29.7	35.4	R60.3
<b>Sales Prices to End Users<sup>2</sup></b>																	
Motor Gasoline .....	91.9	63.7	67.7	68.0	76.8	89.9	81.1	78.7	75.3	72.9	76.1	84.3	83.1	66.0	76.2	R109.1	102.1
Unleaded Regular .....	92.8	63.0	66.3	65.5	73.2	87.0	78.0	75.0	71.4	69.0	72.1	80.9	79.7	62.3	72.8	R106.3	99.2
Conventional .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	68.5	71.4	80.1	78.5	61.0	70.8	R104.4
Oxygenated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.7	77.3	86.1	88.7	69.4	78.2	R111.8
Reformulated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.3	74.1	83.3	82.2	65.1	77.7	R110.9
Unleaded Midgrade .....	NA	NA	NA	NA	NA	NA	NA	82.4	79.2	77.0	80.2	88.5	88.0	71.1	81.2	R114.6	108.5
Conventional .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.6	79.3	87.4	86.5	69.5	78.7	R112.2
Oxygenated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	82.1	83.8	92.9	96.4	76.3	85.3	R118.5
Reformulated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	85.1	82.9	91.6	91.5	74.8	86.9	R119.7
Premium .....	101.6	73.6	78.0	78.6	87.4	99.6	91.9	90.6	87.5	85.2	88.3	96.2	95.5	78.6	88.0	R121.8	115.2
Conventional .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	84.6	87.1	95.0	93.9	76.9	85.6	R119.2
Oxygenated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	90.8	93.8	101.9	105.4	84.5	94.0	R127.9
Reformulated .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	93.7	91.4	99.1	98.8	82.2	93.1	R126.7
No. 2 Distillate .....	89.0	61.4	64.3	61.2	69.5	84.1	76.0	72.6	71.0	67.5	67.3	79.3	75.3	59.9	67.8	R104.4	94.8
No. 2 Distillate to Residences <sup>3</sup> .....	105.3	83.6	80.3	81.3	90.0	106.3	101.9	93.4	91.1	88.4	86.7	98.9	98.4	85.2	87.6	R131.1	124.9
No. 2 Diesel Fuel .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	62.8	63.6	75.7	71.4	56.2	65.4	R100.6
Low Sulfur .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	64.2	64.5	76.7	71.9	56.5	66.3	R101.4
High Sulfur .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	59.8	61.4	73.2	69.8	55.5	62.0	R98.1
Residual Fuel Oil .....	62.3	35.8	42.6	33.9	39.3	45.5	34.7	34.6	34.1	35.8	39.7	46.4	42.9	31.1	37.8	R60.9	53.4
1% or Less Sulfur Content .....	66.0	38.9	44.9	37.3	43.6	51.2	40.0	39.4	39.3	40.3	43.3	52.9	47.2	35.6	40.6	R68.3	62.0
Greater Than 1% Sulfur Content ..	58.9	32.8	39.9	30.6	35.1	40.5	31.1	31.9	31.2	32.7	37.6	43.0	40.7	29.2	36.6	R57.6	49.9
Propane (Consumer Grade) .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.6	76.6	88.6	87.8	77.4	78.1	R104.8

<sup>1</sup> Nominal value.

<sup>2</sup> Sales for resale (wholesale sales) are those made to purchasers who are other than ultimate consumers. Sales to end users are those made directly to the ultimate consumer, including bulk customers, such as agriculture, industry, and utilities, as well as residential and commercial customers.

<sup>3</sup> See Note 7 at end of section for historical data.

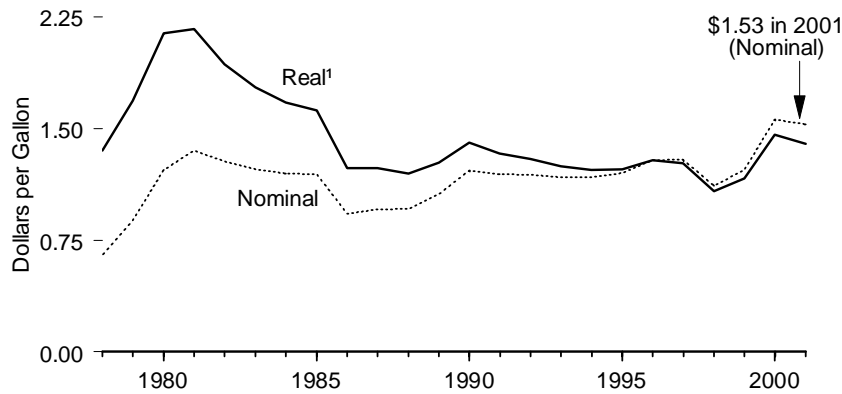
R=Revised. P=Preliminary. NA=Not available.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html).

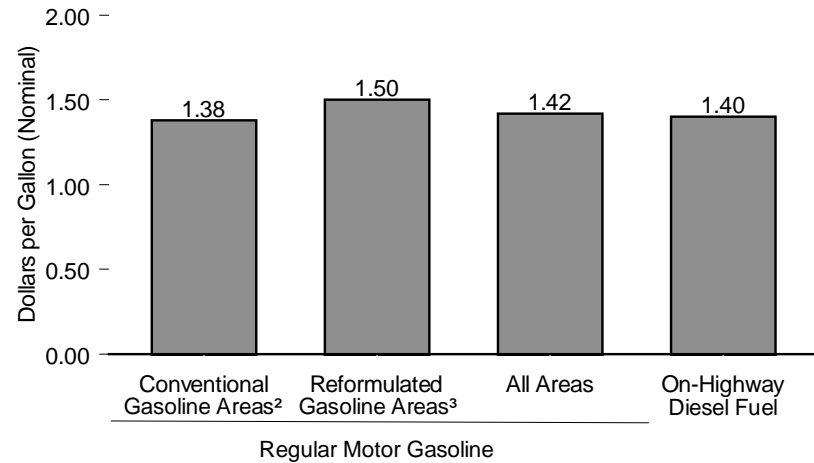
Sources: 1985-2000—Energy Information Administration (EIA), *Petroleum Marketing Annual*, annual reports. 2001—EIA, *Petroleum Marketing Monthly* (March 2002).

**Figure 5.22 Retail Motor Gasoline and On-Highway Diesel Fuel Prices**

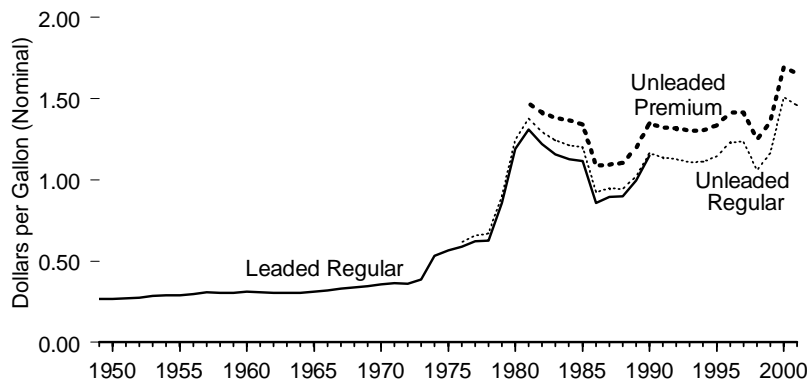
**Motor Gasoline, All Grades, 1978-2001**



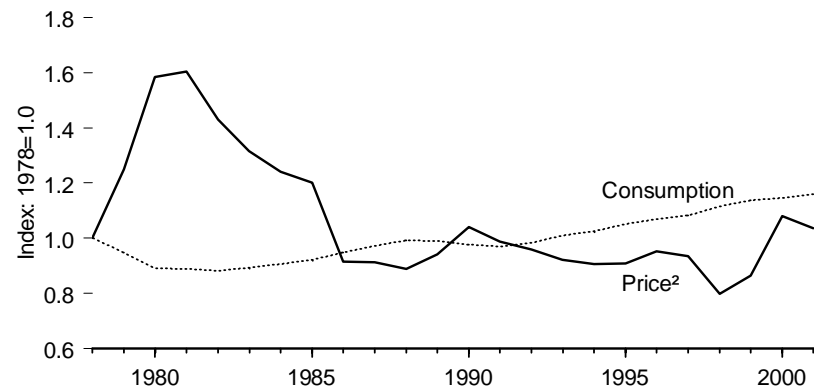
**Regular Motor Gasoline by Area Type and On-Highway Diesel Fuel, 2001**



**Motor Gasoline by Grade, 1949-2001**



**Motor Gasoline<sup>3</sup> Price and Consumption, 1978-2001, Indexed to 1978**



<sup>1</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>2</sup> Any area that does not require the sale of reformulated gasoline.

<sup>3</sup> Reformulated Gasoline (RFG) areas are ozone attainment areas designated by the Environmental Protection Agency that require the use of reformulated gasoline.

Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 5.11 and 5.22.

**Table 5.22 Retail Motor Gasoline and On-Highway Diesel Fuel Prices, 1949-2001**  
(Dollars per Gallon)

Year	Motor Gasoline by Grade								Regular Motor Gasoline by Area Type <sup>1</sup>			On-Highway Diesel Fuel <sup>1</sup>
	Leaded Regular		Unleaded Regular		Unleaded Premium		All Grades		Conventional Gasoline Areas <sup>3</sup>	Reformulated Gasoline Areas <sup>4</sup>	All Areas	
	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>				
1949	0.27	1.55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1950	0.27	1.54	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1951	0.27	1.45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1952	0.27	1.44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1953	0.29	1.49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1954	0.29	1.49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1955	0.29	1.47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1956	0.30	1.46	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1957	0.31	1.47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1958	0.30	1.41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1959	0.31	1.39	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1960	0.31	1.40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1961	0.31	1.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1962	0.31	1.35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1963	0.30	1.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1964	0.30	1.30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1965	0.31	1.31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1966	0.32	1.31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1967	0.33	1.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1968	0.34	1.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1969	0.35	1.26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1970	0.36	1.23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1971	0.36	1.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1972	0.36	1.14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1973	0.39	1.16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1974	0.53	1.45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1975	0.57	1.42	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1976	0.59	1.40	0.61	1.45	NA	NA	NA	NA	NA	NA	NA	NA
1977	0.62	1.38	0.66	1.46	NA	NA	NA	NA	NA	NA	NA	NA
1978	0.63	1.30	0.67	1.39	NA	NA	0.65	1.35	NA	NA	NA	NA
1979	0.86	1.64	0.90	1.73	NA	NA	0.88	1.69	NA	NA	NA	NA
1980	1.19	2.09	1.25	2.18	NA	NA	1.22	2.14	NA	NA	NA	NA
1981	1.31	2.10	1.38	2.21	1.47	2.36	1.35	2.17	NA	NA	NA	NA
1982	1.22	1.85	1.30	1.96	1.42	2.14	1.28	1.93	NA	NA	NA	NA
1983	1.16	1.68	1.24	1.80	1.38	2.01	1.23	1.78	NA	NA	NA	NA
1984	1.13	1.58	1.21	1.70	1.37	1.91	1.20	1.68	NA	NA	NA	NA
1985	1.12	1.51	1.20	1.63	1.34	1.82	1.20	1.62	NA	NA	NA	NA
1986	0.86	1.14	0.93	1.23	1.09	1.44	0.93	1.24	NA	NA	NA	NA
1987	0.90	1.16	0.95	1.22	1.09	1.41	0.96	1.23	NA	NA	NA	NA
1988	0.90	1.12	0.95	1.18	1.11	1.38	0.96	1.20	NA	NA	NA	NA
1989	1.00	1.20	1.02	1.23	1.20	1.44	1.06	1.27	NA	NA	NA	NA
1990	1.15	1.33	1.16	1.35	1.35	1.56	1.22	1.41	NA	NA	NA	NA
1991	NA	NA	1.14	1.27	1.32	1.47	1.20	1.33	1.10	NA	1.10	NA
1992	NA	NA	1.13	1.23	1.32	1.43	1.19	1.30	1.09	NA	1.09	NA
1993	NA	NA	1.11	1.18	1.30	1.38	1.17	1.25	R,51.07	NA	1.07	NA
1994	NA	NA	1.11	1.16	1.31	1.36	1.17	1.22	R1.07	NA	1.08	NA
1995	NA	NA	1.15	1.17	1.34	1.36	1.21	1.23	R1.10	61.16	1.11	1.11
1996	NA	NA	1.23	1.23	1.41	1.41	1.29	1.29	R1.19	R1.28	R1.22	1.24
1997	NA	NA	1.23	1.21	1.42	1.39	1.29	1.27	R1.19	1.25	1.20	1.20
1998	NA	NA	1.06	1.03	1.25	1.21	1.12	1.08	R1.02	1.08	1.03	1.04
1999	NA	NA	1.17	1.11	1.36	1.30	1.22	1.17	R1.12	1.20	1.14	1.12
2000	NA	NA	1.51	1.41	1.69	1.58	1.56	1.46	1.46	1.54	1.48	1.49
2001	NA	NA	1.46	1.34	1.66	1.52	1.53	1.40	1.38	1.50	1.42	1.40

<sup>1</sup> Nominal dollars.

<sup>2</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>3</sup> Any area that does not require the sale of reformulated gasoline.

<sup>4</sup> Reformulated Gasoline (RFG) areas are ozone nonattainment areas designated by the Environmental Protection Agency that require the use of reformulated gasoline.

<sup>5</sup> Beginning in 1993 historical data for oxygenated areas collected between 1993 and 2000 are included with conventional areas.

<sup>6</sup> Beginning in 1995 historical data for combined oxygenated and reformulated areas (collected between

1995 and 2000) are included with reformulated gasoline areas.

R=Revised. NA=Not available.

Web Page: [http://www.eia.doe.gov/oil\\_gas/petroleum/info\\_glance/petroleum.html](http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html)

Sources: **Motor Gasoline by Grade:** 1949-1973—*Platt's Oil Price Handbook and Oilmanac, 1974*, 51st Edition. 1974 forward—Energy Information Administration (EIA), annual averages of monthly data from the U.S. Department of Labor, Bureau of Labor Statistics, *U.S. City Average Gasoline Prices*. **Motor Gasoline by Area Type:** EIA, weighted, annual averages of data from Weekly Retail Gasoline Prices. **On-Highway Diesel:** EIA, weighted, annual averages of data from Weekly On-Highway Diesel Prices.

## Petroleum

**Note 1.** Accurate calculation of the quantity of petroleum products supplied to the domestic market is complicated by the recycling of products at the refinery, the renaming of products involved in a transfer, and the receipt of products from outside the primary supply system. Beginning in 1981, a single adjustment (always a negative quantity) is made to total product supplied to correct this accounting problem. The calculation of this adjustment, called “reclassified,” involves only unfinished oils and gasoline blending components. It is the sum of their net changes in primary stocks (net withdrawals is a plus quantity; net additions is a minus quantity) plus imports minus net input to refineries.

**Note 2.** Total petroleum products supplied is the sum of the products supplied for each petroleum product, crude oil, unfinished oils, and gasoline blending components. For each of these, except crude oil, product supplied is calculated by adding refinery production, natural gas plant liquids production, new supply of other liquids, imports, and stock withdrawals, and subtracting stock additions, refinery inputs, and exports. Crude oil product supplied is the sum of crude oil burned on leases and at pipeline pump stations as reported on Form EIA-813. Prior to 1983, crude oil burned on leases and at pipeline pump stations was reported as either distillate or residual fuel oil and was included as product supplied for these products. Petroleum product supplied is an approximation of petroleum consumption and is synonymous with the term “Petroleum Consumption” in Section 1. Sector data for petroleum products used in more than one sector are derived from surveys of sales to ultimate consumers by refiners, marketers, distributors, and dealers and from receipts at electric utilities.

**Note 3.** Beginning in January 1981, several Energy Information Administration survey forms and calculation methodologies were changed to reflect new developments in refinery and blending plant practices and to improve data integrity. Those changes affect production and product supplied statistics for motor gasoline, distillate fuel oil, and residual fuel oil, and stocks of motor gasoline. On the basis of those changes, motor gasoline production during the last half of 1980 would have averaged 289,000 barrels per day higher than that which was published on the old basis. Distillate and residual fuel oil production and product supplied for all of 1980 would have averaged, respectively, 105,000 and 54,000 barrels per day higher than the numbers that were published.

**Note 4.** The methods of deriving Gross Input to Distillation Units (GIDU) in this report are as follows: 1949-1966, GIDU is estimated by summing annual crude oil runs to stills, net unfinished oil reruns at refineries, and shipments of natural gasoline and plant condensate from natural gas processing plants to refineries. For 1967-1973, GIDU is estimated by summing annual crude oil runs to stills, net unfinished oil reruns, and refinery input of natural gasoline and plant condensate. For 1974-1980, GIDU is published annual data. For 1981 forward, GIDU is the sum of reported monthly data.

**Note 5.** The Crude Oil Domestic First Purchase Price were derived as follows: 1949-1973, weighted average Domestic First Purchase values as reported by State agencies and calculated by the Bureau of Mines; 1974 and 1975, weighted averages of a sample survey of major first purchasers’ purchases; 1976 forward, weighted averages of all first purchasers’ purchases.

**Note 6.** The Refiner Acquisition Cost of Crude Oil was estimated for 1968-1973. The cost of domestic crude oil was derived by adding estimated transportation costs to the reported average domestic first purchase value. The cost of imported crude oil was derived by adding an estimated ocean transport cost based on the published “Average Freight Rate Assessment” to the average “Free Alongside Ship” value published by the U.S. Bureau of the Census. The composite cost was derived by weighting domestic costs and imported costs on the basis of quantities produced and imported.

**Note 7.** Residential heating oil prices for 1956 through 1982 were formerly published in the *Annual Energy Review*. Those data, in cents per gallon, are: 15.2, 16.0, 15.1, 15.3, 15.0, 15.6, 15.6, 16.0, 16.1, 16.0, 16.4, 16.9, 17.4, 17.8, 18.5, 19.6, 19.7, 22.8, 36.0, 37.7, 40.6, 46.0, 49.0, 70.4, 97.4, 119.4, 116.0. The sources of these data are: 1956-1974—Bureau of Labor Statistics, *Retail Prices and Indexes of Fuels and Utilities for Residential Usage*, monthly. January 1975 through September 1977—Federal Energy Administration, Form FEA-P112-M-1, “No. 2 Heating Oil Supply/Price Monitoring Report.” October 1977 Through December 1977—Energy Information Administration (EIA), Form EIA-9, “No. 2 Heating Oil Supply/Price Monitoring Report.” 1978-forward—EIA, *Petroleum Marketing Monthly*, Table 18.

**Table 5.13 Sources**

**Electric Power:** • 1984—EIA, *Petroleum Marketing Annual 1988* (October 1989), Tables A13, A14, and A15. • 1985–1988—EIA, *Fuel Oil and Kerosene Sales, Power Plant Report* and EIA-860B, “Annual Electric Generator Report—Nonutility.” • 2000—EIA, *Fuel Oil and Kerosene Sales 2001* (September 2002), Tables 13, 14, and 15. **All Other Data:** • 1984—EIA,

*Petroleum Marketing Annual 1988* (October 1989), Tables A13, A14, and A15. • 1985–1988—EIA, *Fuel Oil and Kerosene Sales*, annual reports, Tables 13, 14, and 15. • 1989–1999—EIA, Office of Oil and Gas, unpublished data based on EIA, Form EIA-821, “Annual Fuel Oil and Kerosene Sales Report.” • 2000—EIA, *Fuel Oil and Kerosene Sales 2001* (September 2002), Tables 13, 14, and 15.



# 6

## Natural Gas

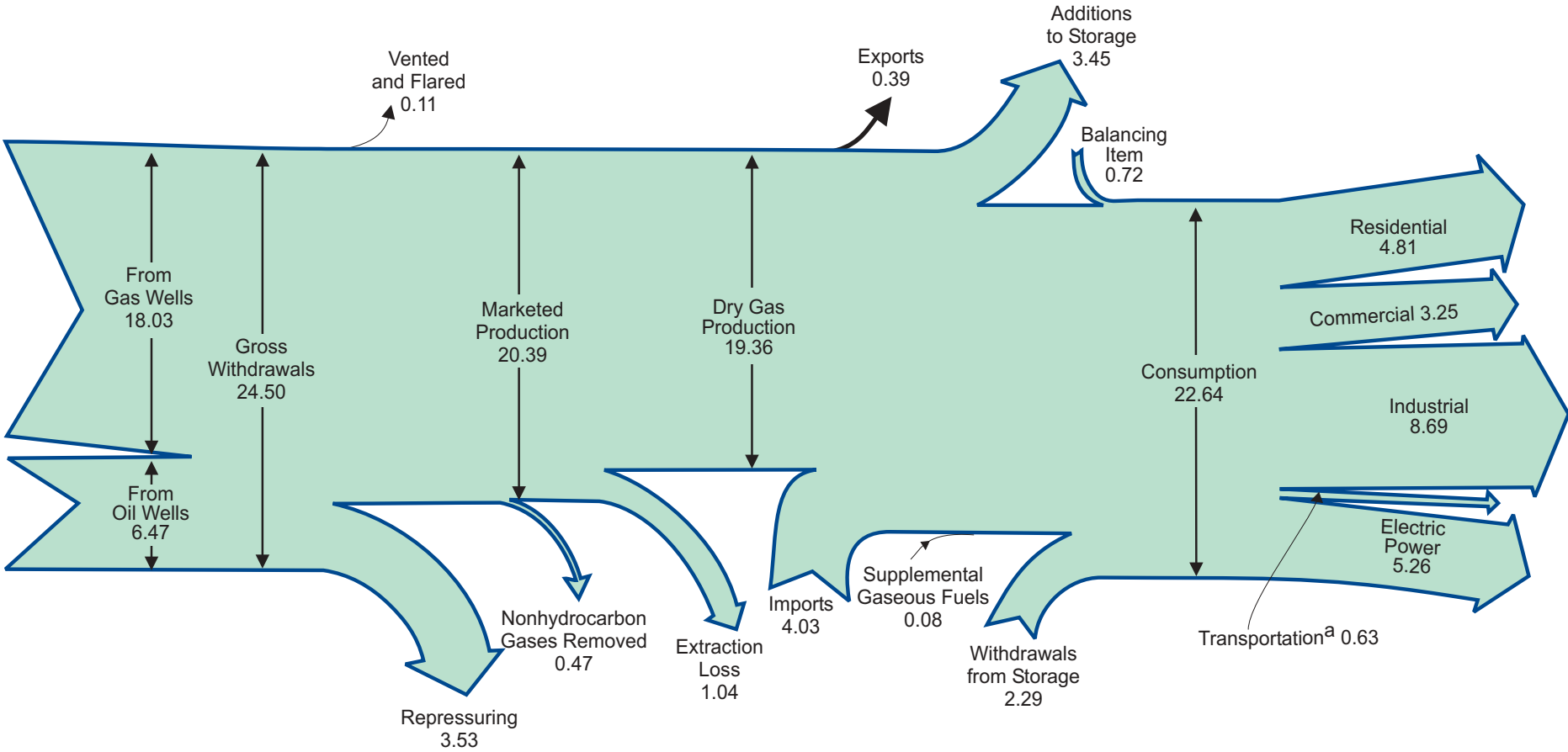


Natural gas pipeline, El Paso County, Texas. Source: U.S. Department of Energy.





**Diagram 3. Natural Gas Flow, 2001**  
(Trillion Cubic Feet)

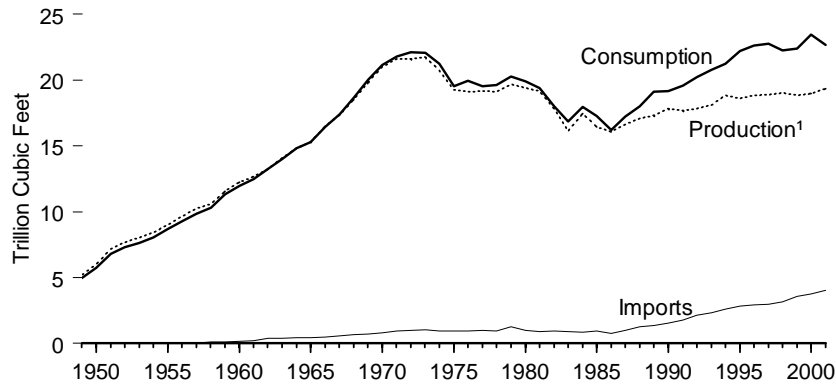


<sup>a</sup> Natural gas consumed in the operation of pipelines, primarily in compressors, and a small quantity used as vehicle fuel.

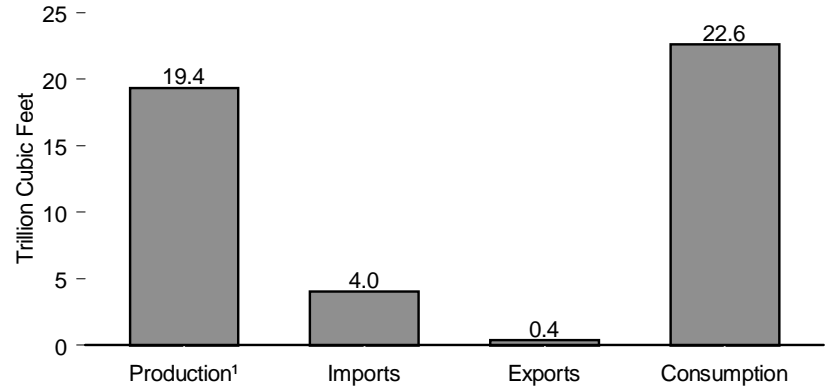
Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.  
Sources: Tables 6.1, 6.2, and 6.5.

**Figure 6.1 Natural Gas Overview**

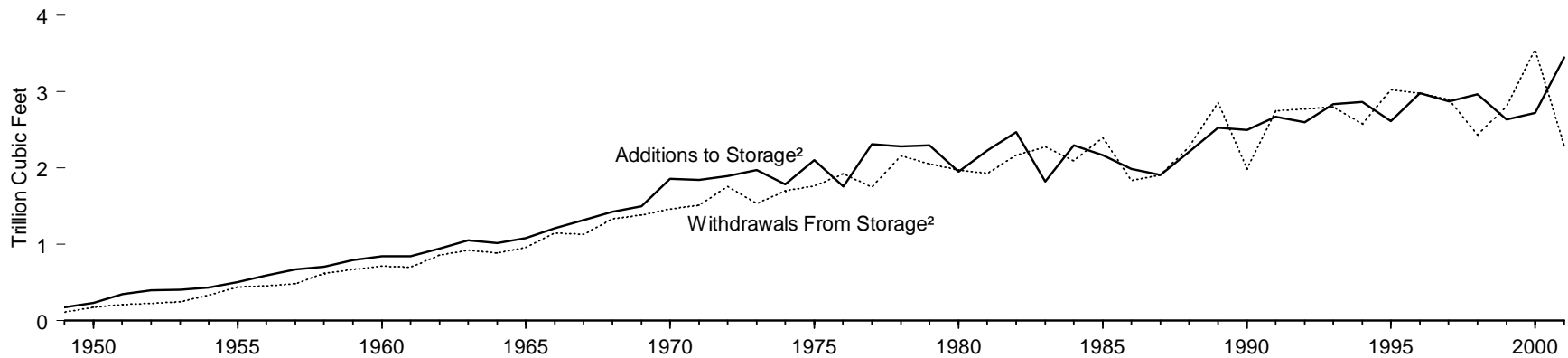
**Overview, 1949-2001**



**Overview, 2001**



**Storage Additions and Withdrawals, 1949-2001**



<sup>1</sup> Dry gas.

<sup>2</sup> Beginning with 1980, includes liquefied natural gas stored in above-ground tanks.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 6.1.

**Table 6.1 Natural Gas Overview, 1949-2001**  
(Trillion Cubic Feet)

Year	Dry Gas Production	Supplemental Gaseous Fuels	Imports	Exports	Withdrawals From Storage <sup>1</sup>	Additions to Storage <sup>1</sup>	Balancing Item <sup>2</sup>	Consumption
1949	5.20	NA	0.00	0.02	0.11	0.17	-0.14	4.97
1950	6.02	NA	0.00	0.03	0.18	0.23	-0.18	5.77
1951	7.16	NA	0.00	0.02	0.21	0.35	-0.19	6.81
1952	7.69	NA	0.01	0.03	0.22	0.40	-0.20	7.29
1953	8.06	NA	0.01	0.03	0.25	0.40	-0.24	7.64
1954	8.39	NA	0.01	0.03	0.33	0.43	-0.22	8.05
1955	9.03	NA	0.01	0.03	0.44	0.51	-0.25	8.69
1956	9.66	NA	0.01	0.04	0.45	0.59	-0.21	9.29
1957	10.25	NA	0.04	0.04	0.48	0.67	-0.21	9.85
1958	10.57	NA	0.14	0.04	0.62	0.70	-0.28	10.30
1959	11.55	NA	0.13	0.02	0.67	0.79	-0.22	11.32
1960	12.23	NA	0.16	0.01	0.71	0.84	-0.27	11.97
1961	12.66	NA	0.22	0.01	0.70	0.84	-0.23	12.49
1962	13.25	NA	0.40	0.02	0.85	0.94	-0.29	13.27
1963	14.08	NA	0.41	0.02	0.92	1.05	-0.36	13.97
1964	14.82	NA	0.44	0.02	0.89	1.01	-0.30	14.81
1965	15.29	NA	0.46	0.03	0.96	1.08	-0.32	15.28
1966	16.47	NA	0.48	0.02	1.14	1.21	-0.40	16.45
1967	17.39	NA	0.56	0.08	1.13	1.32	-0.30	17.39
1968	18.49	NA	0.65	0.09	1.33	1.43	-0.33	18.63
1969	19.83	NA	0.73	0.05	1.38	1.50	-0.33	20.06
1970	21.01	NA	0.82	0.07	1.46	1.86	-0.23	21.14
1971	21.61	NA	0.93	0.08	1.51	1.84	-0.34	21.79
1972	21.62	NA	1.02	0.08	1.76	1.89	-0.33	22.10
1973	21.73	NA	1.03	0.08	1.53	1.97	-0.20	22.05
1974	20.71	NA	0.96	0.08	1.70	1.78	-0.29	21.22
1975	19.24	NA	0.95	0.07	1.76	2.10	-0.24	19.54
1976	19.10	NA	0.96	0.06	1.92	1.76	-0.22	19.95
1977	19.16	NA	1.01	0.06	1.75	2.31	-0.04	19.52
1978	19.12	NA	0.97	0.05	2.16	2.28	-0.29	19.63
1979	19.66	NA	1.25	0.06	2.05	2.30	-0.37	20.24
1980	19.40	0.15	0.98	0.05	1.97	1.95	-0.64	19.88
1981	19.18	0.18	0.90	0.06	1.93	2.23	-0.50	19.40
1982	17.82	0.14	0.93	0.05	2.16	2.47	-0.54	18.00
1983	16.09	0.13	0.92	0.05	2.27	1.82	-0.70	16.83
1984	17.47	0.11	0.84	0.05	2.10	2.30	-0.22	17.95
1985	16.45	0.13	0.95	0.06	2.40	2.16	-0.43	17.28
1986	16.06	0.11	0.75	0.06	1.84	1.98	-0.49	16.22
1987	16.62	0.10	0.99	0.05	1.91	1.91	-0.44	17.21
1988	17.10	0.10	1.29	0.07	2.27	2.21	-0.45	18.03
1989	17.31	0.11	1.38	0.11	2.85	2.53	R0.10	<sup>3</sup> R19.12
1990	17.81	0.12	1.53	0.09	1.99	2.50	R0.30	<sup>3</sup> R19.16
1991	17.70	0.11	1.77	0.13	2.75	2.67	R0.03	<sup>3</sup> R19.56
1992	17.84	0.12	2.14	0.22	2.77	2.60	R0.18	<sup>3</sup> R20.23
1993	18.10	0.12	2.35	0.14	2.80	2.83	R0.40	R20.79
1994	18.82	0.11	2.62	0.16	2.58	2.86	R0.14	R21.25
1995	18.60	0.11	2.84	0.15	3.02	2.61	R0.40	R22.21
1996	18.85	0.11	2.94	0.15	2.98	2.98	R0.86	R22.61
1997	18.90	0.10	2.99	0.16	2.89	2.87	R0.87	R22.74
1998	<sup>R</sup> 19.02	0.10	3.15	0.16	2.43	2.96	R0.66	R22.24
1999	<sup>R</sup> 18.83	0.10	3.59	0.16	<sup>R</sup> 2.81	<sup>R</sup> 2.64	<sup>R</sup> -0.12	<sup>R</sup> 22.40
2000	<sup>R</sup> 18.99	<sup>R</sup> 0.09	<sup>R</sup> 3.78	0.24	<sup>R</sup> 3.55	<sup>R</sup> 2.72	<sup>R</sup> 0.02	<sup>R</sup> 23.46
2001 <sup>P</sup>	19.36	0.08	4.03	0.39	2.29	3.45	0.72	22.64

<sup>1</sup> Beginning with 1980, includes liquefied natural gas stored in above-ground tanks.

<sup>2</sup> Quantities lost and imbalances in data due to differences among data sources. Since 1980, excludes intransit shipments that cross the U.S.-Canada border (i.e., natural gas delivered to its destination via the other country).

<sup>3</sup> For 1989-1992, a small amount of consumption at independent power producers may be counted in both "Other Industrial" and "Electric Power Sector" on Table 6.5. See Note 3 at end of section under "Table 6.5 Notes."

R=Revised. P=Preliminary. NA=Not available.

Notes: Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For

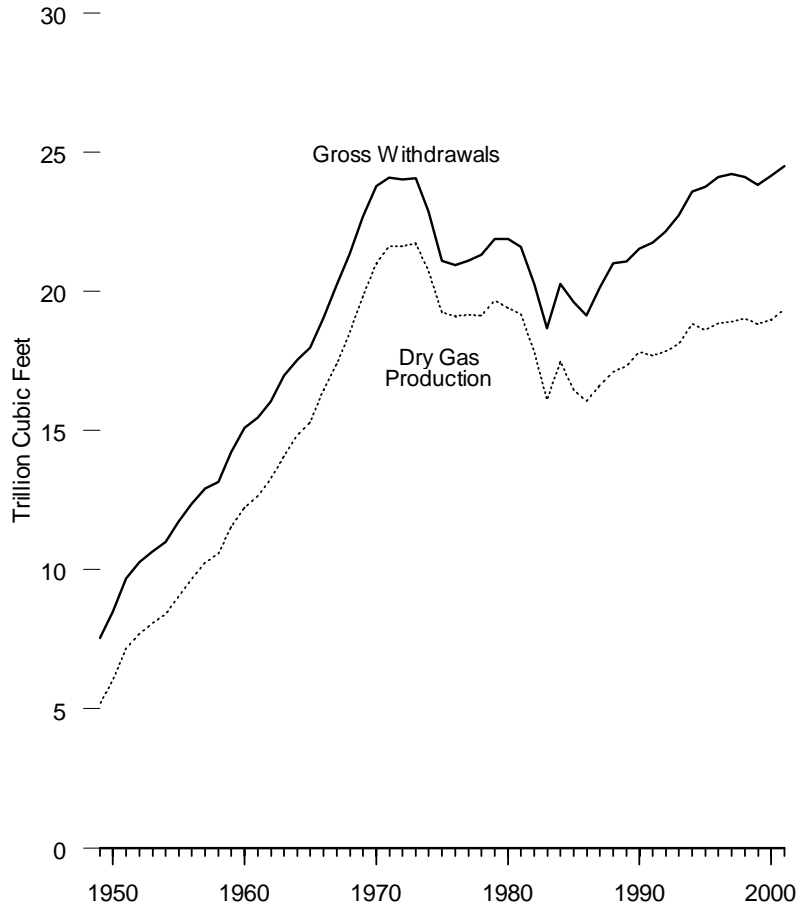
prior years, the pressure base was 14.65 p.s.i.a. at 60° F. Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/natural\\_gas/info\\_glance/natural\\_gas.html](http://www.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html).

Sources: **Supplemental Gaseous Fuels:** 1980-1994—EIA, *Natural Gas Annual*, annual reports. 1995 forward—EIA, *Natural Gas Monthly* (February 2002), Table 2. **Balancing Item:** Calculated as the sum of consumption, exports, and additions to storage minus dry gas production, supplemental gaseous fuels, imports, and withdrawals from storage. **Consumption:** Table 6.5. **All Other Data:** 1949-1994—EIA, *Natural Gas Annual 2000* (November 2001), Table 94. 1995 forward—EIA, *Natural Gas Monthly* (February 2002), Tables 2, 5, 6, and 9.

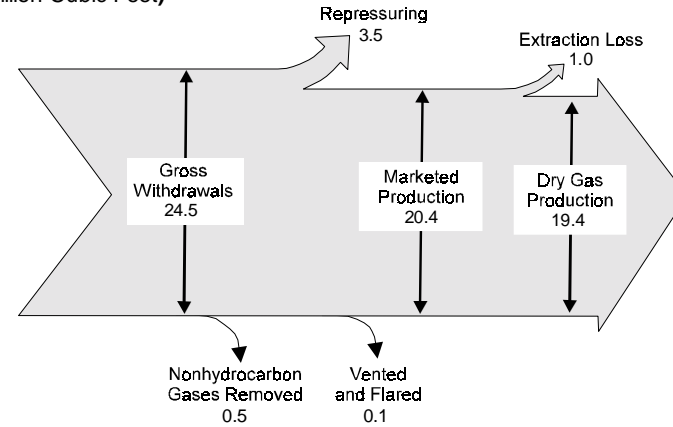
**Figure 6.2 Natural Gas Production**

**Gross Withdrawals and Dry Gas Production, 1949-2001**

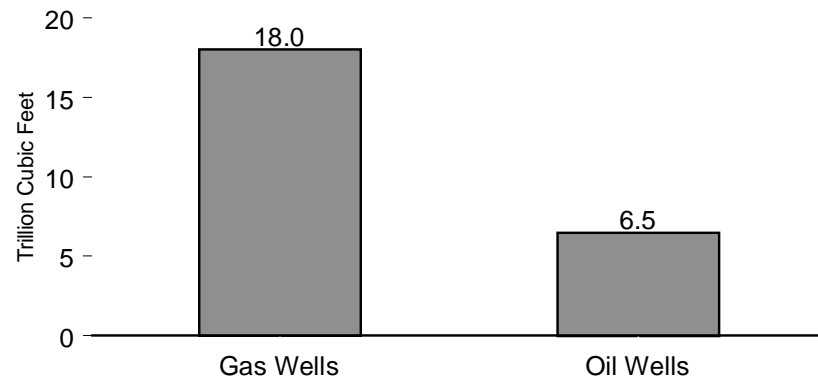


Note: Because vertical scales differ, graphs should not be compared.

**Production Flow, 2001  
(Trillion Cubic Feet)**



**Gross Withdrawals by Well Type, 2001**



Source: Table 6.2.

**Table 6.2 Natural Gas Production, 1949-2001**  
(Trillion Cubic Feet)

Year	Gross Withdrawals			Repressuring	Nonhydrocarbon Gases Removed	Vented and Flared	Marketed Production	Extraction Loss <sup>1</sup>	Dry Gas Production
	From Gas Wells	From Oil Wells	Total						
1949	4.99	2.56	7.55	1.27	NA	0.85	5.42	0.22	5.20
1950	5.60	2.88	8.48	1.40	NA	0.80	6.28	0.26	6.02
1951	6.48	3.21	9.69	1.44	NA	0.79	7.46	0.29	7.16
1952	6.84	3.43	10.27	1.41	NA	0.85	8.01	0.32	7.69
1953	7.10	3.55	10.65	1.44	NA	0.81	8.40	0.34	8.06
1954	7.47	3.52	10.98	1.52	NA	0.72	8.74	0.35	8.39
1955	7.84	3.88	11.72	1.54	NA	0.77	9.41	0.38	9.03
1956	8.31	4.07	12.37	1.43	NA	0.86	10.08	0.42	9.66
1957	8.72	4.19	12.91	1.42	NA	0.81	10.68	0.43	10.25
1958	9.15	3.99	13.15	1.48	NA	0.63	11.03	0.46	10.57
1959	10.10	4.13	14.23	1.61	NA	0.57	12.05	0.50	11.55
1960	10.85	4.23	15.09	1.75	NA	0.56	12.77	0.54	12.23
1961	11.20	4.27	15.46	1.68	NA	0.52	13.25	0.59	12.66
1962	11.70	4.34	16.04	1.74	NA	0.43	13.88	0.62	13.25
1963	12.61	4.37	16.97	1.84	NA	0.38	14.75	0.67	14.08
1964	13.11	4.43	17.54	1.65	NA	0.34	15.55	0.72	14.82
1965	13.52	4.44	17.96	1.60	NA	0.32	16.04	0.75	15.29
1966	13.89	5.14	19.03	1.45	NA	0.38	17.21	0.74	16.47
1967	15.35	4.91	20.25	1.59	NA	0.49	18.17	0.78	17.39
1968	16.54	4.79	21.33	1.49	NA	0.52	19.32	0.83	18.49
1969	17.49	5.19	22.68	1.46	NA	0.53	20.70	0.87	19.83
1970	18.59	5.19	23.79	1.38	NA	0.49	21.92	0.91	21.01
1971	18.93	5.16	24.09	1.31	NA	0.28	22.49	0.88	21.61
1972	19.04	4.97	24.02	1.24	NA	0.25	22.53	0.91	21.62
1973	19.37	4.70	24.07	1.17	NA	0.25	22.65	0.92	21.73
1974	18.67	4.18	22.85	1.08	NA	0.17	21.60	0.89	20.71
1975	17.38	3.72	21.10	0.86	NA	0.13	20.11	0.87	19.24
1976	17.19	3.75	20.94	0.86	NA	0.13	19.95	0.85	19.10
1977	17.42	3.68	21.10	0.93	NA	0.14	20.03	0.86	19.16
1978	17.39	3.91	21.31	1.18	NA	0.15	19.97	0.85	19.12
1979	18.03	3.85	21.88	1.25	NA	0.17	20.47	0.81	19.66
1980	17.57	4.30	21.87	1.37	0.20	0.13	20.18	0.78	19.40
1981	17.34	4.25	21.59	1.31	0.22	0.10	19.96	0.77	19.18
1982	15.81	4.46	20.27	1.39	0.21	0.09	18.58	0.76	17.82
1983	14.15	4.51	18.66	1.46	0.22	0.09	16.88	0.79	16.09
1984	15.51	4.75	20.27	1.63	0.22	0.11	18.30	0.84	17.47
1985	14.54	5.07	19.61	1.92	0.33	0.09	17.27	0.82	16.45
1986	14.15	4.98	19.13	1.84	0.34	0.10	16.86	0.80	16.06
1987	14.81	5.33	20.14	2.21	0.38	0.12	17.43	0.81	16.62
1988	15.47	5.53	21.00	2.48	0.46	0.14	17.92	0.82	17.10
1989	15.71	5.37	21.07	2.48	0.36	0.14	18.10	0.78	17.31
1990	16.05	5.47	21.52	2.49	0.29	0.15	18.59	0.78	17.81
1991	16.02	5.73	21.75	2.77	0.28	0.17	18.53	0.83	17.70
1992	16.16	5.97	22.13	2.97	0.28	0.17	18.71	0.87	17.84
1993	16.69	6.03	22.73	3.10	0.41	0.23	18.98	0.89	18.10
1994	17.35	6.23	23.58	3.23	0.41	0.23	19.71	0.89	18.82
1995	17.28	6.46	23.74	3.57	0.39	0.28	19.51	0.91	18.60
1996	17.74	6.38	24.11	3.51	0.52	0.27	19.81	0.96	18.85
1997	17.84	6.37	24.21	3.49	0.60	0.26	19.87	0.96	18.90
1998	R17.73	6.38	R24.11	R3.43	0.62	R0.10	R19.96	0.94	R19.02
1999	R17.59	R6.23	R23.82	R3.29	R0.62	R0.11	R19.80	0.97	R18.83
2000	R17.72	R6.43	R24.15	R3.43	R0.62	R0.10	R20.00	R1.02	R18.99
2001	E18.03	E6.47	F24.50	F3.53	P0.47	F0.11	F20.39	F1.04	F19.36

<sup>1</sup> Volume reduction resulting from the removal of natural gas plant liquids. Natural gas plant liquids are transferred to petroleum supply.

R=Revised. P=Preliminary. E=Estimate. NA=Not available.

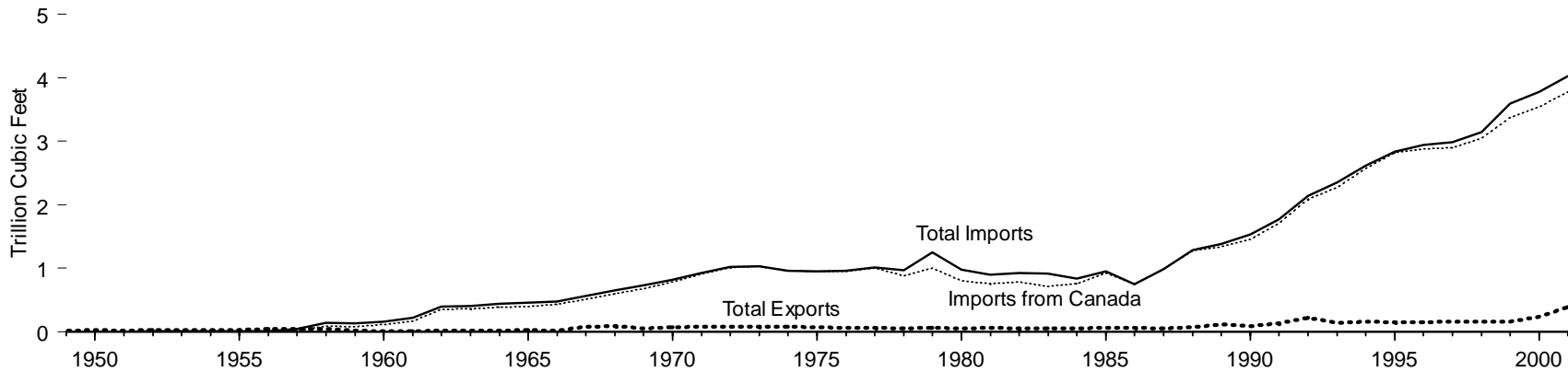
Notes: Beginning with 1965 data, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F. Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/natural\\_gas/info\\_glance/natural\\_gas.html](http://www.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html).

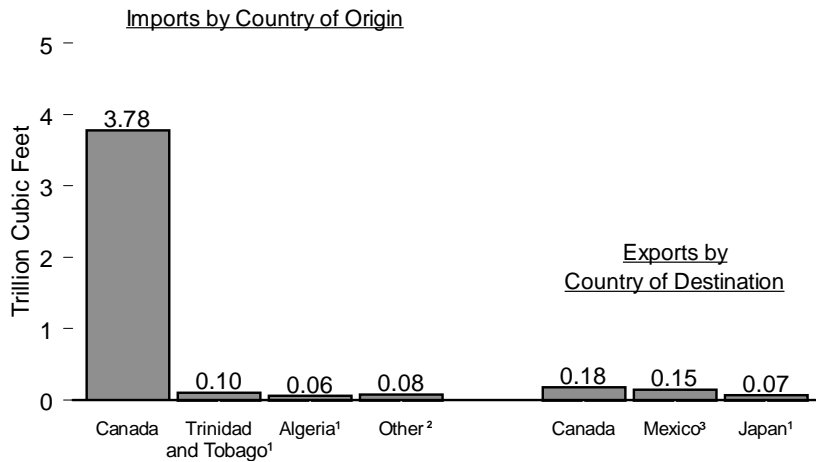
Sources: **From Gas Wells and From Oil Wells:** 1949-1966—Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. 1967-1995—Energy Information Administration (EIA), *Natural Gas Annual*, annual reports. 1996-2000—EIA, *Natural Gas Annual 2000* (November 2001), Table 3. 2001—EIA estimates. **All Other Data:** 1949-1995—EIA, *Natural Gas Annual 2000* (November 2001), Table 93. 1996 forward—EIA, *Natural Gas Monthly* (February 2002), Table 1.

**Figure 6.3 Natural Gas Imports, Exports, and Net Imports**

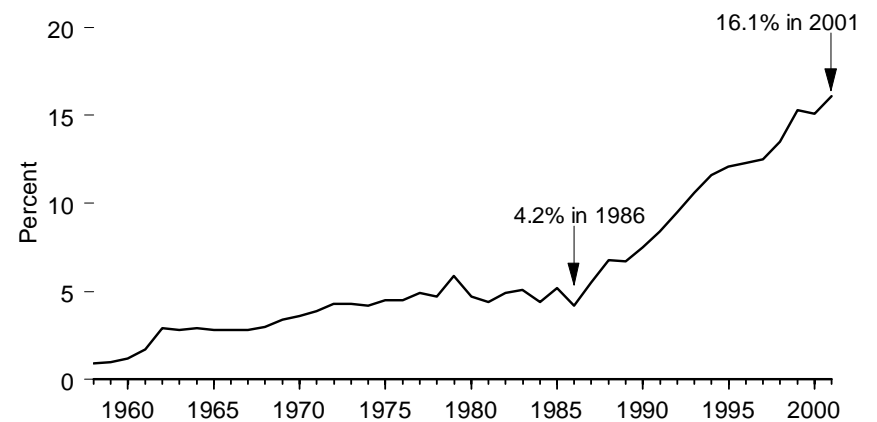
**Trade Overview, 1949-2001**



**Trade, 2001**



**Net Imports as Share of Consumption, 1958-2001**



<sup>1</sup> Liquefied natural gas.

<sup>2</sup> Australia, Mexico, Nigeria, Oman, and Qatar. Except for Mexico, other imports are liquefied natural gas.

<sup>3</sup> Pipeline and liquefied natural gas.

Source: Table 6.3.

**Table 6.3 Natural Gas Imports, Exports, and Net Imports, 1949-2001**

(Billion Cubic Feet, Except as Noted)

Year	Imports by Country of Origin									Exports by Country of Destination				Net Imports <sup>1</sup>	
	Algeria <sup>2</sup>	Australia <sup>2</sup>	Canada	Mexico	Nigeria <sup>2</sup>	Qatar <sup>2</sup>	Trinidad and Tobago <sup>2</sup>	United Arab Emirates <sup>2</sup>	Total <sup>3</sup>	Canada	Japan <sup>2</sup>	Mexico <sup>2</sup>	Total	Total	Percent of U.S. Consumption
1949	0	0	0	0	0	0	0	0	0	(s)	0	20	20	-20	( <sup>4</sup> )
1950	0	0	0	0	0	0	0	0	0	3	0	23	26	-26	( <sup>4</sup> )
1951	0	0	0	0	0	0	0	0	0	4	0	21	24	-24	( <sup>4</sup> )
1952	0	0	8	(s)	0	0	0	0	8	6	0	22	27	-20	( <sup>4</sup> )
1953	0	0	9	0	0	0	0	0	9	6	0	22	28	-19	( <sup>4</sup> )
1954	0	0	7	0	0	0	0	0	7	6	0	23	29	-22	( <sup>4</sup> )
1955	0	0	11	(s)	0	0	0	0	11	11	0	20	31	-20	( <sup>4</sup> )
1956	0	0	10	(s)	0	0	0	0	10	17	0	19	36	-26	( <sup>4</sup> )
1957	0	0	21	17	0	0	0	0	38	31	0	11	42	-4	( <sup>4</sup> )
1958	0	0	90	46	0	0	0	0	136	32	0	7	39	97	0.9
1959	0	0	83	51	0	0	0	0	134	12	0	7	18	116	1.0
1960	0	0	109	47	0	0	0	0	156	6	0	6	11	144	1.2
1961	0	0	167	52	0	0	0	0	219	6	0	5	11	208	1.7
1962	0	0	350	51	0	0	0	0	402	6	0	10	16	386	2.9
1963	0	0	356	50	0	0	0	0	406	7	0	10	17	389	2.8
1964	0	0	391	53	0	0	0	0	443	10	0	10	20	424	2.9
1965	0	0	405	52	0	0	0	0	456	18	0	8	26	430	2.8
1966	0	0	430	50	0	0	0	0	480	20	0	4	25	455	2.8
1967	0	0	513	51	0	0	0	0	564	70	0	11	82	483	2.8
1968	0	0	604	47	0	0	0	0	652	82	0	12	94	558	3.0
1969	0	0	680	47	0	0	0	0	727	35	3	13	51	676	3.4
1970	1	0	779	41	0	0	0	0	821	11	44	15	70	751	3.6
1971	1	0	912	21	0	0	0	0	935	14	50	16	80	854	3.9
1972	2	0	1,009	8	0	0	0	0	1,019	16	48	15	78	941	4.3
1973	3	0	1,028	2	0	0	0	0	1,033	15	48	14	77	956	4.3
1974	0	0	959	(s)	0	0	0	0	959	13	50	13	77	882	4.2
1975	5	0	948	0	0	0	0	0	953	10	53	9	73	880	4.5
1976	10	0	954	0	0	0	0	0	964	8	50	7	65	899	4.5
1977	11	0	997	2	0	0	0	0	1,011	(s)	52	4	56	955	4.9
1978	84	0	881	0	0	0	0	0	966	(s)	48	4	53	913	4.7
1979	253	0	1,001	0	0	0	0	0	1,253	(s)	51	4	56	1,198	5.9
1980	86	0	797	102	0	0	0	0	985	(s)	45	4	49	936	4.7
1981	37	0	762	105	0	0	0	0	904	(s)	56	3	59	845	4.4
1982	55	0	783	95	0	0	0	0	933	(s)	50	2	52	882	4.9
1983	131	0	712	75	0	0	0	0	918	(s)	53	2	55	864	5.1
1984	36	0	755	52	0	0	0	0	843	(s)	53	2	55	788	4.4
1985	24	0	926	0	0	0	0	0	950	(s)	53	2	55	894	5.2
1986	0	0	749	0	0	0	0	0	750	9	50	2	61	689	4.2
1987	0	0	993	0	0	0	0	0	993	3	49	2	54	939	5.5
1988	17	0	1,276	0	0	0	0	0	1,294	20	52	2	74	1,220	6.8
1989	42	0	1,339	0	0	0	0	0	1,382	38	51	17	107	1,275	R6.7
1990	84	0	1,448	0	0	0	0	0	1,532	17	53	16	86	1,447	R7.5
1991	64	0	1,710	0	0	0	0	0	1,773	15	54	60	129	1,644	R8.4
1992	43	0	2,094	0	0	0	0	0	2,138	68	53	96	216	1,921	R9.5
1993	82	0	2,267	2	0	0	0	0	2,350	45	56	40	140	2,210	R10.6
1994	51	0	2,566	7	0	0	0	0	2,624	53	63	47	162	2,462	R11.6
1995	18	0	2,816	7	0	0	0	0	2,841	28	65	61	154	2,687	R12.1
1996	35	0	2,883	14	0	0	0	5	2,937	52	68	34	153	2,784	R12.3
1997	66	10	2,899	17	0	0	0	2	2,994	56	62	38	157	2,837	R12.5
1998	69	12	3,052	15	0	0	0	5	3,152	40	66	53	159	2,993	R13.5
1999	76	12	3,368	55	0	20	51	3	3,586	39	64	61	163	3,422	R15.3
2000	R47	R6	R3,544	R12	13	46	99	R3	R3,782	R73	R66	R106	R244	R3,538	R15.1
2001	P65	P2	E3,781	E8	E38	E23	E99	E0	E4,029	E178	P66	E151	E394	E3,635	E16.1

<sup>1</sup> Net imports = imports minus exports.

<sup>2</sup> Imports from Algeria, Australia, Nigeria, Qatar, Trinidad, Tobago, and United Arab Emirates, and exports to Japan are liquefied natural gas. Exports to Mexico include a small amount of liquefied natural gas.

<sup>3</sup> Included in the total but not shown separately are liquefied natural gas imports from Indonesia in 1986 and 2000, Malaysia in 1999, and Oman in 2000 and 2001.

<sup>4</sup> Not meaningful because there were net exports during this year.

R=Revised. P=Preliminary. E=Estimate. (s)=Less than 0.5 billion cubic feet.

Note: Totals may not equal sum of components due to independent rounding.

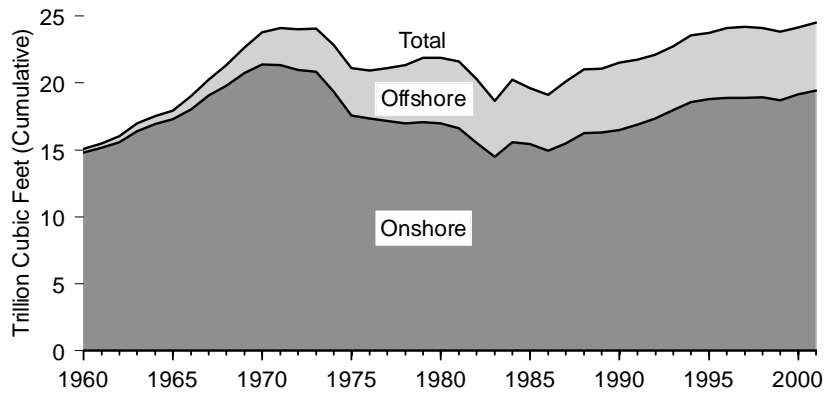
 Web Page: [http://www.eia.doe.gov/oil\\_gas/natural\\_gas/info\\_glance/natural\\_gas.html](http://www.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html).

 Sources: 1949-1954—Energy Information Administration (EIA), Office of Oil and Gas, Reserves and Natural Gas Division, unpublished data. 1955-1971—EIA, Federal Power Commission, by telephone. 1972-1987—EIA, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." 1988-1994—EIA, *Natural Gas Annual*, annual reports. 1995 forward—EIA, *Natural Gas Monthly* (February 2002), Tables 5 and 6.

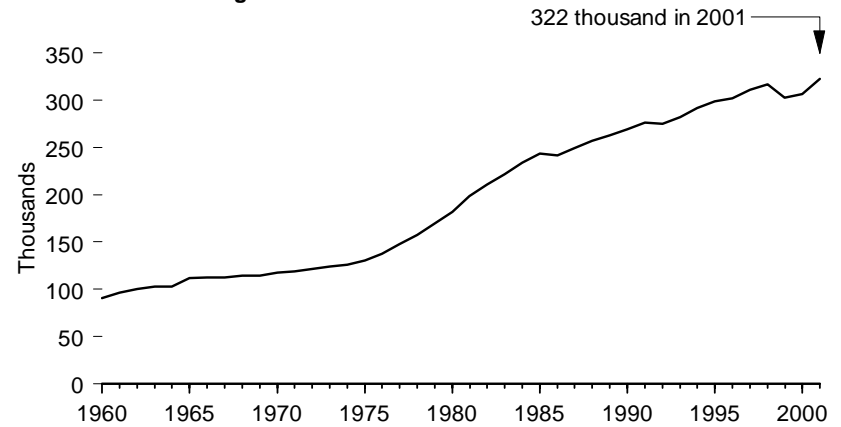


**Figure 6.4 Natural Gas Gross Withdrawals by State and Location and Gas Well Productivity, 1960-2001**

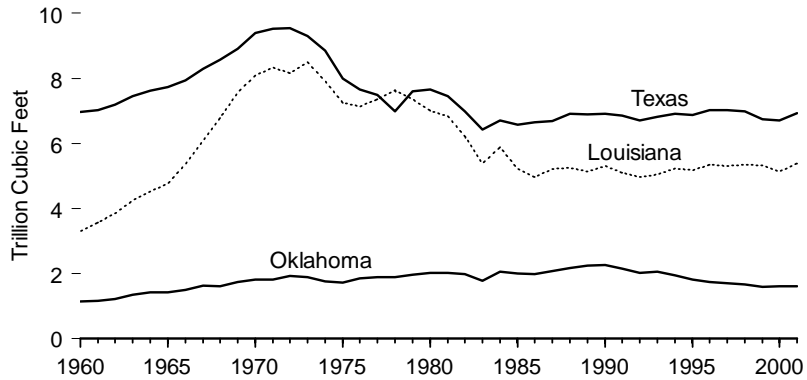
**Gross Withdrawals by Location**



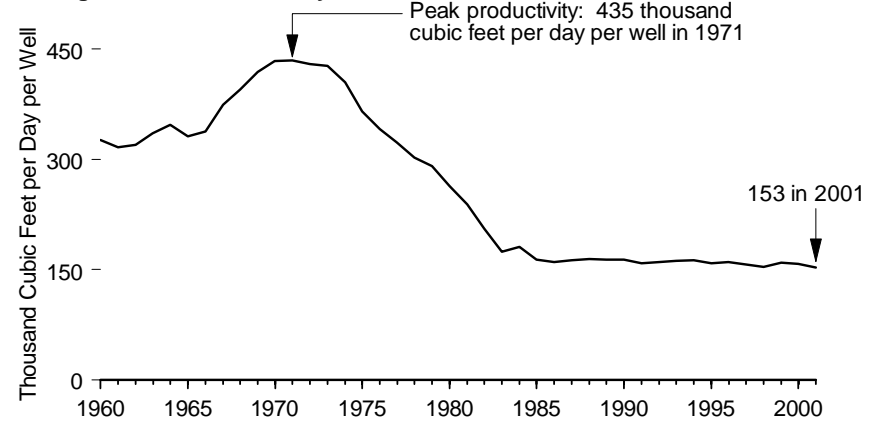
**Number of Producing Wells**



**Gross Withdrawals in Top Producing States**



**Average Gas Well Productivity**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 6.4.

**Table 6.4 Natural Gas Gross Withdrawals by State and Location and Gas Well Productivity, 1960-2001**

(Trillion Cubic Feet, Except as Noted)

Year	State				Location		Gross Withdrawals from Oil and Gas Wells	Gas Well <sup>1</sup> Productivity		
	Texas	Louisiana	Oklahoma	Other	Onshore <sup>2</sup>	Offshore <sup>3</sup>		Gross Withdrawals from Gas Wells	Producing Wells <sup>4</sup> (thousands)	Average Productivity (thousand cubic feet per day)
1960	6.96	3.31	1.13	3.68	14.81	0.27	15.09	10.85	91	326.7
1961	7.02	3.57	1.16	3.71	15.14	0.32	15.46	11.20	97	316.8
1962	7.20	3.85	1.22	3.76	15.59	0.45	16.04	11.70	100	319.8
1963	7.45	4.25	1.35	3.92	16.41	0.56	16.97	12.61	103	335.4
1964	7.62	4.52	1.42	3.98	16.91	0.62	17.54	13.11	103	347.4
1965	7.74	4.76	1.41	4.04	17.32	0.65	17.96	13.52	112	331.8
1966	7.93	5.37	1.50	4.23	18.03	1.01	19.03	13.89	112	338.4
1967	8.29	6.09	1.62	4.25	19.06	1.19	20.25	15.35	112	374.3
1968	8.57	6.78	1.61	4.37	19.80	1.52	21.33	16.54	114	395.1
1969	8.91	7.56	1.74	4.46	20.72	1.95	22.68	17.49	114	418.6
1970	9.40	8.08	1.81	4.50	21.37	2.42	23.79	18.59	117	433.6
1971	9.52	8.32	1.81	4.44	21.31	2.78	24.09	18.93	119	434.8
1972	9.55	8.16	1.93	4.38	20.98	3.04	24.02	19.04	121	429.4
1973	9.29	8.49	1.89	4.40	20.86	3.21	24.07	19.37	124	427.4
1974	8.86	7.92	1.76	4.31	19.34	3.51	22.85	18.67	126	404.9
1975	7.99	7.24	1.72	4.15	17.55	3.55	21.10	17.38	130	365.3
1976	7.67	7.14	1.84	4.29	17.35	3.60	20.94	17.19	138	341.5
1977	7.50	7.35	1.89	4.36	17.16	3.93	21.10	17.42	148	323.1
1978	6.99	7.64	1.89	4.79	16.95	4.36	21.31	17.39	157	302.7
1979	7.59	7.36	1.96	4.97	17.06	4.82	21.88	18.03	170	290.8
1980	7.66	7.01	2.02	5.19	16.97	4.90	21.87	17.57	182	263.8
1981	7.45	6.83	2.02	5.29	16.60	4.99	21.59	17.34	199	238.9
1982	6.98	6.22	1.99	5.09	15.50	4.77	20.27	15.81	211	205.5
1983	6.43	5.38	1.78	5.07	14.48	4.18	18.66	14.15	222	174.7
1984	6.71	5.89	2.05	5.62	15.56	4.71	20.27	15.51	234	181.2
1985	6.58	5.22	1.99	5.82	15.42	4.19	19.61	14.54	243	163.6
1986	6.66	4.96	1.97	5.54	14.95	4.19	19.13	14.15	242	160.6
1987	6.69	5.20	2.07	6.17	15.47	4.67	20.14	14.81	249	162.8
1988	6.92	5.25	2.17	6.67	16.25	4.75	21.00	15.47	257	164.3
1989	6.88	5.14	2.24	6.81	16.30	4.77	21.07	15.71	262	164.0
1990	6.91	5.30	2.26	7.05	16.48	5.05	21.52	16.05	269	163.4
1991	6.85	5.10	2.15	7.65	16.90	4.85	21.75	16.02	276	158.8
1992	6.71	4.98	2.02	8.43	17.36	4.77	22.13	16.16	275	160.4
1993	6.82	5.05	2.05	8.81	17.96	4.77	22.73	16.69	282	162.1
1994	6.91	5.23	1.93	9.51	18.58	5.00	23.58	17.35	292	162.9
1995	6.87	5.16	1.81	9.90	18.80	4.94	23.74	17.28	299	158.6
1996	7.03	5.35	1.73	10.00	18.87	5.25	24.11	17.74	302	160.6
1997	7.02	5.30	1.70	10.19	18.90	5.32	24.21	17.84	311	157.2
1998	<sup>R</sup> 6.98	<sup>R</sup> 5.34	<sup>R</sup> 1.67	<sup>R</sup> 10.12	<sup>R</sup> 18.92	<sup>R</sup> 5.19	<sup>R</sup> 24.11	<sup>R</sup> 17.73	<sup>R</sup> 317	<sup>R</sup> 153.3
1999	<sup>R</sup> 6.73	<sup>R</sup> 5.33	<sup>R</sup> 1.59	<sup>R</sup> 10.17	<sup>R</sup> 18.69	<sup>R</sup> 5.13	<sup>R</sup> 23.82	<sup>R</sup> 17.59	<sup>R</sup> 302	<sup>R</sup> 159.4
2000	<sup>R</sup> 6.71	<sup>R</sup> 5.13	<sup>R</sup> 1.61	<sup>R</sup> 10.70	<sup>R</sup> 19.14	<sup>R</sup> 5.02	<sup>R</sup> 24.15	<sup>R</sup> 17.72	<sup>R</sup> 306	<sup>R</sup> 158.1
2001	<sup>E</sup> 6.94	<sup>E</sup> 5.37	<sup>E</sup> 1.61	<sup>E</sup> 10.58	<sup>E</sup> 19.41	<sup>E</sup> 5.09	<sup>P</sup> 24.50	<sup>E</sup> 18.03	<sup>P</sup> 322	<sup>E</sup> 153.2

<sup>1</sup> See Glossary.

<sup>2</sup> Includes State offshore gross withdrawals.

<sup>3</sup> Excludes State offshore gross withdrawals; includes Federal offshore (Outer Continental Shelf) gross withdrawals.

<sup>4</sup> As of December 31 each year.

R=Revised. P=Preliminary. E=Estimate.

Web Page: [http://www.eia.doe.gov/oil\\_gas/natural\\_gas/info\\_glance/natural\\_gas.html](http://www.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html).

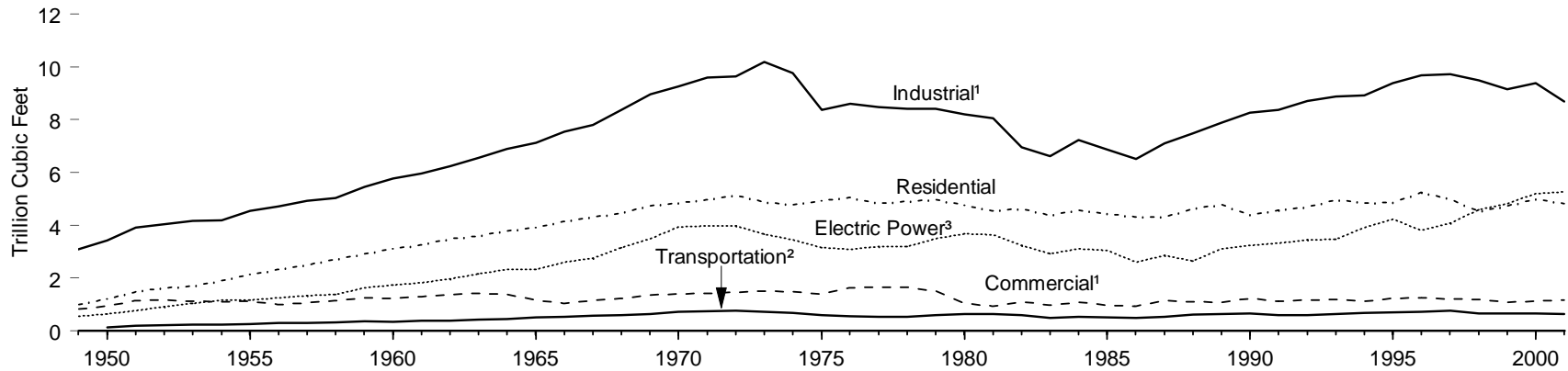
Sources: **Offshore** (Outer Continental Shelf): 1960-1981—U.S. Geological Survey. 1982-1985—The United States Minerals Management Service, *Mineral Revenues - The 1989 Report on Receipts from*

*Federal and Indian Leases*, and predecessor annual reports. 1986-1995—EIA, *Natural Gas Annual*, annual reports. 1996-2000—EIA, *Natural Gas Annual 2000* (November 2001), Table 4. 2001—EIA estimates. **Gross Withdrawals from Oil and Gas Wells:** 1960-1995—EIA, *Natural Gas Annual 2000* (November 2001), Table 93. 1996 forward—EIA, *Natural Gas Monthly* (February 2002), Table 1.

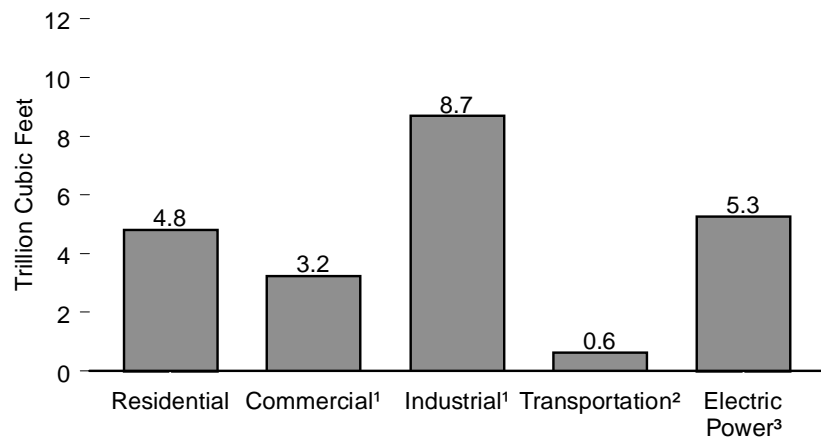
**Producing Wells:** 1960-1966—Bureau of Mines, *Natural Gas Production and Consumption*. 1967-1995—EIA, *Natural Gas Annual*, annual reports. 1996-2000—EIA, *Natural Gas Annual 2000* (November 2001), Table 1. 2001—Gulf Publishing Company, *World Oil* (February 2002). **Average Productivity:** Calculated. **All Other Data:** 1960-1966—Bureau of Mines, *Natural Gas Production and Consumption*. 1967-2000—EIA, *Natural Gas Annual*, annual reports. 2001—EIA estimates.

**Figure 6.5 Natural Gas Consumption by Sector**

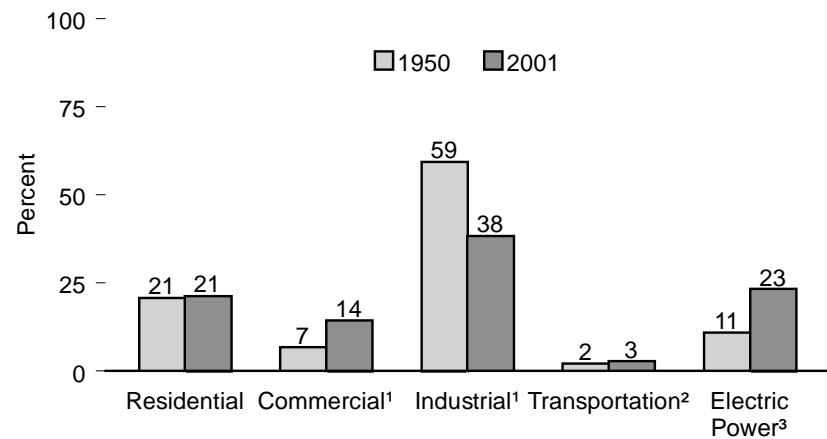
**By Sector, 1949-2001**



**By Sector, 2001**



**End Use and Electric Power Shares, 1950 and 2001**



<sup>1</sup> Includes combined-heat-and-power plants and a small number of electricity-only plants.  
<sup>2</sup> Pipeline and vehicle fuel.  
<sup>3</sup> Electricity-only and combined-heat-and-power plants whose primary business is to sell electricity, or electricity and heat, to the public.

Source: Table 6.5.

**Table 6.5 Natural Gas Consumption by Sector, 1949-2001**  
(Trillion Cubic Feet)

Year	End-Use Sectors													Electric Power Sector <sup>1,2</sup>			Total
	Residential	Commercial			Lease and Plant Fuel	Industrial			Total	Transportation			Total	Electricity Only	CHP	Total	
		CHP <sup>3</sup>	Other <sup>4</sup>	Total		Other Industrial		Pipeline Fuel <sup>7</sup>		Vehicle Fuel	Total						
						CHP <sup>5</sup>	Non-CHP <sup>6</sup>										
1949	0.99	( <sup>8</sup> )	0.35	0.35	0.84	( <sup>9</sup> )	2.25	2.25	3.08	NA	NA	NA	4.42	0.55	( <sup>10</sup> )	0.55	4.97
1950	1.20	( <sup>8</sup> )	0.39	0.39	0.93	( <sup>9</sup> )	2.50	2.50	3.43	0.13	NA	0.13	5.14	0.63	( <sup>10</sup> )	0.63	5.77
1951	1.47	( <sup>8</sup> )	0.46	0.46	1.15	( <sup>9</sup> )	2.77	2.77	3.91	0.19	NA	0.19	6.05	0.76	( <sup>10</sup> )	0.76	6.81
1952	1.62	( <sup>8</sup> )	0.52	0.52	1.16	( <sup>9</sup> )	2.87	2.87	4.04	0.21	NA	0.21	6.38	0.91	( <sup>10</sup> )	0.91	7.29
1953	1.69	( <sup>8</sup> )	0.53	0.53	1.13	( <sup>9</sup> )	3.03	3.03	4.16	0.23	NA	0.23	6.60	1.03	( <sup>10</sup> )	1.03	7.64
1954	1.89	( <sup>8</sup> )	0.58	0.58	1.10	( <sup>9</sup> )	3.07	3.07	4.17	0.23	NA	0.23	6.88	1.17	( <sup>10</sup> )	1.17	8.05
1955	2.12	( <sup>8</sup> )	0.63	0.63	1.13	( <sup>9</sup> )	3.41	3.41	4.54	0.25	NA	0.25	7.54	1.15	( <sup>10</sup> )	1.15	8.69
1956	2.33	( <sup>8</sup> )	0.72	0.72	1.00	( <sup>9</sup> )	3.71	3.71	4.71	0.30	NA	0.30	8.05	1.24	( <sup>10</sup> )	1.24	9.29
1957	2.50	( <sup>8</sup> )	0.78	0.78	1.05	( <sup>9</sup> )	3.89	3.89	4.93	0.30	NA	0.30	8.51	1.34	( <sup>10</sup> )	1.34	9.85
1958	2.71	( <sup>8</sup> )	0.87	0.87	1.15	( <sup>9</sup> )	3.89	3.89	5.03	0.31	NA	0.31	8.93	1.37	( <sup>10</sup> )	1.37	10.30
1959	2.91	( <sup>8</sup> )	0.98	0.98	1.24	( <sup>9</sup> )	4.22	4.22	5.46	0.35	NA	0.35	9.69	1.63	( <sup>10</sup> )	1.63	11.32
1960	3.10	( <sup>8</sup> )	1.02	1.02	1.24	( <sup>9</sup> )	4.53	4.53	5.77	0.35	NA	0.35	10.24	1.72	( <sup>10</sup> )	1.72	11.97
1961	3.25	( <sup>8</sup> )	1.08	1.08	1.29	( <sup>9</sup> )	4.67	4.67	5.96	0.38	NA	0.38	10.66	1.83	( <sup>10</sup> )	1.83	12.49
1962	3.48	( <sup>8</sup> )	1.21	1.21	1.37	( <sup>9</sup> )	4.86	4.86	6.23	0.38	NA	0.38	11.30	1.97	( <sup>10</sup> )	1.97	13.27
1963	3.59	( <sup>8</sup> )	1.27	1.27	1.41	( <sup>9</sup> )	5.13	5.13	6.55	0.42	NA	0.42	11.83	2.14	( <sup>10</sup> )	2.14	13.97
1964	3.79	( <sup>8</sup> )	1.37	1.37	1.37	( <sup>9</sup> )	5.52	5.52	6.89	0.44	NA	0.44	12.49	2.32	( <sup>10</sup> )	2.32	14.81
1965	3.90	( <sup>8</sup> )	1.44	1.44	1.16	( <sup>9</sup> )	5.96	5.96	7.11	0.50	NA	0.50	12.96	2.32	( <sup>10</sup> )	2.32	15.28
1966	4.14	( <sup>8</sup> )	1.62	1.62	1.03	( <sup>9</sup> )	6.51	6.51	7.55	0.54	NA	0.54	13.84	2.61	( <sup>10</sup> )	2.61	16.45
1967	4.31	( <sup>8</sup> )	1.96	1.96	1.14	( <sup>9</sup> )	6.65	6.65	7.79	0.58	NA	0.58	14.64	2.75	( <sup>10</sup> )	2.75	17.39
1968	4.45	( <sup>8</sup> )	2.08	2.08	1.24	( <sup>9</sup> )	7.13	7.13	8.37	0.59	NA	0.59	15.48	3.15	( <sup>10</sup> )	3.15	18.63
1969	4.73	( <sup>8</sup> )	2.25	2.25	1.35	( <sup>9</sup> )	7.61	7.61	8.96	0.63	NA	0.63	16.57	3.49	( <sup>10</sup> )	3.49	20.06
1970	4.84	( <sup>8</sup> )	2.40	2.40	1.40	( <sup>9</sup> )	7.85	7.85	9.25	0.72	NA	0.72	17.21	3.93	( <sup>10</sup> )	3.93	21.14
1971	4.97	( <sup>8</sup> )	2.51	2.51	1.41	( <sup>9</sup> )	8.18	8.18	9.59	0.74	NA	0.74	17.82	3.98	( <sup>10</sup> )	3.98	21.79
1972	5.13	( <sup>8</sup> )	2.61	2.61	1.46	( <sup>9</sup> )	8.17	8.17	9.62	0.77	NA	0.77	18.12	3.98	( <sup>10</sup> )	3.98	22.10
1973	4.88	( <sup>8</sup> )	2.60	2.60	1.50	( <sup>9</sup> )	8.69	8.69	10.18	0.73	NA	0.73	18.39	3.66	( <sup>10</sup> )	3.66	22.05
1974	4.79	( <sup>8</sup> )	2.56	2.56	1.48	( <sup>9</sup> )	8.29	8.29	9.77	0.67	NA	0.67	17.78	3.44	( <sup>10</sup> )	3.44	21.22
1975	4.92	( <sup>8</sup> )	2.51	2.51	1.40	( <sup>9</sup> )	6.97	6.97	8.36	0.58	NA	0.58	16.38	3.16	( <sup>10</sup> )	3.16	19.54
1976	5.05	( <sup>8</sup> )	2.67	2.67	1.63	( <sup>9</sup> )	6.96	6.96	8.60	0.55	NA	0.55	16.87	3.08	( <sup>10</sup> )	3.08	19.95
1977	4.82	( <sup>8</sup> )	2.50	2.50	1.66	( <sup>9</sup> )	6.82	6.82	8.47	0.53	NA	0.53	16.33	3.19	( <sup>10</sup> )	3.19	19.52
1978	4.90	( <sup>8</sup> )	2.60	2.60	1.65	( <sup>9</sup> )	6.76	6.76	8.40	0.53	NA	0.53	16.44	3.19	( <sup>10</sup> )	3.19	19.63
1979	4.97	( <sup>8</sup> )	2.79	2.79	1.50	( <sup>9</sup> )	6.90	6.90	8.40	0.60	NA	0.60	16.75	3.49	( <sup>10</sup> )	3.49	20.24
1980	4.75	( <sup>8</sup> )	2.61	2.61	1.03	( <sup>9</sup> )	7.17	7.17	8.20	0.63	NA	0.63	16.20	3.68	( <sup>10</sup> )	3.68	19.88
1981	4.55	( <sup>8</sup> )	2.52	2.52	0.93	( <sup>9</sup> )	7.13	7.13	8.06	0.64	NA	0.64	15.76	3.64	( <sup>10</sup> )	3.64	19.40
1982	4.63	( <sup>8</sup> )	2.61	2.61	1.11	( <sup>9</sup> )	5.83	5.83	6.94	0.60	NA	0.60	14.78	3.23	( <sup>10</sup> )	3.23	18.00
1983	4.38	( <sup>8</sup> )	2.43	2.43	0.98	( <sup>9</sup> )	5.64	5.64	6.62	0.49	NA	0.49	13.92	2.91	( <sup>10</sup> )	2.91	16.83
1984	4.56	( <sup>8</sup> )	2.52	2.52	1.08	( <sup>9</sup> )	6.15	6.15	7.23	0.53	NA	0.53	14.84	3.11	( <sup>10</sup> )	3.11	17.95
1985	4.43	( <sup>8</sup> )	2.43	2.43	0.97	( <sup>9</sup> )	5.90	5.90	6.87	0.50	NA	0.50	14.24	3.04	( <sup>10</sup> )	3.04	17.28
1986	4.31	( <sup>8</sup> )	2.32	2.32	0.92	( <sup>9</sup> )	5.58	5.58	6.50	0.49	NA	0.49	13.62	2.60	( <sup>10</sup> )	2.60	16.22
1987	4.31	( <sup>8</sup> )	2.43	2.43	1.15	( <sup>9</sup> )	5.95	5.95	7.10	0.52	NA	0.52	14.37	2.84	( <sup>10</sup> )	2.84	17.21
1988	4.63	( <sup>8</sup> )	2.67	2.67	1.10	( <sup>9</sup> )	6.38	6.38	7.48	0.61	NA	0.61	15.39	2.64	( <sup>10</sup> )	2.64	18.03
1989	4.78	P0.03	2.69	2.72	1.07	P0.91	115.90	116.82	7.89	0.63	NA	0.63	16.01	2.11,P2.79	10,11,P0.31	2.11,P3.11	11,R19.12
1990	4.39	P0.04	2.58	2.62	1.24	P0.98	116.03	117.02	8.25	0.66	(s)	0.66	15.93	11,P2.79	10,11,P0.44	11,P3.23	11,R19.16
1991	4.56	P0.05	2.68	2.73	1.13	P1.06	116.17	117.23	8.36	0.60	(s)	0.60	16.25	11,P2.82	10,11,P0.49	11,P3.32	11,R19.56
1992	4.69	P0.06	2.74	2.80	1.17	P1.11	116.42	117.53	8.70	0.59	(s)	0.59	16.78	11,P2.83	10,11,P0.62	11,P3.45	11,R20.23
1993	4.96	P0.07	2.80	2.86	1.17	P1.12	6.58	R7.70	R8.87	0.62	(s)	0.63	R17.32	P2.76	10,P0.72	P3.47	R20.79
1994	4.85	P0.07	2.82	2.90	1.12	P1.18	6.61	R7.79	R8.91	0.69	(s)	0.69	R17.34	P3.06	10,P0.84	P3.90	R21.25
1995	4.85	P0.08	2.95	3.03	1.22	P1.26	6.90	R8.16	R9.38	0.70	(s)	0.70	R17.97	P3.29	10,P0.95	P4.24	R22.21
1996	5.24	P0.08	3.08	3.16	1.25	P1.29	7.15	R8.44	R9.69	0.71	R0.01	R0.72	R18.80	P2.82	10,P0.98	P3.81	R22.61
1997	4.98	P0.09	3.13	3.21	1.20	P1.28	7.23	R8.51	R9.71	0.75	R0.01	0.76	R18.67	P3.04	10,P1.03	P4.06	R22.74
1998	4.52	P0.09	2.91	3.00	R1.17	P1.35	6.97	R8.32	R9.49	0.64	0.01	0.64	R17.66	P3.54	10,P1.04	P4.59	R22.24
1999	4.73	P0.08	2.96	3.04	1.08	P1.40	6.68	R8.08	R9.16	R0.65	0.01	R0.66	R17.58	P3.73	10,P1.09	P4.82	R22.40
2000	R4.99	P0.08	3.13	R3.22	R1.13	P1.39	6.87	R8.25	R9.38	R0.64	0.01	R0.66	R18.25	P4.09	10,P1.11	P5.21	R23.46
2001	4.81	E0.08	3.17	3.25	1.16	E1.35	6.18	7.53	8.69	0.61	0.01	0.63	17.37	P4.08	10,E1.18	P5.26	22.64

<sup>1</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants.

<sup>2</sup> Through 1988, data are for consumption at electric utilities only. Beginning in 1989, data also include consumption at independent power producers.

<sup>3</sup> Commercial combined-heat-and-power and a small number of commercial electricity-only plants.

<sup>4</sup> All commercial sector fuel use other than that in "Commercial CHP."

<sup>5</sup> Industrial combined-heat-and-power (CHP) and a small number of industrial electricity-only plants.

<sup>6</sup> All industrial sector fuel use other than that in "Lease and Plant Fuel" and "Industrial CHP."

<sup>7</sup> Natural gas consumed in the operation of pipelines, primarily in compressors.

<sup>8</sup> Included in "Commercial Other."

<sup>9</sup> Included in "Industrial Non-CHP."

<sup>10</sup> Electric utility CHP plants are included in "Electricity Only."

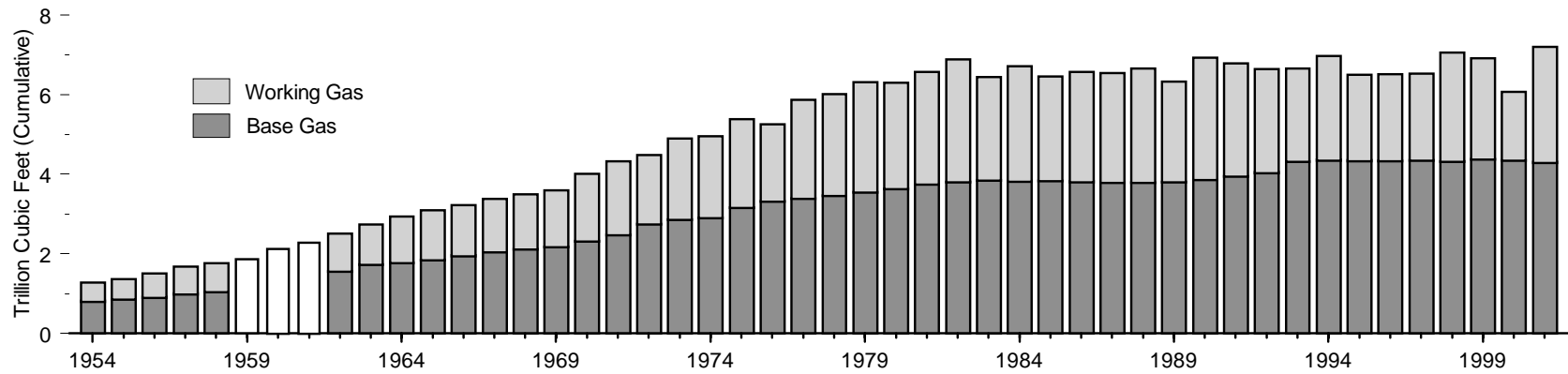
<sup>11</sup> For 1989-1992, a small amount of consumption at independent power producers may be counted in both "Other Industrial" and "Electric Power Sector." See Note 3 at end of section.

R=Revised. P=Preliminary. E=Estimate. NA=Not available. (s)=Less than 0.005 trillion cubic feet.

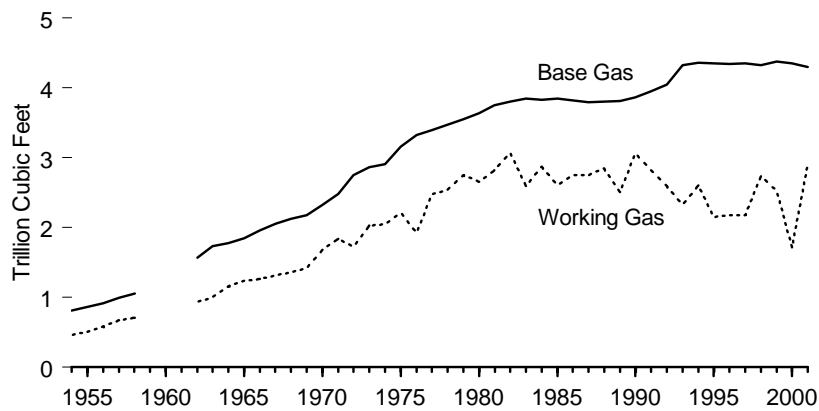
Notes, Web Page, and Sources: See end of section.

**Figure 6.6 Natural Gas in Underground Storage, 1954-2001**

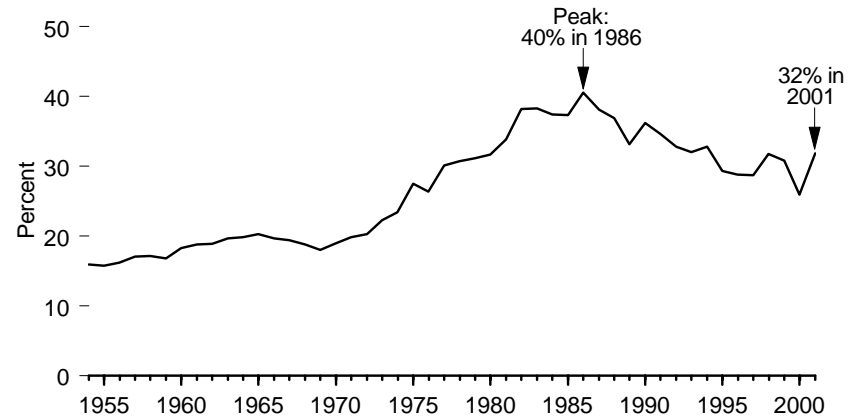
**Total**



**Base Gas and Working Gas**



**End-of-Year Storage as a Share of Total Consumption**



Notes: Storage is at end of year. Because vertical scales differ, graphs should not be compared. Working- and base-gas component data were not collected in 1959, 1960, and 1961.

Sources: Tables 6.5 and 6.6.

**Table 6.6 Natural Gas in Underground Storage, 1954-2001**  
(Billion Cubic Feet)

Year	Base Gas <sup>1</sup>			Working Gas			Total		
	Traditonal Storage	Salt Caverns	Total	Traditonal Storage	Salt Caverns	Total	Traditonal Storage	Salt Caverns	Total
1954	NA	NA	817	NA	NA	465	NA	NA	1,281
1955	NA	NA	863	NA	NA	505	NA	NA	1,368
1956	NA	NA	919	NA	NA	583	NA	NA	1,502
1957	NA	NA	1,001	NA	NA	673	NA	NA	1,674
1958	NA	NA	1,056	NA	NA	708	NA	NA	1,764
1959	NA	NA	NA	NA	NA	NA	NA	NA	1,901
1960	NA	NA	NA	NA	NA	NA	NA	NA	2,184
1961	NA	NA	NA	NA	NA	NA	NA	NA	2,344
1962	NA	NA	1,571	NA	NA	933	NA	NA	2,504
1963	NA	NA	1,738	NA	NA	1,007	NA	NA	2,745
1964	NA	NA	1,781	NA	NA	1,159	NA	NA	2,940
1965	NA	NA	1,848	NA	NA	1,242	NA	NA	3,090
1966	NA	NA	1,958	NA	NA	1,267	NA	NA	3,225
1967	NA	NA	2,058	NA	NA	1,318	NA	NA	3,376
1968	NA	NA	2,128	NA	NA	1,366	NA	NA	3,495
1969	NA	NA	2,181	NA	NA	1,421	NA	NA	3,602
1970	NA	NA	2,326	NA	NA	1,678	NA	NA	4,004
1971	NA	NA	2,485	NA	NA	1,840	NA	NA	4,325
1972	NA	NA	2,751	NA	NA	1,729	NA	NA	4,480
1973	NA	NA	2,864	NA	NA	2,034	NA	NA	4,898
1974	NA	NA	2,912	NA	NA	2,050	NA	NA	4,962
1975	NA	NA	3,162	NA	NA	2,212	NA	NA	5,374
1976	NA	NA	3,323	NA	NA	1,926	NA	NA	5,250
1977	NA	NA	3,391	NA	NA	2,475	NA	NA	5,866
1978	NA	NA	3,473	NA	NA	2,547	NA	NA	6,020
1979	NA	NA	3,553	NA	NA	2,753	NA	NA	6,306
1980	NA	NA	3,642	NA	NA	2,655	NA	NA	6,297
1981	NA	NA	3,752	NA	NA	2,817	NA	NA	6,569
1982	NA	NA	3,808	NA	NA	3,071	NA	NA	6,879
1983	NA	NA	3,847	NA	NA	2,595	NA	NA	6,442
1984	NA	NA	3,830	NA	NA	2,876	NA	NA	6,706
1985	NA	NA	3,842	NA	NA	2,607	NA	NA	6,448
1986	NA	NA	3,819	NA	NA	2,749	NA	NA	6,567
1987	NA	NA	3,792	NA	NA	2,756	NA	NA	6,548
1988	NA	NA	3,800	NA	NA	2,850	NA	NA	6,650
1989	NA	NA	3,812	NA	NA	2,513	NA	NA	6,325
1990	NA	NA	3,868	NA	NA	3,068	NA	NA	6,936
1991	NA	NA	3,954	NA	NA	2,824	NA	NA	6,778
1992	NA	NA	4,044	NA	NA	2,597	NA	NA	6,641
1993	NA	NA	4,327	NA	NA	2,322	NA	NA	6,649
1994	4,317	44	4,360	2,536	70	2,606	6,853	113	6,966
1995	4,290	60	4,349	2,082	72	2,153	6,371	131	6,503
1996	4,277	64	4,341	2,087	85	2,173	6,364	149	6,513
1997	4,283	67	4,350	2,092	83	2,175	6,375	150	6,525
1998	4,259	67	4,326	2,626	104	2,730	6,884	171	7,056
1999	4,314	69	4,383	2,423	100	2,523	6,738	169	6,906
2000 <sup>E</sup>	<sup>R</sup> 4,282	70	<sup>R</sup> 4,352	<sup>R</sup> 1,647	<sup>R</sup> 72	<sup>R</sup> 1,719	<sup>R</sup> 5,929	<sup>R</sup> 142	<sup>R</sup> 6,071
2001 <sup>E</sup>	4,232	71	4,304	2,793	110	2,903	7,025	182	7,207

<sup>1</sup> Includes native gas.

R=Revised. E=Estimate. NA=Not available.

Notes: Storage is at end of year. Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60 degrees F. For prior years, the pressure base was 14.65 p.s.i.a. at 60 degrees F.

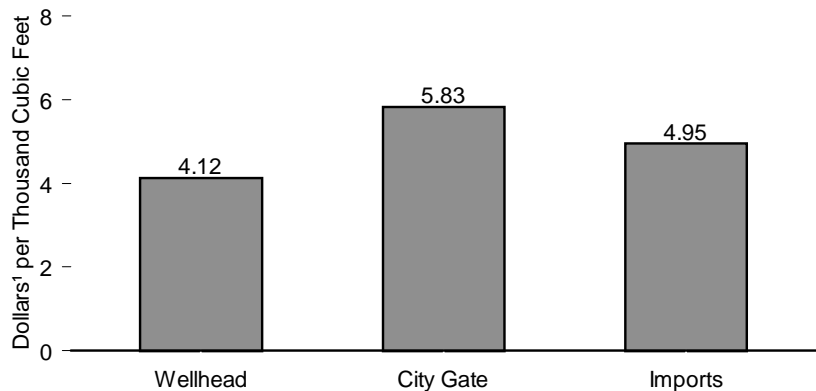
Totals may not equal sum of components due to independent rounding.

Web Page: [http://www.eia.doe.gov/oil\\_gas/natural\\_gas/info\\_glance/natural\\_gas.html](http://www.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html).

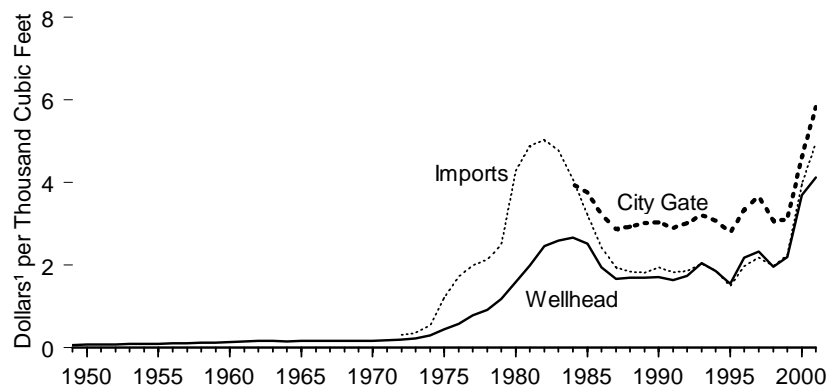
Sources: 1954-1974—American Gas Association, *Gas Facts*. 1975-1978—Federal Energy Administration, Form FEA-G318-M-O, "Underground Gas Storage Report," and Federal Power Commission, Form FPC-8, "Underground Gas Storage Report." 1979-1984—EIA, Form EIA-191, "Underground Gas Storage Report" and Federal Energy Regulatory Commission, Form FERC-8, "Underground Gas Storage Report." 1985-1994—EIA, *Natural Gas Monthly*, monthly reports. 1995 forward—EIA, *Natural Gas Monthly*, (March 2002), Tables 9, 11, and 12.

**Figure 6.7 Natural Gas Wellhead, City Gate, and Imports Prices**

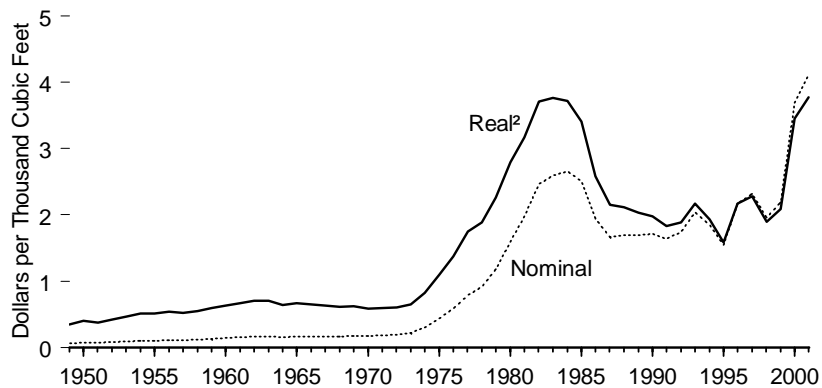
**Wellhead, City Gate, and Imports, 2001**



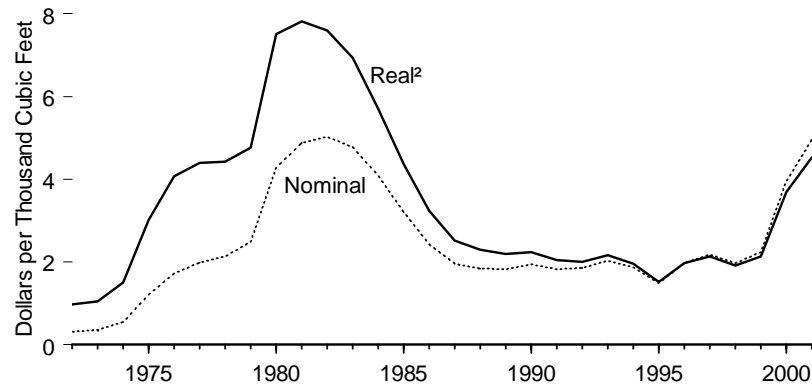
**Wellhead, City Gate, and Imports, 1949-2001**



**Wellhead, 1949-2001**



**Imports, 1972-2001**



<sup>1</sup> Nominal dollars.

<sup>2</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 6.7.

**Table 6.7 Natural Gas Wellhead, City Gate, and Imports Prices, 1949-2001**

(Dollars per Thousand Cubic Feet)

Year	Wellhead <sup>1</sup>		City Gate		Imports	
	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>
1949	0.06	0.35	NA	NA	NA	NA
1950	0.07	0.40	NA	NA	NA	NA
1951	0.07	0.37	NA	NA	NA	NA
1952	0.08	0.42	NA	NA	NA	NA
1953	0.09	0.47	NA	NA	NA	NA
1954	0.10	0.51	NA	NA	NA	NA
1955	0.10	0.51	NA	NA	NA	NA
1956	0.11	0.54	NA	NA	NA	NA
1957	0.11	0.52	NA	NA	NA	NA
1958	0.12	0.55	NA	NA	NA	NA
1959	0.13	0.59	NA	NA	NA	NA
1960	0.14	0.63	NA	NA	NA	NA
1961	0.15	0.67	NA	NA	NA	NA
1962	0.16	0.70	NA	NA	NA	NA
1963	0.16	0.70	NA	NA	NA	NA
1964	0.15	0.64	NA	NA	NA	NA
1965	0.16	0.67	NA	NA	NA	NA
1966	0.16	0.65	NA	NA	NA	NA
1967	0.16	0.63	NA	NA	NA	NA
1968	0.16	0.61	NA	NA	NA	NA
1969	0.17	0.62	NA	NA	NA	NA
1970	0.17	0.58	NA	NA	NA	NA
1971	0.18	0.59	NA	NA	NA	NA
1972	0.19	0.60	NA	NA	0.31	0.97
1973	0.22	0.65	NA	NA	0.35	1.04
1974	0.30	0.82	NA	NA	0.55	1.50
1975	0.44	1.10	NA	NA	1.21	3.02
1976	0.58	1.37	NA	NA	1.72	4.07
1977	0.79	1.75	NA	NA	1.98	4.40
1978	0.91	1.89	NA	NA	2.13	4.42
1979	1.18	2.26	NA	NA	2.49	4.77
1980	1.59	2.79	NA	NA	4.28	7.50
1981	1.98	3.17	NA	NA	4.88	7.82
1982	2.46	3.71	NA	NA	5.03	7.59
1983	2.59	3.76	NA	NA	4.78	6.94
1984	2.66	3.72	3.95	5.53	4.08	5.71
1985	2.51	3.41	3.75	5.09	3.21	4.36
1986	1.94	2.58	3.22	4.28	2.43	3.23
1987	1.67	2.15	2.87	3.70	1.95	2.51
1988	1.69	2.11	2.92	3.64	1.84	2.29
1989	1.69	2.03	3.01	3.61	1.82	2.19
1990	1.71	1.98	3.03	3.50	1.94	2.24
1991	1.64	1.83	2.90	3.23	1.83	2.04
1992	1.74	1.89	3.01	3.28	1.85	2.01
1993	2.04	2.17	3.21	3.41	2.03	2.16
1994	1.85	1.93	3.07	3.20	1.87	1.95
1995	1.55	1.58	2.78	2.83	1.49	1.52
1996	2.17	2.17	3.34	3.34	1.97	1.97
1997	2.32	2.28	3.66	3.59	2.17	2.13
1998	<sup>R</sup> 1.96	<sup>R</sup> 1.90	3.07	2.97	1.97	1.91
1999	<sup>R</sup> 2.19	<sup>R</sup> 2.09	<sup>R</sup> 3.10	<sup>R</sup> 2.96	2.24	2.14
2000	<sup>R</sup> 3.69	<sup>R</sup> 3.45	<sup>R</sup> 4.62	<sup>R</sup> 4.32	<sup>R</sup> 3.95	<sup>R</sup> 3.69
2001	<sup>E</sup> 4.12	<sup>E</sup> 3.77	5.83	5.33	<sup>E</sup> 4.95	<sup>E</sup> 4.53

<sup>1</sup> See Glossary for definition of Natural Gas Wellhead Price.

<sup>2</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Appendix Table E1.

R=Revised. E=Estimate. NA=Not available.

Web Page: [http://www.eia.doe.gov/oil\\_gas/natural\\_gas/info\\_glance/natural\\_gas.html](http://www.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html).

Sources: **Wellhead:** 1949-1994—Energy Information Administration (EIA), *Natural Gas Annual 2000* (November 2001), Table 96. 1995 forward—EIA, *Natural Gas Monthly* (March 2002), Table 4.

**City Gate:** 1984-1994—EIA, *Natural Gas Annual 2000* (November 2001), Table 96. 1995 forward—EIA, *Natural Gas Monthly* (March 2002), Table 4.

**Imports:** 1972 and 1973—Federal Power Commission (FPC), *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG*.

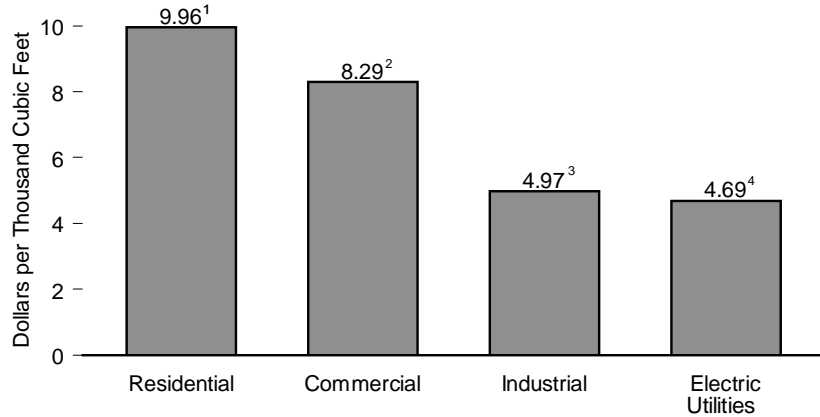
1974-1976—FPC, *United States Imports and Exports of Natural Gas*, annual reports.

1977-1994—EIA, *Natural Gas Annual*, annual reports. 1995 forward—EIA, *Natural Gas Monthly* (March 2002), Table 5.

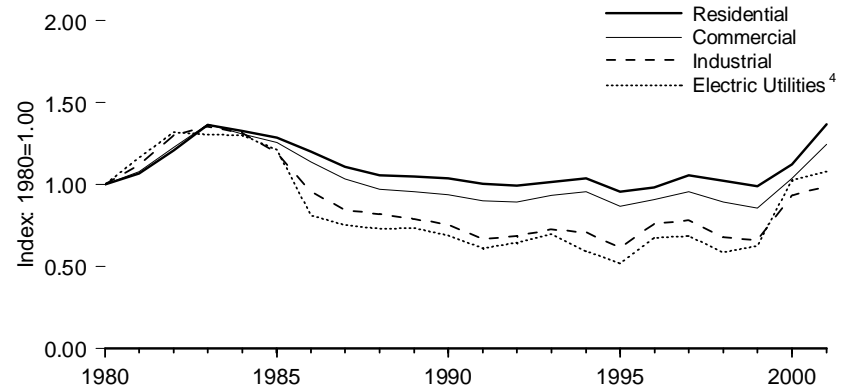


**Figure 6.8 Natural Gas Prices by Sector**

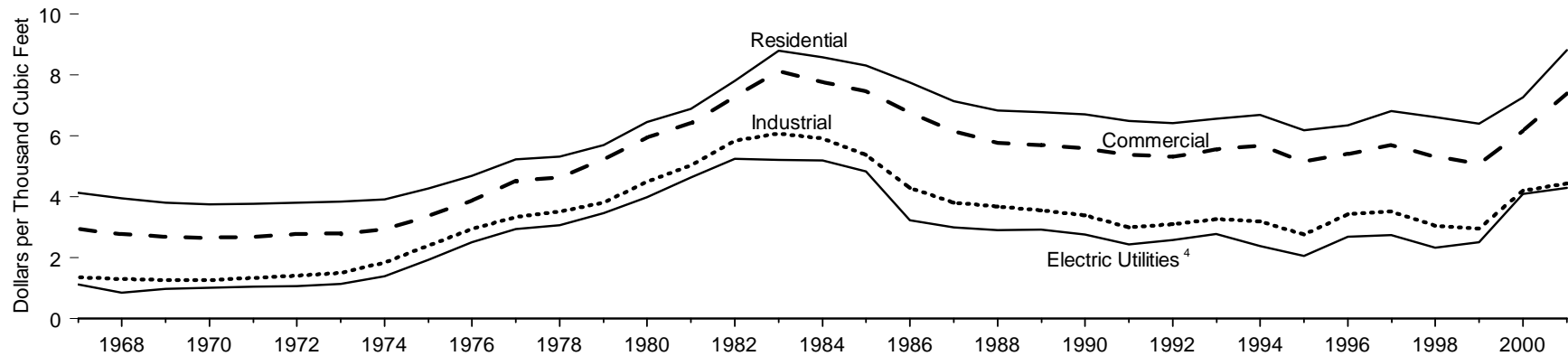
**Nominal Prices, 2001**



**Real Prices,<sup>5</sup> Indexed, 1980-2001**



**Real Prices,<sup>5</sup> 1967-2001**



<sup>1</sup>Based on 92.1 percent of volume delivered.

<sup>2</sup>Based on 62.4 percent of volume delivered.

<sup>3</sup>Based on 16.5 percent of volume delivered.

<sup>4</sup>Based on all steam-electric utility plants with a combined capacity of 50 megawatts or greater.

<sup>5</sup>In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

Source: Table 6.8.

**Table 6.8 Natural Gas Prices by Sector, 1967-2001**

(Price: Dollars per Thousand Cubic Feet; Share of Total Volume Delivered: Percentage)

Year	Residential			Commercial <sup>1</sup>			Industrial <sup>2</sup>			Vehicle Fuel <sup>3</sup>			Electric Utilities	
	Prices		Share of Total Volume Delivered	Prices		Share of Total Volume Delivered	Prices		Share of Total Volume Delivered	Prices		Share of Total Volume Delivered	Prices <sup>4</sup>	
	Nominal	Real <sup>5</sup>		Nominal	Real <sup>5</sup>		Nominal	Real <sup>5</sup>		Nominal	Real <sup>5</sup>		Nominal	Real <sup>5</sup>
1967	1.04	4.13	NA	0.74	2.94	NA	0.34	1.35	NA	NA	NA	NA	0.28	1.11
1968	1.04	3.95	NA	0.73	2.78	NA	0.34	1.29	NA	NA	NA	NA	0.22	0.84
1969	1.05	3.81	NA	0.74	2.68	NA	0.35	1.27	NA	NA	NA	NA	0.27	0.98
1970	1.09	3.75	NA	0.77	2.65	NA	0.37	1.27	NA	NA	NA	NA	0.29	1.00
1971	1.15	3.77	NA	0.82	2.69	NA	0.41	1.34	NA	NA	NA	NA	0.32	1.05
1972	1.21	3.80	NA	0.88	2.77	NA	0.45	1.41	NA	NA	NA	NA	0.34	1.07
1973	1.29	3.84	NA	0.94	2.80	NA	0.50	1.49	NA	NA	NA	NA	0.38	1.13
1974	1.43	3.90	NA	1.07	2.92	NA	0.67	1.83	NA	NA	NA	NA	0.51	1.39
1975	1.71	4.27	NA	1.35	3.37	NA	0.96	2.40	NA	NA	NA	NA	0.77	1.92
1976	1.98	4.68	NA	1.64	3.88	NA	1.24	2.93	NA	NA	NA	NA	1.06	2.51
1977	2.35	5.22	NA	2.04	4.53	NA	1.50	3.33	NA	NA	NA	NA	1.32	2.93
1978	2.56	5.31	NA	2.23	4.62	NA	1.70	3.52	NA	NA	NA	NA	1.48	3.07
1979	2.98	5.70	NA	2.73	5.22	NA	1.99	3.81	NA	NA	NA	NA	1.81	3.46
1980	3.68	6.45	NA	3.39	5.94	NA	2.56	4.49	NA	NA	NA	NA	2.27	3.98
1981	4.29	6.88	NA	4.00	6.41	NA	3.14	5.03	NA	NA	NA	NA	2.89	4.63
1982	5.17	7.80	NA	4.82	7.28	NA	3.87	5.84	85.1	NA	NA	NA	3.48	5.25
1983	6.06	8.80	NA	5.59	8.12	NA	4.18	6.07	80.7	NA	NA	NA	3.58	5.20
1984	6.12	8.57	NA	5.55	7.77	NA	4.22	5.91	74.7	NA	NA	NA	3.70	5.18
1985	6.12	8.31	NA	5.50	7.46	NA	3.95	5.36	68.8	NA	NA	NA	3.55	4.82
1986	5.83	7.74	NA	5.08	6.75	NA	3.23	4.29	59.8	NA	NA	NA	2.43	3.23
1987	5.54	7.14	NA	4.77	6.15	93.1	2.94	3.79	47.4	NA	NA	NA	2.32	2.99
1988	5.47	6.82	NA	4.63	5.77	90.7	2.95	3.68	42.6	NA	NA	NA	2.33	2.90
1989	5.64	6.77	99.9	4.74	5.69	89.1	2.96	3.55	36.9	NA	NA	NA	2.43	2.92
1990	5.80	6.70	99.3	4.83	5.58	86.6	2.93	3.39	35.2	3.39	3.92	NA	2.38	2.75
1991	5.82	6.49	99.2	4.81	5.36	85.1	2.69	3.00	32.7	3.96	4.42	NA	2.18	2.43
1992	5.89	6.41	99.1	4.88	5.31	83.2	2.84	3.09	30.3	4.05	4.41	NA	2.36	2.57
1993	6.16	6.55	99.1	5.22	5.55	83.9	3.07	3.26	29.7	4.27	4.54	87.8	2.61	2.78
1994	6.41	6.68	99.1	5.44	5.67	79.3	3.05	3.18	25.5	4.11	4.28	86.9	2.28	2.37
1995	6.06	6.18	99.1	5.05	5.15	76.7	2.71	2.76	24.5	3.98	4.06	86.6	2.02	2.06
1996	6.34	6.34	99.1	5.40	5.40	77.6	3.42	3.42	19.4	4.34	4.34	94.0	2.69	2.69
1997	6.94	6.81	98.8	5.80	5.69	70.8	3.59	3.52	18.1	4.44	4.36	89.7	2.78	2.73
1998	6.82	6.61	97.7	5.48	5.31	67.0	3.14	3.04	16.1	4.59	4.45	85.4	2.40	2.33
1999	6.69	6.39	95.2	5.33	5.09	66.2	3.10	2.96	17.4	4.34	<sup>R</sup> 4.15	85.6	2.62	2.50
2000	<sup>R</sup> 7.76	<sup>R</sup> 7.25	92.5	<sup>R</sup> 6.59	<sup>R</sup> 6.16	<sup>R</sup> 62.9	<sup>R</sup> 4.48	<sup>R</sup> 4.19	<sup>R</sup> 18.1	<sup>R</sup> 5.54	<sup>R</sup> 5.18	<sup>R</sup> 72.7	<sup>R</sup> 4.38	<sup>R</sup> 4.09
2001	<sup>P</sup> 9.96	<sup>P</sup> 9.11	<sup>E</sup> 92.1	<sup>P</sup> 8.29	<sup>P</sup> 7.58	<sup>E</sup> 62.4	<sup>P</sup> 4.97	<sup>P</sup> 4.54	<sup>E</sup> 16.5	NA	NA	NA	<sup>E</sup> 4.69	<sup>E</sup> 4.29

<sup>1</sup> Includes deliveries to municipalities and public authorities for institutional heating and other purposes.

<sup>2</sup> Most volumes and associated revenues for deliveries to nonutility power producers are included in the industrial sector. In instances where the nonutility is primarily a commercial establishment, volumes and associated revenues are included in the calculation of commercial prices.

<sup>3</sup> Much of the natural gas delivered for vehicle fuel represents deliveries to fueling stations that are used primarily or exclusively by respondents' fleet vehicles. Thus, the prices are often those associated with the operation of fleet vehicles.

<sup>4</sup> Based on all steam-electric utility plants with a combined capacity of 50 megawatts or greater.

<sup>5</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

R=Revised. P=Preliminary. E=Estimate. NA=Not available.

Notes: Natural gas includes supplemental gaseous fuels. Residential, commercial, and industrial price data represent prices of natural gas sold and delivered by local distribution companies to residential, commercial, and industrial consumers, respectively. The data do not reflect prices of natural gas transported for the account of others. The average for each end-use sector is calculated by dividing the total value of the gas consumed by each sector by the total quantity consumed. See Note at end of section.

Web Page: [http://www.eia.doe.gov/oil\\_gas/natural\\_gas/info\\_glance/natural\\_gas.html](http://www.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html).

Sources: **Vehicle Fuel:** 1990-2000—Energy Information Administration (EIA), *Natural Gas Annual*, annual reports. **All Other Data:** 1967-1994—EIA, *Natural Gas Annual*, annual reports. 1995 forward—EIA, *Natural Gas Monthly* (March 2002), Table 4.

## Natural Gas

### Table 6.5 Notes

1. See Table 8.3a for the amount of natural gas used to produce electricity and Table 8.3d for the amount of natural gas used to produce useful thermal output at combined-heat-and-power (CHP) plants. See Appendix G for the “Classification of Power Plants into Energy-Use Sectors,” and Appendix H, “Estimating and Presenting Power Sector Fuel Use in EIA Publications and Analyses,” for a description of revised electric power statistics in this report.

2. Natural gas consumption statistics are compiled from surveys of natural gas production, transmission, and distribution companies and from surveys of electric power generation. Consumption by sector from these surveys is compiled on a national and individual State basis and then balanced with national and individual State supply data. Included in the data are the following: **Residential Sector**—Consumption by private households for space heating, cooking, and other household uses; **Commercial Sector**—Consumption by nonmanufacturing establishments, by municipalities for institutional heating and lighting, and those engaged in agriculture, forestry, and fishing (through 1995). The commercial sector includes generators that produce electricity and/or useful thermal output primarily to support the activities of the above-mentioned commercial establishments; **Industrial Sector**—Consumption by establishments engaged primarily in processing unfinished materials into another form of product (includes mining, petroleum refining, manufacturing, and agriculture, forestry, and fishing (beginning in 1996), and natural gas industry use for lease and plant fuel). The industrial sector includes generators that produce electricity and/or useful thermal output primarily to support the above-mentioned industrial activities; **Transportation Sector**—Natural gas transmission (pipeline) fuel, and natural gas delivered for use as vehicle fuel; and **Electric Power Sector (electric utilities and independent power producers)**—Consumption for electricity generation and useful thermal output at electricity-only and CHP plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants.

3. Prior to 1993, deliveries to nonutility generators were not separately collected from natural gas companies on Form EIA-176, “Annual Report of Natural and Supplemental Gas Supply and Disposition.” As a result, for 1989 through 1992, those volumes are probably included in both the industrial and electric power sectors and double-counted in total consumption.

In 1993, 0.28 trillion cubic feet was reported as delivered to nonutility generators.

4. Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F.

5. Totals may not equal sum of components due to independent rounding.

### Table 6.5 Web Page

[http://www.eia.doe.gov/oil\\_gas\\_/natural\\_gas/info\\_glance/natural\\_gas.html](http://www.eia.doe.gov/oil_gas_/natural_gas/info_glance/natural_gas.html).

### Table 6.5 Sources

**Residential, Commercial Total, and Lease and Plant Fuel 1949-2000; Pipeline Fuel 1950-2000; Other Industrial Total and Total Consumption 1949-1992:** Energy Information Administration (EIA), *Natural Gas Annual 2000* (November 2001), Table 95.

**Residential, Commercial Total, Pipeline Fuel 2001; Other Industrial Total 1993-2001:** EIA, Form EIA-176, “Annual Report of Natural Gas and Supplemental Gas Supply and Disposition.” **Lease and Plant Fuel 2001:** EIA, *Natural Gas Monthly* (May 2002), Table 3.

**CHP and Electric Power Sector:** Tables 8.3b-8.3c. **Vehicle Fuel:** 1990-1991—EIA, *Natural Gas Annual 2000* (November 2001), Table 95. 1992-1995—Science Applications International Corporation, “Alternative Transportation Fuels and Vehicles Data Development,” unpublished final report prepared for EIA (McLean, VA, July 1996) and U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. 1996-2001—EIA, Office of Coal, Nuclear, Electric, and Alternate Fuels.

**All Other Data:** Calculated.

7

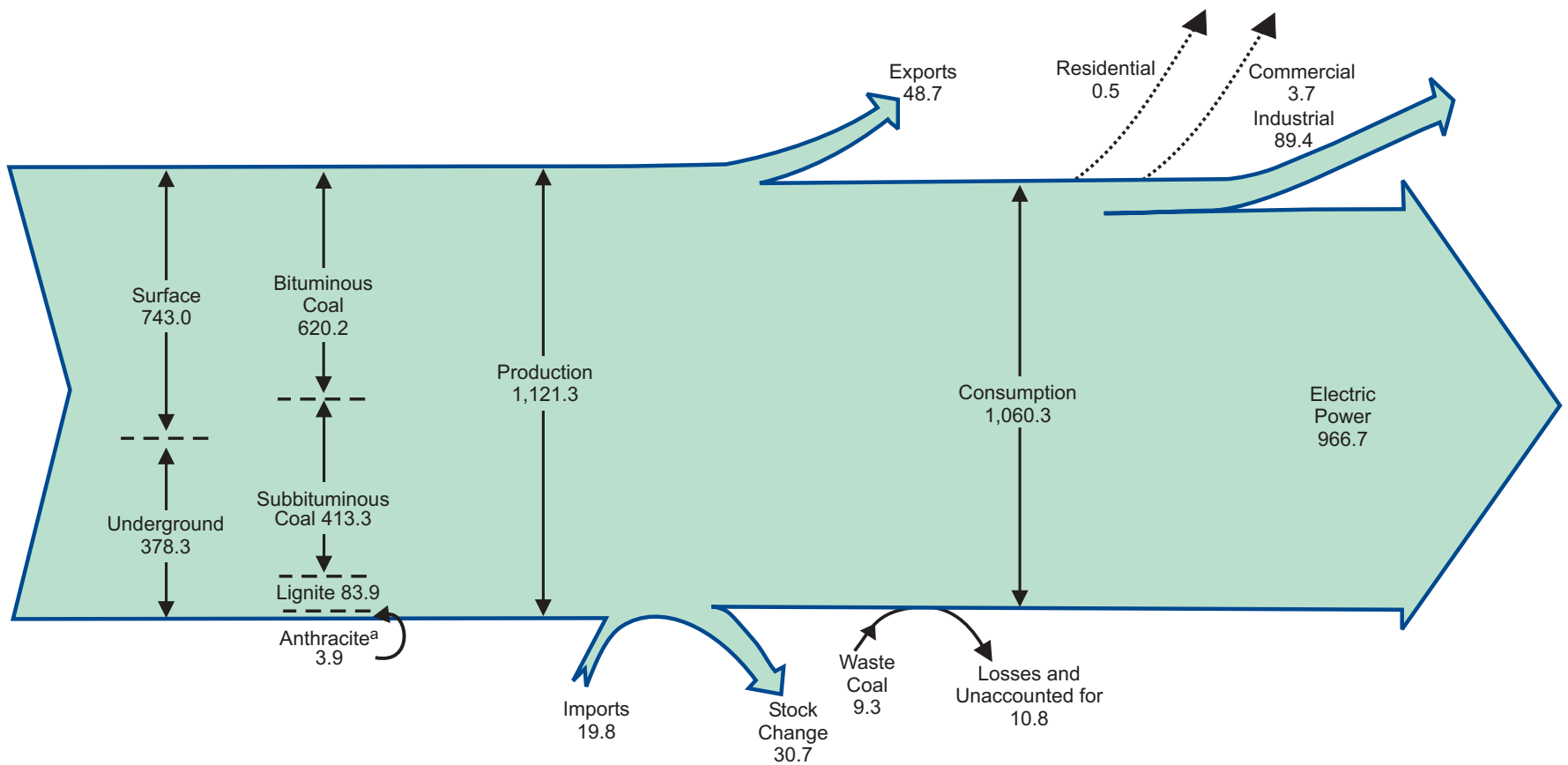
# Coal



Coal yard, Curtis Bay, Maryland. Source: U.S. Department of Energy.



**Diagram 4. Coal Flow, 2001**  
(Million Short Tons)

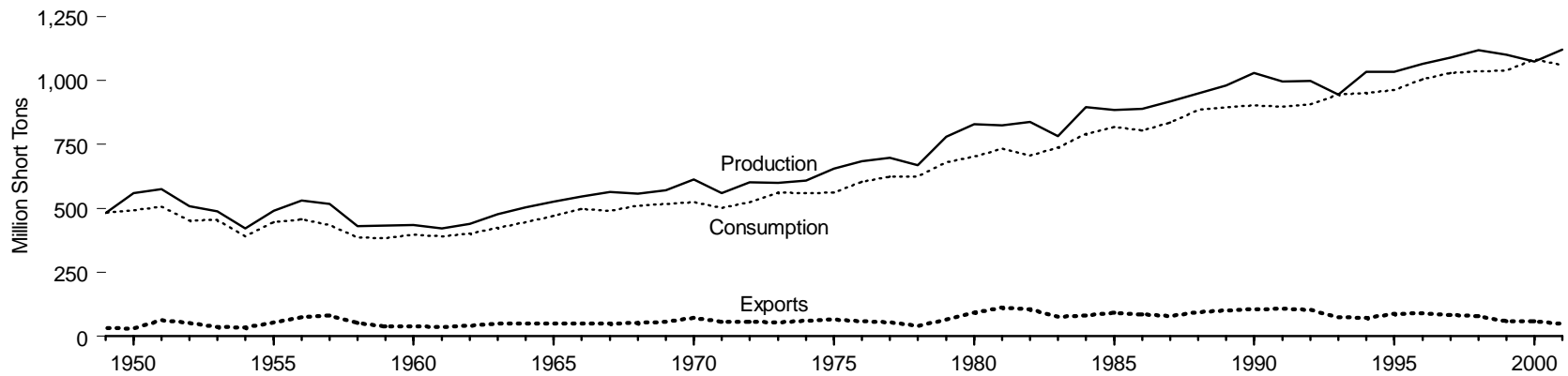


Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.

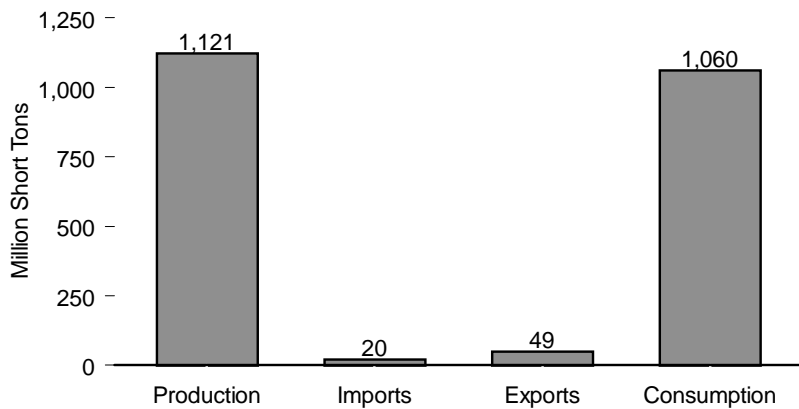
Sources: Tables 7.1, 7.2, and 7.3.

**Figure 7.1 Coal Overview**

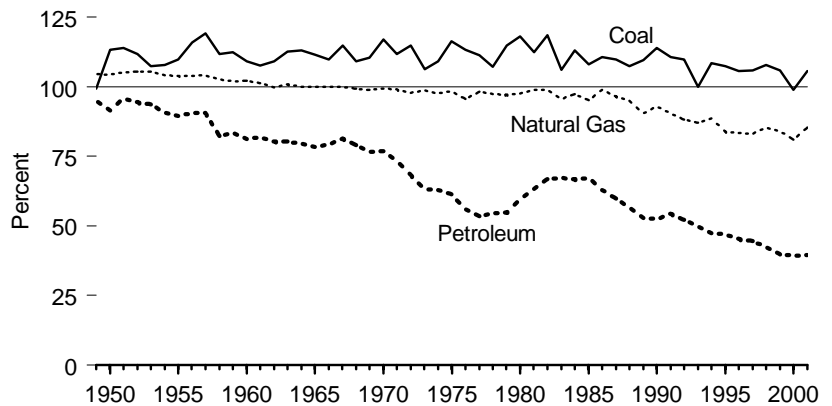
**Overview, 1949-2001**



**Overview, 2001**



**Production as Share of Consumption by Type of Fossil Fuel, 1949-2001**



Sources: Tables 5.1, 6.1, and 7.1.

**Table 7.1 Coal Overview, 1949-2001**  
(Million Short Tons)

Year	Production	Imports	Exports	Stock Change <sup>1</sup>	Waste Coal <sup>2</sup>	Losses and Unaccounted for <sup>3</sup>	Consumption
1949	480.6	0.3	32.8	( 4 )	NA	<sup>5</sup> -35.1	483.2
1950	560.4	0.4	29.4	( 4 )	NA	<sup>5</sup> 9.5	494.1
1951	576.3	0.3	62.7	( 4 )	NA	<sup>5</sup> 5.5	505.9
1952	507.4	0.3	52.2	( 4 )	NA	<sup>5</sup> 0.8	454.1
1953	488.2	0.3	36.5	( 4 )	NA	<sup>5</sup> -6.9	454.8
1954	420.8	0.2	33.9	( 4 )	NA	<sup>5</sup> -8.1	389.9
1955	490.8	0.3	54.4	( 4 )	NA	<sup>5</sup> -6.3	447.0
1956	529.8	0.4	73.8	( 4 )	NA	<sup>5</sup> -10.2	456.9
1957	518.0	0.4	80.8	( 4 )	NA	<sup>5</sup> 0.8	434.5
1958	431.6	0.3	52.6	( 4 )	NA	<sup>5</sup> -1.3	385.7
1959	432.7	0.4	39.0	( 4 )	NA	<sup>5</sup> 9.2	385.1
1960	434.3	0.3	38.0	( 4 )	NA	<sup>5</sup> 1.7	398.1
1961	420.4	0.2	36.4	( 4 )	NA	<sup>5</sup> -4.0	390.4
1962	439.0	0.2	40.2	( 4 )	NA	<sup>5</sup> -1.5	402.3
1963	477.2	0.3	50.4	( 4 )	NA	<sup>5</sup> 3.3	423.5
1964	504.2	0.3	49.5	( 4 )	NA	<sup>5</sup> 4.0	445.7
1965	527.0	0.2	51.0	( 4 )	NA	<sup>5</sup> 2.2	472.0
1966	546.8	0.2	50.1	( 4 )	NA	<sup>5</sup> 2.2	497.7
1967	564.9	0.2	50.1	( 4 )	NA	<sup>5</sup> 4.6	491.4
1968	556.7	0.2	51.2	( 4 )	NA	<sup>5</sup> 3.5	509.8
1969	571.0	0.1	56.9	( 4 )	NA	<sup>5</sup> 2.9	516.4
1970	612.7	(s)	71.7	( 4 )	NA	<sup>5</sup> 6.6	523.2
1971	560.9	0.1	57.3	( 4 )	NA	<sup>5</sup> 4.2	501.6
1972	602.5	(s)	56.7	( 4 )	NA	<sup>5</sup> -4.3	524.3
1973	598.6	0.1	53.6	( 4 )	NA	<sup>5</sup> -17.9	562.6
1974	610.0	2.1	60.7	-8.9	NA	2.0	558.4
1975	654.6	0.9	66.3	32.2	NA	-5.5	562.6
1976	684.9	1.2	60.0	8.5	NA	13.8	603.8
1977	697.2	1.6	54.3	22.6	NA	-3.4	625.3
1978	670.2	3.0	40.7	-4.9	NA	12.1	625.2
1979	781.1	2.1	66.0	36.2	NA	0.4	680.5
1980	829.7	1.2	91.7	25.6	NA	10.8	702.7
1981	823.8	1.0	112.5	-19.0	NA	-1.4	732.6
1982	838.1	0.7	106.3	22.6	NA	3.1	706.9
1983	782.1	1.3	77.8	-29.5	NA	-1.6	736.7
1984	895.9	1.3	81.5	28.7	NA	-4.3	791.3
1985	883.6	2.0	92.7	-27.9	NA	2.8	818.0
1986	890.3	2.2	85.5	4.0	NA	-1.2	804.2
1987	918.8	1.7	79.6	6.5	NA	-2.5	836.9
1988	950.3	2.1	95.0	-24.9	NA	-1.3	883.6
1989	980.7	2.9	100.8	-13.7	P1.4	R2.9	R895.0
1990	1,029.1	2.7	105.8	26.5	P2.1	R-1.4	902.9
1991	996.0	3.4	109.0	-0.9	P4.0	R-3.9	R899.2
1992	997.5	3.8	102.5	-3.0	P6.3	R0.5	R907.7
1993	945.4	8.2	74.5	-51.9	P8.1	R-4.9	R944.1
1994	1,033.5	8.9	71.4	23.6	P8.2	R4.3	R951.3
1995	1,033.0	9.5	88.5	-0.3	P8.6	R0.6	R962.1
1996	1,063.9	8.1	90.5	-17.5	P8.8	R1.4	1,006.3
1997	1,089.9	7.5	83.5	-11.3	P8.1	R3.7	R1,029.5
1998	1,117.5	8.7	78.0	24.2	P8.7	R-4.4	R1,037.1
1999	1,100.4	9.1	58.5	R18.9	P8.7	R2.2	R1,038.6
2000	R1,073.6	12.5	58.5	R-43.5	P9.1	R-3.9	R1,084.1
2001	1,121.3	19.8	48.7	30.7	E9.3	10.8	1,060.3

<sup>1</sup> A negative value indicates a decrease in stocks; a positive value indicates an increase.

<sup>2</sup> Waste coal (including anthracite culm, bituminous gob, fine coal, and lignite waste) consumed by independent power producers. This amount is included here as a supply-side item to balance the same amount of waste coal included in "Consumption."

<sup>3</sup> "Losses and Unaccounted for" is calculated as the sum of production, imports, and waste coal, minus exports, stock change, and consumption.

<sup>4</sup> Included in "Losses and Unaccounted for."

<sup>5</sup> Includes stock change.

R=Revised. P=Preliminary. E=Estimate. NA=Not available. (s)=Less than 0.05 million short tons.

Note: Totals may not equal sum of components due to independent rounding.

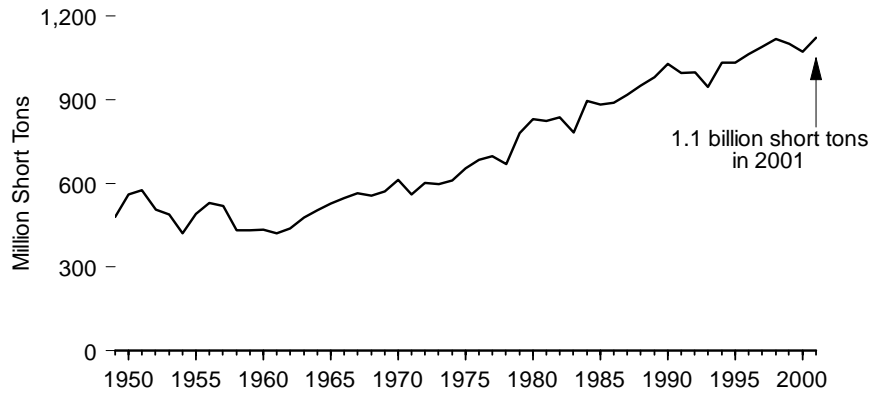
Web Page: <http://www.eia.doe.gov/fuelcoal.html>.

Sources: **Imports:** 1949-forward—Department of Commerce (DOC), U.S. Bureau of the Census, "Monthly Report IM145." **Waste Coal:** 1989-2000—Energy Information Administration (EIA), Form EIA-860B, "Annual Electric Generator Report-Nonutility" and predecessor form. 2001—EIA, Form EIA-906, "Power Plant Report." **All Other Data:** 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. 1976—EIA, Energy Data Report, *Coal-Bituminous and Lignite in 1976 and Coal-Pennsylvania Anthracite 1976*. 1977 and 1978—EIA, Energy Data Reports, *Bituminous Coal and Lignite Production and Mine Operations-1977; 1978 and Coal-Pennsylvania Anthracite 1977; 1978*. 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report*. 1981-1988—EIA, *Weekly Coal Production and Coal Production*, annual reports. 1989 forward—Tables 7.2, 7.3, 7.4, 7.5 of this report.

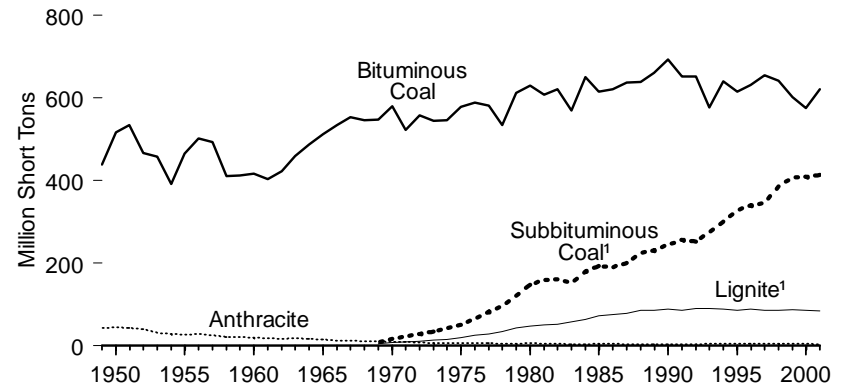


**Figure 7.2 Coal Production, 1949-2001**

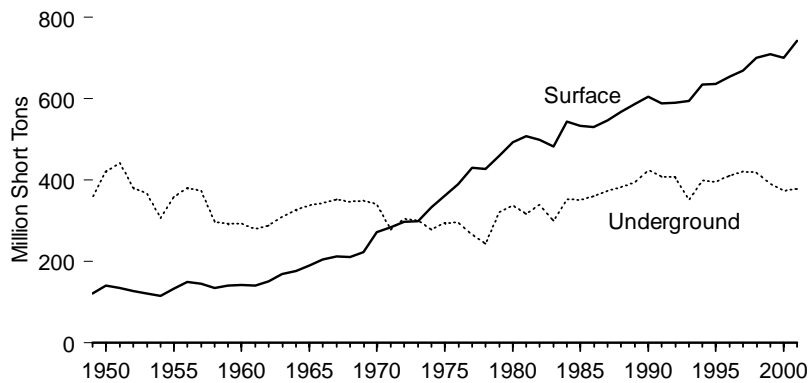
**Total**



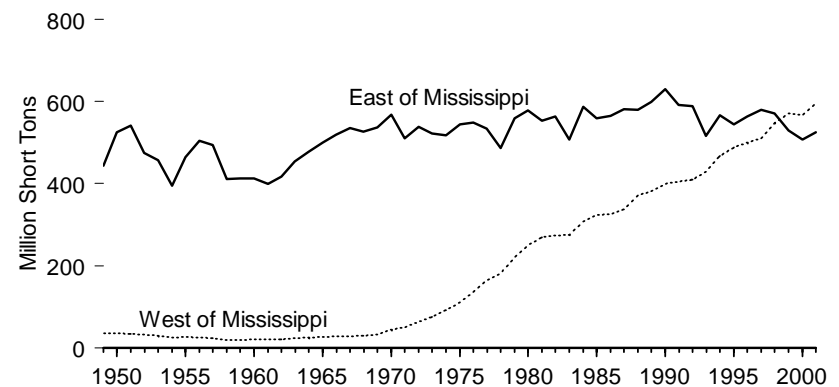
**By Rank**



**By Mining Method**



**By Location**



<sup>1</sup> Included with bituminous coal prior to 1969.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 7.2.

**Table 7.2 Coal Production, 1949-2001**  
(Million Short Tons)

Year	Rank				Mining Method		Location		Total
	Bituminous Coal	Subbituminous Coal	Lignite	Anthracite	Underground	Surface	West of the Mississippi	East of the Mississippi	
1949	437.9	(1)	(1)	42.7	358.9	121.7	36.4	444.2	480.6
1950	516.3	(1)	(1)	44.1	421.0	139.4	36.0	524.4	560.4
1951	533.7	(1)	(1)	42.7	442.2	134.2	34.6	541.7	576.3
1952	466.8	(1)	(1)	40.6	381.2	126.3	32.7	474.8	507.4
1953	457.3	(1)	(1)	30.9	367.4	120.8	30.6	457.7	488.2
1954	391.7	(1)	(1)	29.1	306.0	114.8	25.4	395.4	420.8
1955	464.6	(1)	(1)	26.2	358.0	132.9	26.6	464.2	490.8
1956	500.9	(1)	(1)	28.9	380.8	148.9	25.8	504.0	529.8
1957	492.7	(1)	(1)	25.3	373.6	144.5	24.7	493.4	518.0
1958	410.4	(1)	(1)	21.2	297.6	134.0	20.3	411.3	431.6
1959	412.0	(1)	(1)	20.6	292.8	139.8	20.3	412.4	432.7
1960	415.5	(1)	(1)	18.8	292.6	141.7	21.3	413.0	434.3
1961	403.0	(1)	(1)	17.4	279.6	140.9	21.8	398.6	420.4
1962	422.1	(1)	(1)	16.9	287.9	151.1	21.4	417.6	439.0
1963	458.9	(1)	(1)	18.3	309.0	168.2	23.7	453.5	477.2
1964	487.0	(1)	(1)	17.2	327.7	176.5	25.7	478.5	504.2
1965	512.1	(1)	(1)	14.9	338.0	189.0	27.4	499.5	527.0
1966	533.9	(1)	(1)	12.9	342.6	204.2	28.0	518.8	546.8
1967	552.6	(1)	(1)	12.3	352.4	212.5	28.9	536.0	564.9
1968	545.2	(1)	(1)	11.5	346.6	210.1	29.7	527.0	556.7
1969	547.2	8.3	5.0	10.5	349.2	221.7	33.3	537.7	571.0
1970	578.5	16.4	8.0	9.7	340.5	272.1	44.9	567.8	612.7
1971	521.3	22.2	8.7	8.7	277.2	283.7	51.0	509.9	560.9
1972	556.8	27.5	11.0	7.1	305.0	297.4	64.3	538.2	602.5
1973	543.5	33.9	14.3	6.8	300.1	298.5	76.4	522.1	598.6
1974	545.7	42.2	15.5	6.6	278.0	332.1	91.9	518.1	610.0
1975	577.5	51.1	19.8	6.2	293.5	361.2	110.9	543.7	654.6
1976	588.4	64.8	25.5	6.2	295.5	389.4	136.1	548.8	684.9
1977	581.0	82.1	28.2	5.9	266.6	430.6	163.9	533.3	697.2
1978	534.0	96.8	34.4	5.0	242.8	427.4	183.0	487.2	670.2
1979	612.3	121.5	42.5	4.8	320.9	460.2	221.4	559.7	781.1
1980	628.8	147.7	47.2	6.1	337.5	492.2	251.0	578.7	829.7
1981	608.0	159.7	50.7	5.4	316.5	507.3	269.9	553.9	823.8
1982	620.2	160.9	52.4	4.6	339.2	499.0	273.9	564.3	838.1
1983	568.6	151.0	58.3	4.1	300.4	481.7	274.7	507.4	782.1
1984	649.5	179.2	63.1	4.2	352.1	543.9	308.3	587.6	895.9
1985	613.9	192.7	72.4	4.7	350.8	532.8	324.9	558.7	883.6
1986	620.1	189.6	76.4	4.3	360.4	529.9	325.9	564.4	890.3
1987	636.6	200.2	78.4	3.6	372.9	545.9	336.8	581.9	918.8
1988	638.1	223.5	85.1	3.6	382.2	568.1	370.7	579.6	950.3
1989	659.8	231.2	86.4	3.3	393.8	586.9	381.7	599.0	980.7
1990	693.2	244.3	88.1	3.5	424.5	604.5	398.9	630.2	1,029.1
1991	650.7	255.3	86.5	3.4	407.2	588.8	404.7	591.3	996.0
1992	651.8	252.2	90.1	3.5	407.2	590.3	409.0	588.6	997.5
1993	576.7	274.9	89.5	4.3	351.1	594.4	429.2	516.2	945.4
1994	640.3	300.5	88.1	4.6	399.1	634.4	467.2	566.3	1,033.5
1995	613.8	328.0	86.5	4.7	396.2	636.7	488.7	544.2	1,033.0
1996	630.7	340.3	88.1	4.8	409.8	654.0	500.2	563.7	1,063.9
1997	653.8	345.1	86.3	4.7	420.7	669.3	510.6	579.4	1,089.9
1998	<sup>R</sup> 640.6	<sup>R</sup> 385.9	85.8	5.3	417.7	699.8	547.0	570.6	1,117.5
1999	<sup>R</sup> 601.7	<sup>R</sup> 406.7	87.2	4.8	391.8	708.6	<sup>R</sup> 570.8	529.6	1,100.4
2000	<sup>R</sup> 574.3	<sup>R</sup> 409.2	<sup>R</sup> 85.6	<sup>R</sup> 4.6	<sup>R</sup> 373.7	<sup>R</sup> 700.0	<sup>R</sup> 566.1	<sup>R</sup> 507.5	<sup>R</sup> 1,073.6
2001	<sup>E</sup> 620.2	<sup>E</sup> 413.3	<sup>E</sup> 83.9	<sup>E</sup> 3.9	<sup>E</sup> 378.3	<sup>E</sup> 743.0	<sup>E</sup> 595.6	<sup>E</sup> 525.7	<sup>P</sup> 1,121.3

<sup>1</sup> Included in bituminous coal.

R=Revised. P=Preliminary. E=Estimate.

Note: Totals may not equal sum of components due to independent rounding.

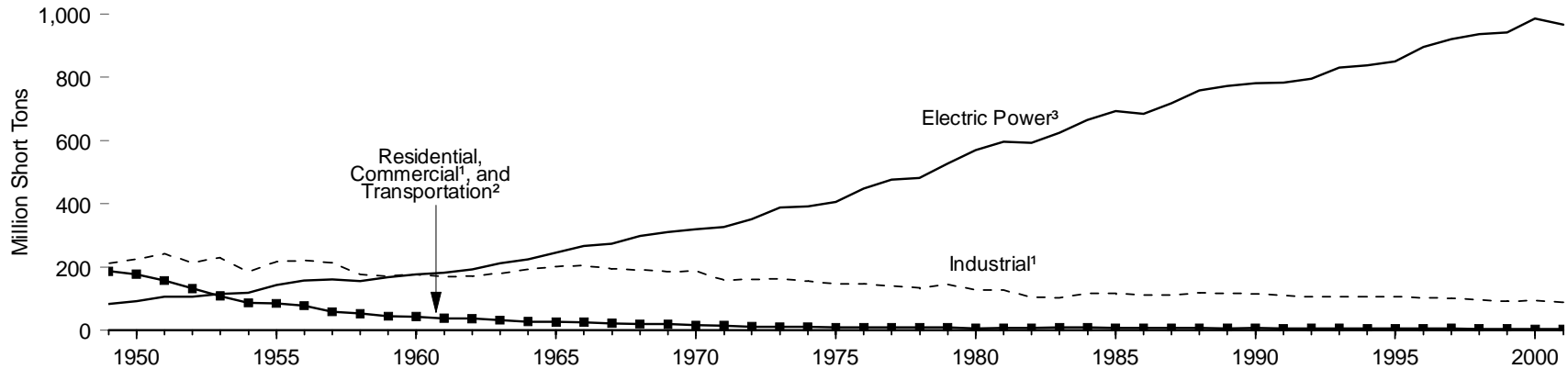
Web Page: <http://www.eia.doe.gov/fuelcoal.html>.

Sources: 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. 1976—Energy Information Administration (EIA), *Energy Data Report, Coal-Bituminous and Lignite in 1976 and Coal-Pennsylvania Anthracite 1976*. 1977 and

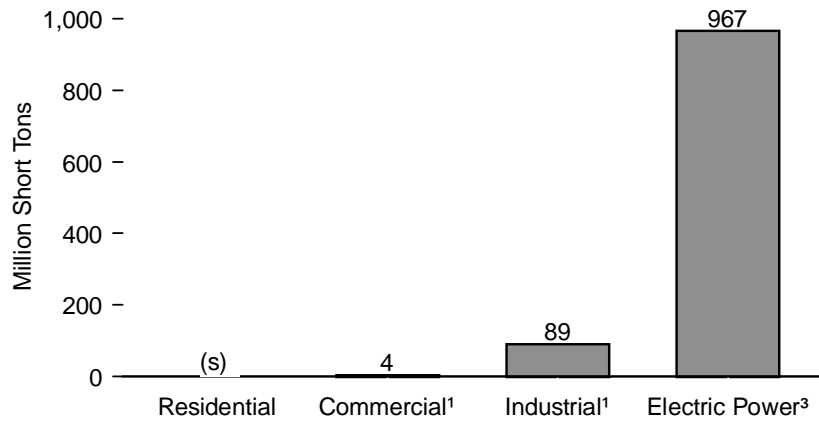
1978—EIA, *Energy Data Report, Bituminous Coal and Lignite Production and Mine Operations-1977; 1978, Coal-Pennsylvania Anthracite 1977; 1978, and Coal Production*, annual reports. 1979 and 1980—EIA, *Energy Data Report, Weekly Coal Report and Coal Production*, annual reports. 1981-1988—EIA, *Weekly Coal Production and Coal Production*, annual reports. 1989-2000—EIA, *Coal Industry Annual*, annual reports. **Rank, Mining Method, Location:** 2001—EIA estimates. **Total:** 2001—EIA, *Quarterly Coal Report October-December (May 2002)*.

**Figure 7.3 Coal Consumption by Sector**

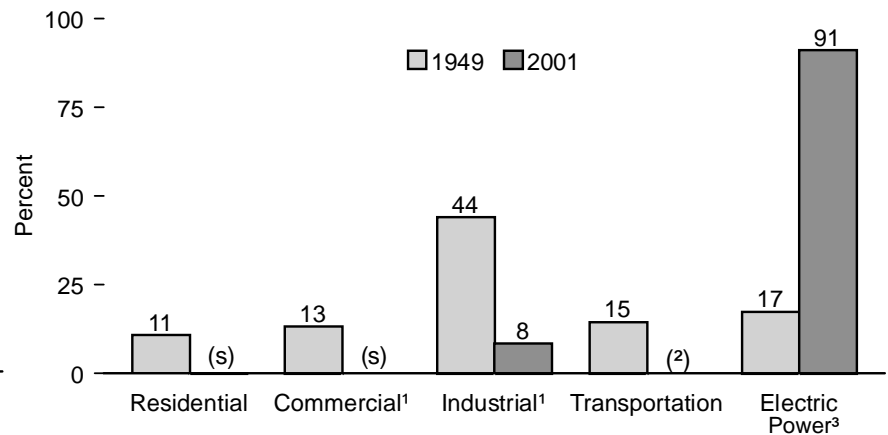
**By Sector, 1949-2001**



**By Sector, 2001**



**Sector Shares, 1949 and 2001**



<sup>1</sup> Includes combined-heat-and-power plants and a small number of electricity-only plants.

<sup>2</sup> For 1978 forward, small amounts of transportation sector use are included in "Industrial."

<sup>3</sup> Electricity-only and combined-heat-and-power plants whose primary business is to sell electricity, or electricity and heat, to the public.

(s)=Less than 0.5 million short tons or less than 0.5 percent, as appropriate.

Source: Table 7.3.

**Table 7.3 Coal Consumption by Sector, 1949-2001**

(Million Short Tons)

Year	End-Use Sectors											Electric Power Sector <sup>1,2</sup>			Total
	Residential	Commercial			Industrial			Transportation	Total	Electricity Only	CHP	Total			
		CHP <sup>3</sup>	Other <sup>4</sup>	Total	Coke Plants	Other Industrial							Total		
						CHP <sup>5</sup>	Non-CHP <sup>6</sup>								
1949	52.4	(7)	64.1	64.1	91.4	(8)	121.2	121.2	212.6	70.2	399.3	84.0	(9)	84.0	483.2
1950	51.6	(7)	63.0	63.0	104.0	(8)	120.6	120.6	224.6	63.0	402.2	91.9	(9)	91.9	494.1
1951	46.7	(7)	54.8	54.8	113.7	(8)	128.7	128.7	242.4	56.2	400.1	105.8	(9)	105.8	505.9
1952	44.3	(7)	48.0	48.0	97.8	(8)	117.1	117.1	214.9	39.8	347.0	107.1	(9)	107.1	454.1
1953	38.8	(7)	40.4	40.4	113.1	(8)	117.0	117.0	230.1	29.6	338.9	115.9	(9)	115.9	454.8
1954	35.2	(7)	33.8	33.8	85.6	(8)	98.2	98.2	183.9	18.6	271.6	118.4	(9)	118.4	389.9
1955	35.6	(7)	32.9	32.9	107.7	(8)	110.1	110.1	217.8	17.0	303.3	143.8	(9)	143.8	447.0
1956	34.0	(7)	30.2	30.2	106.3	(8)	114.3	114.3	220.6	13.8	298.6	158.3	(9)	158.3	456.9
1957	27.0	(7)	22.1	22.1	108.4	(8)	106.5	106.5	214.9	9.8	273.7	160.8	(9)	160.8	434.5
1958	26.8	(7)	21.1	21.1	76.8	(8)	100.5	100.5	177.4	4.7	230.0	155.7	(9)	155.7	385.7
1959	23.7	(7)	17.1	17.1	79.6	(8)	92.7	92.7	172.3	3.6	216.6	168.4	(9)	168.4	385.1
1960	24.2	(7)	16.8	16.8	81.4	(8)	96.0	96.0	177.4	3.0	221.4	176.7	(9)	176.7	398.1
1961	22.0	(7)	15.3	15.3	74.2	(8)	95.9	95.9	170.1	0.8	208.2	182.2	(9)	182.2	390.4
1962	21.2	(7)	15.3	15.3	74.7	(8)	97.1	97.1	171.7	0.7	208.9	193.3	(9)	193.3	402.3
1963	18.2	(7)	13.2	13.2	78.1	(8)	101.9	101.9	180.0	0.7	212.1	211.3	(9)	211.3	423.5
1964	15.8	(7)	11.4	11.4	89.2	(8)	103.1	103.1	192.4	0.7	220.2	225.4	(9)	225.4	445.7
1965	14.9	(7)	10.8	10.8	95.3	(8)	105.6	105.6	200.8	0.7	227.2	244.8	(9)	244.8	472.0
1966	14.6	(7)	11.0	11.0	96.4	(8)	108.7	108.7	205.1	0.6	231.3	266.5	(9)	266.5	497.7
1967	12.6	(7)	9.5	9.5	92.8	(8)	101.8	101.8	194.6	0.5	217.2	274.2	(9)	274.2	491.4
1968	11.4	(7)	8.6	8.6	91.3	(8)	100.4	100.4	191.6	0.4	212.0	297.8	(9)	297.8	509.8
1969	10.6	(7)	8.3	8.3	93.4	(8)	93.1	93.1	186.6	0.3	205.8	310.6	(9)	310.6	516.4
1970	9.0	(7)	7.1	7.1	96.5	(8)	90.2	90.2	186.6	0.3	203.0	320.2	(9)	320.2	523.2
1971	7.6	(7)	7.6	7.6	83.2	(8)	75.6	75.6	158.9	0.2	174.3	327.3	(9)	327.3	501.6
1972	5.0	(7)	6.7	6.7	87.7	(8)	72.9	72.9	160.6	0.2	172.5	351.8	(9)	351.8	524.3
1973	4.1	(7)	7.0	7.0	94.1	(8)	68.0	68.0	162.1	0.1	173.4	389.2	(9)	389.2	562.6
1974	3.7	(7)	7.8	7.8	90.2	(8)	64.9	64.9	155.1	0.1	166.6	391.8	(9)	391.8	558.4
1975	2.8	(7)	6.6	6.6	83.6	(8)	63.6	63.6	147.2	(s)	156.7	406.0	(9)	406.0	562.6
1976	2.6	(7)	6.3	6.3	84.7	(8)	61.8	61.8	146.5	(s)	155.4	448.4	(9)	448.4	603.8
1977	2.5	(7)	6.4	6.4	77.7	(8)	61.5	61.5	139.2	(s)	148.2	477.1	(9)	477.1	625.3
1978	2.2	(7)	7.3	7.3	71.4	(8)	63.1	63.1	134.5	(s)	144.0	481.2	(9)	481.2	625.2
1979	1.7	(7)	6.7	6.7	77.4	(8)	67.7	67.7	145.1	(s)	153.5	527.1	(9)	527.1	680.5
1980	1.4	(7)	5.1	5.1	66.7	(8)	60.3	60.3	127.0	(s)	133.5	569.3	(9)	569.3	702.7
1981	1.3	(7)	6.1	6.1	61.0	(8)	67.4	67.4	128.4	(s)	135.8	596.8	(9)	596.8	732.6
1982	1.4	(7)	6.8	6.8	40.9	(8)	64.1	64.1	105.0	(s)	113.2	593.7	(9)	593.7	706.9
1983	1.4	(7)	7.1	7.1	37.0	(8)	66.0	66.0	103.0	(s)	111.5	625.2	(9)	625.2	736.7
1984	1.6	(7)	7.5	7.5	44.0	(8)	73.7	73.7	117.8	(s)	126.9	664.4	(9)	664.4	791.3
1985	1.6	(7)	6.2	6.2	41.1	(8)	75.4	75.4	116.4	(s)	124.2	693.8	(9)	693.8	818.0
1986	1.5	(7)	6.1	6.1	35.9	(8)	75.6	75.6	111.5	(s)	119.2	685.1	(9)	685.1	804.2
1987	1.4	(7)	5.5	5.5	37.0	(8)	75.2	75.2	112.1	(s)	119.0	717.9	(9)	717.9	836.9
1988	1.4	(7)	5.8	5.8	41.9	(8)	76.3	76.3	118.1	(s)	125.3	758.4	(9)	758.4	883.6
1989	1.2	P1.1	3.9	5.0	40.5	P24.9	51.3	76.1	116.6	(s)	122.8	2,P767.4	9,P4.8	2,P772.2	R895.0
1990	R1.2	P1.2	4.3	R5.5	38.9	P24.9	51.5	76.3	115.2	(s)	121.9	P774.2	9,P6.8	P781.0	902.9
1991	1.0	P1.2	3.9	5.1	33.9	P27.0	48.4	75.4	109.3	(s)	115.4	P773.2	9,P10.7	P783.9	R899.2
1992	1.0	P1.2	3.9	5.1	32.4	P28.2	45.8	74.0	106.4	(s)	112.6	P781.2	9,P13.9	P795.1	R907.7
1993	1.1	P1.4	3.8	5.2	31.3	P28.9	46.0	74.9	106.2	(s)	112.4	P816.6	9,P15.1	P831.6	R944.1
1994	0.9	P1.3	3.8	5.1	31.7	P29.7	45.5	75.2	106.9	(s)	112.9	P821.2	9,P17.1	P838.4	R951.3
1995	0.8	P1.4	3.6	5.1	33.0	P29.4	43.7	73.1	106.1	(s)	111.9	P832.9	9,P17.3	P850.2	R962.1
1996	0.7	P1.7	3.6	5.3	31.7	P29.4	42.3	71.7	103.4	(s)	109.4	P878.8	9,P18.1	P896.9	1,006.3
1997	0.7	P1.7	4.0	5.8	30.2	P29.9	41.7	71.5	101.7	(s)	108.2	P904.2	9,P17.1	P921.4	R1,029.5
1998	R0.5	P1.4	2.9	4.3	28.2	P28.6	38.9	67.4	95.6	(s)	100.5	P920.4	9,P16.3	P936.6	R1,037.1
1999	0.6	P1.5	2.8	4.3	28.1	P27.8	37.0	R64.7	R92.8	(s)	R97.7	P924.7	9,P16.2	P940.9	R1,038.6
2000	R0.5	P1.5	2.1	R3.7	R28.9	P28.0	37.2	R65.2	R94.1	(s)	R98.3	P967.1	9,P18.7	P985.8	R1,084.1
2001	0.5	E1.5	2.2	3.7	26.1	E28.1	35.3	63.4	89.4	(s)	93.6	P948.0	9,E18.8	P966.7	1,060.3

<sup>1</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants.

<sup>2</sup> Through 1988, data are for consumption at electric utilities only. Beginning in 1989, data also include consumption at independent power producers.

<sup>3</sup> Commercial combined-heat-and-power (CHP) and a small number of commercial electricity-only plants, such as those at hospitals and universities. See Appendix G for commercial sector NAICS codes.

<sup>4</sup> All commercial sector fuel use other than that in "Commercial CHP."

<sup>5</sup> Industrial combined-heat-and-power (CHP) and a small number of industrial electricity-only plants. See Appendix G for industrial sector NAICS codes.

<sup>6</sup> All industrial sector fuel use other than that in "Coke Plants" and "Industrial CHP."

<sup>7</sup> Included in "Commercial Other."

<sup>8</sup> Included in "Industrial Non-CHP."

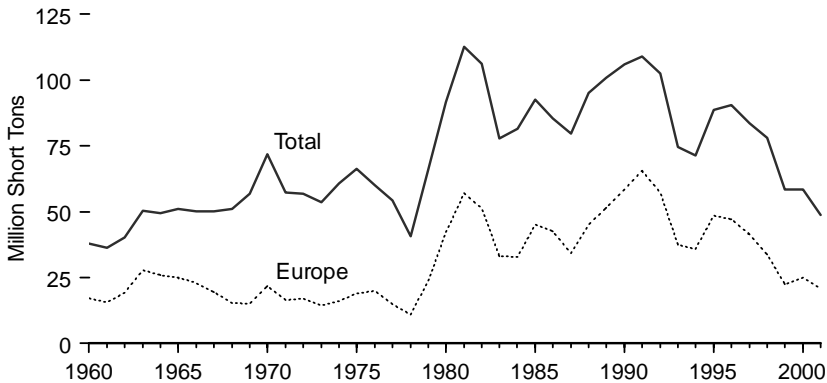
<sup>9</sup> Electric utility CHP plants are included in "Electricity Only."

R=Revised. P=Preliminary. E=Estimate. (s)=Less than 0.05 million short tons.

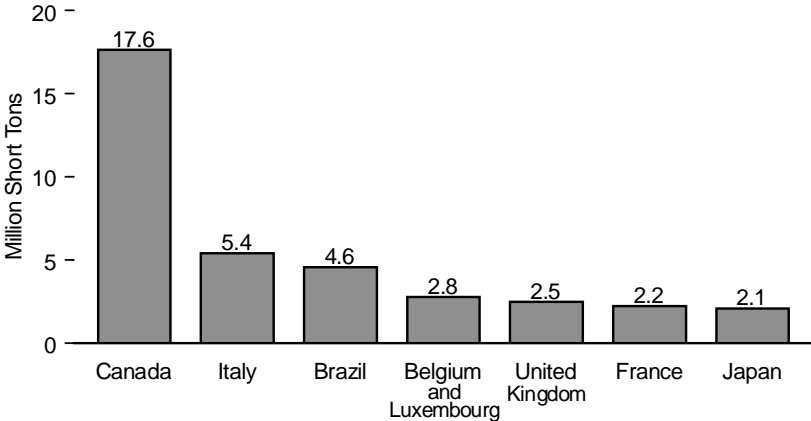
Notes, Web Page, and Sources: See end of section.

**Figure 7.4 Coal Exports by Country of Destination**

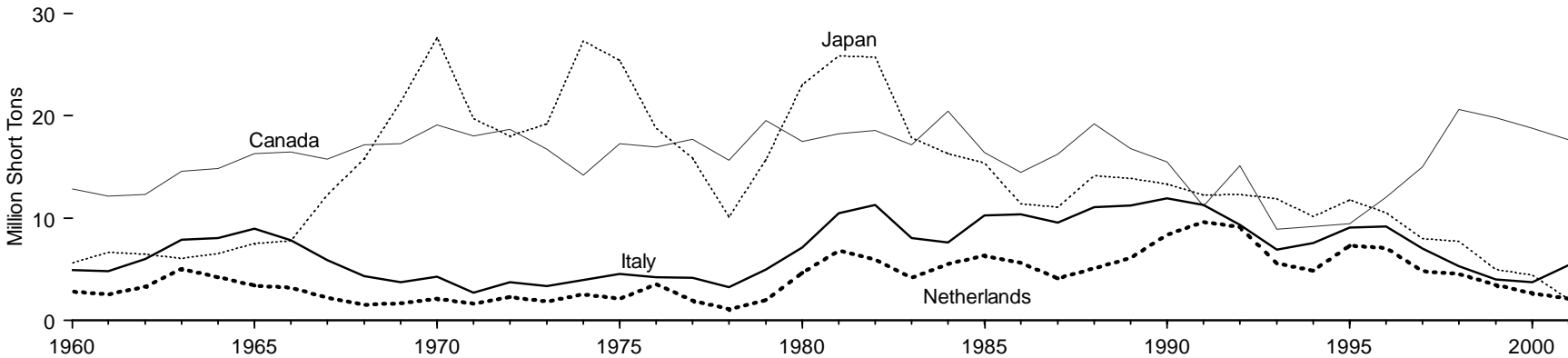
**Total and Europe, 1960-2001**



**By Selected Country, 2001**



**By Selected Country, 1960-2001**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 7.4.

**Table 7.4 Coal Exports by Country of Destination, 1960-2001**  
(Million Short Tons)

Year	Canada	Brazil	Europe										Japan	Other	Total
			Belgium and Luxembourg	Denmark	France	Germany <sup>1</sup>	Italy	Netherlands	Spain	United Kingdom	Other	Total			
1960	12.8	1.1	1.1	0.1	0.8	4.6	4.9	2.8	0.3	0.0	2.4	17.1	5.6	1.3	38.0
1961	12.1	1.0	1.0	0.1	0.7	4.3	4.8	2.6	0.2	0.0	2.0	15.7	6.6	1.0	36.4
1962	12.3	1.3	1.3	(s)	0.9	5.1	6.0	3.3	0.8	(s)	1.8	19.1	6.5	1.0	40.2
1963	14.6	1.2	2.7	(s)	2.7	5.6	7.9	5.0	1.5	0.0	2.4	27.7	6.1	0.9	50.4
1964	14.8	1.1	2.3	(s)	2.2	5.2	8.1	4.2	1.4	0.0	2.6	26.0	6.5	1.1	49.5
1965	16.3	1.2	2.2	(s)	2.1	4.7	9.0	3.4	1.4	(s)	2.3	25.1	7.5	0.9	51.0
1966	16.5	1.7	1.8	(s)	1.6	4.9	7.8	3.2	1.2	(s)	2.5	23.1	7.8	1.0	50.1
1967	15.8	1.7	1.4	0.0	2.1	4.7	5.9	2.2	1.0	0.0	2.1	19.4	12.2	1.0	50.1
1968	17.1	1.8	1.1	0.0	1.5	3.8	4.3	1.5	1.5	0.0	1.9	15.5	15.8	0.9	51.2
1969	17.3	1.8	0.9	0.0	2.3	3.5	3.7	1.6	1.8	0.0	1.3	15.2	21.4	1.2	56.9
1970	19.1	2.0	1.9	0.0	3.6	5.0	4.3	2.1	3.2	(s)	1.8	21.8	27.6	1.2	71.7
1971	18.0	1.9	0.8	0.0	3.2	2.9	2.7	1.6	2.6	1.7	1.1	16.6	19.7	1.1	57.3
1972	18.7	1.9	1.1	0.0	1.7	2.4	3.7	2.3	2.1	2.4	1.1	16.9	18.0	1.2	56.7
1973	16.7	1.6	1.2	0.0	2.0	1.6	3.3	1.8	2.2	0.9	1.3	14.4	19.2	1.6	53.6
1974	14.2	1.3	1.1	0.0	2.7	1.5	3.9	2.6	2.0	1.4	0.9	16.1	27.3	1.8	60.7
1975	17.3	2.0	0.6	0.0	3.6	2.0	4.5	2.1	2.7	1.9	1.6	19.0	25.4	2.6	66.3
1976	16.9	2.2	2.2	(s)	3.5	1.0	4.2	3.5	2.5	0.8	2.1	19.9	18.8	2.1	60.0
1977	17.7	2.3	1.5	0.1	2.1	0.9	4.1	2.0	1.6	0.6	2.1	15.0	15.9	3.5	54.3
1978	15.7	1.5	1.1	0.0	1.7	0.6	3.2	1.1	0.8	0.4	2.2	11.0	10.1	2.5	40.7
1979	19.5	2.8	3.2	0.2	3.9	2.6	5.0	2.0	1.4	1.4	4.4	23.9	15.7	4.1	66.0
1980	17.5	3.3	4.6	1.7	7.8	2.5	7.1	4.7	3.4	4.1	6.0	41.9	23.1	6.0	91.7
1981	18.2	2.7	4.3	3.9	9.7	4.3	10.5	6.8	6.4	2.3	8.8	57.0	25.9	8.7	112.5
1982	18.6	3.1	4.8	2.8	9.0	2.3	11.3	5.9	5.6	2.0	7.6	51.3	25.8	7.5	106.3
1983	17.2	3.6	2.5	1.7	4.2	1.5	8.1	4.2	3.3	1.2	6.4	33.1	17.9	6.1	77.8
1984	20.4	4.7	3.9	0.6	3.8	0.9	7.6	5.5	2.3	2.9	5.3	32.8	16.3	7.2	81.5
1985	16.4	5.9	4.4	2.2	4.5	1.1	10.3	6.3	3.5	2.7	10.3	45.1	15.4	9.9	92.7
1986	14.5	5.7	4.4	2.1	5.4	0.8	10.4	5.6	2.6	2.9	8.4	42.6	11.4	11.4	85.5
1987	16.2	5.8	4.6	0.9	2.9	0.5	9.5	4.1	2.5	2.6	6.6	34.2	11.1	12.3	79.6
1988	19.2	5.3	6.5	2.8	4.3	0.7	11.1	5.1	2.5	3.7	8.5	45.1	14.1	11.3	95.0
1989	16.8	5.7	7.1	3.2	6.5	0.7	11.2	6.1	3.3	4.5	8.9	51.6	13.8	12.9	100.8
1990	15.5	5.8	8.5	3.2	6.9	1.1	11.9	8.4	3.8	5.2	9.5	58.4	13.3	12.7	105.8
1991	11.2	7.1	7.5	4.7	9.5	1.7	11.3	9.6	4.7	6.2	10.4	65.5	12.3	13.0	109.0
1992	15.1	6.4	7.2	3.8	8.1	1.0	9.3	9.1	4.5	5.6	8.5	57.3	12.3	11.4	102.5
1993	8.9	5.2	5.2	0.3	4.0	0.5	6.9	5.6	4.1	4.1	6.9	37.6	11.9	11.0	74.5
1994	9.2	5.5	4.9	0.5	2.9	0.3	7.5	4.9	4.1	3.4	7.3	35.8	10.2	10.7	71.4
1995	9.4	6.4	4.5	2.1	3.7	2.0	9.1	7.3	4.7	4.7	10.7	48.6	11.8	12.4	88.5
1996	12.0	6.5	4.6	1.3	3.9	1.1	9.2	7.1	4.1	6.2	9.8	47.2	10.5	14.2	90.5
1997	15.0	7.5	4.3	0.4	3.4	0.9	7.0	4.8	4.1	7.2	9.2	41.3	8.0	11.8	83.5
1998	20.7	6.5	3.2	0.3	3.2	1.2	5.3	4.5	3.2	5.9	6.9	33.8	7.7	9.4	78.0
1999	19.8	4.4	2.1	0.0	2.5	0.6	4.0	3.4	2.5	3.2	4.3	22.5	5.0	6.7	58.5
2000	18.8	4.5	2.9	0.1	3.0	1.0	3.7	2.6	2.7	3.3	5.7	25.0	4.4	5.8	58.5
2001	17.6	4.6	2.8	0.0	2.2	0.9	5.4	2.1	1.6	2.5	3.3	20.8	2.1	3.6	48.7

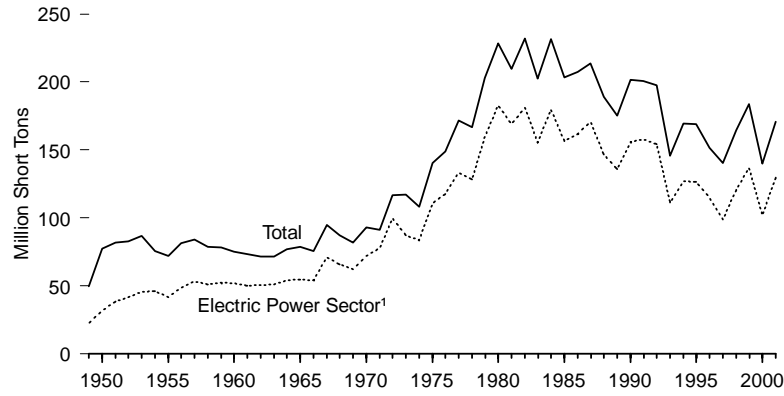
<sup>1</sup> Through 1990, the data for Germany are for the former West Germany only. Beginning with 1991, the data for Germany are for the unified Germany, i.e., the former East Germany and West Germany.  
(s)=Less than 0.05 million short tons.

Note: Totals may not equal sum of components due to independent rounding.

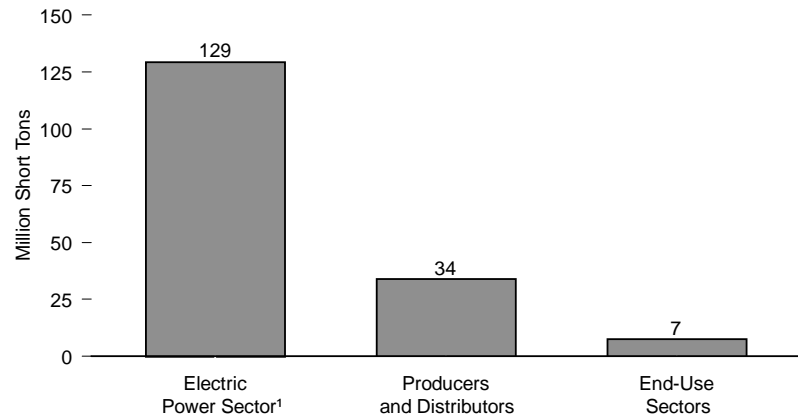
Sources: 1960-1988—U.S. Department of Commerce, Bureau of the Census. *U.S. Exports by Schedule B Commodities, EM 522*. 1989-2000—Energy Information Administration, *Coal Industry Annual*, annual reports. 2001—U.S. Department of Commerce, Bureau of the Census, "Monthly Report EM545."

**Figure 7.5 Coal Stocks**

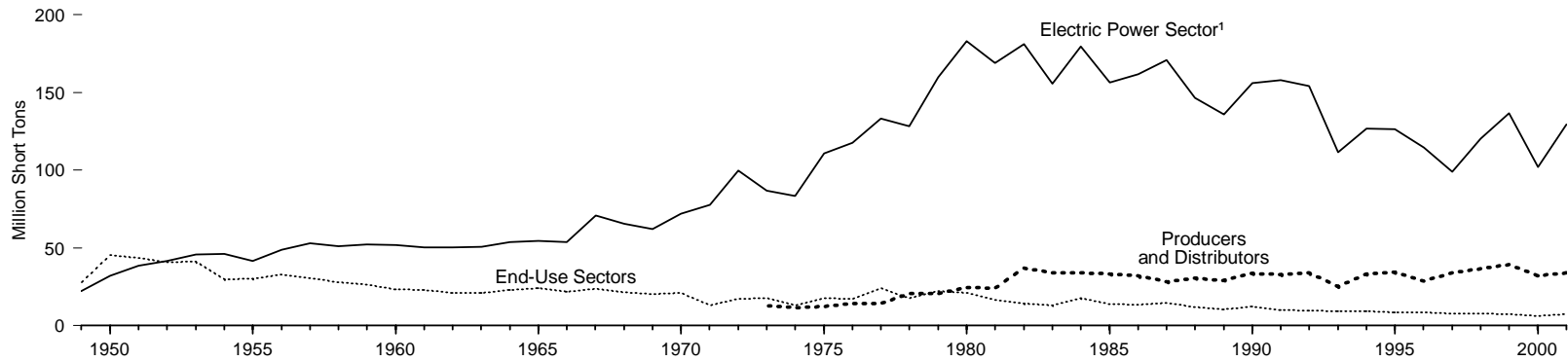
**Total and Electric Power Sector Stocks, 1949-2001**



**By Holding Entity, 2001**



**By Holding Entity, 1949-2001**



<sup>1</sup> Electricity-only and combined-heat-and-power plants whose primary business is to sell electricity, or electricity and heat, to the public.

Notes: Stocks are at end of year. Because vertical scales differ, graphs should not be compared.

Source: Table 7.5.

**Table 7.5 Coal Stocks by Sector, 1949-2001**  
(Million Short Tons)

Year	Producers and Distributors	End-Use Sectors				Electric Power Sector <sup>2,3</sup>	Total	
		Residential and Commercial	Industrial		Total			
			Coke Plants	Other <sup>1</sup>				
1949	NA	1.4	10.0	16.1	26.0	27.4	22.1	49.5
1950	NA	2.5	16.8	26.2	43.0	45.5	31.8	77.3
1951	NA	1.8	15.3	26.2	41.6	43.3	38.5	81.8
1952	NA	1.7	14.5	24.7	39.2	40.9	41.5	82.4
1953	NA	1.5	16.6	22.8	39.4	40.9	45.6	86.6
1954	NA	0.8	12.4	16.4	28.8	29.6	46.1	75.7
1955	NA	1.0	13.4	15.9	29.3	30.3	41.4	71.7
1956	NA	1.1	14.0	17.4	31.5	32.6	48.8	81.3
1957	NA	0.9	14.2	15.5	29.7	30.7	53.1	83.7
1958	NA	0.9	13.1	13.7	26.7	27.7	51.0	78.7
1959	NA	1.0	11.6	13.6	25.2	26.2	52.1	78.4
1960	NA	0.7	11.1	11.6	22.8	23.4	51.7	75.2
1961	NA	0.5	10.5	11.9	22.4	22.9	50.1	73.0
1962	NA	0.5	8.4	12.0	20.4	20.9	50.4	71.3
1963	NA	0.5	8.1	12.3	20.4	20.9	50.6	71.5
1964	NA	0.4	10.2	12.2	22.5	22.8	53.9	76.7
1965	NA	0.4	10.6	13.1	23.8	24.1	54.5	78.6
1966	NA	0.2	9.3	12.2	21.5	21.7	53.9	75.6
1967	NA	0.2	11.1	12.3	23.4	23.6	71.0	94.6
1968	NA	0.2	9.7	11.7	21.3	21.5	65.5	87.0
1969	NA	0.2	9.1	10.8	19.9	20.0	61.9	81.9
1970	NA	0.3	9.0	11.8	20.8	21.1	71.9	93.0
1971	NA	0.3	7.3	5.6	12.9	13.2	77.8	91.0
1972	NA	0.3	9.1	7.6	16.7	17.0	99.7	116.8
1973	12.5	0.3	7.0	10.4	17.4	17.7	87.0	117.2
1974	11.6	0.3	6.2	6.6	12.8	13.1	83.5	108.2
1975	12.1	0.2	8.8	8.5	17.3	17.6	110.7	140.4
1976	14.2	0.2	9.9	7.1	17.0	17.2	117.4	148.9
1977	14.2	0.2	12.8	11.1	23.9	24.1	133.2	171.5
1978	20.7	0.4	8.3	9.0	17.3	17.7	128.2	166.6
1979	20.8	0.3	10.2	11.8	21.9	22.3	159.7	202.8
1980	24.4	NA	9.1	12.0	21.0	21.0	183.0	228.4
1981	24.1	NA	6.5	9.9	16.4	16.4	168.9	209.4
1982	36.8	NA	4.6	9.5	14.1	14.1	181.1	232.0
1983	33.9	NA	4.3	8.7	13.1	13.1	155.6	202.6
1984	34.1	NA	6.2	11.3	17.5	17.5	179.7	231.3
1985	33.1	NA	3.4	10.4	13.9	13.9	156.4	203.4
1986	32.1	NA	3.0	10.4	13.4	13.4	161.8	207.3
1987	28.3	NA	3.9	10.8	14.7	14.7	170.8	213.8
1988	30.4	NA	3.1	8.8	11.9	11.9	146.5	188.8
1989	29.0	NA	2.9	7.4	10.2	10.2	135.9	175.1
1990	33.4	NA	3.3	8.7	12.0	12.0	156.2	201.6
1991	33.0	NA	2.8	7.1	9.8	9.8	157.9	200.7
1992	34.0	NA	2.6	7.0	9.6	9.6	154.1	197.7
1993	25.3	NA	2.4	6.7	9.1	9.1	111.3	145.7
1994	33.2	NA	2.7	6.6	9.2	9.2	126.9	169.4
1995	34.4	NA	2.6	5.7	8.3	8.3	126.3	169.1
1996	28.6	NA	2.7	5.7	8.4	8.4	114.6	151.6
1997	34.0	NA	2.0	5.6	7.6	7.6	98.8	140.4
1998	36.5	NA	2.0	5.5	7.6	7.6	120.5	164.6
1999	39.5	NA	1.9	5.6	7.5	7.5	<sup>3,RP</sup> 136.5	<sup>R</sup> 183.5
2000	<sup>R</sup> 31.9	NA	<sup>R</sup> 1.5	<sup>R</sup> 4.6	<sup>R</sup> 6.1	<sup>R</sup> 6.1	<sup>RP</sup> 102.0	<sup>R</sup> 140.0
2001	33.9	NA	1.5	5.9	7.4	7.4	<sup>P</sup> 129.4	170.7

<sup>1</sup> Includes transportation sector.

<sup>2</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants.

<sup>3</sup> Through 1998, data are for stocks at electric utilities only. Beginning in 1999, data also include stocks at independent power producers.

R=Revised. P=Preliminary. NA=Not available.

Notes: Stocks are at end of year. Totals may not equal sum of components due to independent rounding.

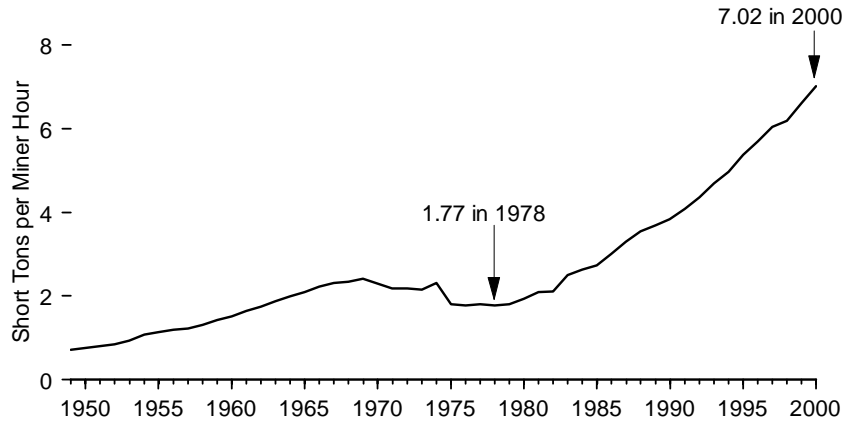
Web Page: <http://www.eia.doe.gov/fuelcoal.html>.

Sources: **Producers and Distributors, End-Use Sectors, and Total Stocks:** 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. 1976—Energy Information Administration (EIA), *Energy Data Report, Coal-Bituminous and Lignite in 1976 and Coal-Pennsylvania Anthracite 1976*. 1977 and 1978—EIA, *Energy Data Report, Coal-Pennsylvania Anthracite 1977, 1978, and Weekly Coal Report*. 1979—EIA, *Energy Data Report, Weekly Coal Report*. 1980-2001—EIA, *Quarterly Coal Report October-December*, quarterly reports. **Electric Power Sector:** Table 8.4.

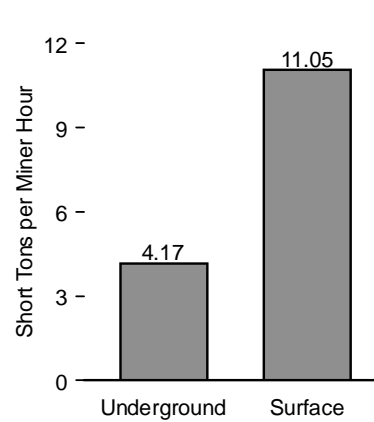


**Figure 7.6 Coal Mining Productivity**

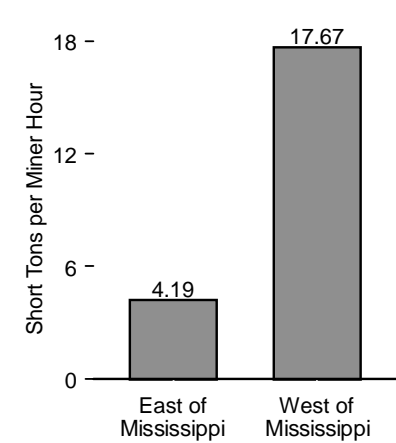
**Total, 1949-2000**



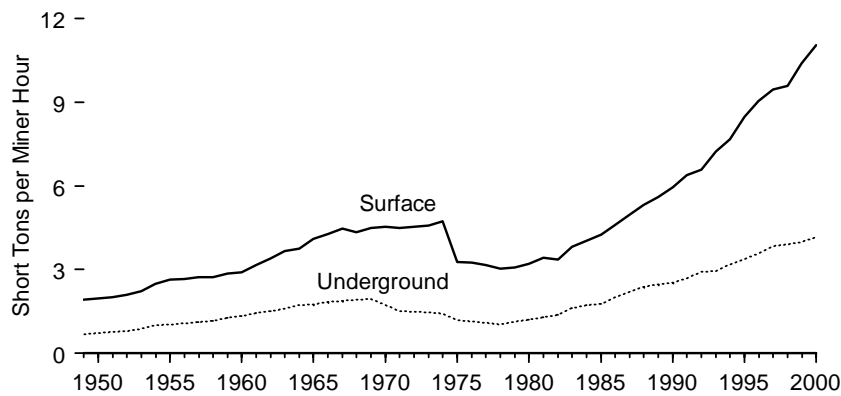
**Mining Methods, 2000**



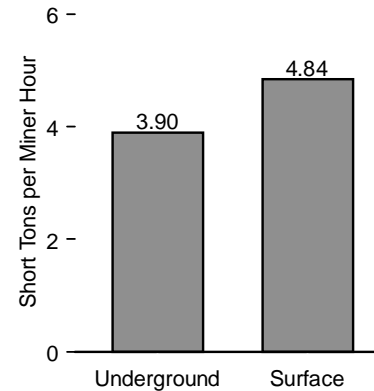
**Location, 2000**



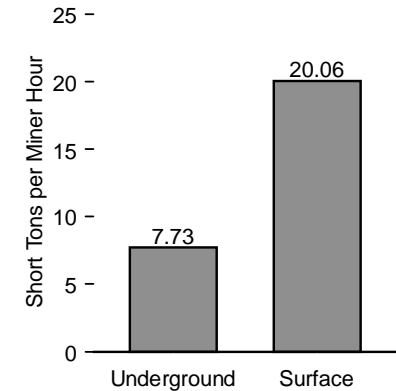
**Mining Method,<sup>1</sup> 1949-2000**



**East of Mississippi, 2000**



**West of Mississippi, 2000**



<sup>1</sup> For 1979 forward, includes all coal; prior to 1979, excludes anthracite.  
 Note: Because vertical scales differ, graphs should not be compared.

Source: Table 7.6.

**Table 7.6 Coal Mining Productivity, 1949-2000**

(Short Tons per Miner Hour <sup>1</sup>)

Year	Mining Method		Location						Total
	Underground	Surface	East of the Mississippi			West of the Mississippi			
			Underground	Surface	Total	Underground	Surface	Total	
1949	20.68	21.92	NA	NA	NA	NA	NA	NA	0.72
1950	20.72	21.96	NA	NA	NA	NA	NA	NA	0.76
1951	20.76	22.00	NA	NA	NA	NA	NA	NA	0.80
1952	20.80	22.10	NA	NA	NA	NA	NA	NA	0.84
1953	20.88	22.22	NA	NA	NA	NA	NA	NA	0.93
1954	21.00	22.48	NA	NA	NA	NA	NA	NA	1.08
1955	21.04	22.65	NA	NA	NA	NA	NA	NA	1.14
1956	21.08	22.67	NA	NA	NA	NA	NA	NA	1.19
1957	21.11	22.73	NA	NA	NA	NA	NA	NA	1.23
1958	21.17	22.73	NA	NA	NA	NA	NA	NA	1.31
1959	21.26	22.87	NA	NA	NA	NA	NA	NA	1.43
1960	21.33	22.91	NA	NA	NA	NA	NA	NA	1.52
1961	21.43	23.16	NA	NA	NA	NA	NA	NA	1.64
1962	21.50	23.40	NA	NA	NA	NA	NA	NA	1.74
1963	21.60	23.66	NA	NA	NA	NA	NA	NA	1.87
1964	21.72	23.76	NA	NA	NA	NA	NA	NA	1.99
1965	21.75	24.10	NA	NA	NA	NA	NA	NA	2.09
1966	21.83	24.28	NA	NA	NA	NA	NA	NA	2.23
1967	21.88	24.48	NA	NA	NA	NA	NA	NA	2.31
1968	21.93	24.33	NA	NA	NA	NA	NA	NA	2.35
1969	21.95	24.50	NA	NA	NA	NA	NA	NA	2.41
1970	21.72	24.53	NA	NA	NA	NA	NA	NA	2.30
1971	21.50	24.49	NA	NA	NA	NA	NA	NA	2.19
1972	21.49	24.54	NA	NA	NA	NA	NA	NA	2.18
1973	21.46	24.58	NA	NA	NA	NA	NA	NA	2.16
1974	21.41	24.74	NA	NA	NA	NA	NA	NA	2.31
1975	21.19	23.26	NA	NA	NA	NA	NA	NA	1.81
1976	21.14	23.25	NA	NA	NA	NA	NA	NA	1.78
1977	21.09	23.16	NA	NA	NA	NA	NA	NA	1.80
1978	21.04	23.03	NA	NA	NA	NA	NA	NA	1.77
1979	1.13	3.08	NA	NA	NA	NA	NA	NA	1.81
1980	1.20	3.21	NA	NA	NA	NA	NA	NA	1.93
1981	1.29	3.42	NA	NA	NA	NA	NA	NA	2.10
1982	1.37	3.36	NA	NA	NA	NA	NA	NA	2.11
1983	1.61	3.81	NA	NA	NA	NA	NA	NA	2.50
1984	1.72	4.03	1.69	2.56	1.98	2.49	8.15	7.07	2.64
1985	1.78	4.24	1.75	2.52	2.00	2.45	8.61	7.40	2.74
1986	2.00	4.60	1.96	2.75	2.21	2.80	9.02	7.90	3.01
1987	2.20	4.98	2.16	2.97	2.42	3.39	9.86	8.73	3.30
1988	2.38	5.32	2.32	2.99	2.54	3.55	10.73	9.38	3.55
1989	2.46	5.61	2.39	3.13	2.63	3.92	11.86	10.21	3.70
1990	2.54	5.94	2.46	3.32	2.73	4.01	12.26	10.41	3.83
1991	2.69	6.38	2.59	3.49	2.86	4.53	12.36	10.79	4.09
1992	2.93	6.59	2.82	3.61	3.07	4.85	12.49	11.03	4.36
1993	2.95	7.23	2.81	3.74	3.11	5.18	13.94	12.14	4.70
1994	3.19	7.67	3.02	3.85	3.28	5.93	15.19	13.22	4.98
1995	3.39	8.48	3.19	4.03	3.45	6.32	16.23	14.18	5.38
1996	3.57	9.05	3.36	4.25	3.63	7.03	17.89	15.66	5.69
1997	3.83	9.46	3.63	4.49	3.89	6.82	18.63	16.04	6.04
1998	R3.90	R9.58	R3.69	R4.31	R3.89	R6.76	R18.82	R16.27	R6.20
1999	R3.99	R10.39	R3.74	R4.48	R3.97	R7.45	R19.57	R17.18	R6.61
2000 <sup>P</sup>	4.17	11.05	3.90	4.84	4.19	7.73	20.06	17.67	7.02

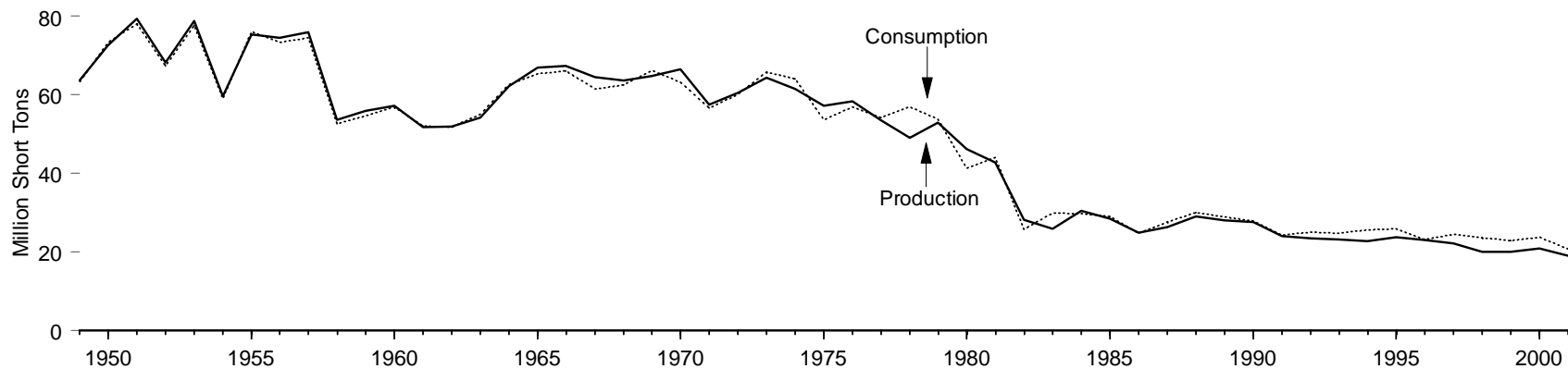
<sup>1</sup> Data for bituminous, subbituminous, and lignite mines 1949-1973 and anthracite mines 1949-1978 were originally reported in short tons per miner-day. The data were converted to short-tons per miner-hour by assuming an eight-hour day. All remaining data were calculated by dividing total production by total labor hours worked by all mine employees except office workers.

<sup>2</sup> Anthracite mining productivity is unavailable by underground and surface but is included in the Total. R=Revised. P=Preliminary. NA=Not available. Web Page: <http://www.eia.doe.gov/fuelcoal.html>.

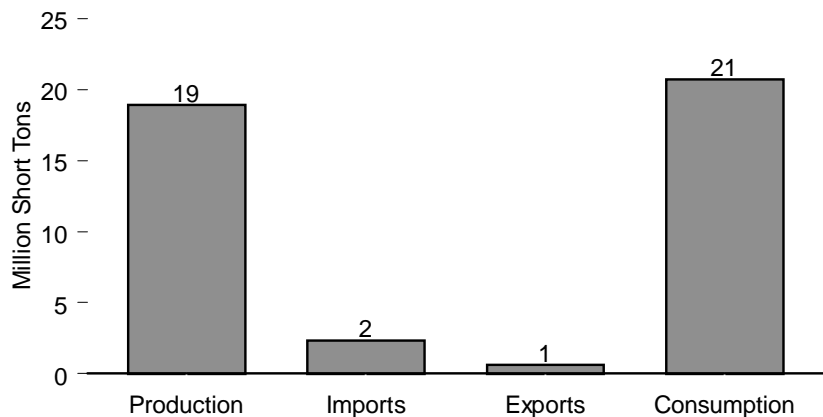
Sources: 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. 1976—Energy Information Administration (EIA), *Energy Data Report, Coal-Bituminous and Lignite in 1976 and Coal-Pennsylvania Anthracite 1976*. 1977 and 1978—EIA, *Energy Data Report, Bituminous Coal and Lignite Production and Mine Operations-1977; 1978 and Coal-Pennsylvania Anthracite 1977; 1978*. 1979—EIA, *Energy Data Report, Coal Production-1979*. 1980-1988—EIA, *Coal Production*, annual reports. 1989 forward—EIA, *Coal Industry Annual*, annual reports.

**Figure 7.7 Coke Overview**

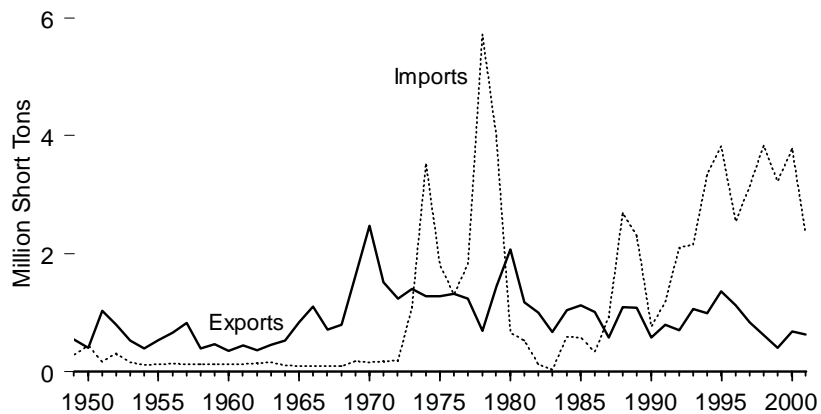
**Production and Consumption, 1949-2001**



**Overview, 2001**



**Trade, 1949-2001**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 7.7.

**Table 7.7 Coke Overview, 1949-2001**  
(Million Short Tons)

Year	Production	Imports	Exports	Stock Change <sup>1</sup>	Consumption <sup>2</sup>
1949	63.6	0.3	0.5	0.2	63.2
1950	72.7	0.4	0.4	-0.7	73.4
1951	79.3	0.2	1.0	0.4	78.1
1952	68.3	0.3	0.8	0.4	67.4
1953	78.8	0.2	0.5	0.8	77.7
1954	59.7	0.1	0.4	0.3	59.1
1955	75.3	0.1	0.5	-1.2	76.1
1956	74.5	0.1	0.7	0.6	73.3
1957	76.0	0.1	0.8	0.8	74.4
1958	53.6	0.1	0.4	0.7	52.7
1959	55.9	0.1	0.5	0.9	54.7
1960	57.2	0.1	0.4	0.1	56.9
1961	51.7	0.1	0.4	-0.7	52.1
1962	51.9	0.1	0.4	-0.1	51.8
1963	54.3	0.2	0.5	-1.0	55.0
1964	62.1	0.1	0.5	-0.9	62.6
1965	66.9	0.1	0.8	0.7	65.4
1966	67.4	0.1	1.1	0.4	66.0
1967	64.6	0.1	0.7	2.4	61.6
1968	63.7	0.1	0.8	0.5	62.4
1969	64.8	0.2	1.6	-2.9	66.2
1970	66.5	0.2	2.5	1.0	63.2
1971	57.4	0.2	1.5	-0.6	56.7
1972	60.5	0.2	1.2	-0.6	60.0
1973	64.3	1.1	1.4	-1.7	65.8
1974	61.6	3.5	1.3	-0.2	64.1
1975	57.2	1.8	1.3	4.1	53.7
1976	58.3	1.3	1.3	1.5	56.8
1977	53.5	1.8	1.2	(s)	54.1
1978	49.0	5.7	0.7	-2.9	56.9
1979	52.9	4.0	1.4	1.7	53.8
1980	46.1	0.7	2.1	3.4	41.3
1981	42.8	0.5	1.2	-1.9	44.0
1982	28.1	0.1	1.0	1.5	25.8
1983	25.8	(s)	0.7	-4.7	29.9
1984	30.4	0.6	1.0	0.2	29.7
1985	28.4	0.6	1.1	-1.2	29.1
1986	24.9	0.3	1.0	-0.5	24.7
1987	26.3	0.9	0.6	-1.0	27.7
1988	28.9	2.7	1.1	0.5	30.0
1989	28.0	2.3	1.1	0.3	28.9
1990	27.6	0.8	0.6	(s)	27.8
1991	24.0	1.2	0.8	0.2	24.2
1992	23.4	2.1	0.7	-0.2	25.0
1993	23.2	2.2	1.1	-0.4	24.7
1994	22.7	3.3	1.0	-0.5	25.6
1995	23.7	3.8	1.4	0.4	25.8
1996	23.1	2.5	<sup>R</sup> 1.1	<sup>R</sup> 1.3	<sup>R</sup> 23.2
1997	22.1	3.1	<sup>R</sup> 0.8	(s)	<sup>R</sup> 24.5
1998	20.0	3.8	<sup>R</sup> 0.6	-0.4	<sup>R</sup> 23.6
1999	20.0	3.2	<sup>R</sup> 0.4	-0.1	<sup>R</sup> 22.9
2000	<sup>R</sup> 20.8	3.8	<sup>R</sup> 0.7	0.2	<sup>R</sup> 23.7
2001 <sup>P</sup>	18.9	2.3	0.6	-0.1	20.8

<sup>1</sup> Producer and distributor stocks at end of year. A negative value indicates a net decrease in stocks; a positive value indicates a net increase in stocks.

<sup>2</sup> "Consumption" is calculated as the sum of production and imports minus exports and stock change.

R=Revised. P=Preliminary. (s)=Less than 0.05 million short tons.

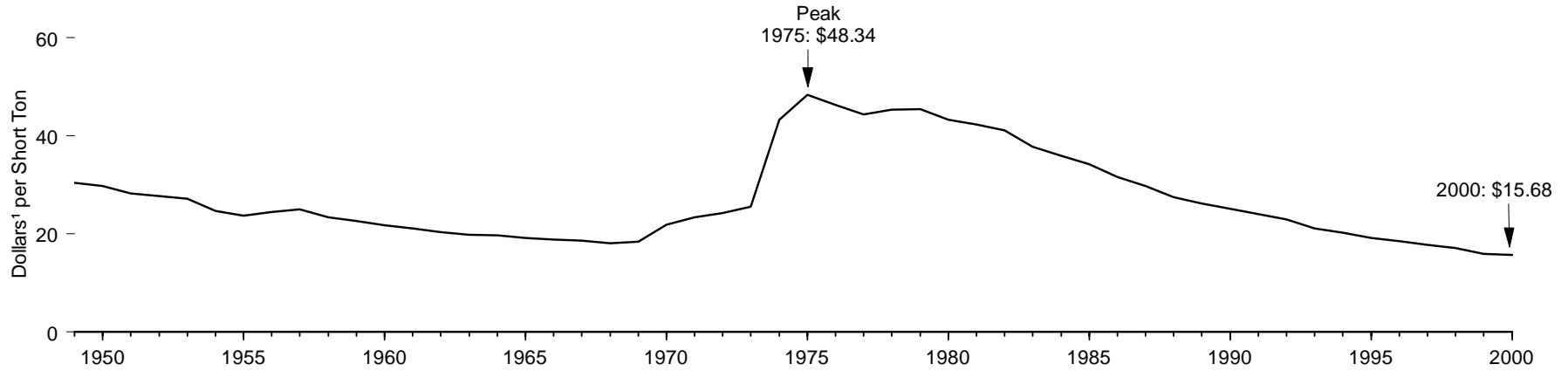
Note: Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelcoal.html>.

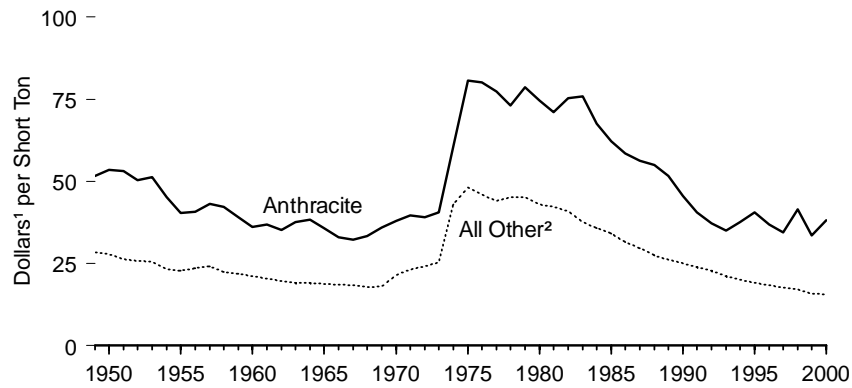
Sources: 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coke and Coal Chemicals" chapter.  
1976-1980—Energy Information Administration (EIA), Energy Data Report, *Coke and Coal Chemicals*, annual reports. 1981-2001—EIA, *Quarterly Coal Report October-December*, quarterly reports.

**Figure 7.8 Coal Prices**

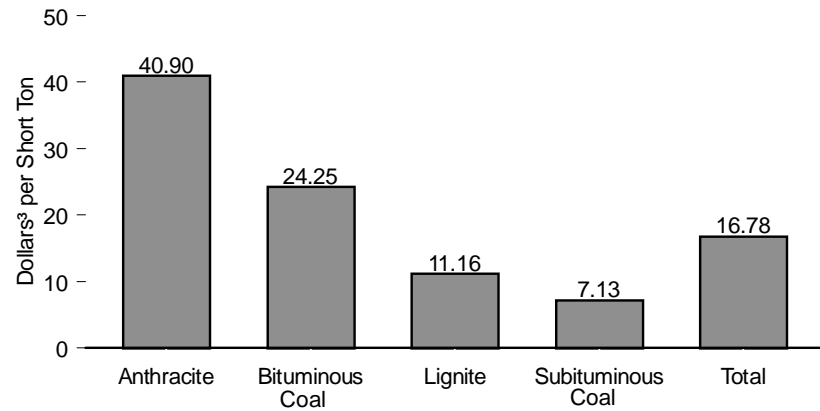
**Total, 1949-2000**



**By Type, 1949-2000**



**By Type, 2000**



<sup>1</sup> In chained (1996) dollars, calculated by using gross domestic implicit price deflators. See Table E1.

<sup>2</sup> Bituminous coal, subbituminous coal, and lignite.

<sup>3</sup> Nominal dollars.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 7.8.

**Table 7.8 Coal Prices, 1949-2000**

(Dollars per Short Ton)

Year	Bituminous Coal		Subbituminous Coal		Lignite <sup>1</sup>		Subtotal <sup>2</sup>		Anthracite		Total	
	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>	Nominal	Real <sup>3</sup>
1949	44.90	428.39	( <sup>5</sup> )	( <sup>5</sup> )	2.37	13.73	4.88	28.27	8.90	51.56	5.24	30.36
1950	44.86	427.85	( <sup>5</sup> )	( <sup>5</sup> )	2.41	13.81	4.84	27.74	9.34	53.52	5.19	29.74
1951	44.94	426.40	( <sup>5</sup> )	( <sup>5</sup> )	2.44	13.04	4.92	26.30	9.94	53.13	5.29	28.27
1952	44.92	425.89	( <sup>5</sup> )	( <sup>5</sup> )	2.39	12.58	4.90	25.79	9.58	50.42	5.27	27.74
1953	44.94	425.66	( <sup>5</sup> )	( <sup>5</sup> )	2.38	12.36	4.92	25.56	9.87	51.27	5.23	27.17
1954	44.54	423.35	( <sup>5</sup> )	( <sup>5</sup> )	2.43	12.50	4.52	23.25	8.76	45.06	4.81	24.74
1955	44.51	422.80	( <sup>5</sup> )	( <sup>5</sup> )	2.38	12.03	4.50	22.75	8.00	40.44	4.69	23.71
1956	44.83	423.62	( <sup>5</sup> )	( <sup>5</sup> )	2.39	11.69	4.82	23.57	8.33	40.73	5.01	24.50
1957	45.09	424.09	( <sup>5</sup> )	( <sup>5</sup> )	2.35	11.12	5.08	24.04	9.11	43.11	5.28	24.99
1958	44.87	422.50	( <sup>5</sup> )	( <sup>5</sup> )	2.35	10.86	4.86	22.46	9.14	42.24	5.07	23.43
1959	44.79	421.89	( <sup>5</sup> )	( <sup>5</sup> )	2.25	10.28	4.77	21.80	8.55	39.08	4.95	22.62
1960	44.71	421.23	( <sup>5</sup> )	( <sup>5</sup> )	2.29	10.32	4.69	21.14	8.01	36.10	4.83	21.77
1961	44.60	420.50	( <sup>5</sup> )	( <sup>5</sup> )	2.24	9.98	4.58	20.41	8.26	36.81	4.73	21.08
1962	44.50	419.79	( <sup>5</sup> )	( <sup>5</sup> )	2.23	9.81	4.48	19.70	7.99	35.14	4.62	20.32
1963	44.40	419.13	( <sup>5</sup> )	( <sup>5</sup> )	2.17	9.43	4.39	19.09	8.64	37.57	4.55	19.78
1964	44.46	419.11	( <sup>5</sup> )	( <sup>5</sup> )	2.14	9.17	4.45	19.07	8.93	38.26	4.60	19.71
1965	44.45	418.71	( <sup>5</sup> )	( <sup>5</sup> )	2.13	8.96	4.44	18.67	8.51	35.79	4.55	19.13
1966	44.56	418.64	( <sup>5</sup> )	( <sup>5</sup> )	1.98	8.09	4.54	18.56	8.08	33.03	4.62	18.89
1967	44.64	418.41	( <sup>5</sup> )	( <sup>5</sup> )	1.92	7.62	4.62	18.33	8.15	32.33	4.69	18.60
1968	44.70	417.87	( <sup>5</sup> )	( <sup>5</sup> )	1.79	6.81	4.67	17.76	8.78	33.38	4.75	18.06
1969	45.02	418.19	( <sup>5</sup> )	( <sup>5</sup> )	1.86	6.74	4.99	18.09	9.91	35.92	5.08	18.41
1970	46.30	421.68	( <sup>5</sup> )	( <sup>5</sup> )	1.86	6.40	6.26	21.54	11.03	37.96	6.34	21.82
1971	47.13	423.36	( <sup>5</sup> )	( <sup>5</sup> )	1.93	6.32	7.07	23.17	12.08	39.58	7.15	23.43
1972	47.78	424.45	( <sup>5</sup> )	( <sup>5</sup> )	2.04	6.41	7.66	24.07	12.40	38.97	7.72	24.26
1973	48.71	425.92	( <sup>5</sup> )	( <sup>5</sup> )	2.09	6.22	8.53	25.39	13.65	40.63	8.59	25.57
1974	416.01	443.72	( <sup>5</sup> )	( <sup>5</sup> )	2.19	5.98	15.75	43.01	22.19	60.60	15.82	43.20
1975	419.79	449.44	( <sup>5</sup> )	( <sup>5</sup> )	3.17	7.92	19.23	48.04	32.26	80.59	19.35	48.34
1976	420.11	447.54	( <sup>5</sup> )	( <sup>5</sup> )	3.74	8.84	19.43	45.93	33.92	80.19	19.56	46.24
1977	420.59	445.74	( <sup>5</sup> )	( <sup>5</sup> )	4.03	8.95	19.82	44.02	34.86	77.43	19.95	44.31
1978	422.64	446.94	( <sup>5</sup> )	( <sup>5</sup> )	5.68	11.78	21.76	45.12	35.25	73.09	21.86	45.32
1979	427.31	452.27	9.55	18.28	6.48	12.40	23.66	45.28	41.06	78.58	23.75	45.45
1980	29.17	51.14	11.08	19.42	W	W	24.52	42.99	42.51	74.53	24.65	43.22
1981	31.51	50.52	12.18	19.53	W	W	26.29	42.15	44.28	71.00	26.40	42.33
1982	32.15	48.53	13.37	20.18	W	W	27.14	40.97	49.85	75.25	27.25	41.13
1983	31.11	45.17	13.03	18.92	W	W	25.85	37.53	52.29	75.91	25.98	37.72
1984	30.63	42.88	12.41	17.37	10.45	14.63	25.51	35.71	48.22	67.50	25.61	35.85
1985	30.78	41.77	12.57	17.06	10.68	14.49	25.10	34.06	45.80	62.15	25.20	34.20
1986	28.84	38.30	12.26	16.28	10.64	14.13	23.70	31.47	44.12	58.58	23.79	31.59
1987	28.19	36.34	11.32	14.59	10.85	13.99	23.00	29.65	43.65	56.26	23.07	29.74
1988	27.66	34.48	10.45	13.03	10.06	12.54	22.00	27.43	44.16	55.06	22.07	27.52
1989	27.40	32.91	10.16	12.20	9.91	11.90	21.76	26.13	42.93	51.56	21.82	26.20
1990	27.43	31.71	9.70	11.21	10.13	11.71	21.71	25.10	39.40	45.54	21.76	25.15
1991	27.49	30.66	9.68	10.80	10.89	12.15	21.45	23.92	36.34	40.53	21.49	23.97
1992	26.78	29.16	9.68	10.54	10.81	11.77	20.99	22.85	34.24	37.28	21.03	22.90
1993	26.15	27.80	9.33	9.92	11.11	11.81	19.79	21.04	32.94	35.02	19.85	21.11
1994	25.68	26.75	8.37	8.72	10.77	11.22	19.34	20.14	36.07	37.57	19.41	20.22
1995	25.56	26.06	8.10	8.26	10.83	11.04	18.74	19.10	39.78	40.55	18.83	19.19
1996	25.17	25.17	7.87	7.87	10.92	10.92	18.42	18.42	36.78	36.78	18.50	18.50
1997	24.64	24.17	7.42	7.28	10.91	10.70	18.07	17.72	35.12	34.45	18.14	17.79
1998	R24.69	R23.92	R7.01	R6.79	R11.26	R10.91	R17.55	R17.01	R42.91	R41.58	R17.67	R17.12
1999	R23.88	R22.82	R6.90	R6.59	R11.02	R10.53	R16.55	R15.81	R35.13	R33.57	R16.63	R15.89
2000 <sup>P</sup>	24.25	22.66	7.13	6.66	11.16	10.43	16.68	15.58	40.90	38.21	16.78	15.68

<sup>1</sup> In years past, some lignite prices were withheld to protect company confidentiality. Consequently, prices for 1955 through 1977 excluded Texas lignite and prices for 1974 through 1978 excluded Montana lignite. As a result, lignite prices for the period 1974 through 1977 are based on North Dakota only.

<sup>2</sup> Subtotal of bituminous coal, subbituminous coal, and lignite.

<sup>3</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>4</sup> Includes subbituminous coal.

<sup>5</sup> Included in bituminous coal.

R=Revised. P=Preliminary. W=Withheld to avoid disclosure of individual company data.

Note: Prices are free-on-board (f.o.b.) mine prices. See Glossary.

Web Page: <http://www.eia.doe.gov/fuelcoal.html>.

Sources: **Bituminous Coal, Subbituminous Coal, and Lignite:** 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" chapter. 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976*. 1977 and 1978—EIA, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977; 1978*. 1979-1992—EIA, *Coal Production*, annual reports. 1993-forward—EIA, *Coal Industry Annual*, annual reports. **Anthracite:** 1949-1976—Bureau of Mines, *Minerals Yearbook*, "Coal-Pennsylvania Anthracite" chapter. 1977 and 1978—EIA, Energy Data Report, *Coal-Pennsylvania Anthracite 1977; 1978*. 1979—EIA, Energy Data Report, *Coal Production-1979*. 1980-1992—EIA, *Coal Production*, annual reports. 1993-forward—EIA, *Coal Industry Annual*, annual reports. **Total:** 1949-1978—Calculated as a production-weighted average of the rank prices shown. 1979-forward—EIA, *Coal Industry Annual*, annual reports.

## Coal

**Note 1.** Data in this report on the consumption of bituminous coal (including subbituminous coal), lignite, anthracite, and waste coal are developed primarily from consumption data reported in surveys. Included are data reported by all electric utility companies and coke plant companies. Data on coal consumption by all industrial and manufacturing establishments and by the residential and commercial sector are based on distribution data obtained quarterly from coal companies. Included in each sector's data are the following: Electric Power Sector—consumption by privately and publicly owned establishments engaged in the generation and/or distribution of electric power. Industrial and Miscellaneous Sector—consumption at manufacturing plants, large commercial establishments, coking plants, and by agriculture, mining (other than coal mining), and construction industries; Transportation Sector—sales to railroads and for vessel bunkering; Residential and Commercial Sector—retail dealer sales to households and small commercial establishments.

Coal consumption by the residential and commercial sectors is reported to the Energy Information Administration (EIA) for the two sectors combined; EIA estimates the amount consumed by the sectors individually. Previously, the breakdown was 40 percent residential and 60 percent commercial for each year. The current method results in variation over time. Beginning in 1949, a larger portion of the coal, 45 percent, is assigned to the residential sector; the share falls gradually over time and reaches 11 percent in 2001. To create the estimate, it is first assumed that

an occupied coal-heated housing unit consumes fuel at the same Btu rate as an oil-heated housing unit. Then, for the years in which data are available on the number of occupied housing units by heating source (1950, 1960, 1970, 1973–1981, and subsequent odd-numbered years (Table 2.8)), residential use of coal is estimated by the following steps: a ratio is created of the number of occupied housing units heated by coal to the number of housing units heated by oil; the ratio is multiplied by the Btu quantity of oil used by the residential sector to estimate the Btu quantity of coal used by the residential sector; and the residential sector's share of residential and commercial use is calculated. The 1950 share is applied to 1949; the 1999 share is applied to 2000; and the other missing years' shares are interpolated.

**Table 7.3 Web Page:** <http://www.eia.doe.gov/fuelcoal.html>.

### Table 7.3 Sources

**End-Use Sectors:**

- 1949–1975—Bureau of Mines *Minerals Yearbook* “Coal-Bituminous and Lignite” and “Coal-Pennsylvania Anthracite” chapters.
- 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976*.
- 1977 and 1978—EIA, Energy Data Report, *Coal-Pennsylvania Anthracite 1977; 1978*, and *Weekly Coal Report*.
- 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report*.
- 1981–2001—EIA, *Quarterly Coal Report October-December*, quarterly reports. **CHP:** Tables 8.3c–8.3d.

**Electric Power Sector:** Tables 8.3b–8.3e.

# 8

# Electricity

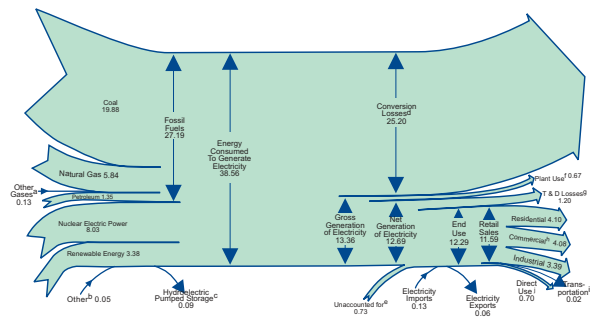


High-tension power lines and towers. Source: U.S. Department of Energy.





Diagram 5. Electricity Flow, 2001  
(Quadrillion Btu)

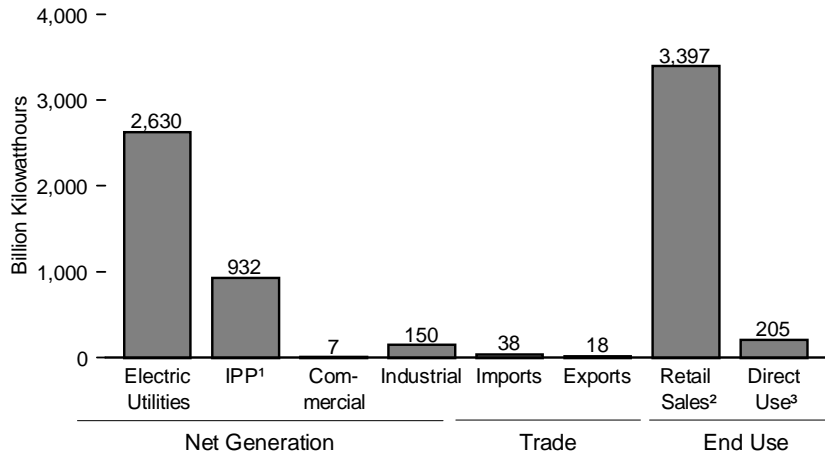


<sup>a</sup> Blast furnace gas, propane gas, and other manufactured waste gases derived from fossil fuels.  
<sup>b</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
<sup>c</sup> Pumped storage facility production minus energy used for pumping.  
<sup>d</sup> Approximately two-thirds of all energy used to generate electricity. See Note 1 at end of section.  
<sup>e</sup> Data collection frame differences and non-sampling error.

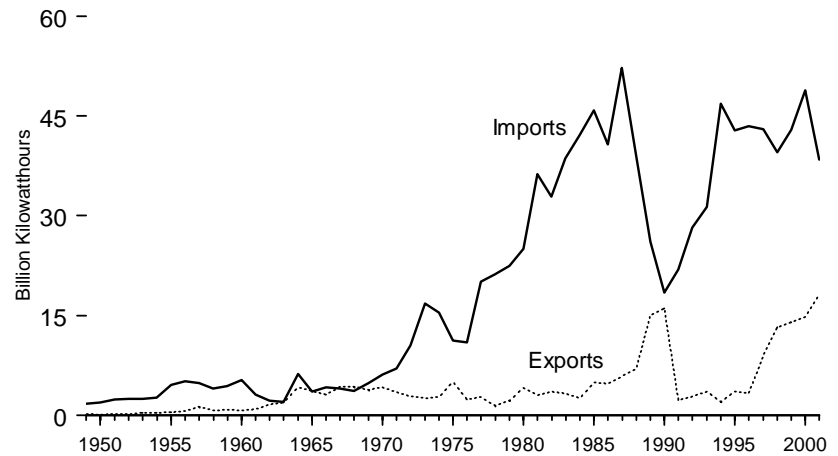
<sup>f</sup> Electric energy used in the operation of power plants, estimated as 5 percent of gross generation. See Note 1 at end of section.  
<sup>g</sup> Transmission and distribution losses, estimated as 9 percent of gross generation. See Note 1 at end of section.  
<sup>h</sup> Commercial retail sales plus approximately 95 percent of "Other" retail sales from Table 8.5.  
<sup>i</sup> Approximately 5 percent of "Other" retail sales from Table 8.5.  
<sup>j</sup> Commercial and industrial body use of crude net electricity generation.  
 Note: Totals may not equal sum of components due to independent rounding.  
 Sources: Tables 2.2a, 8.1, 8.5, and 8.6.

**Figure 8.1 Electricity Overview**

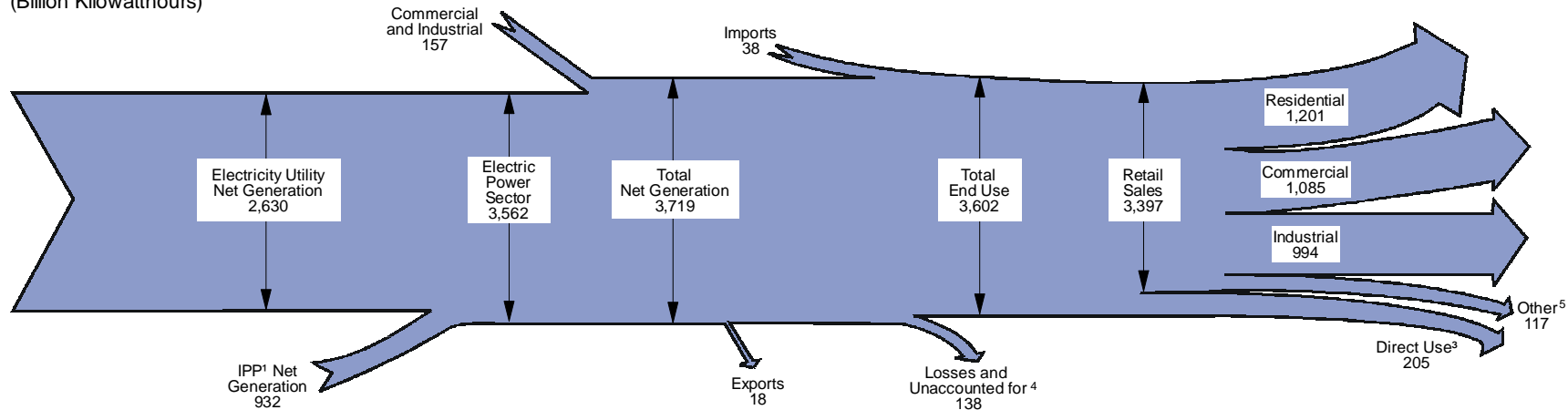
**Overview, 2001**



**Electricity Trade, 1949-2001**



**Net-Generation-to-End-Use Flow, 2001**  
(Billion Kilowatt-hours)



<sup>1</sup> Independent Power Producers. See Glossary.

<sup>2</sup> Electricity sales to ultimate customers reported by electric utilities and other energy service providers.

<sup>3</sup> Commercial and industrial facility use of onsite net electricity generation; and electricity sales among adjacent or co-located facilities for which revenue information is not available.

<sup>4</sup> Energy losses that occur between the point of generation and delivery to the customer, and data collection frame differences and nonsampling error.

<sup>5</sup> Public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 8.1 and 8.5.

**Table 8.1 Electricity Overview, 1949-2001**  
(Billion Kilowatthours)

Year	Net Generation						Imports <sup>4</sup>	Exports <sup>4</sup>	Losses and Unaccounted for <sup>5</sup>	End Use		
	Electric Power Sector <sup>1</sup>			Commercial Sector <sup>2</sup>	Industrial Sector <sup>3</sup>	Total				Retail Sales <sup>6</sup>	Direct Use <sup>7</sup>	Total
	Electric Utilities	Independent Power Producers	Total									
1949	291	NA	291	NA	5	R296	2	(s)	43	255	NA	255
1950	329	NA	329	NA	5	R334	2	(s)	44	291	NA	291
1951	371	NA	371	NA	5	R375	2	(s)	47	330	NA	330
1952	399	NA	399	NA	5	R404	3	(s)	50	356	NA	356
1953	443	NA	443	NA	4	R447	2	(s)	53	396	NA	396
1954	472	NA	472	NA	5	R476	3	(s)	54	424	NA	424
1955	547	NA	547	NA	3	R550	5	(s)	58	497	NA	497
1956	601	NA	601	NA	3	R604	5	1	62	546	NA	546
1957	632	NA	632	NA	3	R635	5	1	62	576	NA	576
1958	645	NA	645	NA	3	R648	4	1	64	588	NA	588
1959	710	NA	710	NA	3	R713	4	1	70	647	NA	647
1960	756	NA	756	NA	4	R759	5	1	76	688	NA	688
1961	794	NA	794	NA	3	R797	3	1	77	722	NA	722
1962	855	NA	855	NA	3	R858	2	2	81	778	NA	778
1963	917	NA	917	NA	3	R920	2	2	88	833	NA	833
1964	984	NA	984	NA	3	R987	6	4	93	896	NA	896
1965	1,055	NA	1,055	NA	3	R1,058	4	4	104	954	NA	954
1966	1,144	NA	1,144	NA	3	R1,148	4	3	113	1,035	NA	1,035
1967	1,214	NA	1,214	NA	3	R1,218	4	4	118	1,099	NA	1,099
1968	1,329	NA	1,329	NA	3	R1,333	4	4	129	1,203	NA	1,203
1969	1,442	NA	1,442	NA	3	R1,445	5	4	133	1,314	NA	1,314
1970	1,532	NA	1,532	NA	3	R1,535	6	4	145	1,392	NA	1,392
1971	1,613	NA	1,613	NA	3	R1,616	7	4	150	1,470	NA	1,470
1972	1,750	NA	1,750	NA	3	R1,753	10	3	166	1,595	NA	1,595
1973	1,861	NA	1,861	NA	3	R1,864	17	3	165	1,713	NA	1,713
1974	1,867	NA	1,867	NA	3	R1,870	15	3	177	1,706	NA	1,706
1975	1,918	NA	1,918	NA	3	R1,921	11	5	180	1,747	NA	1,747
1976	2,038	NA	2,038	NA	3	R2,041	11	2	194	1,855	NA	1,855
1977	2,124	NA	2,124	NA	3	R2,127	20	3	197	1,948	NA	1,948
1978	2,206	NA	2,206	NA	3	R2,209	21	1	211	2,018	NA	2,018
1979	2,247	NA	2,247	NA	3	R2,251	23	2	200	2,071	NA	2,071
1980	2,286	NA	2,286	NA	3	R2,290	25	4	216	2,094	NA	2,094
1981	2,295	NA	2,295	NA	3	R2,298	36	3	184	2,147	NA	2,147
1982	2,241	NA	2,241	NA	3	R2,244	33	4	187	2,086	NA	2,086
1983	2,310	NA	2,310	NA	3	R2,313	39	3	198	2,151	NA	2,151
1984	2,416	NA	2,416	NA	3	R2,419	42	3	173	2,286	NA	2,286
1985	2,470	NA	2,470	NA	3	R2,473	46	5	190	2,324	NA	2,324
1986	2,487	NA	2,487	NA	3	R2,490	41	5	158	2,369	NA	2,369
1987	2,572	NA	2,572	NA	3	R2,575	52	6	164	2,457	NA	2,457
1988	2,704	NA	2,704	NA	3	R2,707	39	7	161	2,578	NA	2,578
1989	2,784	F62	F2,847	F4	P115	RP2,966	26	15	R222	2,647	RP108	F2,755
1990	2,808	F88	F2,896	F6	P122	RP3,024	18	16	R199	2,713	RP115	F2,827
1991	2,825	P108	F2,934	F6	P132	RP3,072	22	2	R211	2,762	RP118	F2,880
1992	2,797	P137	F2,934	F6	P143	RP3,084	28	3	224	2,763	P122	F2,886
1993	2,883	P161	F3,044	F7	P146	P3,197	31	4	236	2,861	RP128	F2,989
1994	2,911	P178	F3,089	F8	P151	RP3,248	47	2	R224	2,935	RP134	F3,069
1995	2,995	P200	F3,194	F8	P151	RP3,353	43	4	235	3,013	RP144	F3,157
1996	3,077	P207	F3,284	F9	P151	RP3,444	43	3	237	3,101	RP146	F3,247
1997	3,123	F207	F3,329	F9	P154	RP3,492	43	9	R232	3,146	RP148	F3,294
1998	3,212	F245	F3,457	F9	P154	RP3,620	40	13	R221	3,264	RP161	F3,425
1999	3,174	F356	F3,530	F9	P156	RP3,695	43	14	R229	3,312	RP183	F3,495
2000	R3,015	F622	F3,638	F8	P157	RP3,802	F49	15	R231	R3,421	RP183	F3,605
2001	2,630	E932	F3,562	E7	E150	E3,719	38	18	138	3,397	E205	3,602

<sup>1</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants. Due to the restructuring of the electric power sector, the sale of generation assets is resulting in a reclassification of plants from electric utilities to independent power producers.

<sup>2</sup> Commercial combined-heat-and-power (CHP) and commercial electricity-only plants. See Appendix G for commercial sector NAICS codes.

<sup>3</sup> Industrial combined-heat-and-power (CHP) and industrial electricity-only plants. Through 1988, includes industrial hydroelectric power only. See Appendix G for industrial sector NAICS codes.

<sup>4</sup> Electricity transmitted across U.S. borders with Canada and Mexico.

<sup>5</sup> Energy losses that occur between the point of generation and delivery to the customer, and data collection frame differences and nonsampling error. See Note 1 at end of section.

<sup>6</sup> Electricity retail sales to ultimate customers reported by electric utilities and other energy service providers.

<sup>7</sup> Commercial and industrial facility use of onsite net electricity generation; and electricity sales among adjacent or co-located facilities for which revenue information is not available.

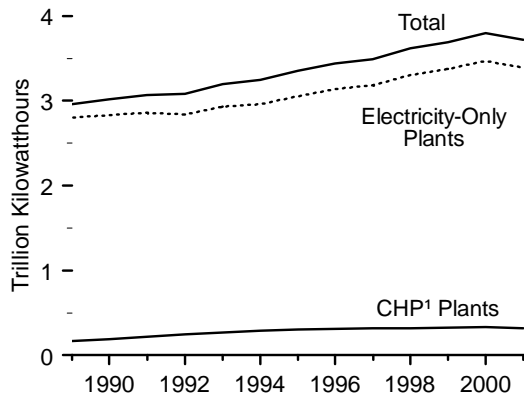
R=Revised. P=Preliminary. E=Estimate. NA=Not available. (s)=Less than 0.5 billion kilowatthours.

Notes: See Note 2 at end of section. Totals may not equal sum of components due to independent rounding.

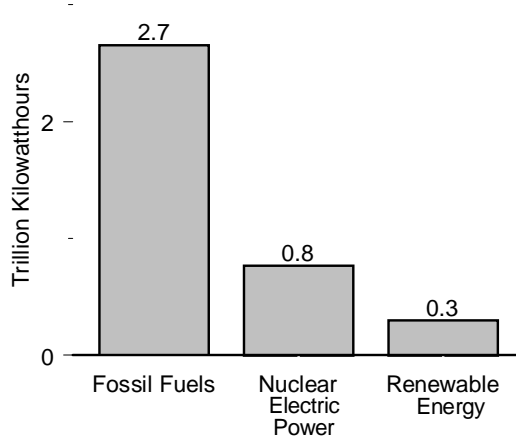
Web Page and Sources: See end of section.

**Figure 8.2a Electricity Net Generation**

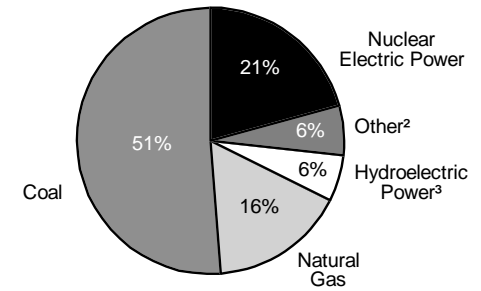
**Total and by Plant Type, 1989-2001**



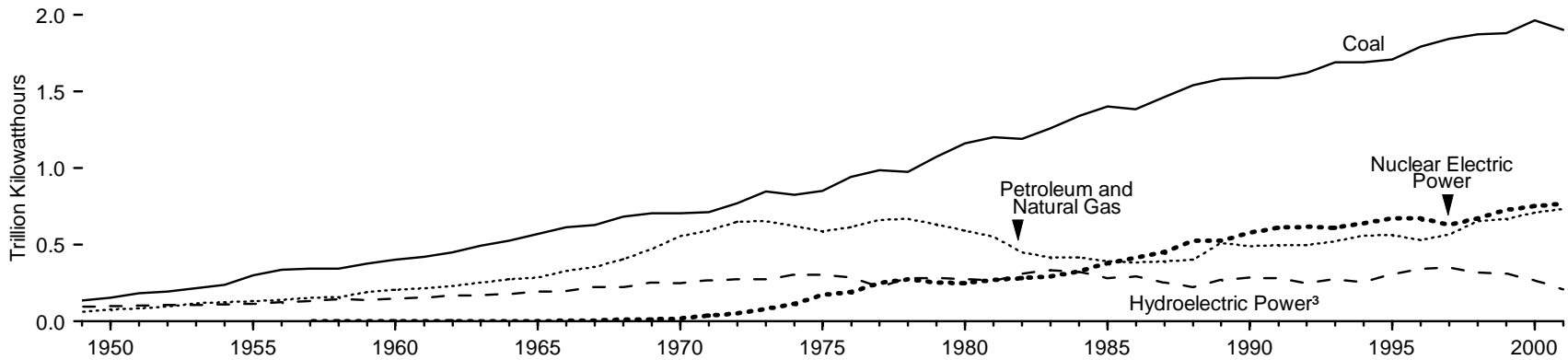
**Total by Source Category, 2001**



**Total by Source, 2001**



**Total by Major Sources, 1949-2001**



<sup>1</sup> Combined-heat-and-power.

<sup>2</sup> Petroleum, other gases, wood, waste, geothermal, solar, wind, and other.

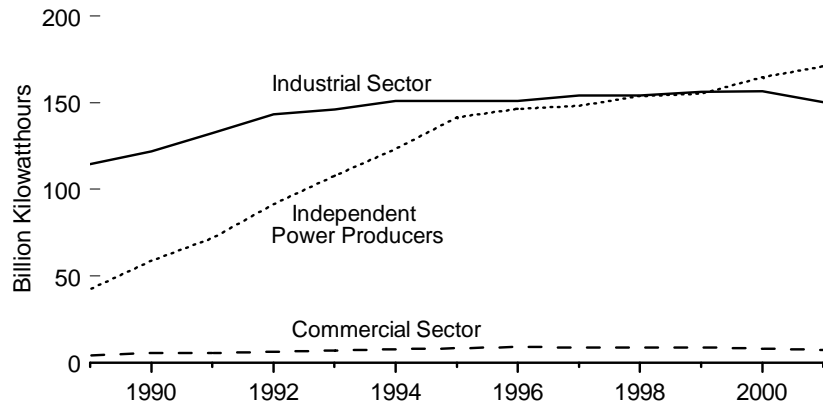
<sup>3</sup> Conventional hydroelectric power and pumped-storage.

Note: Because vertical scales differ, graphs should not be compared.

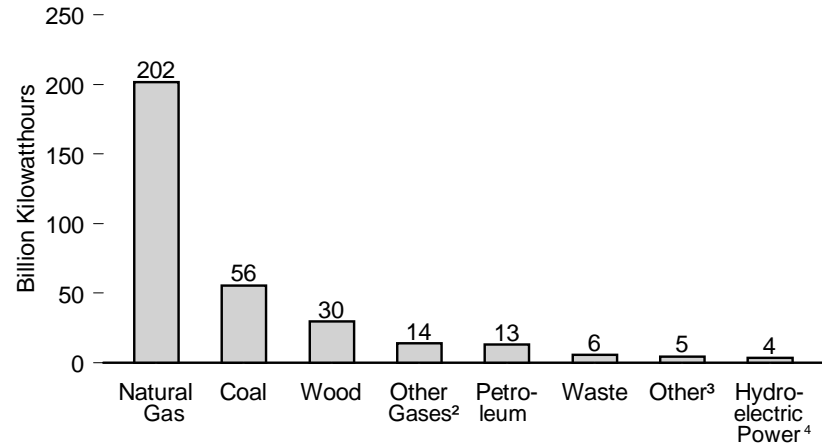
Sources: Tables 8.2a and 8.2b.

**Figure 8.2b Net Generation and Useful Thermal Output at Combined-Heat-and-Power Plants**

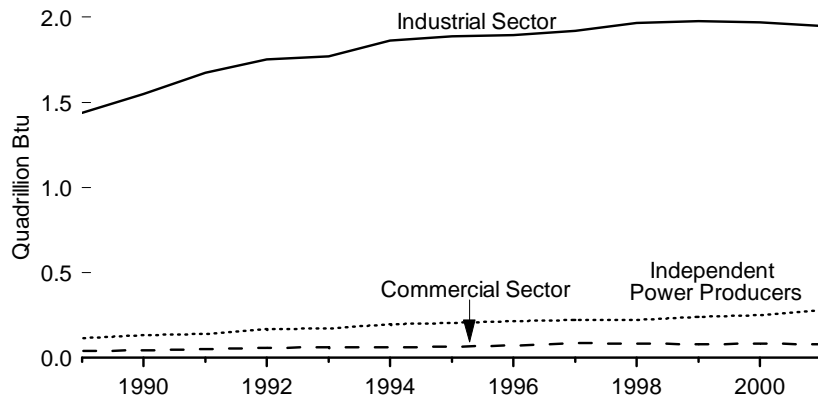
**Net Generation at CHP<sup>1</sup> Plants by Sector, 1989-2001**



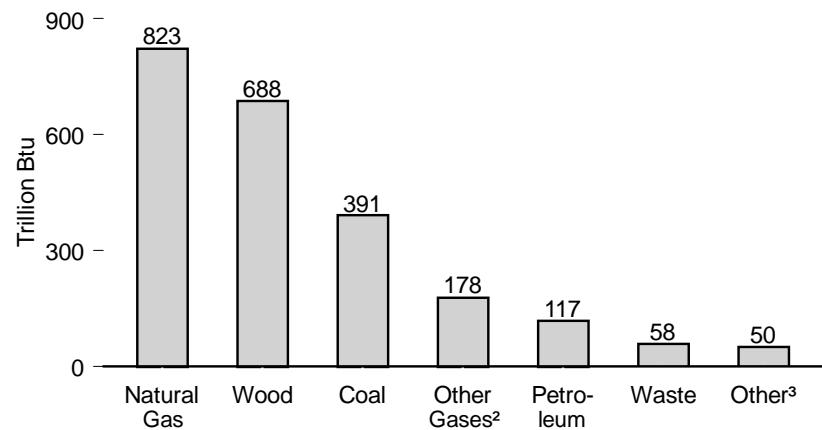
**Sources of Net Generation at CHP<sup>1</sup> Plants, 2001**



**Fuel Consumption for Useful Thermal Output at CHP<sup>1</sup> Plants by Sector, 1989-2001**



**Sources of Useful Thermal Output at CHP<sup>1</sup> Plants, 2001**



<sup>1</sup> Combined-heat-and-power.

<sup>2</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>3</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>4</sup> Conventional hydroelectric power.

Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 8.2c and 8.2d.

**Table 8.2a Electricity Net Generation: Total (All Sectors), 1949-2001**  
(Billion Kilowatthours)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage <sup>5</sup>	Renewable Energy							Other <sup>9</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power	Wood <sup>6</sup>	Waste <sup>7</sup>	Geo-thermal	Solar <sup>8</sup>	Wind	Total		
1949	135.5	28.5	37.0	NA	201.0	0.0	( <sup>10</sup> )	94.8	0.4	NA	NA	NA	NA	95.2	NA	R296.1
1950	154.5	33.7	44.6	NA	232.8	0.0	( <sup>10</sup> )	100.9	0.4	NA	NA	NA	NA	101.3	NA	R334.1
1951	185.2	28.7	56.6	NA	270.5	0.0	( <sup>10</sup> )	104.4	0.4	NA	NA	NA	NA	104.8	NA	R375.3
1952	195.4	29.7	68.5	NA	293.6	0.0	( <sup>10</sup> )	109.7	0.5	NA	NA	NA	NA	110.2	NA	R403.8
1953	218.8	38.4	79.8	NA	337.0	0.0	( <sup>10</sup> )	109.6	0.4	NA	NA	NA	NA	110.0	NA	R447.0
1954	239.1	31.5	93.7	NA	364.4	0.0	( <sup>10</sup> )	111.6	0.3	NA	NA	NA	NA	111.9	NA	R476.3
1955	301.4	37.1	95.3	NA	433.8	0.0	( <sup>10</sup> )	116.2	0.3	NA	NA	NA	NA	116.5	NA	R550.3
1956	338.5	35.9	104.0	NA	478.5	0.0	( <sup>10</sup> )	125.2	0.2	NA	NA	NA	NA	125.4	NA	R603.9
1957	346.4	40.5	114.2	NA	501.1	(s)	( <sup>10</sup> )	133.4	0.2	NA	NA	NA	NA	133.5	NA	R634.6
1958	344.4	40.4	119.8	NA	504.5	0.2	( <sup>10</sup> )	143.6	0.2	NA	NA	NA	NA	143.8	NA	R648.5
1959	378.4	46.8	146.6	NA	571.9	0.2	( <sup>10</sup> )	141.2	0.2	NA	NA	NA	NA	141.3	NA	R713.4
1960	403.1	48.0	158.0	NA	609.0	0.5	( <sup>10</sup> )	149.4	0.1	NA	(s)	NA	NA	149.6	NA	R759.2
1961	421.9	48.5	169.3	NA	639.7	1.7	( <sup>10</sup> )	155.5	0.1	NA	0.1	NA	NA	155.8	NA	R797.1
1962	450.2	48.9	184.3	NA	683.4	2.3	( <sup>10</sup> )	172.0	0.1	NA	0.1	NA	NA	172.2	NA	R857.9
1963	493.9	52.0	201.6	NA	747.5	3.2	( <sup>10</sup> )	169.0	0.1	NA	0.2	NA	NA	169.3	NA	R920.0
1964	526.2	57.0	220.0	NA	803.2	3.3	( <sup>10</sup> )	180.3	0.1	NA	0.2	NA	NA	180.7	NA	R987.2
1965	570.9	64.8	221.6	NA	857.3	3.7	( <sup>10</sup> )	197.0	0.3	NA	0.2	NA	NA	197.4	NA	R1,058.4
1966	613.5	78.9	251.2	NA	943.6	5.5	( <sup>10</sup> )	197.9	0.3	NA	0.2	NA	NA	198.5	NA	R1,147.5
1967	630.5	89.3	264.8	NA	984.6	7.7	( <sup>10</sup> )	224.9	0.3	NA	0.3	NA	NA	225.6	NA	R1,217.8
1968	684.9	104.3	304.4	NA	1,093.6	12.5	( <sup>10</sup> )	225.9	0.4	NA	0.4	NA	NA	226.7	NA	R1,332.8
1969	706.0	137.8	333.3	NA	1,177.1	13.9	( <sup>10</sup> )	253.5	0.3	NA	0.6	NA	NA	254.4	NA	R1,445.5
1970	704.4	184.2	372.9	NA	1,261.5	21.8	( <sup>10</sup> )	251.0	0.1	0.2	0.5	NA	NA	251.8	NA	R1,535.1
1971	713.1	220.2	374.0	NA	1,307.4	38.1	( <sup>10</sup> )	269.5	0.1	0.2	0.5	NA	NA	270.4	NA	R1,615.9
1972	771.1	274.3	375.7	NA	1,421.2	54.1	( <sup>10</sup> )	275.9	0.1	0.2	1.5	NA	NA	277.7	NA	R1,753.0
1973	847.7	314.3	340.9	NA	1,502.9	83.5	( <sup>10</sup> )	275.4	0.1	0.2	2.0	NA	NA	277.7	NA	R1,864.1
1974	828.4	300.9	320.1	NA	1,449.4	114.0	( <sup>10</sup> )	304.2	0.1	0.2	2.5	NA	NA	306.9	NA	R1,870.3
1975	852.8	289.1	299.8	NA	1,441.7	172.5	( <sup>10</sup> )	303.2	(s)	0.2	3.2	NA	NA	306.6	NA	R1,920.8
1976	944.4	320.0	294.6	NA	1,559.0	191.1	( <sup>10</sup> )	286.9	0.1	0.2	3.6	NA	NA	290.8	NA	R2,040.9
1977	985.2	358.2	305.5	NA	1,648.9	250.9	( <sup>10</sup> )	223.6	0.3	0.2	3.6	NA	NA	227.7	NA	R2,127.4
1978	975.7	365.1	305.4	NA	1,646.2	276.4	( <sup>10</sup> )	283.5	0.2	0.1	3.0	NA	NA	286.8	NA	R2,209.4
1979	1,075.0	303.5	329.5	NA	1,708.0	255.2	( <sup>10</sup> )	283.1	0.3	0.2	3.9	NA	NA	287.5	NA	R2,250.7
1980	1,161.6	246.0	346.2	NA	1,753.8	251.1	( <sup>10</sup> )	279.2	0.3	0.2	5.1	NA	NA	284.7	NA	R2,289.6
1981	1,203.2	206.4	345.8	NA	1,755.4	272.7	( <sup>10</sup> )	263.8	0.2	0.1	5.7	NA	NA	269.9	NA	R2,298.0
1982	1,192.0	146.8	305.3	NA	1,644.1	282.8	( <sup>10</sup> )	312.4	0.2	0.1	4.8	NA	NA	317.5	NA	R2,244.4
1983	1,259.4	144.5	274.1	NA	1,678.0	293.7	( <sup>10</sup> )	335.3	0.2	0.2	6.1	NA	(s)	341.7	NA	R2,313.4
1984	1,341.7	119.8	297.4	NA	1,758.9	327.6	( <sup>10</sup> )	324.3	0.5	0.4	7.7	(s)	(s)	332.9	NA	R2,419.5
1985	1,402.1	100.2	291.9	NA	1,794.3	383.7	( <sup>10</sup> )	284.3	0.7	0.6	9.3	(s)	(s)	295.0	NA	R2,473.0
1986	1,385.8	136.6	248.5	NA	1,770.9	414.0	( <sup>10</sup> )	294.0	0.5	0.7	10.3	(s)	(s)	305.5	NA	R2,490.5
1987	1,463.8	118.5	272.6	NA	1,854.9	455.3	( <sup>10</sup> )	252.9	0.8	0.7	10.8	(s)	(s)	265.1	NA	R2,575.3
1988	1,540.7	148.9	252.8	NA	1,942.4	527.0	( <sup>10</sup> )	226.1	0.9	0.7	10.3	(s)	(s)	238.1	NA	R2,707.4
1989P,11	1,583.8	R164.5	R352.6	R7.9	R2,108.8	529.4	( <sup>10</sup> )	R271.1	R27.2	9.2	R14.1	R0.3	R1.9	R323.6	3.8	R2,965.6
1990P	R1,591.1	R125.2	R368.7	R9.8	R2,094.7	R576.9	-3.5	R291.2	R30.0	13.1	R14.9	R0.4	R2.3	R352.0	3.6	R3,023.6
1991P	R1,590.6	R119.8	R381.6	R11.3	R2,103.3	612.6	-4.5	R287.6	R33.7	15.7	R15.5	R0.5	R2.6	R355.6	4.7	R3,071.6
1992P	R1,621.2	R100.2	R404.1	R13.3	R2,138.7	618.8	-4.2	253.1	R36.5	17.8	R16.1	R0.4	2.9	R326.9	3.7	R3,083.9
1993P	R1,690.1	R112.8	R414.9	R13.0	R2,230.7	R610.3	-4.0	280.5	R37.6	18.3	R16.8	R0.5	3.0	R356.7	3.5	R3,197.2
1994P	R1,690.7	R105.9	R460.2	R13.3	R2,270.1	R640.4	-3.4	R260.1	R37.9	19.1	R15.5	R0.5	3.4	R336.7	3.7	R3,247.5
1995P	R1,709.4	R74.6	R496.1	R13.9	R2,293.9	673.4	-2.7	R310.8	R36.5	20.4	R13.4	R0.5	3.2	R384.8	4.1	R3,353.5
1996P	R1,795.2	R81.4	R455.1	R14.4	R2,346.0	674.7	-3.1	R347.2	R36.8	20.9	R14.3	R0.5	R3.2	R423.0	3.6	R3,444.2
1997P	R1,845.0	R92.6	R479.4	R13.4	R2,430.3	628.6	-4.0	R356.5	R36.9	21.7	R14.7	R0.5	R3.3	R433.6	3.6	R3,492.2
1998P	R1,873.5	R128.8	R531.3	R13.5	R2,547.1	673.7	R-4.5	323.3	R36.3	22.4	R14.8	R0.5	3.0	R400.4	3.6	R3,620.3
1999P	R1,881.1	R118.1	R556.4	R14.1	R2,569.7	728.3	R-6.1	319.5	R37.0	22.6	R14.8	R0.5	4.5	R399.0	4.0	R3,694.8
2000P	R1,966.3	R111.2	R601.1	R14.0	R2,692.5	753.9	R-5.5	R275.6	R37.6	23.1	R14.1	R0.5	R5.6	R356.5	4.8	R3,802.1
2001E	1,904.0	126.0	613.0	14.1	2,657.2	768.8	-8.8	217.5	36.9	22.8	13.8	0.5	5.8	297.3	5.0	3,719.5

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.  
<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.  
<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.  
<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
<sup>5</sup> Pumped storage facility production minus energy used for pumping.  
<sup>6</sup> Wood, black liquor, and other wood waste.  
<sup>7</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.  
<sup>8</sup> Solar thermal and photovoltaic energy.  
<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>10</sup> Included in "Conventional Hydroelectric Power."  
<sup>11</sup> Hydroelectric data through 1988 are for generation at electric utilities and industrial plants only; beginning in 1989, data also include generation at independent power producers and commercial plants. For all other series, data through 1988 are for generation at electric utilities only; beginning in 1989, data also include generation at independent power producers, commercial plants, and industrial plants.  
R=Revised. P=Preliminary. E=Estimate. NA=Not available. (s)=Less than 0.05 billion kilowatthours.  
Note: Totals may not equal sum of components due to independent rounding.  
Web Page: <http://www.eia.doe.gov/fuelelectric.html>.  
Sources: See Tables 8.2b and 8.2c.

**Table 8.2b Electricity Net Generation at Electricity-Only Plants: Electric Power Sector, 1949-2001**  
(Billion Kilowatthours)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage <sup>5</sup>	Renewable Energy							Other <sup>9</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power	Wood <sup>6</sup>	Waste <sup>7</sup>	Geo-thermal	Solar <sup>8</sup>	Wind	Total		
1949	135.5	28.5	37.0	NA	201.0	0	( <sup>10</sup> )	89.7	0.4	NA	NA	NA	NA	90.1	NA	291.1
1950	154.5	33.7	44.6	NA	232.8	0	( <sup>10</sup> )	95.9	0.4	NA	NA	NA	NA	96.3	NA	329.1
1951	185.2	28.7	56.6	NA	270.5	0	( <sup>10</sup> )	99.8	0.4	NA	NA	NA	NA	100.1	NA	370.7
1952	195.4	29.7	68.5	NA	293.6	0	( <sup>10</sup> )	105.1	0.5	NA	NA	NA	NA	105.6	NA	399.2
1953	218.8	38.4	79.8	NA	337.0	0	( <sup>10</sup> )	105.2	0.4	NA	NA	NA	NA	105.6	NA	442.7
1954	239.1	31.5	93.7	NA	364.4	0	( <sup>10</sup> )	107.1	0.3	NA	NA	NA	NA	107.3	NA	471.7
1955	301.4	37.1	95.3	NA	433.8	0	( <sup>10</sup> )	113.0	0.3	NA	NA	NA	NA	113.3	NA	547.0
1956	338.5	35.9	104.0	NA	478.5	0	( <sup>10</sup> )	122.0	0.2	NA	NA	NA	NA	122.2	NA	600.7
1957	346.4	40.5	114.2	NA	501.1	(s)	( <sup>10</sup> )	130.2	0.2	NA	NA	NA	NA	130.4	NA	631.5
1958	344.4	40.4	119.8	NA	504.5	0.2	( <sup>10</sup> )	140.3	0.2	NA	NA	NA	NA	140.4	NA	645.1
1959	378.4	46.8	146.6	NA	571.9	0.2	( <sup>10</sup> )	137.8	0.2	NA	NA	NA	NA	137.9	NA	710.0
1960	403.1	48.0	158.0	NA	609.0	0.5	( <sup>10</sup> )	145.8	0.1	NA	(s)	NA	NA	146.0	NA	755.5
1961	421.9	48.5	169.3	NA	639.7	1.7	( <sup>10</sup> )	152.2	0.1	NA	0.1	NA	NA	152.4	NA	793.8
1962	450.2	48.9	184.3	NA	683.4	2.3	( <sup>10</sup> )	168.6	0.1	NA	0.1	NA	NA	168.8	NA	854.5
1963	493.9	52.0	201.6	NA	747.5	3.2	( <sup>10</sup> )	165.8	0.1	NA	0.2	NA	NA	166.1	NA	916.8
1964	526.2	57.0	220.0	NA	803.2	3.3	( <sup>10</sup> )	177.1	0.1	NA	0.2	NA	NA	177.4	NA	984.0
1965	570.9	64.8	221.6	NA	857.3	3.7	( <sup>10</sup> )	193.9	0.3	NA	0.2	NA	NA	194.3	NA	1,055.3
1966	613.5	78.9	251.2	NA	943.6	5.5	( <sup>10</sup> )	194.8	0.3	NA	0.2	NA	NA	195.3	NA	1,144.4
1967	630.5	89.3	264.8	NA	984.6	7.7	( <sup>10</sup> )	221.5	0.3	NA	0.3	NA	NA	222.2	NA	1,214.4
1968	684.9	104.3	304.4	NA	1,093.6	12.5	( <sup>10</sup> )	222.5	0.4	NA	0.4	NA	NA	223.3	NA	1,329.4
1969	706.0	137.8	333.3	NA	1,177.1	13.9	( <sup>10</sup> )	250.2	0.3	NA	0.6	NA	NA	251.1	NA	1,442.2
1970	704.4	184.2	372.9	NA	1,261.5	21.8	( <sup>10</sup> )	247.7	0.1	0.2	0.5	NA	NA	248.6	NA	1,531.9
1971	713.1	220.2	374.0	NA	1,307.4	38.1	( <sup>10</sup> )	266.3	0.1	0.2	0.5	NA	NA	267.2	NA	1,612.6
1972	771.1	274.3	375.7	NA	1,421.2	54.1	( <sup>10</sup> )	272.6	0.1	0.2	1.5	NA	NA	274.4	NA	1,749.7
1973	847.7	314.3	340.9	NA	1,502.9	83.5	( <sup>10</sup> )	272.1	0.1	0.2	2.0	NA	NA	274.4	NA	1,860.7
1974	828.4	300.9	320.1	NA	1,449.4	114.0	( <sup>10</sup> )	301.0	0.1	0.2	2.5	NA	NA	303.7	NA	1,867.1
1975	852.8	289.1	299.8	NA	1,441.7	172.5	( <sup>10</sup> )	300.0	(s)	0.2	3.2	NA	NA	303.5	NA	1,917.6
1976	944.4	320.0	294.6	NA	1,559.0	191.1	( <sup>10</sup> )	283.7	0.1	0.2	3.6	NA	NA	287.6	NA	2,037.7
1977	985.2	358.2	305.5	NA	1,648.9	250.9	( <sup>10</sup> )	220.5	0.3	0.2	3.6	NA	NA	224.5	NA	2,124.3
1978	975.7	365.1	305.4	NA	1,646.2	276.4	( <sup>10</sup> )	280.4	0.2	0.1	3.0	NA	NA	283.7	NA	2,206.3
1979	1,075.0	303.5	329.5	NA	1,708.0	255.2	( <sup>10</sup> )	279.8	0.3	0.2	3.9	NA	NA	284.2	NA	2,247.4
1980	1,161.6	246.0	346.2	NA	1,753.8	251.1	( <sup>10</sup> )	276.0	0.3	0.2	5.1	NA	NA	281.5	NA	2,286.4
1981	1,203.2	206.4	345.8	NA	1,755.4	272.7	( <sup>10</sup> )	260.7	0.2	0.1	5.7	NA	NA	266.7	NA	2,294.8
1982	1,192.0	146.8	305.3	NA	1,644.1	282.8	( <sup>10</sup> )	309.2	0.2	0.1	4.8	NA	NA	314.4	NA	2,241.2
1983	1,259.4	144.5	274.1	NA	1,678.0	293.7	( <sup>10</sup> )	332.1	0.2	0.2	6.1	NA	(s)	338.6	NA	2,310.3
1984	1,341.7	119.8	297.4	NA	1,758.9	327.6	( <sup>10</sup> )	321.2	0.5	0.4	7.7	(s)	(s)	329.8	NA	2,416.3
1985	1,402.1	100.2	291.9	NA	1,794.3	383.7	( <sup>10</sup> )	281.1	0.7	0.6	9.3	(s)	(s)	291.9	NA	2,469.8
1986	1,385.8	136.6	248.5	NA	1,770.9	414.0	( <sup>10</sup> )	290.8	0.5	0.7	10.3	(s)	(s)	302.3	NA	2,487.3
1987	1,463.8	118.5	272.6	NA	1,854.9	455.3	( <sup>10</sup> )	249.7	0.8	0.7	10.8	(s)	(s)	262.0	NA	2,572.1
1988	1,540.7	148.9	252.8	NA	1,942.4	527.0	( <sup>10</sup> )	222.9	0.9	0.7	10.3	(s)	(s)	234.9	NA	2,704.3
1989 <sup>P,11</sup>	1,554.0	158.3	266.9	0	1,979.3	529.4	( <sup>10</sup> )	268.5	4.2	6.9	14.1	0.3	1.9	295.8	0	2,804.4
1990 <sup>P</sup>	1,560.2	117.5	264.6	(s)	1,942.3	576.9	-3.5	288.4	5.3	10.2	14.9	0.4	2.3	321.6	0	2,837.2
1991 <sup>P</sup>	1,551.9	112.2	267.8	(s)	1,931.9	612.6	-4.5	284.8	6.0	12.2	15.5	0.5	2.6	321.6	0	2,861.6
1992 <sup>P</sup>	1,577.1	90.1	270.9	(s)	1,938.0	618.8	-4.2	250.0	6.6	14.4	16.1	0.4	2.9	290.4	0	2,843.1
1993 <sup>P</sup>	1,642.1	100.6	267.2	(s)	2,009.9	610.3	-4.0	277.5	7.2	14.9	16.8	0.5	3.0	319.8	0	2,935.9
1994 <sup>P</sup>	1,639.9	92.1	299.7	(s)	2,031.7	640.4	-3.4	254.0	7.6	15.4	15.5	0.5	3.4	296.5	0	2,965.2
1995 <sup>P</sup>	1,658.0	62.0	317.4	(s)	2,037.4	673.4	-2.7	305.4	5.9	16.3	13.4	0.5	3.2	344.7	0	3,052.8
1996 <sup>P</sup>	1,742.8	68.5	272.8	(s)	2,084.1	674.7	-3.1	341.2	6.5	16.1	14.3	0.5	3.2	381.8	0	3,137.6
1997 <sup>P</sup>	1,793.2	80.3	291.1	(s)	2,164.6	628.6	-4.0	350.6	6.5	16.4	14.7	0.5	3.3	392.0	0	3,181.3
1998 <sup>P</sup>	1,823.0	115.7	335.9	0.1	2,274.6	673.7	-4.5	317.9	6.6	17.0	14.8	0.5	3.0	359.8	0	3,303.6
1999 <sup>P</sup>	1,832.1	104.8	356.6	(s)	2,293.6	728.3	-6.1	314.7	7.3	17.1	14.8	0.5	4.5	358.8	0	3,374.6
2000 <sup>P</sup>	1,910.6	98.0	399.4	0.2	2,408.2	753.9	-5.5	271.3	7.3	17.6	14.1	0.5	5.6	316.4	0	3,472.9
2001 <sup>P</sup>	1,848.4	113.0	411.3	0.2	2,372.8	768.8	-8.8	213.8	7.2	17.1	13.8	0.5	5.8	258.3	0	3,391.1

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.  
<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.  
<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.  
<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
<sup>5</sup> Pumped storage facility production minus energy used for pumping.  
<sup>6</sup> Wood, black liquor, and other wood waste.  
<sup>7</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.  
<sup>8</sup> Solar thermal and photovoltaic energy.  
<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
<sup>10</sup> Included in "Conventional Hydroelectric Power."

<sup>11</sup> Through 1988, data are for generation at electric utilities only. Beginning in 1989, data also include generation at independent power producers.  
P=Preliminary. NA=Not available. (s)=Less than 0.05 billion kilowatthours.  
Notes: Data on this table for the electric power sector (electric utilities and independent power producers) are for electricity-only plants whose primary business is to sell electricity to the public—i.e., NAICS 22 electricity-only plants. For 1949-2001, also includes electric utility combined-heat-and-power (CHP) plants. Totals may not equal sum of components due to independent rounding.  
Web Page: <http://www.eia.doe.gov/fuelelectric.html>.  
Sources: See end of section.



**Table 8.2c Electricity Net Generation at Combined-Heat-and-Power Plants by Sector, 1989-2001**  
(Billion Kilowatthours)

Year	Fossil Fuels					Renewable Energy				Other <sup>8</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total	Conventional Hydroelectric Power <sup>5</sup>	Wood <sup>6</sup>	Waste <sup>7</sup>	Total		
Electric Power Sector (Independent Power Producers Only) <sup>9</sup>											
1989 <sup>P</sup>	8.4	0.7	30.4	0.5	39.9	0.0	1.3	0.9	2.2	0.3	42.3
1990 <sup>P</sup>	10.8	0.9	43.8	0.6	56.2	0.0	1.4	1.1	2.6	(s)	58.8
1991 <sup>P</sup>	16.9	0.6	50.0	0.7	68.2	0.0	1.7	1.6	3.3	0.4	71.9
1992 <sup>P</sup>	20.7	2.2	63.4	1.2	87.4	0.0	1.9	1.5	3.4	0.5	91.3
1993 <sup>P</sup>	23.4	4.8	75.0	1.0	104.2	0.0	2.0	1.4	3.4	0.4	108.0
1994 <sup>P</sup>	26.4	6.6	86.0	1.1	120.1	0.0	1.6	1.6	3.2	0.2	123.5
1995 <sup>P</sup>	28.1	6.1	101.7	1.9	137.9	0.0	1.7	1.7	3.4	0.2	141.5
1996 <sup>P</sup>	29.2	6.3	105.9	1.3	142.7	0.0	1.9	1.7	3.6	0.2	146.6
1997 <sup>P</sup>	27.6	6.2	108.5	1.5	143.7	0.0	2.2	2.1	4.3	0.1	148.1
1998 <sup>P</sup>	27.2	6.6	113.4	2.3	149.4	0.0	2.0	2.3	4.2	0.2	153.8
1999 <sup>P</sup>	26.6	6.7	116.4	1.6	151.2	0.0	1.7	2.4	4.1	0.1	155.4
2000 <sup>P</sup>	32.5	7.2	118.6	1.8	160.2	0.0	1.6	2.7	4.3	0.1	164.6
2001 <sup>E</sup>	32.6	6.8	124.1	2.2	165.8	0.0	1.9	2.7	4.6	0.5	170.9
Commercial Sector <sup>10</sup>											
1989 <sup>P</sup>	0.7	0.6	2.2	0.1	3.6	0.1	0.1	0.5	0.7	0.0	4.3
1990 <sup>P</sup>	0.8	0.6	3.1	0.1	4.6	0.1	0.1	0.8	1.0	0.0	5.6
1991 <sup>P</sup>	0.8	0.4	3.2	0.1	4.5	0.1	0.1	0.9	1.1	(s)	5.7
1992 <sup>P</sup>	0.7	0.3	3.9	0.1	5.0	0.1	0.1	1.0	1.2	(s)	6.2
1993 <sup>P</sup>	0.9	0.3	4.5	0.1	5.8	0.1	0.1	1.0	1.2	(s)	7.0
1994 <sup>P</sup>	0.8	0.4	4.9	0.1	6.3	0.1	0.1	1.2	1.3	0.0	7.6
1995 <sup>P</sup>	1.0	0.4	5.2	0.0	6.5	0.1	0.1	1.5	1.7	(s)	8.2
1996 <sup>P</sup>	1.1	0.4	5.2	(s)	6.7	0.1	0.1	2.2	2.4	(s)	9.0
1997 <sup>P</sup>	1.0	0.4	4.7	(s)	6.2	0.1	(s)	2.3	2.5	(s)	8.7
1998 <sup>P</sup>	1.0	0.4	4.9	(s)	6.3	0.1	(s)	2.3	2.5	0.0	8.7
1999 <sup>P</sup>	1.0	0.4	4.6	(s)	6.0	0.1	(s)	2.4	2.5	(s)	8.6
2000 <sup>P</sup>	1.1	0.4	4.3	(s)	5.8	0.1	(s)	2.0	2.1	(s)	7.9
2001 <sup>E</sup>	1.0	0.3	4.0	(s)	5.3	0.1	(s)	1.9	2.1	(s)	7.4
Industrial Sector <sup>11</sup>											
1989 <sup>P</sup>	20.7	5.0	53.2	7.3	86.1	2.5	21.6	0.9	24.9	3.5	114.6
1990 <sup>P</sup>	19.3	6.2	57.1	9.0	91.6	2.7	23.1	0.9	26.8	3.6	122.0
1991 <sup>P</sup>	21.0	6.5	60.6	10.5	98.6	2.7	25.9	0.9	29.5	4.3	132.4
1992 <sup>P</sup>	22.7	7.6	65.9	12.0	108.2	2.9	27.9	0.9	31.8	3.2	143.3
1993 <sup>P</sup>	23.7	7.0	68.2	11.9	110.9	2.9	28.4	1.1	32.3	3.1	146.3
1994 <sup>P</sup>	23.6	6.8	69.6	12.1	112.1	6.0	28.7	1.0	35.7	3.4	151.2
1995 <sup>P</sup>	22.4	6.0	71.7	11.9	112.1	5.3	28.9	0.9	35.1	3.9	151.0
1996 <sup>P</sup>	22.2	6.3	71.0	13.0	112.5	5.9	28.4	0.9	35.2	3.4	151.0
1997 <sup>P</sup>	23.2	5.6	75.1	11.8	115.8	5.7	28.2	0.9	34.8	3.5	154.1
1998 <sup>P</sup>	22.3	6.2	77.1	11.2	116.8	5.3	27.7	0.9	33.9	3.4	154.1
1999 <sup>P</sup>	21.5	6.1	78.8	12.5	118.9	4.8	28.1	0.7	33.5	3.9	156.3
2000 <sup>P</sup>	22.1	5.6	78.8	11.9	118.4	4.1	28.7	0.8	33.6	4.7	156.7
2001 <sup>E</sup>	22.0	5.9	73.6	11.7	113.2	3.6	27.7	1.0	32.4	4.5	150.1

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Includes combined-heat-and-power (CHP) plants that use multiple sources of energy including hydropower.

<sup>6</sup> Wood, black liquor, and other wood waste.

<sup>7</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>8</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>9</sup> CHP plants whose primary business is to sell electricity and heat to the public—i.e., NAICS 22 CHP plants. For 1989-2001, does not include electric utility CHP plants—these are included in "Electric Power

Sector" on Table 8.2b.

<sup>10</sup> Commercial combined-heat-and-power (CHP) and a small number of commercial electricity-only plants. See Appendix G for commercial sector NAICS codes.

<sup>11</sup> Industrial combined-heat-and-power (CHP) and a small number of industrial electricity-only plants. See Appendix G for industrial sector NAICS codes.

P=Preliminary. E=Estimate. (s)=Less than 0.05 billion kilowatthours.

Note: Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

Sources: 1989-1997—Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." 2001—EIA, Form EIA-906, "Power Plant Report."

**Table 8.2d Useful Thermal Output at Combined-Heat-and-Power Plants by Sector, 1989-2001**  
(Trillion Btu)

Year	Fossil Fuels					Renewable Energy			Other <sup>7</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total	Wood <sup>5</sup>	Waste <sup>6</sup>	Total		
Electric Power Sector (Independent Power Producers Only) <sup>8</sup>										
1989 <sup>P</sup>	13	8	67	2	90	19	5	24	1	114
1990 <sup>P</sup>	18	8	78	4	109	18	6	25	(s)	133
1991 <sup>P</sup>	21	6	82	4	113	17	9	26	1	140
1992 <sup>P</sup>	28	6	102	5	140	17	8	25	2	167
1993 <sup>P</sup>	30	8	107	3	147	16	8	24	1	173
1994 <sup>P</sup>	37	9	119	5	170	15	10	24	1	195
1995 <sup>P</sup>	40	13	118	4	176	15	12	27	(s)	203
1996 <sup>P</sup>	43	12	121	4	180	16	16	33	(s)	213
1997 <sup>P</sup>	39	12	132	8	191	16	14	30	(s)	221
1998 <sup>P</sup>	43	6	142	5	196	10	16	26	(s)	222
1999 <sup>P</sup>	52	7	146	4	208	10	20	30	(s)	238
2000 <sup>P</sup>	53	7	158	5	223	6	19	26	(s)	249
2001 <sup>E</sup>	55	7	183	6	251	8	19	27	(s)	278
Commercial Sector <sup>9</sup>										
1989 <sup>P</sup>	14	4	10	(s)	27	(s)	10	10	0	38
1990 <sup>P</sup>	15	4	14	(s)	33	(s)	10	10	0	43
1991 <sup>P</sup>	16	4	21	(s)	41	(s)	9	9	(s)	50
1992 <sup>P</sup>	15	4	24	(s)	44	(s)	13	14	(s)	57
1993 <sup>P</sup>	18	4	23	(s)	45	(s)	14	14	(s)	59
1994 <sup>P</sup>	18	4	26	(s)	48	(s)	14	14	0	62
1995 <sup>P</sup>	17	3	29	0	48	(s)	15	15	(s)	63
1996 <sup>P</sup>	20	3	33	0	55	1	17	18	0	73
1997 <sup>P</sup>	22	4	40	(s)	66	1	19	20	0	86
1998 <sup>P</sup>	20	5	39	(s)	64	1	18	18	0	82
1999 <sup>P</sup>	20	3	37	0	61	1	17	17	0	78
2000 <sup>P</sup>	21	4	39	0	64	1	17	18	0	82
2001 <sup>E</sup>	21	3	37	0	61	1	17	17	0	78
Industrial Sector <sup>10</sup>										
1989 <sup>P</sup>	297	84	385	90	856	527	15	542	38	1,437
1990 <sup>P</sup>	291	98	408	123	919	570	20	590	39	1,548
1991 <sup>P</sup>	315	103	444	144	1,005	606	19	625	44	1,674
1992 <sup>P</sup>	324	107	466	155	1,052	641	19	660	40	1,752
1993 <sup>P</sup>	325	117	475	139	1,056	653	23	676	39	1,771
1994 <sup>P</sup>	333	119	502	138	1,093	707	21	729	41	1,863
1995 <sup>P</sup>	329	105	541	140	1,116	706	20	726	44	1,886
1996 <sup>P</sup>	329	118	557	146	1,150	684	21	705	43	1,897
1997 <sup>P</sup>	328	121	541	142	1,132	713	22	735	53	1,920
1998 <sup>P</sup>	318	124	601	162	1,206	689	24	713	46	1,965
1999 <sup>P</sup>	313	115	629	175	1,233	679	18	697	48	1,978
2000 <sup>P</sup>	309	98	615	179	1,201	700	20	720	50	1,971
2001 <sup>E</sup>	315	107	603	172	1,198	679	22	701	50	1,949

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Wood, black liquor, and other wood waste.

<sup>6</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>7</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>8</sup> Combined-heat-and power (CHP) plants whose primary business is to sell electricity and heat to the public—i.e., NAICS 22 CHP plants. For 1989-2001, does not include electric utility CHP plants—these are

included in "Electric Power Sector" on Table 8.2b.

<sup>9</sup> Commercial combined-heat-and-power plants. See Appendix G for commercial sector NAICS codes.

<sup>10</sup> Industrial combined-heat-and-power plants. See Appendix G for industrial sector NAICS codes.

P=Preliminary. E=Estimate. (s)=Less than 0.5 trillion Btu.

Note: Totals may not equal sum of components due to independent rounding.

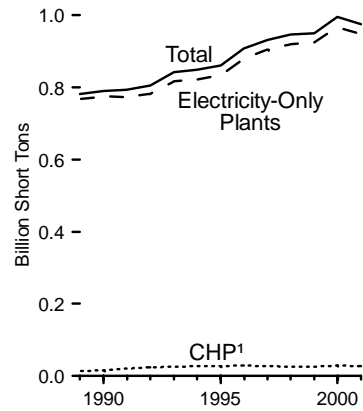
Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

Sources: 1989-1997—Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." 2001—EIA, Form EIA-906, "Power Plant Report."

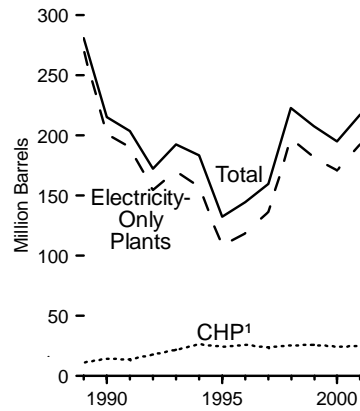
**Figure 8.3 Consumption of Combustible Fuels at Electricity-Only and Combined-Heat-and-Power Plants, 1989-2001**

**For Electricity Generation**

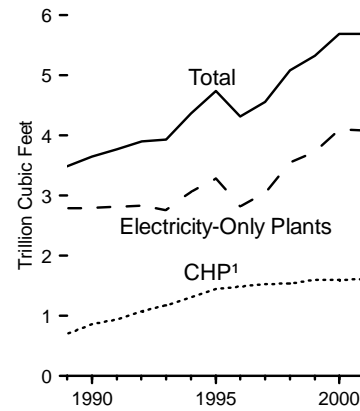
**Coal**



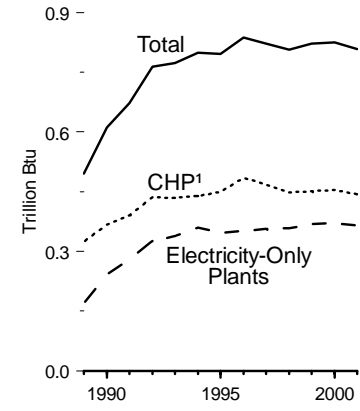
**Petroleum**



**Natural Gas**

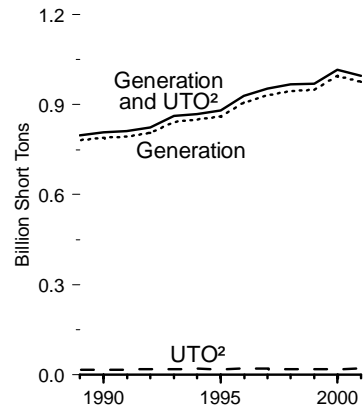


**Wood and Waste**

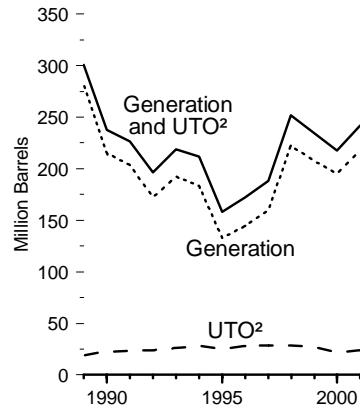


**For Electricity Generation and Useful Thermal Output**

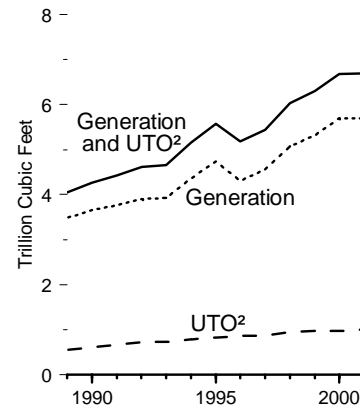
**Coal**



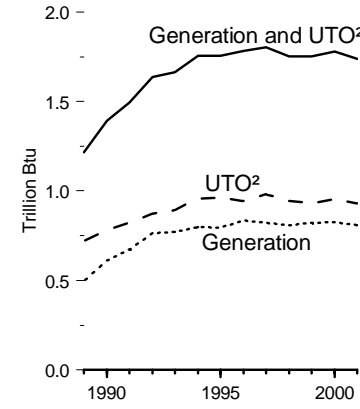
**Petroleum**



**Natural Gas**



**Wood and Waste**



<sup>1</sup> Combined-heat-and-power.

<sup>2</sup> Useful thermal output.

Note: Because vertical scales differ, graphs should not be compared.  
Sources: Tables 8.3a-e.

**Table 8.3a Consumption of Combustible Fuels for Electricity Generation: Total (All Sectors), 1949-2001**

Year	Fossil Fuels						Renewable Energy		Other <sup>9</sup>	
	Coal <sup>1</sup>	Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke	Natural Gas <sup>5</sup>	Other Gases <sup>6</sup>	Wood <sup>7</sup>		Waste <sup>8</sup>
	Thousand Short Tons	Thousand Barrels			Thousand Short Tons	Billion Cubic Feet	Trillion Btu	Trillion Btu		
1949	83,963	4,767	61,534	NA	NA	550	NA	6	NA	NA
1950	91,871	5,423	69,998	NA	NA	629	NA	5	NA	NA
1951	105,768	4,598	59,347	NA	NA	764	NA	5	NA	NA
1952	107,071	4,833	62,385	NA	NA	910	NA	6	NA	NA
1953	115,897	5,913	76,325	NA	NA	1,034	NA	5	NA	NA
1954	118,385	4,799	61,946	NA	NA	1,165	NA	3	NA	NA
1955	143,759	5,412	69,862	NA	NA	1,153	NA	3	NA	NA
1956	158,279	5,228	67,483	NA	NA	1,239	NA	2	NA	NA
1957	160,769	5,730	73,963	NA	NA	1,336	NA	2	NA	NA
1958	155,724	5,584	72,083	NA	NA	1,373	NA	2	NA	NA
1959	168,423	6,346	81,917	NA	NA	1,629	NA	2	NA	NA
1960	176,685	3,824	84,371	NA	NA	1,725	NA	2	NA	NA
1961	182,185	3,708	85,204	NA	NA	1,825	NA	1	NA	NA
1962	193,316	3,910	85,384	NA	NA	1,966	NA	1	NA	NA
1963	211,332	4,233	89,081	NA	NA	2,144	NA	1	NA	NA
1964	225,425	4,310	96,831	NA	NA	2,323	NA	2	NA	NA
1965	244,788	4,928	110,274	NA	NA	2,321	NA	3	NA	NA
1966	266,477	6,311	134,638	NA	NA	2,610	NA	3	NA	NA
1967	274,185	7,393	153,886	NA	NA	2,746	NA	3	NA	NA
1968	297,779	9,830	178,812	NA	NA	3,148	NA	4	NA	NA
1969	310,641	14,961	236,066	NA	NA	3,488	NA	3	NA	NA
1970	320,182	24,123	311,381	NA	636	3,932	NA	1	2	NA
1971	327,301	34,283	362,187	NA	605	3,976	NA	1	2	NA
1972	351,768	53,465	440,294	NA	627	3,977	NA	1	2	NA
1973	389,212	47,058	513,190	NA	507	3,660	NA	1	2	NA
1974	391,811	53,128	483,146	NA	625	3,443	NA	1	2	NA
1975	405,962	38,907	467,221	NA	70	3,158	NA	(s)	2	NA
1976	448,371	41,843	514,077	NA	68	3,081	NA	1	2	NA
1977	477,126	48,837	574,869	NA	98	3,191	NA	3	2	NA
1978	481,235	47,520	588,319	NA	398	3,188	NA	2	1	NA
1979	527,051	30,691	492,606	NA	268	3,491	NA	3	2	NA
1980	569,274	29,051	391,163	NA	179	3,682	NA	3	2	NA
1981	596,797	21,313	329,798	NA	139	3,640	NA	3	1	NA
1982	593,666	15,337	234,434	NA	149	3,226	NA	2	1	NA
1983	625,211	16,512	228,984	NA	261	2,911	NA	2	2	NA
1984	664,399	15,190	189,289	NA	252	3,111	NA	5	4	NA
1985	693,841	14,635	158,779	NA	231	3,044	NA	8	7	NA
1986	685,056	14,326	216,156	NA	313	2,602	NA	5	7	NA
1987	717,894	15,367	184,011	NA	348	2,844	NA	8	7	NA
1988	758,372	18,769	229,327	NA	409	2,636	NA	10	8	NA
1989 <sup>P,10</sup>	<sup>R</sup> 781,672	<sup>R</sup> 27,733	<sup>R</sup> 249,820	303	<sup>R</sup> 667	<sup>R</sup> 3,485	90	345	151	39
1990 <sup>P</sup>	<sup>R</sup> 790,244	<sup>R</sup> 17,858	<sup>R</sup> 188,334	437	<sup>R</sup> 1,750	<sup>R</sup> 3,653	106	402	210	35
1991 <sup>P</sup>	<sup>R</sup> 793,666	<sup>R</sup> 16,564	<sup>R</sup> 177,780	380	<sup>R</sup> 1,789	<sup>R</sup> 3,765	125	425	247	59
1992 <sup>P</sup>	<sup>R</sup> 805,140	<sup>R</sup> 14,493	<sup>R</sup> 144,467	759	<sup>R</sup> 2,504	<sup>R</sup> 3,900	141	481	283	40
1993 <sup>P</sup>	<sup>R</sup> 842,153	<sup>R</sup> 16,845	<sup>R</sup> 159,059	715	<sup>R</sup> 3,169	<sup>R</sup> 3,929	136	485	288	34
1994 <sup>P</sup>	<sup>R</sup> 848,796	<sup>R</sup> 22,365	<sup>R</sup> 145,225	929	<sup>R</sup> 3,020	<sup>R</sup> 4,367	136	498	301	40
1995 <sup>P</sup>	<sup>R</sup> 860,594	<sup>R</sup> 19,615	<sup>R</sup> 95,507	680	<sup>R</sup> 3,355	<sup>R</sup> 4,738	133	480	316	42
1996 <sup>P</sup>	<sup>R</sup> 907,209	<sup>R</sup> 20,252	<sup>R</sup> 106,055	1,712	<sup>R</sup> 3,322	<sup>R</sup> 4,312	159	513	324	37
1997 <sup>P</sup>	<sup>R</sup> 931,949	<sup>R</sup> 20,309	<sup>R</sup> 118,741	237	<sup>R</sup> 4,086	<sup>R</sup> 4,565	119	484	339	36
1998 <sup>P</sup>	<sup>R</sup> 946,295	<sup>R</sup> 25,062	<sup>R</sup> 172,728	549	<sup>R</sup> 4,860	<sup>R</sup> 5,081	125	475	332	36
1999 <sup>P</sup>	<sup>R</sup> 949,802	<sup>R</sup> 25,951	<sup>R</sup> 158,187	974	<sup>R</sup> 4,552	<sup>R</sup> 5,322	126	490	332	41
2000 <sup>P</sup>	<sup>R</sup> 994,933	<sup>R</sup> 31,675	<sup>R</sup> 143,381	1,450	<sup>R</sup> 3,744	<sup>R</sup> 5,691	126	496	330	46
2001 <sup>E</sup>	975,570	32,020	163,168	1,399	4,159	5,690	127	483	325	49

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>2</sup> For 1949-1979, gas turbine and internal combustion plant use of petroleum. For 1980-2001, electric utility data are for light oil (fuel oil nos. 1 and 2, and small amounts of kerosene and jet fuel.)

<sup>3</sup> For 1949-1979, steam plant use of petroleum. For 1980-2001, electric utility data are for heavy oil (fuel oil nos. 5 and 6, and small amounts of fuel oil no. 4.)

<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>5</sup> Natural gas, including a small amount of supplemental gaseous fuels.

<sup>6</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>7</sup> Wood, black liquor, and other wood waste.

<sup>8</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>10</sup> Through 1988, data are for consumption at electric utilities only. Beginning in 1989, data also include consumption at independent power producers, commercial plants, and industrial plants.

R=Revised. P=Preliminary. E=Estimate. NA=Not available. (s)=Less than 0.5 trillion Btu.

Notes: Data are for fuels consumed to produce electricity; they exclude fuels consumed to produce useful thermal output. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

Sources: Tables 8.3b and 8.3c.

**Table 8.3b Consumption of Combustible Fuels for Electricity Generation at Electricity-Only Plants: Electric Power Sector, 1949-2001**

Year	Fossil Fuels						Renewable Energy		Other <sup>9</sup>	
	Coal <sup>1</sup>	Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke	Natural Gas <sup>5</sup>	Other Gases <sup>6</sup>	Wood <sup>7</sup>		Waste <sup>8</sup>
	Thousand Short Tons	Thousand Barrels			Thousand Short Tons	Billion Cubic Feet	Trillion Btu	Trillion Btu		Trillion Btu
1949	83,963	4,767	61,534	NA	NA	550	NA	6	NA	NA
1950	91,871	5,423	69,998	NA	NA	629	NA	5	NA	NA
1951	105,768	4,598	59,347	NA	NA	764	NA	5	NA	NA
1952	107,071	4,833	62,385	NA	NA	910	NA	6	NA	NA
1953	115,897	5,913	76,325	NA	NA	1,034	NA	5	NA	NA
1954	118,385	4,799	61,946	NA	NA	1,165	NA	3	NA	NA
1955	143,759	5,412	69,862	NA	NA	1,153	NA	3	NA	NA
1956	158,279	5,228	67,483	NA	NA	1,239	NA	2	NA	NA
1957	160,769	5,730	73,963	NA	NA	1,336	NA	2	NA	NA
1958	155,724	5,584	72,083	NA	NA	1,373	NA	2	NA	NA
1959	168,423	6,346	81,917	NA	NA	1,629	NA	2	NA	NA
1960	176,685	3,824	84,371	NA	NA	1,725	NA	2	NA	NA
1961	182,185	3,708	85,204	NA	NA	1,825	NA	1	NA	NA
1962	193,316	3,910	85,384	NA	NA	1,966	NA	1	NA	NA
1963	211,332	4,233	89,081	NA	NA	2,144	NA	1	NA	NA
1964	225,425	4,310	96,831	NA	NA	2,323	NA	2	NA	NA
1965	244,788	4,928	110,274	NA	NA	2,321	NA	3	NA	NA
1966	266,477	6,311	134,638	NA	NA	2,610	NA	3	NA	NA
1967	274,185	7,393	153,886	NA	NA	2,746	NA	3	NA	NA
1968	297,779	9,830	178,812	NA	NA	3,148	NA	4	NA	NA
1969	310,641	14,961	236,066	NA	NA	3,488	NA	3	NA	NA
1970	320,182	24,123	311,381	NA	636	3,932	NA	1	2	NA
1971	327,301	34,283	362,187	NA	605	3,976	NA	1	2	NA
1972	351,768	53,465	440,294	NA	627	3,977	NA	1	2	NA
1973	389,212	47,058	513,190	NA	507	3,660	NA	1	2	NA
1974	391,811	53,128	483,146	NA	625	3,443	NA	1	2	NA
1975	405,962	38,907	467,221	NA	70	3,158	NA	(s)	2	NA
1976	448,371	41,843	514,077	NA	68	3,081	NA	1	2	NA
1977	477,126	48,837	574,869	NA	98	3,191	NA	3	2	NA
1978	481,235	47,520	588,319	NA	398	3,188	NA	2	1	NA
1979	527,051	30,691	492,606	NA	268	3,491	NA	3	2	NA
1980	569,274	29,051	391,163	NA	179	3,682	NA	3	2	NA
1981	596,797	21,313	329,798	NA	139	3,640	NA	3	1	NA
1982	593,666	15,337	234,434	NA	149	3,226	NA	2	1	NA
1983	625,211	16,512	228,984	NA	261	2,911	NA	2	2	NA
1984	664,399	15,190	189,289	NA	252	3,111	NA	5	4	NA
1985	693,841	14,635	158,779	NA	231	3,044	NA	8	7	NA
1986	685,056	14,326	216,156	NA	313	2,602	NA	5	7	NA
1987	717,894	15,367	184,011	NA	348	2,844	NA	8	7	NA
1988	758,372	18,769	229,327	NA	409	2,636	NA	10	8	NA
1989 <sup>P,10</sup>	767,378	25,574	241,960	3	517	2,791	0	59	111	0
1990 <sup>P</sup>	774,213	14,956	181,231	17	983	2,794	(s)	83	160	0
1991 <sup>P</sup>	773,183	13,822	171,157	51	974	2,822	(s)	85	195	0
1992 <sup>P</sup>	781,186	11,998	135,779	48	1,320	2,829	(s)	94	232	0
1993 <sup>P</sup>	816,558	13,460	149,287	11	1,553	2,755	(s)	101	237	0
1994 <sup>P</sup>	821,209	16,693	134,666	52	1,193	3,065	(s)	112	248	0
1995 <sup>P</sup>	832,928	16,169	86,584	133	1,082	3,288	(s)	84	262	0
1996 <sup>P</sup>	878,825	17,361	96,386	50	1,010	2,824	(s)	94	258	0
1997 <sup>P</sup>	904,245	17,702	109,989	30	1,687	3,039	1	91	266	0
1998 <sup>P</sup>	920,353	22,293	163,541	295	2,202	3,544	1	95	263	0
1999 <sup>P</sup>	924,692	22,877	149,193	380	1,891	3,729	1	105	264	0
2000 <sup>P</sup>	967,080	28,001	135,419	94	1,457	4,093	2	105	267	0
2001 <sup>P</sup>	947,957	28,214	155,125	97	1,873	4,080	2	105	260	0

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>2</sup> For 1949-1979, gas turbine and internal combustion plant use of petroleum. For 1980-2001, electric utility data are for light oil (fuel oil nos. 1 and 2, and small amounts of kerosene and jet fuel.)

<sup>3</sup> For 1949-1979, steam plant use of petroleum. For 1980-2001, electric utility data are for heavy oil (fuel oil nos. 5 and 6, and small amounts of fuel oil no. 4.)

<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>5</sup> Natural gas, including a small amount of supplemental gaseous fuels.

<sup>6</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>7</sup> Wood, black liquor, and other wood waste.

<sup>8</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>10</sup> Through 1988, data are for consumption at electric utilities only. Beginning in 1989, data also include consumption at independent power producers.

P=Preliminary. NA=Not available. (s)=Less than 0.5.

Notes: Data are for fuels consumed to produce electricity; they exclude fuels consumed to produce useful thermal output. The electric power sector (electric utilities and independent power producers) comprises electricity-only plants whose primary business is to sell electricity to the public—i.e., NAICS 22 electricity-only plants. For 1949-2001, also includes electric utility combined-heat-and-power (CHP) plants.

Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

Sources: See end of section.

**Table 8.3c Estimated Consumption of Combustible Fuels for Electricity Generation at Combined-Heat-and-Power Plants by Sector, 1989-2001**

Year	Fossil Fuels						Renewable Energy		Other <sup>7</sup>	
	Coal <sup>1</sup>	Distillate Fuel Oil	Residual Fuel Oil	Other Liquids <sup>2</sup>	Petroleum Coke	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Wood <sup>5</sup>		Waste <sup>6</sup>
	Thousand Short Tons	Thousand Barrels			Thousand Short Tons	Billion Cubic Feet	Trillion Btu	Trillion Btu		Trillion Btu
Electric Power Sector (Independent Power Producers Only) <sup>8</sup>										
1989 <sup>P</sup>	4,173	462	747	6	0	233	7	16	16	2
1990 <sup>P</sup>	5,784	1,287	653	7	0	345	6	18	18	(s)
1991 <sup>P</sup>	9,470	433	473	7	0	394	6	20	22	4
1992 <sup>P</sup>	12,204	471	1,902	69	170	496	12	25	20	3
1993 <sup>P</sup>	13,293	1,099	2,120	202	1,018	589	12	28	18	3
1994 <sup>P</sup>	14,904	3,548	2,531	615	1,063	694	12	22	22	2
1995 <sup>P</sup>	14,926	1,898	2,311	307	1,370	806	18	22	20	2
1996 <sup>P</sup>	15,575	1,111	2,410	517	1,456	836	15	24	22	2
1997 <sup>P</sup>	14,764	944	2,434	100	1,514	864	14	26	26	1
1998 <sup>P</sup>	13,773	872	2,334	117	1,797	872	21	30	24	2
1999 <sup>P</sup>	13,197	998	2,728	134	1,716	915	14	20	26	1
2000 <sup>P</sup>	15,634	1,721	2,627	310	1,698	921	17	21	28	1
2001 <sup>E</sup>	15,604	1,961	2,073	250	1,667	959	21	25	28	5
Commercial Sector <sup>9</sup>										
1989 <sup>P</sup>	414	882	282	0	0	18	1	2	9	0
1990 <sup>P</sup>	417	569	328	(s)	0	26	1	1	15	0
1991 <sup>P</sup>	403	430	146	(s)	0	27	1	2	15	(s)
1992 <sup>P</sup>	371	289	137	(s)	1	33	1	1	16	(s)
1993 <sup>P</sup>	404	384	279	4	1	37	1	1	16	0
1994 <sup>P</sup>	404	481	209	0	1	41	1	1	17	0
1995 <sup>P</sup>	569	493	152	(s)	1	43	0	1	21	(s)
1996 <sup>P</sup>	656	422	218	(s)	1	42	0	1	31	(s)
1997 <sup>P</sup>	630	583	200	0	1	39	(s)	1	34	0
1998 <sup>P</sup>	440	436	359	0	1	41	(s)	1	32	0
1999 <sup>P</sup>	481	506	421	0	1	39	0	(s)	33	0
2000 <sup>P</sup>	514	505	310	1	1	37	0	(s)	26	(s)
2001 <sup>E</sup>	490	359	310	1	1	35	0	(s)	26	0
Industrial Sector <sup>10</sup>										
1989 <sup>P</sup>	9,707	815	6,830	294	150	444	83	267	15	37
1990 <sup>P</sup>	9,830	1,046	6,122	412	767	488	99	299	16	35
1991 <sup>P</sup>	10,610	1,879	6,004	322	815	522	118	318	14	55
1992 <sup>P</sup>	11,379	1,735	6,650	642	1,013	542	128	359	15	37
1993 <sup>P</sup>	11,898	1,902	7,373	498	597	547	123	355	17	31
1994 <sup>P</sup>	12,279	1,644	7,818	263	762	568	123	364	14	38
1995 <sup>P</sup>	12,171	1,056	6,460	239	902	601	114	373	13	40
1996 <sup>P</sup>	12,153	1,359	7,042	1,145	853	610	143	394	13	35
1997 <sup>P</sup>	12,311	1,079	6,118	107	884	623	105	367	14	36
1998 <sup>P</sup>	11,728	1,461	6,494	137	860	625	102	349	13	35
1999 <sup>P</sup>	11,432	1,571	5,845	460	944	639	112	364	8	39
2000 <sup>P</sup>	11,706	1,448	5,024	1,046	588	640	107	369	10	45
2001 <sup>E</sup>	11,519	1,486	5,659	1,052	617	616	104	354	11	44

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>2</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Wood, black liquor, and other wood waste.

<sup>6</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>7</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>8</sup> Combined-heat-and-power (CHP) plants whose primary business is to sell electricity and heat to the public—i.e., NAICS 22 CHP plants. For 1989-2001, does not include electric utility CHP plants—these are included in "Electric Power Sector" on Table 8.3b.

<sup>9</sup> Commercial combined-heat-and-power (CHP) and a small number of commercial electricity-only

plants. See Appendix G for commercial sector NAICS codes.

<sup>10</sup> Industrial combined-heat-and-power (CHP) and a small number of industrial electricity-only plants.

See Appendix G for industrial sector NAICS codes.

P=Preliminary. E=Estimate. (s)=Less than 0.5.

Notes: Estimates are for fuels consumed to produce electricity; they exclude fuels consumed to produce useful thermal output. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

Sources: 1989-1997—Energy Information Administration (EIA), estimated data using Form EIA-867, "Annual Nonutility Power Producer Report." 1998-2000—EIA, estimated data using Form EIA-860B, "Annual Electric Generator Report—Nonutility." 2001—EIA, estimated data using Form EIA-906, "Power Plant Report."

**Table 8.3d Estimated Consumption of Combustible Fuels for Useful Thermal Output at Combined-Heat-and-Power Plants by Sector, 1989-2001**

Year	Fossil Fuels						Renewable Energy		Other <sup>7</sup>	
	Coal <sup>1</sup>	Distillate Fuel Oil	Residual Fuel Oil	Other Liquids <sup>2</sup>	Petroleum Coke	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Wood <sup>5</sup>		Waste <sup>6</sup>
	Thousand Short Tons	Thousand Barrels			Thousand Short Tons	Billion Cubic Feet	Trillion Btu	Trillion Btu		
Electric Power Sector (Independent Power Producers Only) <sup>8</sup>										
1989 <sup>P</sup>	639	120	1,471	1	0	82	3	24	6	1
1990 <sup>P</sup>	990	157	1,491	2	0	95	5	23	8	(s)
1991 <sup>P</sup>	1,221	104	995	1	0	100	5	21	11	1
1992 <sup>P</sup>	1,704	154	1,045	10	4	123	6	21	10	2
1993 <sup>P</sup>	1,794	290	1,074	27	40	129	4	21	10	2
1994 <sup>P</sup>	2,241	371	1,024	104	58	144	6	18	12	1
1995 <sup>P</sup>	2,376	486	1,127	58	222	143	5	19	15	(s)
1996 <sup>P</sup>	2,520	308	1,155	86	175	147	5	20	21	(s)
1997 <sup>P</sup>	2,355	343	1,246	23	171	162	10	20	17	(s)
1998 <sup>P</sup>	2,493	134	653	19	103	172	6	12	20	(s)
1999 <sup>P</sup>	3,033	183	572	30	128	176	4	13	25	(s)
2000 <sup>P</sup>	3,107	294	467	51	120	192	7	8	24	(s)
2001 <sup>E</sup>	3,178	674	288	50	119	222	7	11	23	(s)
Commercial Sector <sup>9</sup>										
1989 <sup>P</sup>	711	202	601	0	0	12	(s)	(s)	13	0
1990 <sup>P</sup>	773	384	482	(s)	0	17	(s)	(s)	13	0
1991 <sup>P</sup>	826	356	405	(s)	0	25	(s)	(s)	11	(s)
1992 <sup>P</sup>	804	259	538	(s)	2	30	(s)	1	16	(s)
1993 <sup>P</sup>	968	272	548	2	4	28	(s)	(s)	17	(s)
1994 <sup>P</sup>	940	534	379	0	4	31	(s)	(s)	17	0
1995 <sup>P</sup>	850	319	261	(s)	3	35	0	(s)	19	(s)
1996 <sup>P</sup>	1,005	260	328	(s)	3	40	0	1	22	(s)
1997 <sup>P</sup>	1,108	470	309	0	3	48	(s)	1	24	0
1998 <sup>P</sup>	1,002	418	573	0	3	47	(s)	1	22	0
1999 <sup>P</sup>	1,009	254	412	0	3	45	0	1	21	0
2000 <sup>P</sup>	1,034	403	366	2	4	48	0	1	21	0
2001 <sup>E</sup>	1,009	289	366	2	4	45	0	1	21	0
Industrial Sector <sup>10</sup>										
1989 <sup>P</sup>	15,160	1,088	14,320	352	247	470	113	659	19	48
1990 <sup>P</sup>	15,036	1,306	14,085	893	742	497	153	712	25	49
1991 <sup>P</sup>	16,412	2,567	13,893	834	777	539	180	758	23	55
1992 <sup>P</sup>	16,864	1,945	14,891	925	856	565	194	801	24	50
1993 <sup>P</sup>	16,988	1,887	16,312	846	987	578	174	816	29	49
1994 <sup>P</sup>	17,428	1,906	17,423	505	1,075	610	173	884	27	52
1995 <sup>P</sup>	17,192	1,277	15,272	584	1,010	659	175	882	25	55
1996 <sup>P</sup>	17,281	1,624	17,069	670	1,097	679	182	855	26	53
1997 <sup>P</sup>	17,542	1,772	14,328	267	1,835	659	178	892	27	67
1998 <sup>P</sup>	16,824	4,391	15,313	662	1,230	730	202	862	29	58
1999 <sup>P</sup>	16,330	4,228	13,148	808	1,307	762	219	849	23	60
2000 <sup>P</sup>	16,325	2,200	12,459	1,402	800	745	223	875	25	63
2001 <sup>E</sup>	16,590	2,473	14,000	1,400	812	733	215	848	28	63

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>2</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Wood, black liquor, and other wood waste.

<sup>6</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>7</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>8</sup> Combined-heat-and-power (CHP) plants whose primary business is to sell electricity and heat to the public—i.e., NAICS 22 CHP plants. For 1989-2001, does not include electric utility CHP plants—these are included in "Electric Power Sector" on Table 8.3b.

<sup>9</sup> Commercial combined-heat-and-power plants. See Appendix G for commercial sector NAICS codes.

<sup>10</sup> Industrial combined-heat-and-power plants. See Appendix G for industrial sector NAICS codes.

P=Preliminary. E=Estimate. (s)=Less than 0.5.

Notes: Estimates are for fuels consumed to produce useful thermal output; they exclude fuels consumed to produce electricity. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

Sources: 1989-1997—Energy Information Administration (EIA), estimated data using Form EIA-867, "Annual Nonutility Power Producer Report." 1998-2000—EIA, estimated data using Form EIA-860B, "Annual Electric Generator Report—Nonutility." 2001—EIA, estimated data using Form EIA-906, "Power Plant Report."



**Table 8.3e Consumption of Combustible Fuels for Electricity Generation and Useful Thermal Output at Electricity-Only and Combined-Heat-and-Power Plants by Sector, 1989-2001**

Year	Fossil Fuels						Renewable Energy		Other <sup>7</sup>	
	Coal <sup>1</sup>	Distillate Fuel Oil	Residual Fuel Oil	Other Liquids <sup>2</sup>	Petroleum Coke	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Wood <sup>5</sup>		Waste <sup>6</sup>
	Thousand Short Tons	Thousand Barrels			Thousand Short Tons	Billion Cubic Feet	Trillion Btu	Trillion Btu		
Electric Power Sector (Electric Utilities and Independent Power Producers) <sup>8</sup>										
1989P	772,190	<sup>9</sup> 26,156	<sup>10</sup> 244,179	10	517	3,105	9	100	132	3
1990P	780,987	<sup>9</sup> 16,400	<sup>10</sup> 183,375	26	983	3,234	11	124	187	(s)
1991P	783,874	<sup>9</sup> 14,359	<sup>10</sup> 172,625	59	974	3,316	11	126	229	4
1992P	795,094	<sup>9</sup> 12,623	<sup>10</sup> 138,726	128	1,494	3,448	18	140	262	5
1993P	831,645	<sup>9</sup> 14,849	<sup>10</sup> 152,481	239	2,611	3,473	16	150	265	5
1994P	838,354	<sup>9</sup> 20,612	<sup>10</sup> 138,222	771	2,315	3,903	19	152	282	3
1995P	850,230	<sup>9</sup> 18,553	<sup>10</sup> 90,023	499	2,674	4,237	24	125	296	2
1996P	896,921	<sup>9</sup> 18,780	<sup>10</sup> 99,951	653	2,642	3,807	20	138	300	2
1997P	921,364	<sup>9</sup> 18,989	<sup>10</sup> 113,669	152	3,372	4,065	24	137	309	1
1998P	936,619	<sup>9</sup> 23,300	<sup>10</sup> 166,528	431	4,102	4,588	29	137	308	2
1999P	940,922	<sup>9</sup> 24,058	<sup>10</sup> 152,493	544	3,735	4,820	19	138	315	1
2000P	985,821	<sup>9</sup> 30,016	<sup>10</sup> 138,513	454	3,275	5,206	25	134	318	1
2001P	966,739	<sup>9</sup> 30,849	<sup>10</sup> 157,486	397	3,660	5,261	30	140	311	5
Commercial Sector <sup>11</sup>										
1989P	1,125	1,085	883	0	0	30	1	2	22	0
1990P	1,191	953	810	(s)	0	43	1	2	28	0
1991P	1,228	786	551	(s)	0	52	1	2	26	(s)
1992P	1,175	548	675	(s)	2	62	1	2	32	(s)
1993P	1,373	656	828	6	5	65	1	2	33	(s)
1994P	1,344	1,015	588	0	4	72	1	1	35	0
1995P	1,419	812	413	(s)	4	78	0	1	40	(s)
1996P	1,660	682	545	(s)	4	82	0	2	53	(s)
1997P	1,738	1,053	509	0	4	87	(s)	2	58	0
1998P	1,443	854	932	0	4	87	(s)	2	54	0
1999P	1,490	759	834	0	4	84	0	1	54	0
2000P	1,547	908	676	3	6	85	0	1	47	(s)
2001E	1,499	648	676	3	6	80	0	1	46	0
Industrial Sector <sup>12</sup>										
1989P	24,867	1,903	21,150	646	397	914	195	926	35	85
1990P	24,866	2,352	20,207	1,305	1,509	985	252	1,012	41	84
1991P	27,021	4,446	19,897	1,156	1,592	1,061	298	1,076	37	110
1992P	28,244	3,680	21,540	1,567	1,870	1,108	322	1,161	39	87
1993P	28,886	3,788	23,684	1,343	1,583	1,125	297	1,170	46	80
1994P	29,707	3,550	25,242	768	1,838	1,178	296	1,248	41	89
1995P	29,363	2,333	21,732	823	1,912	1,260	290	1,255	38	95
1996P	29,434	2,983	24,111	1,815	1,950	1,289	325	1,249	39	89
1997P	29,853	2,851	20,445	374	2,719	1,282	283	1,259	41	102
1998P	28,553	5,852	21,807	800	2,090	1,355	305	1,211	42	93
1999P	27,763	5,799	18,993	1,268	2,251	1,401	331	1,213	31	99
2000P	28,031	3,648	17,483	2,448	1,388	1,386	331	1,244	35	108
2001E	28,109	3,959	19,659	2,452	1,430	1,348	320	1,202	39	107

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>2</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Wood, black liquor, and other wood waste.

<sup>6</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>7</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>8</sup> Electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants.

<sup>9</sup> Electric utility data are for light oil (fuel oil nos. 1 and 2, and small amounts of kerosene and jet fuel).

<sup>10</sup> Electric utility data are for heavy oil (fuel oil nos. 5 and 6, and small amounts of fuel oil no. 4).

<sup>11</sup> Commercial combined-heat-and-power (CHP) and electricity-only plants. See Appendix G for commercial sector NAICS codes.

<sup>12</sup> Industrial combined-heat-and-power (CHP) and electricity-only plants. See Appendix G for industrial sector NAICS codes.

P=Preliminary. E=Estimate. (s)=Less than 0.5.

Notes: Totals may not equal sum of components due to independent rounding.

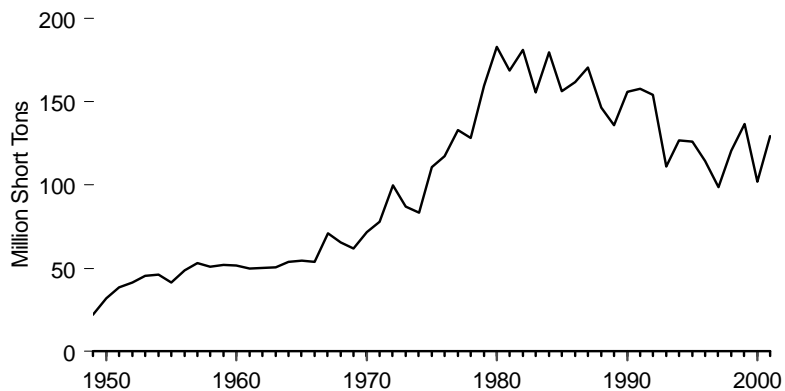
Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

Sources: Tables 8.3b, 8.3c, and 8.3d.

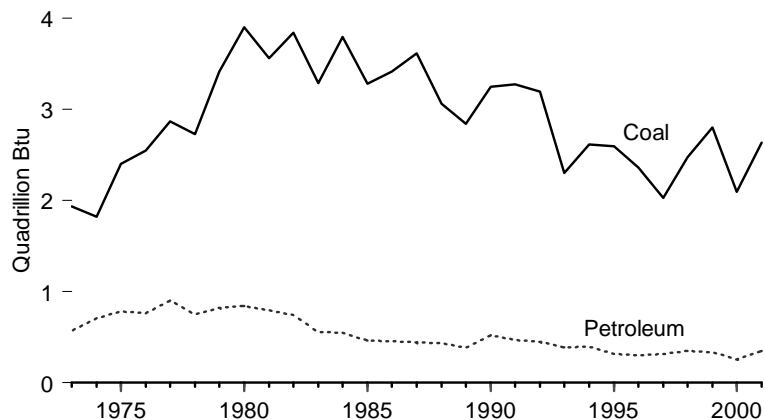


**Figure 8.4 Stocks of Coal and Petroleum: Electric Power Sector**

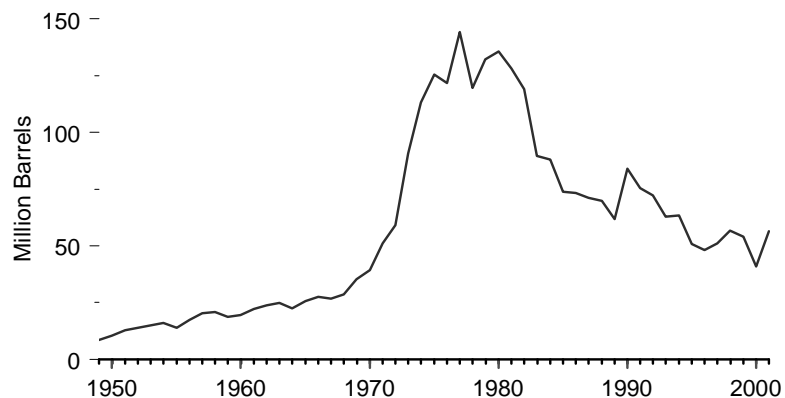
**Coal Stocks, 1949-2001**



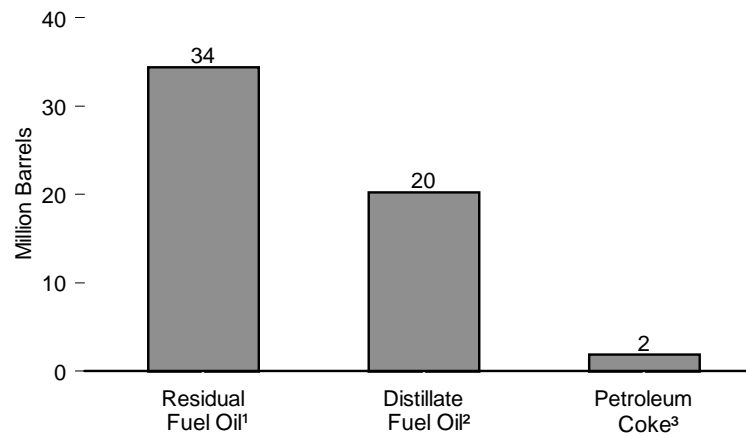
**Coal and Petroleum Stocks, 1973-2001**



**Petroleum Stocks, 1949-2001**



**Petroleum Stocks by Product, 2001**



<sup>1</sup> Fuel oil nos. 5 and 6, and small amounts of fuel oil no 4.

<sup>2</sup> Fuel oil nos. 1 and 2, and small amounts of kerosene and jet fuel.

<sup>3</sup> Petroleum coke, which is reported in short tons, is converted at a rate of 5 barrels per short ton.

Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 8.4, A3, and A5.

**Table 8.4 Stocks of Coal and Petroleum: Electric Power Sector, 1949-2001**

Year	Coal <sup>1</sup>	Petroleum			
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Petroleum Coke <sup>4</sup>	Total <sup>4</sup>
	Thousand Short Tons	Thousand Barrels		Thousand Short Tons	Thousand Barrels
1949	22,054	NA	NA	NA	8,604
1950	31,842	NA	NA	NA	10,201
1951	38,524	NA	NA	NA	12,836
1952	41,492	NA	NA	NA	13,746
1953	45,640	NA	NA	NA	14,961
1954	46,096	NA	NA	NA	15,885
1955	41,391	NA	NA	NA	13,671
1956	48,765	NA	NA	NA	17,328
1957	53,087	NA	NA	NA	20,122
1958	50,989	NA	NA	NA	20,775
1959	52,125	NA	NA	NA	18,548
1960	51,735	NA	NA	NA	19,572
1961	50,069	NA	NA	NA	22,036
1962	50,406	NA	NA	NA	23,821
1963	50,608	NA	NA	NA	24,940
1964	53,908	NA	NA	NA	22,383
1965	54,525	NA	NA	NA	25,647
1966	53,893	NA	NA	NA	27,430
1967	70,987	NA	NA	NA	26,669
1968	65,493	NA	NA	NA	28,685
1969	61,894	NA	NA	NA	35,335
1970	71,908	NA	NA	239	39,151
1971	77,778	NA	NA	291	51,101
1972	99,722	NA	NA	287	59,090
1973	86,967	10,095	79,121	312	90,776
1974	83,509	15,199	97,718	35	113,091
1975	110,724	16,432	108,825	31	125,413
1976	117,436	14,703	106,993	32	121,857
1977	133,219	19,281	124,750	44	144,252
1978	128,225	16,386	102,402	198	119,778
1979	159,714	20,301	111,121	183	132,338
1980	183,010	30,023	105,351	52	135,635
1981	168,893	26,094	102,042	42	128,345
1982	181,132	23,369	95,515	41	119,090
1983	155,598	18,801	70,573	55	89,652
1984	179,727	19,116	68,503	50	87,870
1985	156,376	16,386	57,304	49	73,933
1986	161,806	16,269	56,841	40	73,313
1987	170,797	15,759	55,069	51	71,084
1988	146,507	15,099	54,187	86	69,714
1989	135,860	13,824	47,446	105	61,795
1990	156,166	16,471	67,030	94	83,970
1991	157,876	16,357	58,636	70	75,343
1992	154,130	15,714	56,135	67	72,183
1993	111,341	15,674	46,770	89	62,890
1994	126,897	16,644	46,344	69	63,333
1995	126,304	15,392	35,102	65	50,821
1996	114,623	15,216	32,473	91	48,146
1997	98,826	15,456	33,336	469	51,138
1998	120,501	16,343	37,451	559	56,591
1999 <sup>5,P</sup>	<sup>R</sup> 136,537	17,995	34,256	372	54,109
2000 <sup>P</sup>	<sup>R</sup> 102,034	15,115	24,748	211	40,920
2001 <sup>P</sup>	129,417	20,225	34,381	373	56,471

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, and lignite.

<sup>2</sup> For 1973-1979, gas turbine and internal combustion plant stocks of petroleum. For 1980-2001, electric utility data are for light oil (fuel oil nos. 1 and 2, and small amounts of kerosene and jet fuel).

<sup>3</sup> For 1973-1979, steam plant stocks of petroleum. For 1980-2001, electric utility data are for heavy oil (fuel oil nos. 5 and 6, and small amounts of fuel oil no. 4).

<sup>4</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.

<sup>5</sup> Through 1998, data are for stocks at electric utilities only. Beginning in 1999, data also include stocks at independent power producers.

R=Revised. P=Preliminary. NA=Not available.

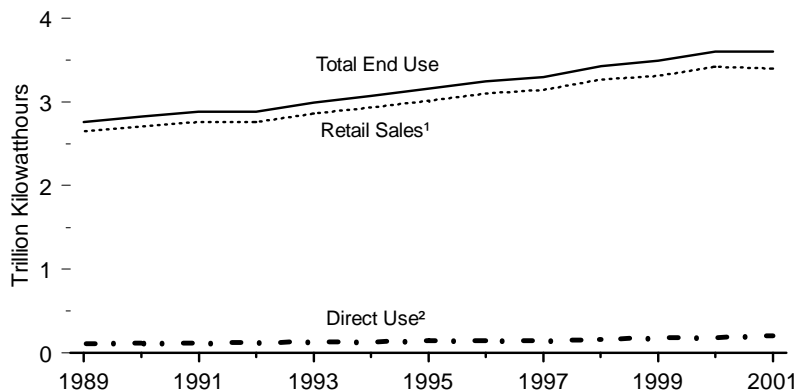
Notes: The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants. Stocks are at end of year. Totals may not equal sum of components due to independent rounding.

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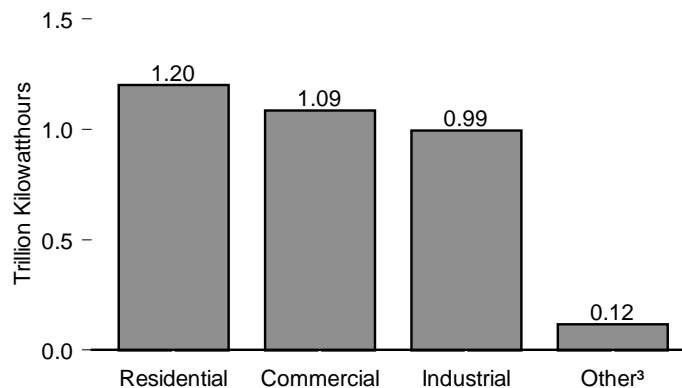
Sources: See end of section.

**Figure 8.5 Electricity End Use**

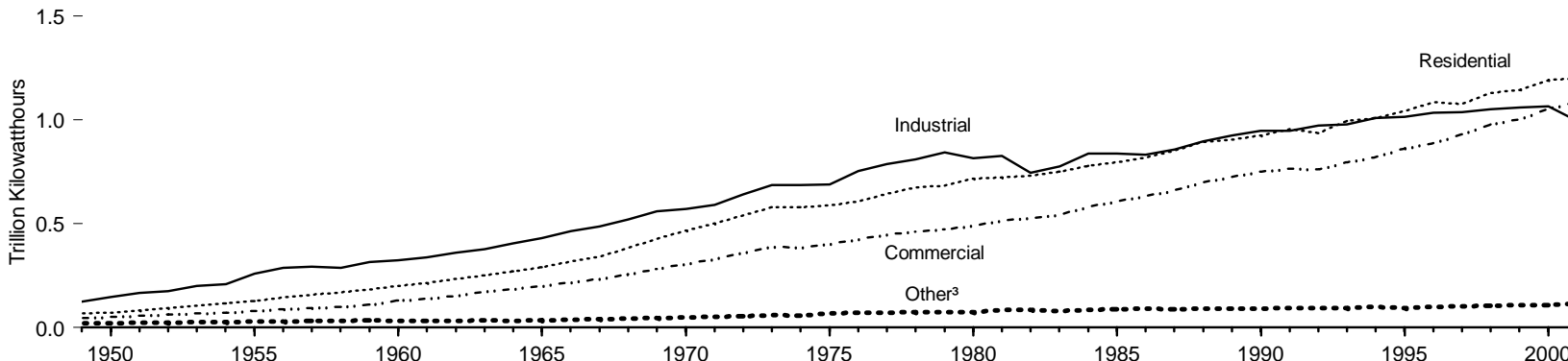
**Overview, 1989-2001**



**Retail Sales<sup>1</sup> by Sector, 2001**



**Retail Sales<sup>1</sup> by Sector, 1949-2001**



<sup>1</sup> Electricity retail sales to ultimate customers by electric utilities and other energy service providers.

<sup>2</sup> Commercial and industrial facility use of onsite net electricity generation; and electricity sales among adjacent or co-located facilities for which revenue information is not available.

<sup>3</sup> Public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 8.5.

**Table 8.5 Electricity End Use, 1949-2001**  
(Billion Kilowatthours)

Year	Retail Sales <sup>1</sup>					Direct Use <sup>3</sup>	Total
	Residential	Commercial	Industrial	Other <sup>2</sup>	Total		
1949	67	45	123	20	255	NA	255
1950	72	51	146	22	291	NA	291
1951	83	57	166	24	330	NA	330
1952	94	62	176	24	356	NA	356
1953	104	67	199	26	396	NA	396
1954	116	72	208	27	424	NA	424
1955	128	79	260	29	497	NA	497
1956	143	87	286	30	546	NA	546
1957	157	94	294	31	576	NA	576
1958	169	100	287	32	588	NA	588
1959	185	112	315	36	647	NA	647
1960	201	131	324	32	688	NA	688
1961	214	138	337	32	722	NA	722
1962	233	153	360	32	778	NA	778
1963	251	171	377	34	833	NA	833
1964	272	187	405	32	896	NA	896
1965	291	200	429	34	954	NA	954
1966	317	218	464	37	1,035	NA	1,035
1967	340	234	485	40	1,099	NA	1,099
1968	382	258	521	42	1,203	NA	1,203
1969	427	282	559	46	1,314	NA	1,314
1970	466	307	571	48	1,392	NA	1,392
1971	500	329	589	51	1,470	NA	1,470
1972	539	359	641	56	1,595	NA	1,595
1973	579	388	686	59	1,713	NA	1,713
1974	578	385	685	58	1,706	NA	1,706
1975	588	403	688	68	1,747	NA	1,747
1976	606	425	754	70	1,855	NA	1,855
1977	645	447	786	71	1,948	NA	1,948
1978	674	461	809	73	2,018	NA	2,018
1979	683	473	842	73	2,071	NA	2,071
1980	717	488	815	74	2,094	NA	2,094
1981	722	514	826	85	2,147	NA	2,147
1982	730	526	745	86	2,086	NA	2,086
1983	751	544	776	80	2,151	NA	2,151
1984	780	583	838	85	2,286	NA	2,286
1985	794	606	837	87	2,324	NA	2,324
1986	819	631	831	89	2,369	NA	2,369
1987	850	660	858	88	2,457	NA	2,457
1988	893	699	896	90	2,578	NA	2,578
1989	906	726	926	90	2,647	RP108	R2,755
1990	924	751	946	92	2,713	RP115	R2,827
1991	955	766	947	94	2,762	RP118	R2,880
1992	936	761	973	93	2,763	P122	R2,886
1993	995	795	977	95	2,861	RP128	R2,989
1994	1,008	820	1,008	98	2,935	RP134	R3,069
1995	1,043	863	1,013	95	3,013	RP144	R3,157
1996	1,083	887	1,034	98	3,101	RP146	R3,247
1997	1,076	929	1,038	103	3,146	RP148	R3,294
1998	1,130	979	1,051	104	3,264	RP161	R3,425
1999	1,145	1,002	1,058	107	3,312	RP183	R3,495
2000	1,192	R1,055	R1,064	R109	R3,421	RP183	R3,605
2001	1,201	1,085	994	117	3,397	E205	3,602

<sup>1</sup> Electricity retail sales to ultimate customers reported by electric utilities and other energy service providers.

<sup>2</sup> Public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

<sup>3</sup> Commercial and industrial facility use of onsite net electricity generation; and electricity sales among adjacent or co-located facilities for which revenue information is not available.

R=Revised, P=Preliminary, E=Estimate, NA=Not available.

Notes: See Note 3 at end of section. Totals may not equal sum of components due to independent rounding.

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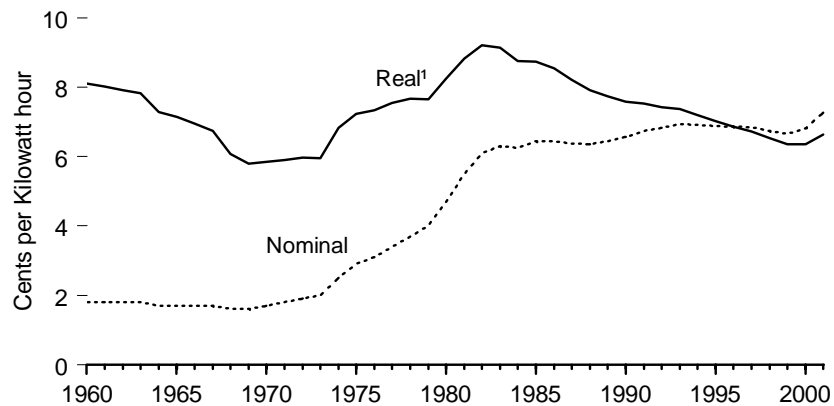
Sources: **Retail Sales:** 1949-September 1977—Federal Power Commission, Form FPC-5, "Monthly Statement of Electric Operating Revenue and Income." October 1977-February 1980—Federal Energy Regulatory Commission (FERC), Form FPC-5, "Monthly Statement of Electric Operating Revenue and Income." March 1980-1982—FERC, Form FPC-5, "Electric Utility Company Monthly Statement."

1983—Energy Information Administration (EIA), Form EIA-826, "Electric Utility Company Monthly Statement." 1984-1990—EIA, Form EIA-861, "Annual Electric Utility Report." 1991 forward—EIA,

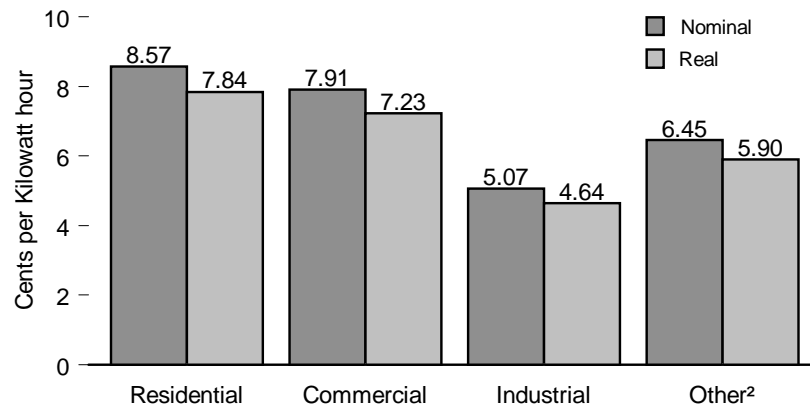
*Electric Power Monthly* (June 2002), Table 44. **Direct Use:** 1989-1997—EIA, Form EIA-867, "Annual Nonutility Power Producer Report." 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." 2001—EIA, Form EIA-906, "Power Plant Report."

**Figure 8.6 Average Retail Prices of Electricity**

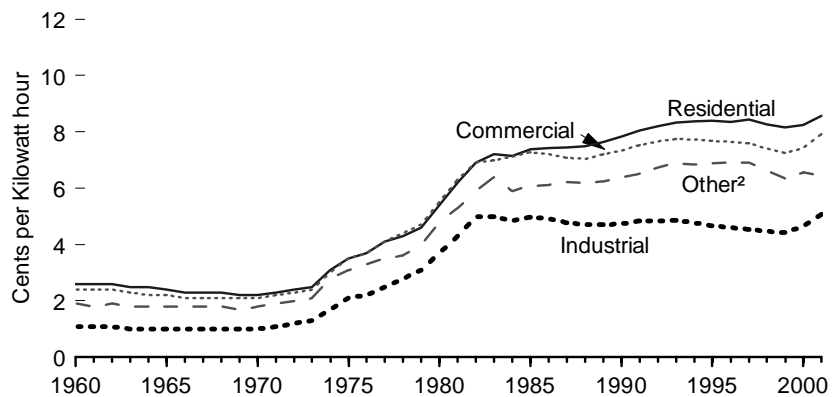
**Total, 1960-2001**



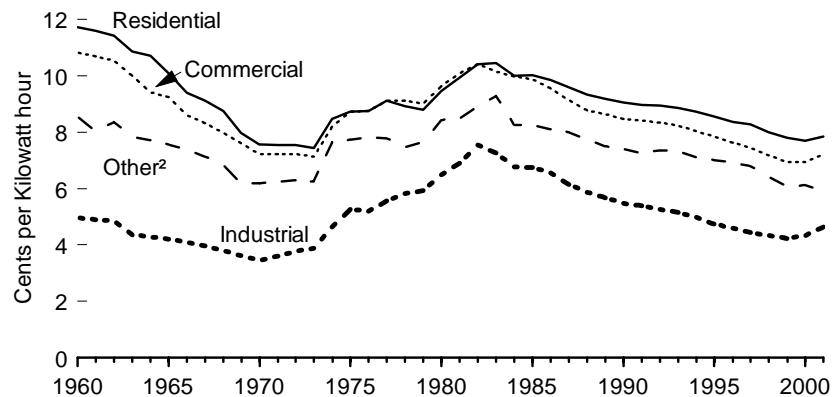
**By Sector, 2001**



**Nominal, 1960-2001**



**Real, 1960-2001**



<sup>1</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>2</sup> Public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Notes: Because vertical scales differ, graphs should not be compared.

Source: Table 8.6.

**Table 8.6 Average Retail Prices of Electricity, 1960-2001**  
(Cents per Kilowatthour)

Year	Residential		Commercial		Industrial		Other <sup>1</sup>		Total	
	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>	Nominal	Real <sup>2</sup>
1960	2.6	11.7	2.4	10.8	1.1	5.0	1.9	8.6	1.8	8.1
1961	2.6	11.6	2.4	10.7	1.1	4.9	1.8	8.0	1.8	8.0
1962	2.6	11.4	2.4	10.6	1.1	4.8	1.9	8.4	1.8	7.9
1963	2.5	10.9	2.3	10.0	1.0	4.4	1.8	7.8	1.8	7.8
1964	2.5	10.7	2.2	9.4	1.0	4.3	1.8	7.7	1.7	7.3
1965	2.4	10.1	2.2	9.2	1.0	4.2	1.8	7.6	1.7	7.2
1966	2.3	9.4	2.1	8.6	1.0	4.1	1.8	7.4	1.7	7.0
1967	2.3	9.1	2.1	8.3	1.0	4.0	1.8	7.1	1.7	6.7
1968	2.3	8.8	2.1	8.0	1.0	3.8	1.8	6.8	1.6	6.1
1969	2.2	8.0	2.1	7.6	1.0	3.6	1.7	6.2	1.6	5.8
1970	2.2	7.6	2.1	7.2	1.0	3.4	1.8	6.2	1.7	5.8
1971	2.3	7.5	2.2	7.2	1.1	3.6	1.9	6.2	1.8	5.9
1972	2.4	7.5	2.3	7.2	1.2	3.8	2.0	6.3	1.9	6.0
1973	2.5	7.4	2.4	7.1	1.3	3.9	2.1	6.2	2.0	6.0
1974	3.1	8.5	3.0	8.2	1.7	4.6	2.8	7.6	2.5	6.8
1975	3.5	8.7	3.5	8.7	2.1	5.2	3.1	7.7	2.9	7.2
1976	3.7	8.8	3.7	8.8	2.2	5.2	3.3	7.8	3.1	7.3
1977	4.1	9.1	4.1	9.1	2.5	5.6	3.5	7.8	3.4	7.6
1978	4.3	8.9	4.4	9.1	2.8	5.8	3.6	7.5	3.7	7.7
1979	4.6	8.8	4.7	9.0	3.1	5.9	4.0	7.7	4.0	7.7
1980	5.4	9.5	5.5	9.6	3.7	6.5	4.8	8.4	4.7	8.2
1981	6.2	9.9	6.3	10.1	4.3	6.9	5.3	8.5	5.5	8.8
1982	6.9	10.4	6.9	10.4	5.0	7.6	5.9	8.9	6.1	9.2
1983	7.2	10.4	7.0	10.2	5.0	7.3	6.4	9.3	6.3	9.2
1984	7.15	10.01	7.13	9.98	4.83	6.76	5.90	8.26	6.25	8.75
1985	7.39	10.03	7.27	9.87	4.97	6.74	6.09	8.26	6.44	8.74
1986	7.42	9.85	7.20	9.56	4.93	6.55	6.11	8.11	6.44	8.55
1987	7.45	9.60	7.08	9.13	4.77	6.15	6.21	8.00	6.37	8.21
1988	7.48	9.33	7.04	8.78	4.70	5.86	6.20	7.73	6.35	7.92
1989	7.65	9.19	7.20	8.65	4.72	5.67	6.25	7.51	6.45	7.75
1990	7.83	9.05	7.34	8.48	4.74	5.48	6.40	7.40	6.57	7.59
1991	8.04	8.97	7.53	8.40	4.83	5.39	6.51	7.26	6.75	7.53
1992	8.21	8.94	7.66	8.34	4.83	5.26	6.74	7.34	6.82	7.43
1993	8.32	8.85	7.74	8.23	4.85	5.16	6.88	7.32	6.93	7.37
1994	8.38	8.73	7.73	8.05	4.77	4.97	6.84	7.12	6.91	7.20
1995	8.40	8.56	7.69	7.84	4.66	4.75	6.88	7.01	6.89	7.02
1996	8.36	8.36	7.64	7.64	4.60	4.60	6.91	6.91	6.86	6.86
1997	8.43	8.27	7.59	7.44	4.53	4.44	6.91	6.78	6.85	6.72
1998	8.26	8.00	7.41	7.18	4.48	4.34	6.63	6.42	6.74	6.53
1999	8.16	<sup>R</sup> 7.80	7.26	<sup>R</sup> 6.94	4.43	4.23	6.35	<sup>R</sup> 6.07	6.66	6.36
2000	<sup>R</sup> 8.24	<sup>R</sup> 7.70	<sup>R</sup> 7.43	<sup>R</sup> 6.94	<sup>R</sup> 4.64	<sup>R</sup> 4.33	<sup>R</sup> 6.56	<sup>R</sup> 6.13	<sup>R</sup> 6.81	<sup>R</sup> 6.36
2001	8.57	7.84	7.91	7.23	5.07	4.64	6.45	5.90	7.26	6.64

<sup>1</sup> Public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

<sup>2</sup> In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

<sup>R</sup>=Revised.

Notes: Data represent revenue from electricity retail sales divided by electricity retail sales. Through 1979, data are for Classes A and B privately owned electric utilities only. For 1980-1982, data are for selected Class A utilities whose electric operating revenues were \$100 million or more during the previous year. For 1983, data are for a selected sample of electric utilities. Beginning in 1984, data are for a census

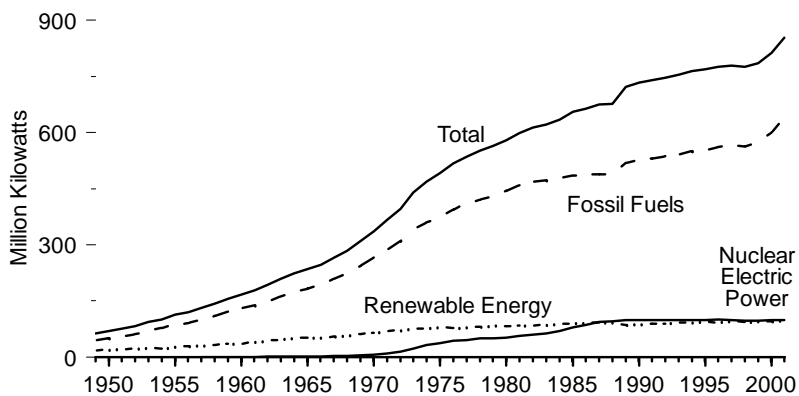
of electric utilities. Beginning in 1996, data also include energy service providers selling to retail customers.

Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

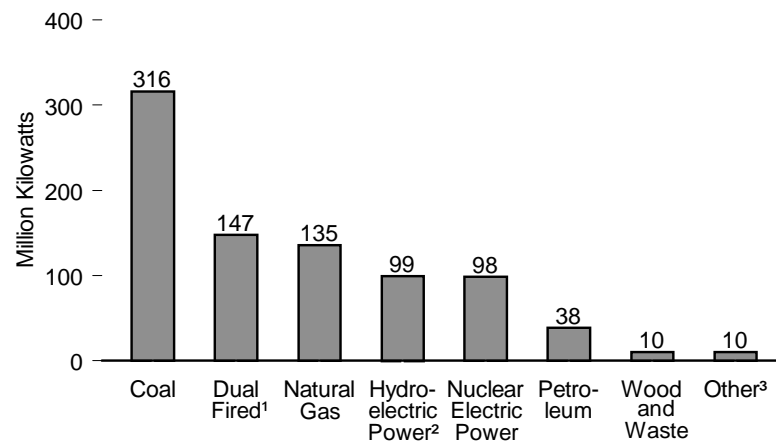
Sources: 1960 through September 1977—Federal Power Commission, Form FPC-5, "Monthly Statement of Electric Operating Revenues and Income." October 1977 through February 1980—Federal Energy Regulatory Commission (FERC), Form FPC-5, "Monthly Statement of Electric Operating Revenues and Income." March 1980 through 1982—FERC, Form FERC-5, "Electric Utility Company Monthly Statement." 1983—Energy Information Administration (EIA), Form EIA-826, "Electric Utility Company Monthly Statement." 1984-1989—EIA, Form EIA-861, "Annual Electric Utility Report." 1990 forward—EIA, *Electric Power Monthly* (July 2002), Table 52.

**Figure 8.7 Electric Net Summer Capability**

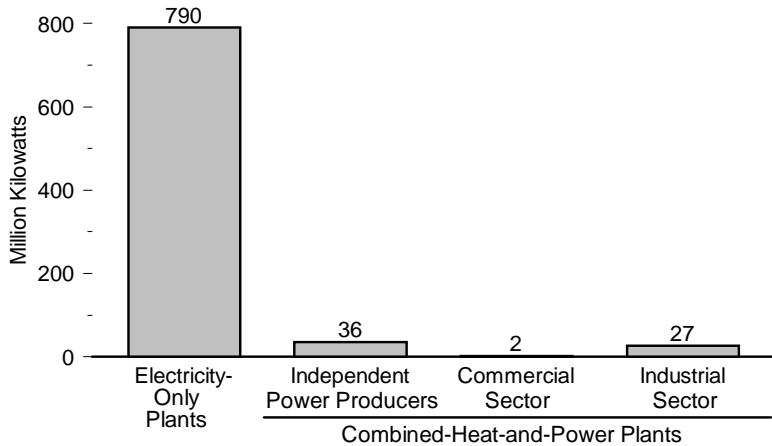
**Total (All Sectors), 1949-2001**



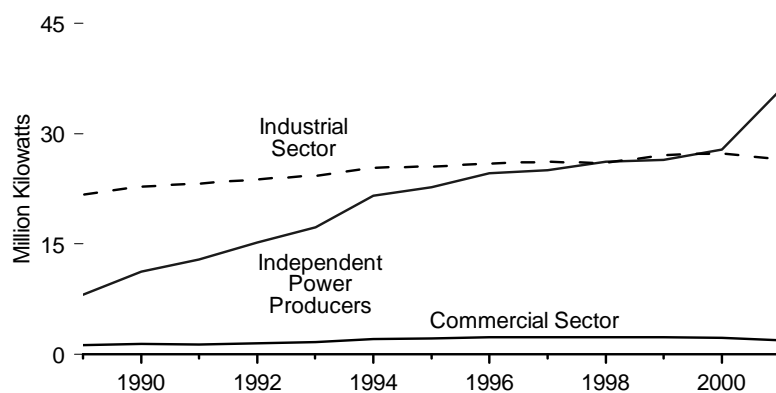
**Total (All Sectors) by Major Sources, 2001**



**Electricity-Only and Combined-Heat-and-Power Plants, 2001**



**Combined-Heat-and-Power Plants, 1989-2001**



<sup>1</sup> Petroleum and natural gas.  
<sup>2</sup> Conventional and pumped storage.  
<sup>3</sup> Other gases, geothermal, solar, wind, and other.

Note: Because vertical scales differ, graphs should not be compared.  
 Sources: Tables 8.7a, 8.7b, and 8.7c.

**Table 8.7a Electric Net Summer Capacity: Total (All Sectors), 1949-2001**  
(Million Kilowatts)

Year	Fossil Fuels						Nuclear Electric Power	Hydro-electric Pumped Storage	Renewable Energy								Other <sup>9</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Dual Fired <sup>4</sup>	Other Gases <sup>5</sup>	Total			Conventional Hydroelectric Power	Wood <sup>6</sup>	Waste <sup>7</sup>	Geo-thermal	Solar <sup>8</sup>	Wind	Total			
1949	NA	NA	NA	NA	NA	44.9	0.0	( <sup>10</sup> )	18.5	(s)	( <sup>11</sup> )	NA	NA	NA	18.5	NA	63.4	
1950	NA	NA	NA	NA	NA	50.0	0.0	( <sup>10</sup> )	19.2	(s)	( <sup>11</sup> )	NA	NA	NA	19.2	NA	69.2	
1951	NA	NA	NA	NA	NA	55.0	0.0	( <sup>10</sup> )	20.5	(s)	( <sup>11</sup> )	NA	NA	NA	20.5	NA	75.5	
1952	NA	NA	NA	NA	NA	60.8	0.0	( <sup>10</sup> )	22.4	(s)	( <sup>11</sup> )	NA	NA	NA	22.4	NA	83.2	
1953	NA	NA	NA	NA	NA	69.5	0.0	( <sup>10</sup> )	23.8	(s)	( <sup>11</sup> )	NA	NA	NA	23.8	NA	93.3	
1954	NA	NA	NA	NA	NA	77.5	0.0	( <sup>10</sup> )	22.5	(s)	( <sup>11</sup> )	NA	NA	NA	22.5	NA	100.0	
1955	NA	NA	NA	NA	NA	86.8	0.0	( <sup>10</sup> )	27.4	(s)	( <sup>11</sup> )	NA	NA	NA	27.4	NA	114.2	
1956	NA	NA	NA	NA	NA	91.2	0.0	( <sup>10</sup> )	28.5	(s)	( <sup>11</sup> )	NA	NA	NA	28.5	NA	119.7	
1957	NA	NA	NA	NA	NA	100.3	0.1	( <sup>10</sup> )	30.7	0.1	( <sup>11</sup> )	NA	NA	NA	30.8	NA	131.1	
1958	NA	NA	NA	NA	NA	110.7	0.1	( <sup>10</sup> )	32.5	0.1	( <sup>11</sup> )	NA	NA	NA	32.6	NA	143.3	
1959	NA	NA	NA	NA	NA	121.0	0.1	( <sup>10</sup> )	34.8	0.1	( <sup>11</sup> )	NA	NA	NA	34.9	NA	155.9	
1960	NA	NA	NA	NA	NA	130.8	0.4	( <sup>10</sup> )	35.8	0.1	( <sup>11</sup> )	(s)	NA	NA	35.9	NA	167.1	
1961	NA	NA	NA	NA	NA	137.8	0.4	( <sup>10</sup> )	40.7	0.1	( <sup>11</sup> )	(s)	NA	NA	40.8	NA	179.0	
1962	NA	NA	NA	NA	NA	147.3	0.7	( <sup>10</sup> )	44.0	0.1	( <sup>11</sup> )	(s)	NA	NA	44.1	NA	192.1	
1963	NA	NA	NA	NA	NA	161.8	0.8	( <sup>10</sup> )	47.0	0.1	( <sup>11</sup> )	(s)	NA	NA	47.1	NA	209.7	
1964	NA	NA	NA	NA	NA	173.4	0.8	( <sup>10</sup> )	49.4	0.1	( <sup>11</sup> )	(s)	NA	NA	49.5	NA	223.7	
1965	NA	NA	NA	NA	NA	182.9	0.8	( <sup>10</sup> )	51.0	0.1	( <sup>11</sup> )	(s)	NA	NA	51.1	NA	234.8	
1966	NA	NA	NA	NA	NA	194.5	1.7	( <sup>10</sup> )	51.2	0.1	( <sup>11</sup> )	(s)	NA	NA	51.3	NA	247.5	
1967	NA	NA	NA	NA	NA	208.9	2.7	( <sup>10</sup> )	55.0	0.1	( <sup>11</sup> )	0.1	NA	NA	55.1	NA	266.7	
1968	NA	NA	NA	NA	NA	223.2	2.7	( <sup>10</sup> )	57.9	0.1	( <sup>11</sup> )	0.1	NA	NA	58.0	NA	284.0	
1969	NA	NA	NA	NA	NA	243.6	4.4	( <sup>10</sup> )	61.6	0.1	( <sup>11</sup> )	0.1	NA	NA	61.7	NA	309.8	
1970	NA	NA	NA	NA	NA	265.4	7.0	( <sup>10</sup> )	63.8	0.1	( <sup>11</sup> )	0.1	NA	NA	63.9	NA	336.4	
1971	NA	NA	NA	NA	NA	288.0	9.0	( <sup>10</sup> )	69.1	0.1	( <sup>11</sup> )	0.2	NA	NA	69.4	NA	366.4	
1972	NA	NA	NA	NA	NA	310.7	14.5	( <sup>10</sup> )	70.5	0.1	( <sup>11</sup> )	0.3	NA	NA	70.9	NA	396.0	
1973	NA	NA	NA	NA	NA	341.2	22.7	( <sup>10</sup> )	75.4	0.1	( <sup>11</sup> )	0.4	NA	NA	75.9	NA	439.8	
1974	NA	NA	NA	NA	NA	360.7	31.9	( <sup>10</sup> )	75.5	0.1	( <sup>11</sup> )	0.4	NA	NA	76.0	NA	468.5	
1975	NA	NA	NA	NA	NA	375.1	37.3	( <sup>10</sup> )	78.4	0.1	( <sup>11</sup> )	0.5	NA	NA	79.0	NA	491.3	
1976	NA	NA	NA	NA	NA	394.8	43.8	( <sup>10</sup> )	78.0	0.1	( <sup>11</sup> )	0.5	NA	NA	78.6	NA	517.2	
1977	NA	NA	NA	NA	NA	410.4	46.3	( <sup>10</sup> )	78.6	0.1	( <sup>11</sup> )	0.5	NA	NA	79.2	NA	535.9	
1978	NA	NA	NA	NA	NA	420.8	50.8	( <sup>10</sup> )	79.9	0.1	( <sup>11</sup> )	0.5	NA	NA	80.5	NA	552.1	
1979	NA	NA	NA	NA	NA	432.1	49.7	( <sup>10</sup> )	82.9	0.1	( <sup>11</sup> )	0.7	NA	NA	83.6	NA	565.5	
1980	NA	NA	NA	NA	NA	444.1	51.8	( <sup>10</sup> )	81.7	0.1	( <sup>11</sup> )	0.9	NA	NA	82.7	NA	578.6	
1981	NA	NA	NA	NA	NA	458.9	56.0	( <sup>10</sup> )	82.4	0.1	( <sup>11</sup> )	0.9	NA	(s)	83.4	NA	598.3	
1982	NA	NA	NA	NA	NA	469.6	60.0	( <sup>10</sup> )	83.0	0.1	( <sup>11</sup> )	1.0	NA	(s)	84.1	NA	613.7	
1983	NA	NA	NA	NA	NA	472.8	63.0	( <sup>10</sup> )	83.9	0.2	( <sup>11</sup> )	1.2	NA	(s)	85.3	NA	621.1	
1984	NA	NA	NA	NA	NA	478.6	69.7	( <sup>10</sup> )	85.3	0.3	( <sup>11</sup> )	1.2	( <sup>12</sup> )	(s)	86.9	NA	635.1	
1985	NA	NA	NA	NA	NA	485.0	79.4	( <sup>10</sup> )	88.9	0.2	0.2	1.6	( <sup>12</sup> )	(s)	90.8	NA	655.2	
1986	NA	NA	NA	NA	NA	488.3	85.2	( <sup>10</sup> )	89.3	0.2	0.2	1.6	( <sup>12</sup> )	(s)	91.2	NA	664.8	
1987	NA	NA	NA	NA	NA	488.8	93.6	( <sup>10</sup> )	89.7	0.2	0.2	1.5	( <sup>12</sup> )	(s)	91.7	NA	674.1	
1988	NA	NA	NA	NA	NA	490.6	94.7	( <sup>10</sup> )	90.3	0.2	0.2	1.7	( <sup>12</sup> )	(s)	92.4	NA	677.7	
1989 <sup>P,13</sup>	R303.1	R48.9	R54.2	R111.7	R1.5	R519.4	98.2	18.1	R74.1	R5.2	2.1	2.6	R0.2	R1.5	R85.7	0.5	R721.8	
1990 <sup>P</sup>	R307.4	R49.0	R56.2	R113.6	R1.6	R527.8	99.6	19.5	R73.9	R5.5	R2.5	2.7	0.3	R1.8	R86.8	0.5	R734.1	
1991 <sup>P</sup>	R307.4	R47.3	R60.8	R113.7	R2.1	R531.4	99.6	R18.4	R76.0	R6.1	R2.9	2.6	0.3	R1.9	R89.9	0.5	R739.9	
1992 <sup>P</sup>	R309.4	R45.6	R60.7	R118.9	R2.1	R536.7	99.0	21.2	R74.8	R6.2	3.0	2.9	0.3	1.8	R89.1	0.5	R746.5	
1993 <sup>P</sup>	R310.1	R44.0	R65.5	R120.2	R1.9	R541.8	R99.0	21.1	R77.4	R6.5	R3.1	R2.9	0.3	1.8	R92.1	0.5	R754.6	
1994 <sup>P</sup>	R311.4	R42.7	R70.7	R123.1	R2.1	R550.0	99.1	21.2	R78.0	R6.7	R3.3	3.0	0.3	1.7	R93.1	0.5	764.0	
1995 <sup>P</sup>	R311.4	R43.7	R75.4	R122.0	R1.7	R554.2	99.5	21.4	R78.6	R6.7	3.5	3.0	0.3	1.7	93.9	0.5	769.5	
1996 <sup>P</sup>	R313.4	R43.6	R74.5	R128.6	R1.7	R561.7	100.8	21.1	R76.4	R6.8	R3.6	2.9	0.3	1.7	R91.7	0.5	775.9	
1997 <sup>P</sup>	R313.6	R43.2	R76.3	R129.4	R1.5	R564.1	99.7	19.3	R79.4	R6.9	R3.6	2.9	0.3	1.6	R94.8	0.8	R778.6	
1998 <sup>P</sup>	R315.8	R40.4	R75.8	R130.4	R1.5	R563.9	97.1	R19.5	R79.2	6.8	R3.7	2.9	R0.3	1.7	R94.6	0.8	775.9	
1999 <sup>P</sup>	R315.5	R35.6	R73.6	R146.0	R1.9	R572.6	R97.4	R19.6	R79.4	R6.8	R3.7	R2.8	0.4	2.3	R95.3	1.0	R785.9	
2000 <sup>P</sup>	R316.0	R36.0	R95.7	R149.8	R2.3	R599.8	R97.9	R19.5	R79.4	R6.1	R3.9	R2.8	0.4	R2.4	R94.9	0.5	R812.7	
2001 <sup>E</sup>	316.2	38.4	135.3	147.5	2.3	639.7	98.1	19.5	79.4	6.2	3.9	2.8	0.4	4.1	96.7	0.5	854.7	

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.

<sup>4</sup> Petroleum and natural gas.

<sup>5</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>6</sup> Wood, black liquor, and other wood waste.

<sup>7</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>8</sup> Solar thermal and photovoltaic energy.

<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>10</sup> Included in "Conventional Hydroelectric Power."

<sup>11</sup> Included in "Wood."

<sup>12</sup> Included in "Wind."

<sup>13</sup> Through 1988, data are for net summer capacity at electric utilities only. Beginning in 1989, data also include net summer capacity at independent power producers, commercial plants, and industrial plants.

R=Revised, P=Preliminary, E=Estimate, NA=Not available, (s)=Less than 0.05 million kilowatts.

Notes: Data are at end of year. See Note 4 at end of section. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelelectric.html>

Sources: Tables 8.7b and 8.7c.



**Table 8.7b Electric Net Summer Capacity at Electricity-Only Plants: Electric Power Sector, 1949-2001**  
(Million Kilowatts)

Year	Fossil Fuels						Nuclear Electric Power	Hydro-electric Pumped Storage	Renewable Energy							Other <sup>9</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Dual Fired <sup>4</sup>	Other Gases <sup>5</sup>	Total			Conventional Hydroelectric Power	Wood <sup>6</sup>	Waste <sup>7</sup>	Geo-thermal	Solar <sup>8</sup>	Wind	Total		
1949	NA	NA	NA	NA	NA	44.9	0	( <sup>10</sup> )	18.5	(s)	( <sup>11</sup> )	NA	NA	NA	18.5	NA	63.4
1950	NA	NA	NA	NA	NA	50.0	0	( <sup>10</sup> )	19.2	(s)	( <sup>11</sup> )	NA	NA	NA	19.2	NA	69.2
1951	NA	NA	NA	NA	NA	55.0	0	( <sup>10</sup> )	20.5	(s)	( <sup>11</sup> )	NA	NA	NA	20.5	NA	75.5
1952	NA	NA	NA	NA	NA	60.8	0	( <sup>10</sup> )	22.4	(s)	( <sup>11</sup> )	NA	NA	NA	22.4	NA	83.2
1953	NA	NA	NA	NA	NA	69.5	0	( <sup>10</sup> )	23.8	(s)	( <sup>11</sup> )	NA	NA	NA	23.8	NA	93.3
1954	NA	NA	NA	NA	NA	77.5	0	( <sup>10</sup> )	22.5	(s)	( <sup>11</sup> )	NA	NA	NA	22.5	NA	100.0
1955	NA	NA	NA	NA	NA	86.8	0	( <sup>10</sup> )	27.4	(s)	( <sup>11</sup> )	NA	NA	NA	27.4	NA	114.2
1956	NA	NA	NA	NA	NA	91.2	0	( <sup>10</sup> )	28.5	(s)	( <sup>11</sup> )	NA	NA	NA	28.5	NA	119.7
1957	NA	NA	NA	NA	NA	100.3	0.1	( <sup>10</sup> )	30.7	0.1	( <sup>11</sup> )	NA	NA	NA	30.8	NA	131.1
1958	NA	NA	NA	NA	NA	110.7	0.1	( <sup>10</sup> )	32.5	0.1	( <sup>11</sup> )	NA	NA	NA	32.6	NA	143.3
1959	NA	NA	NA	NA	NA	121.0	0.1	( <sup>10</sup> )	34.8	0.1	( <sup>11</sup> )	NA	NA	NA	34.9	NA	155.9
1960	NA	NA	NA	NA	NA	130.8	0.4	( <sup>10</sup> )	35.8	0.1	( <sup>11</sup> )	(s)	NA	NA	35.9	NA	167.1
1961	NA	NA	NA	NA	NA	137.8	0.4	( <sup>10</sup> )	40.7	0.1	( <sup>11</sup> )	(s)	NA	NA	40.8	NA	179.0
1962	NA	NA	NA	NA	NA	147.3	0.7	( <sup>10</sup> )	44.0	0.1	( <sup>11</sup> )	(s)	NA	NA	44.1	NA	192.1
1963	NA	NA	NA	NA	NA	161.8	0.8	( <sup>10</sup> )	47.0	0.1	( <sup>11</sup> )	(s)	NA	NA	47.1	NA	209.7
1964	NA	NA	NA	NA	NA	173.4	0.8	( <sup>10</sup> )	49.4	0.1	( <sup>11</sup> )	(s)	NA	NA	49.5	NA	223.7
1965	NA	NA	NA	NA	NA	182.9	0.8	( <sup>10</sup> )	51.0	0.1	( <sup>11</sup> )	(s)	NA	NA	51.1	NA	234.8
1966	NA	NA	NA	NA	NA	194.5	1.7	( <sup>10</sup> )	51.2	0.1	( <sup>11</sup> )	(s)	NA	NA	51.3	NA	247.5
1967	NA	NA	NA	NA	NA	208.9	2.7	( <sup>10</sup> )	55.0	0.1	( <sup>11</sup> )	0.1	NA	NA	55.1	NA	266.7
1968	NA	NA	NA	NA	NA	223.2	2.7	( <sup>10</sup> )	57.9	0.1	( <sup>11</sup> )	0.1	NA	NA	58.0	NA	284.0
1969	NA	NA	NA	NA	NA	243.6	4.4	( <sup>10</sup> )	61.6	0.1	( <sup>11</sup> )	0.1	NA	NA	61.7	NA	309.8
1970	NA	NA	NA	NA	NA	265.4	7.0	( <sup>10</sup> )	63.8	0.1	( <sup>11</sup> )	0.1	NA	NA	63.9	NA	336.4
1971	NA	NA	NA	NA	NA	288.0	9.0	( <sup>10</sup> )	69.1	0.1	( <sup>11</sup> )	0.2	NA	NA	69.4	NA	366.4
1972	NA	NA	NA	NA	NA	310.7	14.5	( <sup>10</sup> )	70.5	0.1	( <sup>11</sup> )	0.3	NA	NA	70.9	NA	396.0
1973	NA	NA	NA	NA	NA	341.2	22.7	( <sup>10</sup> )	75.4	0.1	( <sup>11</sup> )	0.4	NA	NA	75.9	NA	439.8
1974	NA	NA	NA	NA	NA	360.7	31.9	( <sup>10</sup> )	75.5	0.1	( <sup>11</sup> )	0.4	NA	NA	76.0	NA	468.5
1975	NA	NA	NA	NA	NA	375.1	37.3	( <sup>10</sup> )	78.4	0.1	( <sup>11</sup> )	0.5	NA	NA	79.0	NA	491.3
1976	NA	NA	NA	NA	NA	394.8	43.8	( <sup>10</sup> )	78.0	0.1	( <sup>11</sup> )	0.5	NA	NA	78.6	NA	517.2
1977	NA	NA	NA	NA	NA	410.4	46.3	( <sup>10</sup> )	78.6	0.1	( <sup>11</sup> )	0.5	NA	NA	79.2	NA	535.9
1978	NA	NA	NA	NA	NA	420.8	50.8	( <sup>10</sup> )	79.9	0.1	( <sup>11</sup> )	0.5	NA	NA	80.5	NA	552.1
1979	NA	NA	NA	NA	NA	432.1	49.7	( <sup>10</sup> )	82.9	0.1	( <sup>11</sup> )	0.7	NA	NA	83.6	NA	565.5
1980	NA	NA	NA	NA	NA	444.1	51.8	( <sup>10</sup> )	81.7	0.1	( <sup>11</sup> )	0.9	NA	NA	82.7	NA	578.6
1981	NA	NA	NA	NA	NA	458.9	56.0	( <sup>10</sup> )	82.4	0.1	( <sup>11</sup> )	0.9	NA	(s)	83.4	NA	598.3
1982	NA	NA	NA	NA	NA	469.6	60.0	( <sup>10</sup> )	83.0	0.1	( <sup>11</sup> )	1.0	NA	(s)	84.1	NA	613.7
1983	NA	NA	NA	NA	NA	472.8	63.0	( <sup>10</sup> )	83.9	0.2	( <sup>11</sup> )	1.2	NA	(s)	85.3	NA	621.1
1984	NA	NA	NA	NA	NA	478.6	69.7	( <sup>10</sup> )	85.3	0.3	( <sup>11</sup> )	1.2	( <sup>12</sup> )	(s)	86.9	NA	635.1
1985	NA	NA	NA	NA	NA	485.0	79.4	( <sup>10</sup> )	88.9	0.2	0.2	1.6	( <sup>12</sup> )	(s)	90.8	NA	655.2
1986	NA	NA	NA	NA	NA	488.3	85.2	( <sup>10</sup> )	89.3	0.2	0.2	1.6	( <sup>12</sup> )	(s)	91.2	NA	664.8
1987	NA	NA	NA	NA	NA	488.8	93.6	( <sup>10</sup> )	89.7	0.2	0.2	1.5	( <sup>12</sup> )	(s)	91.7	NA	674.1
1988	NA	NA	NA	NA	NA	490.6	94.7	( <sup>10</sup> )	90.3	0.2	0.2	1.7	( <sup>12</sup> )	(s)	92.4	NA	677.7
1989 <sup>P,13</sup>	296.5	47.9	43.2	106.1	0.4	494.2	98.2	18.1	73.6	0.9	1.5	2.6	0.2	1.5	80.3	0	690.7
1990 <sup>P</sup>	299.9	47.8	44.1	106.4	0.4	498.6	99.6	19.5	73.3	1.0	1.9	2.7	0.3	1.8	80.9	(s)	698.6
1991 <sup>P</sup>	299.6	46.0	48.4	106.1	0.7	500.8	99.6	18.4	75.4	1.1	2.2	2.6	0.3	1.9	83.6	0	702.4
1992 <sup>P</sup>	300.8	44.4	47.7	109.5	0.7	503.1	99.0	21.2	74.2	1.2	2.3	2.9	0.3	1.8	82.7	0	706.0
1993 <sup>P</sup>	301.2	42.8	49.8	111.2	0.7	505.7	99.0	21.1	76.8	1.2	2.4	2.9	0.3	1.8	85.5	0	711.3
1994 <sup>P</sup>	301.6	41.4	51.5	113.5	0.7	508.7	99.1	21.2	76.9	1.5	2.5	3.0	0.3	1.7	85.9	0	715.0
1995 <sup>P</sup>	301.3	42.4	55.5	112.1	0.3	511.5	99.5	21.4	77.4	1.5	2.7	3.0	0.3	1.7	86.6	0	719.1
1996 <sup>P</sup>	303.1	42.2	52.9	118.6	0.1	516.9	100.8	21.1	75.3	1.4	2.6	2.9	0.3	1.7	84.2	0	723.0
1997 <sup>P</sup>	303.6	41.7	54.1	119.1	0.2	518.7	99.7	19.3	78.3	1.5	2.5	2.9	0.3	1.6	87.1	0.2	725.0
1998 <sup>P</sup>	305.9	38.8	50.3	122.5	0.1	517.5	97.1	19.5	78.0	1.4	2.6	2.9	0.3	1.7	87.0	0.2	721.4
1999 <sup>P</sup>	305.5	34.2	49.8	135.2	0.2	525.0	97.4	19.6	78.3	1.5	2.6	2.8	0.4	2.3	87.8	0.2	730.0
2000 <sup>P</sup>	305.8	34.5	67.6	141.8	0.1	549.7	97.9	19.5	78.2	1.5	2.8	2.8	0.4	2.4	88.1	(s)	755.2
2001 <sup>P</sup>	306.0	37.0	100.3	139.5	0.1	582.8	98.1	19.5	78.3	1.5	2.8	2.8	0.4	4.1	89.8	(s)	790.3

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.  
<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.  
<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.  
<sup>4</sup> Petroleum and natural gas.  
<sup>5</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
<sup>6</sup> Wood, black liquor, and other wood waste.  
<sup>7</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.  
<sup>8</sup> Solar thermal and photovoltaic energy.  
<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
<sup>10</sup> Included in "Conventional Hydroelectric Power."  
<sup>11</sup> Included in "Wood."

<sup>12</sup> Included in "Wind."  
<sup>13</sup> Through 1988, data are for net summer capacity at electric utilities only. Beginning in 1989, data also include net summer capacity at independent power producers.  
P=Preliminary. NA=Not available. (s)=Less than 0.05 million kilowatts.  
Notes: Data on this table for the electric power sector (electric utilities and independent power producers) are for electricity-only plants whose primary business is to sell electricity to the public—i.e., NAICS 22 electricity-only plants. For 1949-2001, also includes electric utility combined-heat-and-power (CHP) plants. Data are at end of year. See Note 4 at end of section. Totals may not equal sum of components due to independent rounding.  
Web Page: <http://www.eia.doe.gov/fuelectric.html>.  
Sources: See end of section.

**Table 8.7c Electric Net Summer Capacity at Combined-Heat-and-Power Plants by Sector, 1989-2001**  
(Million Kilowatts)

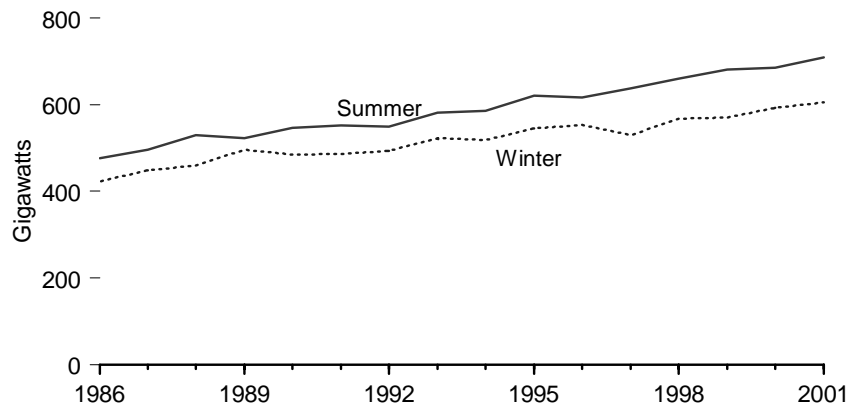
Year	Fossil Fuels						Renewable Energy				Other <sup>9</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Dual Fired <sup>4</sup>	Other Gases <sup>5</sup>	Total	Conventional Hydroelectric Power <sup>6</sup>	Wood <sup>7</sup>	Waste <sup>8</sup>	Total		
Electric Power Sector (Independent Power Producers Only) <sup>10</sup>												
1989 <sup>P</sup>	1.5	0.1	2.9	3.2	0	7.7	0	0.2	0.2	0.4	0	8.1
1990 <sup>P</sup>	2.4	0.1	3.9	4.4	0	10.7	0	0.2	0.2	0.5	0	11.2
1991 <sup>P</sup>	2.9	0.3	4.5	4.8	0	12.5	0	0.2	0.2	0.5	0	12.9
1992 <sup>P</sup>	3.5	0.3	4.3	6.6	(s)	14.7	0	0.2	0.2	0.5	0	15.2
1993 <sup>P</sup>	3.8	0.3	6.3	6.4	0	16.8	0	0.2	0.2	0.5	0	17.3
1994 <sup>P</sup>	4.5	0.3	9.6	6.8	0	21.0	0	0.3	0.2	0.5	0	21.5
1995 <sup>P</sup>	4.8	0.3	10.0	7.0	0	22.1	0	0.4	0.2	0.6	0	22.7
1996 <sup>P</sup>	5.0	0.3	11.5	7.2	0	24.0	0	0.3	0.3	0.6	0	24.6
1997 <sup>P</sup>	4.9	0.3	11.6	7.6	(s)	24.4	0	0.3	0.4	0.7	0	25.1
1998 <sup>P</sup>	5.0	0.4	14.1	6.0	0	25.5	0	0.4	0.4	0.7	0	26.2
1999 <sup>P</sup>	5.2	0.2	11.8	8.4	0	25.7	0	0.4	0.4	0.7	0	26.5
2000 <sup>P</sup>	5.2	0.4	15.1	6.1	0.3	27.1	0	0.2	0.5	0.7	0	27.9
2001 <sup>E</sup>	5.2	0.5	22.8	6.2	0.3	35.0	(s)	0.3	0.5	0.9	0	35.9
Commercial Sector <sup>11</sup>												
1989 <sup>P</sup>	0.3	0.1	0.1	0.6	0	1.0	(s)	(s)	0.2	0.2	0	1.2
1990 <sup>P</sup>	0.3	0.2	0.2	0.6	0	1.2	(s)	(s)	0.2	0.2	0	1.4
1991 <sup>P</sup>	0.2	0.1	0.2	0.6	0	1.1	(s)	(s)	0.2	0.3	0	1.3
1992 <sup>P</sup>	0.2	0.1	0.3	0.6	0	1.2	(s)	(s)	0.2	0.3	0	1.5
1993 <sup>P</sup>	0.3	0.1	0.3	0.6	0	1.3	(s)	(s)	0.3	0.3	0	1.6
1994 <sup>P</sup>	0.3	0.2	0.3	0.9	0	1.7	(s)	(s)	0.3	0.3	0	2.1
1995 <sup>P</sup>	0.3	0.2	0.3	1.0	0	1.8	(s)	(s)	0.3	0.3	0	2.1
1996 <sup>P</sup>	0.3	0.2	0.4	0.9	0	1.8	(s)	(s)	0.4	0.5	0	2.3
1997 <sup>P</sup>	0.3	0.2	0.4	0.9	0	1.9	(s)	(s)	0.4	0.5	0	2.3
1998 <sup>P</sup>	0.3	0.2	0.6	0.7	0	1.8	(s)	(s)	0.5	0.5	0	2.3
1999 <sup>P</sup>	0.3	0.3	0.5	0.8	0	1.8	(s)	(s)	0.5	0.5	0	2.3
2000 <sup>P</sup>	0.3	0.3	0.6	0.6	0	1.8	(s)	(s)	0.4	0.4	0	2.2
2001 <sup>E</sup>	0.3	0.2	0.4	0.6	0	1.5	(s)	(s)	0.4	0.4	0	2.0
Industrial Sector <sup>12</sup>												
1989 <sup>P</sup>	4.8	0.7	7.9	1.8	1.2	16.5	0.5	4.1	0.2	4.8	0.5	21.8
1990 <sup>P</sup>	4.8	0.9	8.1	2.2	1.3	17.3	0.6	4.3	0.2	5.1	0.5	22.9
1991 <sup>P</sup>	4.7	0.8	7.8	2.3	1.4	17.1	0.6	4.8	0.2	5.6	0.5	23.2
1992 <sup>P</sup>	4.8	0.8	8.4	2.2	1.4	17.6	0.6	4.8	0.3	5.6	0.5	23.8
1993 <sup>P</sup>	4.9	0.8	9.1	1.9	1.2	18.0	0.6	5.0	0.3	5.8	0.5	24.3
1994 <sup>P</sup>	5.0	0.9	9.3	1.9	1.4	18.5	1.1	5.0	0.3	6.3	0.5	25.4
1995 <sup>P</sup>	5.0	0.8	9.5	1.9	1.4	18.7	1.1	4.9	0.2	6.3	0.5	25.5
1996 <sup>P</sup>	5.0	0.8	9.6	1.9	1.6	19.0	1.1	5.1	0.2	6.4	0.5	25.9
1997 <sup>P</sup>	4.8	1.0	10.3	1.7	1.3	19.2	1.1	5.1	0.2	6.5	0.6	26.2
1998 <sup>P</sup>	4.6	1.0	10.8	1.3	1.5	19.1	1.1	5.0	0.2	6.3	0.6	26.0
1999 <sup>P</sup>	4.4	0.8	11.5	1.6	1.7	20.1	1.1	5.0	0.2	6.2	0.8	27.1
2000 <sup>P</sup>	4.6	0.8	12.5	1.3	2.0	21.2	1.1	4.4	0.2	5.7	0.5	27.3
2001 <sup>E</sup>	4.6	0.8	11.7	1.3	2.0	20.4	1.1	4.4	0.2	5.7	0.5	26.6

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.  
<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.  
<sup>3</sup> Natural gas, including a small amount of supplemental gaseous fuels.  
<sup>4</sup> Petroleum and natural gas.  
<sup>5</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
<sup>6</sup> Includes combined-heat-and-power (CHP) plants that use multiple sources of energy including hydropower.  
<sup>7</sup> Wood, black liquor, and other wood waste.  
<sup>8</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.  
<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
<sup>10</sup> CHP plants whose primary business is to sell electricity and heat to the public—i.e., NAICS 22 CHP

plants. For 1989-2001, does not include electric utility CHP plants—these are included in "Electric Power Sector" on Table 8.7b.  
<sup>11</sup> Commercial combined-heat-and-power (CHP) and a small number of commercial electricity-only plants. See Appendix G for commercial sector NAICS codes.  
<sup>12</sup> Industrial combined-heat-and-power (CHP) and a small number of industrial electricity-only plants. See Appendix G for industrial sector NAICS codes.  
P=Preliminary. E=Estimate. (s)=Less than 0.05 million kilowatts.  
Notes: Data are at end of year. See Note 4 at end of section. Totals may not equal sum of components due to independent rounding.  
Web Page: <http://www.eia.doe.gov/fuelectric.html>  
Sources: See end of section.

**Figure 8.8 Electric Noncoincident Peak Load and Capacity Margin**

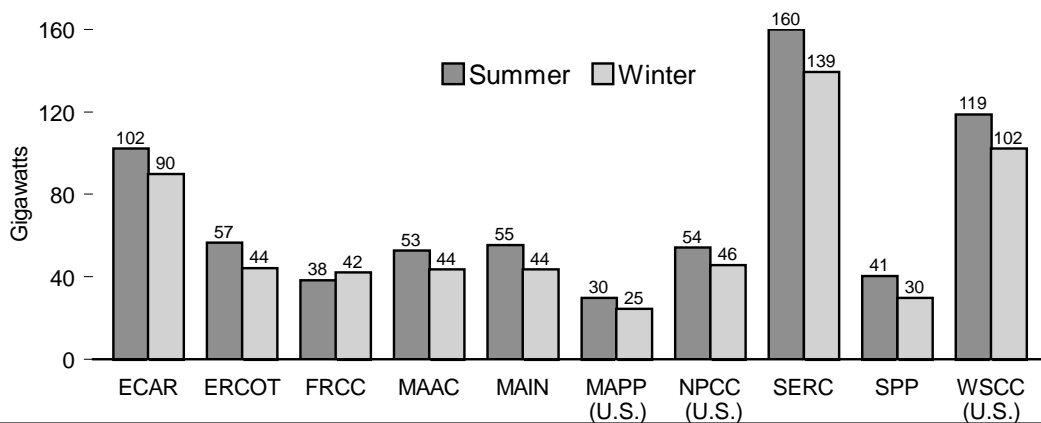
**U.S. Peak Load, 1986-2001**



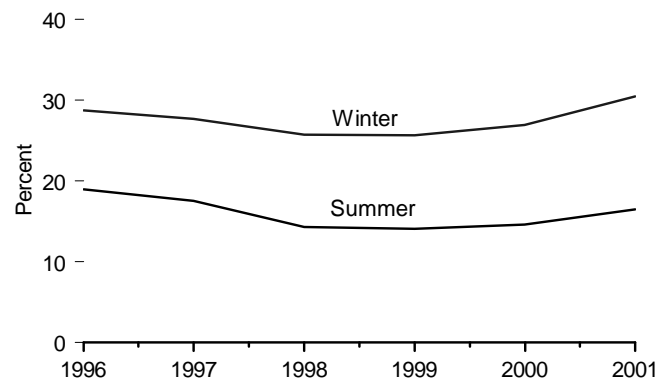
**North American Electric Reliability Council Map for the United States**



**By NERC Region, 2001**



**Capacity Margin, 1996-2001**



Notes: • Noncoincident peak load is the sum of two or more peak loads on individual systems that do not occur at the same time interval. See Glossary for information on North American Electric Reliability Council (NERC). Because vertical scales differ, graphs should not be compared.

Source: Table 8.8.

**Table 8.8 Electric Noncoincident Peak Load and Capacity Margin, 1986-2001**

(Megawatts, Except as Noted)

Year	Noncoincident Peak Load														Capacity Margin <sup>2</sup> (percent)
	North American Electric Reliability Council Regions <sup>1</sup>										Contiguous United States	ASCC (Alaska)	Hawaii	U.S. Total	
	ECAR	ERCOT	FRCC	MAAC	MAIN	MAPP (U.S.)	NPCC (U.S.)	SERC	SPP	WSCC (U.S.)					
Summer															
1986	69,606	39,335	—	37,564	35,943	21,029	39,026	105,570	47,123	81,787	476,983	( <sup>3</sup> )	( <sup>4</sup> )	476,983	NA
1987	72,561	39,339	—	40,526	37,446	23,162	42,651	109,798	47,723	82,967	496,173	( <sup>3</sup> )	( <sup>4</sup> )	496,173	NA
1988	79,149	40,843	—	43,110	41,139	24,899	45,245	115,168	49,356	90,551	529,460	( <sup>3</sup> )	( <sup>4</sup> )	529,460	NA
1989	75,442	40,402	—	41,614	39,460	23,531	45,031	117,051	49,439	90,657	522,627	455	( <sup>4</sup> )	523,082	NA
1990	79,258	42,737	—	42,613	40,740	24,994	44,116	121,149	52,541	97,389	545,537	463	( <sup>4</sup> )	546,000	NA
1991	81,539	41,870	—	45,937	41,598	25,498	46,594	124,688	51,885	92,096	551,705	471	( <sup>4</sup> )	552,176	NA
1992	78,550	42,619	—	43,658	38,819	22,638	43,658	128,236	51,324	99,205	548,707	504	( <sup>4</sup> )	549,211	NA
1993	85,930	44,255	—	46,494	41,956	24,396	46,706	136,101	57,106	97,809	580,753	511	( <sup>4</sup> )	581,264	NA
1994	87,165	44,162	—	46,019	42,562	27,000	47,581	132,584	56,035	102,212	585,320	524	( <sup>4</sup> )	585,844	NA
1995	92,619	46,618	—	48,577	45,782	29,192	47,705	146,569	59,595	103,592	620,249	622	( <sup>4</sup> )	620,871	NA
1996	90,798	47,480	—	44,302	46,402	28,253	45,094	145,650	60,072	108,739	616,790	( <sup>4</sup> )	( <sup>4</sup> )	616,790	18.9
1997	93,492	50,541	35,375	49,464	45,887	29,787	49,269	137,382	36,479	110,001	637,677	( <sup>4</sup> )	( <sup>4</sup> )	637,677	17.5
1998	93,784	54,666	38,730	48,445	47,509	30,722	49,566	143,226	37,724	115,921	660,293	( <sup>4</sup> )	( <sup>4</sup> )	660,293	14.3
1999	99,239	55,529	37,493	51,645	51,535	31,903	52,855	149,012	38,609	113,629	681,449	( <sup>4</sup> )	( <sup>4</sup> )	681,449	R14.1
2000	97,557	54,817	37,728	51,206	51,271	32,899	53,450	151,065	39,383	116,440	685,816	( <sup>4</sup> )	( <sup>4</sup> )	685,816	14.6
2001 <sup>F</sup>	102,161	56,759	38,478	52,977	55,368	29,814	54,270	159,930	40,522	118,887	709,166	( <sup>4</sup> )	( <sup>4</sup> )	709,166	16.5
Winter															
1986	64,561	28,730	—	32,807	28,036	18,850	37,976	101,849	33,877	76,171	422,857	( <sup>3</sup> )	( <sup>4</sup> )	422,857	NA
1987	68,118	31,399	—	35,775	30,606	19,335	41,902	105,476	34,472	81,182	448,265	( <sup>3</sup> )	( <sup>4</sup> )	448,265	NA
1988	67,771	34,621	—	36,363	30,631	20,162	42,951	108,649	35,649	82,937	459,734	( <sup>3</sup> )	( <sup>4</sup> )	459,734	NA
1989	73,080	38,388	—	38,161	33,770	20,699	42,588	121,995	42,268	84,768	495,717	626	( <sup>4</sup> )	496,343	NA
1990	67,097	35,815	—	36,551	32,461	21,113	40,545	117,231	38,949	94,252	484,014	613	( <sup>4</sup> )	484,627	NA
1991	71,181	35,448	—	37,983	33,420	21,432	41,786	119,575	38,759	86,097	485,681	622	( <sup>4</sup> )	486,303	NA
1992	72,885	35,055	—	37,915	31,289	21,866	41,125	121,250	39,912	91,686	492,983	635	( <sup>4</sup> )	493,618	NA
1993	81,846	35,407	—	41,406	34,966	21,955	42,063	133,635	41,644	88,811	521,733	632	( <sup>4</sup> )	522,365	NA
1994	75,638	36,180	—	40,653	33,999	23,033	42,547	132,661	42,505	91,037	518,253	641	( <sup>4</sup> )	518,894	NA
1995	83,465	36,965	—	40,790	35,734	23,429	42,755	142,032	44,626	94,890	544,686	676	( <sup>4</sup> )	545,360	NA
1996	84,534	38,868	—	40,468	37,162	24,251	41,208	143,060	49,095	95,435	554,081	( <sup>4</sup> )	( <sup>4</sup> )	554,081	28.7
1997	75,760	37,966	33,076	37,217	34,973	25,390	41,338	122,649	27,437	94,158	529,964	( <sup>4</sup> )	( <sup>4</sup> )	529,874	27.7
1998	84,401	41,876	39,975	36,532	37,410	26,080	44,119	127,416	27,847	101,822	567,478	( <sup>4</sup> )	( <sup>4</sup> )	567,558	25.7
1999	86,239	39,164	40,178	40,220	39,081	25,200	45,227	128,563	27,963	99,080	570,915	( <sup>4</sup> )	( <sup>4</sup> )	570,915	25.6
2000	86,455	44,287	40,894	43,139	39,742	27,363	45,170	134,488	28,375	102,435	592,348	( <sup>4</sup> )	( <sup>4</sup> )	592,348	26.9
2001 <sup>F</sup>	90,041	44,394	42,208	43,809	43,663	24,661	45,650	139,459	29,804	102,237	605,926	( <sup>4</sup> )	( <sup>4</sup> )	605,926	30.4

<sup>1</sup> See Glossary for information on the North American Electric Reliability Council (NERC) Regions. Data include the U.S. portion of NERC only. See Figure 8.8 for an illustration of NERC regions.

<sup>2</sup> The percent by which planned generating capacity resources are expected to be greater (or less) than estimated net internal demand at the time of expected peak summer (or winter) demand. Net internal demand does not include estimated demand for direct control load management and customers with interruptible service agreements.

<sup>3</sup> Data submission for ASCC (Alaska) began in 1989.

<sup>4</sup> Data were not filed.

R=Revised. F=Forecast. NA=Not available. — = Not applicable.

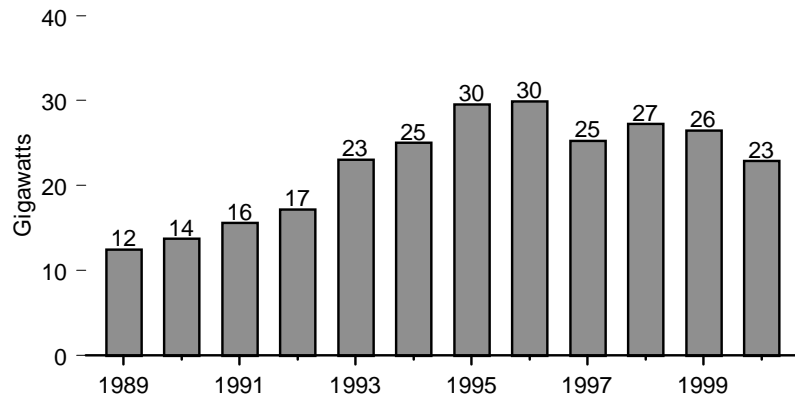
Note: Noncoincident peak load is the sum of two or more peak loads on individual systems that do not occur at the same time interval.

Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

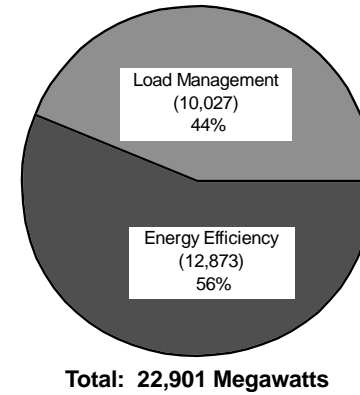
Sources: 1986-1990—Energy Information Administration (EIA), *Electric Power Annual 1990* (January 1992), Table 53. 1991 forward—EIA, *Electric Power Annual Volume II*, annual reports.

**Figure 8.9 Electric Utility Demand-Side Management Programs**

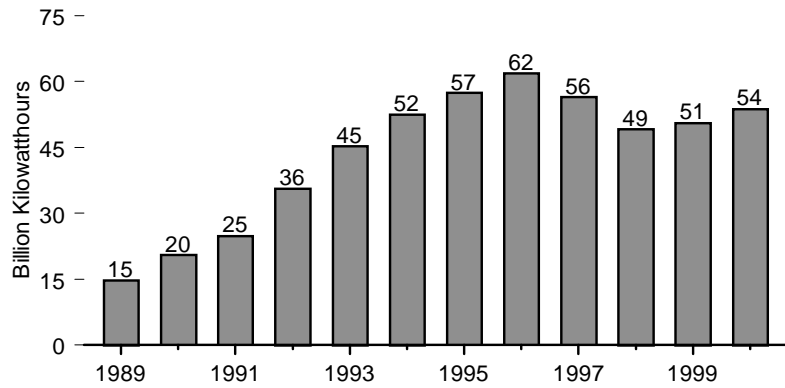
**Actual Peakload Reductions Total, 1989-2000**



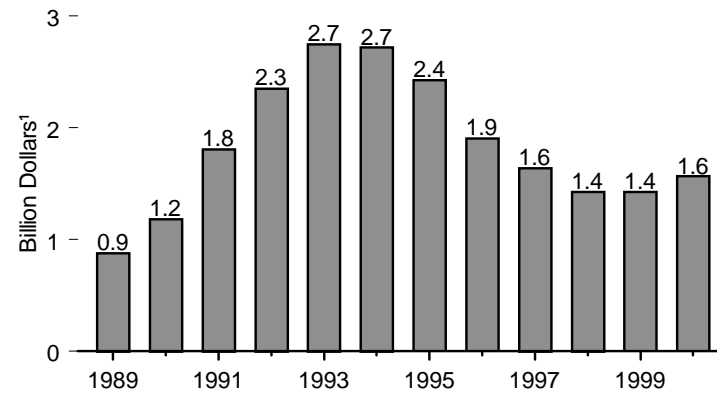
**Actual Peakload Reductions, 2000**



**Energy Savings, 1989-2000**



**Costs, 1989-2000**



<sup>1</sup> Nominal dollars.

Source: Table 8.9.

**Table 8.9 Electric Utility Demand-Side Management Programs, 1989-2000**

Year	Actual Peakload Reductions <sup>1</sup> (megawatts)			Energy Savings (million kilowatthours)	Costs (thousand dollars <sup>4</sup> )
	Load Management <sup>2</sup>	Energy Efficiency <sup>3</sup>	Total		
1989	NA	NA	12,463	14,672	872,935
1990	7,911	<sup>5</sup> 5,793	13,704	20,458	1,177,457
1991	8,767	<sup>5</sup> 6,852	15,619	24,848	1,803,773
1992	7,357	<sup>5</sup> 9,847	17,204	35,563	2,348,094
1993	10,583	<sup>5</sup> 12,486	23,069	45,294	2,743,533
1994	10,922	<sup>5</sup> 14,079	25,001	52,483	2,715,657
1995	13,753	<sup>5</sup> 15,807	29,561	57,421	2,421,261
1996	12,965	<sup>5</sup> 16,928	29,893	61,842	1,902,197
1997	11,958	13,326	25,284	56,406	1,636,020
1998	13,640	13,591	27,231	49,167	1,420,920
1999	13,003	13,452	26,455	50,563	1,423,644
2000	10,027	12,873	22,901	53,701	1,564,901

<sup>1</sup> The actual reduction in peak load reflects the change in demand for electricity that results from a utility demand-side management program that is in effect at the time that the utility experiences its actual peak load as opposed to the potential installed peakload reduction capability. Differences between actual and potential peak reduction result from changes in weather, economic activity, and other variable conditions.

<sup>2</sup> Load Management includes programs such as Direct Load Control and Interruptible Load Control, and beginning in 1997, "other types" of demand-side management programs. Direct load control refers to program activities that can interrupt consumer load at the time of annual peak load by direct control of the utility system operator by interrupting power supply to individual appliances or equipment on consumer premises. This type of control usually involves residential consumers. 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. "Other types" are programs that limit or shift peak loads from on-peak to off-peak time periods, such as space heating and water heating storage systems.

<sup>3</sup> 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, 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 systems or control modifications, efficient building design, advanced electric motor drives, and heat recovery systems.

<sup>4</sup> Nominal dollars.

<sup>5</sup> From 1989 to 1996, Energy Efficiency includes "other types" of demand-side management programs. Beginning in 1997, these programs are included under Load Management.

NA=Not available.

Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

Sources: 1989-1999—Energy Information Administration (EIA), *Electric Power Annual*, annual reports. 2000—EIA, Form EIA-861, "Annual Electric Utility Report."

## Electricity

**Note 1.** Electrical system energy losses are estimated as the difference between total energy consumed to generate electricity and the total energy content of electricity consumed by end users. Most of these losses occur at steam-electric power plants (conventional and nuclear) in the conversion of heat energy into mechanical energy to turn electric generators. This loss is a thermodynamically necessary feature of the steam-electric cycle. Part of the energy input-to-output losses are a result of imputing fossil energy equivalent inputs for hydroelectric and other energy sources, since there is no generally accepted practice for measuring these thermal conversion rates. In addition to conversion losses, other losses include power plant use of electricity, transmission and distribution of electricity from power plants to end-use consumers (also called “line-losses”), and unaccounted-for electricity. Total losses are allocated to the end-use sectors in proportion to each sector’s share of total electricity sales. Overall, approximately 67 percent of total energy input is lost in conversion; of electricity generated, approximately 5 percent is lost in plant use and 9 percent is lost in transmission and distribution. Calculated electrical energy transmission system losses may be less than actual losses, because primary consumption does not include the energy equivalent of electricity imports from Canada and Mexico, although they are included in electricity end use.

**Note 2.** Prior to 1985, electric utility statistics included data reported by institutions (such as universities) and military facilities that generated electricity primarily for their own use. Beginning in 1985, electric utility statistics exclude data for these facilities.

**Note 3.** Data on electric utility retail sales of electricity represent gross output of electricity (measured at the generator terminals) minus power plant use and transmission and distribution losses. Included in each end-use sector are the following: Commercial Sector—sales of electricity to businesses that generally require less than 1,000 kilowatts of service; Industrial Sector—sales of electricity to businesses that generally require more than 1,000 kilowatts of service; Residential Sector—sales of electricity to residences for household purposes; “Other” Sector—sales of electricity for public street and highway lighting, to public authorities, railways, and railroads, and interdepartmental sales.

**Note 4.** Electric utility net summer capacities were first collected on Form EIA-860 for 1984. Units not assigned a net summer capacity rating by the

utility were given an estimated rating by use of a statistical relationship between installed nameplate capacity and net summer capacity for each prime mover. To estimate net summer capacity for the years 1949 through 1984, two methods were used. For each prime mover except nuclear and “other,” net summer capacity estimates were calculated in two steps. First, the unit capacity values reported on Form EIA-860 and the unit start dates contained in the 1984 Generating Unit Reference File (GURF) were used to compute preliminary aggregate estimates of annual net summer capacity and installed nameplate capacity. These preliminary estimates were obtained by aggregating unit capacity values for all units in service during a given year. Next, the ratio of the preliminary capacity to nameplate estimate was computed for each year and multiplied by the previously published installed nameplate capacity values to produce the final estimates of net summer capacity. The net summer capacity data for nuclear and “other” units were used directly from the 1984 GURF for all years. Historical aggregates were then developed by using the unit start dates on the GURF.

Historical capacity has also been modified to estimate capacity based upon the operable definition. This was accomplished by assuming that non-nuclear generating units became operable between 1 and 4 months prior to their commercial operation dates, depending upon the prime mover and time period. The actual operable dates for nuclear units were used. It should be noted that nonutility net summer capacities, which are not currently collected for nonutilities, are estimated based on installed nameplate capacity data.

**Table 8.1 Web Page:** <http://www.eia.doe.gov/fuelelectric.html>.

### Table 8.1 Sources

**Net Generation, Electric Utilities** • 1949-September 1977—Federal Power Commission, Form FPC-4, “Monthly Power Plant Report.” • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, “Monthly Power Plant Report.” • 1982-2000—Energy Information Administration (EIA), Form EIA-759, “Monthly Power Plant Report.” • 2001—EIA, Form EIA-906, “Power Plant Report.” **Net Generation, Independent Power Producers:** • 1989-1997—EIA, Form EIA-867, “Annual Nonutility Power Producer Report.” • 1998-2000—EIA, Form EIA-860B, “Annual Electric Generator Report—Nonutility.” • 2001—EIA, Form EIA-906, “Power Plant Report.” **Net Generation, Commercial:** Table 8.2c. **Net Generation, Industrial:** Table 8.2c. **Imports and Exports:** • 1949-September 1977—unpublished Federal Power Commission data. •



October 1977-1980—unpublished Economic Regulatory Administration (ERA) data. • 1981—Department of Energy (DOE), Office of Energy Emergency Operations, “Report on Electric Energy Exchanges with Canada and Mexico for Calendar Year 1981,” April 1982 (revised June 1982). • 1982 and 1983—DOE, ERA, Electricity Exchanges Across International Borders. • 1984-1986—DOE, ERA, Electricity Transactions Across International Borders. • 1987 and 1988—DOE, ERA, Form ERA-781R, “Annual Report of International Electrical Export/Import Data.” • 1989—DOE Fossil Energy, Form FE-781R, “Annual Report of International Electrical Export/Import Data.” • 1990-1998—Mexico’s Data: DOE, Fossil Fuels, Office of Fuels Programs, Form FE-781R, “Annual Report of International Electrical Export/Import Data.” Canada’s Data: National Energy Board of Canada (metered energy, firm and interruptible). • 1999 forward—EIA estimates based on preliminary data from DOE, Fossil Energy, and actual data from the National Energy Board of Canada. **Losses and Unaccounted For:** Calculated as the sum of total net generation and imports minus total end use and exports. **End Use:** Table 8.5.

#### **Table 8.2b Sources**

• 1949-September 1977—Federal Power Commission, Form FPC-4, “Monthly Power Plant Report.” • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, “Monthly Power Plant Report.” • 1982-1988—Energy Information Administration (EIA), Form EIA-759, “Monthly Power Plant Report.” • 1989-1997—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-867, “Annual Nonutility Power Producer Report.” • 1998-2000—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-860B, “Annual Electric Generator Report—Nonutility.” • 2001—EIA, Form EIA-906, “Power Plant Report.”

#### **Table 8.3b Sources**

• 1949-September 1977—Federal Power Commission, Form FPC-4, “Monthly Power Plant Report.” • October 1977-1981—Federal Energy Regulatory

Commission, Form FPC-4, “Monthly Power Plant Report.” • 1982-1988—Energy Information Administration (EIA), Form EIA-759, “Monthly Power Plant Report.” • 1989-1997—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-867, “Annual Nonutility Power Producer Report.” • 1998-2000—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-860B, “Annual Electric Generator Report—Nonutility.” • 2001—EIA, Form EIA-906, “Power Plant Report.”

#### **Table 8.4 Sources**

• 1949-September 1977—Federal Power Commission, Form FPC-4, “Monthly Power Plant Report.” • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, “Monthly Power Plant Report.” • 1982-1988—Energy Information Administration (EIA), Form EIA-759, “Monthly Power Plant Report.” • 1989-1997—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-867, “Annual Nonutility Power Producer Report.” • 1998-2000—EIA, EIA-759, “Monthly Power Plant Report” and Form EIA-860B, “Annual Electric Generator Report—Nonutility.” • 2001—EIA, Form EIA-906, “Power Plant Report.”

#### **Table 8.7b Sources**

• 1949-1983—Energy Information Administration, EIA, Form EIA-860A, “Annual Electric Generator Report—Utility” and predecessor forms. • 1984-1997—Energy Information Administration, EIA, Form EIA-860, “Annual Electric Generator Report” and predecessor forms. • 1998 forward EIA, Form EIA-860A, “Annual Electric Generator Report—Utility” and predecessor forms and EIA, Form EIA-860B, “Annual Electric Generator Report—Nonutility” and predecessor forms.

#### **Table 8.7c Sources**

• 1989-1997—Energy Information Administration (EIA), Form EIA-867, “Annual Nonutility Power Producer Report.” • 1998-2000—EIA, Form EIA-860B, “Annual Electric Generator Report—Nonutility.” • 2001—EIA, Form EIA-906, “Power Plant Report.”





# 9

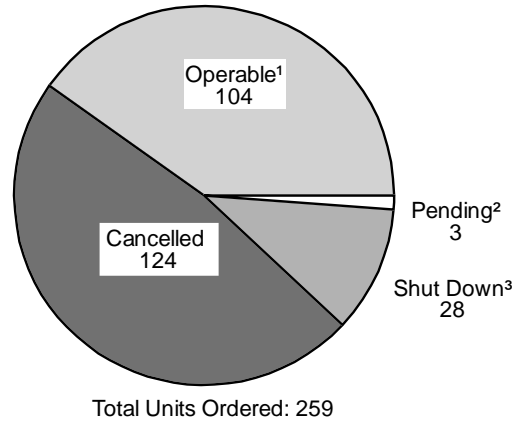
## Nuclear Energy



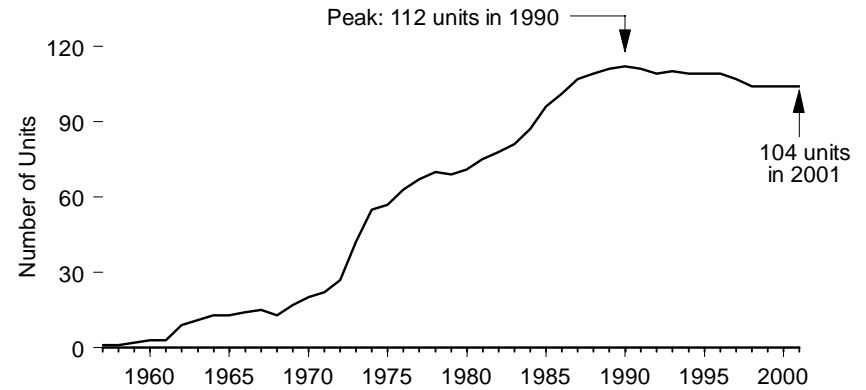
Site of Shippingport atomic power station, the first commercial nuclear power plant in the United States (rectangular reactor building and foreground); background, Beaver Valley 1 and 2 nuclear power plants and Bruce Mansfield coal-fired power plant (southwestern Pennsylvania). Source: U.S. Department of Energy.

# Figure 9.1 Nuclear Generating Units

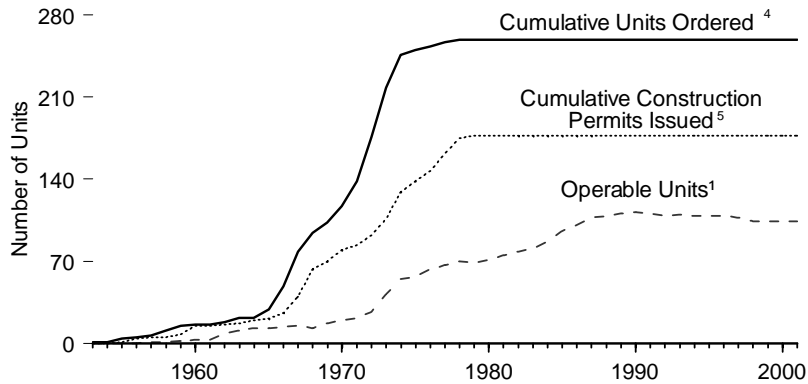
Status of All Ordered Units, 1953-2001



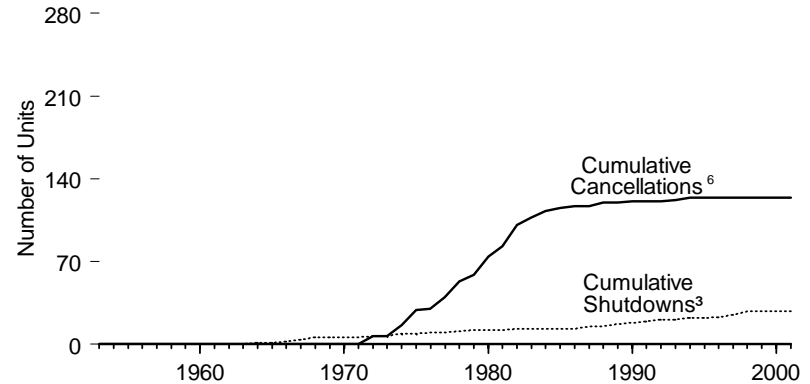
Operable Units,<sup>1</sup> 1957-2001



Orders, Permits, and Operable Units, 1953-2001



Cancellations and Shutdowns, 1953-2001



<sup>1</sup> Issuance by a regulatory authority of full-power operating license, or equivalent permission to operate.

<sup>2</sup> Ordered but not completed or cancelled.

<sup>3</sup> Ceased operation permanently.

<sup>4</sup> Placement of an order by a utility for a nuclear steam supply system.

<sup>5</sup> Issuance by regulatory authority of a permit, or equivalent permission, to begin construction.

<sup>6</sup> Cancellation of ordered units.

Note: Data are at end of year.

Source: Table 9.1.

**Table 9.1 Nuclear Generating Units, 1953-2001**

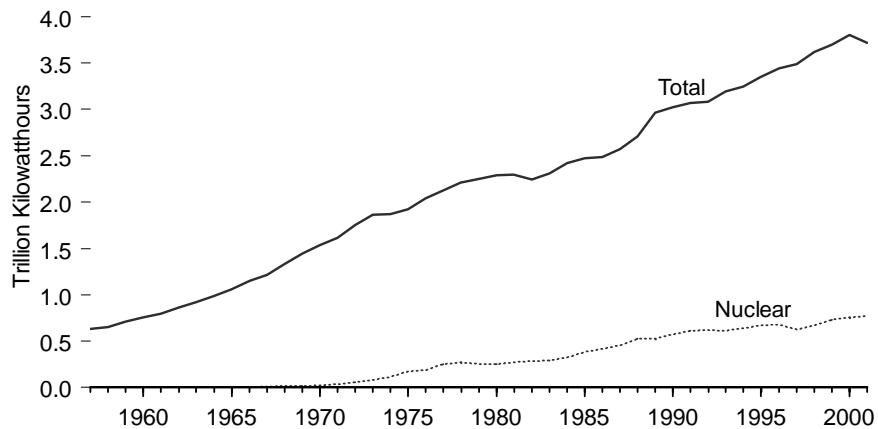
Year	Orders <sup>1</sup>	Cancelled Orders <sup>2</sup>	Construction Permits <sup>3</sup>	Low-Power Operating Licenses <sup>4</sup>	Full-Power Operating Licenses <sup>5</sup>	Shutdowns <sup>6</sup>	Operable Units <sup>7</sup>
1953	1	0	0	0	0	0	0
1954	0	0	0	0	0	0	0
1955	3	0	1	0	0	0	0
1956	1	0	3	0	0	0	0
1957	2	0	1	1	1	0	1
1958	4	0	0	0	0	0	1
1959	4	0	3	1	1	0	2
1960	1	0	7	1	1	0	3
1961	0	0	0	0	0	0	3
1962	2	0	1	7	6	0	9
1963	4	0	1	3	2	0	11
1964	0	0	3	2	3	1	13
1965	7	0	1	0	0	0	13
1966	20	0	5	1	2	1	14
1967	29	0	14	3	3	2	15
1968	16	0	23	0	0	2	13
1969	9	0	7	4	4	0	17
1970	14	0	10	4	3	0	20
1971	21	0	4	5	2	0	22
1972	38	7	8	6	6	1	27
1973	42	0	14	12	15	0	42
1974	28	9	23	14	15	2	55
1975	4	13	9	3	2	0	57
1976	3	1	9	7	7	1	63
1977	4	10	15	4	4	0	67
1978	2	13	13	3	4	1	70
1979	0	6	2	0	0	1	69
1980	0	15	0	5	2	0	71
1981	0	9	0	3	4	0	75
1982	0	18	0	6	4	1	78
1983	0	6	0	3	3	0	81
1984	0	6	0	7	6	0	87
1985	0	2	0	7	9	0	96
1986	0	2	0	7	5	0	<sup>8</sup> 101
1987	0	0	0	6	8	2	<sup>8</sup> 107
1988	0	3	0	1	2	0	<sup>8</sup> 109
1989	0	0	0	3	4	2	<sup>8</sup> 111
1990	0	1	0	1	2	1	<sup>8</sup> 112
1991	0	0	0	0	0	1	<sup>8</sup> 111
1992	0	0	0	0	0	2	<sup>8</sup> 109
1993	0	0	0	1	1	0	<sup>8</sup> 110
1994	0	1	0	0	0	1	<sup>8</sup> 109
1995	0	2	0	1	0	0	<sup>8</sup> 109
1996	0	0	0	0	1	1	<sup>8</sup> 109
1997	0	0	0	0	0	2	<sup>8</sup> 107
1998	0	0	0	0	0	3	<sup>8</sup> 104
1999	0	0	0	0	0	0	<sup>8</sup> 104
2000	0	0	0	0	0	0	<sup>8</sup> 104
2001	0	0	0	0	0	0	<sup>8</sup> 104
Total	259	124	177	132	132	28	—

<sup>1</sup> Placement of an order by a utility or government agency for a nuclear steam supply system.  
<sup>2</sup> Cancellation by utilities of ordered units. Does not include three units (Bellefonte 1 and 2 and Watts Bar 2) where construction has been stopped indefinitely.  
<sup>3</sup> Issuance by regulatory authority of a permit, or equivalent permission, to begin construction. Numbers reflect permits issued in a given year, not extant permits.  
<sup>4</sup> Issuance by regulatory authority of license, or equivalent permission, to conduct testing but not to operate at full power.  
<sup>5</sup> Issuance by regulatory authority of full-power operating license, or equivalent permission. Units generally did not begin immediate operation. See Note 1 at end of section.  
<sup>6</sup> Ceased operation permanently.  
<sup>7</sup> Total of units holding full-power licenses, or equivalent permission to operate, at the end of the year. See Note 1 at end of section.  
<sup>8</sup> Includes Browns Ferry 1, which was shut down in 1985. The unit is defueled but is still fully licensed. In May 2002, the Tennessee Valley Authority announced its intention to have the unit resume operation in 2007. See Note 1 at end of section.  
 — = Not applicable.  
 Web Page: <http://www.eia.doe.gov/fuelnuclear.html>.  
 Sources: 1953-1997: **Orders:** Energy Information Administration, *Commercial Nuclear Power 1991*,

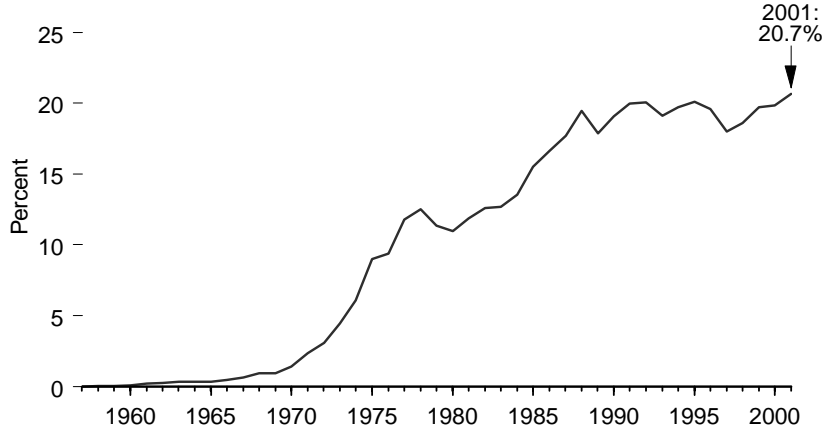
Appendix E, September 1991; Nuclear Energy Institute, *Historical Profile of U.S. Nuclear Power Development*, 1988 edition; U.S. Atomic Energy Commission, *1973 Annual Report to Congress, Volume 2, Regulatory Activities*; various utilities. **Cancelled Orders:** Energy Information Administration, *Commercial Nuclear Power 1991*, Appendix E, September 1991; Nuclear Regulatory Commission, *Information Digest*, 1997 edition, Appendix C; and Nuclear Energy Institute, *Historical Profile of U.S. Nuclear Power Development*, 1988 edition. **Construction Permits:** Nuclear Regulatory Commission, *Information Digest*, 1997 edition, Appendix A; Nuclear Energy Institute, *Historical Profile of U.S. Nuclear Power Development*, 1988 edition; various utility, Federal, and contractor officials. **Low-Power Operating Licenses:** Nuclear Energy Institute, *Historical Profile of U.S. Nuclear Power Development*, 1988 edition; U.S. Department of Energy, *Nuclear Reactors Built, Being Built, and Planned: 1995*; various utility, Federal, and contractor officials. **Full-Power Operating Licenses:** Nuclear Regulatory Commission, *Information Digest*, 1997 edition, Table 11 and Appendices A and B; various utility, Federal, and contractor officials. **Shutdowns:** Energy Information Administration, *Commercial Nuclear Power 1991*, Appendix E; Nuclear Regulatory Commission, *Information Digest*, 1998 edition; U.S. Department of Energy, *Nuclear Reactors Built, Being Built, and Planned: 1995*; Tennessee Valley Authority officials; Nuclear Regulatory Commission, "Plant Status Report." **Operable Units:** Commercial reactors fully licensed to operate, excluding permanent shutdowns. 1998 forward—<http://www.nrc.gov/NRC/reactors.html>.

**Figure 9.2 Nuclear Power Plant Operations**

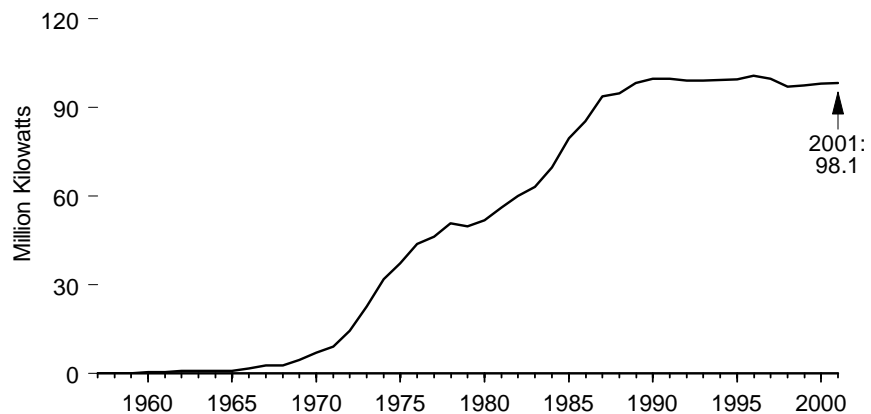
**Total Electricity and Nuclear Electricity Net Generation, 1957-2001**



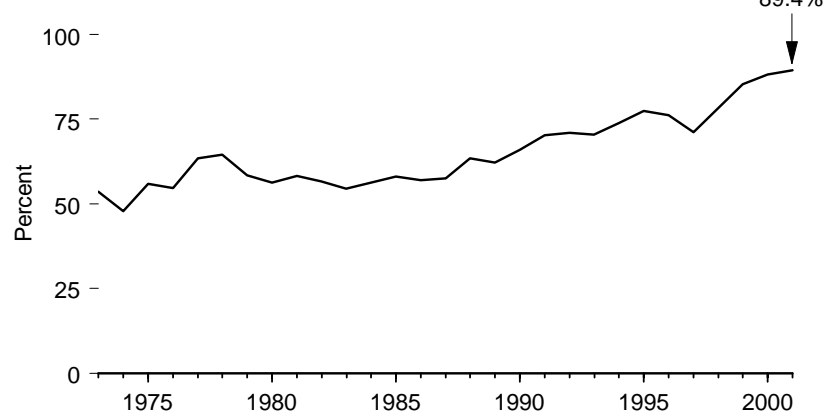
**Nuclear Share of Electricity Net Generation, 1957-2001**



**Net Summer Capacity of Operable Units, 1957-2001**



**Capacity Factor, 1973-2001**



Sources: Tables 8.1 and 9.2.

**Table 9.2 Nuclear Power Plant Operations, 1957-2001**

Year	Nuclear Electricity Net Generation	Nuclear Share of Electricity Net Generation	Net Summer Capacity of Operable Units <sup>1,2</sup>	Capacity Factor <sup>2</sup>
	Billion Kilowatthours	Percent	Million Kilowatts	Percent
1957	(s)	(s)	0.1	NA
1958	0.2	(s)	0.1	NA
1959	0.2	(s)	0.1	NA
1960	0.5	0.1	0.4	NA
1961	1.7	0.2	0.4	NA
1962	2.3	0.3	0.7	NA
1963	3.2	<sup>R</sup> 0.3	0.8	NA
1964	3.3	0.3	0.8	NA
1965	3.7	0.3	0.8	NA
1966	5.5	0.5	1.7	NA
1967	7.7	0.6	2.7	NA
1968	12.5	0.9	2.7	NA
1969	13.9	1.0	4.4	NA
1970	21.8	1.4	7.0	NA
1971	38.1	2.4	9.0	NA
1972	54.1	3.1	14.5	NA
1973	83.5	4.5	22.7	53.5
1974	114.0	6.1	31.9	47.8
1975	172.5	9.0	37.3	55.9
1976	191.1	9.4	43.8	54.7
1977	250.9	11.8	46.3	63.3
1978	276.4	12.5	50.8	64.5
1979	255.2	<sup>R</sup> 11.3	49.7	58.4
1980	251.1	11.0	51.8	56.3
1981	272.7	11.9	56.0	58.2
1982	282.8	12.6	60.0	56.6
1983	293.7	12.7	63.0	54.4
1984	327.6	<sup>R</sup> 13.5	69.7	56.3
1985	383.7	15.5	79.4	58.0
1986	414.0	16.6	85.2	56.9
1987	455.3	17.7	93.6	57.4
1988	527.0	19.5	94.7	63.5
1989 <sup>P</sup>	529.4	<sup>R</sup> 17.9	98.2	62.2
1990 <sup>P</sup>	<sup>R</sup> 576.9	19.1	99.6	66.0
1991 <sup>P</sup>	612.6	19.9	99.6	70.2
1992 <sup>P</sup>	618.8	20.1	99.0	70.9
1993 <sup>P</sup>	<sup>R</sup> 610.3	19.1	<sup>R</sup> 99.0	70.5
1994 <sup>P</sup>	<sup>R</sup> 640.4	19.7	99.1	73.8
1995 <sup>P</sup>	673.4	20.1	99.5	77.4
1996 <sup>P</sup>	674.7	19.6	100.8	76.2
1997 <sup>P</sup>	628.6	18.0	99.7	71.1
1998 <sup>P</sup>	673.7	18.6	97.1	78.2
1999 <sup>P,3</sup>	728.3	19.7	<sup>R</sup> 97.4	85.3
2000 <sup>P</sup>	753.9	<sup>R</sup> 19.8	<sup>R</sup> 97.9	88.1
2001 <sup>P</sup>	768.8	20.7	98.1	89.4

<sup>1</sup> At end of year.

<sup>2</sup> See Note 2 at end of section.

<sup>3</sup> Through 1998, data include nuclear generating units at electric utilities only. Beginning in 1999, data also include nuclear generating units at independent power producers.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.05.

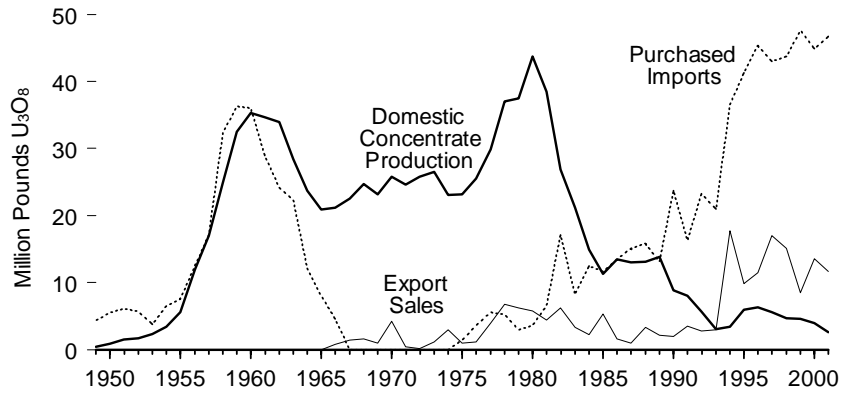
Note: The performance data shown in this table are based on a universe of reactor units that differs in some respects from the reactor universe used to profile the nuclear power industry in Table 9.1, especially

in the years prior to 1973. See Note 1 at end of section for further discussion.

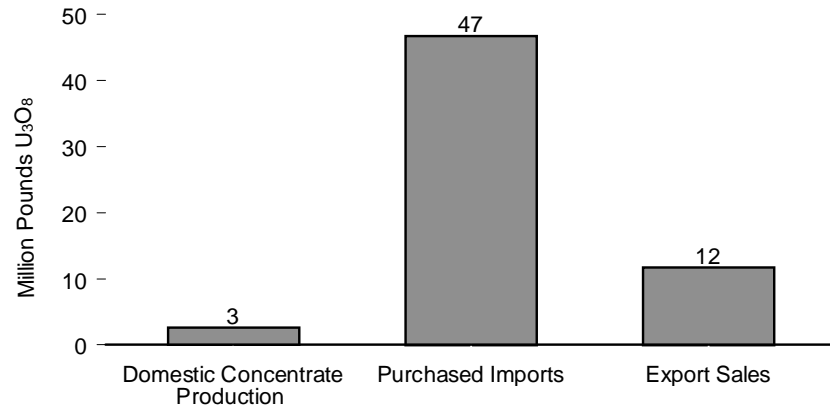
Sources: **Nuclear Electricity Net Generation** and **Nuclear Share of Electricity Net Generation:** Table 8.2a. **Net Summer Capacity of Operable Units:** Table 8.7a. **Capacity Factor:** Computed as a weighted average of monthly values for the year. Monthly factors are computed as the actual monthly generation divided by the maximum possible generation for that month. The maximum possible generation is the number of hours in the month multiplied by the net summer capacity at the end of the month. That fraction is then multiplied by 100 to obtain a percentage.

# Figure 9.3 Uranium Overview

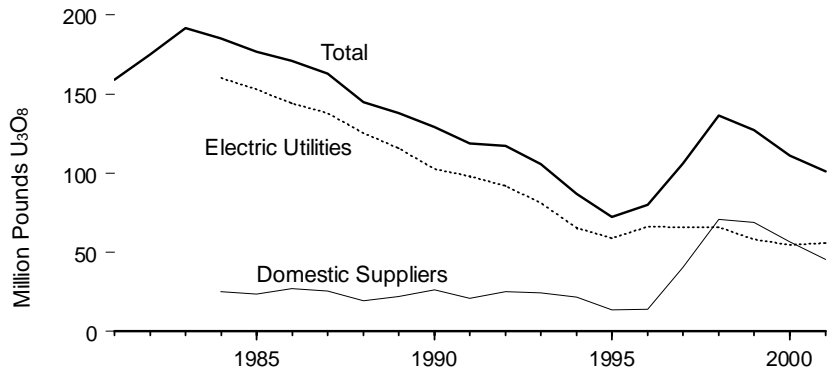
Production and Trade, 1949-2001



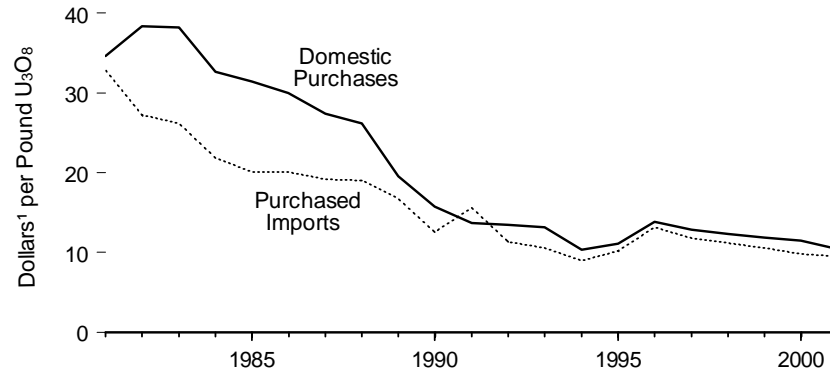
Production and Trade, 2001



Inventories, End of Year 1981-2001



Average Prices, 1981-2001



<sup>1</sup> Nominal dollars.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 9.3.

**Table 9.3 Uranium Overview, 1949-2001**

Year	Domestic Concentrate Production	Purchased Imports <sup>1</sup>	Export Sales <sup>1</sup>	Utility Purchases From Domestic Suppliers	Loaded Into U.S. Nuclear Reactors <sup>2</sup>	Inventories			Average Price	
						Domestic Suppliers	Electric Utilities	Total	Purchased Imports	Domestic Purchases
Million Pounds U <sub>3</sub> O <sub>8</sub>						U.S. Dollars <sup>3</sup> per Pound U <sub>3</sub> O <sub>8</sub>				
1949	0.36	4.3	0.0	NA	NA	NA	NA	NA	NA	NA
1950	0.92	5.5	0.0	NA	NA	NA	NA	NA	NA	NA
1951	1.54	6.1	0.0	NA	NA	NA	NA	NA	NA	NA
1952	1.74	5.7	0.0	NA	NA	NA	NA	NA	NA	NA
1953	2.32	3.8	0.0	NA	NA	NA	NA	NA	NA	NA
1954	3.40	6.5	0.0	NA	NA	NA	NA	NA	NA	NA
1955	5.56	7.6	0.0	NA	NA	NA	NA	NA	NA	NA
1956	11.92	12.5	0.0	NA	NA	NA	NA	NA	NA	NA
1957	16.96	17.1	0.0	NA	NA	NA	NA	NA	NA	NA
1958	24.88	32.3	0.0	NA	NA	NA	NA	NA	NA	NA
1959	32.48	36.3	0.0	NA	NA	NA	NA	NA	NA	NA
1960	35.28	36.0	0.0	NA	NA	NA	NA	NA	NA	NA
1961	34.70	29.0	0.0	NA	NA	NA	NA	NA	NA	NA
1962	34.02	24.2	0.0	NA	NA	NA	NA	NA	NA	NA
1963	28.44	22.4	0.0	NA	NA	NA	NA	NA	NA	NA
1964	23.70	12.1	0.0	NA	NA	NA	NA	NA	NA	NA
1965	20.88	8.0	0.0	NA	NA	NA	NA	NA	NA	NA
1966	21.18	4.6	0.8	NA	NA	NA	NA	NA	NA	NA
1967	22.51	0.0	1.4	NA	NA	NA	NA	NA	—	NA
1968	24.74	0.0	1.6	NA	NA	NA	NA	NA	—	NA
1969	23.22	0.0	1.0	NA	NA	NA	NA	NA	—	NA
1970	25.81	0.0	4.2	NA	NA	NA	NA	NA	—	NA
1971	24.55	0.0	0.4	NA	NA	NA	NA	NA	—	NA
1972	25.80	0.0	0.2	NA	NA	NA	NA	NA	—	NA
1973	26.47	0.0	1.2	NA	NA	NA	NA	NA	—	NA
1974	23.06	0.0	3.0	NA	NA	NA	NA	NA	—	NA
1975	23.20	1.4	1.0	NA	NA	NA	NA	NA	NA	NA
1976	25.49	3.6	1.2	NA	NA	NA	NA	NA	NA	NA
1977	29.88	5.6	4.0	NA	NA	NA	NA	NA	NA	NA
1978	36.97	5.2	6.8	NA	NA	NA	NA	NA	NA	NA
1979	37.47	3.0	6.2	NA	NA	NA	NA	NA	NA	NA
1980	43.70	3.6	5.8	NA	NA	NA	NA	NA	NA	NA
1981	38.47	6.6	4.4	32.6	NA	NA	NA	159.2	32.90	34.65
1982	26.87	17.1	6.2	27.1	NA	NA	NA	174.8	27.23	38.37
1983	21.16	8.2	3.3	24.2	NA	NA	NA	191.8	26.16	38.21
1984	14.88	12.5	2.2	22.5	NA	25.0	160.2	185.2	21.86	32.65
1985	11.31	11.7	5.3	21.7	NA	23.7	153.2	176.9	20.08	31.43
1986	13.51	13.5	1.6	18.9	NA	27.0	144.1	171.1	20.07	30.01
1987	12.99	15.1	1.0	20.8	NA	25.4	137.8	163.2	19.14	27.37
1988	13.13	15.8	3.3	17.6	NA	19.3	125.5	144.8	19.03	26.15
1989	13.84	13.1	2.1	18.4	NA	22.2	115.8	138.1	16.75	19.56
1990	8.89	23.7	2.0	20.5	NA	26.4	102.7	129.1	12.55	15.70
1991	7.95	16.3	3.5	26.8	34.6	20.7	98.0	118.7	15.55	13.66
1992	5.65	23.3	2.8	23.4	43.0	25.2	92.1	117.3	11.34	13.45
1993	3.06	21.0	3.0	15.5	45.1	24.5	81.2	105.7	10.53	13.14
1994	3.35	36.6	17.7	22.7	40.4	21.5	65.4	86.9	8.95	10.30
1995	6.04	41.3	9.8	22.3	51.1	13.7	58.7	72.5	10.20	11.11
1996	6.32	45.4	11.5	R 23.7	46.2	13.9	66.1	80.0	13.15	13.81
1997	5.64	43.0	17.0	R 19.4	48.2	40.4	65.9	106.2	11.81	12.87
1998	4.71	43.7	15.1	R 21.6	38.2	70.7	65.8	136.5	11.19	12.31
1999	4.61	47.6	8.5	R 21.4	58.8	68.8	58.3	127.1	10.55	11.88
2000	3.96	44.9	13.6	R 24.3	R 51.5	56.5	R 54.8	R 111.3	9.84	11.45
2001	2.64	46.7	11.7	27.5	P 52.7	P 45.4	P 55.7	P 101.1	9.51	10.45

<sup>1</sup> Import quantities through 1970 are reported for fiscal years. Prior to 1968, the Atomic Energy Commission was the sole purchaser of all imported U<sub>3</sub>O<sub>8</sub>. Trade data prior to 1982 were for transactions conducted by uranium suppliers only. For 1982 forward, transactions by uranium buyers (consumers) have been included. Buyer imports and exports prior to 1982 are believed to be small.

<sup>2</sup> Does not include any fuel rods removed from reactors and later reloaded.

<sup>3</sup> Nominal dollars.

R=Revised. P=Preliminary. NA=Not available. — = Not applicable.

Web Page: <http://www.eia.doe.gov/fuelnuclear.html>.

Sources: 1949-1966—U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry*, Report No. GJO-100, annual. 1967 forward—Energy Information Administration, *Uranium Industry Annual*, annual reports.



## Nuclear Energy

**Note 1.** In 1997 EIA undertook a major revision of Table 9.1 to more fully describe the history of the U.S. commercial nuclear power industry. The time frame was extended back to the birth of the industry in 1953, and the data categories were revised for greater relevance to current industry conditions and trends. To acquire the data for the revised categories it was necessary to develop a reactor unit database employing different sources than those used previously for Table 9.1 and still used for Table 9.2.

The data in Table 9.1 apply to commercial nuclear power units, which means that the units contributed power to the commercial electricity grid whether or not they were owned by an electric utility. A total of 259 units ever ordered was identified. Although most orders were placed by electric utilities, several units are or were ordered, owned, and operated wholly or in part by the Federal Government, including BONUS (Boiling Nuclear Superheater Power Station), Elk River, Experimental Breeder Reactor 2, Hallam, Hanford N, Piqua, and Shippingport.

A reactor is generally defined as operable in Table 9.1 while it possessed a full-power license from the Nuclear Regulatory Commission or its predecessor the Atomic Energy Commission, or equivalent permission to operate, at the end of the year. The definition is liberal in that it does not exclude units retaining full-power licenses during long, non-routine shut-downs. For example:

In 1985 the five then-active Tennessee Valley Authority units (Browns Ferry 1, 2, and 3 and Sequoyah 1 and 2) were shut down under a regulatory forced outage. Browns Ferry 1 remains shut down and has been defueled, while the other units were idle for several years, restarting in 1991, 1995, 1988, and 1988, respectively. All five units are counted as operable during the shut-downs. Brown's Ferry 1 is the only one of the five TVA plants that has not returned to service. Because it is still fully licensed to operate, it continues to meet the definition of operable.

Shippingport was shut down from 1974 through 1976 for conversion to a light-water breeder reactor, but is counted as operable until its retirement in 1982.

Calvert Cliffs 2 was shut down in 1989 and 1990 for replacement of pressurizer heater sleeves but is counted as operable during those years.

Exceptions to the rule are Shoreham and Three Mile Island 2. Shoreham was granted a full-power license in April 1989, but was shut down two months later and never restarted. In 1991, the license was changed to Possession Only. Although not operable at the end of the year, Shoreham is treated as operable during 1989 and shut down in 1990, because counting it as operable and shut down in the same year would introduce a statistical discrepancy in the tallies. A major accident closed Three Mile Island 2 in 1979, and although the unit retained its full-power license for several years, it is considered permanently shut down since that year.

**Note 2.** Net summer capacities were first collected on Form EIA-860 for 1984. Units not assigned a net summer capacity rating by the utility were given an estimated rating by use of a statistical relationship between installed nameplate capacity and net summer capacity for each prime mover. To estimate net summer capacity for 1949-1984, two methods were used. For each prime mover except nuclear and "other," net summer capacity estimates were calculated in two steps. First, the unit capacity values reported on Form EIA-860 and the unit start dates contained in the 1984 Generating Unit Reference File (GURF) were used to compute preliminary aggregate estimates of annual net summer capacity and installed nameplate capacity. These preliminary estimates were obtained by aggregating unit capacity values for all units in service during a given year. Next, the ratio of the preliminary capacity to nameplate estimate was computed for each year and multiplied by the previously published installed nameplate capacity values to produce the final estimates of net summer capacity. The net summer capacity data for nuclear and "other" units were used directly from the 1984 GURF for all years. Historical aggregates were then developed by use of the unit start dates on the GURF.

Historical capacity has also been modified to estimate capacity based upon the operable definition, by assuming that non-nuclear generating units became operable between 1 and 4 months prior to their commercial operation dates, depending upon the prime mover and time period. The actual operable dates for nuclear units were used. It should be noted that nonutility net summer capacities, which are not currently collected for nonutilities, are estimated based on installed nameplate capacity data.

# 10

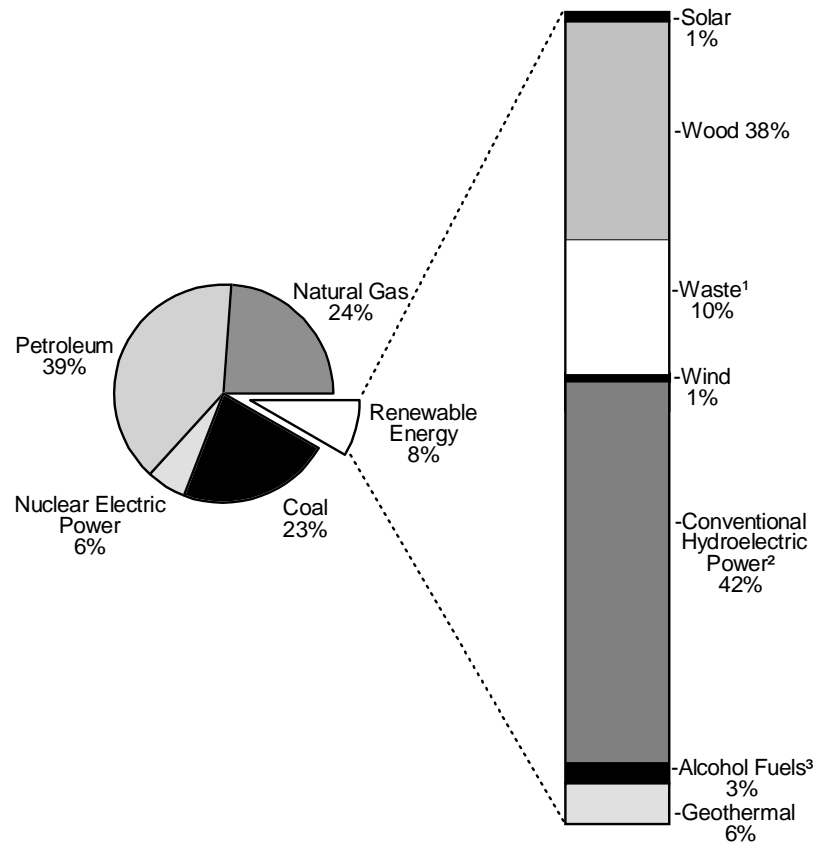
# Renewable Energy



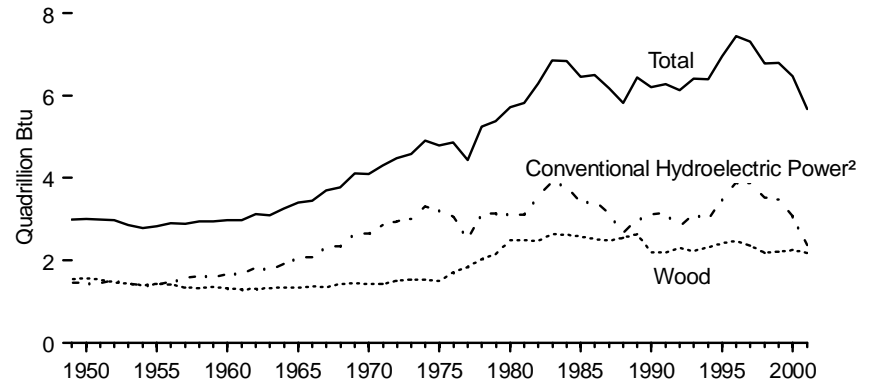
Grand Coulee Dam, Washington State. Source: U.S. Bureau of Reclamation.

**Figure 10.1 Renewable Energy Consumption by Source**

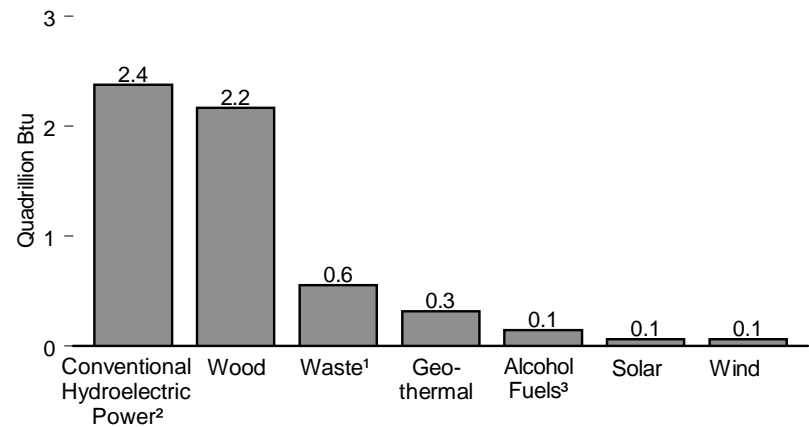
**Renewable Energy as Share of Total Energy, 2001**



**Major Sources of Renewable Energy Consumption, 1949-2001**



**Renewable Energy Consumption by Source, 2001**



<sup>1</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>2</sup> Through 1988, includes all electricity net imports. Beginning in 1989, includes only the portion of electricity net imports derived from hydroelectric power.

<sup>3</sup> Ethanol blended into motor gasoline.

Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 1.3 and 10.1.

**Table 10.1 Renewable Energy Consumption by Source, 1949-2001**  
(Trillion Btu)

Year	Conventional Hydroelectric Power <sup>1,2</sup>	Wood <sup>3</sup>	Waste <sup>4</sup>	Alcohol Fuels <sup>5</sup>	Geothermal <sup>6</sup>	Solar <sup>7</sup>	Wind <sup>8</sup>	Total
1949	1,449	1,549	NA	NA	NA	NA	NA	2,998
1950	1,440	1,562	NA	NA	NA	NA	NA	3,003
1951	1,454	1,535	NA	NA	NA	NA	NA	2,988
1952	1,496	1,474	NA	NA	NA	NA	NA	2,970
1953	1,439	1,419	NA	NA	NA	NA	NA	2,857
1954	1,388	1,394	NA	NA	NA	NA	NA	2,783
1955	1,407	1,424	NA	NA	NA	NA	NA	2,832
1956	1,487	1,416	NA	NA	NA	NA	NA	2,903
1957	1,557	1,334	NA	NA	NA	NA	NA	2,890
1958	1,629	1,323	NA	NA	NA	NA	NA	2,952
1959	1,587	1,353	NA	NA	NA	NA	NA	2,940
1960	1,657	1,320	NA	NA	1	NA	NA	2,977
1961	1,680	1,295	NA	NA	2	NA	NA	2,977
1962	1,822	1,300	NA	NA	2	NA	NA	3,124
1963	1,772	1,323	NA	NA	4	NA	NA	3,099
1964	1,907	1,337	NA	NA	5	NA	NA	3,248
1965	2,058	1,335	NA	NA	4	NA	NA	3,397
1966	2,073	1,369	NA	NA	4	NA	NA	3,446
1967	2,344	1,340	NA	NA	7	NA	NA	3,691
1968	2,342	1,419	NA	NA	9	NA	NA	3,771
1969	2,659	1,440	NA	NA	13	NA	NA	4,113
1970	2,654	1,429	2	NA	11	NA	NA	4,096
1971	2,861	1,430	2	NA	12	NA	NA	4,305
1972	2,944	1,501	2	NA	31	NA	NA	4,478
1973	3,010	1,527	2	NA	43	NA	NA	4,581
1974	3,309	1,538	2	NA	53	NA	NA	4,902
1975	3,219	1,497	2	NA	70	NA	NA	4,788
1976	3,066	1,711	2	NA	78	NA	NA	4,857
1977	2,515	1,837	2	NA	77	NA	NA	4,431
1978	3,141	2,036	1	NA	64	NA	NA	5,243
1979	3,141	2,150	2	NA	84	NA	NA	5,377
1980	3,118	2,483	2	NA	110	NA	NA	5,712
1981	3,105	2,495	88	7	123	NA	NA	5,818
1982	3,572	2,477	119	19	105	NA	NA	6,292
1983	3,899	2,639	157	35	129	NA	(s)	6,860
1984	3,800	2,629	208	43	165	(s)	(s)	6,845
1985	3,398	2,576	236	52	198	(s)	(s)	6,460
1986	3,446	2,518	263	60	219	(s)	(s)	6,507
1987	3,117	2,465	289	69	229	(s)	(s)	6,170
1988	2,662	2,552	315	70	217	(s)	(s)	5,817
1989	R2,987	R2,637	354	71	R317	R55	R19	R6,441
1990	R3,128	R2,190	408	63	R337	R60	R24	R6,209
1991	R3,139	R2,190	440	73	R351	R63	R27	R6,283
1992	2,818	R2,290	473	83	R368	R64	30	R6,127
1993	3,119	R2,228	479	97	R382	R66	31	R6,403
1994	2,993	R2,315	515	109	R366	R69	36	R6,401
1995	R3,480	R2,420	531	117	R312	R70	33	R6,962
1996	R3,889	R2,467	577	84	R329	R71	R33	R7,450
1997	R3,881	R2,349	551	106	R325	R70	R34	R7,316
1998	R3,518	R2,175	R542	117	R329	R70	31	R6,782
1999	R3,472	R2,210	R540	122	R332	R69	46	R6,790
2000	R3,077	R2,257	R552	139	R317	R66	R57	R6,465
2001 <sup>E</sup>	2,376	2,170	551	147	315	64	59	5,683

<sup>1</sup> Hydroelectricity generated by pumped storage is not included in renewable energy.

<sup>2</sup> Through 1988, includes all electricity net imports. Beginning in 1989, includes only the portion of electricity net imports derived from hydroelectric power.

<sup>3</sup> Wood, black liquor, and other wood waste.

<sup>4</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>5</sup> Ethanol blended into motor gasoline.

<sup>6</sup> Geothermal electricity net generation, heat pump, and direct use energy. Beginning in 1989, also

includes electricity net imports derived from geothermal energy.

<sup>7</sup> Solar thermal and photovoltaic electricity net generation, and solar thermal direct use energy.

<sup>8</sup> Wind electricity net generation.

R=Revised. E=Estimate. NA=Not available. (s)=Less than 0.5 trillion Btu.

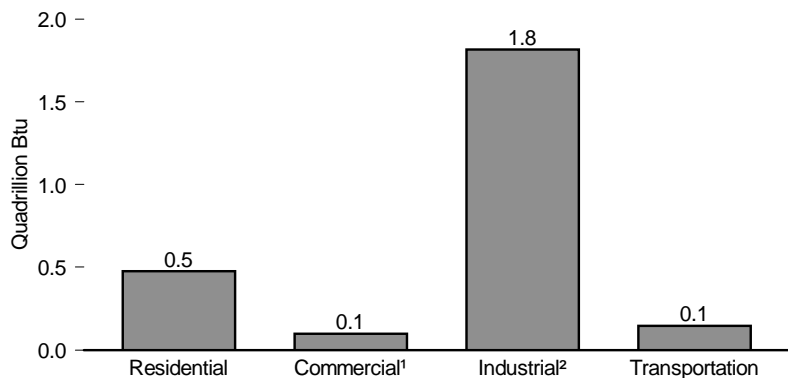
Note: Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelrenewable.html>.

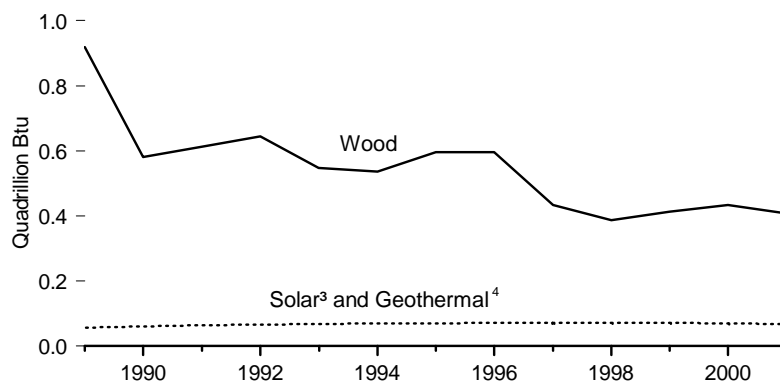
Sources: Tables 10.2a and 10.2b.

**Figure 10.2a Renewable Energy Consumption: End-Use Sectors**

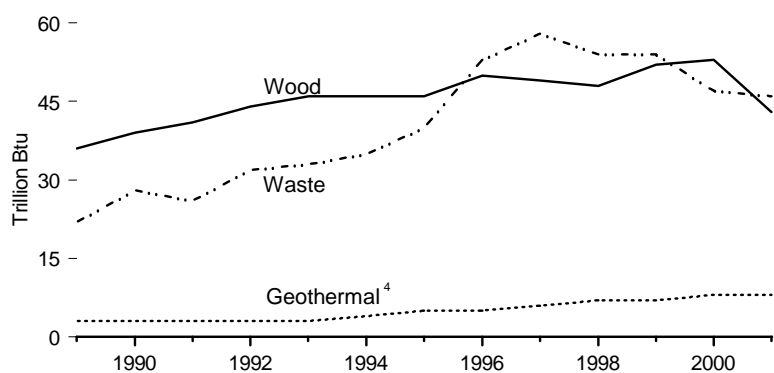
**End-Use Sectors, 2001**



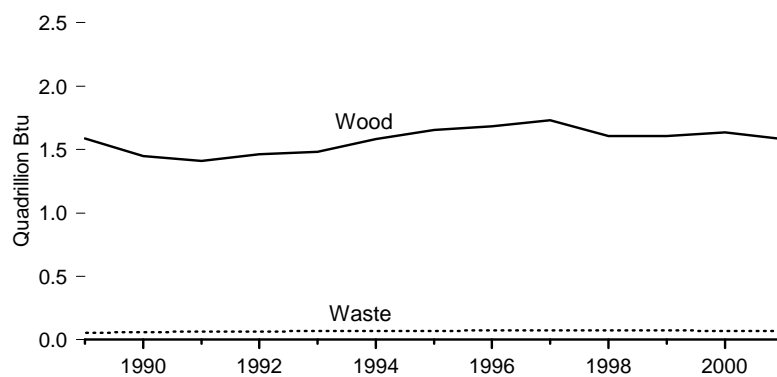
**Residential Sector, 1989-2001**



**Commercial¹ Sector, Major Sources, 1989-2001**



**Industrial² Sector, Major Sources, 1989-2001**



<sup>1</sup> Includes fuel used at combined-heat-and-power plants and at commercial electricity-only plants.

<sup>2</sup> Includes fuel used at combined-heat-and-power plants and at industrial electricity-only plants.

<sup>3</sup> Solar thermal direct use energy and photovoltaic electricity generation. Includes small amounts of commercial sector use.

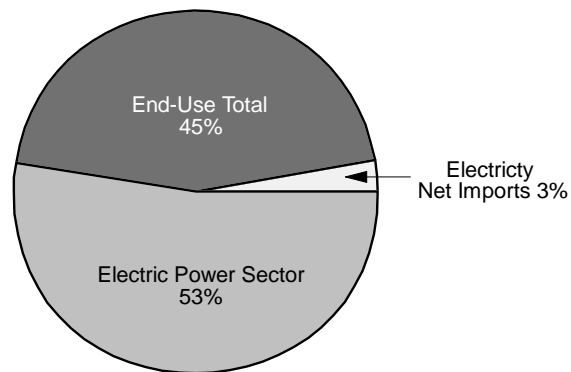
<sup>4</sup> Geothermal heat pump and direct use energy.

Note: Because vertical scales differ, graphs should not be compared.

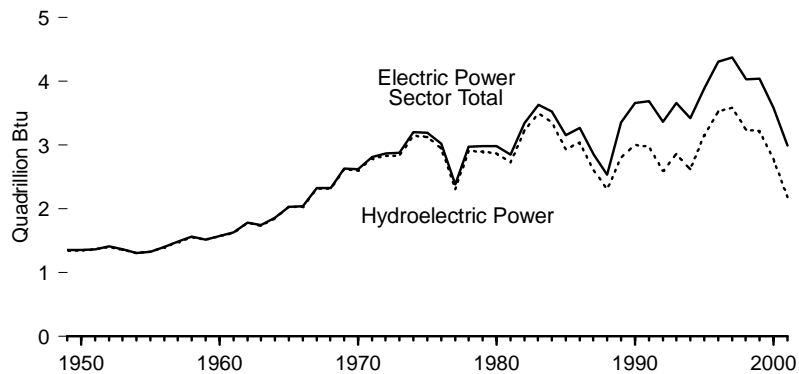
Source: Table 10.2a.

**Figure 10.2b Renewable Energy Consumption: Electric Power Sector**

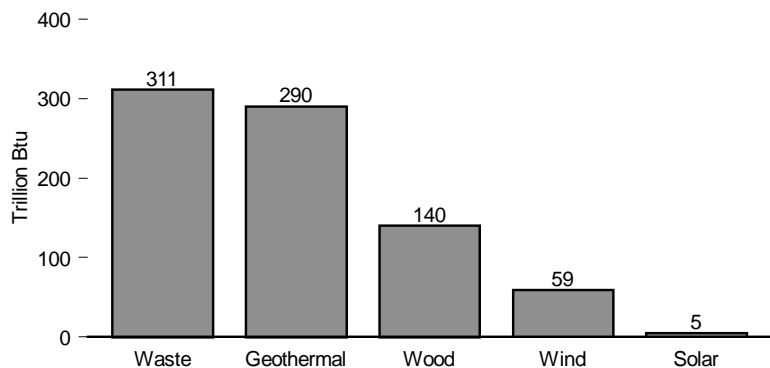
**Electric Power Share of Total Renewable Energy Consumption, 2001**



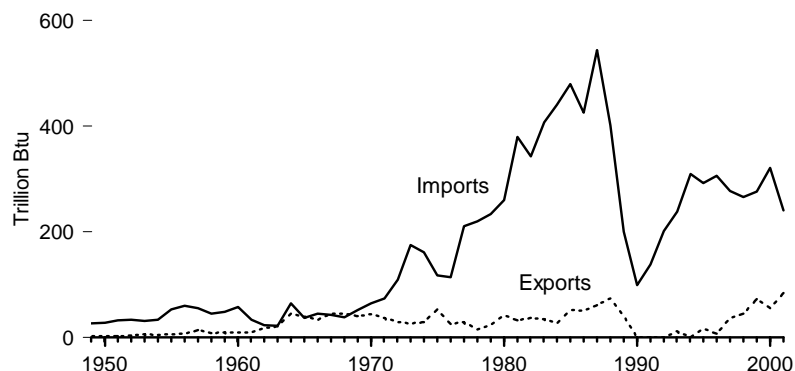
**Electric Power Sector Total and Hydroelectric Power, 1949-2001**



**Non-Hydroelectric Power Sources, 2001**



**Hydroelectricity Trade, 1949-2001**



Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 10.2a and 10.2b.

**Table 10.2a Renewable Energy Consumption: End-Use Sectors, 1949-2001**  
(Trillion Btu)

Year	Residential				Commercial <sup>1</sup>					Industrial <sup>2</sup>					Transportation	End-Use Total
	Wood <sup>3</sup>	Geo-thermal <sup>4</sup>	Solar <sup>5</sup>	Total	Hydro-power <sup>6</sup>	Wood <sup>3</sup>	Waste <sup>7</sup>	Geo-thermal <sup>4</sup>	Total	Hydro-power <sup>6</sup>	Wood <sup>3</sup>	Waste <sup>7</sup>	Geo-thermal <sup>4</sup>	Total	Alcohol Fuels <sup>8</sup>	
1949	1,055	NA	NA	1,055	NA	20	NA	NA	20	76	468	NA	NA	R544	NA	R1,619
1950	1,006	NA	NA	1,006	NA	19	NA	NA	19	69	532	NA	NA	R602	NA	R1,626
1951	958	NA	NA	958	NA	18	NA	NA	18	63	553	NA	NA	R616	NA	R1,592
1952	899	NA	NA	899	NA	17	NA	NA	17	62	552	NA	NA	R613	NA	R1,529
1953	832	NA	NA	832	NA	16	NA	NA	16	57	566	NA	NA	R622	NA	R1,470
1954	800	NA	NA	800	NA	15	NA	NA	15	56	576	NA	NA	R632	NA	R1,447
1955	775	NA	NA	775	NA	15	NA	NA	15	38	631	NA	NA	R669	NA	R1,459
1956	739	NA	NA	739	NA	14	NA	NA	14	37	661	NA	NA	R698	NA	R1,451
1957	702	NA	NA	702	NA	13	NA	NA	13	36	616	NA	NA	R652	NA	R1,367
1958	688	NA	NA	688	NA	13	NA	NA	13	37	620	NA	NA	R657	NA	R1,358
1959	647	NA	NA	647	NA	12	NA	NA	12	37	692	NA	NA	R729	NA	R1,388
1960	627	NA	NA	627	NA	12	NA	NA	12	39	680	NA	NA	R719	NA	R1,357
1961	587	NA	NA	587	NA	11	NA	NA	11	36	695	NA	NA	R731	NA	R1,329
1962	560	NA	NA	560	NA	11	NA	NA	11	36	728	NA	NA	R764	NA	R1,335
1963	537	NA	NA	537	NA	10	NA	NA	10	34	775	NA	NA	R809	NA	R1,356
1964	499	NA	NA	499	NA	9	NA	NA	9	34	827	NA	NA	R861	NA	R1,369
1965	468	NA	NA	468	NA	9	NA	NA	9	33	855	NA	NA	R888	NA	R1,365
1966	455	NA	NA	455	NA	9	NA	NA	9	33	902	NA	NA	R935	NA	R1,399
1967	434	NA	NA	434	NA	8	NA	NA	8	36	895	NA	NA	R930	NA	R1,373
1968	426	NA	NA	426	NA	8	NA	NA	8	35	982	NA	NA	R1,017	NA	R1,451
1969	415	NA	NA	415	NA	8	NA	NA	8	34	1,014	NA	NA	R1,048	NA	R1,471
1970	401	NA	NA	401	NA	8	NA	NA	8	34	1,019	NA	NA	R1,053	NA	R1,461
1971	382	NA	NA	382	NA	7	NA	NA	7	34	1,040	NA	NA	R1,074	NA	R1,463
1972	380	NA	NA	380	NA	7	NA	NA	7	34	1,113	NA	NA	R1,147	NA	R1,534
1973	354	NA	NA	354	NA	7	NA	NA	7	35	1,165	NA	NA	R1,200	NA	R1,560
1974	371	NA	NA	371	NA	7	NA	NA	7	33	1,159	NA	NA	R1,192	NA	R1,570
1975	425	NA	NA	425	NA	8	NA	NA	8	32	1,063	NA	NA	R1,096	NA	R1,529
1976	482	NA	NA	482	NA	9	NA	NA	9	33	1,220	NA	NA	R1,253	NA	R1,744
1977	542	NA	NA	542	NA	10	NA	NA	10	33	1,281	NA	NA	R1,314	NA	R1,866
1978	622	NA	NA	622	NA	12	NA	NA	12	32	1,400	NA	NA	R1,432	NA	R2,066
1979	728	NA	NA	728	NA	14	NA	NA	14	34	1,405	NA	NA	R1,439	NA	R2,181
1980	859	NA	NA	859	NA	21	NA	NA	21	33	1,600	NA	NA	R1,633	NA	R2,513
1981	869	NA	NA	869	NA	21	NA	NA	21	33	1,602	87	NA	R1,722	7	R2,619
1982	937	NA	NA	937	NA	22	NA	NA	22	33	1,516	118	NA	R1,667	19	R2,645
1983	925	NA	NA	925	NA	22	NA	NA	22	33	1,690	155	NA	R1,879	35	R2,861
1984	923	NA	NA	923	NA	22	NA	NA	22	33	1,679	204	NA	R1,916	43	R2,904
1985	899	NA	NA	899	NA	24	NA	NA	24	33	1,645	230	NA	R1,908	52	R2,883
1986	876	NA	NA	876	NA	27	NA	NA	27	33	1,610	256	NA	R1,899	60	R2,862
1987	852	NA	NA	852	NA	29	NA	NA	29	33	1,576	282	NA	R1,891	69	R2,841
1988	885	NA	NA	885	NA	32	NA	NA	32	33	1,625	308	NA	R1,965	70	R2,952
1989	918	5	53	976	P1	R36	22	3	R61	RP26	R1,584	R200	2	R1,812	71	R2,919
1990	581	6	56	642	P1	R39	28	3	R71	RP28	R1,447	R194	2	R1,671	63	R2,447
1991	613	6	58	677	P1	R41	26	3	R72	RP28	R1,410	R185	2	R1,625	73	R2,446
1992	645	6	60	711	P1	R44	32	3	R81	RP31	R1,461	R179	2	R1,672	83	R2,548
1993	548	7	62	616	P1	R46	33	3	R84	RP30	R1,484	R181	2	R1,697	97	R2,495
1994	537	6	64	607	P1	R46	35	4	R86	RP62	R1,580	R199	3	R1,844	109	R2,645
1995	596	7	65	667	P1	R46	40	5	R92	RP55	R1,652	R195	3	R1,905	117	R2,781
1996	595	7	R65	R667	P1	R50	53	5	R110	RP61	R1,683	R224	3	R1,971	84	R2,832
1997	433	R8	65	506	P1	R49	58	6	R113	RP58	R1,731	R184	3	R1,976	106	R2,701
1998	387	8	65	459	P1	R48	54	7	R111	RP55	R1,603	R180	3	R1,841	117	R2,528
1999	414	R9	64	486	P1	R52	54	7	R114	RP49	R1,606	R171	4	R1,830	122	R2,551
2000	433	9	R61	503	P1	R53	47	8	R109	RP42	R1,636	R186	4	R1,869	139	R2,620
2001 <sup>E</sup>	407	9	59	475	1	43	46	8	98	37	1,580	194	5	1,816	147	2,537

<sup>1</sup> Commercial sector fuel use, including that at commercial combined-heat-and-power (CHP) and commercial electricity-only plants. See Appendix G for commercial sector NAICS codes.

<sup>2</sup> Industrial sector fuel use, including that at industrial combined-heat-and-power (CHP) and industrial electricity-only plants. See Appendix G for industrial sector NAICS codes.

<sup>3</sup> Wood, black liquor, and other wood waste.

<sup>4</sup> Geothermal heat pump and direct use energy.

<sup>5</sup> Solar thermal direct use energy and photovoltaic electricity generation. Small amounts of commercial sector use are included in the residential sector.

<sup>6</sup> Conventional hydroelectric power.

<sup>7</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>8</sup> Ethanol blended into motor gasoline.

R=Revised. P=Preliminary. E=Estimate. NA=Not available.

Note: Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelrenewable.html>.

Sources: See end of section.

**Table 10.2b Renewable Energy Consumption: Electric Power Sector, Electricity Trade, and Total, 1949-2001**  
(Trillion Btu)

Year	Electric Power Sector <sup>1,2</sup>							Electricity Trade <sup>3</sup>				Renewable Energy Consumption Total
	Hydro-power <sup>4</sup>	Wood <sup>5</sup>	Waste <sup>6</sup>	Geo-thermal <sup>7</sup>	Solar <sup>8</sup>	Wind <sup>9</sup>	Total	Hydropower <sup>4</sup>		Geo-thermal Imports	Total Net Imports	
								Imports	Exports			
1949	1,349	6	NA	NA	NA	NA	1,355	27	3	NA	24	2,998
1950	1,346	5	NA	NA	NA	NA	1,351	27	2	NA	25	3,003
1951	1,361	5	NA	NA	NA	NA	1,366	33	3	NA	30	2,988
1952	1,404	6	NA	NA	NA	NA	1,411	33	3	NA	30	2,970
1953	1,356	5	NA	NA	NA	NA	1,361	31	6	NA	26	2,857
1954	1,304	3	NA	NA	NA	NA	1,307	33	4	NA	28	2,783
1955	1,322	3	NA	NA	NA	NA	1,325	53	6	NA	48	2,832
1956	1,398	2	NA	NA	NA	NA	1,400	59	7	NA	52	2,903
1957	1,480	2	NA	NA	NA	NA	1,482	55	14	NA	41	2,890
1958	1,555	2	NA	NA	NA	NA	1,557	45	8	NA	37	2,952
1959	1,511	2	NA	NA	NA	NA	1,513	48	9	NA	39	2,940
1960	1,569	2	NA	1	NA	NA	1,571	57	8	NA	49	2,977
1961	1,621	1	NA	2	NA	NA	1,624	34	10	NA	24	2,977
1962	1,780	1	NA	2	NA	NA	1,784	23	18	NA	6	3,124
1963	1,737	1	NA	4	NA	NA	1,743	22	21	NA	1	3,099
1964	1,853	2	NA	5	NA	NA	1,859	65	44	NA	20	3,248
1965	2,026	3	NA	4	NA	NA	2,033	37	39	NA	-1	3,397
1966	2,028	3	NA	4	NA	NA	2,036	44	33	NA	11	3,446
1967	2,311	3	NA	7	NA	NA	2,321	42	45	NA	-3	3,691
1968	2,313	4	NA	9	NA	NA	2,327	38	45	NA	-7	3,771
1969	2,614	3	NA	13	NA	NA	2,630	51	40	NA	11	4,113
1970	2,600	1	2	11	NA	NA	2,615	65	44	NA	21	4,096
1971	2,790	1	2	12	NA	NA	2,806	74	37	NA	37	4,305
1972	2,829	1	2	31	NA	NA	2,864	109	29	NA	80	4,478
1973	2,827	1	2	43	NA	NA	2,873	175	27	NA	148	4,581
1974	3,143	1	2	53	NA	NA	3,199	161	28	NA	133	4,902
1975	3,122	(s)	2	70	NA	NA	3,194	117	53	NA	64	4,788
1976	2,943	1	2	78	NA	NA	3,024	114	25	NA	89	4,857
1977	2,301	3	2	77	NA	NA	2,383	210	29	NA	182	4,431
1978	2,905	2	1	64	NA	NA	2,973	220	15	NA	204	5,243
1979	2,897	3	2	84	NA	NA	2,986	233	23	NA	211	5,377
1980	2,867	3	2	110	NA	NA	2,982	260	43	NA	217	5,712
1981	2,725	3	1	123	NA	NA	2,852	379	32	NA	347	5,818
1982	3,233	2	1	105	NA	NA	3,341	343	37	NA	306	6,292
1983	3,494	2	2	129	NA	(s)	3,627	407	35	NA	372	6,860
1984	3,353	5	4	165	(s)	(s)	3,527	441	27	NA	414	6,845
1985	2,937	8	7	198	(s)	(s)	3,150	479	52	NA	428	6,460
1986	3,038	5	7	219	(s)	(s)	3,270	425	50	NA	375	6,507
1987	2,602	8	7	229	(s)	(s)	2,846	544	61	NA	483	6,170
1988	2,302	10	8	217	(s)	(s)	2,536	401	73	NA	328	5,817
1989	2,P2,801	2,P100	2,P132	2,P296	2,P3	2,P19	2,P3,351	200	40	11	171	R6,441
1990	P3,000	P124	P187	P315	P4	P24	P3,653	99	(s)	11	110	R6,209
1991	P2,972	P126	P229	P325	P5	P27	P3,684	138	(s)	15	153	R6,283
1992	P2,586	P140	P262	P338	P4	P30	P3,360	201	(s)	19	219	R6,127
1993	P2,861	P150	P265	P351	P5	P31	P3,662	238	11	18	246	R6,403
1994	P2,620	P152	P282	P325	P5	P36	P3,420	309	(s)	27	337	R6,401
1995	P3,149	P125	P296	P280	P5	P33	P3,889	291	17	19	293	R6,962
1996	P3,528	P138	P300	P300	P5	P33	P4,305	306	7	14	313	R7,450
1997	P3,581	P137	P309	P309	P5	P34	P4,375	R277	R36	(s)	R241	R7,316
1998	P3,241	P137	P308	P311	P5	P31	P4,032	R265	R45	1	R221	R6,782
1999	P3,218	P138	P315	P312	P5	P46	P4,034	R277	R72	1	R205	R6,790
2000	P2,768	P134	P318	P296	P5	P57	P3,579	R321	R55	0	266	R6,465
2001	P2,181	P140	P311	P290	P5	P59	P2,987	E241	E84	E2	E159	E5,683

<sup>1</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants.

<sup>2</sup> Through 1988, data are for consumption at electric utilities only. Beginning in 1989, data also include consumption at independent power producers.

<sup>3</sup> Through 1988, all electricity imports and exports are included in "Hydropower." Beginning in 1989, includes only electricity imports and exports derived from hydroelectric power or geothermal energy.

<sup>4</sup> Conventional hydroelectric power.

<sup>5</sup> Wood, black liquor, and other wood waste.

<sup>6</sup> Municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass.

<sup>7</sup> Geothermal electricity net generation.

<sup>8</sup> Solar thermal and photovoltaic electricity net generation.

<sup>9</sup> Wind electricity net generation.

R=Revised. P=Preliminary. E=Estimate. NA=Not available. (s)=Less than 0.5 trillion Btu.

Note: Totals may not equal sum of components due to independent rounding.

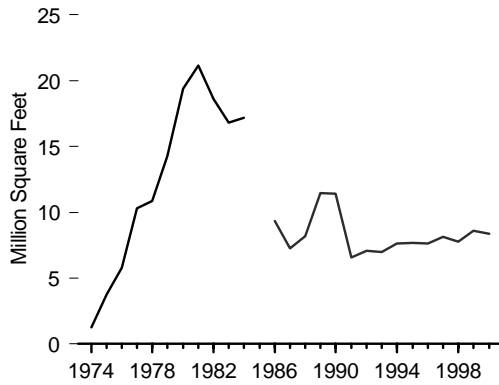
Web Page: <http://www.eia.doe.gov/fuelrenewable.html>.

Sources: See end of section.

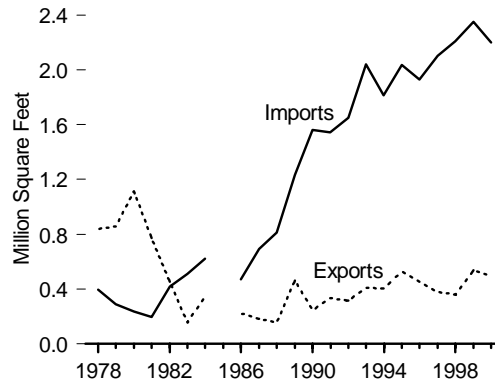


**Figure 10.3 Solar Thermal Collector Shipments by Type, Price, and Trade**

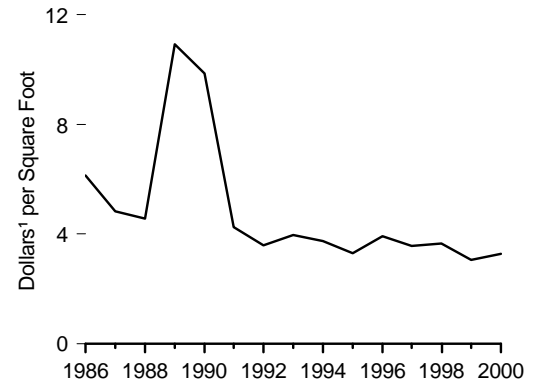
**Total Shipments, 1974-1984 and 1986-2000**



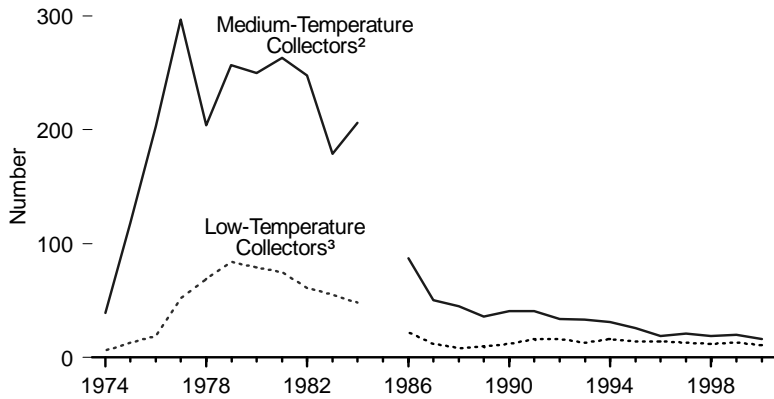
**Trade, 1978-1984 and 1986-2000**



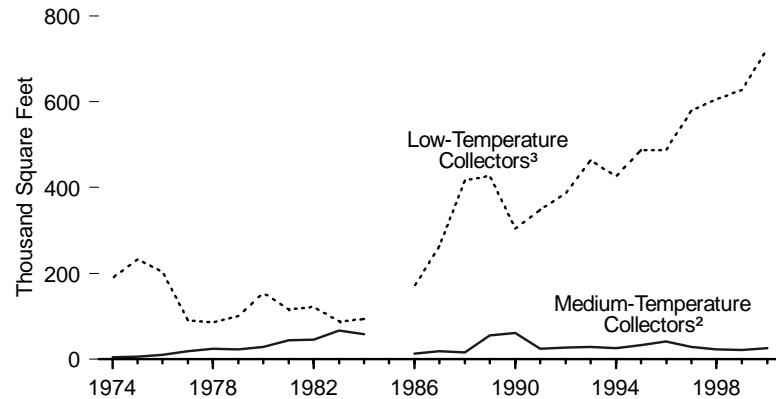
**Price of Total Shipments, 1986-2000**



**Number of U.S. Manufacturers, 1974-1984 and 1986-2000**



**Average Annual Shipments per Manufacturer, 1974-1984 and 1986-2000**



<sup>1</sup> Nominal dollars.

<sup>2</sup> Collectors that generally operate in the temperature range of 140 degrees Fahrenheit to 180 degrees Fahrenheit but can also operate at temperatures as low as 110 degrees Fahrenheit.

<sup>3</sup> Collectors that generally operate at temperatures below 110 degrees Fahrenheit.

Notes: Data were not collected for 1985. Medium-temperature collectors include special collectors. Because vertical scales differ, graphs should not be compared.

Source: Table 10.3.

**Table 10.3 Solar Thermal Collector Shipments by Type, Price, and Trade, 1974-2000**  
(Thousand Square Feet, Except as Noted)

Year	Low-Temperature Collectors <sup>1</sup>				Medium-Temperature Collectors <sup>2</sup>				High-Temperature Collectors <sup>3</sup>		Total Shipments <sup>4</sup>		Imports	Exports
	Number of U.S. Manufacturers	Quantity Shipped	Shipments per Manufacturer	Price <sup>5</sup> (dollars per square foot)	Number of U.S. Manufacturers	Quantity Shipped	Shipments per Manufacturer	Price <sup>5</sup> (dollars per square foot)	Quantity Shipped	Price <sup>5</sup> (dollars per square foot)	Quantity Shipped	Price <sup>5</sup> (dollars per square foot)		
1974	6	1,137	189.5	NA	39	137	3.5	NA	NA	NA	1,274	NA	NA	NA
1975	13	3,026	232.8	NA	118	717	6.1	NA	NA	NA	3,743	NA	NA	NA
1976	19	3,876	204.0	NA	203	1,925	9.5	NA	NA	NA	5,801	NA	NA	NA
1977	52	4,743	91.2	NA	297	5,569	18.8	NA	NA	NA	10,312	NA	NA	NA
1978	69	5,872	85.1	NA	204	4,988	24.5	NA	NA	NA	10,860	NA	396	840
1979	84	8,394	100.0	NA	257	5,856	22.8	NA	NA	NA	14,251	NA	290	855
1980	79	12,233	154.8	NA	250	7,165	28.7	NA	NA	NA	19,398	NA	235	1,115
1981	75	8,677	115.7	NA	263	11,456	43.6	NA	NA	NA	21,133	NA	196	771
1982	61	7,476	122.6	NA	248	11,145	44.9	NA	NA	NA	18,621	NA	418	455
1983	55	4,853	88.2	NA	179	11,975	66.9	NA	NA	NA	16,828	NA	511	159
1984	48	4,479	93.3	NA	206	11,939	58.0	NA	773	NA	17,191	NA	621	348
1985	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1986	22	3,751	170.5	2.30	87	1,111	12.8	18.30	4,498	NA	9,360	6.14	473	224
1987	12	3,157	263.1	2.18	50	957	19.1	13.50	3,155	NA	7,269	4.82	691	182
1988	8	3,326	415.8	2.24	45	732	16.2	14.88	4,116	NA	8,174	4.56	814	158
1989	10	4,283	428.3	2.60	36	1,989	55.3	11.74	5,209	17.76	11,482	10.92	1,233	461
1990	12	3,645	303.8	2.90	41	2,527	61.6	7.68	5,237	15.74	11,409	9.86	1,562	245
1991	16	5,585	349.0	2.90	41	989	24.1	11.94	1	31.94	6,574	4.26	1,543	332
1992	16	6,187	386.7	2.50	34	897	26.4	10.96	2	75.66	7,086	3.58	1,650	316
1993	13	6,025	463.5	2.80	33	931	28.2	11.74	12	22.12	6,968	3.96	2,039	411
1994	16	6,823	426.0	2.54	31	803	26.0	13.54	2	177.00	7,627	3.74	1,815	405
1995	14	6,813	487.0	2.32	26	840	32.0	10.48	13	53.26	7,666	3.30	2,037	530
1996	14	6,821	487.0	2.67	19	785	41.0	14.48	10	18.75	7,616	3.91	1,930	454
1997	13	7,524	579.0	2.60	21	606	29.0	15.17	7	25.00	8,138	3.56	2,102	379
1998	12	7,292	607.0	2.83	19	443	23.0	15.17	21	53.21	7,756	3.66	2,206	360
1999	13	8,152	627.0	2.08	20	427	21.0	19.12	4	286.49	8,583	3.05	2,352	537
2000	11	7,948	723.0	2.09	16	400	25.0	23.98	5	223.26	8,354	3.28	2,201	496

<sup>1</sup> Low-temperature collectors are solar thermal collectors that generally operate at temperatures below 110 degrees Fahrenheit.

<sup>2</sup> Medium-temperature collectors are solar thermal collectors that generally operate in the temperature range of 140 degrees Fahrenheit to 180 degrees Fahrenheit but can also operate at temperatures as low as 110 degrees Fahrenheit. Special collectors are included in this category. Special collectors are evacuated tube collectors or concentrating (focusing) collectors. They operate in the temperature range from just above ambient temperature (low concentration for pool heating) to several hundred degrees Fahrenheit (high concentration for air conditioning and specialized industrial processes).

<sup>3</sup> High-temperature collectors are solar thermal collectors that generally operate at temperatures above 180 degrees Fahrenheit.

<sup>4</sup> Total shipments as reported by respondents include all domestic and export shipments and may

include imports that subsequently were shipped to domestic or to foreign customers.

<sup>5</sup> Prices, in nominal dollars, equal shipment value divided by quantity shipped. Value includes charges for advertising and warranties. Excluded are excise taxes and the cost of freight or transportation for the shipments.

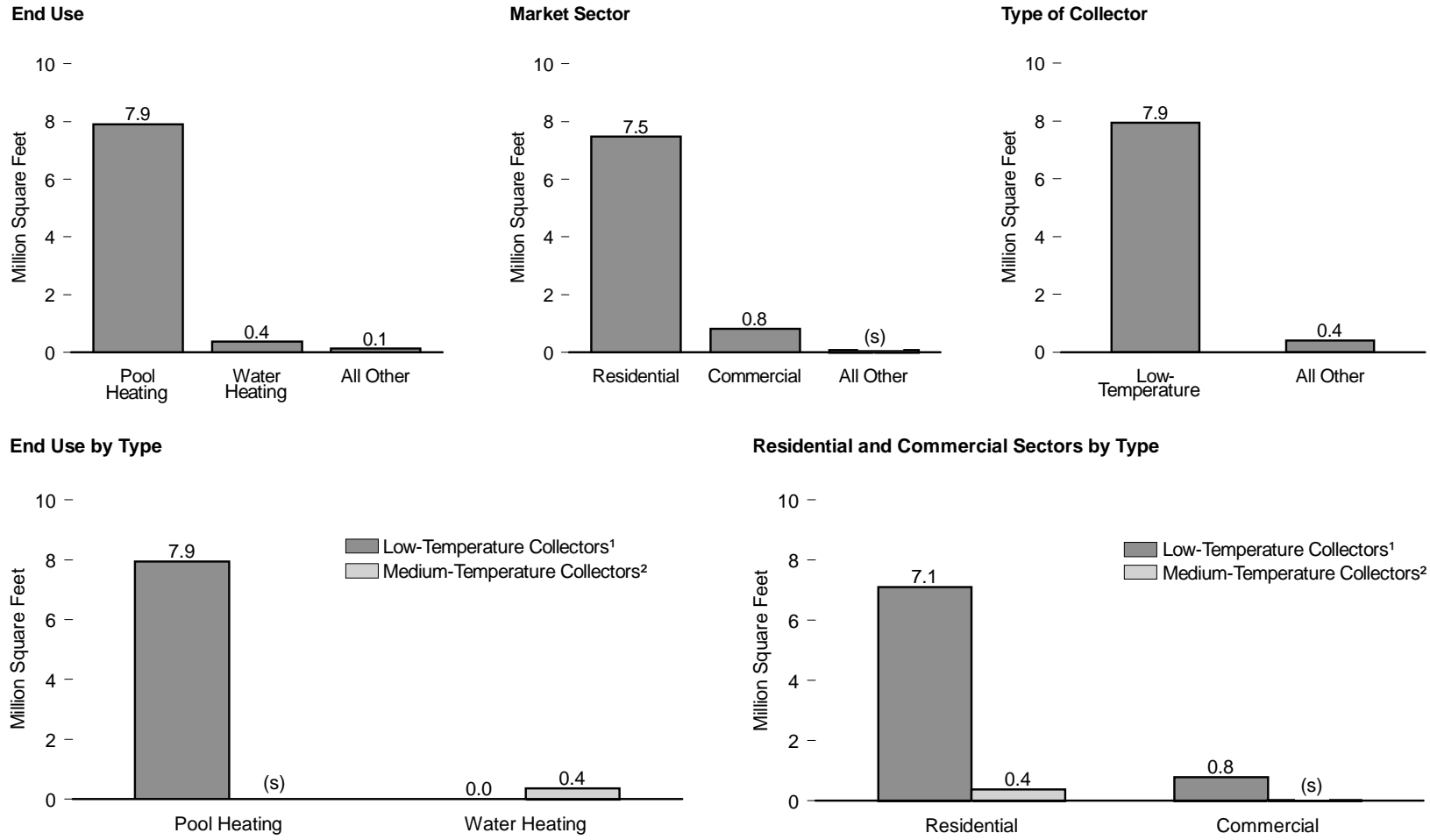
NA=Not available.

Notes: Manufacturers producing more than one type of collector are accounted for in both groups. No data are available for 1985. High-temperature collector shipments were dominated by one manufacturer.

Web Page: <http://www.eia.doe.gov/fuelrenewable.html>.

Sources: 1974-1992—Energy Information Administration (EIA), *Solar Collector Manufacturing Activity*, annual reports. 1993 forward—EIA, *Renewable Energy Annual*, annual reports.

**Figure 10.4 Solar Thermal Collector Shipments by End Use, Market Sector, and Type, 2000**



<sup>1</sup> Collectors that generally operate at temperatures below 110 degrees Fahrenheit.

<sup>2</sup> Collectors that generally operate in the temperature range of 140 degrees Fahrenheit to 180 degrees Fahrenheit but can also operate at temperatures as low as 110 degrees Fahrenheit.

(s)=Less than 0.05 million square feet.

Source: Table 10.4.

**Table 10.4 Solar Thermal Collector Shipments by End Use, Market Sector, and Type, 2000**  
(Thousand Square Feet)

End Use	Low-Temperature Collectors <sup>1</sup>	Medium-Temperature Collectors <sup>2</sup>	High-Temperature Collectors <sup>3</sup>	Total
<b>End-Use Total</b> .....	<b>7,949</b>	<b>400</b>	<b>5</b>	<b><sup>4</sup> 8,355</b>
Pool Heating .....	7,836	26	0	7,863
Water Heating .....	0	365	2	367
Space Heating .....	92	7	0	99
Space Cooling .....	0	0	0	0
Combined Space and Water Heating .....	0	2	(s)	2
Process Heating .....	20	0	0	20
Electricity Generation .....	0	0	3	<sup>4</sup> 3
Other <sup>5</sup> .....	(s)	(s)	0	(s)
<b>Market Sector Total</b> .....	<b>7,949</b>	<b>400</b>	<b>5</b>	<b><sup>4</sup> 8,355</b>
Residential .....	7,102	370	1	7,473
Commercial .....	786	23	1	810
Industrial <sup>6</sup> .....	52	5	0	57
Electric Utility .....	0	(s)	3	<sup>4</sup> 5
Other <sup>7</sup> .....	9	1	0	10

<sup>1</sup> Low-temperature collectors are solar thermal collectors that generally operate at temperatures below 110 degrees Fahrenheit.

<sup>2</sup> Medium-temperature collectors are solar thermal collectors that generally operate in the temperature range of 140 degrees Fahrenheit to 180 degrees Fahrenheit but can also operate at temperatures as low as 110 degrees Fahrenheit. Special collectors are included in this category. Special collectors are evacuated tube collectors or concentrating (focusing) collectors. They operate in the temperature range from just above ambient temperature (low concentration for pool heating) to several hundred degrees Fahrenheit (high concentration for air conditioning and specialized industrial processes).

<sup>3</sup> High-temperature collectors are solar thermal collectors that generally operate at temperatures above 180 degrees Fahrenheit. These are Parabolic dish/trough collectors used primarily by independent power producers to generate electricity for the electric grid.

<sup>4</sup> Totals include other types of collectors not shown.

<sup>5</sup> "Other" includes shipments of solar thermal collectors for other uses, such as cooking foods, water pumping, water purification, desalinization, distilling, etc.

<sup>6</sup> Includes all independent power producers.

<sup>7</sup> "Other" includes shipments of solar thermal collectors to other sectors, such as government, including the military but excluding space applications.

(s)=Less than 0.5 thousand square feet.

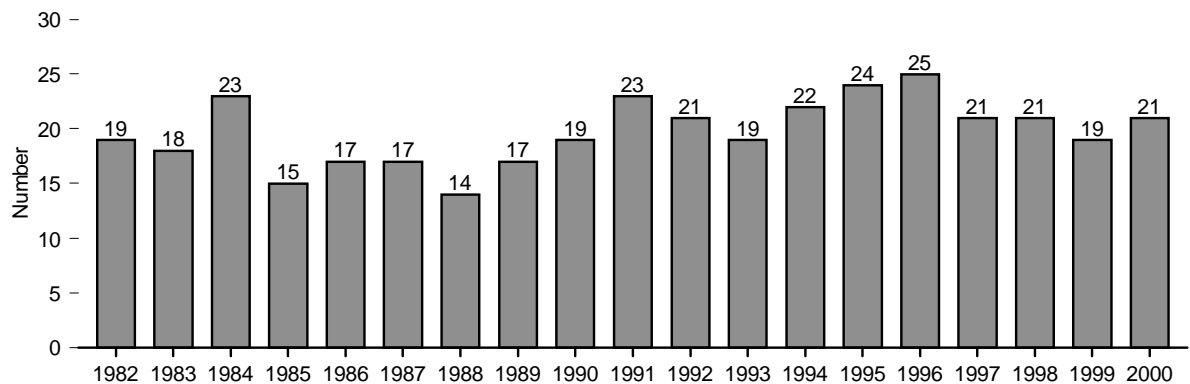
Notes: Data represent shipments from U.S. manufacturers only. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelrenewable.html>.

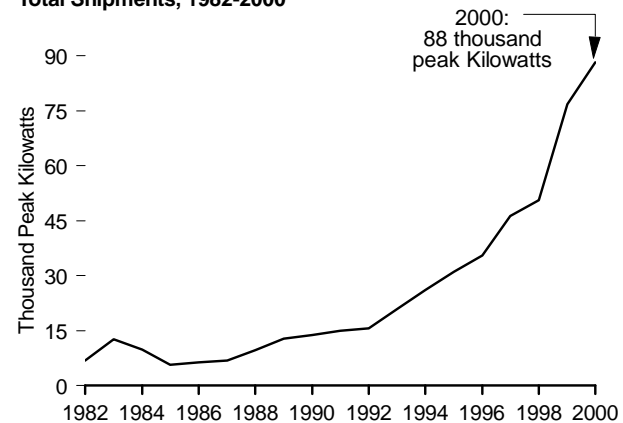
Source: Energy Information Administration, *Renewable Energy Annual 2001*.

**Figure 10.5 Photovoltaic Cell and Module Shipments, Trade, and Prices**

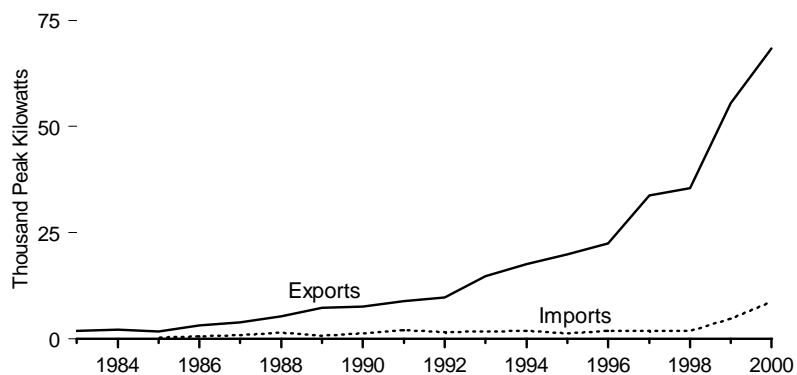
**Number of U.S. Companies Reporting Shipments, 1982-2000**



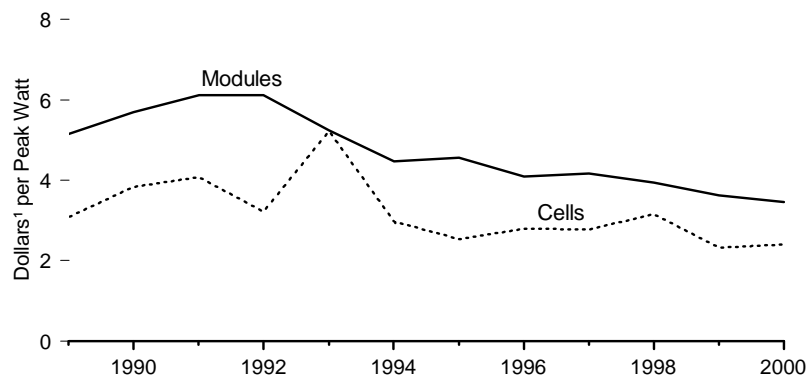
**Total Shipments, 1982-2000**



**Trade, 1983-2000**



**Prices, 1989-2000**



<sup>1</sup> Nominal dollars.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 10.5.

**Table 10.5 Photovoltaic Cell and Module Shipments by Type, Trade, and Prices, 1982-2000**

Year	Number of U.S. Companies Reporting Shipments	Shipments			Imports	Exports	Prices <sup>1</sup>	
		Crystalline Silicon	Thin-Film Silicon	Total <sup>2</sup>			Modules	Cells
		Peak Kilowatts					Dollars per Peak Watt	
1982	19	NA	NA	6,897	NA	NA	NA	NA
1983	18	NA	NA	12,620	NA	1,903	NA	NA
1984	23	NA	NA	9,912	NA	2,153	NA	NA
1985	15	5,461	303	5,769	285	1,670	NA	NA
1986	17	5,806	516	6,333	678	3,109	NA	NA
1987	17	5,613	1,230	6,850	921	3,821	NA	NA
1988	14	7,364	1,895	9,676	1,453	5,358	NA	NA
1989	17	10,747	1,628	12,825	826	7,363	5.14	3.08
1990	<sup>3</sup> 19	12,492	1,321	<sup>3</sup> 13,837	1,398	7,544	5.69	3.84
1991	23	14,205	723	14,939	2,059	8,905	6.12	4.08
1992	21	14,457	1,075	15,583	1,602	9,823	6.11	3.21
1993	19	20,146	782	20,951	1,767	14,814	5.24	5.23
1994	22	24,785	1,061	26,077	1,960	17,714	4.46	2.97
1995	24	29,740	1,266	31,059	1,337	19,871	4.56	2.53
1996	25	33,996	1,445	35,464	1,864	22,448	4.09	2.80
1997	21	44,314	1,886	46,354	1,853	33,793	4.16	2.78
1998	21	47,186	3,318	50,562	1,931	35,493	3.94	3.15
1999	19	73,461	3,269	76,787	4,784	55,562	3.62	2.32
2000	21	85,155	2,736	88,221	8,821	68,382	3.46	2.40

<sup>1</sup> Prices, in nominal dollars, equal shipment value divided by quantity shipped. Value includes charges for advertising and warranties. Excluded are excise taxes and the cost of freight or transportation for the shipments.

<sup>2</sup> Total shipments include all types of photovoltaic cells and modules (single-crystal silicon, cast silicon, ribbon silicon, thin-film silicon, and concentrator silicon) and internationally traded cells and modules. Shipments of cells and modules for space and satellite applications are not included.

<sup>3</sup> Data were imputed for one nonrespondent who exited the industry during 1990.

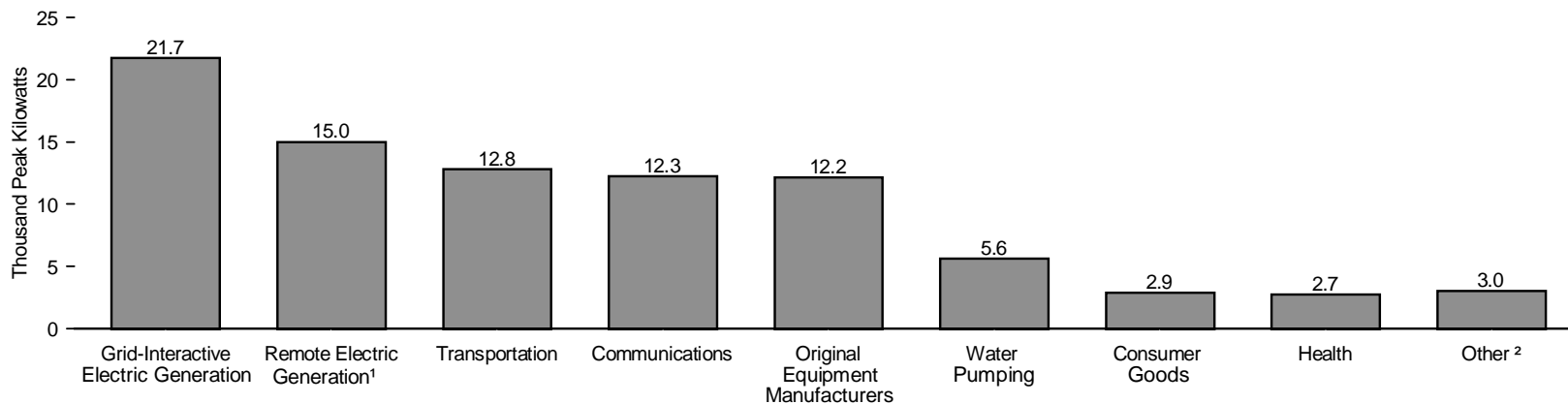
NA=Not available.

Web Page: <http://www.eia.doe.gov/fuelrenewable.html>.

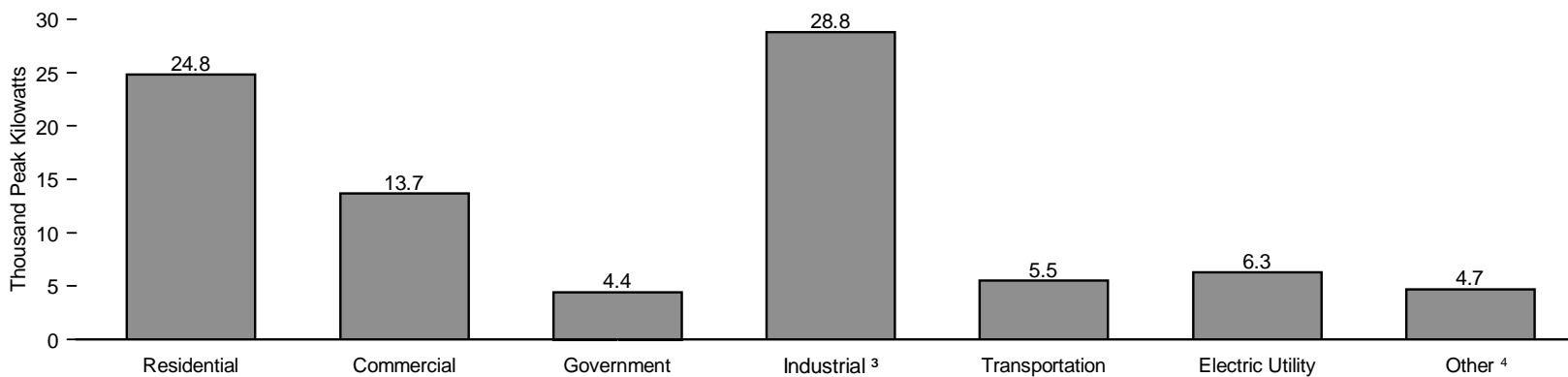
Sources: 1982-1992—Energy Information Administration (EIA), *Solar Collector Manufacturing Activity*, annual reports. 1993 forward—EIA, *Renewable Energy Annual*, annual reports.

**Figure 10.6 Photovoltaic Cell and Module Shipments by End Use and Market Sector, 2000**

**By End Use**



**By Market Sector**



<sup>1</sup> Units designed for installations that are not grid-interactive.

<sup>2</sup> Represents such applications as cooking food, desalinization, and distilling.

<sup>3</sup> Includes all independent power producers.

<sup>4</sup> Shipments to foreign governments and for specialty purposes.

Source: Table 10.6.

**Table 10.6 Photovoltaic Cell and Module Shipments by End Use and Market Sector, 1989-2000**

Year	End Use									Market Sector							Total
	Communica-tions	Consumer Goods	Electric Generation <sup>1</sup>		Health	Original Equip-ment Manu-facturers <sup>2</sup>	Trans- portation	Water Pumping	Other <sup>3</sup>	Resi- dential	Com- mercial	Gov- ernment	Indus- trial <sup>4</sup>	Trans- portation	Electric Utility	Other <sup>5</sup>	
			Grid- Inter-active	Remote													
Amount Shipped (peak kilowatts)																	
1989	2,590	2,788	1,251	2,620	5	1,595	1,196	711	69	1,439	3,850	1,077	3,993	1,130	785	551	12,825
1990	4,340	2,484	469	3,097	5	1,119	1,069	1,014	240	1,701	6,086	1,002	2,817	974	826	432	13,837
1991	3,538	3,312	856	3,594	61	1,315	1,523	729	13	3,624	3,345	815	3,947	1,555	1,275	377	14,939
1992	3,717	2,566	1,227	4,238	67	828	1,602	809	530	4,154	2,386	1,063	4,279	1,673	1,553	477	15,583
1993	3,846	946	1,096	5,761	674	2,023	4,238	2,294	74	5,237	4,115	1,325	5,352	2,564	1,503	856	20,951
1994	5,570	3,239	2,296	9,253	79	1,849	2,128	1,410	254	6,632	5,429	2,114	6,855	2,174	2,364	510	26,077
1995	5,154	1,025	4,585	8,233	776	3,188	4,203	2,727	1,170	6,272	8,100	2,000	7,198	2,383	3,759	1,347	31,059
1996	6,041	1,063	4,844	10,884	977	2,410	5,196	3,261	789	8,475	5,176	3,126	8,300	3,995	4,753	1,639	35,464
1997	7,383	347	8,273	8,630	1,303	5,245	6,705	3,783	4,684	10,993	8,111	3,909	11,748	3,574	5,651	2,367	46,354
1998	8,280	1,198	14,193	8,634	1,061	5,044	6,356	4,306	1,491	15,936	8,460	2,808	13,232	3,440	3,965	2,720	50,562
1999	12,147	2,292	24,782	10,829	1,466	12,400	8,486	4,063	322	19,817	17,283	3,107	24,972	4,341	5,876	1,392	76,787
2000	12,269	2,870	21,713	14,997	2,742	12,153	12,804	5,644	3,028	24,814	13,692	4,417	28,808	5,502	6,298	4,690	88,221
Percent of Total																	
1989	20.2	21.7	9.8	20.4	(s)	12.4	9.3	5.5	0.5	11.2	30.0	8.4	31.1	8.8	6.1	4.3	100.0
1990	31.4	18.0	3.4	22.4	(s)	8.1	7.7	7.3	1.7	12.3	44.0	7.2	20.4	7.0	6.0	3.1	100.0
1991	23.7	22.2	5.7	24.1	0.4	8.8	10.2	4.9	0.1	24.3	22.4	5.5	26.4	10.4	8.5	2.5	100.0
1992	23.9	16.5	7.9	27.2	0.4	5.3	10.3	5.2	3.4	26.7	15.3	6.8	27.5	10.7	10.0	3.1	100.0
1993	18.4	4.5	5.2	27.5	3.2	9.7	20.2	10.9	0.4	25.0	19.6	6.3	25.5	12.2	7.2	4.1	100.0
1994	21.4	12.4	8.8	35.5	0.3	7.1	8.2	5.4	1.0	25.4	20.8	8.1	26.3	8.3	9.1	2.0	100.0
1995	16.6	3.3	14.8	26.5	2.5	10.3	13.5	8.8	3.8	20.2	26.1	6.4	23.2	7.7	12.1	4.3	100.0
1996	17.0	3.0	13.7	30.7	2.8	6.8	14.7	9.2	2.2	23.9	14.6	8.8	23.4	11.3	13.4	4.6	100.0
1997	15.9	0.7	17.8	18.6	2.8	11.3	14.5	8.2	10.1	23.7	17.5	8.4	25.3	7.7	12.2	5.1	100.0
1998	16.4	2.4	28.1	17.1	2.1	10.0	12.6	8.5	2.9	31.5	16.7	5.6	26.2	6.8	7.8	5.4	100.0
1999	15.8	3.0	32.3	14.1	1.9	16.1	11.1	5.3	0.4	25.8	22.5	4.0	32.5	5.7	7.7	1.8	100.0
2000	13.9	3.3	24.6	17.0	3.1	13.8	14.5	6.4	3.4	28.1	15.5	5.0	32.7	6.2	7.1	5.3	100.0

<sup>1</sup> Grid-interactive means connection to the electrical distribution system; remote means electricity, for general use, that does not interact with the electrical distribution system, such as at an isolated residential site or mobile home. The other end uses in this table also include electricity generation but only for the specific use cited.

<sup>2</sup> Original Equipment Manufacturers are non-photovoltaic manufacturers that combine photovoltaic technology into existing or newly developed product lines.

<sup>3</sup> Represents such applications as cooking food, desalinization, and distilling.

<sup>4</sup> Includes all independent power producers.

<sup>5</sup> Shipments to foreign governments and for specialty purposes.

(s)=Less than 0.05 percent.

Note: Totals may not equal sum of components due to independent rounding.

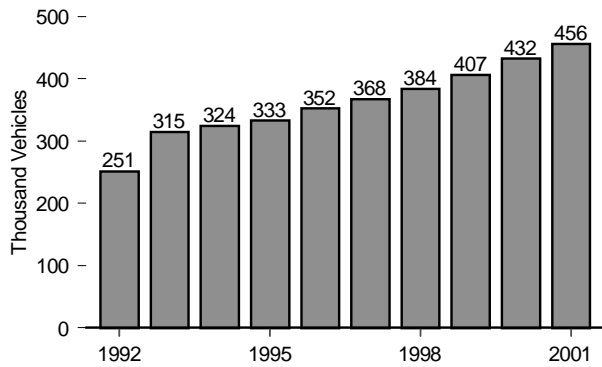
Web Page: <http://www.eia.doe.gov/fuelrenewable.html>.

Sources: 1989-1992—Energy Information Administration (EIA), *Solar Collector Manufacturing Activity*, annual reports. 1993 forward—EIA, *Renewable Energy Annual*, annual reports.

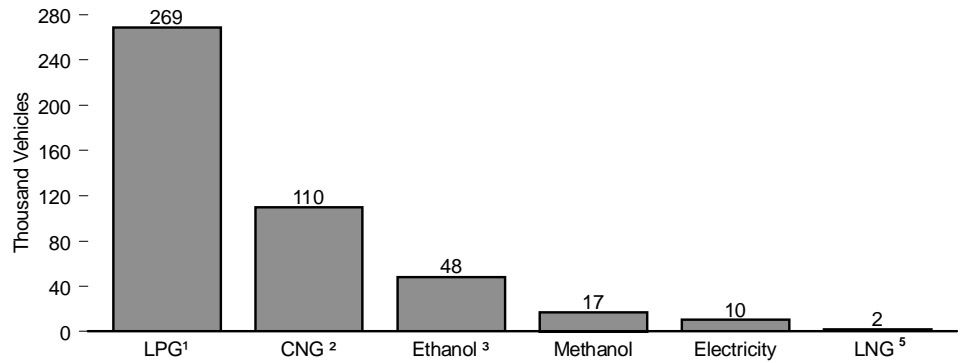


**Figure 10.7 Estimated Alternative-Fueled Vehicles and Fuel Consumption by Type**

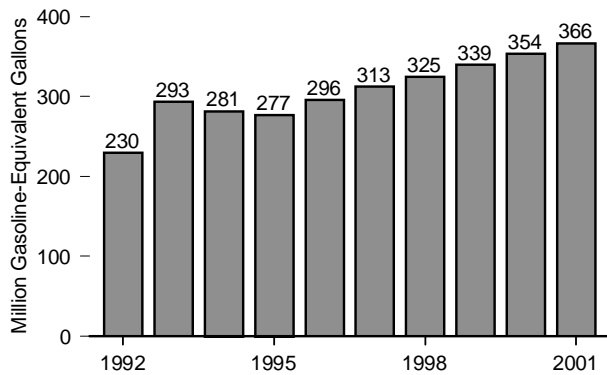
**Vehicles in Use, 1992-2001**



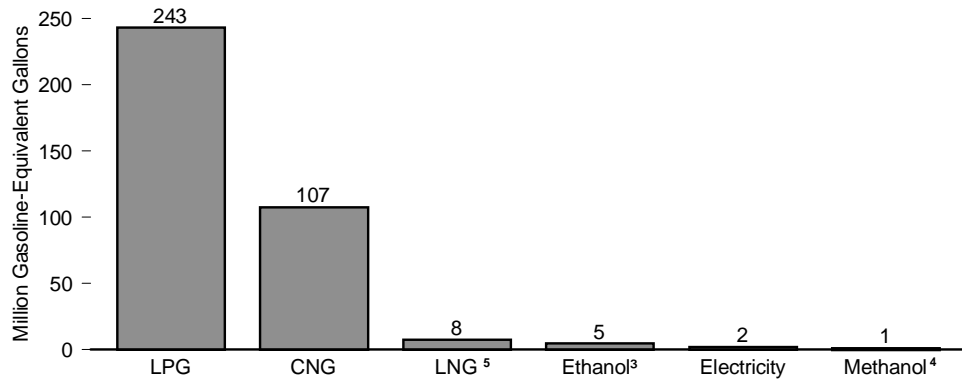
**Vehicles in Use by Fuel Type, 2001**



**Fuel Consumption, 1992-2001**



**Fuel Consumption by Type, 2001**



<sup>1</sup> Liquefied petroleum gases.

<sup>2</sup> Compressed natural gas.

<sup>3</sup> Ethanol, 85 percent and ethanol, 95 percent.

<sup>4</sup> Methanol, 85 percent, and methanol, neat.

<sup>5</sup> Liquefied natural gas.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 10.7.

**Table 10.7 Estimated Alternative-Fueled Vehicles and Fuel Consumption by Type, 1992-2001**

Year	Liquefied Petroleum Gases <sup>1</sup>	Compressed Natural Gas	Liquefied Natural Gas	Methanol, 85 Percent <sup>2</sup>	Methanol, Neat	Ethanol, 85 Percent <sup>2</sup>	Ethanol, 95 Percent <sup>2</sup>	Electricity	Total
Number of Vehicles in Use									
1992	221,000	23,191	90	4,850	404	172	38	1,607	251,352
1993	269,000	32,714	299	10,263	414	441	27	1,690	314,848
1994	264,000	41,227	484	15,484	415	605	33	2,224	324,472
1995	259,000	50,218	603	18,319	386	1,527	136	2,860	333,049
1996	263,000	60,144	663	20,265	172	4,536	361	3,280	352,421
1997	263,000	68,571	813	21,040	172	9,130	347	4,453	367,526
1998	266,000	78,782	1,172	19,648	200	12,788	14	5,243	383,847
1999	267,000	89,556	1,681	18,964	198	22,464	14	6,964	406,841
2000	268,000	100,530	1,900	18,365	195	34,680	13	8,661	432,344
2001 <sup>P</sup>	269,000	109,730	2,039	16,918	184	48,022	13	10,400	456,306
Fuel Consumption (Thousand Gasoline-Equivalent Gallons)									
1992	208,142	16,823	585	1,069	2,547	21	85	359	229,631
1993	264,655	21,603	1,901	1,593	3,166	48	80	288	293,334
1994	248,467	24,160	2,345	2,340	3,190	80	140	430	281,152
1995	232,701	35,162	2,759	2,023	2,150	190	995	663	276,643
1996	239,158	46,923	3,247	1,775	347	694	2,699	773	295,616
1997	238,356	65,192	3,714	1,554	347	1,280	1,136	1,010	312,589
1998	241,583	73,251	5,343	1,212	449	1,727	59	1,202	324,826
1999	242,141	86,286	5,828	1,073	447	2,075	59	1,431	339,340
2000	242,695	97,568	6,847	996	437	3,344	54	1,819	353,760
2001 <sup>P</sup>	243,196	107,476	7,566	918	406	4,575	51	2,143	366,331

<sup>1</sup> Vehicles in use represent lower bound estimates, rounded to the nearest thousand.

<sup>2</sup> Remaining portion is motor gasoline.

P=Preliminary.

Note: Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/fuelalternate.html>.

Sources: 1992-1995—Science Applications International Corporation, "Alternative Transportation Fuels and Vehicles Data Development," unpublished final report prepared for the Energy Information Administration (EIA) (McLean, VA, July 1996) and U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. 1996-2001—EIA, Office of Coal, Nuclear, Electric, and Alternate Fuels.

## Renewable Energy

### Table 10.2a Sources

**Wood, Residential:** • 1949-1979—Energy Information Administration (EIA), *Estimates of U.S. Wood Energy Consumption from 1949 to 1981*, Table A2. • 1980-1983—EIA, *Estimates of U.S. Wood Energy Consumption 1980-1983*, Table ES1. • 1984—EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 1. • 1985 and 1986—Values interpolated. • 1987—EIA, *Estimates of Biofuels Consumption in the United States During 1987*, Table 2. • 1988—Value interpolated. • 1989-2001—EIA, Office of Coal, Nuclear, Electric and Alternate Fuels (CNEAF) estimates based upon data from Form EIA-457A/G, “Residential Energy Consumption Survey.” **Wood, Commercial:** • 1949-1979—EIA, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981*, Table A2. • 1980-1983—EIA, *Estimates of U.S. Wood Energy Consumption 1980-1983*, Table ES1. • 1984—EIA, CNEAF estimate. • 1985-1988—Values interpolated. • 1989-2001 CNEAF estimates combined with data from Table 8.3e. **Wood, Industrial:** • 1949-1979—EIA, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981*, Table A2. • 1980-1983—EIA, *Estimates of U.S. Wood Energy Consumption 1980-1983*, Table ES1. • 1984—EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 1. • 1985 and 1986—Values interpolated. • 1987—EIA, *Estimates of Biofuels Consumption in the United States During 1987*, Table 2. • 1988—Value interpolated. • 1989-2001—EIA, CNEAF estimates based upon Form EIA-846 (A,B,C) “Manufacturing Energy Consumption Survey” and data from Table 8.3e. **Waste, Commercial:** • 1989-2001—Table 8.3e. **Waste, Industrial:** • 1981-1988—EIA, CNEAF estimates. • 1989-2001—EIA, CNEAF estimates based upon data from Government Advisory Associates, *Resource Recovery Yearbook* and *Methane Recovery Yearbook*, and data from Table 8.3e. **Hydropower, Commercial:** 1989-2001—Tables 8.2c and A6. **Hydropower, Industrial:** • 1949-1978—Federal Power Commission (FPC), Form FPC-4, “Monthly

Power Plant Report,” for plants with generating capacity exceeding 10 megawatts, and FPC, Form FPC-12C, “Industrial Electric Generating Capacity,” for all other plants, and Table A6. • 1979—FPC, Form FPC-4, “Monthly Power Plant Report,” for plants with generating capacity exceeding 10 megawatts, and EIA estimates for all other plants; and Table A6. • 1980-1988—Estimated by EIA as the average generation over the 6-year period of 1974-1979; and Table A6. • 1989-2001—Tables 8.2c and A6. **Alcohol Fuels:** • 1981—EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 10. • 1982 and 1983—EIA, CNEAF estimates. • 1984—EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 10. • 1985 and 1986—Values interpolated. • 1987—EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 10. • 1988—Value interpolated. • 1989—EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 10. • 1990 and 1992—EIA, *Estimates of U.S. Biomass Energy Consumption 1992*, Table D1. • 1991—Value interpolated. • 1993-2000 EIA, *Petroleum Supply Monthly*, Tables 2 and 28, and Table A1. 2001—EIA, CNEAF estimates based upon EIA, Form-EIA-819M, “Monthly Oxygenate Telephone Report,” and Form EIA-814, “Monthly Imports Report.” **Geothermal:** • 1989-1999—John Lund, Oregon Institute of Technology Geoheat Center, unpublished data. **Solar:** • 1989-1991—EIA, CNEAF estimates. • 1992 and 1993—EIA, *Renewable Energy Annual 1997*, Table 2. • 1994-1998—EIA, *Renewable Energy Annual 1999*, Table 2. • 1999—EIA, *Renewable Energy Annual 2000*, Table 2. • 2000-2001—EIA, CNEAF estimates based upon Form EIA-63-A, “Annual Solar Thermal Collector Manufacturers Survey,” and Form EIA-63B, “Annual Photovoltaic Module/Cell Manufacturers Survey.”

### Table 10.2b Sources

Electric Power Sector: Tables 8.2b, 8.2c, and Table A6. **Electricity Trade:** • 1949-1988—Tables 8.1 and A6. • 1989-2001—Trade data from National Energy Board of Canada, the California Energy Commission, analysis by EIA, CNEAF, and Table A6.

# 11

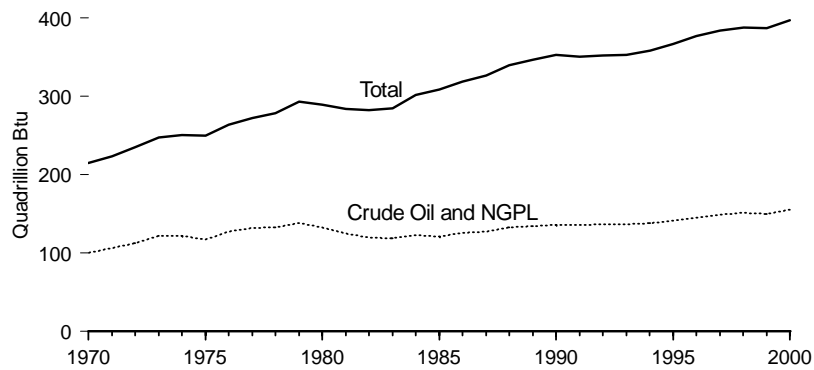
## International Energy



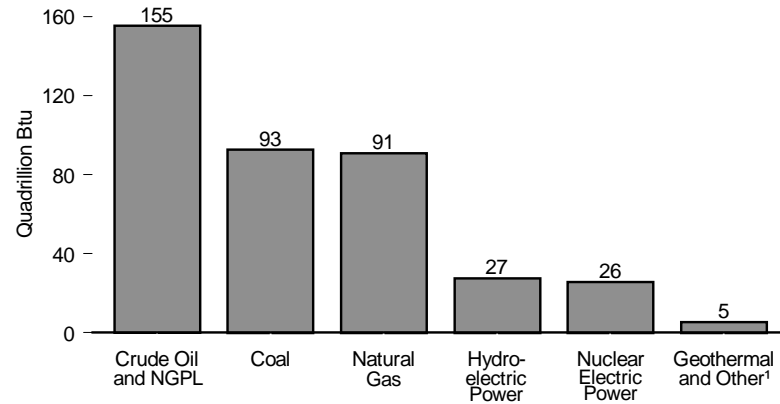
Drilling rig, Gansu Province, People's Republic of China. Source: U.S. Department of Energy.

**Figure 11.1 World Primary Energy Production by Source**

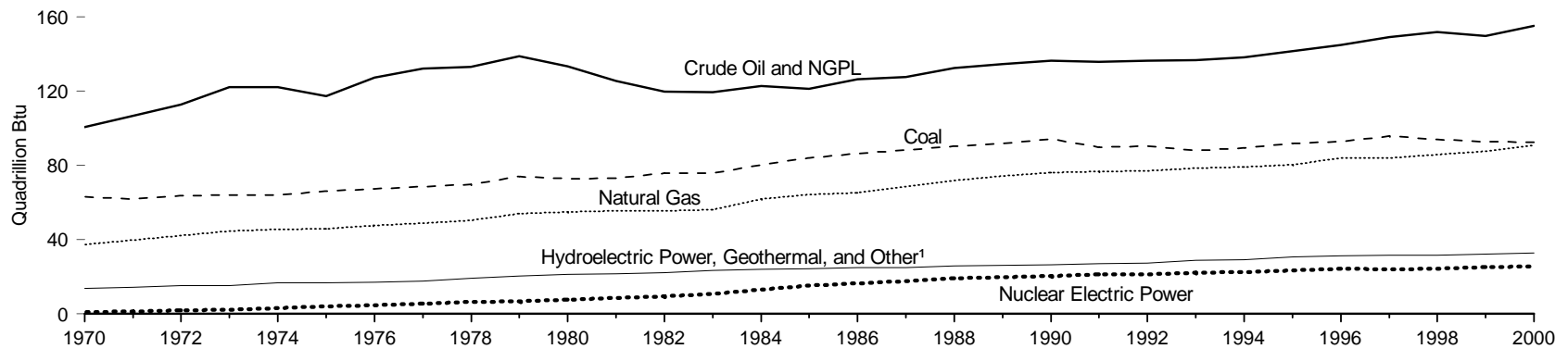
**Total and Crude Oil and NGPL, 1970-2000**



**By Source, 2000**



**By Source, 1970-2000**



<sup>1</sup>Net electricity generation from wood, waste, solar, and wind. Data for the United States also include other renewable energy.

Notes: Crude oil includes lease condensate. NGPL is natural gas plant liquids.

Because vertical scales differ, graphs should not be compared.

Source: Table 11.1.

**Table 11.1 World Primary Energy Production by Source, 1970-2000**  
(Quadrillion Btu)

Year	Coal	Natural Gas <sup>1</sup>	Crude Oil <sup>2</sup>	Natural Gas Plant Liquids	Nuclear Electric Power <sup>3</sup>	Hydroelectric Power <sup>3</sup>	Geothermal <sup>3</sup> and Other <sup>4</sup>	Total
1970	62.96	37.09	97.09	3.61	0.90	12.15	1.59	215.39
1971	61.72	39.80	102.70	3.85	1.23	12.74	1.61	223.64
1972	63.65	42.08	108.52	4.09	1.66	13.31	1.68	234.99
1973	63.87	44.44	117.88	4.23	2.15	13.52	1.73	247.83
1974	63.79	45.35	117.82	4.22	2.86	14.84	1.76	250.64
1975	66.20	45.67	113.08	4.12	3.85	15.03	1.74	249.69
1976	67.32	47.62	122.92	4.24	4.52	15.08	1.97	263.67
1977	68.46	48.85	127.75	4.40	5.41	15.56	2.11	272.54
1978	69.56	50.26	128.51	4.55	6.42	16.80	2.32	278.41
1979	73.83	53.93	133.87	4.87	6.69	17.69	2.48	293.36
1980	72.72	54.73	128.12	5.10	7.58	18.06	2.95	289.26
1981	73.04	55.56	120.16	5.36	8.53	18.35	3.09	284.09
1982	75.64	55.49	114.51	5.34	9.51	18.83	3.24	282.56
1983	75.70	56.12	113.97	5.34	10.72	19.73	3.51	285.10
1984	<sup>R</sup> 80.21	61.78	116.86	5.71	<sup>R</sup> 13.00	20.35	3.64	<sup>R</sup> 301.54
1985	<sup>R</sup> 84.09	64.22	115.40	5.82	<sup>R</sup> 15.30	20.57	3.67	<sup>R</sup> 309.06
1986	<sup>R</sup> 86.33	65.32	120.24	6.12	<sup>R</sup> 16.25	21.03	3.73	<sup>R</sup> 319.03
1987	<sup>R</sup> 88.34	68.48	121.16	6.32	<sup>R</sup> 17.64	21.10	3.79	<sup>R</sup> 326.84
1988	<sup>R</sup> 90.26	71.80	125.93	6.63	<sup>R</sup> 19.23	21.90	3.94	<sup>R</sup> 339.70
1989	<sup>R</sup> 91.78	74.24	127.98	6.67	<sup>R</sup> 19.74	<sup>R</sup> 21.73	<sup>R</sup> 4.27	<sup>R</sup> 346.42
1990	<sup>R</sup> 94.29	75.91	129.50	6.85	<sup>R</sup> 20.31	<sup>R</sup> 22.55	<sup>R</sup> 3.94	<sup>R</sup> 353.34
1991	<sup>R</sup> 89.70	76.68	128.77	7.13	<sup>R</sup> 21.13	<sup>R</sup> 22.97	<sup>R</sup> 4.03	<sup>R</sup> 350.41
1992	<sup>R</sup> 90.20	<sup>R</sup> 76.90	129.13	7.38	<sup>R</sup> 21.23	22.94	<sup>R</sup> 4.34	<sup>R</sup> 352.11
1993	<sup>R</sup> 87.74	<sup>R</sup> 78.41	128.86	<sup>R</sup> 7.68	<sup>R</sup> 21.96	24.30	<sup>R</sup> 4.38	<sup>R</sup> 353.31
1994	<sup>R</sup> 89.39	<sup>R</sup> 79.17	130.46	<sup>R</sup> 7.85	<sup>R</sup> 22.36	<sup>R</sup> 24.47	<sup>R</sup> 4.59	<sup>R</sup> 358.28
1995	<sup>R</sup> 91.84	<sup>R</sup> 80.26	133.32	<sup>R</sup> 8.16	<sup>R</sup> 23.21	<sup>R</sup> 25.70	<sup>R</sup> 4.78	<sup>R</sup> 367.28
1996	<sup>R</sup> 92.60	<sup>R</sup> 84.01	136.64	<sup>R</sup> 8.31	<sup>R</sup> 24.05	26.10	<sup>R</sup> 4.94	<sup>R</sup> 376.65
1997	<sup>R</sup> 95.78	<sup>R</sup> 83.95	140.52	<sup>R</sup> 8.51	<sup>R</sup> 23.82	<sup>R</sup> 26.67	<sup>R</sup> 4.98	<sup>R</sup> 384.23
1998	<sup>R</sup> 93.97	<sup>R</sup> 85.65	143.15	<sup>R</sup> 8.75	<sup>R</sup> 24.34	<sup>R</sup> 26.61	<sup>R</sup> 4.94	<sup>R</sup> 387.40
1999	<sup>R</sup> 92.66	<sup>R</sup> 87.57	<sup>R</sup> 140.79	<sup>R</sup> 8.89	<sup>R</sup> 25.08	<sup>R</sup> 27.05	<sup>R</sup> 5.13	<sup>R</sup> 387.18
2000 <sup>P</sup>	92.51	90.83	145.97	9.28	25.51	27.46	5.36	396.93

<sup>1</sup> Dry production.

<sup>2</sup> Includes lease condensate.

<sup>3</sup> Net generation, i.e., gross generation less plant use.

<sup>4</sup> Includes net electricity generation from wood, waste, solar, and wind. Data for the United States also include other renewable energy.

R=Revised. P=Preliminary.

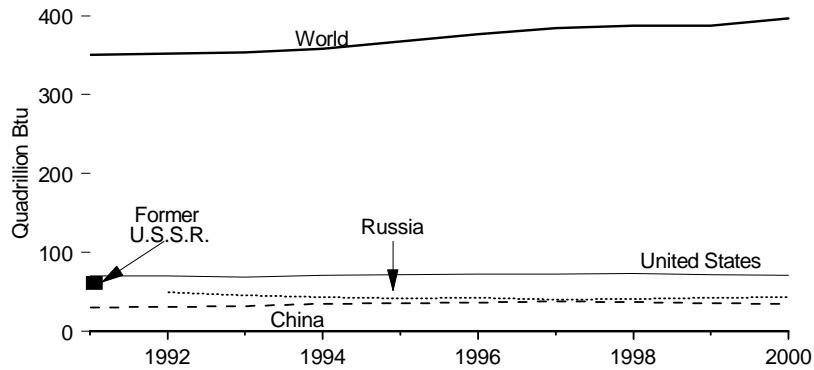
Notes: See Note 1 at end of section. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/international>.

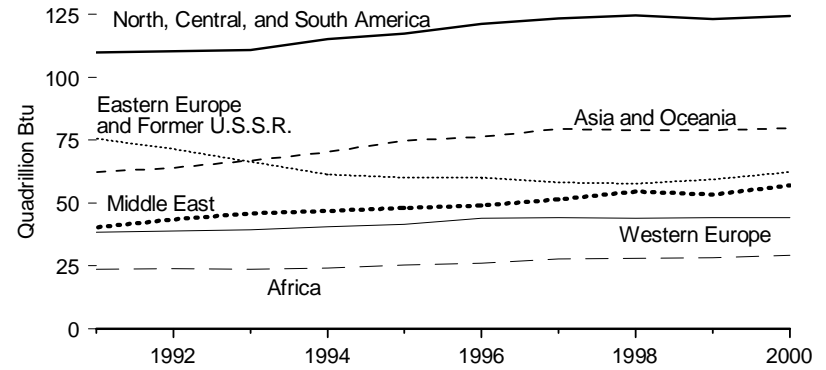
Sources: 1970-1990—Energy Information Administration (EIA), International Energy Database. 1991 forward—EIA, *International Energy Annual 2000* (May 2002), Tables F1-F8, and the International Energy Database.

**Figure 11.2 World Primary Energy Production by Region and Country**

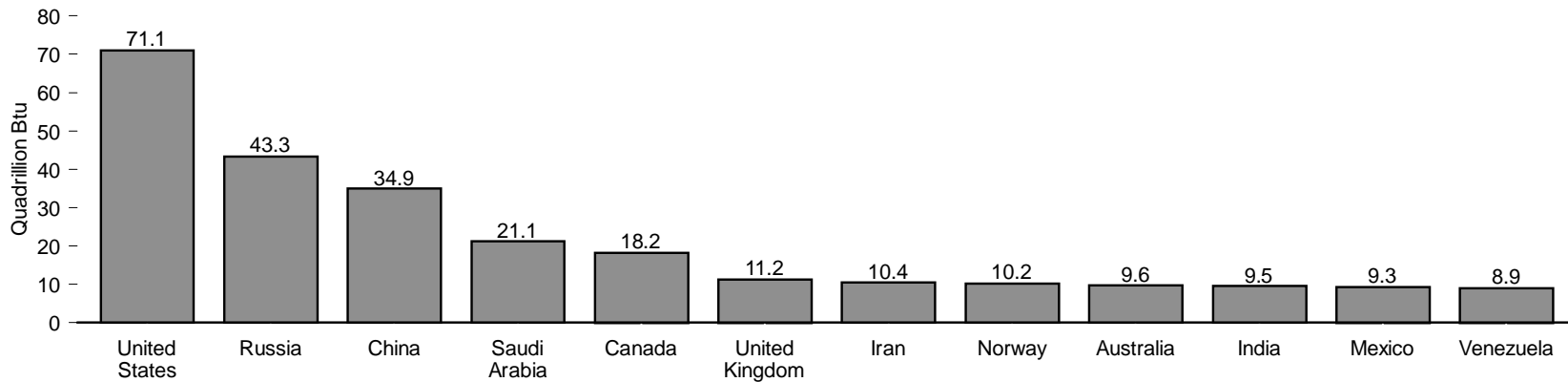
**World and Leading Producers, 1991-2000**



**World Areas, 1991-2000**



**Top Producing Countries, 2000**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.2.

**Table 11.2 World Primary Energy Production by Region, 1991-2000**  
(Quadrillion Btu)

Region and Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 <sup>P</sup>
<b>North, Central, and South America</b> .....	<b>R109.92</b>	<b>R110.40</b>	<b>R110.70</b>	<b>R115.08</b>	<b>R117.34</b>	<b>R121.06</b>	<b>R123.27</b>	<b>R124.56</b>	<b>R122.97</b>	<b>124.40</b>
Brazil .....	3.94	4.01	4.15	4.31	4.51	4.87	5.14	5.56	R5.98	6.52
Canada .....	13.94	14.48	15.40	16.36	16.85	R17.24	R17.54	R17.50	R17.73	18.20
Mexico .....	8.01	8.01	8.11	8.10	8.04	8.74	9.07	9.31	R9.06	9.34
United States .....	R70.33	R69.93	R68.26	R70.68	R71.17	R72.49	R72.39	R72.79	R71.64	71.06
Venezuela .....	6.96	6.96	7.27	7.70	8.08	R8.62	R9.49	9.41	R8.50	8.93
Other .....	6.73	7.01	R7.51	R7.92	R8.69	R9.09	R9.65	R9.99	R10.07	10.36
<b>Western Europe</b> .....	<b>38.49</b>	<b>R38.91</b>	<b>39.52</b>	<b>R40.54</b>	<b>41.66</b>	<b>44.04</b>	<b>44.10</b>	<b>R43.88</b>	<b>R44.17</b>	<b>44.14</b>
France .....	4.47	4.63	4.84	4.87	4.97	5.04	4.91	4.80	R4.96	5.07
Germany .....	6.35	6.17	5.84	5.71	5.58	5.49	5.56	5.26	R5.32	5.22
Netherlands .....	2.95	2.93	2.98	2.91	2.91	3.25	2.89	2.78	R2.58	2.49
Norway .....	6.23	7.09	7.28	7.65	8.36	9.29	9.61	9.37	9.55	10.20
United Kingdom .....	9.26	9.07	9.40	10.19	10.76	11.58	11.35	R11.58	R11.95	11.22
Other .....	9.24	9.02	9.17	9.22	9.07	9.39	9.77	R10.09	R9.80	9.95
<b>Eastern Europe and Former U.S.S.R.</b> .....	<b>75.48</b>	<b>R71.40</b>	<b>R66.52</b>	<b>R61.40</b>	<b>R60.03</b>	<b>R60.07</b>	<b>R58.24</b>	<b>R57.65</b>	<b>R59.49</b>	<b>62.26</b>
Kazakhstan .....	—	3.77	3.39	2.57	2.28	2.36	2.44	R2.38	2.33	2.94
Poland .....	3.74	3.68	3.70	3.75	3.60	3.25	3.86	R3.35	R3.20	3.05
Former U.S.S.R. ....	66.43	—	—	—	—	—	—	—	—	—
Russia .....	—	R48.98	R45.53	R42.87	R41.87	R42.01	R40.13	R40.41	R42.06	43.29
Ukraine .....	—	4.38	4.00	3.50	R3.63	R3.45	3.40	R3.41	R3.48	3.49
Other .....	5.31	R10.59	R9.90	R8.71	R8.66	R8.99	R8.41	R8.10	R8.42	9.48
<b>Middle East</b> .....	<b>40.31</b>	<b>43.57</b>	<b>45.76</b>	<b>46.94</b>	<b>47.97</b>	<b>49.03</b>	<b>51.33</b>	<b>R54.50</b>	<b>R53.30</b>	<b>57.13</b>
Iran .....	8.27	8.53	8.83	9.16	9.35	9.65	9.84	R9.90	R10.00	10.44
Iraq .....	0.69	1.02	1.21	1.33	1.35	1.39	2.60	4.71	R5.47	5.62
Kuwait .....	0.43	2.44	4.28	4.73	4.81	4.94	4.85	5.02	R4.60	5.14
Saudi Arabia .....	19.75	20.39	20.11	20.00	20.25	20.39	20.82	21.00	19.64	21.12
United Arab Emirates .....	6.24	6.11	5.78	5.84	6.14	6.34	6.50	6.61	6.25	6.82
Other .....	4.94	5.08	5.54	5.88	6.06	6.32	6.72	7.27	R7.33	8.00
<b>Africa</b> .....	<b>R23.84</b>	<b>R23.87</b>	<b>R23.85</b>	<b>R24.13</b>	<b>R25.41</b>	<b>R26.15</b>	<b>R27.89</b>	<b>R27.96</b>	<b>R28.25</b>	<b>29.31</b>
Algeria .....	5.04	5.06	4.87	4.79	5.13	5.28	5.63	5.75	R6.03	6.21
Libya .....	3.43	3.34	3.17	3.21	3.23	3.28	3.39	3.26	R3.07	3.30
Nigeria .....	4.30	4.43	4.45	4.37	4.53	4.57	4.85	R4.90	R4.89	5.14
South Africa .....	R5.35	R5.17	R5.44	R5.76	R6.09	R6.28	R7.15	R7.12	R7.08	7.21
Other .....	5.72	5.88	5.91	6.01	6.44	R6.75	6.88	6.93	R7.18	7.46
<b>Asia and Oceania</b> .....	<b>R62.36</b>	<b>R63.96</b>	<b>R66.96</b>	<b>R70.20</b>	<b>R74.86</b>	<b>R76.29</b>	<b>R79.38</b>	<b>R78.85</b>	<b>R79.01</b>	<b>79.69</b>
Australia .....	6.29	6.59	6.63	6.93	7.45	7.59	8.35	R8.69	R8.91	9.64
China .....	29.68	30.33	31.85	R34.08	R35.47	R36.02	R37.63	R36.38	R35.54	34.90
India .....	6.86	7.17	7.37	7.63	9.01	8.83	9.05	9.03	R9.18	9.48
Indonesia .....	5.85	5.99	6.29	6.63	6.98	7.43	7.44	7.51	R7.80	7.64
Japan .....	3.61	3.54	3.90	3.81	4.19	4.29	4.55	R4.60	R4.39	4.32
Other .....	R10.07	R10.34	R10.92	R11.12	R11.75	R12.13	R12.36	R12.64	R13.19	13.69
<b>World</b> .....	<b>R350.41</b>	<b>R352.11</b>	<b>R353.31</b>	<b>R358.29</b>	<b>R367.27</b>	<b>R376.65</b>	<b>R384.23</b>	<b>R387.41</b>	<b>R387.18</b>	<b>396.94</b>

R=Revised. P=Preliminary. — = Not applicable.

Notes: See Note 1 at end of section. World primary energy production includes production of crude oil (including lease condensate), natural gas plant liquids, dry natural gas, and coal; and net electricity generation from nuclear electric power, hydroelectric power, wood, waste, geothermal, solar, and wind. Data for the United States also include other renewable energy. Totals may not equal sum of

components due to independent rounding.

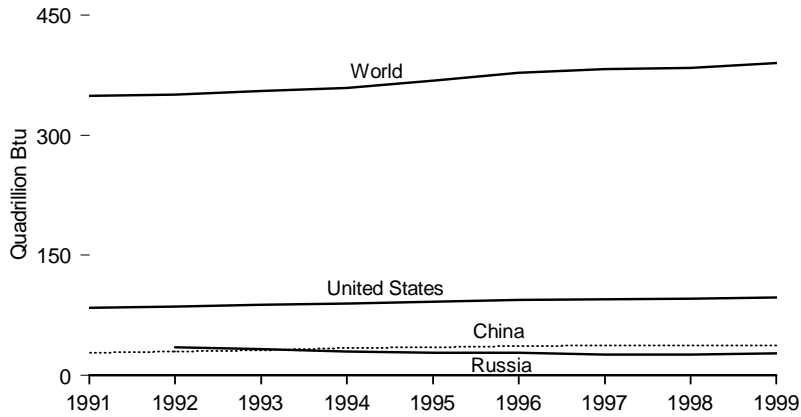
Web Page: <http://www.eia.doe.gov/international>.

Sources: **United States:** Table 1.2. **All Other Data:** Energy Information Administration, *International Energy Annual 2000* (May 2002), Table F1, and the International Energy Database.

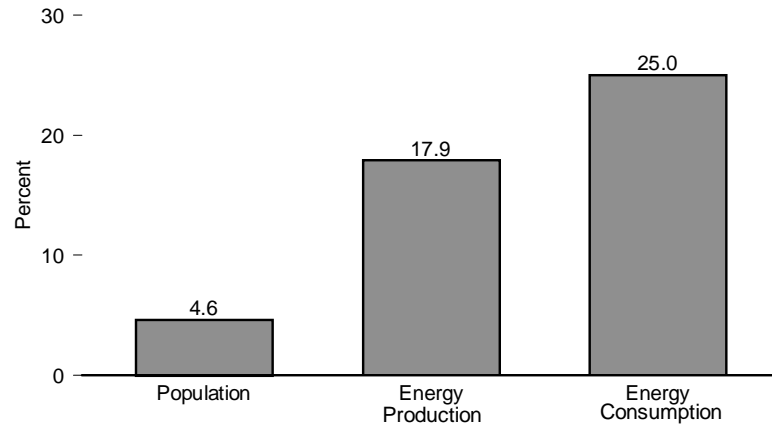


**Figure 11.3 World Primary Energy Consumption**

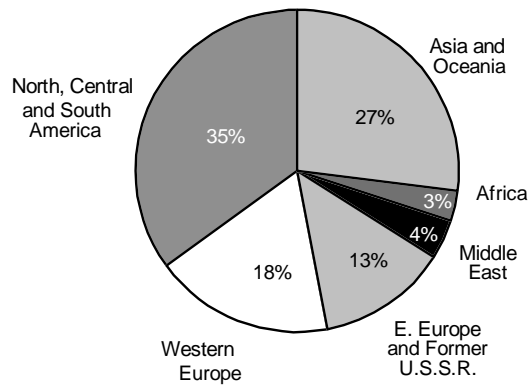
**World and Leading Consumers, 1991-2000**



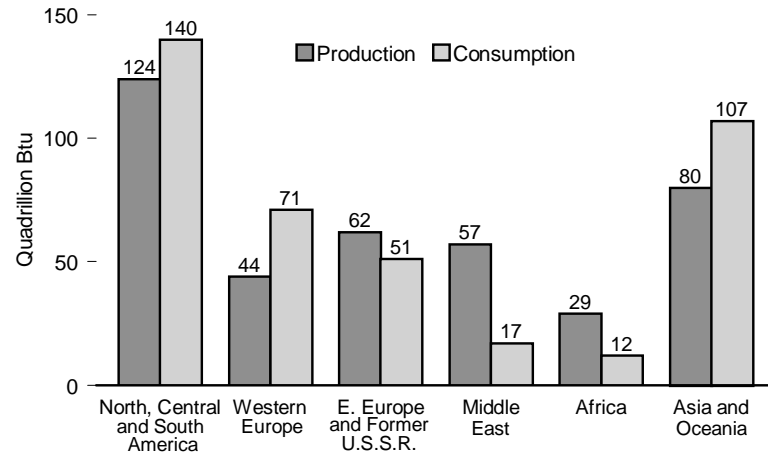
**U.S. Share of World, 2000**



**Regional Consumption Shares, 2000**



**Production and Consumption by Region, 2000**



Note: Because vertical scales differ, graphics should not be compared.

Sources: Tables 11.2, 11.3, and E1.

**Table 11.3 World Primary Energy Consumption by Region, 1991-2000**  
(Quadrillion Btu)

Region and Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 <sup>P</sup>
<b>North, Central, and South America</b>	<b>115.61</b>	<b>117.49</b>	<b>120.50</b>	<b>123.50</b>	<b>126.26</b>	<b>130.73</b>	<b>132.46</b>	<b>133.76</b>	<b>136.17</b>	<b>139.65</b>
Argentina	1.99	2.12	2.29	2.32	2.40	2.47	2.57	2.73	2.59	2.71
Brazil	6.21	6.30	6.58	6.89	7.30	7.76	8.19	8.45	8.72	9.10
Canada	10.89	10.94	11.46	11.74	11.75	12.11	12.37	12.20	12.74	13.07
Mexico	5.02	5.12	5.13	5.30	5.31	5.55	5.65	5.93	6.06	6.18
United States	84.64	86.05	87.78	89.57	91.50	94.52	94.97	95.34	96.97	99.32
Venezuela	2.21	2.22	2.29	2.42	2.47	2.58	2.66	2.81	2.72	2.72
Other	4.64	4.73	4.98	5.25	5.54	5.74	6.05	6.29	6.37	6.55
<b>Western Europe</b>	<b>65.08</b>	<b>64.23</b>	<b>64.63</b>	<b>64.69</b>	<b>66.67</b>	<b>68.49</b>	<b>68.96</b>	<b>70.37</b>	<b>70.32</b>	<b>71.29</b>
Belgium	2.27	2.24	2.26	2.31	2.36	2.55	2.63	2.66	2.61	2.75
France	9.39	9.41	9.37	9.28	9.54	9.92	9.87	10.19	10.30	10.41
Germany	14.31	14.00	14.06	14.01	14.32	14.30	14.30	14.33	14.13	13.98
Italy	7.17	7.22	7.05	6.97	7.56	7.64	7.45	7.73	7.77	7.96
Netherlands	3.56	3.53	3.60	3.57	3.70	3.82	3.83	3.81	3.83	3.91
Spain	4.15	4.12	4.04	4.22	4.48	4.39	4.72	5.02	5.21	5.40
Sweden	2.17	2.17	2.18	2.19	2.34	2.28	2.18	2.28	2.23	2.25
Turkey	2.08	2.13	2.33	2.23	2.47	2.74	2.96	3.02	2.92	3.20
United Kingdom	9.60	9.33	9.65	9.64	9.60	10.16	9.88	9.87	9.79	9.88
Other	10.39	10.08	10.09	10.27	10.28	10.68	11.14	11.48	11.53	11.55
<b>Eastern Europe and Former U.S.S.R.</b>	<b>69.40</b>	<b>65.16</b>	<b>60.75</b>	<b>54.66</b>	<b>53.20</b>	<b>52.47</b>	<b>49.78</b>	<b>48.76</b>	<b>50.08</b>	<b>51.14</b>
Poland	3.88	3.87	4.00	3.84	3.69	3.55	4.09	3.83	3.68	3.68
Former U.S.S.R.	57.46	—	—	—	—	—	—	—	—	—
Russia	—	34.88	32.67	29.63	28.24	27.92	25.52	25.62	27.45	28.07
Ukraine	—	8.89	8.58	7.31	7.21	6.73	6.44	6.26	6.41	6.46
Uzbekistan	—	1.66	2.04	1.76	1.85	1.91	1.89	1.84	1.87	1.92
Other	8.06	15.87	13.45	12.13	12.20	12.36	11.84	11.20	10.67	11.02
<b>Middle East</b>	<b>11.26</b>	<b>12.06</b>	<b>12.77</b>	<b>13.41</b>	<b>13.97</b>	<b>14.65</b>	<b>15.50</b>	<b>16.08</b>	<b>16.37</b>	<b>16.80</b>
Iran	3.23	3.35	3.47	3.66	3.81	3.95	4.44	4.47	4.61	4.72
Saudi Arabia	3.28	3.39	3.52	3.64	3.85	4.05	4.08	4.27	4.35	4.57
Other	4.75	5.33	5.78	6.11	6.30	6.65	6.98	7.34	7.41	7.51
<b>Africa</b>	<b>9.76</b>	<b>9.91</b>	<b>10.05</b>	<b>10.25</b>	<b>10.73</b>	<b>10.78</b>	<b>11.57</b>	<b>11.84</b>	<b>11.68</b>	<b>11.88</b>
Egypt	1.43	1.43	1.51	1.55	1.58	1.73	1.80	1.87	1.91	2.04
South Africa	3.58	3.73	3.80	3.85	4.16	3.97	4.64	4.88	4.60	4.64
Other	4.75	4.75	4.73	4.85	4.99	5.09	5.12	5.09	5.17	5.21
<b>Asia and Oceania</b>	<b>78.33</b>	<b>81.61</b>	<b>86.73</b>	<b>92.24</b>	<b>97.67</b>	<b>100.84</b>	<b>104.09</b>	<b>102.99</b>	<b>105.48</b>	<b>107.16</b>
Australia	3.70	3.82	3.93	3.96	4.11	4.18	4.56	4.60	4.84	4.89
China	28.26	29.31	31.36	34.04	35.21	36.04	37.61	37.07	37.02	36.67
India	8.06	8.71	9.10	9.59	11.10	11.25	11.55	11.78	12.12	12.67
Indonesia	2.36	2.54	2.87	3.06	3.26	3.52	3.68	3.52	3.72	3.85
Japan	18.89	19.14	19.41	20.18	20.83	21.48	21.78	21.43	21.57	21.77
South Korea	4.28	4.79	5.55	6.01	6.62	6.95	7.40	6.82	7.31	7.88
Taiwan	2.09	2.21	2.43	2.63	2.96	3.16	3.27	3.42	3.69	3.78
Thailand	1.37	1.47	1.68	1.87	2.25	2.44	2.52	2.37	2.50	2.56
Other	9.31	9.64	10.39	10.91	11.32	11.83	11.73	11.98	12.70	13.10
<b>World</b>	<b>349.44</b>	<b>350.47</b>	<b>355.43</b>	<b>358.75</b>	<b>368.50</b>	<b>377.97</b>	<b>382.36</b>	<b>383.79</b>	<b>390.10</b>	<b>397.93</b>

P=Preliminary. — = Not applicable.

Notes: World primary energy consumption includes consumption of petroleum products (including natural gas plant liquids, and crude oil burned as fuel), dry natural gas, and coal (including net imports of coal coke); and the consumption of net electricity generated from nuclear electric power, hydroelectric power, wood, waste, geothermal, solar, and wind. It also includes, for the United States, the consumption

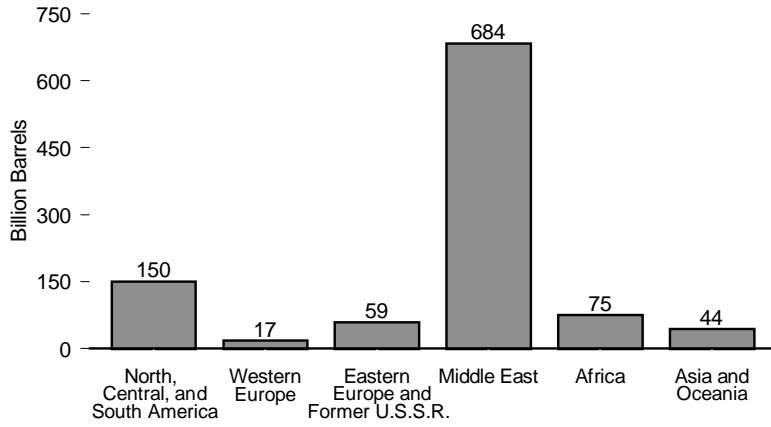
of renewable energy by the end-use sector. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/international>.

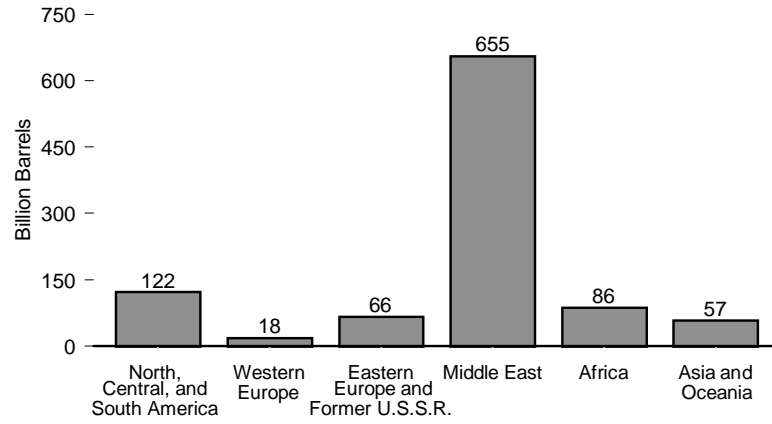
Sources: **United States:** Table 1.3. **All Other Data:** Energy Information Administration, *International Energy Annual 2000* (May 2002), Table E1, and the International Energy Database.

**Figure 11.4 World Crude Oil and Natural Gas Reserves, January 1, 2001**

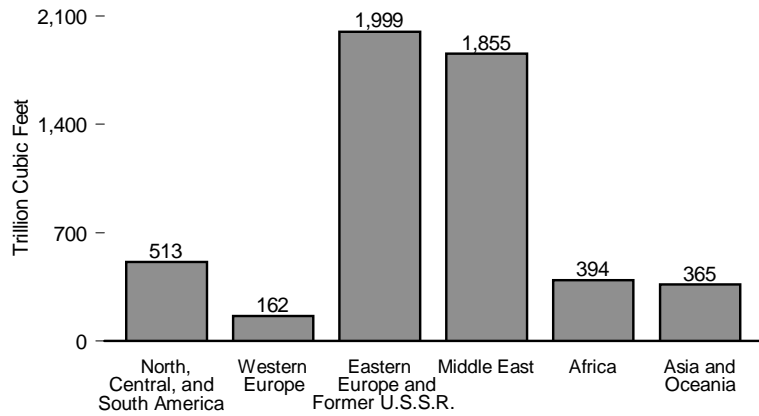
**Crude Oil Reserves: *Oil and Gas Journal***



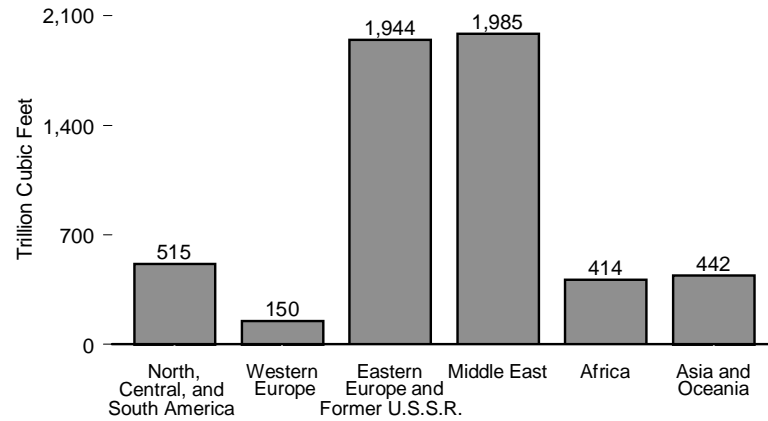
**Crude Oil Reserves: *World Oil***



**Natural Gas Reserves: *Oil and Gas Journal***



**Natural Gas Reserves: *World Oil***



Source: Table 11.4.

**Table 11.4 World Crude Oil and Natural Gas Reserves, January 1, 2001**

Region and Country	Crude Oil (billion barrels)		Natural Gas (trillion cubic feet)		Region and Country	Crude Oil (billion barrels)		Natural Gas (trillion cubic feet)	
	<i>Oil &amp; Gas Journal</i>	<i>World Oil</i>	<i>Oil &amp; Gas Journal</i>	<i>World Oil</i>		<i>Oil &amp; Gas Journal</i>	<i>World Oil</i>	<i>Oil &amp; Gas Journal</i>	<i>World Oil</i>
<b>North America</b> .....	<b>55.0</b>	<b>54.6</b>	<b>268.8</b>	<b>281.0</b>	<b>Middle East</b> .....	<b>683.5</b>	<b>654.6</b>	<b>1,854.8</b>	<b>1,985.3</b>
Canada .....	4.7	5.6	61.0	62.2	Bahrain .....	0.1	NA	3.9	NA
Mexico .....	28.3	26.9	30.4	41.4	Iran .....	89.7	96.4	812.3	929.1
United States .....	22.0	22.0	177.4	177.4	Iraq .....	112.5	115.0	109.8	112.6
<b>Central and South America</b> .....	<b>94.5</b>	<b>67.5</b>	<b>244.6</b>	<b>234.4</b>	Kuwait .....	96.5	98.8	52.7	56.6
Argentina .....	3.1	3.0	26.4	27.4	Oman .....	5.5	5.8	29.3	30.3
Bolivia .....	0.4	0.2	18.3	6.6	Qatar .....	13.2	5.6	393.8	400.0
Brazil .....	8.1	8.5	8.2	7.8	Saudi Arabia .....	261.7	265.3	213.8	214.0
Colombia .....	2.0	2.6	6.9	6.9	Syria .....	2.5	2.2	8.5	8.4
Ecuador .....	2.1	3.1	3.7	4.2	United Arab Emirates .....	97.8	62.8	212.1	204.1
Peru .....	0.3	0.9	8.7	8.7	Yemen .....	4.0	2.1	16.9	17.0
Trinidad and Tobago .....	0.7	0.7	21.4	23.5	Other .....	(s)	0.5	1.7	13.2
Venezuela .....	76.9	47.6	146.8	147.6	<b>Africa</b> .....	<b>74.9</b>	<b>86.4</b>	<b>394.2</b>	<b>413.7</b>
Other .....	1.0	1.0	4.2	1.8	Algeria .....	9.2	12.7	159.7	155.6
<b>Western Europe</b> .....	<b>17.4</b>	<b>17.6</b>	<b>161.8</b>	<b>150.0</b>	Angola .....	5.4	9.0	1.6	4.0
Denmark .....	1.1	1.1	3.4	2.6	Cameroon .....	0.4	NA	3.9	NA
Germany .....	0.4	0.3	11.5	9.3	Congo .....	1.5	1.7	3.2	4.2
Italy .....	0.6	0.6	8.1	7.0	Egypt .....	2.9	3.6	35.2	50.6
Netherlands .....	0.1	0.1	62.5	58.4	Libya .....	29.5	30.0	46.4	46.4
Norway .....	9.4	10.1	44.0	41.8	Nigeria .....	22.5	24.1	124.0	125.0
United Kingdom .....	5.0	4.7	26.8	26.0	Tunisia .....	0.3	0.3	2.8	2.8
Other .....	0.7	0.7	5.4	4.9	Other .....	3.1	5.1	17.4	25.2
<b>Eastern Europe and Former U.S.S.R.</b> .....	<b>58.9</b>	<b>66.1</b>	<b>1,999.2</b>	<b>1,944.0</b>	<b>Asia and Oceania</b> .....	<b>44.0</b>	<b>57.2</b>	<b>365.1</b>	<b>441.8</b>
Hungary .....	0.1	0.1	2.9	1.1	Australia .....	2.9	2.8	44.6	44.0
Kazakhstan .....	5.4	NA	65.0	NA	Brunei .....	1.4	1.2	13.8	8.8
Romania .....	1.4	1.2	13.2	4.9	China .....	24.0	30.6	48.3	42.0
Russia .....	48.6	54.3	1,700.0	1,695.0	India .....	4.7	3.3	22.8	15.9
Other <sup>1</sup> .....	3.3	10.6	218.1	243.0	Indonesia .....	5.0	9.7	72.3	146.9
					Malaysia .....	3.9	5.1	81.7	81.7
					New Zealand .....	0.1	0.2	2.5	3.0
					Pakistan .....	0.2	0.3	21.6	25.1
					Papua New Guinea .....	0.4	0.6	7.9	16.9
					Thailand .....	0.4	0.5	11.8	12.7
					Other .....	1.1	2.9	37.9	44.8
					<b>World</b> .....	<b>1,028.1</b>	<b>1,004.1</b>	<b>5,288.5</b>	<b>5,450.2</b>

<sup>1</sup> Albania, Azerbaijan, Belarus, Bulgaria, Czech Republic, Georgia, Kyrgyzstan, Lithuania, Poland, Slovakia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

NA=Not available. (s)=Less than 0.05 billion barrels.

Notes: Data for Kuwait and Saudi Arabia include one-half of the reserves in the Neutral Zone between Kuwait and Saudi Arabia. All reserve figures except those for the former U.S.S.R. and natural gas reserves in Canada are proved reserves recoverable with present technology and prices at the time of

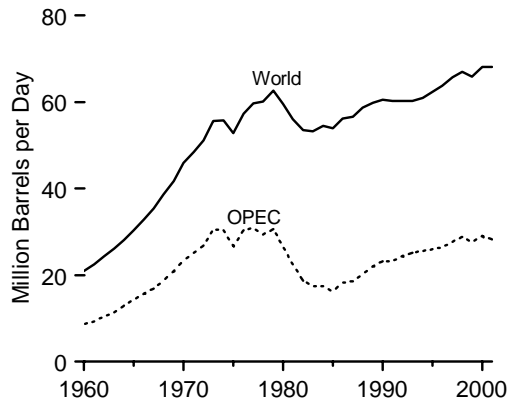
estimation. Former U.S.S.R. and Canadian natural gas figures include proved, and some probable reserves. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/international>.

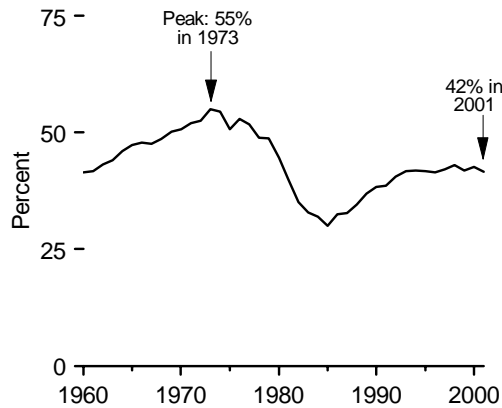
Sources: **United States:** Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves* (December 2001). **All Other Data:** PennWell Publishing Company, *Oil & Gas Journal*, December 18, 2000 and Gulf Publishing Company, *World Oil*, August 2001.

**Figure 11.5 World Crude Oil Production**

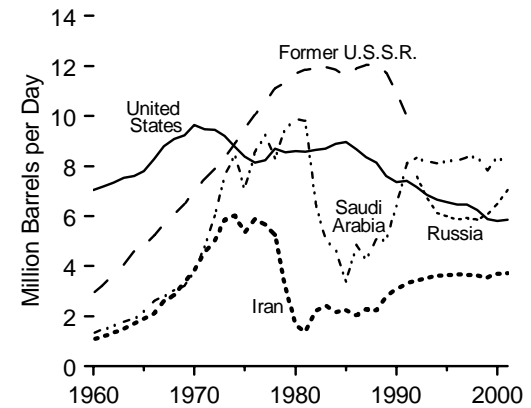
**World and OPEC, 1960-2001**



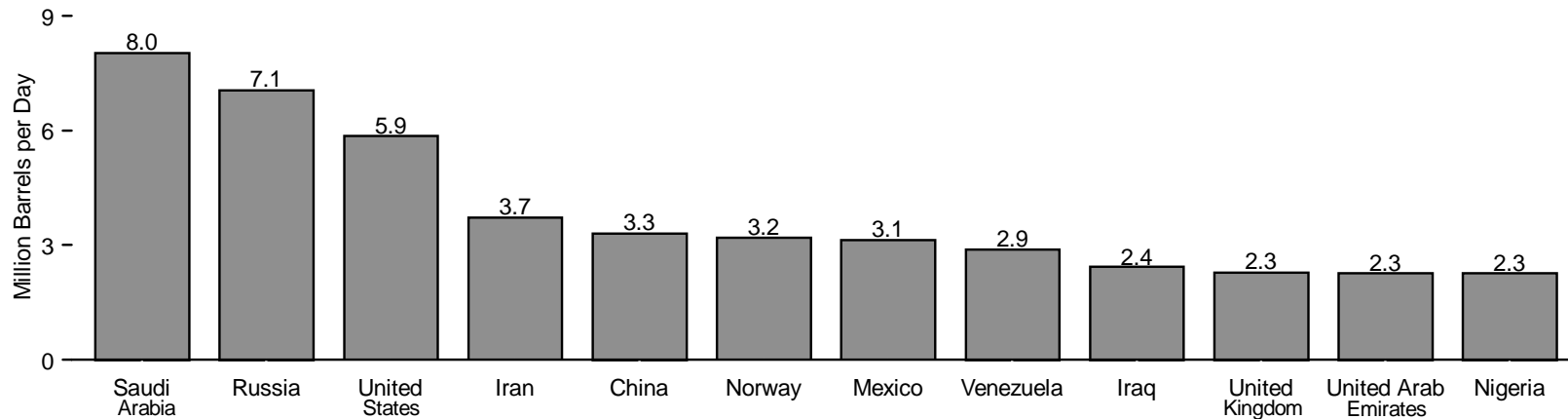
**OPEC's Share of World, 1960-2001**



**Leading Producers, 1960-2001**



**Selected Producing Countries, 2001**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.5.

**Table 11.5 World Crude Oil Production, 1960-2001**  
(Million Barrels per Day)

Year	Persian Gulf Nations <sup>2</sup>	Selected OPEC <sup>1</sup> Producers								Selected Non-OPEC Producers								World	
		Iran	Iraq	Kuwait <sup>3</sup>	Nigeria	Saudi Arabia <sup>3</sup>	United Arab Emirates	Venezuela	Total OPEC	Canada	China	Mexico	Norway	Former U.S.S.R.	Russia	United Kingdom	United States		Total Non-OPEC <sup>4</sup>
1960	5.27	1.07	0.97	1.69	0.02	1.31	0.00	2.85	8.70	0.52	0.10	0.27	0.00	2.91	—	(s)	7.04	12.29	20.99
1961	5.65	1.20	1.01	1.74	0.05	1.48	0.00	2.92	9.36	0.61	0.11	0.29	0.00	3.28	—	(s)	7.18	13.09	22.45
1962	6.19	1.33	1.01	1.96	0.07	1.64	0.01	3.20	10.51	0.67	0.12	0.31	0.00	3.67	—	(s)	7.33	13.84	24.35
1963	6.82	1.49	1.16	2.10	0.08	1.79	0.05	3.25	11.51	0.71	0.13	0.31	0.00	4.07	—	(s)	7.54	14.62	26.13
1964	7.61	1.71	1.26	2.30	0.12	1.90	0.19	3.39	12.98	0.75	0.18	0.32	0.00	4.60	—	(s)	7.61	15.20	28.18
1965	8.37	1.91	1.32	2.36	0.27	2.21	0.28	3.47	14.35	0.81	0.23	0.32	0.00	4.79	—	(s)	7.80	15.98	30.33
1966	9.32	2.13	1.39	2.48	0.42	2.60	0.36	3.37	15.77	0.88	0.29	0.33	0.00	5.23	—	(s)	8.30	17.19	32.96
1967	9.91	2.60	1.23	2.50	0.32	2.81	0.38	3.54	16.85	0.96	0.28	0.36	0.00	5.68	—	(s)	8.81	18.54	35.39
1968	10.91	2.84	1.50	2.61	0.14	3.04	0.50	3.60	18.79	1.19	0.30	0.39	0.00	6.08	—	(s)	9.10	19.84	38.63
1969	11.95	3.38	1.52	2.77	0.54	3.22	0.63	3.59	20.91	1.13	0.48	0.46	0.00	6.48	—	(s)	9.24	20.79	41.70
1970	13.39	3.83	1.55	2.99	1.08	3.80	0.78	3.71	23.30	1.26	0.60	0.49	0.00	6.99	—	(s)	9.64	22.59	45.89
1971	15.77	4.54	1.69	3.20	1.53	4.77	1.06	3.55	25.21	1.35	0.78	0.49	0.01	7.48	—	(s)	9.46	23.31	48.52
1972	17.54	5.02	1.47	3.28	1.82	6.02	1.20	3.22	26.89	1.53	0.90	0.51	0.03	7.89	—	(s)	9.44	24.25	51.14
1973	20.67	5.86	2.02	3.02	2.05	7.60	1.53	3.37	30.63	1.80	1.09	0.47	0.03	8.32	—	(s)	9.21	25.05	55.68
1974	21.28	6.02	1.97	2.55	2.26	8.48	1.68	2.98	30.35	1.55	1.32	0.57	0.04	8.91	—	(s)	8.77	25.37	55.72
1975	18.93	5.35	2.26	2.08	1.78	7.08	1.66	2.35	26.77	1.43	1.49	0.71	0.19	9.52	—	0.01	8.37	26.06	52.83
1976	21.51	5.88	2.42	2.15	2.07	8.58	1.94	2.29	30.33	1.31	1.67	0.83	0.28	10.06	—	0.25	8.13	27.01	57.34
1977	21.73	5.66	2.35	1.97	2.09	9.25	2.00	2.24	30.89	1.32	1.87	0.98	0.28	10.60	—	0.77	8.24	28.82	59.71
1978	20.61	5.24	2.56	2.13	1.90	8.30	1.83	2.17	29.46	1.32	2.08	1.21	0.36	11.11	—	1.08	8.71	30.70	60.16
1979	21.07	3.17	3.48	2.50	2.30	9.53	1.83	2.36	30.58	1.50	2.12	1.46	0.40	11.38	—	1.57	8.55	32.09	62.67
1980	17.96	1.66	2.51	1.66	2.06	9.90	1.71	2.17	26.61	1.44	2.11	1.94	0.53	11.71	—	1.62	8.60	32.99	59.60
1981	15.25	1.38	1.00	1.13	1.43	9.82	1.47	2.10	22.48	1.29	2.01	2.31	0.50	11.85	—	1.81	8.57	33.60	56.08
1982	12.16	2.21	1.01	0.82	1.30	6.48	1.25	1.90	18.78	1.27	2.05	2.75	0.52	11.91	—	2.07	8.65	34.70	53.48
1983	11.08	2.44	1.01	1.06	1.24	5.09	1.15	1.80	17.50	1.36	2.12	2.69	0.61	11.97	—	2.29	8.69	35.76	53.26
1984	10.78	2.17	1.21	1.16	1.39	4.66	1.15	1.80	17.44	1.44	2.30	2.78	0.70	11.86	—	2.48	8.88	37.05	54.49
1985	9.63	2.25	1.43	1.02	1.50	3.39	1.19	1.68	16.18	1.47	2.51	2.75	0.79	11.59	—	2.53	8.97	37.80	53.98
1986	11.70	2.04	1.69	1.42	1.47	4.87	1.33	1.79	18.28	1.47	2.62	2.44	0.87	11.90	—	2.54	8.68	37.95	56.23
1987	12.10	2.30	2.08	1.59	1.34	4.27	1.54	1.75	18.52	1.54	2.69	2.55	1.02	12.05	—	2.41	8.35	38.15	56.67
1988	13.46	2.24	2.69	1.49	1.45	5.09	1.57	1.90	20.32	1.62	2.73	2.51	1.16	12.05	—	2.23	8.14	38.42	58.74
1989	14.84	2.81	2.90	1.78	1.72	5.06	1.86	1.91	22.07	1.56	2.76	2.52	1.55	11.72	—	1.80	7.61	37.79	59.86
1990	15.28	3.09	2.04	1.18	1.81	6.41	2.12	2.14	23.20	1.55	2.77	2.55	1.70	10.98	—	1.82	7.36	37.37	60.57
1991	14.74	3.31	0.31	0.19	1.89	8.12	2.39	2.38	23.27	1.55	2.84	2.68	1.89	9.99	—	1.80	7.42	36.94	60.21
1992	15.97	3.43	0.43	1.06	1.94	8.33	2.27	2.37	24.40	1.61	2.85	2.67	2.23	—	7.63	1.83	7.17	35.81	60.21
1993	16.71	3.54	0.51	1.85	1.96	8.20	2.16	2.45	25.12	1.68	2.89	2.67	2.35	—	6.73	1.92	6.85	35.12	60.24
1994	16.96	3.62	0.55	2.03	1.93	8.12	2.19	2.59	25.51	1.75	2.94	2.69	2.52	—	6.14	2.37	6.66	35.48	60.99
1995	17.21	3.64	0.56	2.06	1.99	8.23	2.23	2.75	26.00	1.81	2.99	2.62	2.77	—	6.00	2.49	6.56	36.33	62.33
1996	17.37	3.69	0.58	2.06	2.00	8.22	2.28	2.94	26.46	1.84	3.13	2.86	3.10	—	5.85	2.57	6.46	37.25	63.71
1997	18.10	3.66	1.16	2.01	2.13	8.36	2.32	3.28	27.71	1.92	3.20	3.02	3.14	—	5.92	2.52	6.45	37.98	65.69
1998	19.34	3.63	2.15	2.09	2.15	8.39	2.35	3.17	28.77	1.98	3.20	3.07	3.02	—	5.85	2.62	6.25	R38.15	R66.92
1999	18.67	3.56	2.51	1.90	2.13	7.83	2.17	2.83	27.58	1.91	R3.20	2.91	3.02	—	6.08	2.68	5.88	R38.27	R65.85
2000	19.94	R3.70	2.57	2.13	2.14	8.40	R2.37	2.95	R29.07	1.98	3.25	3.01	3.20	—	6.48	R2.28	R5.82	R39.03	R68.10
2001 <sup>P</sup>	19.22	3.72	2.43	2.03	2.26	8.03	2.26	2.88	28.31	2.03	3.30	3.13	3.20	—	7.05	2.28	5.85	39.76	68.07

<sup>1</sup> Organization of Petroleum Exporting Countries. See Glossary for membership.

<sup>2</sup> Persian Gulf Nations are Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and United Arab Emirates.

<sup>3</sup> Includes about one-half of the production in the Neutral Zone between Kuwait and Saudi Arabia.

<sup>4</sup> Ecuador, which withdrew from OPEC on December 31, 1992, and Gabon, which withdrew on December 31, 1994, are included in "Non-OPEC" for all years.

R=Revised. P=Preliminary. — = Not applicable. (s)=Less than 0.005 million barrels per day.

Notes: Includes lease condensate, excludes natural gas plant liquids. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/international>.

Sources: **China:** 1960-1972—Central Intelligence Agency, unpublished data. 1973-2000—Energy Information Administration (EIA), *International Energy Annual*, annual reports, and the International Energy Database. 2001—EIA, *Monthly Energy Review* (March 2002), Table 10.1b. **United States:** 1960-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*.

1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual*. 1981-2000—EIA, *Petroleum Supply Annual*. 2001—EIA, *Petroleum Supply Monthly* (February 2002). **Former U.S.S.R.:**

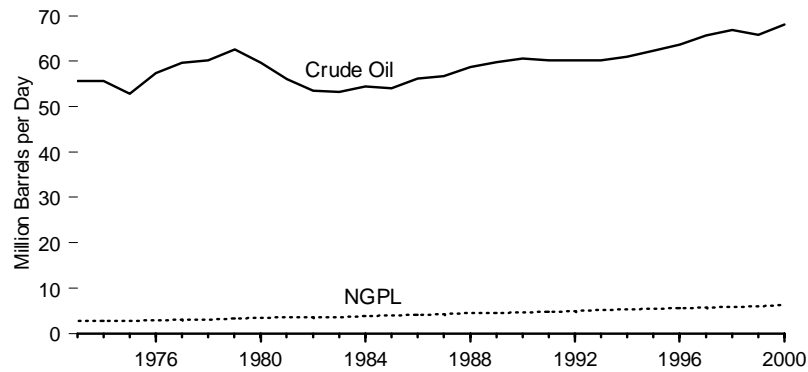
1960-1969—U.S.S.R. Central Statistical Office, *Narodnoye Khozyaystvo SSSR* (National Economy USSR). 1970-1991—EIA, *International Petroleum Monthly*, February 2001, Table 4.1c. **Russia:**

1992-2000—EIA, *International Petroleum Monthly*, February 2002. 2001—EIA, *Monthly Energy Review* (March 2002), Table 10.1b. **OPEC Nations:** 1960-1972—Organization of Petroleum Exporting Countries, *Annual Statistical Bulletin 1979*. 1973-2000—EIA, *International Energy Annual*, annual reports, and the International Energy Database. 2001—EIA, *Monthly Energy Review* (March 2002), Table 10.1a. **All Other Countries:** 1960-1969—Bureau of Mines, *International Petroleum Annual, 1969*.

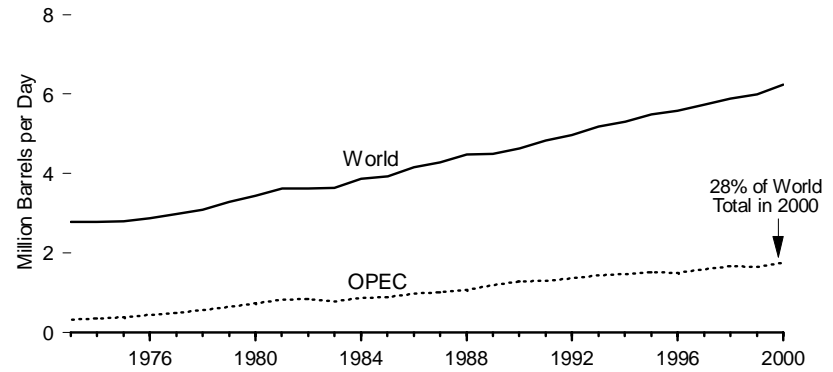
1970-1972—EIA, *International Petroleum Annual, 1978*. 1973-2000—EIA, *International Energy Annual*, annual reports, and the International Energy Database. 2001—EIA, *Monthly Energy Review* (March 2002), Tables 11.1a and 11.1b.

**Figure 11.6 World Natural Gas Plant Liquids Production**

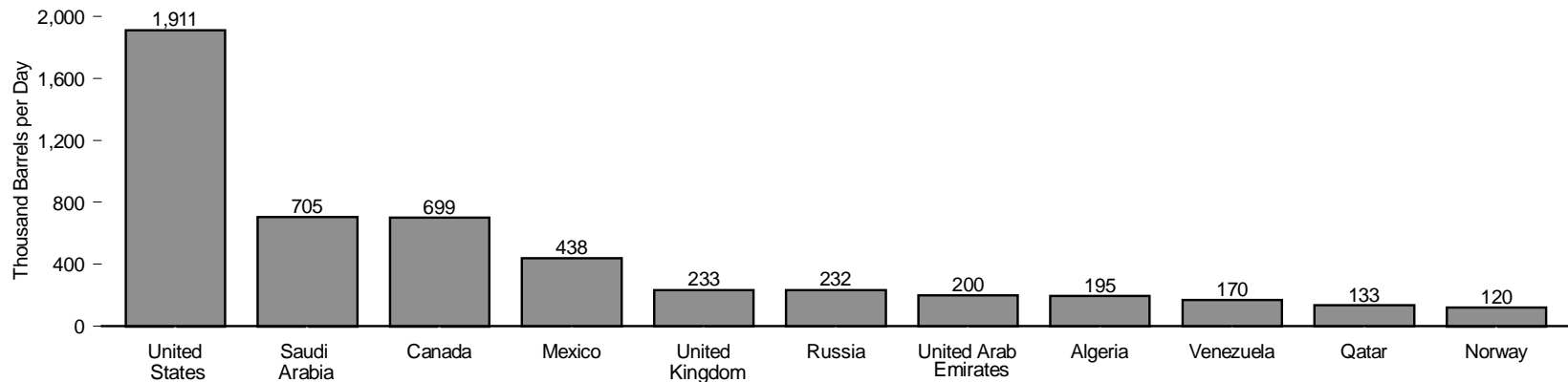
**Crude Oil and NGPL Production, 1973-2000**



**World and OPEC NGPL Production, 1973-2000**



**Top NGPL Producing Countries, 2000**



Notes: Crude oil includes lease condensate. NGPL is natural gas plant liquids. Because vertical scales differ, graphs should not be compared.

Sources: Tables 11.5 and 11.6.

**Table 11.6 World Natural Gas Plant Liquids Production, 1973-2000**  
(Thousand Barrels per Day)

Year	Selected OPEC <sup>1</sup> Producers								Selected Non-OPEC Producers										World
	Algeria	Indonesia	Kuwait <sup>2</sup>	Qatar	Saudi Arabia <sup>2</sup>	United Arab Emirates	Venezuela	Total OPEC	Australia	Canada	Malaysia	Mexico	Norway	Former U.S.S.R.	Russia	United Kingdom	United States	Total Non-OPEC <sup>3</sup>	
1973	9	(s)	60	(s)	90	(s)	89	324	50	314	0	75	(s)	170	—	5	1,738	2,462	2,786
1974	12	(s)	50	5	130	(s)	84	347	50	314	0	80	(s)	190	—	5	1,688	2,443	2,790
1975	20	(s)	50	10	140	(s)	76	372	50	309	0	80	5	205	—	15	1,633	2,419	2,791
1976	24	10	50	10	185	(s)	77	442	50	289	0	95	20	220	—	15	1,604	2,425	2,867
1977	19	10	55	5	215	15	78	482	55	290	0	105	20	235	—	30	1,618	2,502	2,984
1978	25	30	75	5	250	30	61	566	60	281	0	115	35	255	—	40	1,567	2,514	3,080
1979	30	40	95	10	303	30	69	637	60	331	0	150	40	270	—	45	1,584	2,650	3,287
1980	36	70	95	10	369	35	60	732	60	331	0	193	40	285	—	45	1,573	2,712	3,444
1981	49	95	60	24	433	60	55	825	60	330	0	241	31	300	—	50	1,609	2,800	3,625
1982	58	80	40	30	430	90	60	842	52	318	0	255	33	315	—	78	1,550	2,784	3,626
1983	56	94	55	25	330	120	57	780	52	309	0	265	38	330	—	111	1,559	2,855	3,635
1984	105	75	67	28	355	130	57	869	54	336	10	257	36	340	—	136	1,630	3,000	3,869
1985	120	44	54	30	375	160	63	892	65	337	10	271	41	350	—	145	1,609	3,046	3,938
1986	120	30	75	22	385	185	97	969	60	328	9	352	53	440	—	152	1,551	3,181	4,150
1987	140	30	95	24	418	145	94	1,006	65	367	11	338	55	430	—	162	1,595	3,273	4,279
1988	120	30	100	30	499	130	98	1,077	67	381	11	370	75	450	—	159	1,625	3,404	4,481
1989	130	72	105	24	503	130	108	1,188	65	410	11	384	74	425	—	140	1,546	3,314	4,502
1990	130	77	65	40	620	135	114	1,281	63	426	12	428	78	425	—	108	1,559	3,351	4,632
1991	140	76	0	50	680	146	117	1,299	61	431	12	457	94	420	—	141	1,659	3,528	4,827
1992	140	75	34	55	713	144	113	1,364	56	460	13	454	95	—	230	160	1,697	3,610	4,974
1993	145	78	53	55	704	146	143	1,435	55	506	17	459	100	—	220	169	1,736	<sup>R</sup> 3,751	<sup>R</sup> 5,186
1994	140	80	85	50	698	150	146	1,465	56	529	17	461	103	—	200	218	1,727	<sup>R</sup> 3,832	<sup>R</sup> 5,297
1995	145	76	95	55	701	160	149	1,506	52	581	20	447	137	—	180	267	1,762	<sup>R</sup> 3,986	<sup>R</sup> 5,492
1996	150	80	85	50	697	160	150	1,501	62	596	20	423	138	—	185	259	1,830	<sup>R</sup> 4,084	<sup>R</sup> 5,585
1997	160	85	109	70	712	160	143	1,589	71	636	50	388	139	—	195	233	1,817	<sup>R</sup> 4,140	<sup>R</sup> 5,729
1998	155	87	115	85	755	170	145	1,662	70	651	90	424	131	—	220	241	1,759	<sup>R</sup> 4,219	<sup>R</sup> 5,881
1999	190	87	115	111	666	160	<sup>R</sup> 170	1,648	72	653	85	439	121	—	231	238	1,850	<sup>R</sup> 4,345	<sup>R</sup> 5,993
2000 <sup>P</sup>	195	90	115	133	705	200	170	1,758	70	699	65	438	120	—	232	233	1,911	4,487	6,245

<sup>1</sup> Organization of Petroleum Exporting Countries. See Glossary for membership.

<sup>2</sup> Includes about one-half of the production in the Neutral Zone between Kuwait and Saudi Arabia.

<sup>3</sup> Ecuador, which withdrew from OPEC on December 31, 1992, and Gabon, which withdrew on December 31, 1994, are included in "Non-OPEC" for all years.

R=Revised. P=Preliminary. — = Not applicable. (s)=Less than 500 barrels per day.

Note: Totals may not equal sum of components due to independent rounding.

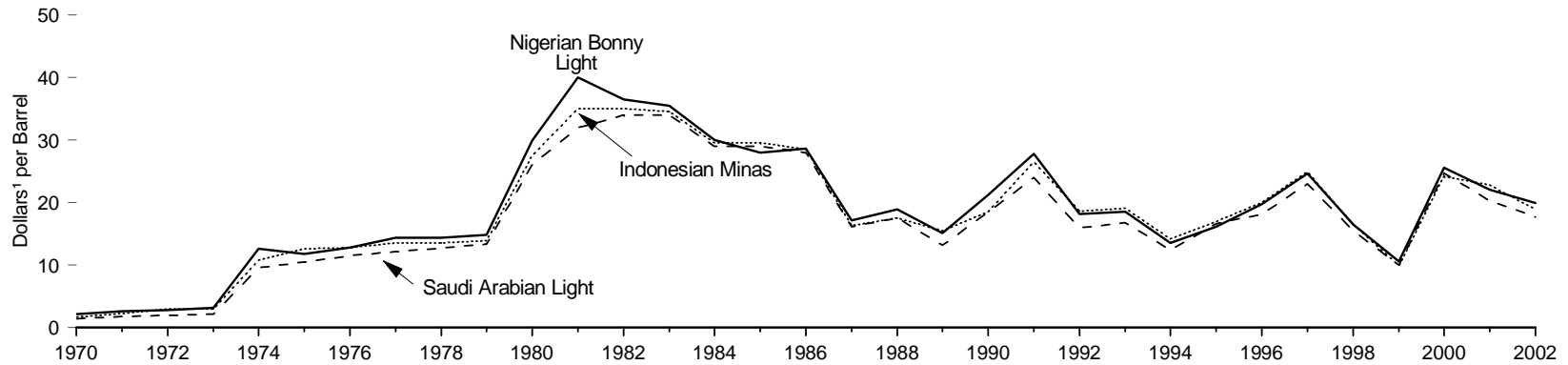
Web Page: <http://www.eia.doe.gov/international>.

Sources: 1973-1989—Energy Information Administration (EIA), *International Energy Annual*, annual reports, and the International Energy Database. 1990 forward—EIA, *International Energy Annual 2000* (May 2002), Table 2.3, and the International Energy Database.

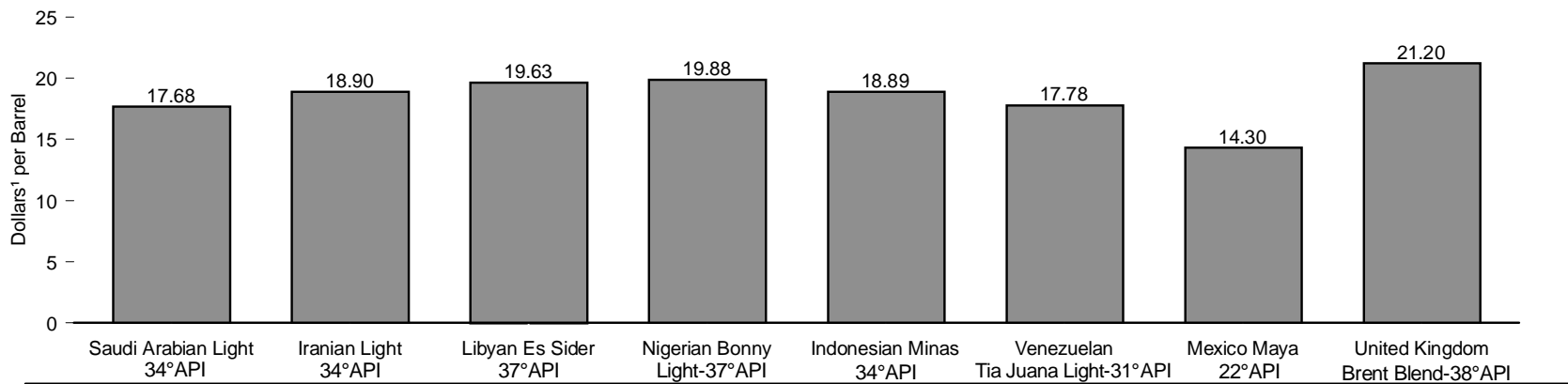


**Figure 11.7 Crude Oil Prices by Selected Type**

**Selected Types, 1970-2002**



**Selected Types, 2002**



<sup>1</sup> Nominal dollars.  
API=API gravity.

Source: Table 11.7.

Notes: Prices are as of the Friday that is closest to January 1, except in 1987, when prices are as of the first Friday in February. Because vertical scales differ, graphs should not be compared.

**Table 11.7 Crude Oil Prices by Selected Type, 1970-2002**

(Dollars<sup>1</sup> per Barrel)

Year	Saudi Arabian Light-34 API	Iranian Light-34 API	Libyan <sup>2</sup> Es Sider-37 API	Nigerian <sup>3</sup> Bonny Light-37 API	Indonesian Minas-34 API	Venezuelan Tia Juana Light <sup>4</sup>	Mexico Maya-22 API	United Kingdom Brent Blend-38 API
1970	1.35	1.36	2.09	2.10	1.67	2.05	NA	NA
1971	1.75	1.76	2.80	2.65	2.18	2.45	NA	NA
1972	1.90	1.91	2.80	2.80	2.96	2.45	NA	NA
1973	2.10	2.11	3.10	3.10	2.96	2.60	NA	NA
1974	9.60	10.63	14.30	12.60	10.80	9.30	NA	NA
1975	10.46	10.67	11.98	11.80	12.60	11.00	NA	NA
1976	11.51	11.62	12.21	12.84	12.80	11.12	NA	NA
1977	12.09	12.81	13.74	14.33	13.55	12.72	NA	NA
1978	12.70	12.81	13.80	14.33	13.55	12.82	NA	NA
1979	13.34	13.45	14.52	14.80	13.90	13.36	15.45	15.70
1980	26.00	<sup>5</sup> 30.37	34.50	29.97	27.50	25.20	28.00	26.02
1981	32.00	37.00	40.78	40.00	35.00	32.88	34.50	39.25
1982	34.00	34.20	36.50	36.50	35.00	32.88	26.50	36.60
1983	34.00	31.20	35.10	35.50	34.53	32.88	25.50	33.50
1984	29.00	28.00	30.15	30.00	29.53	27.88	25.00	30.00
1985	29.00	28.00	30.15	28.00	29.53	27.88	25.50	28.65
1986	28.00	28.05	30.15	28.65	28.53	28.05	21.93	26.00
1987	16.15	16.14	16.95	17.13	16.28	15.10	14.00	18.25
1988	17.52	15.55	18.52	18.92	17.56	17.62	11.10	18.00
1989	13.15	12.75	15.40	15.05	15.50	12.27	10.63	15.80
1990	18.40	18.20	20.40	21.20	18.55	24.69	17.05	21.00
1991	24.00	23.65	26.90	27.80	26.50	28.62	20.00	27.20
1992	15.90	15.50	17.20	18.20	18.65	19.67	10.75	17.75
1993	16.80	16.70	17.55	18.50	19.10	17.97	12.50	17.90
1994	12.40	12.40	12.55	13.50	14.15	12.97	9.01	13.15
1995	16.63	16.18	16.05	16.15	16.95	16.57	13.77	16.15
1996	18.20	17.73	19.20	19.70	20.05	18.52	15.79	19.37
1997	22.98	22.63	24.10	24.65	24.95	26.62	19.33	24.05
1998	15.50	14.93	16.72	16.50	16.50	15.93	10.81	15.89
1999	10.03	9.83	10.65	10.60	9.95	9.45	6.38	10.44
2000	24.78	24.63	25.85	25.55	24.15	24.85	20.20	25.10
2001	<sup>R</sup> 20.30	<sup>R</sup> 20.20	<sup>R</sup> 22.40	<sup>R</sup> 22.00	<sup>R</sup> 22.80	<sup>R</sup> 22.13	<sup>R</sup> 15.82	<sup>R</sup> 22.50
2002	17.68	18.90	19.63	19.88	18.89	17.78	14.30	21.20

<sup>1</sup> Nominal dollars.

<sup>2</sup> Prices for 1974 and 1975 are for crude oil with 40 API gravity. Prices for 1980 include \$4.72 in retroactive charges and market premiums.

<sup>3</sup> Prices from 1977 forward include 2 cents per barrel harbor dues.

<sup>4</sup> 1970-1985—26 API; 1986 forward—31 API.

<sup>5</sup> Price for 1980 includes \$1.87 market premiums and credit charges.

API=API gravity. R=Revised. NA=Not available.

Notes: Based on official government-selling prices, netback values, or spot market quotations.

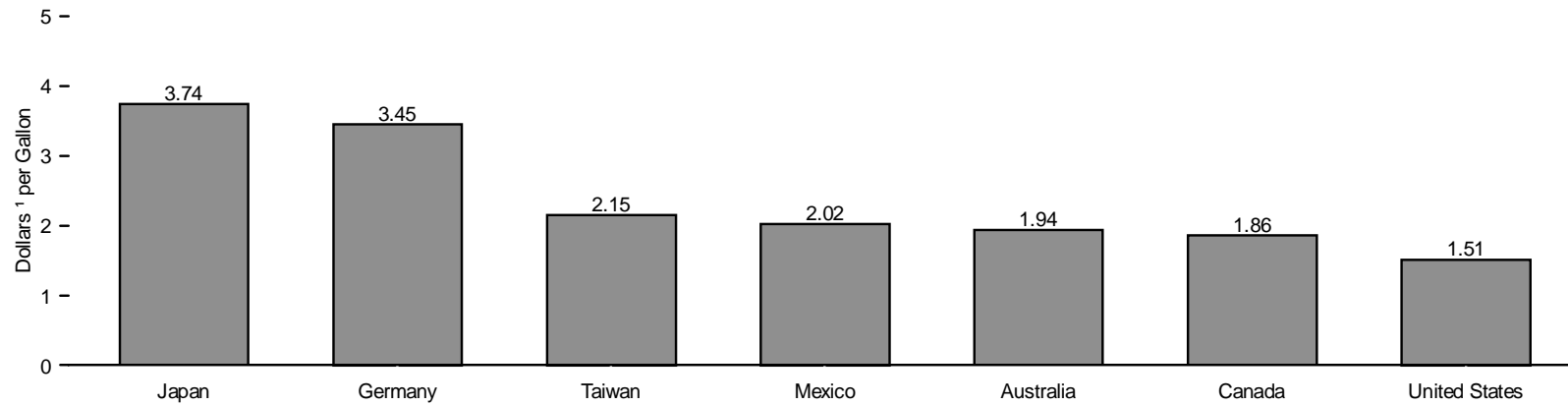
Prices are usually f.o.b. at the foreign port of lading. Prices are as of the Friday that is closest to January 1, except in 1987, when prices are as of the first Friday in February. See Tables 5.16, 5.17, and 5.19 for other types of crude oil prices for the United States, such as Domestic First Purchase Prices, Landed Costs of Crude Oil Imports, and Refiner Acquisition Costs.

Web Page: <http://www.eia.doe.gov/international>.

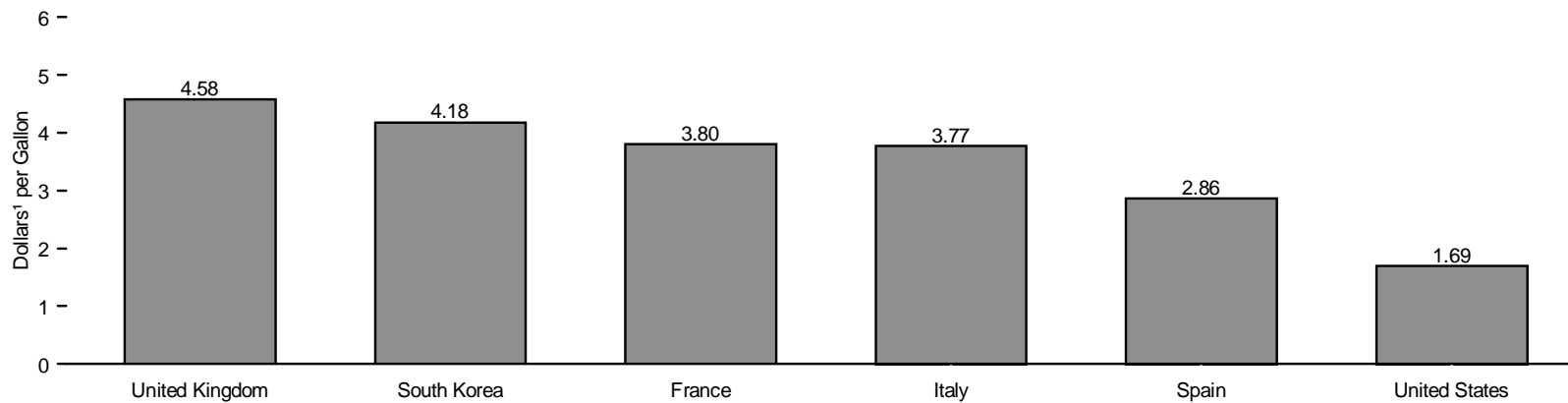
Sources: 1970-1978—Petroleum and Energy Intelligence Weekly, Inc., *Petroleum Intelligence Weekly*. 1979 forward—Energy Information Administration, *Weekly Petroleum Status Report*.

**Figure 11.8 Retail Motor Gasoline Prices in Selected Countries, 2000**

**Regular Unleaded**



**Premium Unleaded²**



<sup>1</sup> Nominal dollars.

<sup>2</sup> Research Octane Number (RON) of 95.

Source: Table 11.8.

**Table 11.8 Retail Motor Gasoline Prices in Selected Countries, 1990-2000**  
(Dollars<sup>1</sup> per Gallon)

Year	Regular Unleaded									Premium Unleaded <sup>2</sup>							
	Australia	Brazil	Canada	China	Germany	Japan	Mexico	Taiwan	United States	France	Italy	South Africa	South Korea	Spain	Thailand	United Kingdom	United States
1990	NA	3.82	1.87	NA	2.65	3.17	1.00	2.49	1.16	3.63	4.60	NA	2.03	NA	NA	2.82	1.35
1991	1.96	2.91	1.92	NA	2.90	3.46	1.29	2.39	1.14	3.45	4.50	NA	2.49	NA	1.40	3.01	1.32
1992	1.89	2.92	1.73	NA	3.27	3.59	1.50	2.42	1.13	3.57	4.53	NA	2.70	3.49	1.35	3.06	1.32
1993	1.73	2.40	1.57	NA	3.07	4.02	1.56	2.27	1.11	3.41	3.68	NA	2.88	3.02	1.26	2.84	1.30
1994	1.84	2.80	1.45	0.96	3.52	4.39	1.48	2.14	1.11	3.59	3.71	NA	2.87	2.99	1.21	2.99	1.31
1995	1.95	2.16	1.53	1.03	3.96	4.43	1.12	2.23	1.15	4.26	4.00	NA	<sup>R</sup> 2.94	3.24	1.25	3.21	1.34
1996	2.12	2.31	1.61	1.03	3.94	3.65	1.26	2.15	1.23	4.41	4.39	1.74	<sup>R</sup> 3.18	3.32	1.31	3.34	1.41
1997	2.05	2.61	1.62	1.07	3.54	3.27	1.47	2.23	1.23	4.01	4.06	1.72	3.34	3.01	1.22	3.83	1.42
1998	1.63	2.80	1.38	1.08	3.34	2.82	1.50	1.86	1.06	3.87	3.84	1.51	<sup>R</sup> 3.04	2.81	1.03	4.06	1.25
1999	1.72	NA	1.51	NA	3.42	3.27	1.80	1.86	1.17	<sup>R</sup> 3.85	<sup>R</sup> 3.87	NA	3.80	2.82	NA	4.29	1.36
2000	1.94	NA	1.86	NA	3.45	3.74	2.02	2.15	1.51	3.80	3.77	NA	4.18	2.86	NA	4.58	1.69

<sup>1</sup> Nominal dollars.

<sup>2</sup> Research Octane Number (RON) of 95.

R=Revised. NA=Not available.

Notes: Prices are those actually paid, i.e., net of rebates, and include transport costs and taxes which are not refundable. Prices in national currencies are converted to U.S. dollars using exchange rates published by the International Monetary Fund. Prices for all countries, except the United States, have been converted from dollars per liter to dollars per gallon at 3.786 liters per gallon. Comparisons between prices and price trends in different countries require care. They are of limited validity because of

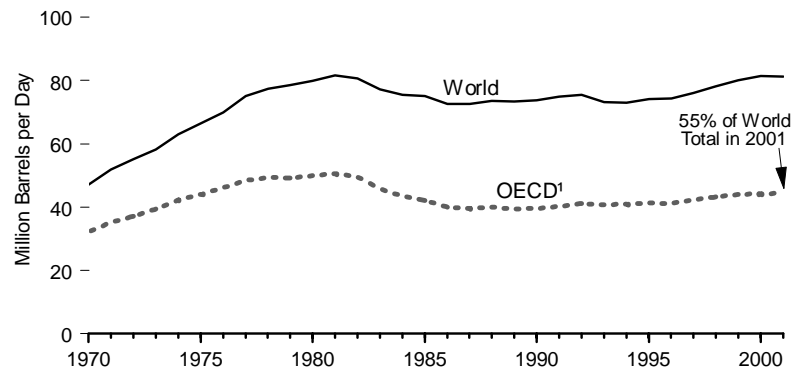
fluctuations in exchange rates, differences in product quality, marketing practices, market structures, and the extent to which the standard categories of sales are representative of total national sales for a given period.

Web Page: <http://www.eia.doe.gov/international>.

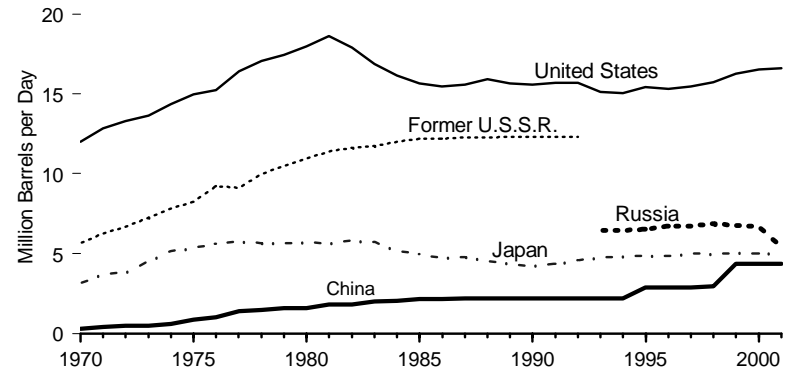
Sources: **United States:** Table 5.22. **All Other Data:** International Energy Agency, Organization for Economic Cooperation and Development, *Energy Prices and Taxes, Part II, Section D, and Part III, Section B*, quarterly reports.

**Figure 11.9 World Crude Oil Refining Capacity**

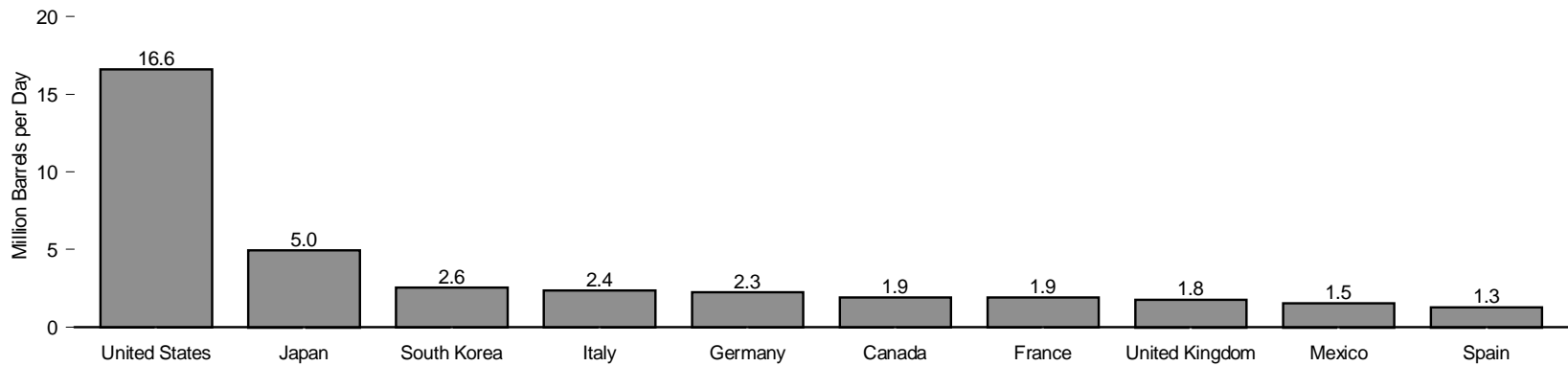
**World and OECD,<sup>1</sup> 1970-2001**



**Leading Countries, 1970-2001**



**Selected OECD<sup>1</sup> Countries, 2001**



<sup>1</sup> Organization for Economic Cooperation and Development. See Glossary for membership.

Source: Table 11.9.

Notes: Capacity is as of January 1. Because vertical scales differ, graphs should not be compared.

**Table 11.9 World Crude Oil Refining Capacity, 1970-2001**  
(Million Barrels per Day)

Year	Selected OECD <sup>1</sup> Countries											Selected Non-OECD Countries						World	
	Canada	France	Germany <sup>2</sup>	Italy	Japan	Mexico <sup>3</sup>	South Korea <sup>3</sup>	Spain	United Kingdom	United States	Total OECD <sup>4</sup>	Brazil	China	Former U.S.S.R.	Russia	Saudi Arabia	Ukraine		Total Non-OECD
1970	1.40	2.32	2.36	2.96	3.14	0.50	0.18	0.69	2.30	12.02	32.18	0.50	0.30	5.64	—	0.38	—	14.92	47.10
1971	1.45	2.53	2.54	3.24	3.70	0.57	0.25	0.85	2.39	12.86	35.18	0.51	0.42	6.27	—	0.91	—	16.73	51.91
1972	1.45	2.69	2.56	3.68	3.82	0.59	0.22	0.87	2.59	13.29	37.22	0.56	0.48	6.68	—	0.51	—	17.92	55.14
1973	1.73	2.95	2.70	3.59	4.53	0.63	0.43	1.03	2.47	13.64	39.48	0.72	0.50	7.26	—	0.43	—	18.72	58.20
1974	1.79	3.14	2.83	3.88	5.15	0.63	0.42	1.16	2.76	14.36	42.41	0.79	0.60	7.81	—	0.43	—	20.74	63.15
1975	1.88	3.34	2.99	3.95	5.35	0.76	0.43	1.17	2.78	14.96	44.07	0.96	0.85	8.24	—	0.61	—	22.45	66.52
1976	2.02	3.31	3.10	4.08	5.63	0.76	0.44	1.32	2.89	15.24	46.16	0.99	1.01	9.23	—	0.54	—	23.77	69.93
1977	2.10	3.52	3.08	4.26	5.76	0.94	0.42	1.28	3.01	16.40	48.34	1.12	1.40	9.10	—	0.60	—	26.77	75.11
1978	2.17	3.46	3.08	4.23	5.67	1.38	0.48	1.27	2.91	17.05	49.37	1.16	1.46	9.98	—	0.59	—	28.09	77.46
1979	2.23	3.47	3.10	4.20	5.68	1.24	0.54	1.43	2.53	17.44	49.31	1.21	1.58	10.48	—	0.49	—	29.27	78.58
1980	2.22	3.40	2.99	4.13	5.71	1.39	0.60	1.46	2.53	17.99	50.07	1.21	1.60	10.95	—	0.49	—	29.78	79.85
1981	2.17	3.34	3.02	4.09	5.66	1.39	0.61	1.46	2.63	18.62	50.57	1.40	1.81	11.40	—	0.49	—	30.99	81.56
1982	2.20	3.29	2.94	4.00	5.81	1.47	0.76	1.52	2.48	17.89	49.70	1.41	1.81	11.60	—	0.49	—	30.93	80.63
1983	2.02	2.87	2.47	3.28	5.73	1.29	0.76	1.52	2.26	16.86	45.79	1.22	2.00	11.75	—	0.71	—	31.42	77.21
1984	1.81	2.67	2.39	3.05	5.17	1.27	0.78	1.49	2.09	16.14	43.41	1.30	2.05	12.00	—	0.86	—	32.01	75.42
1985	1.87	2.39	2.17	3.10	4.97	1.27	0.78	1.49	2.01	15.66	42.10	1.31	2.15	12.20	—	0.84	—	33.02	75.12
1986	1.86	1.95	1.93	2.74	4.72	1.27	0.78	1.37	1.79	15.46	40.00	1.31	2.15	12.20	—	1.12	—	32.55	72.55
1987	1.76	1.83	1.72	2.68	4.79	1.35	0.86	1.31	1.78	15.57	39.64	1.32	2.20	12.26	—	1.13	—	32.93	72.57
1988	1.87	1.94	1.65	2.56	4.57	1.35	0.82	1.31	1.80	15.92	40.03	1.41	2.20	12.26	—	1.38	—	33.54	73.57
1989	1.86	1.88	1.52	2.45	4.36	1.35	0.88	1.29	1.80	15.65	39.35	1.41	2.20	12.30	—	1.38	—	33.99	73.34
1990	1.85	1.82	1.51	2.80	4.20	1.51	0.87	1.29	1.83	15.57	39.66	1.40	2.20	12.30	—	1.48	—	34.20	73.86
1991	1.88	1.82	2.07	2.39	4.38	1.68	0.87	1.32	1.87	15.68	40.16	1.41	2.20	12.30	—	1.86	—	34.75	74.91
1992	1.91	1.82	2.06	2.39	4.61	1.57	1.16	1.32	1.86	15.70	41.26	1.41	2.20	12.30	—	1.86	—	34.17	75.43
1993	1.87	1.85	2.23	2.42	4.74	1.52	1.15	1.30	1.84	15.12	40.82	1.40	2.20	—	6.46	1.86	1.24	32.29	73.11
1994	1.88	1.86	2.27	2.26	4.81	1.52	1.15	1.28	1.87	15.03	40.98	1.25	2.20	—	6.46	1.61	1.24	32.09	73.07
1995	1.91	1.77	2.32	2.26	4.85	1.52	1.17	1.28	1.87	15.43	41.42	1.25	2.87	—	6.53	1.66	1.26	32.83	74.25
1996	1.85	1.78	2.13	2.28	4.87	1.52	1.24	1.33	1.89	15.33	41.19	1.26	2.87	—	6.72	1.66	1.26	33.20	74.39
1997	1.85	1.79	2.11	2.26	4.99	1.52	2.21	1.30	1.94	15.45	42.36	1.26	2.87	—	6.73	1.66	1.25	33.63	75.99
1998	1.85	1.87	2.18	2.45	4.97	1.52	2.54	1.29	1.83	15.71	43.31	1.66	2.97	—	6.87	1.65	1.25	34.91	78.22
1999	1.87	1.95	2.25	2.45	5.06	1.53	2.54	1.32	1.85	16.26	44.08	1.77	4.35	—	6.75	1.69	1.09	36.00	80.08
2000	1.91	1.90	2.28	2.34	5.00	1.53	2.54	1.32	1.79	16.51	44.21	1.78	4.35	—	6.67	1.71	1.15	37.32	81.53
2001	1.91	1.90	2.26	2.36	4.96	1.53	2.56	1.29	1.77	16.60	44.37	1.92	4.35	—	5.44	1.75	1.03	36.95	81.32

<sup>1</sup> Organization for Economic Cooperation and Development. See Glossary for membership.

<sup>2</sup> Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

<sup>3</sup> Mexico, which joined the OECD on May 18, 1994, and South Korea, which joined the OECD on December 12, 1996, are included in the OECD for all years shown in this table.

<sup>4</sup> Hungary and Poland, which joined the OECD on May 7, 1996, and November 22, 1996, respectively, are included in Total OECD beginning in 1992, the first year that data for these countries were available. The Czech Republic, which joined the OECD on December 21, 1995, is included in Total OECD beginning in 1994, the first year that data for the country were available.

— = Not applicable.

Notes: Capacity data represent distillation capacity. Capacity for all years is as of January 1.

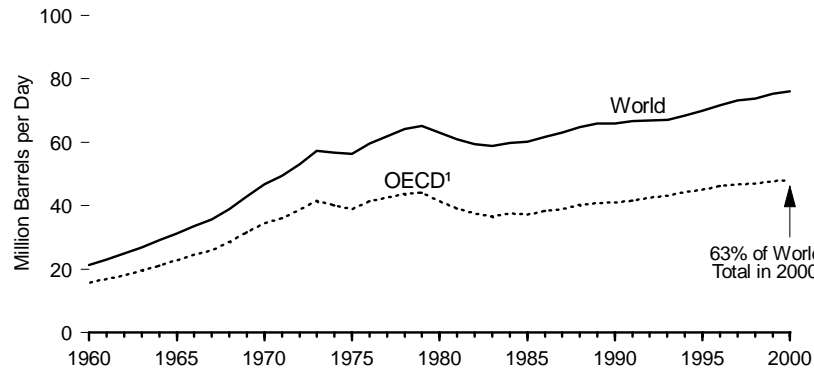
Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/international>.

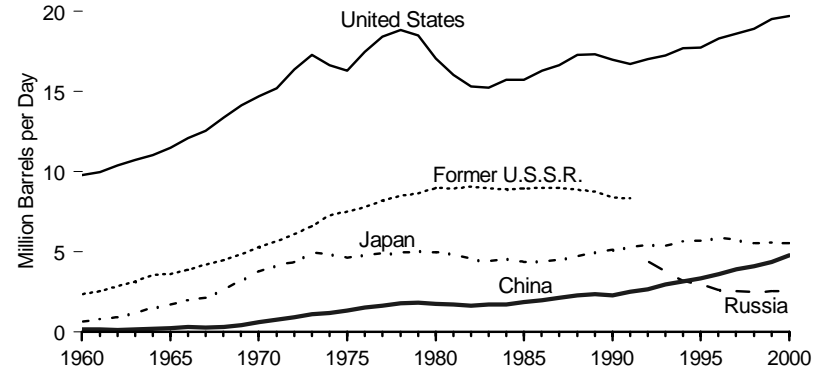
Sources: **United States:** 1970-1977—Bureau of Mines, Mineral Industry Surveys, *Petroleum Refineries, Annual*, annual reports. 1978-1981—Energy Information Administration (EIA), *Energy Data Reports, Petroleum Refineries in the United States and U.S. Territories*. 1982 forward—EIA, *Petroleum Supply Annual*, annual reports. **China and Former U.S.S.R.:** 1970-1976—Ballinger Publishing Company, *The Energy Decade, 1970-1980, A Statistical and Graphic Chronicle*. 1977 forward—PennWell Publishing Company, *Oil & Gas Journal*. **All Other Countries:** PennWell Publishing Company, *Oil & Gas Journal*.

**Figure 11.10 World Petroleum Consumption**

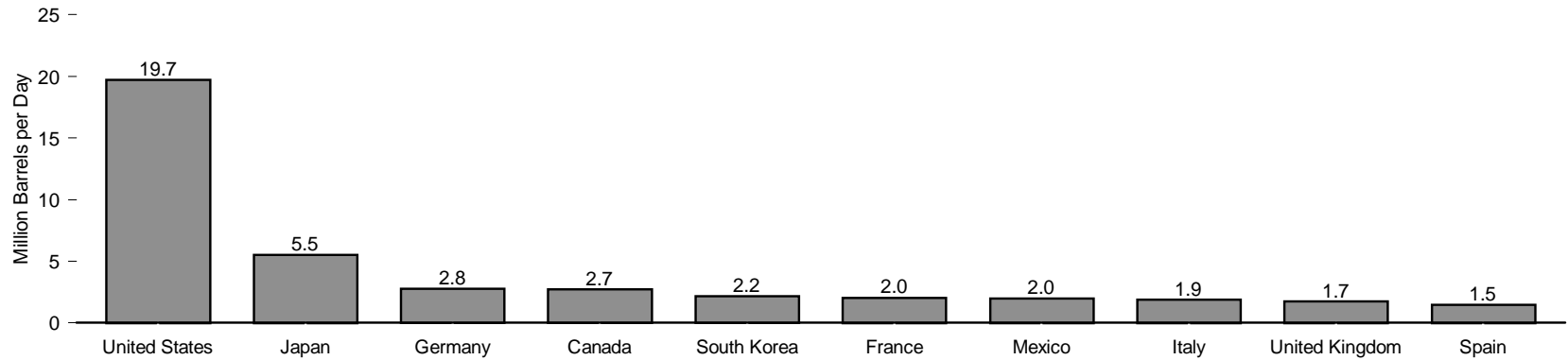
**World and OECD,<sup>1</sup> 1960-2000**



**Leading Consumers, 1960-2000**



**Selected OECD<sup>1</sup> Consumers, 2000**



<sup>1</sup> Organization for Economic Cooperation and Development. See Glossary for membership.

Source: Table 11.10.

Note: Because vertical scales differ, graphs should not be compared.

**Table 11.10 World Petroleum Consumption, 1960-2000**  
(Million Barrels per Day)

Year	Selected OECD <sup>1</sup> Consumers											Selected Non-OECD Consumers					World	
	Canada	France	Germany <sup>2</sup>	Italy	Japan	Mexico <sup>3</sup>	South Korea <sup>3</sup>	Spain	United Kingdom	United States	Total OECD <sup>4</sup>	Brazil	China	India	Former U.S.S.R.	Russia		Total Non-OECD
1960	0.84	0.56	0.63	0.44	0.66	0.30	0.01	0.10	0.94	9.80	15.78	0.27	0.17	0.16	2.38	—	5.56	21.34
1961	0.87	0.63	0.79	0.54	0.82	0.29	0.02	0.12	1.04	9.98	16.77	0.28	0.17	0.17	2.57	—	6.23	23.00
1962	0.92	0.73	1.00	0.67	0.93	0.30	0.02	0.12	1.12	10.40	18.06	0.31	0.14	0.18	2.87	—	6.83	24.89
1963	0.99	0.86	1.17	0.77	1.21	0.31	0.03	0.12	1.27	10.74	19.60	0.34	0.17	0.21	3.15	—	7.32	26.92
1964	1.05	0.98	1.36	0.90	1.48	0.33	0.02	0.20	1.36	11.02	21.05	0.35	0.20	0.22	3.58	—	8.03	29.08
1965	1.14	1.09	1.61	0.98	1.74	0.34	0.03	0.23	1.49	11.51	22.81	0.33	0.23	0.25	3.61	—	8.33	31.14
1966	1.21	1.19	1.80	1.08	1.98	0.36	0.04	0.31	1.58	12.08	24.60	0.38	0.30	0.28	3.87	—	8.96	33.56
1967	1.25	1.34	1.86	1.19	2.14	0.39	0.07	0.36	1.64	12.56	25.94	0.38	0.28	0.26	4.22	—	9.65	35.59
1968	1.34	1.46	1.99	1.40	2.66	0.41	0.10	0.46	1.82	13.39	28.56	0.46	0.31	0.31	4.48	—	10.40	38.96
1969	1.42	1.66	2.33	1.69	3.25	0.45	0.15	0.49	1.98	14.14	31.54	0.48	0.44	0.34	4.87	—	11.35	42.89
1970	1.52	1.94	2.83	1.71	3.82	0.50	0.20	0.58	2.10	14.70	34.49	0.53	0.62	0.40	5.31	—	12.32	46.81
1971	1.56	2.12	2.94	1.84	4.14	0.52	0.23	0.64	2.14	15.21	36.07	0.58	0.79	0.42	5.66	—	13.35	49.42
1972	1.66	2.32	3.13	1.95	4.36	0.59	0.23	0.68	2.28	16.37	38.74	0.66	0.91	0.46	6.12	—	14.35	53.09
1973	1.73	2.60	3.34	2.07	4.95	0.67	0.28	0.78	2.34	17.31	41.53	0.78	1.12	0.49	6.60	—	15.71	57.24
1974	1.78	2.45	3.06	2.00	4.86	0.71	0.29	0.86	2.21	16.65	40.12	0.86	1.19	0.47	7.28	—	16.56	56.68
1975	1.78	2.25	2.96	1.86	4.62	0.75	0.31	0.87	1.91	16.32	38.82	0.92	1.36	0.50	7.52	—	17.38	56.20
1976	1.82	2.42	3.21	1.97	4.84	0.83	0.36	0.97	1.89	17.46	41.39	1.00	1.53	0.51	7.78	—	18.28	59.67
1977	1.85	2.29	3.21	1.90	4.88	0.88	0.42	0.94	1.91	18.43	42.43	1.02	1.64	0.55	8.18	—	19.40	61.83
1978	1.90	2.41	3.29	1.95	4.95	0.99	0.48	0.98	1.94	18.85	43.62	1.11	1.79	0.62	8.48	—	20.54	64.16
1979	1.97	2.46	3.37	2.04	5.05	1.10	0.53	1.02	1.97	18.51	44.01	1.18	1.84	0.66	8.64	—	21.21	65.22
1980	1.87	2.26	3.08	1.93	4.96	1.27	0.54	0.99	1.73	17.06	41.41	1.15	1.77	0.64	9.00	—	21.66	63.07
1981	1.77	2.02	2.80	1.87	4.85	1.40	0.54	0.94	1.59	16.06	39.14	1.09	1.71	0.73	8.94	—	21.76	60.90
1982	1.58	1.88	2.74	1.78	4.58	1.48	0.53	1.00	1.59	15.30	37.45	1.06	1.66	0.74	9.08	—	22.05	59.50
1983	1.45	1.84	2.66	1.75	4.40	1.35	0.56	1.01	1.53	15.23	36.59	0.98	1.73	0.77	8.95	—	22.15	58.74
1984	1.47	1.75	2.66	1.65	4.58	1.45	0.59	0.91	1.85	15.73	37.43	1.03	1.74	0.82	8.91	—	22.41	59.84
1985	1.50	1.78	2.70	1.72	4.38	1.47	0.57	0.85	1.63	15.73	37.23	1.08	1.89	0.90	8.95	—	22.87	60.10
1986	1.51	1.77	2.86	1.74	4.44	1.49	0.61	0.88	1.65	16.28	38.28	1.24	2.00	0.95	8.98	—	23.48	61.76
1987	1.55	1.79	2.77	1.86	4.48	1.52	0.64	0.90	1.60	16.67	38.96	1.26	2.12	0.99	9.00	—	24.04	63.00
1988	1.69	1.80	2.74	1.84	4.75	1.55	0.73	0.98	1.70	17.28	40.24	1.30	2.28	1.08	8.89	—	24.58	64.82
1989	1.73	1.86	2.58	1.93	4.98	1.64	0.84	1.03	1.74	17.33	40.88	1.32	2.38	1.15	8.74	—	25.04	65.92
1990	1.69	1.82	2.66	1.87	5.14	1.68	1.03	1.01	1.75	16.99	40.92	1.34	2.30	1.17	8.39	—	25.05	65.97
1991	1.62	1.94	2.83	1.86	5.28	1.70	1.20	1.07	1.80	16.71	<sup>R</sup> 41.63	<sup>R</sup> 1.48	2.50	1.19	8.35	—	<sup>R</sup> 25.10	<sup>R</sup> 66.73
1992	1.64	1.93	2.84	1.94	5.45	1.72	1.46	1.11	1.80	17.03	<sup>R</sup> 42.64	<sup>R</sup> 1.52	2.66	1.28	—	4.42	<sup>R</sup> 24.30	<sup>R</sup> 66.94
1993	1.69	1.88	2.90	1.85	5.40	1.71	1.69	1.06	1.82	17.24	<sup>R</sup> 43.04	<sup>R</sup> 1.58	2.96	1.31	—	3.75	<sup>R</sup> 24.10	<sup>R</sup> 67.14
1994	1.73	1.83	2.88	1.84	5.67	1.80	1.86	1.13	1.84	17.72	<sup>R</sup> 44.23	<sup>R</sup> 1.67	3.16	1.41	—	3.18	<sup>R</sup> 24.21	<sup>R</sup> 68.44
1995	1.76	1.90	2.88	2.05	5.71	1.72	<sup>R</sup> 2.01	1.26	1.85	17.72	<sup>R</sup> 45.01	<sup>R</sup> 1.79	3.36	1.58	—	2.98	<sup>R</sup> 25.03	<sup>R</sup> 70.04
1996	1.80	1.94	2.91	2.06	5.87	1.76	<sup>R</sup> 2.16	1.18	1.85	18.31	<sup>R</sup> 46.11	<sup>R</sup> 1.90	3.61	1.68	—	2.62	<sup>R</sup> 25.49	<sup>R</sup> 71.60
1997	<sup>R</sup> 1.92	1.96	<sup>R</sup> 2.92	<sup>R</sup> 1.91	<sup>R</sup> 5.73	<sup>R</sup> 1.86	<sup>R</sup> 2.26	<sup>R</sup> 1.28	<sup>R</sup> 1.81	18.62	<sup>R</sup> 46.69	<sup>R</sup> 2.03	3.92	1.77	—	2.56	<sup>R</sup> 26.37	73.06
1998	<sup>R</sup> 1.95	2.03	2.92	<sup>R</sup> 1.95	<sup>R</sup> 5.53	<sup>R</sup> 1.95	<sup>R</sup> 1.93	<sup>R</sup> 1.38	<sup>R</sup> 1.79	18.92	<sup>R</sup> 46.96	<sup>R</sup> 2.10	4.11	1.84	—	<sup>R</sup> 2.49	<sup>R</sup> 26.83	<sup>R</sup> 73.79
1999	<sup>R</sup> 2.03	2.03	<sup>R</sup> 2.84	<sup>R</sup> 1.84	<sup>R</sup> 5.59	<sup>R</sup> 2.00	<sup>R</sup> 2.08	1.43	<sup>R</sup> 1.74	19.52	<sup>R</sup> 47.76	<sup>R</sup> 2.13	<sup>R</sup> 4.36	<sup>R</sup> 1.96	—	<sup>R</sup> 2.54	<sup>R</sup> 27.54	<sup>R</sup> 75.30
2000 <sup>P</sup>	2.70	2.02	2.77	1.87	5.53	1.99	2.15	1.46	1.72	19.70	47.98	2.16	4.78	1.99	—	2.50	28.04	76.02

<sup>1</sup> Organization for Economic Cooperation and Development. See Glossary for membership.

<sup>2</sup> Through 1969, the data for Germany are for the former West Germany only. For 1970 through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

<sup>3</sup> Mexico, which joined the OECD on May 18, 1994, and South Korea, which joined the OECD on December 12, 1996, are included in the OECD for all years shown in this table.

<sup>4</sup> Hungary and Poland, which joined the OECD on May 7, 1996, and November 22, 1996, respectively, are included in Total OECD beginning in 1970, the first year that data for these countries were available.

The Czech Republic, which joined the OECD on December 21, 1995, is included in Total OECD beginning in 1993, the year that it came into existence.

R=Revised. P=Preliminary. — = Not applicable.

Note: Totals may not equal sum of components due to independent rounding.

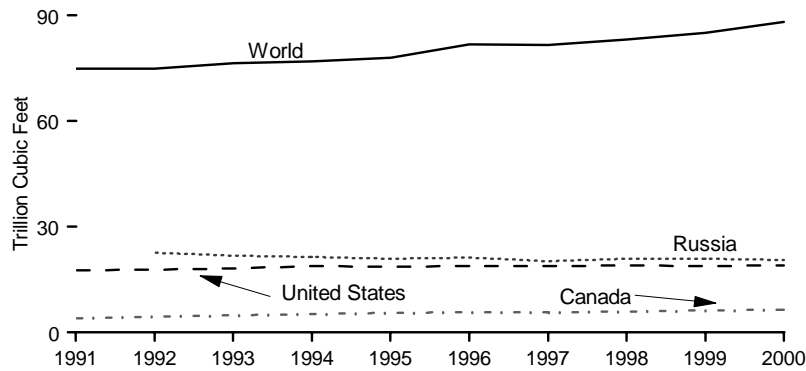
Web Page: <http://www.eia.doe.gov/international>.

Sources: 1960-1979—Energy Information Administration (EIA), International Energy Database. 1980 forward—EIA, *International Energy Annual*, annual reports, and the International Energy Database.

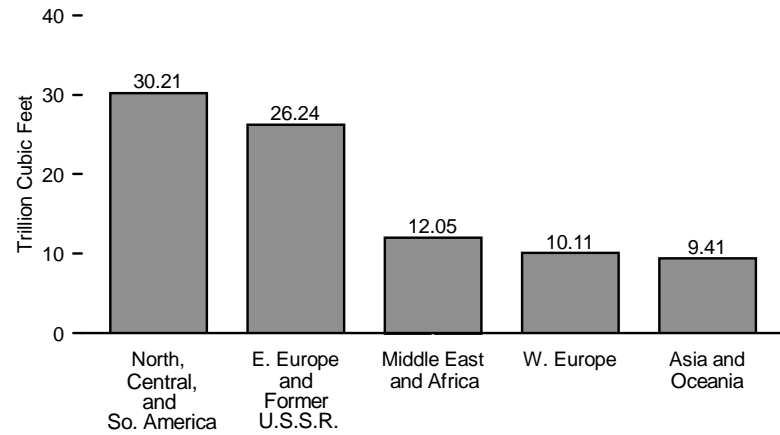


**Figure 11.11 World Dry Natural Gas Production**

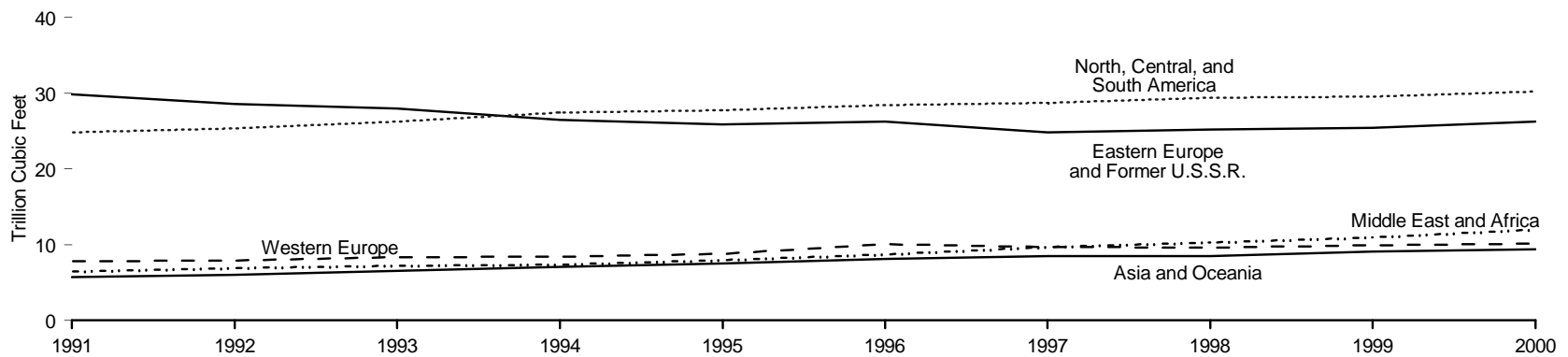
**World and Leading Producers, 1991-2000**



**World Areas, 2000**



**World Areas, 1991-2000**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.11.

**Table 11.11 World Dry Natural Gas Production, 1991-2000**  
(Trillion Cubic Feet)

Region and Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 <sup>P</sup>
<b>North, Central, and South America</b>	<b>24.81</b>	<b>25.38</b>	<b>26.26</b>	<b>27.50</b>	<b>27.74</b>	<b>R28.39</b>	<b>R28.75</b>	<b>R29.39</b>	<b>R29.53</b>	<b>30.21</b>
Argentina	0.70	0.71	0.76	0.79	0.88	0.94	0.97	1.04	1.22	1.32
Canada	4.06	4.52	4.91	5.27	5.60	R5.71	R5.76	R5.98	6.26	6.47
Mexico	0.90	0.88	0.95	0.97	0.96	1.06	1.17	1.27	1.29	1.33
United States	17.70	17.84	18.10	18.82	18.60	18.85	18.90	R19.02	R18.83	18.99
Venezuela	0.79	0.76	0.82	0.88	0.89	0.96	0.99	1.11	R0.95	0.96
Other	0.65	0.66	0.73	0.78	0.81	0.86	0.96	0.96	R0.98	1.15
<b>Western Europe</b>	<b>7.83</b>	<b>7.92</b>	<b>8.33</b>	<b>8.44</b>	<b>8.80</b>	<b>10.09</b>	<b>9.71</b>	<b>9.64</b>	<b>R9.92</b>	<b>10.11</b>
Germany	0.67	0.68	0.68	0.70	0.74	0.80	0.79	0.77	0.82	0.78
Italy	0.61	0.64	0.69	0.73	0.72	0.71	0.68	0.67	0.62	0.57
Netherlands	3.04	3.06	3.11	2.95	2.98	3.37	2.99	2.84	R2.67	2.57
Norway	0.97	1.04	0.97	1.04	1.08	1.45	1.62	1.63	1.76	1.81
United Kingdom	2.01	1.96	2.31	2.47	2.67	3.18	3.03	3.14	3.49	3.83
Other	0.53	0.54	0.57	0.55	0.61	0.59	0.60	0.58	R0.57	0.56
<b>Eastern Europe and Former U.S.S.R.</b>	<b>29.85</b>	<b>28.58</b>	<b>R27.99</b>	<b>26.47</b>	<b>25.93</b>	<b>26.28</b>	<b>24.85</b>	<b>R25.17</b>	<b>25.41</b>	<b>26.24</b>
Romania	0.88	0.78	0.75	0.69	0.68	0.63	0.61	0.52	0.50	0.50
Former U.S.S.R.	28.62	—	—	—	—	—	—	—	—	—
Russia	—	22.62	21.81	21.45	21.01	21.23	20.17	20.87	20.83	20.63
Turkmenistan	—	2.02	2.29	1.26	1.14	1.31	0.90	0.47	0.79	1.64
Ukraine	—	0.74	0.68	0.64	0.62	0.64	0.64	0.64	0.63	0.64
Uzbekistan	—	1.51	1.59	1.67	1.70	1.70	1.74	1.94	1.96	1.99
Other	0.36	0.92	0.87	0.76	0.79	0.76	0.79	0.74	0.70	0.84
<b>Middle East and Africa</b>	<b>6.52</b>	<b>6.91</b>	<b>7.24</b>	<b>7.41</b>	<b>7.99</b>	<b>8.76</b>	<b>9.74</b>	<b>10.30</b>	<b>R10.95</b>	<b>12.05</b>
Algeria	1.93	1.97	1.90	1.81	2.05	2.19	2.43	2.60	R2.88	2.94
Egypt	0.32	0.35	0.40	0.42	0.44	0.47	0.48	0.49	R0.52	0.65
Iran	0.92	0.88	0.96	1.12	1.25	1.42	1.66	1.77	R2.04	2.13
Qatar	0.33	0.40	0.48	0.48	0.48	0.48	0.61	0.69	R0.78	1.03
Saudi Arabia	1.13	1.20	1.27	1.33	1.34	1.46	1.60	1.65	1.63	1.76
United Arab Emirates	0.92	1.02	0.94	0.91	1.11	1.19	1.28	1.31	1.34	1.41
Other	0.98	1.08	1.30	1.34	1.33	1.53	1.67	1.79	R1.76	2.15
<b>Asia and Oceania</b>	<b>5.76</b>	<b>6.06</b>	<b>6.55</b>	<b>7.11</b>	<b>7.50</b>	<b>8.13</b>	<b>8.47</b>	<b>8.55</b>	<b>R9.10</b>	<b>9.41</b>
Australia	0.75	0.80	0.86	0.93	1.03	1.06	1.06	1.10	1.10	1.12
China	0.53	0.53	0.56	0.59	0.60	0.67	0.75	0.78	0.85	0.96
India	0.45	0.48	0.53	0.59	0.63	0.70	0.72	0.76	0.75	0.79
Indonesia	1.72	1.79	1.97	2.21	2.24	2.35	2.37	2.27	R2.51	2.36
Malaysia	0.75	0.80	0.88	0.92	1.02	1.23	1.36	1.37	R1.42	1.50
Pakistan	0.53	0.55	0.58	0.63	0.65	0.70	0.70	0.71	0.78	0.86
Other	1.03	1.10	1.16	1.23	1.33	1.42	1.52	1.56	R1.69	1.84
<b>World</b>	<b>74.78</b>	<b>74.84</b>	<b>76.36</b>	<b>76.93</b>	<b>77.96</b>	<b>R81.65</b>	<b>R81.52</b>	<b>R83.03</b>	<b>R84.91</b>	<b>88.03</b>

R=Revised. P=Preliminary. — = Not applicable.

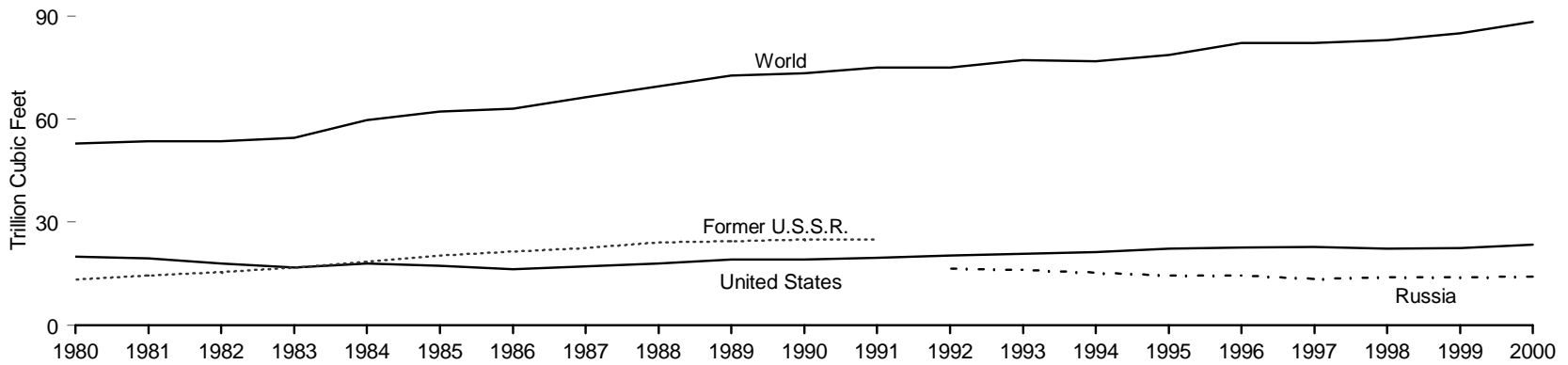
Note: Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/international>.

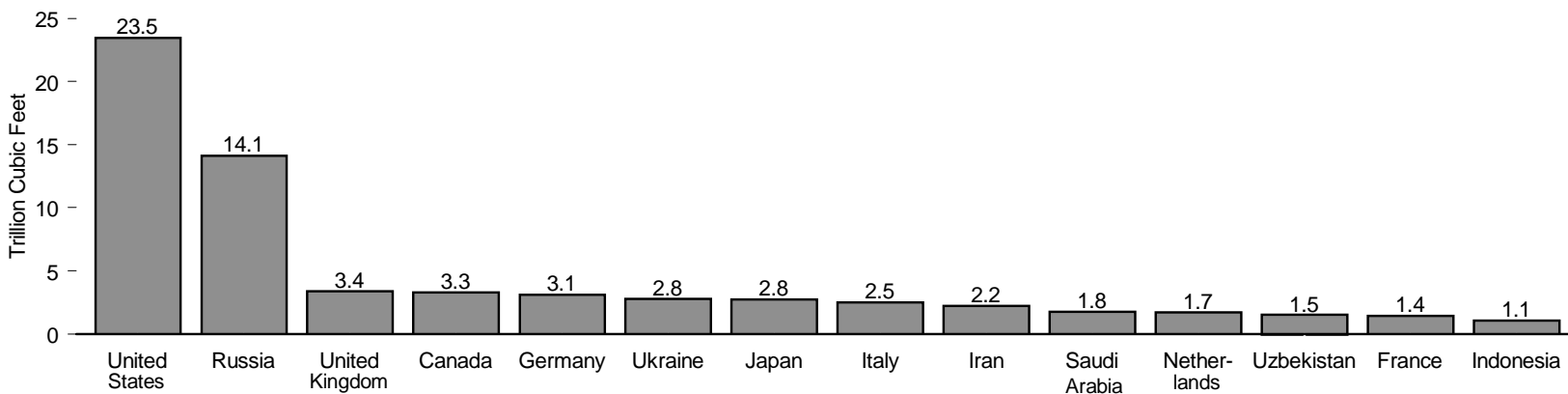
Sources: **United States:** Table 6.1. **All Other Data:** Energy Information Administration, *International Energy Annual 2000* (May 2002), Table 2.4, and the International Energy Database.

**Figure 11.12 World Dry Natural Gas Consumption**

**World and Leading Consumers, 1980-2000**



**Selected Consuming Countries, 2000**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.12.

**Table 11.12 World Dry Natural Gas Consumption, 1980-2000**  
(Billion Cubic Feet)

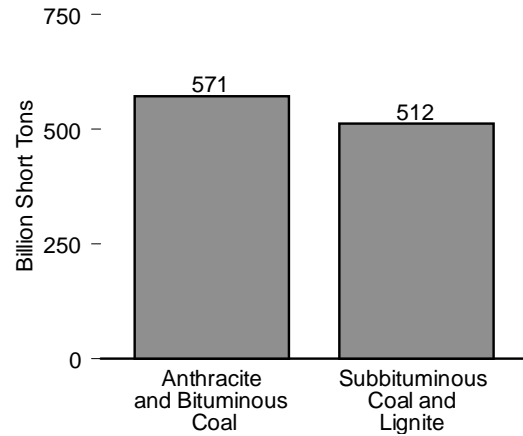
Year	Canada	France	Germany <sup>1</sup>	Indonesia	Iran	Italy	Japan	Nether-lands	Former U.S.S.R.	Russia	Saudi Arabia	Ukraine	United Kingdom	United States	Uzbek-istan	Other	World
1980	1,883	981	2,621	195	232	972	903	1,493	13,328	—	334	—	1,702	19,877	—	8,369	52,890
1981	1,842	1,003	2,513	232	155	942	925	1,421	14,440	—	564	—	1,740	19,404	—	8,333	53,513
1982	1,859	979	2,334	218	200	944	956	1,511	15,522	—	430	—	1,743	18,001	—	8,931	53,628
1983	1,863	999	2,397	302	310	967	1,020	1,451	16,822	—	418	—	1,815	16,835	—	9,427	54,626
1984	2,017	1,079	2,584	365	476	1,135	1,372	1,540	18,512	—	620	—	1,851	17,951	—	10,189	59,692
1985	2,165	1,110	2,546	513	600	1,151	1,468	1,624	20,302	—	716	—	1,991	17,281	—	10,777	62,244
1986	2,130	1,129	2,595	441	536	1,217	1,494	1,620	21,522	—	890	—	2,020	16,221	—	11,303	63,118
1987	2,112	1,038	2,733	542	565	1,346	1,543	1,672	22,462	—	946	—	2,079	17,211	—	12,062	66,312
1988	2,331	963	2,716	492	706	1,460	1,618	1,513	24,092	—	1,028	—	1,972	18,030	—	12,628	69,548
1989	2,427	984	2,835	546	784	1,581	1,731	1,550	24,529	—	1,052	—	1,951	<sup>R</sup> 19,119	—	13,549	<sup>R</sup> 72,638
1990	2,378	997	2,669	547	837	1,674	1,851	1,535	24,961	—	1,077	—	2,059	<sup>R</sup> 19,163	—	<sup>R</sup> 13,625	<sup>R</sup> 73,372
1991	2,400	1,131	2,776	557	811	1,775	1,976	1,715	25,014	—	1,130	—	2,218	<sup>R</sup> 19,562	—	<sup>R</sup> 13,856	<sup>R</sup> 74,922
1992	2,596	1,146	2,739	673	883	1,760	2,023	1,669	—	16,482	1,201	3,503	2,170	<sup>R</sup> 20,228	1,095	<sup>R</sup> 16,884	<sup>R</sup> 75,053
1993	2,736	1,158	2,830	850	938	1,801	2,034	1,714	—	16,185	1,268	3,871	2,412	<sup>R</sup> 20,790	1,541	<sup>R</sup> 17,022	<sup>R</sup> 77,149
1994	2,824	1,157	2,965	965	1,123	1,748	2,180	1,654	—	15,214	1,331	3,327	2,542	<sup>R</sup> 21,247	1,229	<sup>R</sup> 17,419	<sup>R</sup> 76,926
1995	2,791	1,183	3,172	1,061	1,243	1,921	2,207	1,701	—	14,507	1,343	2,970	2,690	<sup>R</sup> 22,206	1,349	<sup>R</sup> 18,317	<sup>R</sup> 78,660
1996	<sup>R</sup> 2,917	1,314	3,163	1,108	1,416	1,984	2,390	1,874	—	14,504	1,460	2,935	3,182	<sup>R</sup> 22,609	1,434	<sup>R</sup> 19,911	<sup>R</sup> 82,201
1997	<sup>R</sup> 2,887	1,300	3,012	1,125	1,663	2,048	2,439	1,763	—	13,434	1,601	2,832	3,013	<sup>R</sup> 22,736	1,455	<sup>R</sup> 20,794	<sup>R</sup> 82,104
1998	<sup>R</sup> 2,794	1,313	<sup>R</sup> 3,130	983	1,828	2,205	2,535	1,752	—	14,045	1,653	2,606	3,072	<sup>R</sup> 22,245	1,409	<sup>R</sup> 21,341	<sup>R</sup> 82,909
1999	<sup>R</sup> 3,105	<sup>R</sup> 1,382	<sup>R</sup> 3,151	<sup>R</sup> 1,124	<sup>R</sup> 2,112	2,396	2,646	<sup>R</sup> 1,705	—	14,013	1,632	2,755	3,259	<sup>R</sup> 22,403	1,423	<sup>R</sup> 21,966	<sup>R</sup> 85,071
2000 <sup>P</sup>	3,291	1,429	3,099	1,081	2,221	2,486	2,753	1,722	—	14,130	1,759	2,779	3,384	23,455	1,511	23,185	88,286

<sup>1</sup> Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.  
R=Revised. P=Preliminary. — = Not applicable.  
Note: Totals may not equal sum of components due to independent rounding.  
Web Page: <http://www.eia.doe.gov/international>.

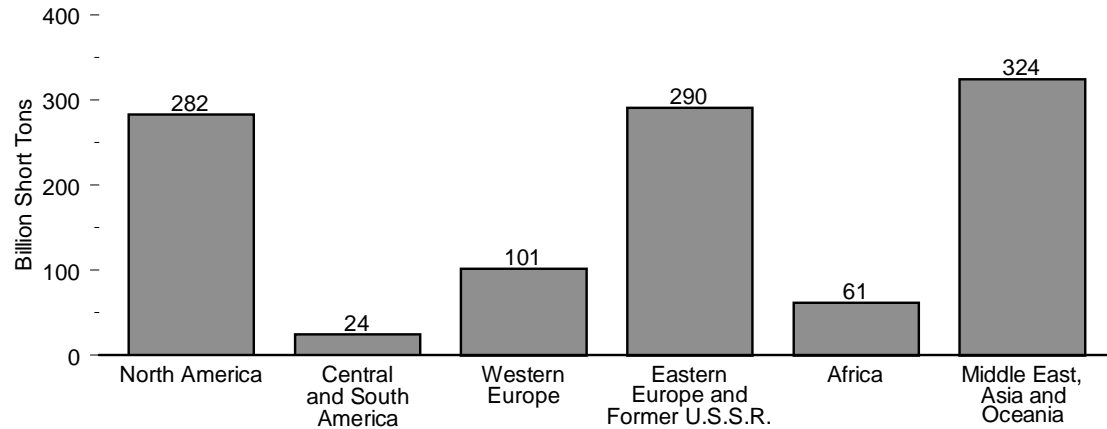
Sources: **United States:** Table 6.1. **All Other Data:** 1980-1990—Energy Information Administration (EIA), *International Energy Annual*, annual reports, and the International Energy Database. 1991 forward—EIA, *International Energy Annual 2000* (May 2002), Table 1.3, and the International Energy Database.

**Figure 11.13 World Recoverable Reserves of Coal**

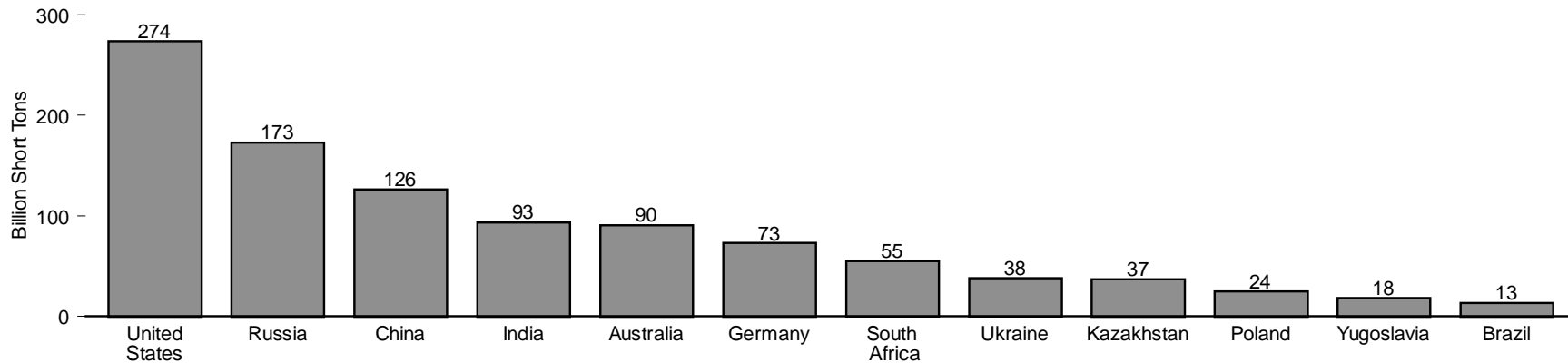
**By Type**



**By Region**



**Top Reserves Countries**



Notes: Recoverable reserves are as of December 31, 1999, except for U.S. recoverable reserves, which are as of December 31, 2000. Because vertical scales differ, graphs should not be compared.

Source: Table 11.13.

**Table 11.13 World Recoverable Reserves of Coal**  
(Million Short Tons)

Region and Country	Anthracite and Bituminous Coal	Subbituminous Coal and Lignite	Total
<b>North America</b> .....	<b>R131,579</b>	<b>R150,866</b>	<b>R 282,444</b>
Canada .....	R 3,826	R 3,425	R 7,251
Greenland .....	0	202	202
Mexico .....	948	387	1,335
United States <sup>1</sup> .....	R126,804	R146,852	R 273,656
<b>Central and South America</b> .....	<b>R 8,530</b>	<b>R 15,448</b>	<b>R 23,977</b>
Brazil .....	0	R 13,149	R 13,149
Chile .....	34	1,268	1,302
Colombia .....	R 6,908	420	R 7,328
Peru .....	1,058	110	1,168
Other .....	529	R 500	R 1,030
<b>Western Europe</b> .....	<b>R 27,650</b>	<b>R 73,693</b>	<b>R 101,343</b>
Germany .....	R 25,353	47,399	R 72,753
Greece .....	0	3,168	3,168
Turkey .....	R 306	R 3,760	R 4,066
United Kingdom .....	1,102	551	1,653
Yugoslavia .....	71	R 17,849	R 17,919
Other .....	R 818	R 966	R 1,784
<b>Eastern Europe and Former U.S.S.R.</b> .....	<b>R132,046</b>	<b>R158,138</b>	<b>R 290,183</b>
Bulgaria .....	14	2,974	2,988
Czech Republic .....	R 2,330	3,929	R 6,259
Hungary .....	R 0	R 1,209	R 1,209
Kazakhstan .....	34,172	3,307	37,479
Poland .....	R 22,377	R 2,050	R 24,427
Romania .....	1	R 1,605	R 1,606
Russia .....	54,110	118,964	173,074
Ukraine .....	R 17,939	R 19,708	R 37,647
Uzbekistan .....	1,102	3,307	4,409
Other .....	0	1,085	1,085
<b>Africa</b> .....	<b>R 60,816</b>	<b>R 216</b>	<b>R 61,032</b>
Botswana .....	R 4,740	0	R 4,740
South Africa .....	R 54,586	0	R 54,586
Zimbabwe .....	R 553	0	R 553
Other .....	R 936	R 216	R 1,152
<b>Middle East, Asia, and Oceania</b> .....	<b>R210,604</b>	<b>R113,675</b>	<b>R 324,279</b>
Australia .....	R 46,903	R 43,585	R 90,489
China .....	68,564	57,651	126,215
India .....	R 90,826	2,205	R 93,031
Indonesia .....	R 871	R 5,049	R 5,919
Japan .....	R 852	0	R 852
Pakistan .....	0	R 2,497	R 2,497
Thailand .....	0	R 1,398	R 1,398
Other .....	R 2,588	R 1,291	R 3,879
<b>World</b> .....	<b>R571,224</b>	<b>R512,035</b>	<b>R1,083,259</b>

<sup>1</sup> U.S. data are more current than other data on this table. They represent recoverable reserves as of December 31, 2000; data for the other countries are as of December 31, 1999, the most recent period for which they are available.

R=Revised.

Notes: World Energy Council data represent "Proved Recoverable Reserves," which are the tonnage within the "Proved Amount in Place" that can be recovered (extracted from the earth in raw form) under present and expected local economic conditions with existing, available technology. The EIA does not certify the international reserves data but reproduces the information as a matter of convenience for the reader. U. S. reserves represent estimated recoverable reserves from the Demonstrated Reserve Base

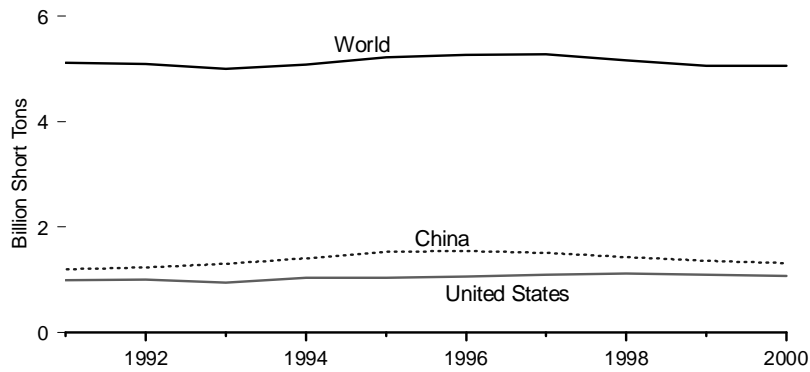
which includes both measured and indicated tonnage. The U.S. term "measured" approximates the term "proved," used by the World Energy Council. The U.S. "measured and indicated" data have been combined and cannot be recaptured as "measured alone." Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/international>.

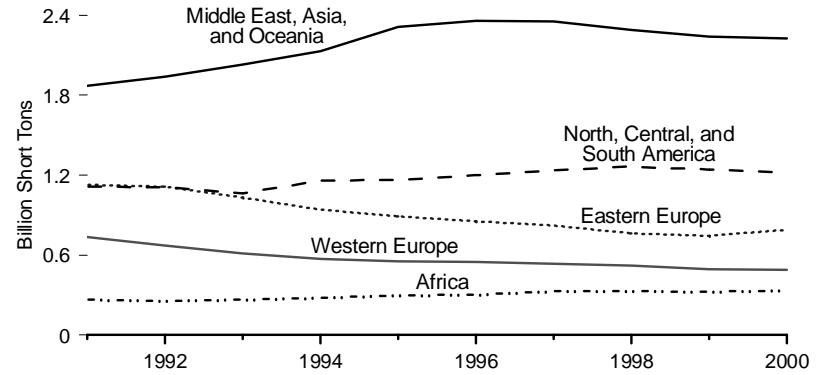
Sources: **United States:** Energy Information Administration, Coal Reserves Database (February 2002), data are as of December 31, 2000. **All Other Data:** World Energy Council, *Survey of Energy Resources 2001*, data are as of December 31, 1999.

**Figure 11.14 World Coal Production**

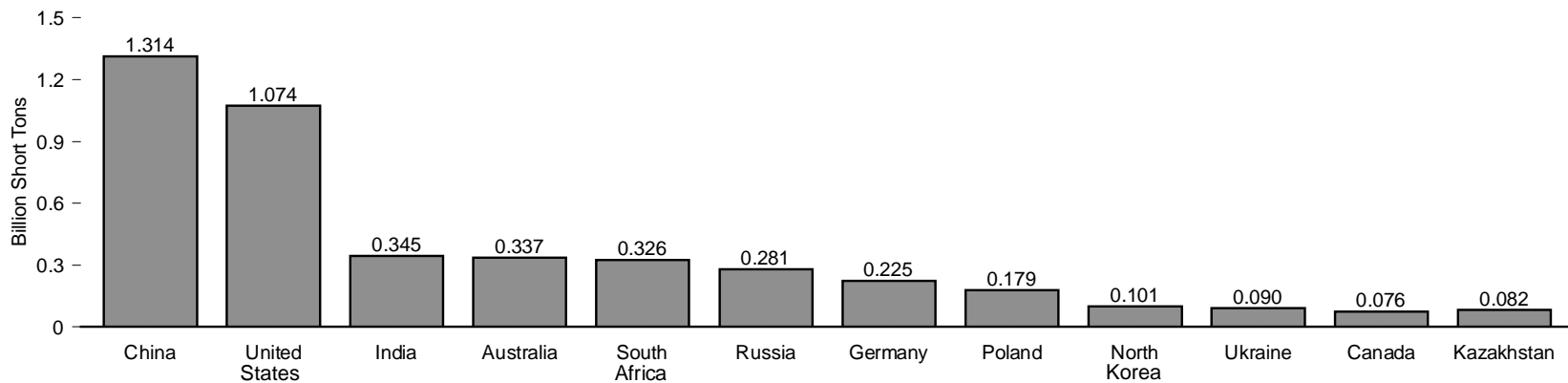
**World and Leading Producers, 1991-2000**



**World Areas, 1991-2000**



**Top Producing Countries, 2000**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.14.

**Table 11.14 World Coal Production, 1991-2000**  
(Million Short Tons)

Region and Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 <sup>P</sup>
<b>North, Central, and South America</b> .....	<b>1,115</b>	<b>1,111</b>	<b>1,064</b>	<b>1,160</b>	<b>1,165</b>	<b>R1,201</b>	<b>R1,236</b>	<b>R1,265</b>	<b>R1,241</b>	<b>1,220</b>
Canada .....	78	72	76	80	83	83	87	83	80	76
Colombia .....	22	24	23	25	28	33	36	37	36	42
Mexico .....	8	7	8	10	10	11	11	12	11	11
United States .....	996	998	945	1,034	1,033	1,064	1,090	1,118	1,100	1,074
Other .....	11	10	11	11	11	11	R12	14	R13	17
<b>Western Europe</b> .....	<b>738</b>	<b>672</b>	<b>611</b>	<b>571</b>	<b>555</b>	<b>548</b>	<b>536</b>	<b>R521</b>	<b>R496</b>	<b>490</b>
France .....	14	13	12	11	11	9	8	7	6	5
Germany .....	388	346	315	292	274	265	252	233	226	225
Greece .....	58	61	60	62	64	66	65	67	R68	69
Macedonia .....	—	8	8	8	8	8	8	9	8	8
Slovenia .....	—	6	6	5	5	5	6	R5	5	5
Spain .....	37	37	35	33	31	31	29	29	27	26
Turkey .....	51	57	54	60	61	62	66	74	74	74
United Kingdom .....	105	94	75	54	52	55	54	R44	R40	35
Yugoslavia .....	—	44	41	42	44	42	45	R49	R37	38
Other .....	84	7	6	5	5	4	4	4	4	4
<b>Eastern Europe</b> .....	<b>1,129</b>	<b>1,115</b>	<b>1,030</b>	<b>939</b>	<b>R889</b>	<b>R854</b>	<b>R821</b>	<b>R762</b>	<b>R746</b>	<b>790</b>
Bulgaria .....	31	33	32	32	34	34	33	34	29	30
Czech Republic .....	—	—	94	85	82	84	R81	R74	65	72
Hungary .....	19	17	16	16	16	17	17	R17	R17	15
Kazakhstan .....	—	139	123	115	92	85	80	R77	64	82
Poland .....	231	218	218	220	220	193	222	R196	R188	179
Romania .....	36	42	44	45	45	46	37	29	R25	32
Russia .....	—	406	364	313	296	304	R258	R241	R259	281
Ukraine .....	—	147	128	104	R95	83	85	R85	91	90
Uzbekistan .....	—	5	4	4	3	3	3	3	3	3
Other .....	812	106	7	5	5	5	5	5	R5	5
<b>Africa</b> .....	<b>R265</b>	<b>R256</b>	<b>R267</b>	<b>R281</b>	<b>R297</b>	<b>R305</b>	<b>R331</b>	<b>R329</b>	<b>R327</b>	<b>333</b>
South Africa .....	R256	R247	R258	R272	R288	R297	R325	R322	R320	326
Zimbabwe .....	6	6	6	6	6	5	4	5	R4	5
Other .....	3	3	3	3	3	2	R2	3	3	3
<b>Middle East, Asia, and Oceania</b> .....	<b>1,870</b>	<b>1,939</b>	<b>2,030</b>	<b>2,131</b>	<b>2,312</b>	<b>R2,357</b>	<b>R2,354</b>	<b>R2,292</b>	<b>R2,243</b>	<b>2,226</b>
Australia .....	236	249	248	248	267	272	292	R317	R322	337
China .....	1,199	1,229	1,304	1,404	1,537	R1,545	R1,507	R1,429	R1,365	1,314
India .....	253	270	281	280	298	315	326	322	R329	345
Indonesia .....	16	25	30	34	46	55	60	66	71	74
Mongolia .....	8	7	6	6	6	6	5	6	5	6
North Korea .....	103	105	109	108	107	106	R105	R99	R100	101
South Korea .....	17	13	10	8	6	5	5	5	5	5
Thailand .....	16	17	17	19	20	24	26	22	R20	20
Vietnam .....	5	5	7	6	9	11	13	12	R10	10
Other .....	19	19	18	18	17	17	15	14	15	15
<b>World</b> .....	<b>R5,116</b>	<b>R5,094</b>	<b>R5,003</b>	<b>R5,082</b>	<b>R5,218</b>	<b>R5,265</b>	<b>R5,278</b>	<b>R5,169</b>	<b>R5,053</b>	<b>5,059</b>

R=Revised. P=Preliminary. — = Not applicable.

Notes: Coal includes anthracite, subanthracite, bituminous coal, subbituminous coal, lignite, and brown coal. Totals may not equal sum of components due to independent rounding.

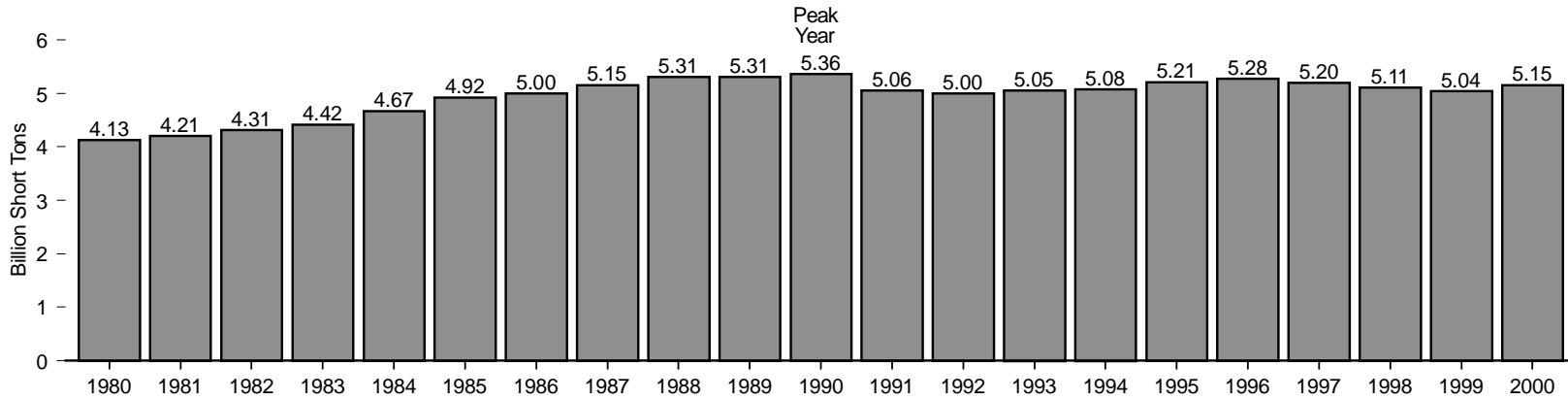
Web Page: <http://www.eia.doe.gov/international>.

Sources: **United States:** Table 7.1. **All Other Data:** Energy Information Administration, *International Energy Annual 2000* (May 2002), Table 2.5, and the International Energy Database.

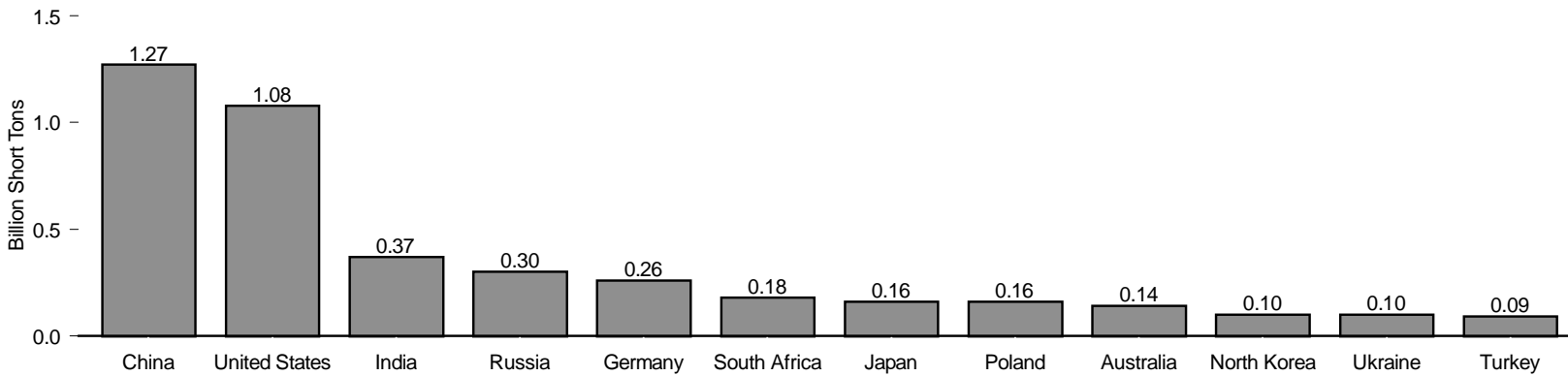


**Figure 11.15 World Coal Consumption**

**World Total, 1980-2000**



**Top Consuming Countries, 2000**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.15.

**Table 11.15 World Coal Consumption, 1980-2000**  
(Million Short Tons)

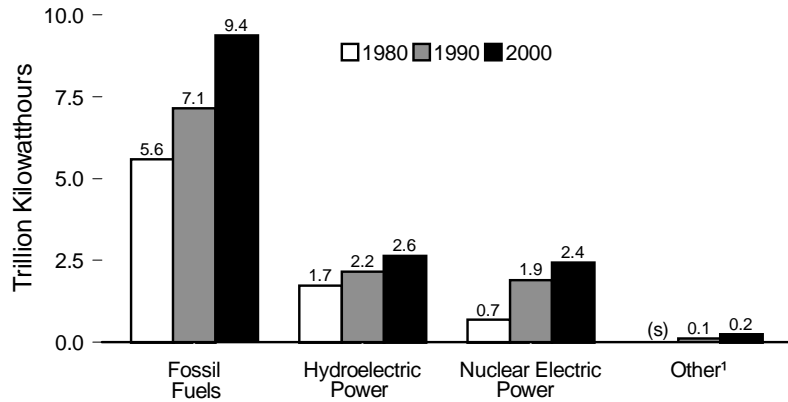
Year	Australia	China	Germany <sup>1</sup>	Greece	India	Japan	North Korea	Poland	Former U.S.S.R.	Russia	South Africa	Turkey	Ukraine	United Kingdom	United States	Other	World
1980	74	679	535	26	130	98	40	221	751	—	105	20	—	134	703	618	4,133
1981	75	680	544	30	139	106	40	200	748	—	116	23	—	130	733	641	4,206
1982	79	726	548	31	147	105	41	208	771	—	124	26	—	122	707	673	4,307
1983	78	768	549	36	160	100	44	213	764	—	127	29	—	123	737	693	4,421
1984	81	845	573	36	178	113	61	227	770	—	137	35	—	88	791	737	4,672
1985	86	921	579	42	193	119	66	238	779	—	142	46	—	116	818	772	4,917
1986	84	962	576	44	209	109	71	247	803	—	145	54	—	123	804	770	5,002
1987	93	1,027	565	49	208	111	80	258	807	—	148	54	—	129	837	789	5,155
1988	96	1,098	562	56	215	123	91	253	821	—	151	51	—	123	884	785	5,308
1989	104	1,113	553	59	226	123	96	242	777	—	140	60	—	126	895	796	<sup>R</sup> 5,311
1990	104	1,124	528	59	242	125	102	202	848	—	<sup>R</sup> 193	60	—	119	903	<sup>R</sup> 751	<sup>R</sup> 5,361
1991	108	1,165	<sup>R</sup> 408	59	252	128	105	202	672	—	<sup>R</sup> 153	64	—	118	899	<sup>R</sup> 727	<sup>R</sup> 5,060
1992	<sup>R</sup> 111	1,199	<sup>R</sup> 362	62	274	126	107	192	—	375	<sup>R</sup> 152	<sup>R</sup> 66	152	111	<sup>R</sup> 908	<sup>R</sup> 803	<sup>R</sup> 5,000
1993	109	1,276	335	62	286	<sup>R</sup> 128	112	194	—	361	<sup>R</sup> 156	<sup>R</sup> 61	135	96	<sup>R</sup> 944	<sup>R</sup> 793	<sup>R</sup> 5,048
1994	110	1,390	<sup>R</sup> 314	66	291	133	110	184	—	316	<sup>R</sup> 158	66	109	91	<sup>R</sup> 951	<sup>R</sup> 795	<sup>R</sup> 5,085
1995	112	1,498	298	64	<sup>R</sup> 312	140	109	184	—	296	<sup>R</sup> 173	67	<sup>R</sup> 110	79	962	<sup>R</sup> 804	<sup>R</sup> 5,207
1996	120	<sup>R</sup> 1,517	296	66	<sup>R</sup> 333	143	108	160	—	317	<sup>R</sup> 166	73	<sup>R</sup> 95	79	1,006	<sup>R</sup> 803	<sup>R</sup> 5,282
1997	127	<sup>R</sup> 1,450	280	66	<sup>R</sup> 343	147	<sup>R</sup> 107	182	—	<sup>R</sup> 258	<sup>R</sup> 178	80	92	70	1,030	789	<sup>R</sup> 5,201
1998	<sup>R</sup> 138	<sup>R</sup> 1,392	269	68	<sup>R</sup> 340	<sup>R</sup> 143	<sup>R</sup> 102	168	—	<sup>R</sup> 238	<sup>R</sup> 187	86	<sup>R</sup> 92	<sup>R</sup> 68	<sup>R</sup> 1,037	<sup>R</sup> 784	<sup>R</sup> 5,113
1999	142	<sup>R</sup> 1,341	<sup>R</sup> 257	<sup>R</sup> 70	<sup>R</sup> 345	149	<sup>R</sup> 103	<sup>R</sup> 161	—	<sup>R</sup> 276	<sup>R</sup> 175	84	98	<sup>R</sup> 62	<sup>R</sup> 1,039	<sup>R</sup> 744	<sup>R</sup> 5,044
2000 <sup>P</sup>	144	1,269	261	70	369	161	104	157	—	298	176	91	97	66	1,084	801	5,149

<sup>1</sup> Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.  
R=Revised. P=Preliminary. — = Not applicable.  
Note: Totals may not equal sum of components due to independent rounding.  
Web Page: <http://www.eia.doe.gov/international>.

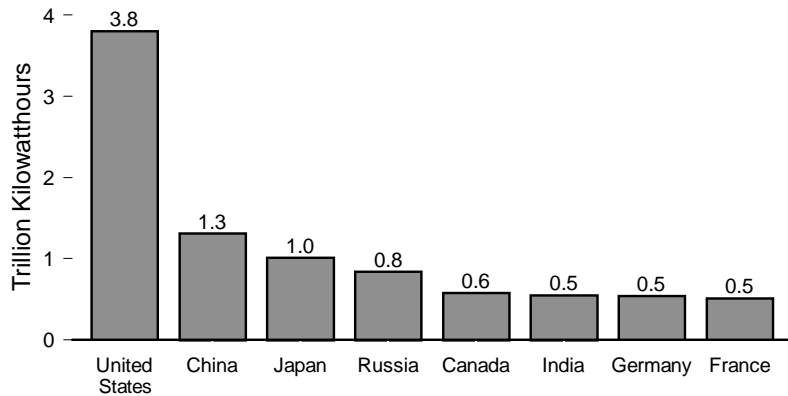
Sources: **United States:** Table 7.1. **All Other Data:** 1980-1990—Energy Information Administration (EIA), *International Energy Annual*, annual reports, and the International Energy Database. 1991 forward—EIA, *International Energy Annual 2000* (May 2002), Table 1.4, and the International Energy Database.

**Figure 11.16 World Net Generation of Electricity, 2000**

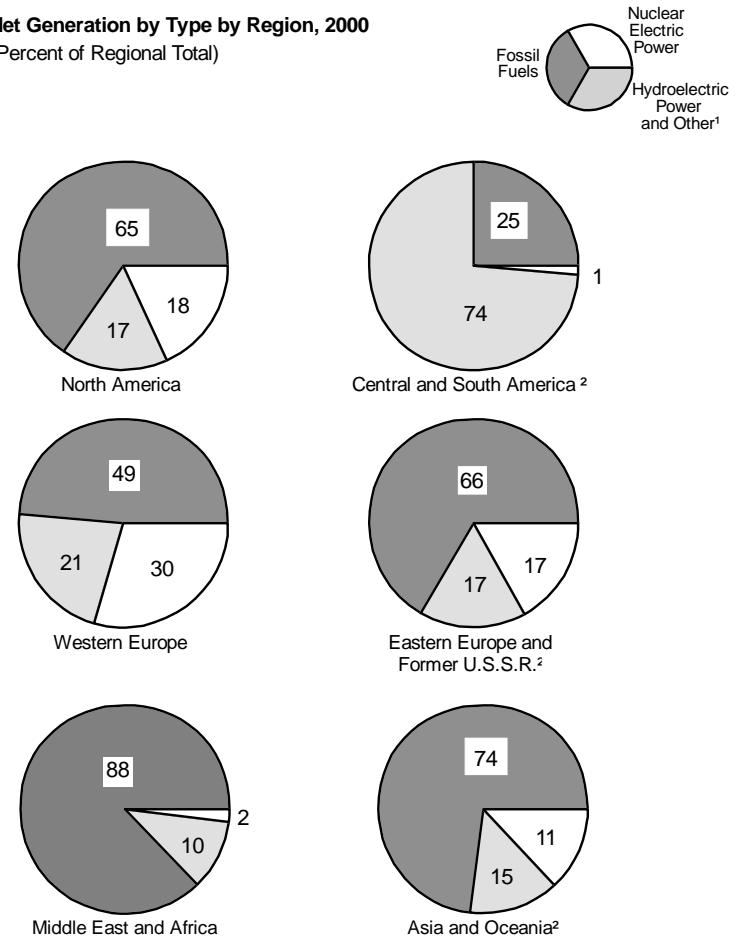
**Net Generation by Type—1980, 1990 and 2000**



**Net Generation in Leading Countries, 2000**



**Net Generation by Type by Region, 2000**  
(Percent of Regional Total)



<sup>1</sup> Wood, waste, geothermal, solar, wind, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
<sup>2</sup> Sum of components does not equal 100 percent due to independent rounding.

(s)=Less than 0.05 trillion kilowatt-hours.  
 Note: Because vertical scales differ, graphs should not be compared.  
 Source: Table 11.16.

**Table 11.16 World Net Generation of Electricity by Type, 1980, 1990, and 2000**

(Billion Kilowatthours)

Region and Country	Fossil Fuels			Nuclear Electric Power			Hydroelectric Power <sup>1</sup>			Total <sup>2</sup>		
	1980	1990	2000 <sup>P</sup>	1980	1990	2000 <sup>P</sup>	1980	1990	2000 <sup>P</sup>	1980	1990	2000 <sup>P</sup>
<b>North America</b> .....	<b>R1,880.1</b>	<b>2,286.6</b>	<b>2,986.7</b>	<b>287.0</b>	<b>648.9</b>	<b>830.4</b>	<b>546.9</b>	<b>604.8</b>	<b>655.6</b>	<b>R2,721.6</b>	<b>3,613.1</b>	<b>4,573.6</b>
Canada .....	79.8	105.5	145.8	35.9	69.2	68.7	251.0	293.9	352.8	367.9	472.3	576.2
Mexico .....	46.0	85.7	147.5	0.0	2.8	7.8	16.7	23.2	32.8	63.6	116.6	194.4
United States .....	R1,753.8	2,094.7	2,692.5	251.1	576.9	753.9	279.2	287.7	270.0	R2,289.6	3,023.6	3,802.1
Other .....	0.5	0.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.9
<b>Central and South America</b> .....	<b>99.7</b>	<b>115.6</b>	<b>194.7</b>	<b>2.2</b>	<b>9.0</b>	<b>10.9</b>	<b>201.5</b>	<b>364.7</b>	<b>554.6</b>	<b>308.2</b>	<b>497.4</b>	<b>778.8</b>
Argentina .....	22.2	20.9	42.9	2.2	7.0	6.0	17.3	20.2	33.7	41.5	48.3	82.8
Brazil .....	7.5	8.1	20.0	0.0	1.9	4.9	128.4	204.6	304.5	138.3	219.6	342.3
Paraguay .....	(s)	(s)	(s)	0.0	0.0	0.0	0.7	26.9	53.0	0.8	27.0	53.1
Venezuela .....	17.6	21.0	18.5	0.0	0.0	0.0	14.4	36.6	62.3	32.0	57.6	80.8
Other .....	52.4	65.6	113.3	0.0	0.0	0.0	40.6	76.3	101.1	95.7	144.9	219.8
<b>Western Europe</b> .....	<b>1,180.1</b>	<b>1,181.0</b>	<b>1,398.1</b>	<b>219.2</b>	<b>707.5</b>	<b>849.4</b>	<b>431.7</b>	<b>453.4</b>	<b>551.3</b>	<b>1,844.5</b>	<b>2,360.9</b>	<b>2,874.5</b>
Belgium .....	38.3	25.6	32.0	11.9	40.6	45.7	0.3	0.3	0.5	50.8	67.1	79.3
Finland .....	22.0	22.8	30.8	6.6	18.3	21.3	10.1	10.8	14.5	38.7	51.8	75.4
France .....	118.0	45.8	49.1	63.4	298.4	394.4	68.3	52.8	66.7	250.8	399.1	513.9
Germany .....	390.3	358.9	338.9	55.6	145.1	161.2	18.8	17.2	19.6	469.9	526.0	537.3
Italy .....	125.5	167.7	206.0	2.1	0.0	0.0	45.0	31.3	44.0	176.4	202.2	257.4
Netherlands .....	58.0	64.1	79.4	3.9	3.3	3.7	0.0	0.1	0.1	62.9	68.5	88.0
Norway .....	0.1	0.4	0.7	0.0	0.0	0.0	82.7	119.9	140.2	82.9	120.6	141.2
Spain .....	74.5	67.2	120.2	5.2	51.6	58.9	29.2	25.2	26.4	109.2	144.6	211.6
Sweden .....	10.1	5.0	8.8	25.3	64.8	54.1	58.1	71.8	77.8	94.3	143.3	144.6
Switzerland .....	0.9	1.1	2.5	12.9	22.4	23.7	32.5	29.5	36.5	46.4	53.6	64.2
Turkey .....	12.0	32.3	88.3	0.0	0.0	0.0	11.2	22.9	30.6	23.3	55.2	119.2
United Kingdom .....	228.9	231.3	260.5	32.3	58.7	81.7	3.9	5.1	5.2	265.1	296.5	355.8
Other .....	101.4	158.7	180.9	0.0	4.4	4.5	71.7	66.6	89.3	173.8	232.4	286.6
<b>Eastern Europe and Former U.S.S.R.</b> .....	<b>1,309.3</b>	<b>1,471.5</b>	<b>1,043.3</b>	<b>83.2</b>	<b>251.3</b>	<b>265.7</b>	<b>211.3</b>	<b>253.6</b>	<b>255.8</b>	<b>1,604.1</b>	<b>1,976.6</b>	<b>1,569.1</b>
Czech Republic .....	—	—	54.1	—	—	12.9	—	—	1.7	—	—	69.6
Kazakhstan .....	—	—	42.1	—	—	0.0	—	—	6.6	—	—	48.7
Poland .....	111.1	125.0	132.6	0.0	0.0	0.0	3.2	3.3	2.1	114.7	128.5	135.2
Romania .....	51.4	49.7	26.2	0.0	0.0	5.2	12.5	10.9	18.4	63.9	60.6	49.8
Russia .....	—	—	552.6	—	—	122.5	—	—	157.8	—	—	835.6
Ukraine .....	—	—	81.0	—	—	71.1	—	—	11.5	—	—	163.6
Other .....	1,146.8	1,296.7	154.7	83.2	251.3	54.1	195.5	239.4	57.7	1,425.6	1,787.5	266.7
<b>Middle East</b> .....	<b>82.8</b>	<b>216.3</b>	<b>429.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>9.6</b>	<b>12.4</b>	<b>14.8</b>	<b>92.4</b>	<b>228.9</b>	<b>443.9</b>
Iran .....	15.7	49.8	113.4	0.0	0.0	0.0	5.6	6.0	6.9	21.3	55.9	120.3
Saudi Arabia .....	20.5	64.9	123.5	0.0	0.0	0.0	0.0	0.0	0.0	20.5	64.9	123.5
Other .....	46.6	101.6	192.2	0.0	0.0	0.0	4.1	6.5	7.8	50.7	108.1	200.1
<b>Africa</b> .....	<b>129.1</b>	<b>243.7</b>	<b>330.2</b>	<b>0.0</b>	<b>8.4</b>	<b>13.0</b>	<b>60.6</b>	<b>55.5</b>	<b>70.7</b>	<b>189.7</b>	<b>308.1</b>	<b>414.3</b>
Egypt .....	8.6	31.5	53.7	0.0	0.0	0.0	9.7	9.9	15.9	18.3	41.4	69.6
South Africa .....	92.1	146.6	180.0	0.0	8.4	13.0	1.0	1.0	1.3	93.1	156.0	194.4
Other .....	28.4	65.6	96.5	0.0	0.0	0.0	49.9	44.7	53.4	78.4	110.7	150.3
<b>Asia and Oceania</b> .....	<b>907.7</b>	<b>1,626.8</b>	<b>2,992.4</b>	<b>92.7</b>	<b>279.9</b>	<b>464.7</b>	<b>275.2</b>	<b>420.9</b>	<b>543.2</b>	<b>1,280.5</b>	<b>2,354.6</b>	<b>4,042.6</b>
Australia .....	74.5	131.8	182.0	0.0	0.0	0.0	12.8	14.1	17.2	87.7	146.4	202.7
China .....	227.9	465.2	1,070.0	0.0	0.0	16.0	57.6	125.1	220.1	285.5	590.3	1,307.7
India .....	69.7	198.9	456.3	3.0	5.6	14.1	46.5	70.9	75.8	119.3	275.5	547.1
Indonesia .....	10.6	35.3	75.0	0.0	0.0	0.0	3.0	10.1	13.0	13.5	46.5	92.6
Japan .....	381.6	524.0	615.9	78.6	192.2	293.8	87.8	88.4	86.6	549.1	822.1	1,014.7
South Korea .....	29.8	45.5	165.7	3.3	50.2	103.5	1.5	4.6	4.0	34.6	100.4	273.2
Taiwan .....	31.3	43.6	104.1	7.8	31.6	37.0	2.9	8.2	8.7	42.0	83.3	149.8
Thailand .....	12.3	38.7	87.0	0.0	0.0	0.0	1.3	4.9	6.0	13.6	43.7	94.3
Other .....	70.1	143.8	236.5	(s)	0.4	0.4	61.8	94.5	112.0	135.3	246.4	360.6
<b>World</b> .....	<b>R5,588.8</b>	<b>7,141.4</b>	<b>9,374.6</b>	<b>684.4</b>	<b>1,905.1</b>	<b>2,434.2</b>	<b>1,736.8</b>	<b>2,165.5</b>	<b>2,646.0</b>	<b>R 8,041.1</b>	<b>11,339.6</b>	<b>14,696.7</b>

<sup>1</sup> Excludes pumped storage, except for the United States.

<sup>2</sup> Wood, waste, geothermal, solar, wind, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies are included in total.

R=Revised. P=Preliminary. — = Not applicable.

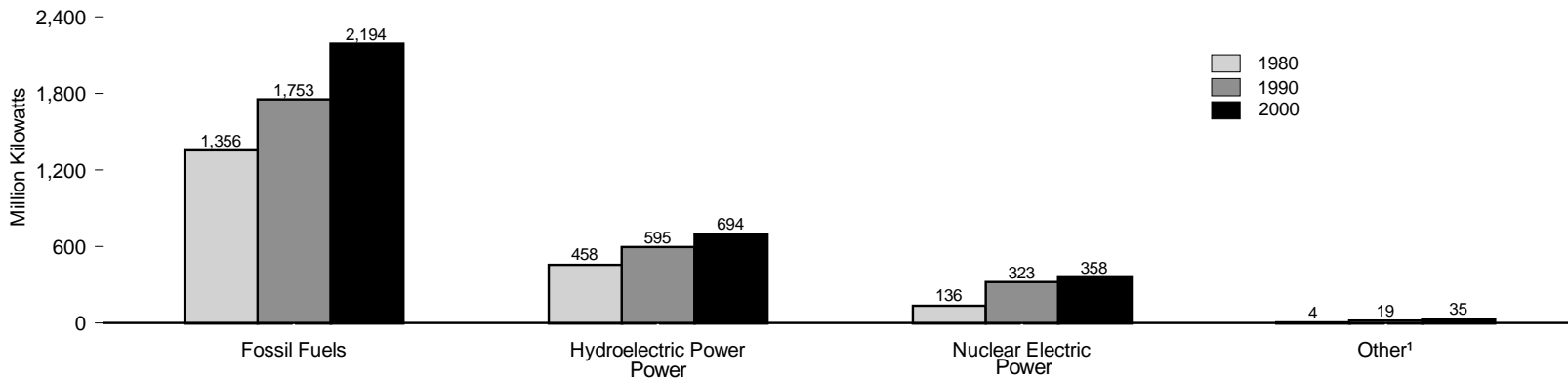
Note: Totals may not equal sum of components due to independent rounding.

 Web Page: <http://www.eia.doe.gov/international>.

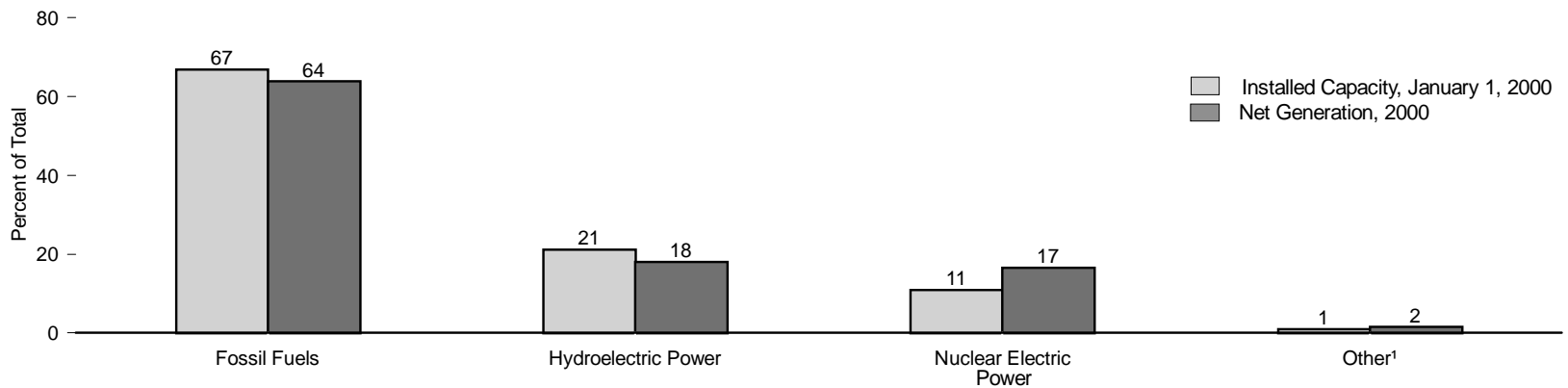
 Sources: **United States:** Tables 1.2 and 8.2a. **All Other Data:** 1980 and 1990—Energy Information Administration (EIA), International Energy Database. 2000—EIA, *International Energy Annual 2000* (May 2002).

**Figure 11.17 World Electrical Installed Capacity by Type**

By Type—1980, 1990, and 2000



Installed Capacity and Net Generation Shares by Type



<sup>1</sup> Wood, waste, geothermal, solar, wind, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous.

Note: Shares are based on data prior to rounding for publication and may not sum exactly to 100 percent.

Sources: Tables 11.16 and 11.17.

**Table 11.17 World Electrical Installed Capacity by Type, 1980, 1990, and 2000**  
(Million Kilowatts)

Region and Country	Fossil Fuels			Nuclear Electric Power			Hydroelectric Power <sup>1</sup>			Total <sup>2</sup>		
	1980	1990	2000 <sup>P</sup>	1980	1990	2000 <sup>P</sup>	1980	1990	2000 <sup>P</sup>	1980	1990	2000 <sup>P</sup>
<b>North America</b> .....	<b>R 482.4</b>	<b>578.0</b>	<b>660.5</b>	<b>R57.7</b>	<b>112.2</b>	<b>109.8</b>	<b>R 135.7</b>	<b>159.1</b>	<b>175.5</b>	<b>R676.9</b>	<b>863.4</b>	<b>962.8</b>
Canada .....	27.4	30.9	33.1	5.9	11.9	10.6	47.9	57.9	66.9	81.1	100.7	110.8
Mexico .....	10.8	19.1	27.2	0.0	0.7	1.4	6.1	7.8	9.6	17.0	28.2	39.0
United States <sup>3</sup> .....	<b>R 444.1</b>	527.8	599.8	<b>R51.8</b>	99.6	97.9	<b>R 81.7</b>	93.4	98.9	<b>R578.6</b>	734.1	812.7
Other .....	0.2	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3
<b>Central and South America</b> .....	<b>36.0</b>	<b>44.9</b>	<b>64.5</b>	<b>0.4</b>	<b>1.7</b>	<b>1.7</b>	<b>43.0</b>	<b>84.1</b>	<b>112.1</b>	<b>81.2</b>	<b>132.8</b>	<b>181.4</b>
Argentina .....	8.0	9.5	12.9	0.4	1.0	1.0	3.6	6.6	9.6	12.0	17.2	23.5
Brazil .....	4.1	4.7	6.4	0.0	0.7	0.7	27.5	44.8	59.0	33.4	52.1	68.8
Paraguay .....	0.1	(s)	(s)	0.0	0.0	0.0	0.2	5.8	7.4	0.2	5.8	7.4
Venezuela .....	5.8	8.5	8.1	0.0	0.0	0.0	2.7	10.0	13.2	8.5	18.5	21.3
Other .....	18.0	22.1	37.1	0.0	0.0	0.0	9.0	16.9	22.9	27.1	39.2	60.3
<b>Western Europe</b> .....	<b>294.9</b>	<b>318.2</b>	<b>352.8</b>	<b>44.7</b>	<b>117.7</b>	<b>128.5</b>	<b>126.7</b>	<b>141.0</b>	<b>142.1</b>	<b>467.0</b>	<b>578.2</b>	<b>633.4</b>
Belgium .....	8.2	7.2	8.4	1.7	5.5	5.7	0.7	0.1	0.1	10.6	12.8	14.3
Finland .....	6.3	7.8	10.6	2.2	2.4	2.6	2.4	2.6	2.9	11.0	12.7	16.2
France .....	30.0	22.8	26.2	14.4	52.5	63.2	16.4	20.3	20.8	61.0	95.9	110.5
Germany .....	84.0	88.2	79.4	10.4	24.5	22.3	7.9	8.7	3.0	102.4	121.4	108.8
Italy .....	29.1	37.6	52.4	1.4	0.0	0.0	15.8	12.6	13.4	46.8	50.6	66.8
Netherlands .....	16.8	16.8	19.7	0.5	0.5	0.4	0.0	(s)	(s)	17.3	17.3	20.7
Norway .....	0.2	0.3	0.3	0.0	0.0	0.0	19.8	25.7	27.0	20.0	26.0	27.2
Spain .....	15.4	20.0	25.6	1.1	7.5	7.4	13.5	11.6	11.8	29.9	39.1	46.3
Sweden .....	7.9	7.9	6.9	4.6	9.9	10.1	14.9	15.8	16.4	27.4	33.5	33.5
Switzerland .....	0.7	0.8	0.9	1.9	3.0	3.1	11.5	10.1	10.4	14.1	13.9	14.4
Turkey .....	3.0	9.2	15.6	0.0	0.0	0.0	2.1	6.6	10.5	5.1	15.8	26.1
United Kingdom .....	64.7	58.8	57.8	6.5	11.4	13.0	2.5	1.4	1.5	73.6	71.6	72.4
Other .....	28.4	41.0	49.1	0.0	0.7	0.7	19.3	25.5	24.4	47.7	67.6	76.3
<b>Eastern Europe and Former U.S.S.R.</b> .....	<b>261.1</b>	<b>313.5</b>	<b>297.9</b>	<b>14.2</b>	<b>45.8</b>	<b>47.8</b>	<b>61.6</b>	<b>78.3</b>	<b>80.3</b>	<b>336.9</b>	<b>437.6</b>	<b>426.0</b>
Czech Republic .....	—	—	11.3	—	—	1.8	—	—	1.0	—	—	14.1
Kazakhstan .....	—	—	15.1	—	—	0.0	—	—	2.2	—	—	17.3
Poland .....	23.4	28.8	28.6	0.0	0.0	0.0	1.3	2.0	2.2	24.7	30.8	30.7
Romania .....	12.7	17.3	15.6	0.0	0.0	0.7	3.5	5.6	5.9	16.1	22.9	22.2
Russia .....	—	—	138.1	—	—	21.2	—	—	43.4	—	—	202.8
Ukraine .....	—	—	36.3	—	—	12.9	—	—	4.7	—	—	53.9
Other .....	225.0	267.4	52.9	14.2	45.8	11.2	56.9	70.7	20.9	296.1	384.0	85.0
<b>Middle East</b> .....	<b>27.9</b>	<b>68.2</b>	<b>94.4</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>2.6</b>	<b>4.8</b>	<b>4.1</b>	<b>30.4</b>	<b>73.0</b>	<b>98.5</b>
Iran .....	9.4	15.5	28.6	0.0	0.0	0.0	1.8	2.0	2.0	11.2	17.4	30.6
Saudi Arabia .....	5.9	19.1	22.9	0.0	0.0	0.0	0.0	0.0	0.0	5.9	19.1	22.9
Other .....	12.5	33.7	42.9	0.0	0.0	0.0	0.8	2.8	2.1	13.3	36.5	45.0
<b>Africa</b> .....	<b>30.5</b>	<b>57.4</b>	<b>72.8</b>	<b>0.0</b>	<b>1.8</b>	<b>1.8</b>	<b>13.9</b>	<b>18.5</b>	<b>19.9</b>	<b>44.5</b>	<b>77.8</b>	<b>94.6</b>
Egypt .....	2.4	8.7	10.5	0.0	0.0	0.0	2.4	2.7	2.8	4.9	11.5	13.3
South Africa .....	17.8	28.6	37.3	0.0	1.8	1.8	0.5	0.6	0.7	18.4	31.0	39.8
Other .....	10.3	20.1	25.0	0.0	0.0	0.0	10.9	15.2	16.4	21.2	35.4	41.4
<b>Asia and Oceania</b> .....	<b>223.1</b>	<b>372.9</b>	<b>650.7</b>	<b>18.5</b>	<b>43.9</b>	<b>68.6</b>	<b>74.4</b>	<b>109.3</b>	<b>159.7</b>	<b>316.7</b>	<b>527.6</b>	<b>883.4</b>
Australia .....	18.1	29.3	36.5	0.0	0.0	0.0	6.2	7.3	6.1	24.2	36.5	42.6
China .....	45.6	92.1	221.5	0.0	0.0	2.2	20.3	34.6	70.0	65.9	126.6	293.7
India .....	20.7	51.9	80.3	0.9	1.6	2.2	11.8	18.3	24.5	33.3	71.8	108.1
Indonesia .....	3.9	9.6	17.2	0.0	0.0	0.0	1.0	3.0	3.0	4.9	12.7	20.6
Japan .....	98.1	125.0	161.9	15.7	29.4	45.2	19.6	20.4	21.6	133.4	175.1	229.2
South Korea .....	6.5	11.0	34.7	0.6	7.6	13.7	0.8	1.3	1.5	7.9	20.0	50.0
Taiwan .....	6.9	10.2	16.3	1.3	5.1	5.1	1.4	2.6	4.3	9.6	17.9	25.7
Thailand .....	2.6	6.0	15.8	0.0	0.0	0.0	1.3	2.3	2.9	3.8	8.3	18.7
Other .....	20.8	37.8	66.4	0.1	0.1	0.1	12.1	19.6	25.8	33.6	58.6	94.6
<b>World</b> .....	<b>R1,355.9</b>	<b>1,753.2</b>	<b>2,193.6</b>	<b>R135.5</b>	<b>323.1</b>	<b>358.3</b>	<b>R457.9</b>	<b>595.1</b>	<b>693.7</b>	<b>R1,953.7</b>	<b>2,690.4</b>	<b>3,280.1</b>

<sup>1</sup> Excludes pumped storage, except for the United States.

<sup>2</sup> Wood, waste, geothermal, solar, wind, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies are included in total.

<sup>3</sup> Net summer capacity at end of previous year. See Table 8.7a.

R=Revised. P=Preliminary. — = Not applicable. (s)=Less than 0.05 million kilowatts.

Notes: Capacity for all years is as of January 1. Totals may not equal sum of components due to

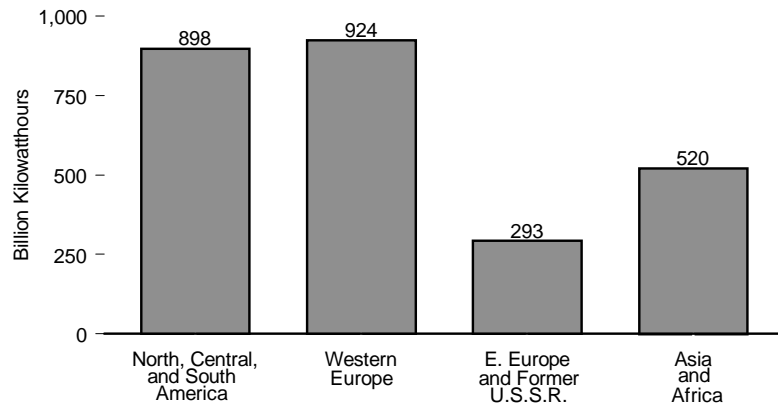
independent rounding.

Web Page: <http://www.eia.doe.gov/international>.

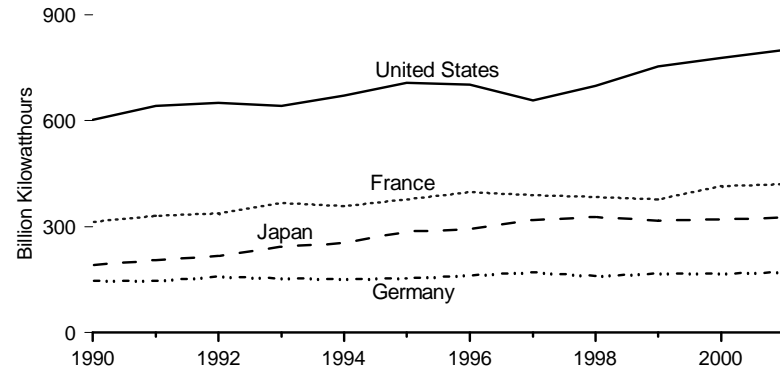
Sources: **United States:** Table 8.7a **All Other Data:** 1980 and 1990—Energy Information Administration (EIA), International Energy Database. 2000—EIA, *International Energy Annual 2000* (May 2002), Table 6.4, and the International Energy Database.

**Figure 11.18 World Nuclear Electricity Gross Generation**

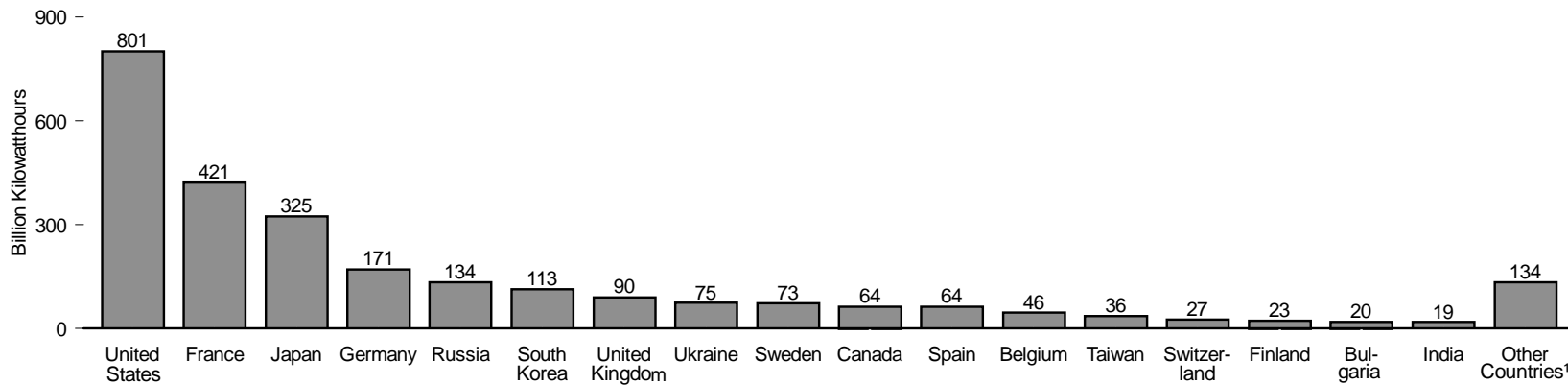
**By Region, 2001**



**By Major Producer, 1991-2001**



**By Country, 2001**



<sup>1</sup> Argentina, Armenia, Brazil, China, Czech Republic, Hungary, Lithuania, Mexico, Netherlands, Pakistan, Romania, Slovakia, Slovenia, and South Africa.

Note: Because vertical scales differ, graphs should not be compared.  
Source: Table 11.18.

**Table 11.18 World Nuclear Electricity Gross Generation, 1991-2001**  
(Billion Kilowatthours)

Region and Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>North America</b> .....	<b>733.4</b>	<b>735.2</b>	<b>744.6</b>	<b>787.3</b>	<sup>E</sup> 816.1	<sup>E</sup> 806.4	<sup>E</sup> 752.8	<sup>E</sup> 781.0	<sup>E</sup> 837.3	<sup>E</sup> 860.3	<sup>E</sup> 873.5
Canada .....	86.1	81.3	97.6	110.7	100.4	95.2	84.1	<sup>E</sup> 72.7	73.9	73.8	<sup>E</sup> 64.1
Mexico .....	4.2	3.9	4.9	4.2	7.9	7.9	10.4	9.5	10.0	8.2	8.7
United States <sup>1</sup> .....	643.0	650.0	642.0	672.4	<sup>E</sup> 707.7	<sup>E</sup> 703.3	<sup>E</sup> 658.3	<sup>E</sup> 698.7	<sup>E</sup> 753.4	<sup>E</sup> 778.3	<sup>E</sup> 800.6
<b>Central and South America</b> .....	<b>9.2</b>	<b>8.8</b>	<b>8.1</b>	<b>8.2</b>	<b>9.6</b>	<b>9.8</b>	<b>11.1</b>	<b>10.8</b>	<b>11.1</b>	<sup>E</sup> 11.5	<sup>E</sup> 24.9
Argentina .....	7.7	7.1	7.7	8.2	7.1	7.4	8.0	7.5	7.1	6.3	<sup>E</sup> 7.0
Brazil .....	1.4	1.8	0.4	0.0	2.5	2.4	3.2	3.3	4.0	<sup>E</sup> 5.2	<sup>E</sup> 17.8
<b>Western Europe</b> .....	<b>769.7</b>	<sup>E</sup> 787.8	<b>820.9</b>	<b>820.2</b>	<sup>E</sup> 835.7	<sup>E</sup> 879.5	<sup>E</sup> 886.5	<sup>E</sup> 884.2	<sup>E</sup> 878.1	<sup>E</sup> 893.1	<sup>E</sup> 923.6
Belgium .....	42.9	43.5	41.9	40.6	41.4	43.3	47.4	46.1	49.0	<sup>E</sup> 47.8	<sup>E</sup> 45.8
Finland .....	19.2	19.0	19.6	19.1	18.9	19.5	20.9	21.9	23.0	22.5	22.8
France .....	331.4	337.6	366.7	359.1	377.6	397.0	389.3	<sup>E</sup> 384.4	<sup>E</sup> 377.4	415.2	421.1
Germany .....	147.3	158.8	153.5	151.1	154.3	161.7	170.4	161.0	167.8	<sup>E</sup> 168.3	171.3
Netherlands .....	3.3	3.8	3.9	4.0	4.0	4.2	3.1	3.8	3.8	3.9	4.0
Slovenia .....	NA	<sup>E</sup> 4.0	4.0	4.6	4.8	4.6	5.4	5.3	<sup>E</sup> 4.7	<sup>E</sup> 5.0	5.3
Spain .....	55.6	55.8	56.1	55.1	54.5	59.1	55.4	<sup>E</sup> 58.6	58.9	<sup>E</sup> 62.0	63.7
Sweden .....	76.8	63.5	61.4	72.8	69.9	76.2	<sup>E</sup> 70.6	73.8	<sup>E</sup> 74.5	57.2	<sup>E</sup> 72.8
Switzerland .....	22.9	23.4	23.3	24.2	24.8	25.0	25.3	25.7	24.8	<sup>E</sup> 26.3	26.7
United Kingdom .....	70.4	78.5	90.4	89.5	<sup>E</sup> 85.5	<sup>E</sup> 88.8	<sup>E</sup> 98.8	<sup>E</sup> 103.7	<sup>E</sup> 94.1	<sup>E</sup> 84.9	<sup>E</sup> 90.3
<b>Eastern Europe <sup>2</sup> and Former U.S.S.R.</b> ...	NA	<sup>E</sup> 267.5	<sup>E</sup> 259.0	<sup>E</sup> 227.8	<sup>E</sup> 234.9	<sup>E</sup> 261.6	<sup>E</sup> 247.1	<sup>E</sup> 248.9	<sup>E</sup> 264.7	<sup>R</sup> <sup>E</sup> 282.2	<sup>E</sup> 292.8
Armenia .....	—	—	—	—	NA	NA	1.4	1.6	2.4	<sup>E</sup> 1.9	<sup>E</sup> 2.0
Bulgaria .....	NA	<sup>E</sup> 12.2	14.0	14.9	17.2	18.7	<sup>E</sup> 15.5	<sup>E</sup> 19.2	<sup>E</sup> 19.0	<sup>R</sup> 18.2	19.6
Czech Republic .....	NA	<sup>E</sup> 12.9	<sup>E</sup> 13.2	<sup>E</sup> 12.7	<sup>E</sup> 12.8	<sup>E</sup> 13.5	NA	7.6	13.4	<sup>E</sup> 13.8	14.8
Hungary .....	NA	<sup>E</sup> 13.8	13.8	14.0	14.0	14.2	14.0	13.9	<sup>E</sup> 14.2	14.2	<sup>E</sup> 14.2
Kazakhstan .....	NA	<sup>E</sup> 0.5	<sup>E</sup> 0.4	<sup>E</sup> 0.4	<sup>E</sup> 0.4	<sup>E</sup> 0.1	<sup>E</sup> 0.3	NA	0.0	0.0	0.0
Lithuania .....	NA	<sup>E</sup> 16.4	<sup>E</sup> 12.9	<sup>E</sup> 7.0	<sup>E</sup> 9.7	<sup>E</sup> 13.6	12.1	13.5	9.9	8.7	<sup>E</sup> 10.2
Romania .....	—	—	—	—	—	<sup>E</sup> 1.0	3.9	5.1	5.2	<sup>E</sup> 5.5	<sup>E</sup> 5.4
Russia .....	NA	<sup>E</sup> 125.6	120.4	97.7	98.3	108.8	108.1	103.7	118.0	128.9	134.4
Slovakia .....	NA	<sup>E</sup> 11.7	<sup>E</sup> 11.6	<sup>E</sup> 12.7	<sup>E</sup> 12.0	<sup>E</sup> 11.8	11.0	10.3	10.5	16.2	<sup>E</sup> 17.5
Ukraine .....	NA	<sup>E</sup> 74.6	<sup>E</sup> 72.7	68.4	70.4	80.0	80.8	<sup>E</sup> 74.0	<sup>E</sup> 72.2	<sup>E</sup> 74.8	<sup>E</sup> 74.6
<b>Africa</b> .....	<b>9.7</b>	<b>9.9</b>	<b>7.7</b>	<b>10.3</b>	<b>11.9</b>	<sup>E</sup> 12.5	<b>13.3</b>	<b>14.3</b>	<b>13.5</b>	<sup>E</sup> 13.6	<b>11.3</b>
South Africa .....	9.7	9.9	7.7	10.3	11.9	<sup>E</sup> 12.5	13.3	14.3	13.5	<sup>E</sup> 13.6	11.3
<b>Asia</b> .....	<b>303.3</b>	<b>315.2</b>	<sup>E</sup> 345.2	<sup>E</sup> 366.7	<sup>E</sup> 407.0	<sup>E</sup> 426.4	<sup>E</sup> 456.2	<sup>E</sup> 477.2	<sup>E</sup> 478.0	<sup>E</sup> 497.1	<sup>E</sup> 508.8
China .....	—	—	<sup>E</sup> 2.6	<sup>E</sup> 14.2	<sup>E</sup> 13.0	<sup>E</sup> 14.3	<sup>E</sup> 11.4	<sup>E</sup> 14.5	<sup>E</sup> 14.6	<sup>E</sup> 14.7	<sup>E</sup> 13.7
India .....	5.4	6.3	6.2	5.0	<sup>E</sup> 8.0	8.3	<sup>E</sup> 11.0	<sup>E</sup> 11.2	<sup>E</sup> 13.2	<sup>E</sup> 14.8	19.2
Japan .....	205.8	218.0	243.5	253.8	286.1	293.2	318.0	326.9	317.4	319.8	<sup>E</sup> 324.9
Pakistan .....	0.4	0.6	0.4	0.6	0.5	0.4	0.4	0.4	0.1	0.4	2.2
South Korea .....	56.3	56.4	58.1	58.3	64.0	72.5	78.9	87.3	94.6	108.9	<sup>E</sup> 113.3
Taiwan .....	35.3	33.8	34.3	34.8	35.3	37.8	36.6	36.9	38.2	38.5	35.5
<b>World</b> .....	<b>1,825.2</b>	<sup>E</sup> 2,124.5	<sup>E</sup> 2,185.6	<sup>E</sup> 2,220.4	<sup>E</sup> 2,315.1	<sup>E</sup> 2,396.3	<sup>E</sup> 2,367.0	<sup>E</sup> 2,416.4	<sup>E</sup> 2,482.6	<sup>R</sup> <sup>E</sup> 2,557.8	<sup>E</sup> 2,634.9

<sup>1</sup> See Note 2 at end of section.

<sup>2</sup> The gross generation estimates for 1992 through 1997 for Eastern European countries are calculated as 5 percent more than the annual net nuclear generation reported by the International Atomic Energy Agency and published annually in *Nuclear Power Reactors in the World*.

<sup>3</sup> There is a data discontinuity between 1991 and 1992; beginning with 1992, data for Eastern Europe and the Former U.S.S.R. are included for the first time.

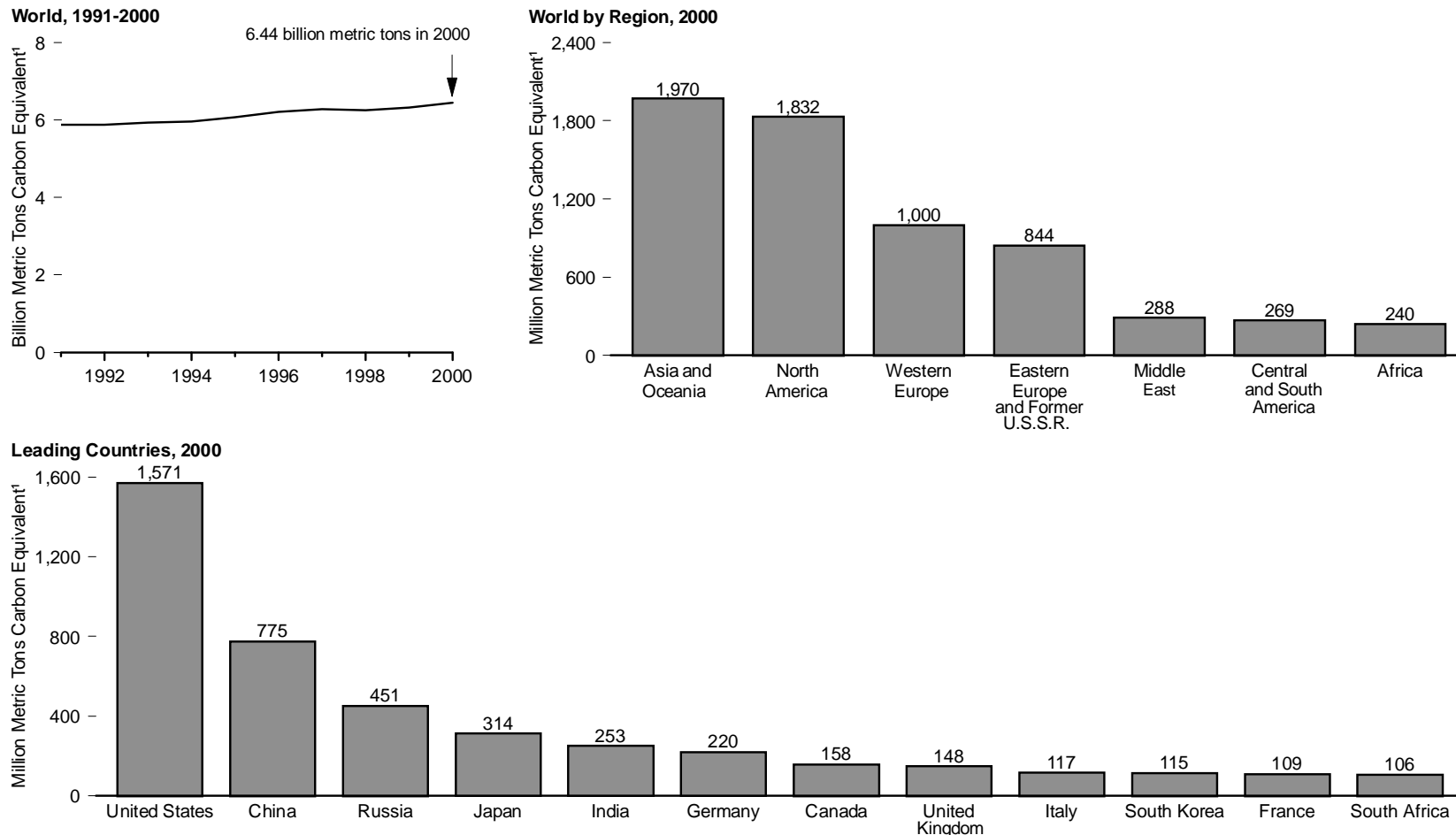
R=Revised. E=Estimate. NA=Not available. — = Not applicable.

Note: Totals may not equal sum of components due to independent rounding.

Sources: **France:** 2000 and 2001—Ministry of Industry, General Directorate for Energy and Raw Material. **Bulgaria 2000 and 2001:** **Czech Republic 2001:** NucNet, an on-line service. Used with permission. **All Other Data:** *Nucleonics Week*, a copyrighted publication of The McGraw-Hill Publishing Companies, Inc. Used with permission.



**Figure 11.19 World Carbon Dioxide Emissions From Energy Consumption and Natural Gas Flaring**



<sup>1</sup> Tons of carbon equivalent can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon equivalent = 3.667 tons of carbon dioxide gas.

Note: Because vertical scales differ, graphs should not be compared.  
Source: Table 11.19.

**Table 11.19 World Carbon Dioxide Emissions From Energy Consumption and Natural Gas Flaring, 1991-2000**  
(Million Metric Tons Carbon Equivalent<sup>1</sup>)

Region and Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 <sup>P</sup>
<b>North America</b>	<b>R1,553</b>	<b>1,577</b>	<b>R1,608</b>	<b>R1,642</b>	<b>R1,652</b>	<b>R1,712</b>	<b>1,744</b>	<b>1,757</b>	<b>R1,784</b>	<b>1,832</b>
Canada	125	R125	130	135	135	R138	R146	R149	R153	158
Mexico	84	86	85	90	R87	R92	R95	R104	R104	103
United States <sup>2</sup>	R1,343	1,366	1,393	R1,417	1,430	1,481	R1,503	1,504	R1,526	1,571
Other	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)
<b>Central and South America</b>	<b>R204</b>	<b>R209</b>	<b>R218</b>	<b>R224</b>	<b>R236</b>	<b>R244</b>	<b>R254</b>	<b>263</b>	<b>R265</b>	<b>269</b>
Argentina	30	31	33	32	33	35	35	37	R36	36
Brazil	R71	R72	R74	R78	R82	R84	R87	88	R92	95
Venezuela	31	31	31	33	34	36	37	R39	R36	35
Other	72	75	79	81	86	89	95	100	R101	102
<b>Western Europe</b>	<b>R1,003</b>	<b>R966</b>	<b>R958</b>	<b>R953</b>	<b>R973</b>	<b>R1,000</b>	<b>R1,006</b>	<b>R1,006</b>	<b>R984</b>	<b>1,000</b>
Belgium	35	34	34	35	35	R38	38	40	38	40
France	108	104	100	97	101	R106	104	110	109	109
Germany	R252	R242	241	R237	239	240	R239	R235	R223	220
Italy	R113	114	110	108	118	R118	R113	R115	R113	117
Netherlands	59	58	60	60	61	62	R64	R62	R61	64
Spain	64	66	62	64	67	R64	73	R74	R79	81
Turkey	38	R38	39	38	41	R46	R49	50	R49	55
United Kingdom	166	157	R158	155	153	R160	154	R149	R144	148
Other	167	155	154	R159	R158	R167	171	R171	R168	166
<b>Eastern Europe and Former U.S.S.R.</b>	<b>R1,190</b>	<b>R1,124</b>	<b>R1,034</b>	<b>914</b>	<b>R877</b>	<b>R861</b>	<b>R807</b>	<b>R790</b>	<b>R824</b>	<b>844</b>
Former Czechoslovakia	R71	R66	—	—	—	—	—	—	—	—
Poland	89	89	92	87	83	78	91	85	R82	81
Romania	37	35	34	32	33	34	33	27	R24	25
Former U.S.S.R.	957	—	—	—	—	—	—	—	—	—
Russia	—	574	536	477	R445	R445	R395	R396	R440	451
Ukraine	—	156	145	121	R122	R109	102	R100	R105	104
Other	R36	R206	R227	197	195	R195	186	R182	R173	183
<b>Middle East</b>	<b>R217</b>	<b>R224</b>	<b>R234</b>	<b>R244</b>	<b>R251</b>	<b>R259</b>	<b>272</b>	<b>R277</b>	<b>R281</b>	<b>288</b>
Iran	62	64	65	68	71	71	R79	R78	R80	81
Saudi Arabia	63	64	65	67	69	R73	72	R70	R71	75
Other	R92	R95	R103	R109	R115	R115	R122	R129	R130	132
<b>Africa</b>	<b>R205</b>	<b>R206</b>	<b>R213</b>	<b>R216</b>	<b>R226</b>	<b>R224</b>	<b>238</b>	<b>R246</b>	<b>R238</b>	<b>240</b>
Egypt	26	26	26	27	27	R29	31	32	R32	33
South Africa	R86	R86	R88	R88	R96	R91	R107	R113	R105	106
Other	R93	R94	99	R100	R103	R104	R101	R102	R102	101
<b>Asia and Oceania</b>	<b>R1,510</b>	<b>R1,575</b>	<b>R1,674</b>	<b>R1,770</b>	<b>R1,860</b>	<b>R1,913</b>	<b>R1,955</b>	<b>R1,915</b>	<b>R1,946</b>	<b>1,970</b>
Australia	73	R75	77	77	80	R81	R90	R90	R96	97
China	646	668	712	768	788	R803	R824	R805	R792	775
India	161	176	186	190	R226	R228	R231	R235	R240	253
Indonesia	43	47	54	56	R58	R64	R67	R64	R67	69
Japan	280	286	283	299	298	R308	R309	300	307	314
North Korea	R70	R71	R74	R73	R72	R71	R67	R64	R65	66
South Korea	R73	R78	R91	R99	R109	R112	R118	101	R105	115
Taiwan	34	35	43	44	R52	R56	58	R61	R67	69
Thailand	25	27	32	35	43	46	R46	R43	45	45
Other	105	111	R124	129	R135	R145	R145	R151	R161	167
<b>World</b>	<b>R5,882</b>	<b>R5,880</b>	<b>R5,939</b>	<b>R5,963</b>	<b>R6,075</b>	<b>R6,214</b>	<b>R6,275</b>	<b>R6,254</b>	<b>R6,323</b>	<b>6,443</b>

<sup>1</sup> Tons of carbon equivalent can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon equivalent = 3.667 tons of carbon dioxide gas.

<sup>2</sup> Data, when converted to million metric tons of carbon dioxide gas, may differ from the values shown for the United States in Table 12.1 because they exclude carbon dioxide emissions from geothermal, cement production, other industrial sources, waste combustion, and U.S. Territories, and include emissions from bunker fuels consumption.

R=Revised. P=Preliminary. — = Not applicable. (s)=Less than 0.5 million metric tons.  
Notes: See Note 3 at end of section. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/international>.  
Source: Energy Information Administration, *International Energy Annual 2000* (May 2002), Table H1, and the International Energy Database.

## International Energy

**Note 1.** World primary energy production includes production of crude oil (including lease condensate), natural gas plant liquids, dry natural gas, and coal; and net electricity generation from nuclear electric power, hydroelectric power, wood, waste, geothermal, solar, and wind. Data for the United States also include other renewable energy. Crude oil production is measured at the wellhead and includes lease condensate. Natural gas plant liquids are products obtained from processing natural gas at natural gas processing plants, including natural gas plants, cycling plants, and fractionators. Dry natural gas production is that amount of natural gas produced that is available to be marketed and consumed as a gas. Coal (anthracite, bituminous, subbituminous, and lignite) production is the sum of sales, mine consumption, issues to miners, and issues to coking, briquetting, and other ancillary plants at mines. Coal production data include quantities extracted from surface and underground mines and normally exclude wastes removed at mines or associated preparation plants. The data on generation of electricity from nuclear electric power, hydroelectric power, wood, waste, geothermal, solar, and wind include data reported on a net basis, thus excluding electricity that is generally used by the electric power plant for its own operating purposes or electricity losses in the transformers that are considered integral parts of the station.

**Note 2.** Nuclear electricity generation data in Table 11.18 are for gross output of electricity (measured at the generator terminals). Data on the gross generation of electricity in the United States are derived from data for net generation, which is gross output of electricity minus power plant use.

**Note 3.** Data for carbon dioxide emissions include anthropogenic (human-caused) emissions from the consumption of petroleum, natural gas, and coal, and the flaring of natural gas. They do not include carbon dioxide emissions from cement production and other industrial sources. Hydrocarbon consumption and flaring statistics for each country have been reduced to account for the fraction of fuels not combusted and, in the case of petroleum, for the fraction of sequestration of non-fuel uses. Carbon dioxide emissions have been determined by applying carbon emission coefficients to the adjusted consumption and flaring data. Carbon emission coefficients for petroleum, natural gas, and flared gas are from Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2000*, DOE/EIA-0573(2000), October 2001, Table B1 at: <http://www.eia.doe.gov/oiaf/1605/ggrpt/appendixb.html>. Carbon emission coefficients for coal are from Energy Information Administration, *Emissions of Greenhouse Gases in the United States 1985-1990*, DOE/EIA-0573, October 1993, Table 11.

# 12

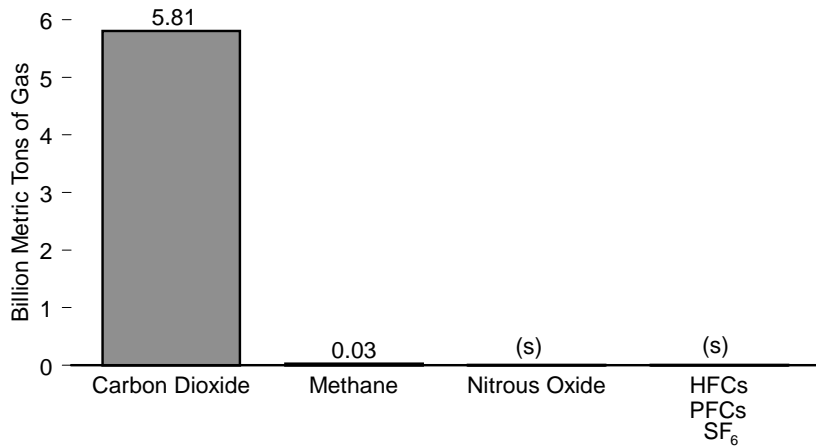
## Environmental Indicators



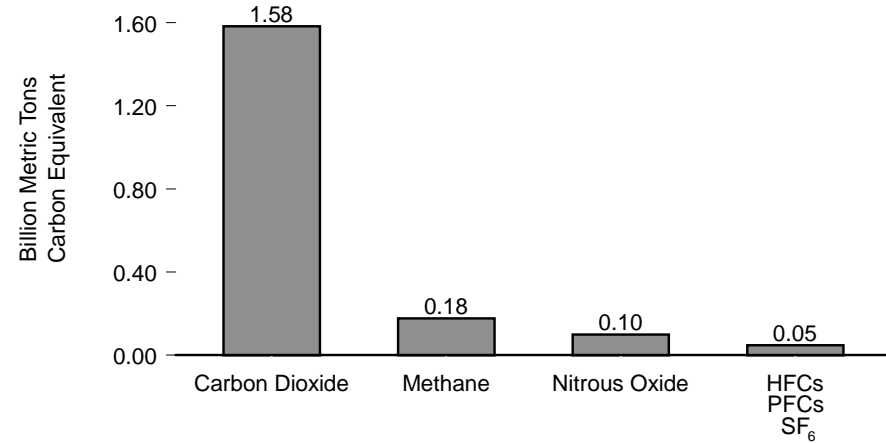
“Harpers Ferry, Junction of the Rivers Shenandoah and Potomac.” Engraving by W. Goodacre and James Archer, published in *The History and Topography of the United States of North America*, by John Howard Hinton, 1852. From the collection of the National Park Service, Harpers Ferry National Historical Park, Accession #1297.

**Figure 12.1 Estimated Emissions of Greenhouse Gases**

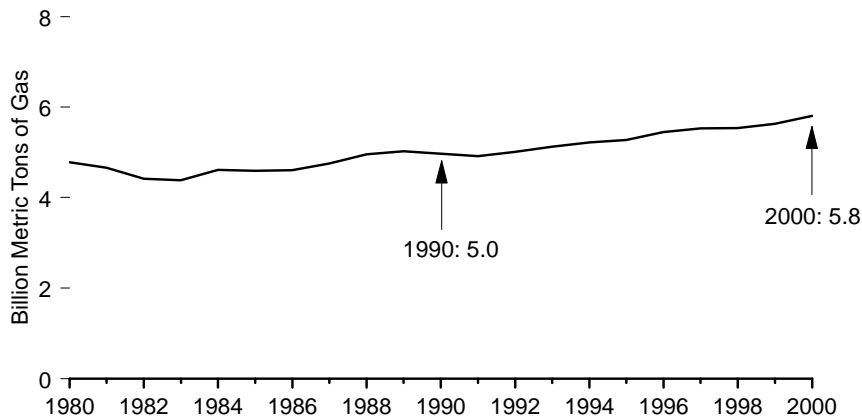
**Emissions by Type of Gas, 2000**



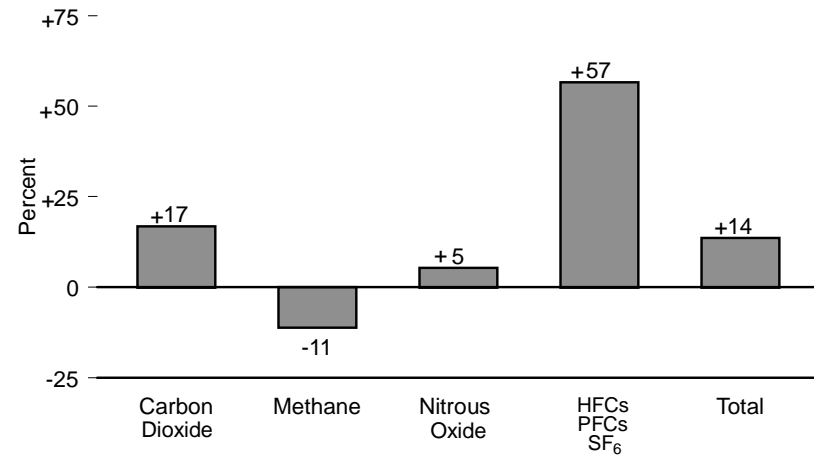
**Emissions, Based on Global Warming Potential, by Type of Gas, 2000**



**Carbon Dioxide Emissions, 1980-2000**



**Change 1990-2000 in Emissions Based on Global Warming Potential**



(s)=Less than 0.005 billion metric tons of gas.

Notes: HFCs=hydrofluorocarbons; PFCs=perfluorocarbons; and SF<sub>6</sub> =sulfur hexafluoride. Because vertical scales differ, graphs should not be compared.

Source: Table 12.1.

**Table 12.1 Estimated Emissions of Greenhouse Gases, 1980-2000**

Year	Greenhouse Gases (million metric tons of gas)				Greenhouse Gases, Based on Global Warming Potential <sup>1</sup> (million metric tons carbon equivalent)				
	Carbon Dioxide <sup>2</sup>	Methane	Nitrous Oxide	HFCs PFCs SF <sub>6</sub>	Carbon Dioxide	Methane	Nitrous Oxide	HFCs PFCs SF <sub>6</sub>	Total
1980	4,783.8	R27.7	1.0	(s)	1,305	R159	82	R19	1,565
1981	4,661.2	R28.3	1.0	(s)	1,271	R162	84	R20	R1,538
1982	4,417.6	R28.7	1.0	(s)	1,205	R164	82	R15	1,466
1983	4,383.9	R28.5	0.9	(s)	1,196	R163	R78	R18	1,454
1984	4,619.0	R29.2	1.0	(s)	1,260	R167	85	21	1,532
1985	4,595.8	R29.5	1.1	(s)	1,253	R169	96	R19	1,537
1986	R4,602.6	R29.0	1.1	(s)	1,255	R166	R94	R20	R1,535
1987	4,753.6	R29.6	1.1	(s)	1,296	R169	R94	R21	R1,581
1988	4,961.8	R29.8	1.1	(s)	1,353	R171	91	R25	1,640
1989	R5,023.5	R30.1	1.1	(s)	R1,370	R172	96	26	R1,664
1990	R4,969.4	31.7	1.2	(s)	R1,355	R199	R94	R30	R1,678
1991	R4,917.7	31.9	1.2	(s)	R1,341	R200	R96	R28	R1,665
1992	R5,013.0	R31.8	1.2	(s)	R1,367	R200	R98	R29	R1,694
1993	R5,130.4	R31.0	1.2	(s)	R1,399	R194	R98	R30	R1,722
1994	R5,224.4	R31.0	1.3	(s)	R1,425	R194	R106	R32	R1,757
1995	R5,273.5	R31.1	1.3	(s)	R1,438	R195	R101	R35	R1,770
1996	R5,454.8	R29.9	1.2	(s)	R1,488	R188	R101	R39	R1,815
1997	R5,533.0	R29.6	1.2	(s)	R1,509	R186	R99	R42	R1,836
1998	R5,540.0	R28.9	1.2	(s)	R1,511	R181	R99	R46	R1,836
1999	R5,630.7	R28.7	1.2	(s)	R1,536	R180	R100	R45	R1,860
2000 <sup>P</sup>	5,805.5	28.2	1.2	(s)	1,583	177	99	47	1,906

<sup>1</sup> Emissions of greenhouse gases were weighted based upon their relative global warming potential (gwp), with carbon dioxide gas equal to a weight of one, and were converted to carbon equivalent by dividing by 3.667. The use of updated estimates of gwp resulted in a number of revisions to previously published data. It is also important to note that revisions in estimated emissions result from revisions in energy consumption as well.

<sup>2</sup> Carbon dioxide emissions do not reflect the revised electric power statistics that are presented in other sections of the *Annual Energy Review 2001*.

R=Revised. P=Preliminary. (s)=Less than 0.05 million metric tons.

Notes: HFCs = hydrofluorocarbons; PFCs = perfluorocarbons; and SF<sub>6</sub> = sulfur hexafluoride. Emissions are from anthropogenic sources. Anthropogenic means produced as the result of human

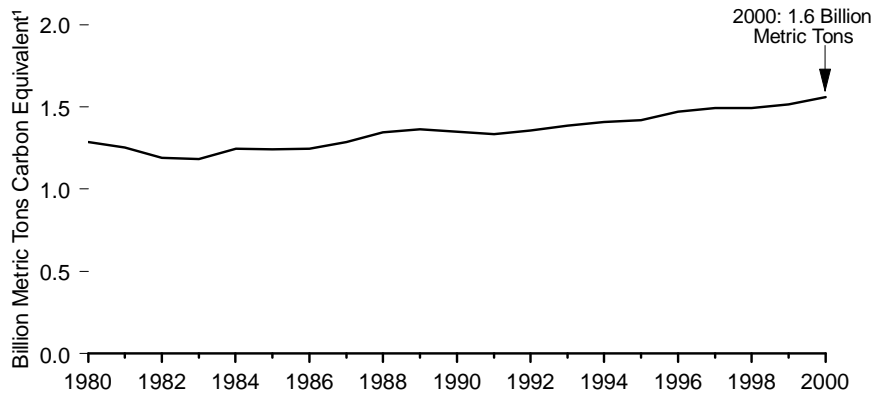
activities, including emissions from agricultural activity and domestic livestock. Emissions from natural sources, such as wetlands and wild animals, are not included. Because estimation methods for greenhouse gases are currently being developed, data are frequently revised on an annual basis in keeping with the latest findings of the international scientific community. For some of the gases, such as carbon dioxide, revisions are a small percentage of the total (on the order of 1 percent), but for other gases, such as nitrous oxide, they may be on the order of 100 percent.

Web Page: <http://www.eia.doe.gov/environment.html>.

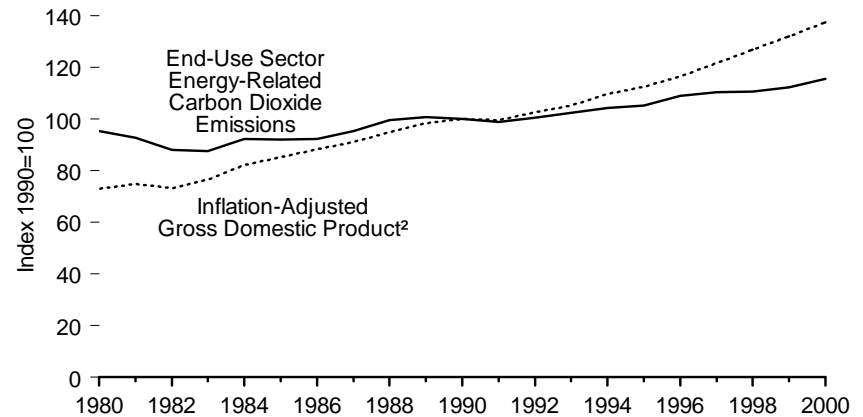
Sources: 1980-1989—Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States*, annual reports. 1990 forward—EIA, *Emissions of Greenhouse Gases in the United States 2000* (November 2001), Tables ES1 and ES2.

**Figure 12.2 Carbon Dioxide Emissions From Energy Consumption by Sector**

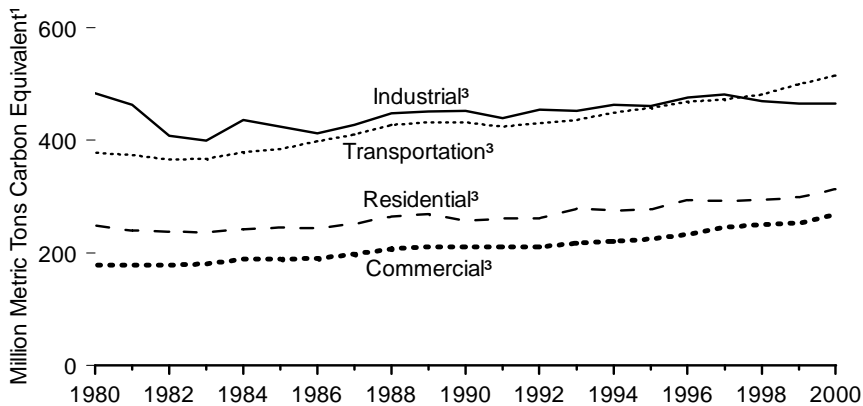
**End-Use Sector Total, 1980-2000**



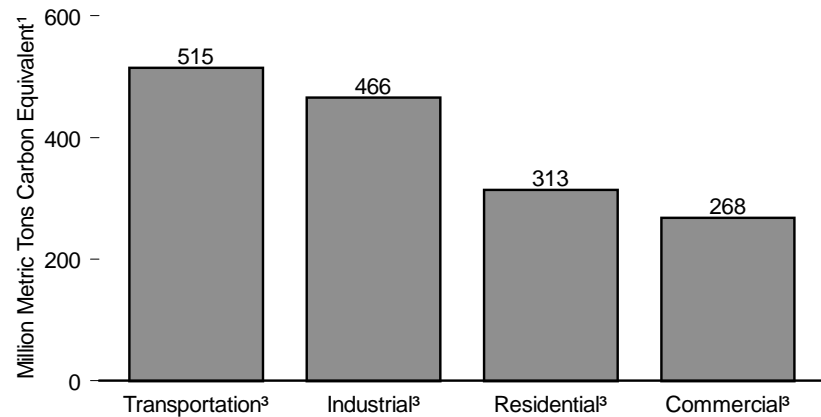
**Economic Growth and Carbon Dioxide Emissions, 1980-2000**



**By End-Use Sector, 1980-2000**



**By End-Use Sector, 2000**



<sup>1</sup> Tons of carbon equivalent can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon equivalent = 3.667 tons of carbon dioxide gas.

<sup>2</sup> Based on chained (1996) dollars.

<sup>3</sup> Electric power sector emissions are distributed across the end-use sectors.

Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 1.5 and 12.2.

**Table 12.2 Carbon Dioxide Emissions From Energy Consumption by Sector, 1980-2000**  
(Million Metric Tons Carbon Equivalent <sup>1</sup>)

Year	End-Use Sectors					Electric Power Sector <sup>2</sup>
	Residential	Commercial	Industrial	Transportation	Total	
1980	247.9	178.0	484.2	378.1	1,288.2	417.0
1981	239.4	177.9	463.3	374.1	1,254.7	419.1
1982	237.9	178.4	408.2	365.6	1,190.1	400.1
1983	236.3	180.1	399.6	366.9	1,182.9	410.9
1984	241.6	189.2	436.5	379.0	1,246.3	429.1
1985	245.4	189.3	424.1	384.3	R1,243.0	437.6
1986	244.2	190.6	412.5	399.0	1,246.2	435.9
1987	251.5	197.6	427.9	411.0	1,287.9	454.0
1988	264.5	207.3	447.9	427.3	1,347.0	474.7
1989	R268.4	R210.8	R451.1	R432.5	R1,362.8	486.1
1990	R257.0	R210.3	R452.7	431.8	R1,351.7	507.0
1991	R261.6	R210.4	R439.8	R424.2	R1,336.0	506.0
1992	R261.8	R210.8	R455.1	431.1	R1,358.7	512.0
1993	R278.4	R217.2	R452.9	436.4	R1,384.8	532.4
1994	R275.8	R220.4	R463.3	449.3	R1,408.8	540.7
1995	R277.9	R224.6	R461.1	457.8	R1,421.3	542.5
1996	R293.9	R233.1	R476.1	468.9	R1,471.9	562.1
1997	R292.8	R245.4	R481.5	473.6	R1,493.3	583.1
1998	R293.7	R250.4	R469.5	R481.5	R1,495.2	607.2
1999	R298.8	R253.1	R465.8	R499.4	R1,517.1	612.6
2000 <sup>P</sup>	313.4	267.8	465.7	514.8	1,561.7	641.6

<sup>1</sup> Tons of carbon equivalent can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

<sup>2</sup> Electric power sector emissions are distributed across the end-use sectors. R=Revised. P=Preliminary.

Notes: Includes energy from petroleum, natural gas, and coal. Totals may not equal sum of

components due to independent rounding.

Web Page: <http://www.eia.doe.gov/environment.html>.

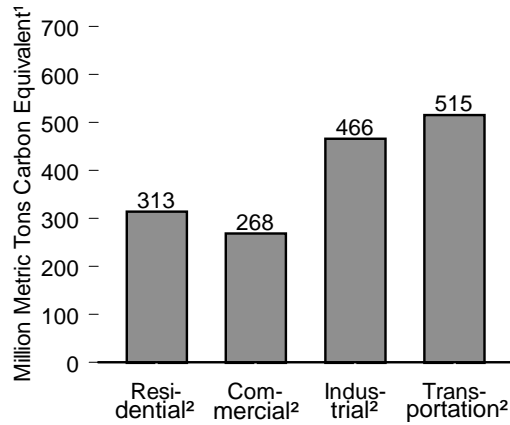
Sources: 1980-1989—Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States*, annual reports. 1990 forward—EIA, *Emissions of Greenhouse Gases in the United States 2000* (November 2001), Table 5.

Data in this table come from *Emissions of Greenhouse Gases in the United States 2000*, which does not reflect the revised electric power statistics that are presented in other sections of the *Annual Energy Review 2001*. The electric power sector in this table includes the fuel consumed by combined-heat-and-power plants to generate electricity (fuel consumed for useful thermal output is included in the industrial sector). *Emissions of Greenhouse Gases in the United States 2001* will include the revised electricity statistics.

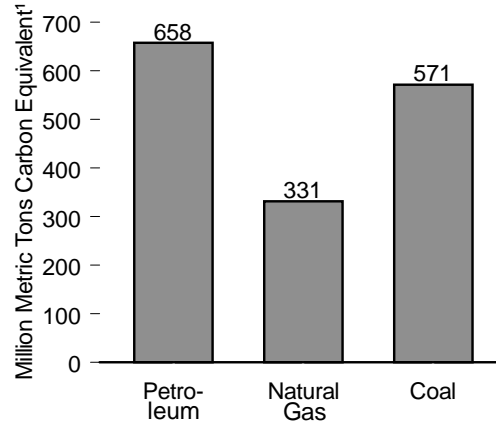


**Figure 12.3 Carbon Dioxide Emissions From Energy Consumption by Sector by Energy Source, 2000**

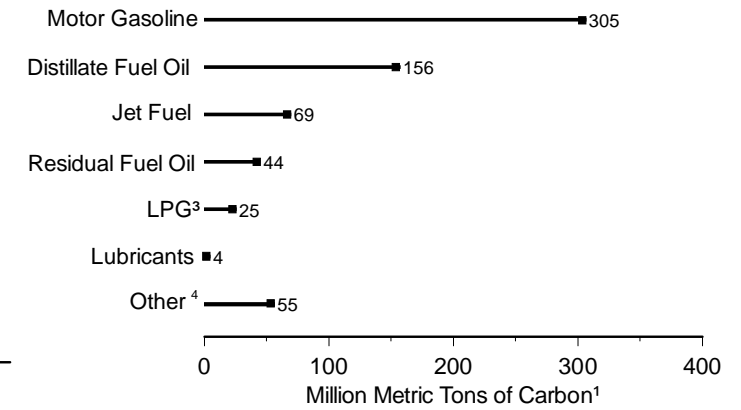
**By End-Use Sector**



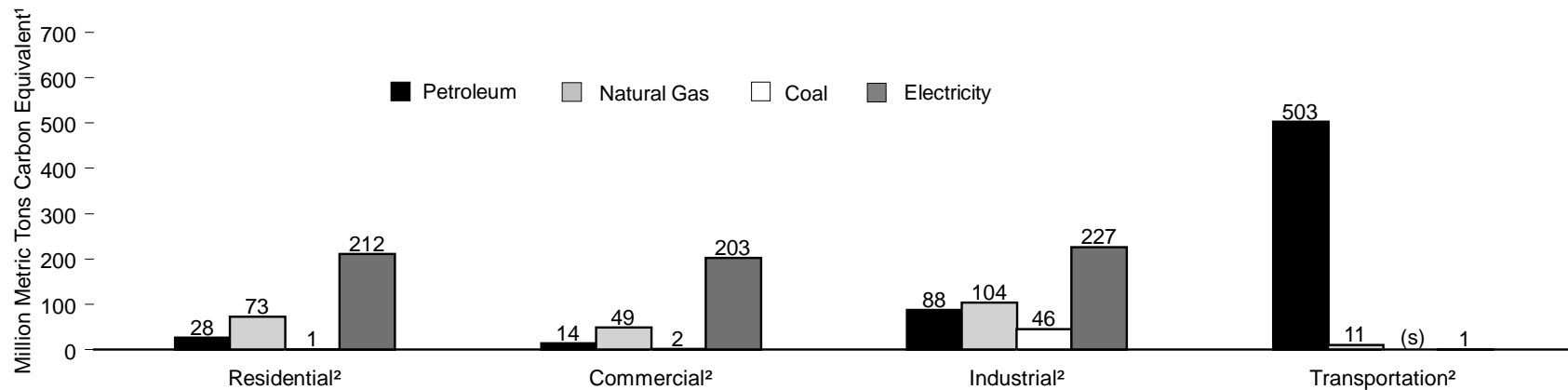
**By Fuel**



**By Petroleum Product**



**By End-Use Sector and Source**



<sup>1</sup> Tons of carbon equivalent can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon equivalent = 3.667 tons of carbon dioxide gas.

<sup>2</sup> Total emissions in the electric power sector are distributed across the end-use sectors.

<sup>3</sup> Liquefied petroleum gases.

<sup>4</sup> Aviation gasoline, kerosene, and other products.

(s)=Less than 0.5 million metric tons.

Source: Table 12.3.

**Table 12.3 Carbon Dioxide Emissions From Energy Consumption by Sector by Energy Source, 2000**  
(Million Metric Tons Carbon Equivalent <sup>1</sup>)

Energy Source	End-Use Sectors					Electric Power Sector	Total
	Residential	Commercial	Industrial	Transportation	Total		
Petroleum .....	27.5	14.2	87.6	502.5	631.6	26.0	657.7
Aviation Gasoline .....	—	—	—	0.7	0.7	—	0.7
Distillate Fuel Oil .....	16.2	8.6	20.8	106.6	152.2	<sup>2</sup> 3.9	156.1
Jet Fuel .....	—	—	—	68.5	68.5	—	68.5
Kerosene .....	2.0	0.5	0.2	—	2.7	—	2.7
Liquefied Petroleum Gases .....	9.3	1.6	13.7	0.2	24.8	—	24.8
Lubricants .....	—	—	1.9	1.8	3.7	—	3.7
Motor Gasoline .....	—	0.9	2.9	301.5	305.3	—	305.3
Residual Fuel Oil .....	—	2.6	0.5	23.1	26.2	<sup>3</sup> 17.6	43.8
Other .....	—	—	47.6	—	47.6	<sup>4</sup> 4.4	52.0
Natural Gas .....	73.2	49.3	104.0	11.4	237.9	93.2	331.2
Coal .....	1.2	1.8	45.7	(s)	48.7	522.4	571.1
Coal Coke Net Imports .....	—	—	1.7	—	1.7	—	1.7
Electricity .....	211.5	202.5	226.7	0.9	641.6	—	—
Electricity Sales to the Grid (-) .....	—	—	13.2	—	13.2	—	—
Total .....	313.4	267.8	465.7	514.8	1,561.7	<sup>5</sup> 641.6	1,561.7

<sup>1</sup> Tons of carbon equivalent can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

<sup>2</sup> Light oil.

<sup>3</sup> Heavy oil.

<sup>4</sup> Petroleum coke.

<sup>5</sup> Total emissions in the electric power sector are distributed across the end-use sectors.

— = Not applicable. (s)=Less than 0.05 million metric tons.

Notes: Data are preliminary. Totals may not equal sum of components due to independent rounding.

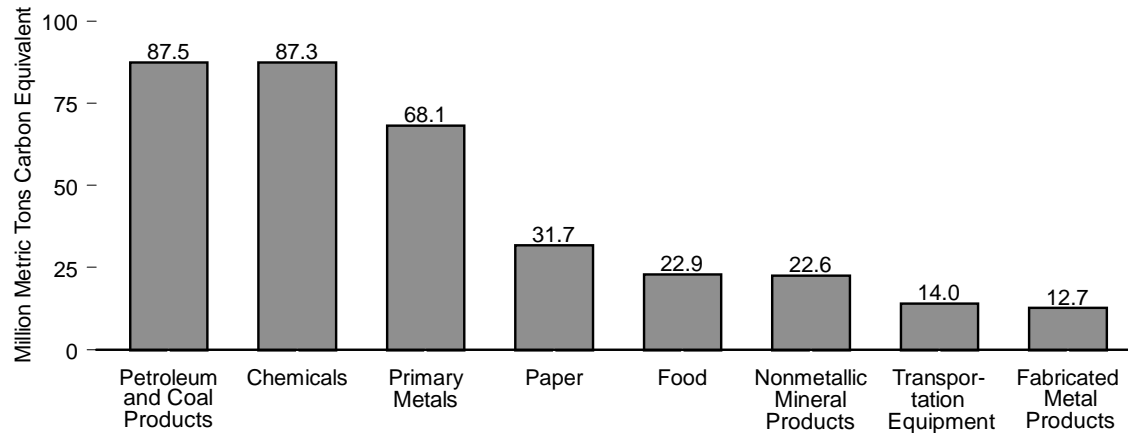
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Source: Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States 2000* (November 2001), Tables 6-10.

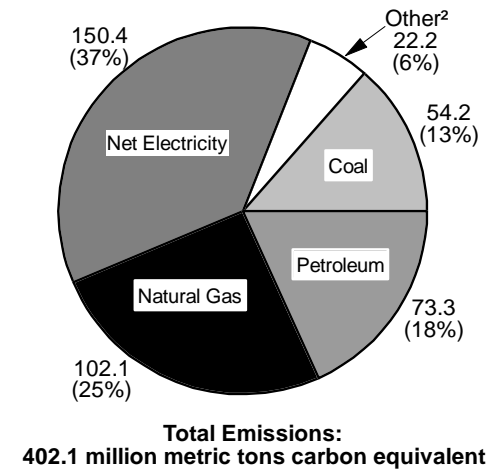
Data in this table come from *Emissions of Greenhouse Gases in the United States 2000*, which does not reflect the revised electric power statistics that are presented in other sections of the *Annual Energy Review 2001*. The electric power sector in this table includes the fuel consumed by combined-heat-and-power plants to generate electricity (fuel consumed for useful thermal output is included in the industrial sector). *Emissions of Greenhouse Gases in the United States 2001* will include the revised electricity statistics.

**Figure 12.4 Carbon Dioxide Emissions From Energy Consumption for Manufacturing Industries, 1998**

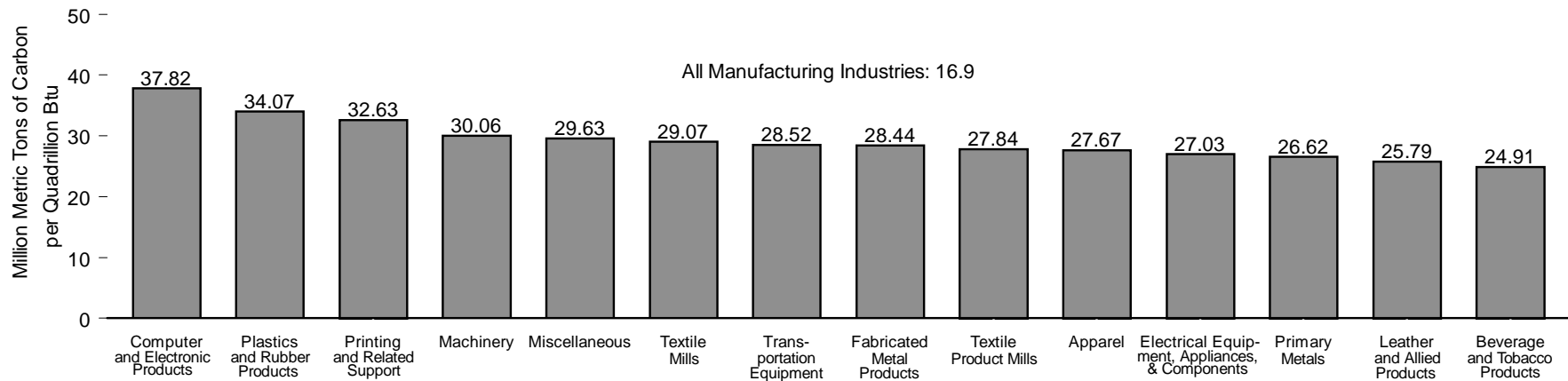
**Carbon Emissions by Top Industry Groups**



**Carbon Emissions by Energy Source<sup>1</sup>**



**Carbon Intensity by Top Industry Groups**



<sup>1</sup> Sum of shares does not equal 100 percent due to independent rounding.

<sup>2</sup> All other types of energy that respondents indicated were consumed.

Source: Table 12.4.

**Table 12.4 Carbon Dioxide Emissions From Energy Consumption for Manufacturing Industries, 1998**

NAICS <sup>2</sup> Code	Major Group	Carbon <sup>1</sup> Emissions (million metric tons carbon equivalent)					Carbon Intensity <sup>5</sup>	
		Coal	Natural Gas	Petroleum	Net Electricity <sup>3</sup>	Other <sup>4</sup>		Total
311	Food .....	3.3	8.2	0.8	10.6	(s)	22.9	21.90
312	Beverage and Tobacco Products .....	0.7	0.6	0.1	1.2	0.0	2.7	24.91
313	Textile Mills .....	0.5	1.5	0.4	5.1	(s)	7.4	29.07
314	Textile Product Mills .....	0.1	0.4	Q	0.9	0.0	1.4	27.84
315	Apparel .....	(s)	0.3	0.1	0.9	0.0	1.3	27.67
316	Leather and Allied Products .....	0.0	0.1	(s)	0.1	0.0	0.2	25.79
321	Wood Products .....	0.1	1.1	0.3	3.6	0.1	5.1	9.93
322	Paper .....	7.0	8.4	4.1	11.9	0.2	31.7	11.54
323	Printing and Related Support .....	0.0	0.6	(s)	2.5	(s)	3.2	32.63
324	Petroleum and Coal Products .....	0.0	14.5	47.7	6.2	19.0	87.5	11.95
325	Chemicals .....	7.8	34.1	15.4	28.6	1.3	87.3	14.40
326	Plastics and Rubber Products .....	0.1	1.8	0.2	9.1	0.0	11.2	34.07
327	Nonmetallic Mineral Products .....	7.6	6.4	1.8	6.6	0.2	22.6	23.09
331	Primary Metals .....	25.8	13.4	0.9	27.0	1.0	68.1	26.62
332	Fabricated Metal Products .....	0.2	3.5	0.3	8.7	(s)	12.7	28.44
333	Machinery .....	0.2	1.4	0.1	4.8	0.1	6.5	30.06
334	Computer and Electronic Products .....	0.0	0.9	(s)	6.8	0.0	7.8	37.82
335	Electrical Equipment, Appliances, and Components .....	(s)	0.8	0.1	2.7	0.2	3.9	27.03
336	Transportation Equipment .....	0.8	3.1	0.5	9.7	0.1	14.0	28.52
337	Furniture and Related Products .....	0.1	0.4	(s)	1.5	(s)	2.0	22.52
339	Miscellaneous .....	0.0	0.6	0.1	2.0	0.0	2.6	29.63
—	Total Manufacturing .....	54.2	102.1	73.3	150.4	22.2	402.1	16.90

<sup>1</sup> Tons of carbon equivalent can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon equivalent = 3.667 tons of carbon dioxide gas.

<sup>2</sup> The Standard Industrial Classification (SIC) system has been replaced by the North American Industry Classification System (NAICS).

<sup>3</sup> "Net Electricity" is obtained by summing purchases, transfers in, and generation from noncombustible renewable resources, minus quantities sold and transferred out. It excludes electricity generated from combustible fuels.

<sup>4</sup> Includes all other types of energy that respondents indicated were consumed.

<sup>5</sup> Carbon Intensity is million metric tons of carbon per quadrillion Btu. In the carbon intensity calculations electricity was evaluated as site electricity, the electricity delivered to the end user. Site electricity is equal to 3,412 Btu per kilowatt-hour.

(s)=Less than 0.05 million metric tons. Q=Data withheld because the relative standard error was greater

than 50 percent.

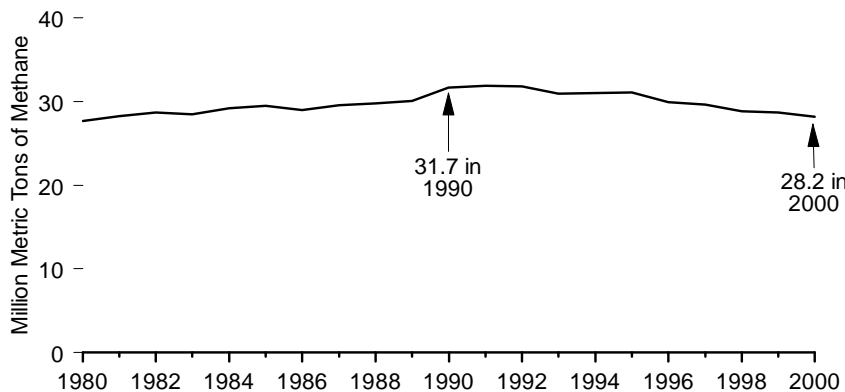
Notes: For prior surveys and the current Manufacturing Energy Consumption Survey, emissions are available classified under the old Standard Industrial Classification System. See the Web Page. The estimates are for the first use of energy for heat and power and as feedstocks or raw material inputs. First use is defined as the consumption of the energy that was originally produced offsite or was produced onsite from input materials not classified as energy. See Table 2.3 for manufacturing energy use. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/emeu/mecs>.

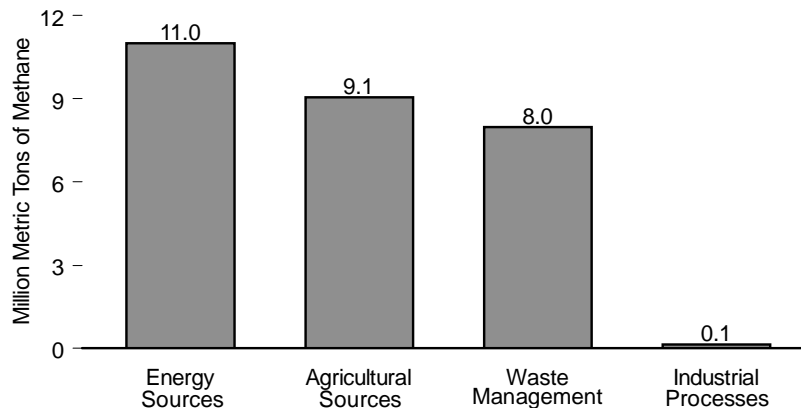
Sources: Energy Information Administration, Form EIA-846, "1998 Manufacturing Energy Consumption Survey," Form EIA-810, "Monthly Refinery Report" for 1998, and *Emissions of Greenhouse Gases in the United States 2000* (November 2001).

**Figure 12.5 Methane Emissions**

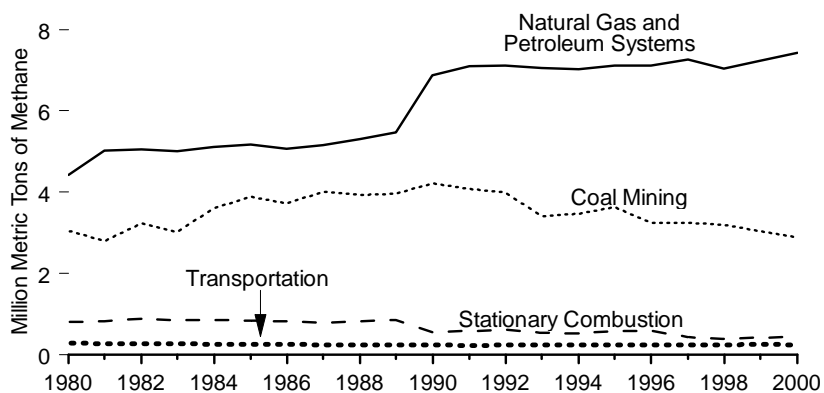
**Total, 1980-2000**



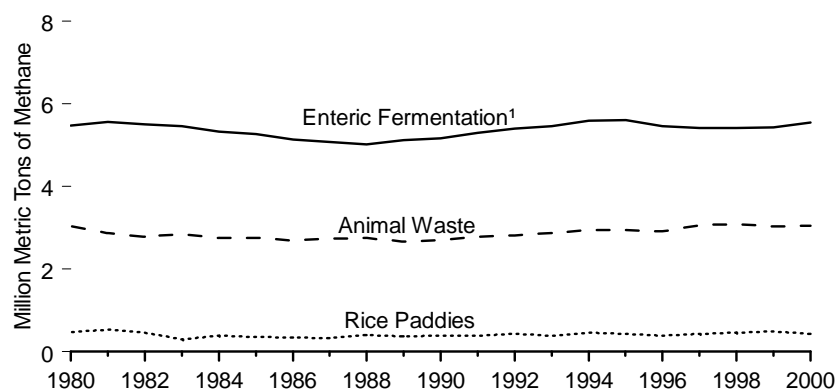
**By Source, 2000**



**Energy Sources by Type, 1980-2000**



**Agricultural Sources by Type, 1980-2000**



<sup>1</sup> Animals such as cattle, buffalo, sheep, goats, and camels emit methane as a product of digestion.

Note: Because vertical scales differ, graphs should not be compared.  
Source: Table 12.5.

**Table 12.5 Methane Emissions, 1980-2000**  
(Million Metric Tons of Methane)

Year	Energy Sources					Waste Management			Agricultural Sources					Industrial Processes	Total
	Natural Gas and Petroleum Systems	Coal Mining	Transportation	Stationary Combustion	Total	Landfills	Wastewater Treatment	Total	Enteric Fermentation <sup>1</sup>	Animal Waste	Rice Paddies	Crop Residue Burning	Total		
1980	4.42	3.05	0.28	0.81	8.56	9.85	0.14	9.99	5.47	R3.03	0.48	R0.04	R9.02	0.13	R27.70
1981	5.02	2.80	0.27	0.82	8.92	10.07	0.14	R10.20	5.56	R2.88	0.54	0.04	R9.03	0.14	R28.29
1982	5.05	3.23	0.27	0.88	9.42	R10.21	0.14	R10.35	5.50	R2.78	0.47	0.04	R8.79	0.10	R28.66
1983	5.01	3.02	0.27	0.86	9.17	R10.41	0.14	R10.55	5.46	R2.84	0.31	0.03	R8.64	0.11	R28.46
1984	5.12	3.60	0.26	0.86	9.85	R10.55	0.14	R10.70	5.33	R2.76	0.40	0.04	R8.53	0.11	R29.19
1985	R5.17	3.88	R0.26	0.84	R10.15	R10.67	0.14	R10.81	5.27	R2.76	0.36	0.04	R8.43	0.11	R29.50
1986	R5.06	3.73	R0.26	0.82	R9.86	R10.69	0.15	R10.83	5.13	R2.70	0.34	R0.04	R8.20	0.10	R29.00
1987	R5.16	4.01	R0.25	0.80	R10.22	R10.92	0.15	R11.07	5.08	R2.74	0.33	R0.04	R8.19	0.11	R29.59
1988	R5.31	3.93	R0.25	0.83	R10.32	R10.98	0.15	R11.13	R5.01	R2.76	0.41	0.03	R8.21	0.12	R29.78
1989	R25.47	3.96	R0.25	0.86	R10.54	R11.08	0.15	R11.23	5.11	R2.66	0.38	0.04	R8.19	0.12	R30.08
1990	6.87	R4.22	0.25	0.56	R11.90	R11.21	0.15	R11.36	5.16	2.69	0.40	0.04	8.29	0.12	R31.67
1991	7.10	R4.08	0.23	0.59	R12.00	R11.07	0.15	R11.23	5.30	2.79	R0.40	R0.04	8.52	0.11	R31.86
1992	7.12	R3.99	0.24	0.62	R11.97	R10.91	0.15	R11.07	5.39	2.81	0.44	0.04	8.68	0.12	R31.84
1993	7.05	R3.41	0.24	0.54	R11.23	R10.68	0.16	R10.84	5.46	2.87	0.40	R0.04	R8.77	0.12	R30.96
1994	7.03	R3.47	0.24	0.53	R11.27	R10.39	0.16	R10.55	5.59	2.95	0.47	R0.05	R9.06	0.13	R31.00
1995	7.11	R3.63	0.25	0.58	R11.58	R10.17	0.16	R10.33	5.61	2.95	0.44	R0.04	R9.04	0.13	R31.08
1996	7.11	R3.24	0.24	0.58	R11.17	R9.65	0.16	R9.81	5.46	R2.92	0.40	0.04	8.83	0.13	R29.94
1997	7.26	R3.24	0.24	0.44	R11.18	R9.19	0.16	R9.35	5.42	R3.07	0.44	0.04	8.98	0.13	R29.63
1998	R7.04	R3.20	0.24	0.39	R10.88	R8.70	0.16	R8.86	5.41	3.09	R0.46	0.04	9.00	0.13	R28.88
1999	R7.24	R3.03	R0.26	R0.42	R10.94	R8.42	0.16	R8.59	R5.43	3.03	R0.49	0.04	R9.00	0.13	R28.66
2000 <sup>P</sup>	7.43	2.89	0.25	0.44	11.01	7.82	0.17	7.99	5.54	3.05	0.43	0.05	9.06	0.14	28.19

<sup>1</sup> Animals such as cattle, buffalo, sheep, goats, and camels emit methane as a product of digestion.

<sup>2</sup> There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of the emissions from oil production beginning in 1990.

R=Revised. P=Preliminary.

Notes: Emissions are from anthropogenic sources. Anthropogenic means produced as the result of human activities, including emissions from agricultural activity and domestic livestock. Emissions from natural sources, such as wetlands and wild animals, are not included. Estimates of methane emissions are, in general, highly uncertain. The level of precision is probably on the order of 30 to 50 percent. For additional information, see "Appendix C, Tier 1 Uncertainty Analysis of Emissions Estimates" in the source

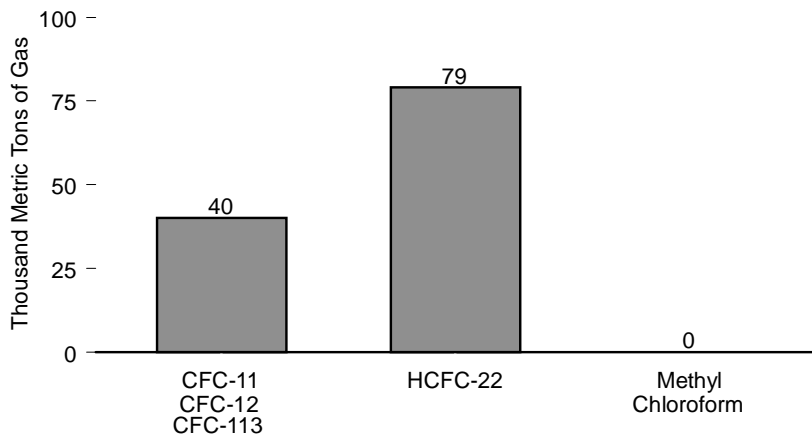
report. Under certain conditions, methane may be produced via anaerobic decomposition of organic materials in landfills, animal wastes, and rice paddies. Because inventory methods for greenhouse gases are currently being developed, data are frequently revised on an annual basis in keeping with the latest findings of the international scientific community. Totals may not equal sum of components due to independent rounding.

Web Page: <http://www.eia.doe.gov/environment.html>.

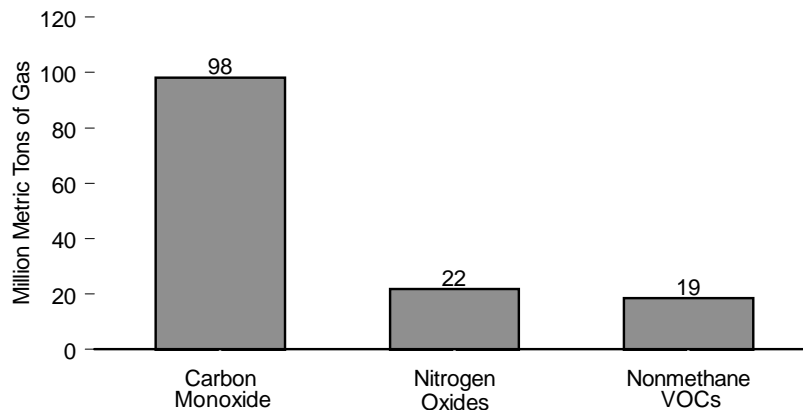
Sources: 1980 -1989—Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States*, annual reports. 1990 forward—EIA, *Emissions of Greenhouse Gases in the United States, 2000* (November 2001), Table 14.

**Figure 12.6 Ozone Depleting Substances and Criteria Pollutants**

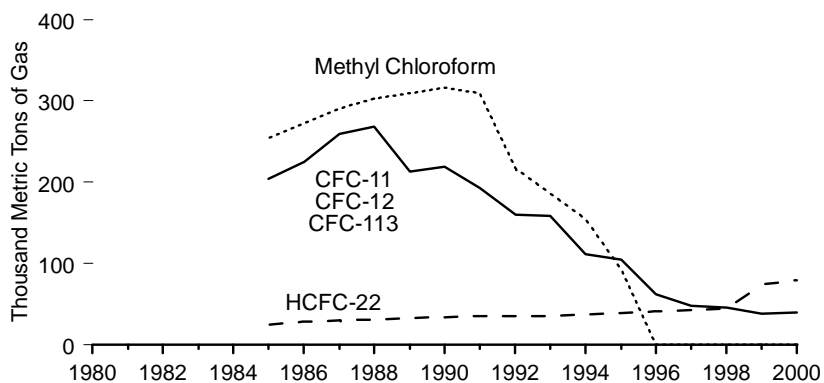
**Ozone Depleting Substances, 2000**



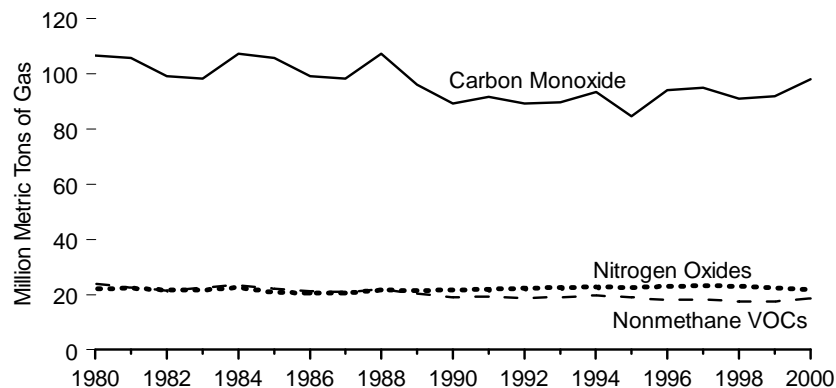
**Criteria Pollutants, 2000**



**Ozone Depleting Substances, 1980-2000**



**Criteria Pollutants, 1980-2000**



Notes: CFC=chlorofluorocarbons; HCFC=chlorodifluoromethane; VOCs=volatile organic compounds. Because vertical scales differ, graphs should not be compared.

Source: Table 12.6.

**Table 12.6 Ozone Depleting Substances and Criteria Pollutants, 1980-2000**

Year	Ozone Depleting Substances (thousand metric tons of gas)			Criteria Pollutants (million metric tons of gas)		
	CFC-11 CFC-12 CFC-113	HCFC-22	Methyl Chloroform	Carbon Monoxide	Nitrogen Oxides	Nonmethane VOCs
1980	NA	NA	NA	106.5	22.1	23.9
1981	NA	NA	NA	105.7	22.4	22.5
1982	NA	NA	NA	99.2	21.8	21.5
1983	NA	NA	NA	98.3	21.7	22.6
1984	NA	NA	NA	107.2	22.6	23.5
1985	R204.2	R24.9	R253.9	105.7	20.9	22.2
1986	R225.3	R28.5	R272.7	99.2	20.5	21.2
1987	R259.3	R29.7	R290.5	98.3	20.6	21.0
1988	R268.4	R30.9	R302.5	107.2	21.8	22.0
1989	R212.8	R32.7	R309.4	96.0	21.5	20.4
1990	R218.8	R34.0	R316.6	89.3	21.8	19.1
1991	R192.9	R35.4	R309.4	91.7	21.9	19.3
1992	R159.8	R35.2	R216.6	89.2	22.3	18.9
1993	R158.9	R35.3	R185.7	89.8	22.6	19.1
1994	R111.3	R37.7	R154.7	93.4	22.9	19.7
1995	R105.1	R39.3	R92.8	84.6	22.5	19.0
1996	62.1	R41.0	R0.0	R94.1	R23.1	R18.0
1997	48.2	R42.4	R0.0	R94.9	R23.3	R18.4
1998	45.9	R43.9	R0.0	R91.0	R23.0	R17.5
1999	R38.0	R74.1	R0.0	R91.8	R22.4	R17.6
2000 <sup>P</sup>	40.0	79.1	0.0	98.1	21.9	18.5

R=Revised. P=Preliminary. NA=Not available.

Notes: CFC = chlorofluorocarbons; HCFC = chlorodifluoromethane; and VOCs = volatile organic compounds. Ozone depleting substances are gases containing chlorine that are being controlled under the Montreal Protocol because they deplete the earth's stratospheric ozone layer. They are also powerful greenhouse gases that have direct and indirect impacts on the earth's climate. CFC-113, carbon tetrachloride, and methyl chloroform were primarily used as solvents until the production of these ozone depleting compounds ended in 1995. Emissions of these compounds will eventually end completely when all stockpiles are used. Criteria pollutants are regulated as urban air pollutants. They are also powerful

greenhouse gases that have direct and indirect impacts on Earth's climate. Because estimation methods for greenhouse gases are currently being developed, data are frequently revised on an annual basis in keeping with the latest findings of the international scientific community.

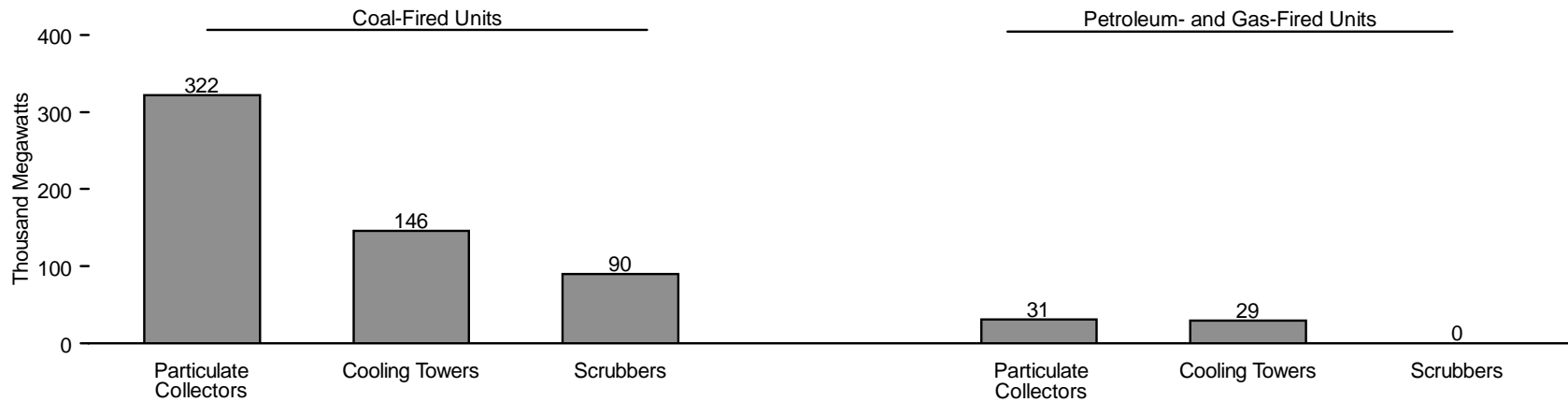
Web Page: <http://www.eia.doe.gov/environment.html>.

Sources: **Ozone Depleting Substances:** 1980 forward—Estimates from the U.S. Environmental Protection Agency. **Criteria Pollutants:** 1980-2000—EIA, Office of Integrated Analysis and Forecasting estimates based upon data obtained from the U.S. Environmental Protection Agency: Air Pollutant Emission Trends Summaries (May 2002), Tables A2, A4, and A5.

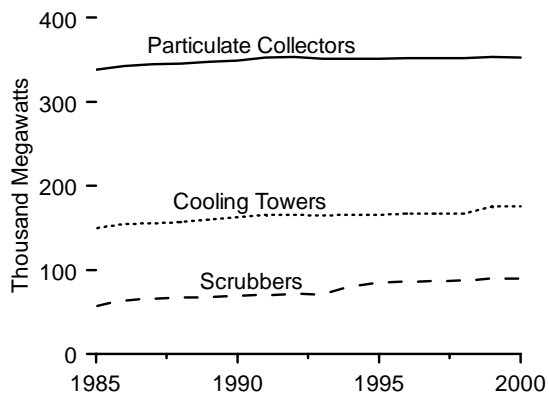


**Figure 12.7 Installed Nameplate Capacity of Steam-Electric Generators for Electric Utility Plants With Environmental Equipment**

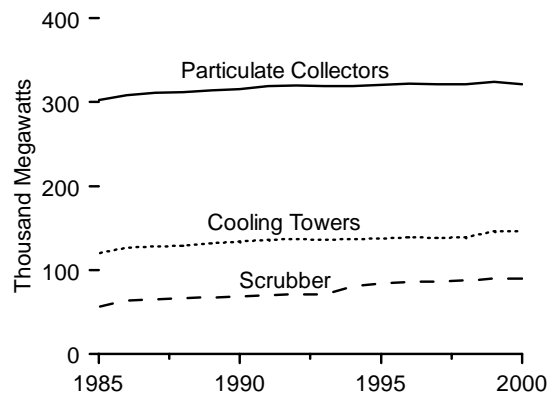
By Fuel and Equipment Type, 2000



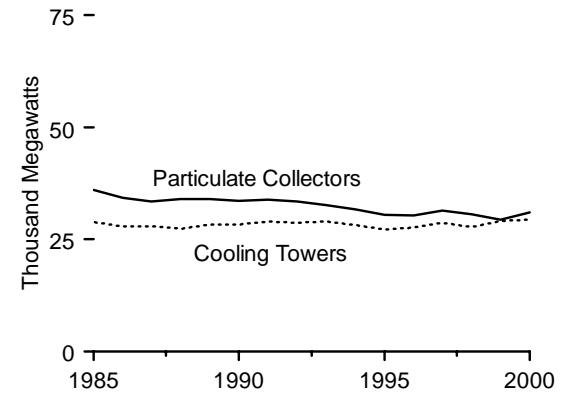
**Total Units by Equipment Type, 1985-2000**



**Coal-Fired Units by Equipment Type, 1985-2000**



**Petroleum- and Gas-Fired Units by Equipment Type, 1985-2000**



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 12.7.

**Table 12.7 Installed Nameplate Capacity of Steam-Electric Generators for Electric Utility Plants  
With Environmental Equipment, 1985-2000**  
(Megawatts)

Year	Coal-Fired				Petroleum- and Gas-Fired				Total			
	Particulate Collectors	Cooling Towers	Scrubbers	Total <sup>1</sup>	Particulate Collectors	Cooling Towers	Scrubbers	Total <sup>1</sup>	Particulate Collectors	Cooling Towers	Scrubbers	Total <sup>1</sup>
1985	302,056	120,591	56,955	304,706	36,054	28,895	65	62,371	338,110	149,486	57,020	367,078
1986	308,566	126,731	63,735	311,217	34,258	27,919	65	59,618	342,825	154,650	63,800	370,835
1987	311,043	127,875	65,688	312,885	33,431	27,912	65	58,783	344,474	155,786	65,753	371,668
1988	311,776	129,366	67,156	313,618	34,063	27,434	65	58,937	345,839	156,800	67,221	372,555
1989	313,708	131,697	67,506	315,549	33,975	28,386	65	59,736	347,655	160,087	67,534	375,257
1990	315,681	134,199	69,057	317,522	33,639	28,359	65	59,372	349,319	162,557	69,122	376,894
1991	319,127	136,270	70,294	319,189	33,864	29,067	260	59,773	352,990	165,337	70,554	378,963
1992	320,016	136,542	71,157	320,078	33,509	28,764	195	59,116	353,525	165,306	71,351	379,194
1993	318,830	136,028	70,890	318,893	32,620	28,922	0	58,580	351,451	164,951	70,890	377,473
1994	319,309	137,266	80,617	319,600	31,695	28,186	0	57,123	351,180	165,452	80,617	376,899
1995	320,268	137,825	84,260	320,467	30,513	27,187	0	54,942	351,198	165,295	84,677	375,691
1996	321,721	139,065	86,359	321,785	30,349	27,685	0	55,275	352,254	166,749	86,359	377,244
1997	320,832	138,120	86,605	320,896	31,422	28,766	0	56,485	352,254	166,886	86,605	377,381
1998	321,082	139,082	87,783	321,353	30,708	27,814	0	55,764	351,790	166,896	87,783	377,117
1999	324,109	146,377	89,666	331,379	29,371	29,142	0	55,812	353,480	175,520	89,666	387,192
2000 <sup>P</sup>	321,636	146,093	89,675	328,741	31,090	29,427	0	57,697	352,727	175,520	89,675	386,438

<sup>1</sup> Components are not additive because some generators are included in more than one category.  
P=Preliminary.

Note: Data cover only plants with fossil-fueled steam-electric capacity of 100 megawatts or greater.  
Web Page: <http://www.eia.doe.gov/fuelelectric.html>.

Sources: 1985-1987—Energy Information Administration (EIA), Form EIA-767, "Steam-Electric Plant Operation and Design Report." 1988-1993—EIA, *Electric Power Annual*, annual reports. 1994 forward—EIA, *Electric Power Annual Volume II*, annual reports.



# Appendix A

## Thermal Conversion Factors

### Using Thermal Conversion Factors

The thermal conversion factors presented in the following tables can be used to estimate the heat content in British thermal units (Btu) of a given amount of energy measured in physical units, such as barrels or cubic feet. For example, 10 barrels of asphalt has a heat content of approximately 66.36 million Btu (10 barrels x 6.636 million Btu per barrel = 66.36 million Btu).

The heat content rates (i.e., thermal conversion factors) provided in this section represent the gross (or upper) energy content of the fuels. Gross heat content rates are applied in all Btu calculations for the *Annual Energy Review* and are commonly used in energy calculations in the United States; net (or lower) heat content rates are typically used in European energy calculations. The difference between the two rates is the amount of energy that is consumed to vaporize water that is created during the combustion process. Generally, the difference ranges from 2 percent to 10 percent, depending on the specific fuel and its hydrogen content. Some fuels, such as unseasoned wood, can be more than 40 percent different in their gross and net heat content rates.

In general, the annual thermal conversion factors presented in Tables A2 through A6 are computed from final annual data or from the best available data and are labeled “preliminary.” Often, the previous year’s factor is used as the preliminary value until data become available to calculate the factor appropriate to the year. The source of each factor is described in the section entitled “Thermal Conversion Factor Source Documentation,” which follows Table A6 in this appendix.

Thermal conversion factors for hydrocarbon mixes are weighted averages of the thermal conversion factors for each hydrocarbon included in the mix. For example, in calculating the thermal conversion factor for a 60-40 butane-propane mixture, the thermal conversion factor for butane is weighted 1.5 times the thermal conversion factor for propane.

More information about British thermal units (the standardized unit of measure for energy) can be found in the Glossary.

**Table A1. Approximate Heat Content of Petroleum Products**  
(Million Btu per Barrel)

Energy Source	Heat Content
Asphalt . . . . .	6.636
Aviation Gasoline . . . . .	5.048
Butane . . . . .	4.326
Butane-Propane Mixture (60 percent-40 percent) . . . . .	4.130
Distillate Fuel Oil . . . . .	5.825
Ethane . . . . .	3.082
Ethane-Propane Mixture (70 percent-30 percent) . . . . .	3.308
Isobutane . . . . .	3.974
Jet Fuel, Kerosene-Type . . . . .	5.670
Jet Fuel, Naphtha-Type . . . . .	5.355
Kerosene . . . . .	5.670
Lubricants . . . . .	6.065
Motor Gasoline	
Conventional <sup>1</sup> . . . . .	5.253
Oxygenated <sup>1</sup> . . . . .	5.150
Reformulated <sup>1</sup> . . . . .	5.150
Fuel Ethanol <sup>2</sup> . . . . .	3.539
Natural Gasoline . . . . .	4.620
Pentanes Plus . . . . .	4.620
Petrochemical Feedstocks	
Naphtha less than 401° F . . . . .	5.248
Other Oils equal to or greater than 401° F . . . . .	5.825
Still Gas . . . . .	6.000
Petroleum Coke . . . . .	6.024
Plant Condensate . . . . .	5.418
Propane . . . . .	3.836
Residual Fuel Oil . . . . .	6.287
Road Oil . . . . .	6.636
Special Naphthas . . . . .	5.248
Still Gas . . . . .	6.000
Unfinished Oils . . . . .	5.825
Unfractionated Stream . . . . .	5.418
Waxes . . . . .	5.537
Miscellaneous . . . . .	5.796

<sup>1</sup>See Table A3 for motor gasoline annual weighted averages beginning in 1994.

<sup>2</sup>Fuel ethanol, which is derived from agricultural feedstocks (primarily corn), is not a petroleum product but is blended into motor gasoline. Its gross heat content (3.539 million Btu per barrel) is used in *Annual Energy Review* calculations; its net heat content (3.192 million Btu per barrel) is used in the Energy Information Administration’s *Renewable Energy Annual* calculations.

Source: See “Thermal Conversion Factor Source Documentation,” which follows Table A6.

**Table A2. Approximate Heat Content of Crude Oil, Crude Oil and Products, and Natural Gas Plant Liquids, 1949-2001**  
(Million Btu per Barrel)

Year	Crude Oil Only			Crude Oil and Products		Natural Gas Plant Liquids Production
	Production	Imports	Exports	Imports	Exports	
1949	5.800	5.952	5.800	6.059	5.692	4.544
1950	5.800	5.943	5.800	6.080	5.766	4.522
1951	5.800	5.938	5.800	6.075	5.762	4.495
1952	5.800	5.938	5.800	6.067	5.774	4.464
1953	5.800	5.924	5.800	6.052	5.742	4.450
1954	5.800	5.931	5.800	6.052	5.745	4.415
1955	5.800	5.924	5.800	6.040	5.768	4.406
1956	5.800	5.916	5.800	6.024	5.754	4.382
1957	5.800	5.918	5.800	6.023	5.780	4.369
1958	5.800	5.916	5.800	5.993	5.779	4.366
1959	5.800	5.916	5.800	6.020	5.829	4.311
1960	5.800	5.911	5.800	6.021	5.834	4.295
1961	5.800	5.900	5.800	5.991	5.832	4.283
1962	5.800	5.890	5.800	6.004	5.841	4.273
1963	5.800	5.894	5.800	6.002	5.840	4.264
1964	5.800	5.882	5.800	5.998	5.844	4.268
1965	5.800	5.872	5.800	5.997	5.743	4.264
1966	5.800	5.863	5.800	5.993	5.729	4.259
1967	5.800	5.838	5.800	5.999	5.777	4.232
1968	5.800	5.836	5.800	5.977	5.763	4.218
1969	5.800	5.825	5.800	5.974	5.714	4.170
1970	5.800	5.822	5.800	5.985	5.810	4.146
1971	5.800	5.824	5.800	5.961	5.775	4.117
1972	5.800	5.809	5.800	5.935	5.741	4.070
1973	5.800	5.817	5.800	5.897	5.752	4.049
1974	5.800	5.827	5.800	5.884	5.774	4.011
1975	5.800	5.821	5.800	5.858	5.748	3.984
1976	5.800	5.808	5.800	5.856	5.745	3.964
1977	5.800	5.810	5.800	5.834	5.797	3.941
1978	5.800	5.802	5.800	5.839	5.808	3.925
1979	5.800	5.810	5.800	5.810	5.832	3.955
1980	5.800	5.812	5.800	5.796	5.820	3.914
1981	5.800	5.818	5.800	5.775	5.821	3.930
1982	5.800	5.826	5.800	5.775	5.820	3.872
1983	5.800	5.825	5.800	5.774	5.800	3.839
1984	5.800	5.823	5.800	5.745	5.850	3.812
1985	5.800	5.832	5.800	5.736	5.814	3.815
1986	5.800	5.903	5.800	5.808	5.832	3.797
1987	5.800	5.901	5.800	5.820	5.858	3.804
1988	5.800	5.900	5.800	5.820	5.840	3.800
1989	5.800	5.906	5.800	5.833	5.857	3.826
1990	5.800	5.934	5.800	5.849	5.833	3.822
1991	5.800	5.948	5.800	5.873	5.823	3.807
1992	5.800	5.953	5.800	5.877	5.777	3.804
1993	5.800	5.954	5.800	5.883	5.779	3.801
1994	5.800	5.950	5.800	5.861	5.779	3.794
1995	5.800	5.938	5.800	5.855	5.746	3.796
1996	5.800	5.947	5.800	5.847	5.736	3.777
1997	5.800	5.954	5.800	5.862	5.734	3.762
1998	5.800	5.953	5.800	5.861	5.720	3.769
1999	5.800	5.942	5.800	5.840	5.699	3.744
2000	5.800	<sup>R</sup> 5.959	5.800	<sup>R</sup> 5.849	5.658	3.733
2001 <sup>P</sup>	5.800	5.976	5.800	5.866	5.737	3.735

R=Revised. P=Preliminary.  
Note: Crude oil includes lease condensate.

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A6.

**Table A3. Approximate Heat Content of Petroleum Product Weighted Averages, 1949-2001**  
(Million Btu per Barrel)

Year	Consumption				Electric Power Sector <sup>1</sup>	Total	Imports	Exports	Liquefied Petroleum Gases Consumption	Motor Gasoline Consumption
	End-Use Sectors									
	Residential	Commercial	Industrial	Transportation						
1949	5.493	5.858	5.947	5.465	6.254	5.649	6.261	5.651	4.011	5.253
1950	5.482	5.865	5.940	5.461	6.254	5.649	6.263	5.751	4.011	5.253
1951	5.492	5.856	5.913	5.458	6.254	5.634	6.265	5.753	4.011	5.253
1952	5.488	5.849	5.905	5.442	6.254	5.621	6.261	5.768	4.011	5.253
1953	5.465	5.845	5.897	5.426	6.254	5.608	6.268	5.732	4.011	5.253
1954	5.475	5.832	5.883	5.412	6.254	5.595	6.252	5.738	4.011	5.253
1955	5.480	5.832	5.866	5.408	6.254	5.591	6.234	5.765	4.011	5.253
1956	5.474	5.828	5.856	5.406	6.254	5.585	6.225	5.744	4.011	5.253
1957	5.462	5.813	5.842	5.405	6.254	5.577	6.219	5.774	4.011	5.253
1958	5.465	5.802	5.832	5.393	6.254	5.567	6.091	5.778	4.011	5.253
1959	5.408	5.803	5.811	5.389	6.254	5.557	6.142	5.830	4.011	5.253
1960	5.430	5.849	5.800	5.388	6.267	5.555	6.161	5.835	4.011	5.253
1961	5.432	5.847	5.795	5.386	6.268	5.552	6.102	5.833	4.011	5.253
1962	5.418	5.835	5.784	5.386	6.267	5.545	6.138	5.842	4.011	5.253
1963	5.396	5.818	5.759	5.384	6.266	5.534	6.126	5.841	4.011	5.253
1964	5.375	5.811	5.728	5.388	6.267	5.528	6.129	5.845	4.011	5.253
1965	5.380	5.837	5.728	5.387	6.267	5.532	6.123	5.742	4.011	5.253
1966	5.354	5.839	5.722	5.388	6.266	5.532	6.112	5.728	4.011	5.253
1967	5.291	5.818	5.682	5.391	6.266	5.515	6.128	5.758	2.3838	5.253
1968	5.272	5.797	5.646	5.394	6.263	5.504	6.095	5.762	3.818	5.253
1969	5.213	5.769	5.603	5.394	6.259	5.492	6.093	5.713	3.805	5.253
1970	5.216	5.773	5.604	5.393	6.252	5.503	6.088	5.811	3.779	5.253
1971	5.212	5.758	5.600	5.389	6.245	5.504	6.062	5.775	3.772	5.253
1972	5.193	5.733	5.564	5.388	6.233	5.500	6.045	5.741	3.760	5.253
1973	5.205	5.749	5.568	5.395	6.245	5.515	5.983	5.752	3.746	5.253
1974	5.196	5.740	5.538	5.394	6.238	5.504	5.959	5.773	3.730	5.253
1975	5.192	5.704	5.528	5.392	6.250	5.494	5.935	5.747	3.715	5.253
1976	5.215	5.726	5.538	5.395	6.251	5.504	5.980	5.743	3.711	5.253
1977	5.213	5.733	5.555	5.400	6.249	5.518	5.908	5.796	3.677	5.253
1978	5.213	5.716	5.553	5.404	6.251	5.519	5.955	5.814	3.669	5.253
1979	5.298	5.769	5.418	5.428	6.258	5.494	5.811	5.864	3.680	5.253
1980	5.245	5.803	5.376	5.440	6.254	5.479	5.748	5.841	3.674	5.253
1981	5.191	5.751	5.313	5.432	6.258	5.448	5.659	5.837	3.643	5.253
1982	5.167	5.751	5.263	5.422	6.258	5.415	5.664	5.829	3.615	5.253
1983	5.022	5.642	5.273	5.415	6.255	5.406	5.677	5.800	3.614	5.253
1984	5.129	5.700	5.223	5.422	6.251	5.395	5.613	5.867	3.599	5.253
1985	5.115	5.660	5.221	5.423	6.247	5.387	5.572	5.819	3.603	5.253
1986	5.130	5.691	5.286	5.427	6.257	5.418	5.624	5.839	3.640	5.253
1987	5.095	5.659	5.253	5.430	6.249	5.403	5.599	5.860	3.659	5.253
1988	5.118	5.657	5.248	5.434	6.250	5.410	5.618	5.842	3.652	5.253
1989	5.057	R5.619	R5.234	5.440	RP6.240	5.410	5.641	5.869	3.683	5.253
1990	R4.950	R5.617	5.272	R5.444	RP6.244	5.411	5.614	5.838	3.625	5.253
1991	4.912	R5.590	R5.190	5.442	RP6.246	5.384	5.636	5.827	3.614	5.253
1992	R4.942	R5.577	5.188	5.445	RP6.238	5.378	5.623	5.774	3.624	5.253
1993	R4.942	R5.571	R5.195	5.438	RP6.230	5.379	5.620	5.777	3.606	5.253
1994	R4.936	R5.580	R5.165	R5.426	RP6.213	5.361	5.534	5.777	3.635	3.5230
1995	R4.925	R5.546	R5.133	5.419	RP6.188	5.341	5.483	5.740	3.623	5.215
1996	R4.869	R5.494	R5.129	5.421	RP6.195	5.336	5.468	5.728	3.613	5.216
1997	R4.870	R5.459	R5.133	5.417	RP6.199	5.336	5.469	5.726	3.616	5.213
1998	R4.842	R5.440	R5.149	R5.414	RP6.210	5.349	5.462	5.710	3.614	5.212
1999	R4.749	R5.349	R5.105	R5.415	RP6.205	5.328	5.421	5.684	3.616	5.211
2000	R4.754	R5.388	R5.072	R5.423	RP6.189	5.326	R5.432	5.651	R3.607	5.210
2001	P4.824	P5.422	P5.120	P5.421	P6.195	P5.346	P5.460	P5.736	P3.614	P5.210

<sup>1</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants.

<sup>2</sup> There is a discontinuity in this time series between 1966 and 1967; beginning in 1967, the single constant factor is replaced by a quantity-weighted average of liquefied petroleum gases' major components.

<sup>3</sup> There is a discontinuity in this time series between 1993 and 1994; beginning in 1994, the single

constant factor is replaced by a factor that is a quantity-weighted average of motor gasoline's major components. See Table A1.

R=Revised. P=Preliminary.

Note: Weighted averages of the products included in each category are calculated by using heat content values shown in Table A1.

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A6.

**Table A4. Approximate Heat Content of Natural Gas, 1949-2001**  
(Btu per Cubic Foot)

Year	Production		Consumption			Imports	Exports
	Dry	Marketed	End-Use Sectors	Electric Power Sector <sup>1</sup>	Total		
1949	1,035	1,120	1,035	1,035	1,035	—	1,035
1950	1,035	1,119	1,035	1,035	1,035	—	1,035
1951	1,035	1,114	1,035	1,035	1,035	—	1,035
1952	1,035	1,115	1,035	1,035	1,035	1,035	1,035
1953	1,035	1,116	1,035	1,035	1,035	1,035	1,035
1954	1,035	1,115	1,035	1,035	1,035	1,035	1,035
1955	1,035	1,120	1,035	1,035	1,035	1,035	1,035
1956	1,035	1,116	1,035	1,035	1,035	1,035	1,035
1957	1,035	1,113	1,035	1,035	1,035	1,035	1,035
1958	1,035	1,110	1,035	1,035	1,035	1,035	1,035
1959	1,035	1,109	1,035	1,035	1,035	1,035	1,035
1960	1,035	1,107	1,035	1,035	1,035	1,035	1,035
1961	1,035	1,108	1,035	1,035	1,035	1,035	1,035
1962	1,035	1,107	1,035	1,035	1,035	1,035	1,035
1963	1,031	1,103	1,031	1,031	1,031	1,031	1,031
1964	1,032	1,102	1,032	1,032	1,032	1,032	1,032
1965	1,032	1,101	1,032	1,032	1,032	1,032	1,032
1966	1,033	1,103	1,033	1,033	1,033	1,033	1,033
1967	1,032	1,105	1,032	1,032	1,032	1,032	1,032
1968	1,031	1,115	1,031	1,031	1,031	1,031	1,031
1969	1,031	1,103	1,031	1,031	1,031	1,031	1,031
1970	1,031	1,102	1,031	1,031	1,031	1,031	1,031
1971	1,031	1,103	1,031	1,031	1,031	1,031	1,031
1972	1,027	1,100	1,027	1,027	1,027	1,027	1,027
1973	1,021	1,093	1,020	1,024	1,021	1,026	1,023
1974	1,024	1,097	1,024	1,022	1,024	1,027	1,016
1975	1,021	1,095	1,020	1,026	1,021	1,026	1,014
1976	1,020	1,093	1,019	1,023	1,020	1,025	1,013
1977	1,021	1,093	1,019	1,029	1,021	1,026	1,013
1978	1,019	1,088	1,016	1,034	1,019	1,030	1,013
1979	1,021	1,092	1,018	1,035	1,021	1,037	1,013
1980	1,026	1,098	1,024	1,035	1,026	1,022	1,013
1981	1,027	1,103	1,025	1,035	1,027	1,014	1,011
1982	1,028	1,107	1,026	1,036	1,028	1,018	1,011
1983	1,031	1,115	1,031	1,030	1,031	1,024	1,010
1984	1,031	1,109	1,030	1,035	1,031	1,005	1,010
1985	1,032	1,112	1,031	1,038	1,032	1,002	1,011
1986	1,030	1,110	1,029	1,034	1,030	997	1,008
1987	1,031	1,112	1,031	1,032	1,031	999	1,011
1988	1,029	1,109	1,029	1,028	1,029	1,002	1,018
1989	1,031	1,107	1,031	RP1,028	1,031	1,004	1,019
1990	1,031	1,106	1,030	RP1,027	R1,029	1,012	1,018
1991	1,030	1,108	1,031	RP1,025	1,030	1,014	1,022
1992	1,030	1,110	1,031	RP1,025	1,030	1,011	1,018
1993	1,027	1,106	1,028	RP1,025	1,027	1,020	1,016
1994	1,028	1,105	1,029	RP1,025	1,028	1,022	1,011
1995	1,027	1,106	1,027	RP1,021	R1,026	1,021	1,011
1996	1,027	1,109	1,027	RP1,020	R1,026	1,022	1,011
1997	1,026	1,107	1,027	RP1,020	1,026	1,023	1,011
1998	1,031	R1,109	1,033	RP1,024	1,031	1,023	1,011
1999	1,027	R1,107	1,028	RP1,022	1,027	1,022	1,006
2000	R1,025	R1,107	R1,026	RP1,021	R1,025	R1,023	1,006
2001	P1,025	P1,107	P1,026	P1,026	P1,026	P1,023	P1,006

<sup>1</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants.

R=Revised. P=Preliminary. — = Not applicable.

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A6.

**Table A5. Approximate Heat Content of Coal and Coal Coke, 1949-2001**

(Million Btu per Short Ton)

Year	Coal							Coal Coke	
	Production	Consumption				Total	Imports		Exports
		End-Use Sectors		Electric Power Sector <sup>2</sup>	Total				
		Residential and Commercial	Industrial						
	Coke Plants		Other <sup>1</sup>					Imports and Exports	
1949	24.916	24.263	26.797	24.612	23.761	24.793	25.000	26.759	24.800
1950	25.090	24.461	26.798	24.820	23.937	24.989	25.020	26.788	24.800
1951	25.019	24.281	26.796	24.521	23.701	24.813	25.034	26.848	24.800
1952	25.096	24.371	26.796	24.724	23.885	24.901	25.040	26.859	24.800
1953	25.147	24.383	26.796	24.785	23.964	25.006	25.048	26.881	24.800
1954	25.054	24.362	26.795	24.788	23.996	24.913	25.012	26.865	24.800
1955	25.201	24.373	26.794	24.821	24.056	24.982	25.000	26.907	24.800
1956	25.117	24.195	26.792	24.664	23.943	24.843	25.000	26.886	24.800
1957	25.213	24.238	26.792	24.707	23.980	24.905	25.001	26.914	24.800
1958	24.983	24.287	26.794	24.606	23.897	24.716	25.005	26.931	24.800
1959	24.910	24.224	26.790	24.609	23.924	24.719	25.003	26.927	24.800
1960	24.906	24.226	26.791	24.609	23.927	24.713	25.003	26.939	24.800
1961	24.849	24.248	26.792	24.580	23.904	24.653	25.002	26.937	24.800
1962	24.828	24.173	26.788	24.562	23.911	24.627	25.013	26.928	24.800
1963	24.831	24.033	26.784	24.509	23.897	24.588	25.007	26.894	24.800
1964	24.840	24.037	26.785	24.477	23.864	24.602	25.000	26.949	24.800
1965	24.775	24.028	26.787	24.385	23.780	24.537	25.000	26.973	24.800
1966	24.629	23.915	26.786	24.226	23.648	24.396	25.000	26.976	24.800
1967	24.475	23.685	26.781	24.040	23.506	24.243	25.000	26.981	24.800
1968	24.445	23.621	26.780	24.014	23.486	24.186	25.000	26.984	24.800
1969	24.280	23.474	26.779	23.724	23.240	23.976	25.000	26.982	24.800
1970	23.842	23.203	26.784	22.983	22.573	23.440	25.000	26.982	24.800
1971	23.507	23.090	26.784	22.670	22.301	23.124	25.000	26.981	24.800
1972	23.389	22.998	26.782	22.550	22.204	23.036	25.000	26.979	24.800
1973	23.376	22.831	26.780	22.586	22.246	23.057	25.000	26.596	24.800
1974	23.072	22.479	26.778	22.419	21.781	22.677	25.000	26.700	24.800
1975	22.897	22.261	26.782	22.436	21.642	22.506	25.000	26.562	24.800
1976	22.855	22.774	26.781	22.530	21.679	22.498	25.000	26.601	24.800
1977	22.597	22.919	26.787	22.322	21.508	22.265	25.000	26.548	24.800
1978	22.248	22.466	26.789	22.207	21.275	22.017	25.000	26.478	24.800
1979	22.454	22.242	26.788	22.452	21.364	22.100	25.000	26.548	24.800
1980	22.415	22.543	26.790	22.690	21.295	21.947	25.000	26.384	24.800
1981	22.308	22.474	26.794	22.585	21.085	21.713	25.000	26.160	24.800
1982	22.239	22.695	26.797	22.712	21.194	21.674	25.000	26.223	24.800
1983	22.052	22.775	26.798	22.691	21.133	21.576	25.000	26.291	24.800
1984	22.010	22.844	26.799	22.543	21.101	21.573	25.000	26.402	24.800
1985	21.870	22.646	26.798	22.020	20.959	21.366	25.000	26.307	24.800
1986	21.913	22.947	26.798	22.198	21.084	21.462	25.000	26.292	24.800
1987	21.922	23.404	26.799	22.381	21.136	21.517	25.000	26.291	24.800
1988	21.823	23.571	26.799	22.360	20.900	21.328	25.000	26.299	24.800
1989	21.765	23.650	26.800	22.347	RP20.873	R21.286	25.000	26.160	24.800
1990	21.822	23.137	26.799	22.457	RP20.800	R21.216	25.000	26.202	24.800
1991	21.681	23.114	26.799	22.460	RP20.730	R21.120	25.000	26.188	24.800
1992	21.682	23.105	26.799	22.250	RP20.709	R21.068	25.000	26.161	24.800
1993	21.418	22.994	26.800	22.123	RP20.677	R21.010	25.000	26.335	24.800
1994	21.394	23.112	26.800	22.068	RP20.589	R20.929	25.000	26.329	24.800
1995	21.326	23.118	26.800	21.950	RP20.543	R20.880	25.000	26.180	24.800
1996	21.322	23.011	26.800	22.105	RP20.547	R20.870	25.000	26.174	24.800
1997	21.296	22.494	26.800	22.172	RP20.518	R20.830	25.000	26.251	24.800
1998	21.418	21.620	27.426	23.164	RP20.516	R20.881	25.000	26.800	24.800
1999	21.070	23.880	27.426	22.489	RP20.490	R20.818	25.000	26.081	24.800
2000	21.072	R25.020	P27.426	R22.433	RP20.511	R20.828	25.000	26.117	24.800
2001	P20.905	P25.000	P27.426	P22.433	P20.366	P20.681	25.000	P26.000	24.800

<sup>1</sup> Includes transportation.

<sup>2</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants.

R=Revised. P=Preliminary.

Source: Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels. See "Thermal Conversion Factor Source Documentation," which follows Table A6.



**Table A6. Approximate Heat Rates for Electricity, 1949-2001**  
(Btu per Kilowatthour)

Year	Electricity Net Generation			Electricity Consumption
	Fossil-Fueled Steam-Electric Plants <sup>1</sup>	Nuclear Steam-Electric Plants	Geothermal Energy Plants <sup>2</sup>	
1949	15,033	—	—	3,412
1950	14,030	—	—	3,412
1951	13,641	—	—	3,412
1952	13,361	—	—	3,412
1953	12,889	—	—	3,412
1954	12,180	—	—	3,412
1955	11,699	—	—	3,412
1956	11,456	—	—	3,412
1957	11,365	11,629	—	3,412
1958	11,085	11,629	—	3,412
1959	10,970	11,629	—	3,412
1960	10,760	11,629	23,200	3,412
1961	10,650	11,629	23,200	3,412
1962	10,558	11,629	23,200	3,412
1963	10,482	11,877	22,182	3,412
1964	10,462	11,912	22,182	3,412
1965	10,453	11,804	22,182	3,412
1966	10,415	11,623	22,182	3,412
1967	10,432	11,555	21,770	3,412
1968	10,398	11,297	21,606	3,412
1969	10,447	11,037	21,606	3,412
1970	10,494	10,977	21,606	3,412
1971	10,478	10,837	21,655	3,412
1972	10,379	10,792	21,668	3,412
1973	10,389	10,903	21,674	3,412
1974	10,442	11,161	21,674	3,412
1975	10,406	11,013	21,611	3,412
1976	10,373	11,047	21,611	3,412
1977	10,435	10,769	21,611	3,412
1978	10,361	10,941	21,611	3,412
1979	10,353	10,879	21,545	3,412
1980	10,388	10,908	21,639	3,412
1981	10,453	11,030	21,639	3,412
1982	10,454	11,073	21,629	3,412
1983	10,520	10,905	21,290	3,412
1984	10,440	10,843	21,303	3,412
1985	10,447	R10,622	21,263	3,412
1986	10,446	R10,579	21,263	3,412
1987	10,419	R10,442	21,263	3,412
1988	10,324	R10,602	21,096	3,412
1989	10,432	R10,583	21,096	3,412
1990	10,402	R10,582	21,096	3,412
1991	10,436	R10,484	20,997	3,412
1992	10,342	R10,471	20,914	3,412
1993	10,309	R10,504	20,914	3,412
1994	10,316	R10,452	20,914	3,412
1995	10,312	R10,507	20,914	3,412
1996	10,340	R10,503	20,960	3,412
1997	R10,213	R10,494	20,960	3,412
1998	R10,197	R10,491	21,017	3,412
1999	R10,226	R10,450	21,017	3,412
2000	R10,201	R10,429	21,017	3,412
2001 <sup>P</sup>	10,201	10,442	21,017	3,412

<sup>1</sup> Used as the thermal conversion factor for hydroelectric, solar, and wind electricity net generation.

<sup>2</sup> Used as the thermal conversion factor for geothermal electricity net generation.

R=Revised data. P=Preliminary data. — = Not applicable.

Source: See "Thermal Conversion Factor Source Documentation," which follows this table.

# Thermal Conversion Factor Source Documentation

## Approximate Heat Content of Petroleum and Natural Gas Plant Liquids

**Asphalt.** The Energy Information Administration (EIA) adopted the thermal conversion factor of 6.636 million British thermal units (Btu) per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

**Aviation Gasoline.** EIA adopted the thermal conversion factor of 5.048 million Btu per barrel as adopted by the Bureau of Mines from the Texas Eastern Transmission Corporation publication *Competition and Growth in American Energy Markets 1947-1985*, a 1968 release of historical and projected statistics.

**Butane.** EIA adopted the Bureau of Mines thermal conversion factor of 4.326 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

**Butane-Propane Mixture.** EIA adopted the Bureau of Mines calculation of 4.130 million Btu per barrel based on an assumed mixture of 60 percent butane and 40 percent propane. See **Butane** and **Propane**.

**Crude Oil, Exports.** Assumed by EIA to be 5.800 million Btu per barrel or equal to the thermal conversion factor for crude oil produced in the United States. See **Crude Oil** and **Lease Condensate, Production**.

**Crude Oil, Imports.** Calculated annually by EIA by weighting the thermal conversion factor of each type of crude oil imported by the quantity imported. Thermal conversion factors for each type were calculated on a foreign country basis, by determining the average American Petroleum Institute (API) gravity of crude imported from each foreign country from Form ERA-60 in 1977 and converting average API gravity to average Btu content by using National Bureau of Standards, Miscellaneous Publication No. 97, *Thermal Properties of Petroleum Products*, 1933.

**Crude Oil and Lease Condensate, Production.** EIA adopted the thermal conversion factor of 5.800 million Btu per barrel as reported in a Bureau of

Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950."

**Crude Oil and Petroleum Products, Exports.** Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product exported and crude oil exported weighted by the quantity of each petroleum product and crude oil exported. See **Crude Oil, Exports** and **Exports Petroleum Products**.

**Crude Oil and Petroleum Products, Imports.** Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product and each crude oil imported weighted by the quantity of each petroleum product and each type of crude oil imported. See **Crude Oil, Imports** and **Petroleum Products, Imports**.

**Distillate Fuel Oil.** EIA adopted the Bureau of Mines thermal conversion factor of 5.825 million Btu per barrel as reported in a Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950."

**Ethane.** EIA adopted the Bureau of Mines thermal conversion factor of 3.082 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

**Ethane-Propane Mixture.** EIA calculation of 3.308 million Btu per barrel based on an assumed mixture of 70 percent ethane and 30 percent propane. See **Ethane** and **Propane**.

**Isobutane.** EIA adopted the Bureau of Mines thermal conversion factor of 3.974 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

**Jet Fuel, Kerosene Type.** EIA adopted the Bureau of Mines thermal conversion factor of 5.670 million Btu per barrel for "Jet Fuel, Commercial" as published by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947-1985*, a 1968 release of historical and projected statistics.

**Jet Fuel, Naphtha Type.** EIA adopted the Bureau of Mines thermal conversion factor of 5.355 million Btu per barrel for “Jet Fuel, Military” as published by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947-1985*, a 1968 release of historical and projected statistics.

**Kerosene.** EIA adopted the Bureau of Mines thermal conversion factor of 5.670 million Btu per barrel as reported in a Bureau of Mines internal memorandum, “Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950.”

**Liquefied Petroleum Gases (LPG) Consumption.** Ethane, ethylene, propane, propylene, normal butane, butylene, and isobutane produced at refineries or natural gas processing plants, including plants that fractionate new natural gas plants liquids.

**Lubricants.** EIA adopted the thermal conversion factor of 6.065 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

**Miscellaneous Products.** EIA adopted the thermal conversion factor of 5.796 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

**Motor Gasoline.** EIA adopted the Bureau of Mines thermal conversion factor of 5.253 million Btu per barrel for “Gasoline, Motor Fuel” as published by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947-1985*, a 1968 release of historical and projected statistics. Conversion factors for reformulated and oxygenated motor gasolines are calculated by EIA based on data published in the Environmental Protection Agency, Office of Mobile Sources, National Vehicle and Fuel Emissions Laboratory report EPA 420-F-95-003 *Fuel Economy Impact Analysis of Reformulated Gasoline*. Both of the factors are currently 5.150 million Btu per barrel.

**Natural Gas Plant Liquids, Production.** Calculated annually by EIA as the average of the thermal conversion factors of each natural gas plant liquid produced, weighted by the quantity of each natural gas plant liquid produced.

**Natural Gasoline.** EIA adopted the thermal conversion factor of 4.620 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

**Pentanes Plus.** EIA assumed the thermal conversion factor to be 4.620 million Btu or equal to that for natural gasoline. See **Natural Gasoline**.

**Petrochemical Feedstocks, Naphtha less than 401° F.** Assumed by EIA to be 5.248 million Btu per barrel, equal to the thermal conversion factor for special naphthas. See **Special Naphthas**.

**Petrochemical Feedstocks, Other Oils equal to or greater than 401° F.** Assumed by EIA to be 5.825 million Btu per barrel, equal to the thermal conversion factor for distillate fuel oil. See **Distillate Fuel Oil**.

**Petrochemical Feedstocks, Still Gas.** Assumed by EIA to be 6.000 million Btu per barrel, equal to the thermal conversion factor for still gas. See **Still Gas**.

**Petroleum Coke.** EIA adopted the thermal conversion factor of 6.024 million Btu per barrel as reported in Btu per short ton in the Bureau of Mines internal memorandum, “Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950.” The Bureau of Mines calculated this factor by dividing 30.120 million Btu per short ton, as given in the referenced Bureau of Mines internal memorandum, by 5.0 barrels per short ton, as given in the Bureau of Mines Form 6-1300-M and successor EIA forms.

**Petroleum Products, Total Consumption.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed, weighted by the quantity of each petroleum product consumed.

**Petroleum Products, Consumption by Electric Utilities.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed at electric utilities, weighted by the quantity of each petroleum product consumed at electric utilities. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA’s *State Energy Data Report*.

**Petroleum Products, Consumption by Industrial Users.** Calculated annually by EIA as the average of the thermal conversion factors for all

petroleum products consumed in the industrial sector, weighted by the estimated quantity of each petroleum product consumed in the industrial sector. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA's *State Energy Data Report*.

**Petroleum Products, Consumption by Residential and Commercial Users.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed by the residential and commercial sector, weighted by the estimated quantity of each petroleum product consumed in the residential and commercial sector. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA's *State Energy Data Report*.

**Petroleum Products, Consumption by Transportation Users.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed in the transportation sector, weighted by the estimated quantity of each petroleum product consumed in the transportation sector. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA's *State Energy Data Report*.

**Petroleum Products, Exports.** Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product, weighted by the quantity of each petroleum product exported.

**Petroleum Products, Imports.** Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product imported, weighted by the quantity of each petroleum product imported.

**Plant Condensate.** Estimated to be 5.418 million Btu per barrel by EIA from data provided by McClanahan Consultants, Inc., Houston, Texas.

**Propane.** EIA adopted the Bureau of Mines thermal conversion factor of 3.836 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

**Residual Fuel Oil.** EIA adopted the thermal conversion factor of 6.287 million Btu per barrel as reported in the Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950."

**Road Oil.** EIA adopted the Bureau of Mines thermal conversion factor of 6.636 million Btu per barrel, which was assumed to be equal to that of asphalt (see **Asphalt**) and was first published by the Bureau of Mines in the *Petroleum Statement, Annual, 1970*.

**Special Naphthas.** EIA adopted the Bureau of Mines thermal conversion factor of 5.248 million Btu per barrel, which was assumed to be equal to that of the total gasoline (aviation and motor) factor and was first published in the *Petroleum Statement, Annual, 1970*.

**Still Gas.** EIA adopted the Bureau of Mines estimated thermal conversion factor of 6.000 million Btu per barrel, first published in the *Petroleum Statement, Annual, 1970*.

**Unfinished Oils.** EIA assumed the thermal conversion factor to be 5.825 million Btu per barrel or equal to that for distillate fuel (see **Distillate Fuel Oil**) and first published it in EIA's *Annual Report to Congress, Volume 3, 1977*.

**Unfractionated Stream.** EIA assumed the thermal conversion factor to be 5.418 million Btu per barrel or equal to that for plant condensate (see **Plant Condensate**) and first published it in EIA's *Annual Report to Congress, Volume 2, 1981*.

**Waxes.** EIA adopted the thermal conversion factor of 5.537 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

## Approximate Heat Content of Natural Gas

**Natural Gas, Total Consumption.** • 1949-1962: EIA adopted the thermal conversion factor of 1,035 Btu per cubic foot as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*. • 1963-1979: EIA adopted the thermal conversion factor calculated annually by the American Gas Association (AGA) and published in *Gas Facts*, an AGA annual publication. • 1980 forward: Calculated annually by EIA by dividing the total heat content of natural gas consumed by the total quantity of natural gas consumed.

**Natural Gas, Consumption by Electric Utilities.** Calculated annually by EIA by dividing the total heat content of natural gas received at electric

utilities by the total quantity received at electric utilities. The heat contents and receipts are from Form FERC-423 and predecessor forms.

**Natural Gas, Consumption by Sectors Other Than Electric Utilities.**

Calculated annually by EIA by dividing the heat content of all natural gas consumed less the heat content of natural gas consumed at electric utilities by the quantity of all natural gas consumed less the quantity of natural gas consumed at electric utilities. Data are from Forms EIA-176, FERC-423, EIA-759, and predecessor forms.

**Natural Gas, Exports.** • 1949-1972: Assumed by EIA to be equal to the thermal conversion factor for the consumption of dry natural gas. (See **Natural Gas, Total Consumption**). • 1973 forward: Calculated annually by EIA by dividing the heat content of exported natural gas by the quantity of natural gas exported, both reported on Form FPC-14.

**Natural Gas Imports.** • 1949-1972: Assumed by EIA to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Natural Gas, Total Consumption**. • 1973 forward: Calculated annually by EIA by dividing the heat content of imported natural gas by the quantity of natural gas imported, both reported on Form FPC-14.

**Natural Gas, Production (Dry).** Assumed by EIA to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Natural Gas, Total Consumption**.

**Natural Gas, Production, Marketed (Wet).** Calculated annually by EIA by adding the heat content of natural gas, dry production, and the total heat content of natural gas plant liquids production and dividing this sum by the total quantity of marketed (wet) natural gas production.

## Approximate Heat Content of Coal and Coal Coke

**Coal, Total Consumption.** Calculated annually by EIA by dividing the sum of the heat content of coal consumption by the total tonnage.

**Coal, Consumption by Electric Utilities.** Calculated annually by EIA by dividing the sum of the heat content of coal received at electric utilities by the sum of the total tonnage received.

**Coal, Consumption by Other Power Producers.** Calculated annually by dividing the total heat content of coal consumed by other power producers by their total consumption tonnage.

**Coal, Consumption by the Electric Power Sector.** Calculated annually by dividing the total heat content of coal by total consumption tonnage of the electric power sector.

**Coal, Consumption by End-Use Sectors.** Calculated annually by EIA by dividing the sum of the heat content of coal consumed by the end-use sectors by the sum of the total tonnage.

**Coal, Exports.** Calculated annually by EIA by dividing the sum of the heat content of coal exported by the sum of the total tonnage.

**Coal, Imports.** Calculated annually by EIA by dividing the sum of the heat content of coal imported by the sum of the total tonnage.

**Coal, Production.** Calculated annually by EIA by dividing the sum of the total heat content of coal produced by the sum of the total tonnage.

**Coal Coke, Imports and Exports.** EIA adopted the Bureau of Mines estimate of 24.800 million Btu per short ton.

## Approximate Heat Rates for Electricity

**Fossil-Fueled Steam-Electric Plant Generation.** There is no generally accepted practice for measuring the thermal conversion rates for power plants that generate electricity from hydroelectric, wood and waste, wind, photovoltaic, or solar thermal energy sources. Therefore, EIA used data from Form EIA-767, "Steam-Electric Plant Operation and Design Report," to calculate a rate factor that is equal to the prevailing annual average heat rate factor for fossil-fueled steam-electric power plants in the United States. By using that factor, it is possible to evaluate fossil fuel requirements for replacing those sources during periods of interruption, such as droughts. The heat content of a kilowatt-hour of electricity produced, regardless of the generation process, is 3,412 Btu. • 1949-1955: The weighted annual average heat rate for fossil-fueled steam-electric power plants in the United States, as published by EIA in *Thermal-Electric Plant Construction Cost and Annual Production Expenses-1981* and *Steam-Electric Plant Construction Cost and Annual Production Expenses-1978*. • 1956-1988: The weighted annual average heat



rate for fossil-fueled steam-electric power plants in the United States, as published in EIA, *Electric Plant Cost and Power Production Expenses 1991*, Table 9. • 1989 forward: Calculated annually by EIA by using the heat rate reported on Form EIA-860, “Annual Electric Generator Report” (and predecessor forms EIA-860A, EIA-860B, and EIA-867), and the generation on Form EIA-906, “Power Plant Report” (and predecessor forms).”

**Geothermal Energy Plant Generation.** • 1960-1981: Calculated annually by EIA by weighting the annual average heat rates of operating geothermal units by the installed nameplate capacities as reported on Form FPC-12, “Power System Statement.” • 1982 forward: Estimated annually by EIA on the basis of an informal survey of relevant plants.

**Nuclear Steam-Electric Plant Generation.** • 1957-1984: Calculated annually by dividing the total heat content consumed in nuclear generating units by the total (net) electricity generated by nuclear generating units. The heat content and electricity generation were reported on Form FERC-1, “Annual Report of Major Electric Utilities, Licensees, and Others”; Form EIA-412, “Annual Report of Public Electric Utilities”; and predecessor forms. The factors for 1982 through 1984 were published in the following EIA reports-1982: *Historical Plant Cost and Annual Production Expenses for Selected Electric Plants 1982*, page 215. 1983 and 1984: *Electric Plant Cost and Power Production Expenses 1991*, Table 13. 1985 forward: Calculated annually by EIA by using the heat rate reported on Form EIA-860, “Annual Electric Generator Report,” and the generation reported on Form EIA-906, “Power Plant Report” (and predecessor forms).



## Appendix B

### Metric and Other Physical Conversion Factors

Data presented in the *Annual Energy Review* and in other Energy Information Administration publications are expressed predominately in units that historically have been used in the United States, such as British thermal units, barrels, cubic feet, and short tons. However, because U.S. commerce involves other nations, most of which use metric units of measure, the U.S. Government is committed to the transition to the metric system, as stated in the Metric Conversion Act of 1975 (Public Law 94-168), amended by the Omnibus Trade and Competitiveness Act of 1988 (Public Law 100-418), and Executive Order 12770 of July 25, 1991.

The metric conversion factors presented in Table B1 can be used to calculate the metric-unit equivalents of values expressed in U.S. customary units. For

example, 500 short tons is the equivalent of 453.6 metric tons (500 short tons  $\times$  0.9071847 metric tons/short ton = 453.6 metric tons).

In the metric system of weights and measures, the names of multiples and subdivisions of any unit may be derived by combining the name of the unit with prefixes, such as deka, hecto, and kilo, meaning, respectively, 10, 100, 1,000, and deci, centi, and milli, meaning, respectively, one-tenth, one-hundredth, and one-thousandth. Common metric prefixes can be found in Table B2.

The conversion factors presented in Table B3 can be used to calculate equivalents in various physical units commonly used in energy analyses. For example, 10 barrels is the equivalent of 420 U.S. gallons (10 barrels  $\times$  42 gallons/barrel = 420 gallons).



**Table B1. Metric Conversion Factors**

U.S. Unit	multiplied by	Conversion Factor	equals	Metric Unit	U.S. Unit	multiplied by	Conversion Factor	equals	Metric Unit
<b>Mass</b>					<b>Volume</b>				
short tons (2,000 lb)	x	0.907 184 7	=	metric tons (t)	barrels of oil (bbl)	x	0.158 987 3	=	cubic meters (m <sup>3</sup> )
long tons	x	1.016 047	=	metric tons (t)	cubic yards (yd <sup>3</sup> )	x	0.764 555	=	cubic meters (m <sup>3</sup> )
pounds (lb)	x	0.453 592 37 <sup>a</sup>	=	kilograms (kg)	cubic feet (ft <sup>3</sup> )	x	0.028 316 85	=	cubic meters (m <sup>3</sup> )
pounds uranium oxide (lb U <sub>3</sub> O <sub>8</sub> )	x	0.384 647 <sup>b</sup>	=	kilograms uranium (kgU)	U.S. gallons (gal)	x	3.785 412	=	liters (L)
ounces, avoirdupois (avdp oz)	x	28.349 52	=	grams (g)	ounces, fluid (fl oz)	x	29.573 53	=	milliliters (mL)
					cubic inches (in <sup>3</sup> )	x	16.387 06	=	milliliters (mL)
<b>Length</b>					<b>Area</b>				
miles (mi)	x	1.609 344 <sup>a</sup>	=	kilometers (km)	acres	x	0.404 69	=	hectares (ha)
yards (yd)	x	0.914 4 <sup>a</sup>	=	meters (m)	square miles (mi <sup>2</sup> )	x	2.589 988	=	square kilometers (km <sup>2</sup> )
feet (ft)	x	0.304 8 <sup>a</sup>	=	meters (m)	square yards (yd <sup>2</sup> )	x	0.836 127 4	=	square meters (m <sup>2</sup> )
inches (in)	x	2.54 <sup>a</sup>	=	centimeters (cm)	square feet (ft <sup>2</sup> )	x	0.092 903 04 <sup>a</sup>	=	square meters (m <sup>2</sup> )
					square inches (in <sup>2</sup> )	x	6.451 6 <sup>a</sup>	=	square centimeters (cm <sup>2</sup> )
<b>Energy</b>					<b>Temperature</b>				
British Thermal Units (Btu)	x	1,055.055 852 62 <sup>a,c</sup>	=	joules (J)	degrees Fahrenheit (°F)	x	5/9 (after subtracting 32) <sup>a,d</sup>	=	degrees Celsius (°C)
calories (cal)	x	4.186 8 <sup>a</sup>	=	joules (J)					
kilowatthours (kWh)	x	3.6 <sup>a</sup>	=	megajoules (MJ)					

<sup>a</sup>Exact conversion.

<sup>b</sup>Calculated by the Energy Information Administration.

<sup>c</sup>The Btu used in this table is the International Table Btu adopted by the Fifth International Conference on Properties of Steam, London, 1956.

<sup>d</sup>To convert degrees Celsius (°C) to degrees Fahrenheit (°F) exactly, multiply by 9/5, then add 32.

Notes: • Spaces have been inserted after every third digit to the right of the decimal for ease of reading. • Most metric units shown belong to the International System of Units (SI), and the liter, hectare, and

metric ton are accepted for use with the SI units. For more information about the SI units, contact Dr. Barry Taylor at Building 221, Room B610, National Institute of Standards and Technology, Gaithersburg, MD 20899, or on telephone number 301-975-4220.

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

**Table B2. Metric Prefixes**

Unit Multiple	Prefix	Symbol	Unit Multiple	Prefix	Symbol
10 <sup>1</sup>	deka	da	. 10 <sup>-1</sup>	deci	d
10 <sup>2</sup>	hecto	h	. 10 <sup>-2</sup>	centi	c
10 <sup>3</sup>	kilo	k	. 10 <sup>-3</sup>	milli	m
10 <sup>6</sup>	mega	M	. 10 <sup>-6</sup>	micro	
10 <sup>9</sup>	giga	G	. 10 <sup>-9</sup>	nano	n
10 <sup>12</sup>	tera	T	. 10 <sup>-12</sup>	pico	p
10 <sup>15</sup>	peta	P	. 10 <sup>-15</sup>	femto	f
10 <sup>18</sup>	exa	E	. 10 <sup>-18</sup>	atto	a
10 <sup>21</sup>	zetta	Z	. 10 <sup>-21</sup>	zepto	z
10 <sup>24</sup>	yotta	Y	. 10 <sup>-24</sup>	yocto	y

Source: U.S. Department of Commerce, National Institute of Standards and Technology, *The International System of Units (SI)*, NIST Special Publication 330, 1991 Edition (Washington, DC, August 1991), p. 10.

**Table B3. Other Physical Conversion Factors**

Energy Source	Original Unit	multiplied by	Conversion Factor	equals	Final Unit
<b>Petroleum</b>	barrels (bbl)	x	42 <sup>a</sup>	=	U.S. gallons (gal)
<b>Coal</b>	short tons	x	2,000 <sup>a</sup>	=	pounds (lb)
	long tons	x	2,240 <sup>a</sup>	=	pounds (lb)
	metric tons (t)	x	1,000 <sup>a</sup>	=	kilograms (kg)
<b>Wood</b>	cords (cd)	x	1.25 <sup>b</sup>	=	short tons
	cords (cd)	x	128 <sup>a</sup>	=	cubic feet (ft <sup>3</sup> )

<sup>a</sup>Exact conversion.

<sup>b</sup>Calculated by the Energy Information Administration.

Source: U.S. Department of Commerce, National Institute of Standards and Technology, *Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices*, NIST Handbook 44, 1994 Edition (Washington, DC, October 1993), pp. B-10, C-17, and C-21.



# Appendix C

## Carbon Dioxide Emission Factors for Coal

Table C1 presents U.S. average carbon dioxide emission factors for coal by sector. The factors measure the emissions produced during the combustion of coal and were derived from coal sample analyses. The factors are ratios of the carbon dioxide emitted to the heat content of the coal burned,

assuming complete combustion. Factors vary according to the rank and geographic origin of the coal. Sectoral factors reflect the rank and origin of the coal consumed annually in the sector.

**Table C1. Average Carbon Dioxide Emission Factors for Coal by Sector, 1980-2000**  
(Pounds of Carbon Dioxide per Million Btu)

Year	Residential and Commercial	Industrial			U.S. Average <sup>b</sup>
		Coke Plants <sup>a</sup>	Other Coal	Electricity Generation	
1980	210.6	205.8	205.9	206.7	206.5
1981	212.0	205.8	205.9	206.9	206.7
1982	210.4	205.7	206.0	207.0	206.9
1983	209.2	205.5	205.9	207.1	207.0
1984	209.5	205.6	206.2	207.1	207.0
1985	209.3	205.6	206.4	207.3	207.1
1986	209.2	205.4	206.5	207.3	207.1
1987	209.4	205.2	206.4	207.3	207.2
1988	209.1	205.3	206.4	207.6	207.3
1989	209.7	205.3	206.6	207.5	207.3
1990	212.0	206.6	208.7	209.7	209.6
1991	212.6	206.6	209.3	209.9	209.9
1992	213.5	206.5	209.1	210.1	209.9
1993	211.7	206.4	208.3	209.1	209.0
1994	211.1	206.7	208.4	209.2	209.1
1995	211.4	206.7	208.6	209.5	209.4
1996	210.7	206.6	208.2	209.5	209.3
1997	209.6	206.9	208.2	209.4	209.3
1998	210.9	207.1	208.5	209.6	209.5
1999	210.3	206.9	208.6	209.9	209.7
2000	210.5	207.2	208.1	210.0	209.8

<sup>a</sup>No allowances have been made for carbon retained in non-energy coal chemical byproducts from the carbonization process.

<sup>b</sup>Weighted average. The weights used are consumption values by sector.

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



# Appendix D

## U.S. Census Regions and Divisions



Note: Map not to scale.

Source: Adapted from U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States, 2001* (Washington, DC, November 2001).



# Appendix E

**Table E1. Population and U.S. Gross Domestic Product, 1949-2001**

Year	Population		U.S. Gross Domestic Product		
	United States <sup>1</sup>	World	Billion Nominal Dollars	Billion Chained (1996) Dollars	Implicit Price Deflator <sup>2</sup> (1996 = 1.0000)
	Million People				
1949	148.7	NA	267.7	1,550.9	0.1726
1950	151.3	2,555.1	294.3	1,686.6	0.1745
1951	154.0	2,592.9	339.5	1,815.1	0.1871
1952	156.4	2,634.9	358.6	1,887.3	0.1900
1953	159.0	2,680.3	379.9	1,973.9	0.1925
1954	161.9	2,728.2	381.1	1,960.5	0.1944
1955	165.1	2,779.7	415.2	2,099.5	0.1978
1956	168.1	2,832.6	438.0	2,141.1	0.2045
1957	171.2	2,888.4	461.5	2,183.9	0.2113
1958	174.1	2,944.9	467.9	2,162.8	0.2164
1959	177.1	2,997.3	507.4	2,319.0	0.2188
1960	179.3	3,039.3	527.4	2,376.7	0.2219
1961	183.0	3,080.1	545.7	2,432.0	0.2244
1962	185.7	3,136.2	586.5	2,578.9	0.2274
1963	188.4	3,205.7	618.7	2,690.4	0.2300
1964	191.1	3,276.8	664.4	2,846.5	0.2334
1965	193.5	3,345.8	720.1	3,028.5	0.2378
1966	195.5	3,416.1	789.3	3,227.5	0.2446
1967	197.4	3,485.8	834.1	3,308.3	0.2521
1968	199.3	3,557.7	911.5	3,466.1	0.2630
1969	201.3	3,632.3	985.3	3,571.4	0.2759
1970	203.3	3,707.6	1,039.7	3,578.0	0.2906
1971	206.8	3,785.2	1,128.6	3,697.7	0.3052
1972	209.3	3,862.2	1,240.4	3,898.4	0.3182
1973	211.4	3,938.7	1,385.5	4,123.4	0.3360
1974	213.3	4,014.6	1,501.0	4,099.0	0.3662
1975	215.5	4,088.2	1,635.2	4,084.4	0.4003
1976	217.6	4,160.4	1,823.9	4,311.7	0.4230
1977	219.8	4,232.9	2,031.4	4,511.8	0.4502
1978	222.1	4,305.4	2,295.9	4,760.6	0.4823
1979	224.6	4,380.8	2,566.4	4,912.1	0.5225
1980	226.5	4,456.7	2,795.6	4,900.9	0.5704
1981	229.5	4,533.0	3,131.3	5,021.0	0.6237
1982	231.7	4,613.4	3,259.2	4,919.3	0.6625
1983	233.8	4,693.9	3,534.9	5,132.3	0.6888
1984	235.8	4,773.6	3,932.7	5,505.2	0.7144
1985	237.9	4,854.6	4,213.0	5,717.1	0.7369
1986	240.1	4,937.6	4,452.9	5,912.4	0.7531
1987	242.3	5,023.6	4,742.5	6,113.3	0.7758
1988	244.5	5,110.2	5,108.3	6,368.4	0.8021
1989	246.8	5,196.3	5,489.1	6,591.8	0.8327
1990	R248.8	5,283.8	5,803.2	6,707.9	0.8651
1991	R253.0	5,366.9	5,986.2	6,676.4	0.8966
1992	R256.5	5,449.7	6,318.9	6,880.0	0.9184
1993	R259.9	5,531.0	6,642.3	7,062.6	0.9405
1994	R263.1	5,611.0	7,054.3	7,347.7	0.9601
1995	R266.3	5,690.9	7,400.5	7,543.8	0.9810
1996	R269.4	5,768.6	7,813.2	7,813.2	1.0000
1997	R272.6	5,846.8	8,318.4	8,159.5	1.0195
1998	R275.9	5,924.6	R8,781.5	R8,508.9	R1.0320
1999	R279.0	6,002.5	R9,268.6	R8,856.5	R1.0465
2000	281.4	6,080.1	R9,872.9	R9,224.0	R1.0704
2001	284.8	6,157.4	10,208.1	9,333.8	1.0937

<sup>1</sup> Resident population of the 50 States and the District of Columbia estimated for July 1 of each year, except for the April 1 decennial census counts.

<sup>2</sup> See Glossary.

R=Revised. NA=Not available.

Note: See "Chained Dollars" in the Glossary.

Web Pages: <http://www.census.gov/>. <http://www.bea.doc.gov/>.

Sources: See next page.



## Appendix E

**Sources:** **U.S. Population:** • 1949-1989—Department of Commerce (DOC), U.S. Bureau of the Census, Current Population Reports Series P-25, November 1998. • 1990 forward—DOC, U.S. Bureau of the Census, State Population Estimates. **World Population:** • 1950 forward—DOC, U.S. Bureau of the Census, International Database. **U.S. Gross Domestic Product:** • 1949 forward—DOC, Bureau of Economic Analysis, National Income and Product Accounts.

# Appendix F

**Table F1a. Energy Consumption in the United States, Selected Years, 1635-1945**  
(Quadrillion Btu)

Year	Coal	Natural Gas	Petroleum	Nuclear Electric Power	Hydroelectric Power	Wood
1635	NA	—	—	—	—	(s)
1645	NA	—	—	—	—	0.001
1655	NA	—	—	—	—	0.002
1665	NA	—	—	—	—	0.005
1675	NA	—	—	—	—	0.007
1685	NA	—	—	—	—	0.009
1695	NA	—	—	—	—	0.014
1705	NA	—	—	—	—	0.022
1715	NA	—	—	—	—	0.037
1725	NA	—	—	—	—	0.056
1735	NA	—	—	—	—	0.080
1745	NA	—	—	—	—	0.112
1755	NA	—	—	—	—	0.155
1765	NA	—	—	—	—	0.200
1775	NA	—	—	—	—	0.249
1785	NA	—	—	—	—	0.310
1795	NA	—	—	—	—	0.402
1805	NA	—	—	—	—	0.537
1815	NA	—	—	—	—	0.714
1825	NA	—	—	—	—	0.960
1835	NA	—	—	—	—	1.305
1845	NA	—	—	—	—	1.757
1850	0.219	—	—	—	—	2.138
1855	0.421	—	—	—	—	2.389
1860	0.518	—	0.003	—	—	2.641
1865	0.632	—	0.010	—	—	2.767
1870	1.048	—	0.011	—	—	2.893
1875	1.440	—	0.011	—	—	2.872
1880	2.054	—	0.096	—	—	2.851
1885	2.840	0.082	0.040	—	—	2.683
1890	4.062	0.257	0.156	—	0.022	2.515
1895	4.950	0.147	0.168	—	0.090	2.306
1900	6.841	0.252	0.229	—	0.250	2.015
1905	10.001	0.372	0.610	—	0.386	1.843
1910	12.714	0.540	1.007	—	0.539	1.765
1915	13.294	0.673	1.418	—	0.691	1.688
1920	15.504	0.813	2.676	—	0.775	1.610
1925	14.706	1.191	4.280	—	0.701	1.533
1930	13.639	1.932	5.897	—	0.785	1.455
1935	10.634	1.919	5.675	—	0.831	1.397
1940	12.535	2.665	7.760	—	0.917	1.358
1945	15.972	3.871	10.110	—	1.486	1.261

NA=Not available. — = Not applicable. (s)=Less than 0.0005 quadrillion Btu.

Notes: No data are available for years not shown. See end of section for discussion of geographic coverage of data.

Sources: **Coal, Natural Gas, Petroleum, and Hydroelectric Power:** 1850-1945: *Energy in the American Economy, 1850-1975*, Table VII. **Wood:** 1635-1845: U.S. Department of Agriculture Circular No. 641, *Fuel Wood Used in the United States 1630-1930*, February 1942. This source estimates fuelwood consumption in cords per decade, which were converted to Btu using the conversion factor of 20 million Btu

per cord. The annual average value for each decade was assigned to the fifth year of the decade on the assumption that annual use was likely to increase during any given decade and the average annual value was more likely to reflect mid-decade yearly consumption than use at either the beginning or end of the decade. Values thus begin at 1635 and are plotted at 10-year intervals. 1850-1945: *Energy in the American Economy, 1850-1975*, Table VII. Values are plotted at 5-year intervals. There is a discontinuity in the wood plot between 1945 and 1949 due to changes in definitions. Data through 1945 are for fuelwood only, while thereafter include wood-derived fuel and wood byproducts burned as fuel.

**Table F1b. Energy Consumption in the United States, 1949-2001**  
(Quadrillion Btu)

Year	Coal	Natural Gas <sup>1</sup>	Petroleum <sup>2</sup>	Nuclear Electric Power	Hydroelectric Power <sup>3</sup>	Wood
1949	11.981	5.145	11.883	0	1.449	1.549
1950	12.347	5.968	13.315	0	1.440	1.562
1951	12.553	7.049	14.428	0	1.454	1.535
1952	11.306	7.550	14.956	0	1.496	1.474
1953	11.373	7.907	15.556	0	1.439	1.419
1954	9.715	8.330	15.839	0	1.388	1.394
1955	11.167	8.998	17.255	0	1.407	1.424
1956	11.350	9.614	17.937	0	1.487	1.416
1957	10.821	10.191	17.932	(s)	1.557	1.334
1958	9.533	10.663	18.527	0.002	1.629	1.323
1959	9.518	11.717	19.323	0.002	1.587	1.353
1960	9.838	12.385	19.919	0.006	1.657	1.320
1961	9.623	12.926	20.216	0.020	1.680	1.295
1962	9.906	13.731	21.049	0.026	1.822	1.300
1963	10.413	14.403	21.701	0.038	1.772	1.323
1964	10.964	15.288	22.301	0.040	1.907	1.337
1965	11.581	15.769	23.246	0.043	2.058	1.335
1966	12.143	16.995	24.401	0.064	2.073	1.369
1967	11.914	17.945	25.284	0.088	2.344	1.340
1968	12.331	19.210	26.979	0.142	2.342	1.419
1969	12.382	20.678	28.338	0.154	2.659	1.440
1970	12.265	21.795	29.521	0.239	2.654	1.429
1971	11.598	22.469	30.561	0.413	2.861	1.430
1972	12.077	22.698	32.947	0.584	2.944	1.501
1973	12.971	22.512	34.840	0.910	3.010	1.527
1974	12.663	21.732	33.455	1.272	3.309	1.538
1975	12.663	19.948	32.731	1.900	3.219	1.497
1976	13.584	20.345	35.175	2.111	3.066	1.711
1977	13.922	19.931	37.122	2.702	2.515	1.837
1978	13.766	20.000	37.965	3.024	3.141	2.036
1979	15.040	20.666	37.123	2.776	3.141	2.150
1980	15.423	20.394	34.202	2.739	3.118	2.483
1981	15.908	19.928	31.931	3.008	3.105	2.495
1982	15.322	18.505	30.232	3.131	3.572	2.477
1983	15.894	17.357	30.054	3.203	3.899	2.639
1984	17.071	18.507	31.051	3.553	3.800	2.629
1985	17.478	17.834	30.922	R4.076	3.398	2.576
1986	17.260	16.708	32.196	R4.380	3.446	2.518
1987	18.008	17.744	32.865	R4.754	3.117	2.465
1988	18.846	18.552	34.222	R5.587	2.662	2.552
1989	R19.051	R19.712	34.211	R5.602	R2.987	R2.637
1990	R19.156	R19.718	33.553	R6.104	R3.091	R2.190
1991	R18.992	R20.149	32.845	R6.422	R3.092	R2.190
1992	R19.122	R20.835	33.527	R6.479	2.775	R2.290
1993	R19.835	R21.351	33.841	R6.410	3.077	R2.228
1994	R19.909	R21.842	34.670	R6.694	2.958	R2.315
1995	R20.089	R22.784	34.553	R7.075	R3.452	R2.420
1996	R21.002	R23.196	35.757	R7.087	R3.857	R2.467
1997	R21.445	R23.327	36.266	R6.597	R3.839	R2.349
1998	R21.656	R22.934	36.934	R7.068	R3.472	R2.175
1999	R21.623	R23.008	37.960	R7.610	R3.410	R2.210
2000	R22.580	R24.042	R38.404	R7.862	R3.020	R2.257
2001 <sup>P</sup>	21.928	23.224	38.232	8.028	2.286	2.170

<sup>1</sup> Includes supplemental gaseous fuels.

<sup>2</sup> Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel.

<sup>3</sup> Conventional hydroelectric power and hydroelectric pumped storage (pumped storage facility production minus energy used for pumping). Through 1988, includes all electricity net imports. From 1989,

includes only electricity net imports derived from hydroelectric power.

P=Preliminary. R=Revised data. (s)=Less than 0.0005 quadrillion Btu.

Sources: **Wood:** Table 10.1. **All Other Data:** Table 1.3.

## Geographic Coverage Note

Tables F1a and F1b present estimates of U.S. energy consumption by energy source for a period that begins a century and a half before the original 13 colonies formed a political union and continues through the decades during which the United States was still expanding territorially. The question thus arises, what exactly is meant by “U.S. consumption” of an energy source for those years when the United States did not formally exist or consisted of less territory than is now encompassed by the 50 States and the District of Columbia?

The documents used to assemble the estimates, and (as far as possible) the sources of those documents, were reviewed carefully for clues to geographic coverage. For most energy sources, the extent of coverage expanded more rapidly than the Nation, defined as all the official States and the District of Columbia. Estimates or measurements of consumption of each energy source generally appear to follow settlement patterns. That is, they were made for areas of the continent that were settled enough to have economically significant consumption even though those areas were not to become States for years. The wood data series, for example, begins in 1635 and includes 12 of the original colonies (excepting Georgia), as well as Maine, Vermont, and the area that would become the District of Columbia.

By the time the series reaches 1810, the rest of the continental States are all included, though the last of the 48 States to achieve statehood did not do so until 1912. Likewise, the coal data series begins in 1850 but includes consumption in areas, such as Utah and Washington (State), which were significant coal-producing regions but had not yet attained statehood. (Note: No data were available on State-level historical coal consumption. The coal data shown in Table F1a through 1945 describe *apparent* consumption, i.e., production plus imports minus exports. The geographic coverage for coal was therefore based on a tally of coal-producing States listed in various historical issues of *Minerals Yearbook*. It is likely that coal was consumed in States where it was not mined in significant quantities.)

By energy source, the extent of coverage can be summarized as follows:

- **Wood**—All 48 contiguous States and the District of Columbia by 1810; Alaska and Hawaii beginning in 1949.
- **Coal**—35 coal-producing States by 1885.
- **Petroleum and natural gas**—All 48 contiguous States, the District of Columbia, and Alaska by 1885; Hawaii beginning in 1949.
- **Hydroelectric power**—Coverage for 1890 and 1895 is uncertain, but probably the 48 contiguous States and the District of Columbia. Coverage for 1900 through 1945 is the 48 contiguous States, and the District of Columbia; Alaska and Hawaii beginning in 1949.
- **Nuclear electric power**—Coverage is all 50 States and the District of Columbia throughout.



# Appendix G

## Classification of Power Plants into Energy-Use Sectors

The Energy Information Administration (EIA) classifies power plants (both electricity-only and combined-heat-and-power plants) into energy-use sectors based on the North American Industry Classification System (NAICS), which replaced the Standard Industrial Classification (SIC) system in 1997. Plants with a NAICS code of 22 are assigned to the Electric Power Sector; those with NAICS codes beginning with 11, 21, 23, 31, 32, and 33, as well as the codes 2212 and 22131, are assigned to the Industrial Sector; and those with all other codes are assigned to the Commercial Sector. The Form EIA-860B, "Annual Electric Generator Report–Nonutility," asked respondents to indicate the primary purpose of the facility by selecting a NAICS code from the table below. The new Form EIA-860, "Annual Electric Generator Report," asks respondents to indicate the primary purpose of the facility by selecting from the universal list of NAICS codes at: [www.census.gov/epcd/naics02/naicod02.htm](http://www.census.gov/epcd/naics02/naicod02.htm).

### **Agriculture, Forestry, and Fishing**

- 111 Agriculture production-crops
- 112 Agriculture production, livestock and animal specialties.
- 115 Agricultural services
- 113 Forestry
- 114 Fishing, hunting, and trapping

### **Mining**

- 2122 Metal mining
- 2121 Coal mining
- 211 Oil and gas extraction
- 2123 Mining and quarrying of nonmetallic minerals except fuels

### **Construction**

23

### **Manufacturing**

- 311 Food and kindred products
- 3122 Tobacco products
- 314 Textile and mill products
- 315 Apparel and other finished products made from fabrics and similar materials
- 321 Lumber and wood products, except furniture
- 337 Furniture and fixtures
- 322 Paper and allied products (other than 322122 or 32213)
  - 322122 Paper mills, except building paper
  - 32213 Paperboard mills
- 323 Printing and publishing
- 325 Chemicals and allied products (other than 325188, 325211, 32512, or 325311)
  - 325188 Industrial inorganic chemicals
  - 325211 Plastics materials and resins
  - 32512 Industrial organic chemicals
  - 325311 Nitrogenous fertilizers

- 324 Petroleum refining and related industries (other than 32411)
    - 32411 Petroleum refining
  - 326 Rubber and miscellaneous plastic products
  - 316 Leather and leather products
  - 327 Stone, clay, glass, and concrete products (other than 32731)
    - 32731 Cement, hydraulic
  - 331 Primary metal industries (other than 331111 or 331312)
    - 331111 Blast furnaces and steel mills
    - 331312 Primary aluminum
  - 332 Fabricated metal products, except machinery and transportation equipment
  - 333 Industrial and commercial equipment and components except computer equipment
  - 335 Electronic and other electrical equipment and components except computer equipment
  - 336 Transportation equipment
  - 3345 Measuring, analyzing, and controlling instruments, photographic, medical, and optical goods, watches and clocks
  - 339 Miscellaneous manufacturing industries
- ### **Transportation and Public Utilities**
- 482 Railroad transportation
  - 485 Local and suburban transit and interurban highway passenger transport
  - 484 Motor freight transportation and warehousing
  - 491 United States Postal Service
  - 483 Water transportation
  - 481 Transportation by air
  - 486 Pipelines, except natural gas
  - 487 Transportation services

### **513 Communications**

### **22 Electric, gas, and sanitary services**

- 2212 Natural gas transmission
- 2213 Water supply
- 22132 Sewerage systems
- 562212 Refuse systems
- 22131 Irrigation systems

### **Wholesale Trade**

- 421 to 422
- Retail Trade
- 441 to 454

### **Finance, Insurance, and Real Estate**

521 to 533

### **Services**

- 721 Hotels
  - 812 Personal services
  - 514 Business services
  - 8111 Automotive repair, services, and parking
  - 811 Miscellaneous repair services
  - 512 Motion pictures
  - 713 Amusement and recreation services
  - 622 Health services
  - 541 Legal services
  - 611 Education services
  - 624 Social services
  - 712 Museums, art galleries, and botanical and zoological gardens
  - 813 Membership organizations
  - 561 Engineering, accounting, research, management, and related services
  - 814 Private households
  - 514199 Miscellaneous services
- ### **Public Administration**
- 92



# Appendix H

## Estimating and Presenting Power Sector Fuel Use in EIA Publications and Analyses

This appendix was prepared by an inter-office team under the direction of Mary J. Hutzler. General questions and comments about this document may be referred to Renee Miller (202) 287-1718. Specific technical questions may be referred to:

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Section VII (Petroleum) – Alice A. Lippert (202) 586-9600

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Section IX (Greenhouse Gas Emissions) – Perry M. Lindstrom (202) 586-0934



## I. Background

The Energy Information Administration (EIA) has comprehensively reviewed and revised how it collects, estimates, and reports fuel use for facilities producing electricity. The review addressed inconsistent reporting of the fuels used for electric power and changes in the electric power marketplace that have been inconsistently represented in various EIA survey forms and publications. For example:

In some cases fuel use by combined-heat-and-power (CHP) plants<sup>1</sup> has been reported as industrial sector fuel use, while in other cases it has been reported as electric power sector fuel use.

Electricity generation and fuel consumption have been categorized and reported in several different ways, such as (1) utility only; (2) utility and independent power producers; or (3) utility, independent power producers, and CHP plants. The restructuring of the power industry is making some of these categories less meaningful.

The goal of EIA's comprehensive review was to improve the quality and consistency of its electric power data throughout all data and analysis products. Because power facilities operate in all sectors of the economy (e.g., in commercial buildings, such as hospitals and college campuses, and industrial facilities, such as paper mills and refineries) and use many fuels, any change to electric power data affects data series in nearly all fuel areas and causes changes in a wide variety of EIA publications.

As a result of the comprehensive review, EIA has made the following changes:

EIA has adjusted all presentations of data on electric power to a consistent format and defined the electric power sector to include electricity-only and CHP plants whose primary business is to sell electricity, or electricity and heat, to the public.

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<sup>1</sup> Combined-heat-and-power plants (CHP) produce both electricity and useful thermal output. EIA formerly referred to these plants as cogenerators, but has determined that CHP better describes the facilities because some of the plants included in EIA's data do not produce heat and power in a sequential fashion, and as a result do not meet the legal definition of cogeneration specified in the Public Utilities Regulatory Policies Act (PURPA).

EIA is providing detail within the electric power sector, commercial sector, and industrial sector on fuel used by CHP plants in those sectors.

EIA has changed the sources of data on fuel used by components of the electric power sector. All tabulations and publications will use data obtained from EIA's surveys of electric power generators. This change in data source contributes to changes in total fuel consumption of natural gas.

EIA has revised its historical data on electric power to resolve data anomalies. The revisions contribute to changes in EIA's electricity series as well as the fuel-use series.

This document provides detail on these changes and describes the reasoning behind the changes and their effects on EIA forms and publications. The *Annual Energy Review (AER) 2001* is the first of the annual publications to be released with the new formats. In the upcoming months, EIA will be releasing other annual publications, followed by the monthly publications. The remainder of this document is organized as follows:

Section II provides an overview of the key changes.

Section III discusses the impacts on multi-fuel publications.<sup>2</sup>

Sections IV through VIII provide specific information for electric power, natural gas, coal, petroleum, and renewable energy surveys and publications, respectively. Although the changes have not yet been implemented in these publications, they are reflected in *AER 2001* for these topics.

Section IX provides information on the estimation of greenhouse gas emissions. These data do not appear in the *AER 2001*, but are based on data in it. Data on greenhouse gas emissions will appear in the upcoming EIA publication, *Emissions of Greenhouse Gases in the United States*.

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<sup>2</sup> Multi-fuel publications are those that provide information on multiple fuels and sectors, such as the *Monthly Energy Review* and the *Annual Energy Review*.

## II. Overview of Key Changes

The many changes that will occur because of the fuel review generally fall into three broad categories: (1) the categorization of electric power facilities, (2) the reporting of combined-heat-and-power plant fuel use, and (3) data series revisions resulting from revised electric power fuel use estimates. Each of these areas is discussed below.

### Categorization of Electric Power Facilities

Until the 1990s, most electric power generation and fuel use data could be meaningfully categorized into electric utilities and nonutility power producers.<sup>3</sup> Electric utilities were generally structured as vertically integrated<sup>4</sup> power companies that were responsible for generating, transmitting, and distributing power to consumers within their franchised service territory. Nonutility power producers were generally independent generators—mostly combined-heat-and-power plants—that produced some power for their own use and sold the remainder to utilities for distribution to consumers. However, in recent years, many formerly integrated utilities have split apart, spinning off the generating part of their business into separate companies. Independent developers have built most of the new generating capacity that has been installed in recent years. As a result, the distinction between utility and nonutility power plants has become much less meaningful. In fact, a large portion of the growth in nonutility generation in recent years is due to the reclassification of utility power plants as nonutility power plants.

To reflect the changing industry structure, EIA is now organizing electric power generation and fuel use data into two new categories: electricity-only and combined-heat-and-power (CHP) plants. These categories separate power plants by function; i.e., power only or power plus thermal, rather than by ownership class.

Electricity-only plants represent all plants, whether owned by utilities or nonutilities that produce only electricity. CHP plants represent entities that

<sup>3</sup> For an example of this, see *Electric Power Annual 1998*, Volume II, DOE/EIA-0348(98)/2, December 1999.

<sup>4</sup> In this context "integrated" means that the company is involved in the three main sectors of the electric power business—generation, transmission, and distribution.

produce both electricity and some form of thermal energy. Both categories will have some facilities that are owned by traditional utilities and independent companies.

In addition, EIA is now presenting data for an electric power sector that includes electricity-only plants and CHP plants whose primary business is to sell electricity, or electricity and heat, to the public (North American Industry Classification System code 22). This contrasts with some previous data presentations in which the electric power sector included industrial and commercial CHP plants as well (Figure H1).

**Figure H1. Electric Power Sector in AER 2001 and AER 2000**

AER 2001			AER 2000		
Electric Power Sector <sup>1,2</sup>			Electric Power Sector <sup>1</sup>		
Electricity Only	CHP	Total	Electric Utilities	Nonutility Power Producers	Total

In some tables and publications, the electric power sector will continue to be broken down into electric utilities and independent power producers for customers who have expressed an interest in this breakout. For example, Table 8.1 of *AER 2001* presents an electricity overview and shows data on net generation for electric utilities and independent power producers separately. It is the only table in *AER 2001* that has this break-out (Figure H2).

**Figure H2. Electric Utilities and Independent Power Producers are shown separately in Electricity Overview**

Year	Net Generation					
	Electric Power Sector <sup>1</sup>			Commercial Sector <sup>2</sup>	Industrial Sector <sup>3</sup>	Total
	Electric Utilities	Independent Power Producers	Total			

<sup>1</sup> The electric power sector (electric utilities and independent power producers) comprises electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., NAICS 22 plants. Due to the restructuring of the electric power sector, the sale of generation assets is resulting in a reclassification of plants from electric utilities to independent power producers.

## Reporting of CHP Facility Fuel Use

Historically, fuel consumption in CHP plants has been combined with other uses in many EIA publications. For example, in some tables the use of natural gas in commercial and industrial CHP plants was included with other commercial and industrial uses. Further, some of the fuel consumption (the portion associated with electricity production) at these same facilities was also reported under the column labeled “Nonutility Power Producers.” Based on questions received, it became clear that this categorization led to confusion for many EIA customers.

In the future, EIA will distinguish within the industrial, commercial, and electric power sectors what portion of fuel consumption is used in CHP facilities and non-CHP facilities. For example:

In tabulations of energy use by economic sector, if a commercial or industrial facility has a CHP unit, the total fuel consumption for that unit will be reported under commercial or industrial, but it will be identified separately from other commercial or industrial consumption. Figure H3 provides an example for natural gas consumption in the industrial sector. It shows the headings in Table 6.5 of *AER 2001* compared with the headings for the same table in *AER 2000*.

**Figure H3. Electric Power Sector in AER 2001 and AER 2000**

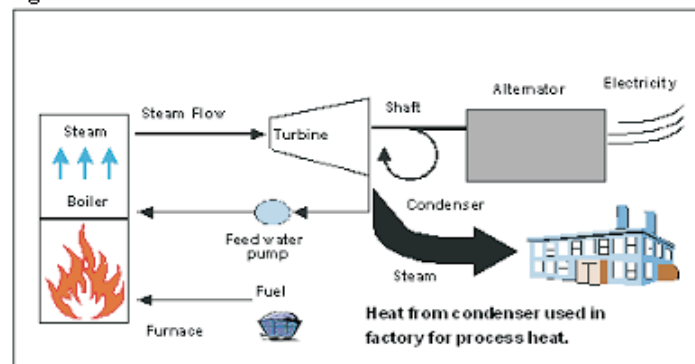
AER 2001				AER 2000		
End-Use Sectors				End-Use Sectors		
Industrial				Industrial <sup>2</sup>		
Lease and Plant Fuel	Other Industrial			Delivered to Industrial Facilities	Lease and Plant Fuel	Total
	CHP <sup>1</sup>	Non-CHP <sup>1</sup>	Total			

CHP plants that report their primary business is generating and selling power to others will be reported in a separate column in the electric power sector, as shown in Figure H1.

In tabulations of energy use to produce electric power, the total fuel consumption reported by CHP plants will be further separated into that which is used to produce electricity and that

which is used to produce thermal energy.<sup>5</sup> See Tables 8.3b,c, and d of *AER 2001*. Figure H4 shows a schematic for combined heat and power producers.

**Figure H4. Schematic for Combined Heat and Power Plants**



The separation between electricity and thermal uses is being done because many EIA data users have expressed interest in knowing how much fuel is used to produce electricity in the United States.

## Data Series Revisions Resulting From Changes in Electric Power Fuel Use Estimates

The revisions to electric power data affect many areas. For example, historically, to estimate natural gas use, EIA surveyed natural gas pipeline-companies and local gas utilities to obtain data on natural gas used by residential, commercial, industrial, and electric utility sectors, and nonutility generators.<sup>6</sup> However, EIA also surveyed electric utilities on their natural gas use. These data obtained directly from the end user were generally thought to be more accurate than the data obtained from natural gas suppliers. As a result, total natural gas use was estimated by adding together the data from natural gas companies on residential, commercial, industrial, and nonutility power producer use to the amount reported directly

<sup>5</sup> For the method used to separate the fuel used at CHP plants between electricity and useful thermal energy production, see Section IV.

<sup>6</sup> Energy Information Administration, Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

by electric utilities. The data collected for nonutility power producers were included with industrial use in previous EIA natural gas publications.

With the changing structure of the electricity sector, this reporting approach no longer appears reasonable. EIA has decided to follow the procedure described for electric utilities and use data obtained from its direct surveys of nonutility electric generators rather than the natural gas supplier surveys.<sup>7</sup> More detail on how the various fuel sectors are affected is given in the following sections.

Data changes are also occurring because of the extensive review of reported data that was undertaken in this process. Since it was decided that data reported directly by utilities and nonutility power generators would be the primary source of fuel consumption data for the power sector, an examination of heat rates,<sup>8</sup> capacity factors,<sup>9</sup> and power-to-steam ratios across 12 years of reported data was conducted. As a result, data for nonutility power producers for 1989 through 2000 have been revised. The data review procedure is described in Section IV under the heading "Efforts to Improve Data." As a result of the review by expert EIA analysts, anomalous values have been investigated and resolved and the result is higher quality data at aggregated levels.

Revisions resulting from changing the source of fuel consumption data for nonutilities and from EIA's data review affect data beyond the category of nonutilities. For example, the revised estimate of natural gas consumption for 2000 is 3 percent higher (.75 trillion cubic feet) in the *Annual Energy Review (AER) 2001* than in *AER 2000* (Table H1 and Figure H5).

On the other hand, the revised estimate of renewable energy consumption for 2000 is 5 percent lower in *AER 2001* than in *AER 2000* (Figure H6), due largely to a downward revision in the estimate of biomass energy consumption particularly wood/wood waste at electric power plants. A

<sup>7</sup> Energy Information Administration, Form EIA-759, "Monthly Power Plant Report" for electric utilities and Forms EIA-867 and EIA-860B, "Annual Electric Generator Report-Nonutility" for nonutilities. Starting with 2001, data for both utilities and nonutilities are collected on a new survey, Form EIA-906, "Power Plant Report."

<sup>8</sup> Heat rates are computed by dividing the heat content of the fuel burned to generate electricity by the resulting net kilowatt-hour generation.

<sup>9</sup> Capacity factors are the ratio of the electrical energy 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 H1. Revisions to Selected Estimates: AER 2001 and AER 2000**

<b>Electricity Net Generation: Total (All Sectors)</b>			
<b>(Billion Kilowatthours)</b>			
<b>Year</b>	<b>AER 2000</b>	<b>AER 2001</b>	<b>Percent Difference</b>
1998	3,618	3,620	0.1
1999	3,706	3,695	-0.3
2000	3,792	3,802	0.3
<b>Total Natural Gas Consumption</b>			
<b>(Trillion Cubic feet)</b>			
<b>Year</b>	<b>AER 2000</b>	<b>AER 2001</b>	<b>Percent Difference</b>
1998	21.26	22.24	4.6
1999	21.70	22.40	3.2
2000	22.71	23.46	3.3
<b>Total Coal Consumption</b>			
<b>(Million Short Tons)</b>			
<b>Year</b>	<b>AER 2000</b>	<b>AER 2001</b>	<b>Percent Difference</b>
1998	1,038.30	1,037.10	-0.1
1999	1,045.30	1,038.60	-0.6
2000	1,079.70	1,084.10	0.4
<b>Total Petroleum Consumption</b>			
<b>(Million Barrels Per Day)</b>			
<b>Year</b>	<b>AER 2000</b>	<b>AER 2001</b>	<b>Percent Difference</b>
1998	18.92	18.92	0.0
1999	19.52	19.52	0.0
2000	19.48	19.70	1.1
<b>Total Renewable Energy Consumption</b>			
<b>(Trillion Btu)</b>			
<b>Year</b>	<b>AER 2000</b>	<b>AER 2001</b>	<b>Percent Difference</b>
1998	6,977	6,782	-2.8
1999	7,226	6,790	-6.0
2000	6,823	6,465	-5.2

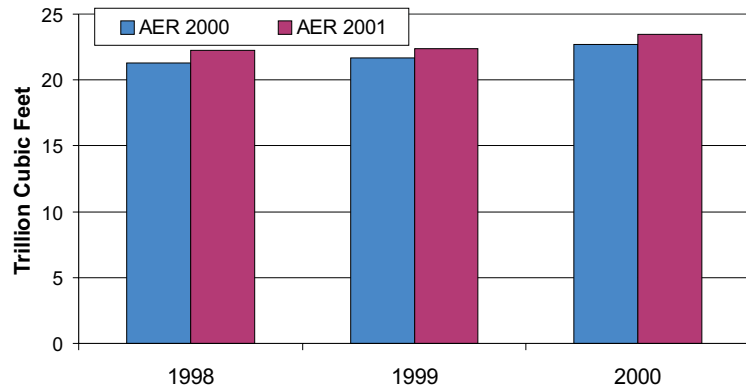
**Sources:** Electricity Net Generation, Table 8.1 of *AER 2000* and *AER 2001*. Natural Gas, Consumption, Table 6.5 of *AER 2000* and *AER 2001*. Coal Consumption, Table 6.5 of *AER 2000* and *AER 2001*. Petroleum Consumption, Table 5.12 of *AER 2000* and *AER 2001*. Renewable Energy Consumption, Table 10.2b of *AER 2000* and *AER 2001*.

smaller revision resulted from the procedure to assign fuel consumption by energy type at some solar and hydroelectric plants. In *AER 2001*, the assignment was made at the boiler level while in *AER 2000* it was based on aggregate plant-level information.

Estimates for petroleum and coal consumption show little change between the 2000 and 2001 *AERs* for the same year. This is also true for electricity net generation.

In addition, as a result of the recategorization of nonutility data, estimates of industrial natural gas consumption have been revised and are lower. For example, in *AER 2000* EIA showed 9.39 trillion cubic feet delivered to industrial facilities in 2000. In *AER 2001* the comparable figure (under the

**Figure H5. Impact of Revisions to Total Natural Gas Consumption**



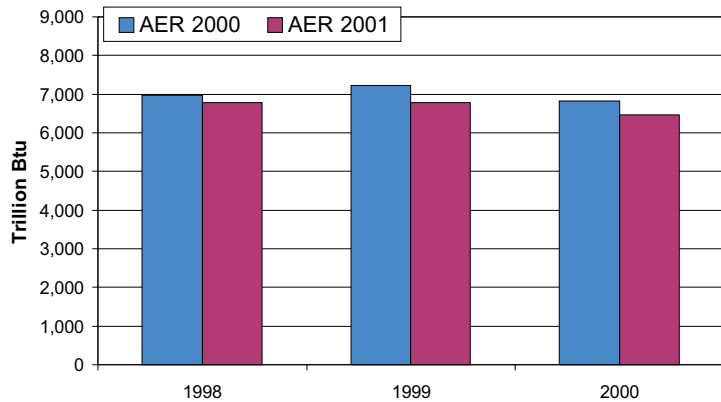
“other industrial” heading) for 2000 is 8.25 trillion cubic feet (Figure H7). This change is a result of the change in the operational definition of deliveries to the industrial sector, which is explained in Section V.

Because the natural gas consumption table in the AER best illustrates the changes that have been made, Table 6.5 of *AER 2001* and *AER 2000* are presented here for comparison.

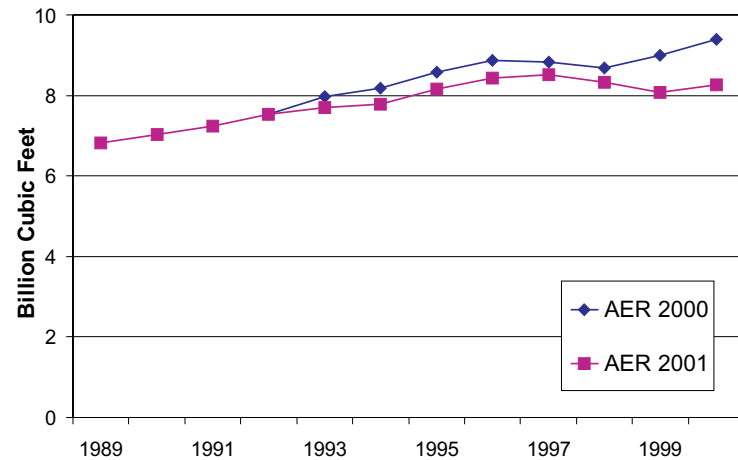
<http://www.eia.doe.gov/emeu/aer/txt/ptb0605.html>  
<http://www.eia.doe.gov/emeu/aer/txt/tab0605.htm>

To summarize the changes, data for combined-heat-and-power plants are shown separately by end-use sector in *AER 2001* while they are included with the sector totals for *AER 2000*. Independent power producers are excluded from the industrial sector in *AER 2001* and included in the electric power sector. Data are based on a survey of electric generators. By contrast, independent power producers were included in the industrial sector in *AER 2000* and data were based on a survey of natural gas suppliers.

**Figure H6. Impact of Revisions to Total Renewable Energy Consumption**



**Figure H7. Industrial Natural Gas Consumption: AER 2001 and AER 2000**



Note: AER 2000 Industrial equals “Deliveries to Industrial Facilities.”  
 AER 2001 Industrial equals “Other Industrial Total.”



### III. Multi-Fuel Publications

EIA's multi-fuel publications—i.e., those that report data on numerous energy sources and provide overall energy totals—will be reformatted to incorporate the new approach described in detail in the preceding sections. The *Annual Energy Review 2001* is the first of the historical multi-fuel publications to be released with the new formats. In the months ahead, EIA will undertake the redesign of the *Monthly Energy Review* (MER) to make its data and presentations conform to the new AER. In addition to the MER, the State-level consumption, price, and expenditure estimates that have previously been released under the titles *State Energy Data Report* and *State Energy Price and Expenditure Report* will be reformatted beginning with the 2001 update; the 2000 updates are now in final processing and will not conform to the new AER formats. Coordinated data and presentation changes will also be incorporated into EIA's forecast products—the *Short-Term Energy Outlook* (STEO) and the *Annual Energy Outlook* (AEO).

The *Annual Energy Review 2001* (AER 2001) includes many redesigned tables (and related graphs) that were adapted to present the new electricity data. Revised tables fall into three groupings: electricity, fuels, and total energy. These tables are interrelated.

Table 8.3e provides data on fuel consumption for both electricity generation and useful thermal output. Data on consumption by the electric power sector on Table 8.3e correspond with data for this sector on fuel consumption tables (e.g., Table 6.5 on natural gas, Table 7.3 on coal, and Table 10.2b on renewable energy consumption). See Figure H8 for natural gas.

Similarly, data on commercial sector CHP plants on Table 8.3e correspond with the commercial sector CHP columns of the fuel consumption tables and data on industrial sector CHP plants on Table 8.3e correspond with the industrial sector CHP columns of the fuel consumption tables.

Table 8.3a provides data on consumption of combustible fuels for electricity generation. Data on the amount of fossil fuel (such as coal, residual fuel oil, and natural gas) and on the amount of renewable energy used to generate electricity at both electricity-only and combined-heat-and-power (CHP) plants can be found on this table.

Table 8.3a data on fuel consumed for electricity generation differ from those for the electric power sector on the fuel consumption tables (e.g., Table 6.5 for natural gas) because the electric power sector includes entities that produce thermal energy as well as electricity (CHP plants whose primary business is to sell electricity). In addition, there are entities that generate electricity that are not in the electric power sector (commercial sector CHP plants and industrial sector CHP plants). Table 8.3d provides data on consumption for useful thermal output at CHP plants.

**Electricity Tables.** Most AER 2000 electricity tables were altered in format for presentation in the AER 2001. This crosswalk provides the relationship from each AER 2000 table to its closest match in the AER 2001:

AER 2000	AER 2001	Title in the AER 2001
8.1	8.1	Electricity Overview
8.2	8.2a	Electricity Net Generation: Total (All Sectors)
8.3	8.2b	Electricity Net Generation at Electricity-Only Plants: Electric Power Sector
8.4	8.2c	Electricity Net Generation at Combined-Heat-and-Power Plants by Sector
--	8.2d	Useful Thermal Output at Combined-Heat-and-Power-Plants by Sector
8.8	8.3a	Consumption of Combustible Fuels for Electricity Generation: Total (All Sectors)
8.9	8.3b	Consumption of Combustible Fuels for Electricity Generation at Electricity-Only Plants: Electric Power Sector
8.10	8.3c	Estimated Consumption of Combustible Fuels for Electricity Generation at Combined-Heat-and-Power-Plants by Sector
--	8.3d	Estimated Consumption of Combustible Fuels for Useful Thermal Output at Combined-Heat-and-Power Plants by Sector
--	8.3e	Consumption of Combustible Fuels for Electricity Generation and Useful Thermal Output at Electricity-Only and Combined-Heat-and-Power Plants by Sector
8.11	8.4	Stocks of Coal and Petroleum: Electric Power Sector
8.12	8.5	Electricity End Use
8.15	8.6	Average Retail Prices of Electricity
8.5	8.7a	Electric Net Summer Capacity: Total (All Sectors)
8.6	8.7b	Electric Net Summer Capacity at Electricity-Only Power Plants: Electric Power Sector
8.7	8.7c	Electric Net Summer Capacity at Combined-Heat-and-Power Plants by Sector
8.14	8.8	Electric Noncoincident Peak Load and Capacity Margin
8.13	8.9	Electric Utility Demand-Side Management Programs

**Figure H8. Consumption of Natural Gas in Electric Power Sector: AER Table 8.3e and Table 6.5**

Fossil Fuel Portion of Table 8.3e for Electric Power Sector: AER 2001

Year	Fossil Fuels					
	Coal <sup>1</sup>	Distillate Fuel Oil	Residual Fuel Oil	Other Liquids <sup>2</sup>	Petroleum Coke	Natural Gas <sup>3</sup>
	Thousand Short Tons	Thousand Barrels			Thousand Short Tons	Billion Cubic Feet
Electric Power Sector (Electric Utilities and Independent Power Producers)						
1989 <sup>P</sup>	772,190	<sup>9</sup> 26,156	<sup>10</sup> 244,179	10	517	3,105
1990 <sup>P</sup>	780,987	<sup>9</sup> 16,400	<sup>10</sup> 183,375	26	983	3,234
1991 <sup>P</sup>	783,874	<sup>9</sup> 14,359	<sup>10</sup> 172,625	59	974	3,316
1992 <sup>P</sup>	795,094	<sup>9</sup> 12,623	<sup>10</sup> 138,726	128	1,494	3,448
1993 <sup>P</sup>	831,645	<sup>9</sup> 14,849	<sup>10</sup> 152,481	239	2,611	3,473
1994 <sup>P</sup>	838,354	<sup>9</sup> 20,612	<sup>10</sup> 138,222	771	2,315	3,903
1995 <sup>P</sup>	850,230	<sup>9</sup> 18,553	<sup>10</sup> 90,023	499	2,674	4,237
1996 <sup>P</sup>	896,921	<sup>9</sup> 18,780	<sup>10</sup> 99,951	653	2,642	3,807
1997 <sup>P</sup>	921,364	<sup>9</sup> 18,989	<sup>10</sup> 113,669	152	3,372	4,065
1998 <sup>P</sup>	936,619	<sup>9</sup> 23,300	<sup>10</sup> 166,528	431	4,102	4,588
1999 <sup>P</sup>	940,922	<sup>9</sup> 24,058	<sup>10</sup> 152,493	544	3,735	4,820
2000 <sup>P</sup>	985,821	<sup>9</sup> 30,016	<sup>10</sup> 138,513	454	3,275	5,206
2001 <sup>P</sup>	966,739	<sup>9</sup> 30,849	<sup>10</sup> 157,486	397	3,660	5,261

Electric Power Sector Portion of Table 6.5 for AER 2001

**Table 6.5 Natural Gas Consumption by Sector, 1949-2001**  
(Trillion Cubic Feet)

Year	Electric Power Sector <sup>1,2</sup>		
	Electricity Only	CHP	Total
1989	2.11 <sup>P</sup> 2.79	10.11 <sup>P</sup> 0.31	2.11 <sup>P</sup> 3.11
1990	11 <sup>P</sup> 2.79	10.11 <sup>P</sup> 0.44	11 <sup>P</sup> 3.23
1991	11 <sup>P</sup> 2.82	10.11 <sup>P</sup> 0.49	11 <sup>P</sup> 3.32
1992	11 <sup>P</sup> 2.83	10.11 <sup>P</sup> 0.62	11 <sup>P</sup> 3.45
1993	<sup>P</sup> 2.76	10. <sup>P</sup> 0.72	<sup>P</sup> 3.47
1994	<sup>P</sup> 3.06	10. <sup>P</sup> 0.84	<sup>P</sup> 3.90
1995	<sup>P</sup> 3.29	10. <sup>P</sup> 0.95	<sup>P</sup> 4.24
1996	<sup>P</sup> 2.82	10. <sup>P</sup> 0.98	<sup>P</sup> 3.81
1997	<sup>P</sup> 3.04	10. <sup>P</sup> 1.03	<sup>P</sup> 4.06
1998	<sup>P</sup> 3.54	10. <sup>P</sup> 1.04	<sup>P</sup> 4.59
1999	<sup>P</sup> 3.73	10. <sup>P</sup> 1.09	<sup>P</sup> 4.82
2000	<sup>P</sup> 4.09	10. <sup>P</sup> 1.11	<sup>P</sup> 5.21
2001	<sup>P</sup> 4.08	10. <sup>E</sup> 1.18	<sup>P</sup> 5.26

**Fuel Tables.** The following AER 2001 fuel tables were reformatted from the previous year's report to incorporate the new electricity information:

- 5.12a Petroleum Consumption: Residential and Commercial Sectors
- 5.2b Petroleum Consumption: Industrial Sector
- 5.12d Petroleum Consumption: Electric Power Sector
- 5.13 Oil and Kerosene Adjusted Sales
- 6.5 Natural Gas Consumption by Sector
- 7.3 Coal Consumption by Sector
- 7.5 Coal Stocks by Sector
- 10.2a Renewable Energy Consumption: End-Use Sectors
- 10.2b Renewable Energy Consumption: Electric Power Sector, Electricity Trade, and Total
- 12.2 Carbon Dioxide Emissions From Energy Consumption by Sector
- 12.3 Carbon Dioxide Emissions From Energy Consumption by Sector by Energy Source
- 12.7 Emissions From Electricity Generation
- A3 Approximate Heat Content of Petroleum Product Weighted Averages
- A4 Approximate Heat Content of Natural Gas
- A5 Approximate Heat Content of Coal and Coal Coke

**Total Energy Tables.** The following AER 2001 tables summarize all energy consumption and include format changes that are related to the new electricity information:

- 2.1a Energy Consumption by Sector
- 2.1c Commercial Energy Consumption Sector
- 2.1d Industrial Energy Consumption Sector
- 2.1f Electric Power Sector Energy Consumption

AER 2000 Table 2.1f is replaced in the AER 2001 with:

- 2.2a Energy Consumption for Electricity Generation: Total (All Sectors)
- 2.2b Energy Consumption for Electricity Generation: Electric Power Sector
- 2.2c Consumption for Electricity Generation: Commercial and Industrial Sectors

## IV. Electric Power Surveys and Publications

### Summary of Key Changes

EIA previously presented data on electric power, such as generation and fuel consumption, in the following categories:

- Electric utilities,
- Nonutility power producers (independent power producers and combined-heat-and power plants),
- Electric power industry (sum of electric utilities and nonutility power producers).

Now EIA is presenting data for the following new categories:

- Electricity-only-plants
- Combined-heat-and-power (CHP) plants,
- U.S. power producers (sum of electricity-only plants and CHP plants and equal to the prior "electric power industry" category).

Data on electricity-only plants are disaggregated for utilities and independent power producers, as there are customers who are interested in maintaining this distinction. Data on CHP plants are disaggregated by the end-use category (commercial, industrial, electric power) they report as their major line of business. The categorization is based on their North American Industrial Classification System code. For example, a CHP plant that is part of a hospital will be classified as "commercial." Similarly, a CHP plant that reports that it is part of a paper mill will be classified as "industrial," and a plant that reports that its primary business is selling power to others will be classified as "electric power."

In addition, EIA has estimated and is presenting data on the amount of fuel used to generate electricity and the amount of fuel used for useful thermal output. Furthermore, during the course of recategorizing the data, EIA performed a thorough data quality review and revised data to resolve anomalies.

### Efforts to Improve Data

EIA reviewed electric power-data from 1989 through 2001 to determine whether there were anomalies. The 1989–2000 data for nonutilities were from Form EIA-860B, "Annual Electric Generator Report-Nonutility," and its predecessor, Form EIA-867, "Annual Nonutility Power Producer



Report.” The 2001 data are from Form EIA-906, “Power Plant Report.” These forms collect data on fuel consumption, generation, and, with the exception of 1995 through 1997, useful thermal output. When anomalies were identified in the data for the more recent years (1998–2001), EIA contacted selected respondents to resolve the inconsistencies. For the historical data it was not possible to contact respondents. In this situation EIA made data adjustments to resolve the anomalies.

EIA reviewed data for facilities with heat rates greater than 40,000 Btu per kilowatt-hour and less than 5,500 Btu per kilowatt-hour. The upper limit was chosen to allow for the heat rates of older non-electricity boilers. In addition, EIA reviewed data for facilities with overall efficiency of greater than 100 percent and identified facilities with thermal output that were not designated as CHP plants. To ensure consistency, EIA compared North American Industry Classification System (NAICS) codes, cogenerator status, fuel consumption, electric generation, and thermal output levels over time. Moreover, EIA analysts also reviewed and evaluated aggregate-level data by State, NAICS code, fuel type, and generator type. For the historical data (1989–1997), EIA also:

- Estimated a value for useful thermal output for 1995 through 1997 (when useful thermal output was not included on the survey form) that produced a heat rate between 5,500 and 40,000 Btu per kilowatt-hour and an efficiency rate consistent with that observed in other years (see discussion below on CHP fuel use methodology).
- Corrected errors in units reported for fuel consumption.
- Compared data on fuel consumption with data on electric generation and adjusted data on fuel consumption or generation to maintain a consistent ratio.
- Adjusted data on useful thermal output for those respondents with heat rates outside the 5,500-to-40,000 Btu per kilowatt-hour range and an efficiency rate consistent with other years.

The review included an examination of both respondent-level data and aggregate-level data. For the 1998-2000 data, the review also included a comparison for consistency with data reported by manufacturing plants on Form EIA-3, “Quarterly Coal Consumption—Manufacturing Plants,” since a subset of the EIA-3 manufacturing plants generate electricity and also reported on the electric generator survey Form EIA-860B. In general, there was good correspondence between the data submissions. In situations where there were inconsistencies, selected respondents were contacted to explain the differences. The analysis revealed that in some instances there were legitimate explanations for high percentage differences, such as a

respondent reporting data for a facility on one survey that should not be included in the other survey.

For 2001, EIA determined that the monthly submissions for a substantial number of facilities were not of high enough quality. For those facilities in question and for all of the facilities that submit data only on an annual basis, EIA substituted that facility’s 2000 data submission for total fuel consumption, electricity generation, and useful thermal output to obtain estimates for *AER 2001*. EIA is in the process of reviewing and revising these submissions for release at a later date.

#### **Allocating CHP Fuel Use**

Because respondents do not keep records on how much fuel a CHP plant uses exclusively to produce electricity, EIA developed the following method for estimating how the total fuel consumed in the boiler is split between electricity generation and useful thermal output:

First, a steam boiler efficiency rate of 80 percent was assumed.<sup>10</sup> Then the reported or estimated value for useful thermal output (in Btu) was divided by 0.8 to estimate the fuel used to generate this amount of thermal output.

Next, this value was subtracted from total fuel consumption and the remainder was assumed to be the amount used for electric generation.

#### **Electric Power Publication Tables Affected**

In both the *Electric Power Monthly* and the *Electric Power Annual*:

- Data will be shown for the following categories throughout most of the report: (1) U.S. power producers, (2) electricity-only plants, and (3) CHP plants (commercial, industrial, and electric power). Data on fuel consumption are shown for both electric generation and thermal output.
- The lowest level of aggregation is at the State level.
- Data on petroleum coke are converted to barrels and included in petroleum consumption and stocks tables.
- Fuel types are revised to be consistent with the *Annual Energy Review*.

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<sup>10</sup> Arthur D. Little, Report to the Energy Information Administration, Industrial Model: *Update on Energy Use and Industrial Characteristics*, (September 2001), Appendix C, “Average Boiler Efficiencies.”

## V. Natural Gas Surveys and Publications

### Summary of Key Changes

A number of changes have been made to natural gas consumption data presentations, definitions, and data sources. As a result of these changes the presentation of natural gas consumption by end-use sector will be consistent with end-use sector presentations and definitions in other EIA publications and the measures of natural gas used by electricity generators will be explicitly presented and identical to the quantities presented in electric power publications.

In prior EIA data publications natural gas consumption was presented for residential, commercial, industrial, transportation, and electric utility sectors. Deliveries of natural gas to independent power producers (called “other nonutility power producers” on the survey form) were included in the data reported for the industrial sector and the measures were collected through natural gas survey forms submitted by gas delivery agents (local distribution companies and pipelines).

Beginning with *Annual Energy Review (AER) 2001*, the definition of industrial sector gas consumption for 1993-2001 no longer includes independent power producers. In addition, a new electric power sector is being used which includes independent power producers, utilities, and other electricity generators as described in the previous electricity discussion. The data reported for the electric power sector are derived entirely from data submitted on electricity data collection forms used over the period 1993-2001. These include Forms EIA-759, “Monthly Power Plant Report” and EIA-860B, “Annual Electric Generator Report-Nonutility” through 2000 and Form EIA-906, “Power Plant Report” for 2001.

Compared with past publications, the impact of the definitional change for the industrial sector is to reduce measured natural gas consumption by the industrial sector. For example, in *AER 2000* EIA showed 9.39 trillion cubic feet delivered to industrial facilities in 2000. In *AER 2001*, the comparable figure (under the “other industrial” heading) for 2000 is 8.25 trillion cubic feet. This change is a result of the change in the operational definition of deliveries to the industrial sector.

Compared with past publications, the impact of the definitional change and the new data sources for the electric power sector is to increase measured natural gas consumption compared to the previous electric utility data series. As a result of the changes in data sources (predominantly new electric power data sources), total natural gas consumption is higher than previously published; i.e., total natural gas consumption has increased by 5, 3, and 3 percent in 1998, 1999, and 2000, respectively.

Also beginning with the publication of *AER 2001* and following with the *Natural Gas Annual*, new detail is available about gas consumption in the commercial, industrial and electric power sectors that distinguishes deliveries of natural gas to combined-heat-and-power (CHP) plants in these sectors from deliveries to other facilities within these sectors. “Deliveries to industrial consumers” includes deliveries to industrial consumers that are CHP plants, such as paper mills, as well as other industrial users. Included with the CHP plant data are a small number of industrial firms that report using natural gas only to generate electricity (most likely for their own use). “Deliveries to commercial consumers” also include deliveries to CHP plants, such as hospitals. Similarly, a small number of plants that report natural gas use for only electricity generation are included with the data on commercial CHP plants.

The sources for total commercial and industrial sector data are natural gas survey forms while the sources of the subcomponent CHP data series are electric power survey forms. The sources of all electric power data series, including the CHP subcomponent, are electric power survey forms.

### Publication Elements Affected

- Deliveries to industrial consumers
- Deliveries to industrial consumers for the account of others
- Deliveries to electric utilities (deleted)
- Total deliveries to consumers
- Total consumption
- Balancing item
- Deliveries to electric generators (new element)
- Average price for natural gas delivered to industrial consumer
- Number of industrial consumers
- Average annual consumption per industrial consumer

### Publication Tables Affected

Changes affect 64 of the 83 tables in the *Natural Gas Annual*.

- National-level tables (Tables 1, 26, B1, B2)
- State-level or State-detail tables (Tables 2, 15, 16, 18, 21, 23, 27, A2)
- Summary Statistics by State (Tables 29-79)

## VI. Coal Survey and Publications

### Summary of Key Changes

Data on coal consumed by the commercial and industrial sectors will now be separated into coal consumed by combined-heat-and-power (CHP) plants and coal consumed by the other plants in the commercial and industrial sector (referred to as other or “non-CHP”).<sup>11</sup> Consumption by electric utilities and independent power producers, shown separately in the past, will be combined and called “electric power sector.” Coal consumed by the electric power sector will be subdivided into coal consumed solely for power generation (“electricity-only plants”) and coal used at CHP plants. Note that “independent power producers” were previously called “other power producers” in the coal publications and tabulations. Both terms refer to the same entities, i.e., generating facilities with a North American Industrial Classification System (NAICS) code of 22.

### Coal Consumption Data Sources

The sources for total coal consumption remain unchanged for the residential and commercial sectors and for coke plants. They are:

- Residential and Commercial—Form EIA-6A, “Coal Distribution Report.”
- Coke—Form EIA-5, “Coke Plant Report.”

For the industrial sector excluding coke plants (referred to as “other industrial,”) the data sources remain the same for the following categories:

- Manufacturing—Form EIA-3, “Quarterly Coal Consumption—Manufacturing Plants.”
- Mines—Form EIA-7A, “Coal Production Report.”

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<sup>11</sup> A small number of commercial and industrial plants that use coal only to generate electricity are included with the data on commercial and industrial CHP plants.

- Agriculture, Mining, Construction, and Transportation—Form EIA-6A, “Coal Distribution Report.”

For the portion of coal consumed by CHP plants in the commercial and industrial sectors through 2000, data were obtained from Form EIA-860B, “Annual Electric Generator Report-Nonutility” and beginning in 2001, Form EIA-906, “Power Plant Report.”

Data for the electric power sector for the years 1989 through 2000 were from Form EIA-759 and Form EIA-860B. Beginning in 2001, data from Form EIA-906 will be used.

## VII. Petroleum Surveys and Publications

### Summary of Key Changes

Data on sales to independent power producers (that may have been previously reported in the industrial sector) are now included in the sales for electric power generation category in the “adjusted sales” tables of the *Fuel Oil and Kerosene Sales Report*, Tables 13-24. This category includes data on electric utilities and data on independent power producers. The data on electric utilities are obtained from Form EIA-759, “Monthly Power Plant Report,” and FERC Form 423, “Monthly Report of Cost and Quality of Fuels for Electric Plants.” The data on independent power producers are from Form EIA-860B, “Annual Electric Generator Report-Nonutility” through 2000, and Form EIA-906, “Power Plant Report” for 2001. Previously, some data on sales of kerosene, distillate, and residual fuel oils to independent power producers were obtained from Form EIA-821 survey, “Fuel Oil and Kerosene Sales Report” but coverage may not have been complete or data for independent power producers may have been included in the end-use sectors.

### Publication Tables Affected

Data on sales by end-use sector are published in the *Fuel Oil and Kerosene Sales Report*. Data appear in two sets of tables. Tables 1-12 publish the results of the EIA-821 survey, except for on-highway diesel and kerosene. For on-highway diesel, State-level estimates are obtained from the Federal Highway Administration.

In Tables 13-24 (Adjusted Sales), estimates of distillate fuel oil are adjusted at the Petroleum Administration for Defense (PAD) district level to equal published *Petroleum Supply Annual (PSA)* volume estimates of products supplied. On-highway diesel State-level sales are calculated from Federal Highway Administration data.

Residual fuel oil volumes in Tables 13-24 are adjusted at the national level to equal published *PSA* products supplied estimates.

## VIII. Renewable Energy Publications

### Summary of Key Changes

For the first time EIA is presenting data on biomass energy consumption that were obtained by aggregating individual power plant data for nonutilities rather than by applying a generalized heat rate to the aggregate net generation figure. All new renewable energy publications also reflect changes in EIA definitions of the energy use sectors described earlier.

### Publication Tables Affected

The main changes occur in estimates of renewable energy consumption and outputs found in the *Renewable Energy Annual's* Executive Summary, Chapter 1, and Appendix C.

### Detailed Table Changes for the *Renewable Energy Annual*

Throughout the tables, estimates of biomass consumption are based on the new methodology described earlier and result in significant revisions. Where energy use sectors are presented, information reflects the new definitions.

Table presentations remain the same for Table H1 in the Executive Summary and Tables 1 and 5 in Chapter 1. Changes to the other tables are as follows:

Table 2. Renewable Energy Consumption by Energy Use Sector and Energy Source, 1997-2001

- Commercial sector now includes energy consumption for electric-only power plants and combined-heat-and-power (CHP) plants.

Previously, this was included as a small fraction of the industrial sector's consumption.

- Industrial sector energy consumption no longer includes commercial sector or independent power producers' consumption.
- Electric utility sector is changed to electric power sector and now includes consumption for electric utilities and independent power producers combined.

Table 3. Renewable Energy Consumption for Electricity Generation by Energy Use Sector and Energy Source, 1997-2001

- Commercial sector is added for the first time. Previously, commercial sector energy consumption was included as a small fraction of industrial.
- Industrial sector energy consumption no longer includes consumption by the commercial sector or independent power producers..
- Electric utility sector is changed to electric power sector and now includes information for electric utility and independent power producers combined. Previously, independent power producers' consumption was included in industrial.
- Electric power industry is changed to total, which is the sum of the commercial, industrial, and electric power sectors.

Table 4. Electricity Net Generation from Renewable Energy by Energy Use Sector and Energy Source, 1997-2001

- Generation is reorganized into three new sectors: commercial, industrial, and electric power.
- Commercial sector includes generation by nonutilities whose primary purpose of business is commercial.
- Industrial sector includes generation by nonutilities whose primary purpose of business is industrial.
- Electric power sector includes generation by electric utilities and nonutilities that are independent power producers.
- Total by energy source is the sum of the commercial, industrial and electric power sectors.

Table 6. Renewable Energy Consumption of Nonelectric use by Energy Use Sector and Energy Source, 1997-2001

- Commercial sector now includes energy consumption for useful thermal output at combined-heat-and-power plants. Previously this was included as a small fraction of the industrial sector's consumption.
- Industrial sector energy consumption no longer includes commercial sector or independent power producers' consumption.

- Electric power sector now includes consumption for electric utilities and independent power producer combined.

Table 7. Biomass Energy Consumption by Energy Source and Energy Use Sector, 1997-2001

- Electric power sector includes wood energy consumption by electric utilities and independent power producers that were previously included in the industrial sector.
- Distributions of biomass energy consumption by Census Region are no longer included.

Table 8. Industrial Biomass Energy Consumption and Electricity Net Generation by Primary Purpose of Business, 2000

- New table that presents detailed characteristics of industrial biomass consumption.

Table 9. Waste Energy Consumption by Type and Energy Use Sector, 2000

- New table that presents detailed information on waste consumption excluding wood waste.

## Appendix B

Table B1 is a new table presenting historical renewable energy consumption for 1989 to 2001. It reflects the changes described for Table 2 above.

## Appendix C

Throughout Appendix C, information on electricity generation and net summer capacity by State, which was previously provided in separate tables for electric utilities and nonutilities, is now provided in separate tables for the electric power sector, which includes electric utilities and independent power producers, and for the commercial and industrial sectors combined.

# IX. Greenhouse Gas Emissions Publication

## Summary of Key Changes

The EIA report *Emissions of Greenhouse Gases in the United States* assigns all energy-consumption-related carbon dioxide emissions to one of four end-use sectors: residential, commercial, industrial and

transportation. A sector's emissions consist of the fuels directly burned in that sector (e.g., natural gas consumed to heat homes) as well as a share of the emissions resulting from electricity generation. Previously, emissions from nonutility generators were all assigned to the industrial sector, even though some of those emissions were based on electricity that was sold into the electricity grid and consumed in the residential and commercial sectors. Only emissions attributable to conventional electric utilities were shared out to the end-use sectors. Beginning with the 2002 publication on greenhouse gas emissions, emissions attributable to the electric power sector (which includes entities other than utilities) will be shared out to the end-use sectors. The electric power sector includes electricity-only plants (utilities and independent power producers) and combined-heat-and-power plants who are primarily in the business of selling electricity.

## Evolution of Presentation of Emissions Data

In the 2000 report a table was created that measured emissions based on electricity generation in the industrial sector and traditional electric utility emissions. Emissions from the two sources were summed to provide EIA's customers with a more complete total. However, in the end-use sector tables only the electric utility emissions were shared out. This created some confusion for EIA customers who could not add the electricity totals across sectors and arrive at the value in the stand-alone table.

In the 2001 report a table was created that presented an emissions total for both utility and nonutility generators. Unlike the previous year, this was not a stand-alone table, and the value from this table was shared out to the four end-use sectors. Because none of EIA's other multi-fuel publications allocated energy consumption in quite this same way there was somewhat of a disconnect created by this method as EIA customers could not re-create these emission values based on energy consumption in the multi-fuel, integrated publications.

For the 2002 report and beyond, the electric power sector will consist of emissions based on the multi-fuel, integrated publications that, beginning with the *Annual Energy Review* (AER), include plants whose primary business is to sell electricity (North American Industrial Classification System, NAICS, code 22). The consumption tables (e.g., *AER* Table 6.5 for natural gas) include a small amount of thermal energy produced by NAICS 22 CHP plants. In assigning emissions to end-use sectors, all of the emissions related to fuel consumed for electricity only or CHP plants remain in the

commercial and industrial sector unless they are categorized as being primarily in the business of selling electricity (NAICS 22) in which case they are included in the electric power sector as indicated above.

The electric power sector's emissions are shared out to the end-use sectors as determined by *AER* Table 8.5. Because the end-use categories in Table 8.5 differ slightly from the four detailed above in that there is an "Other"

category rather than "Transportation," an alteration is made to the data. A small amount of the "Other" category is estimated to be Transportation (4 to 6 billion kilowatthours). The rest of the "Other" category's electricity sales are allocated to the "Commercial Sector." Likewise, because there are no data to separate the "Direct Use" category, it is all allocated to the "Industrial Sector."



# Glossary

**Account of Others (Natural Gas):** Natural gas deliveries for the account of others are deliveries to customers by transporters that do not own the natural gas but deliver it for others for a fee. Included are quantities covered by long-term contracts and quantities involved in short-term or spot market sales.

**Alcohol:** The family name of a group of organic chemical compounds composed of carbon, hydrogen, and oxygen. The series of molecules vary in chain length and are composed of a hydrocarbon plus a hydroxyl group:  $\text{CH}_3\text{-(CH}_2\text{)}_n\text{-OH}$  (e.g., methanol, ethanol, and tertiary butyl alcohol).

**Alternative-fuel Vehicle (AFV):** A vehicle designed to operate on an alternative fuel (e.g., compressed natural gas, methane blend, electricity). The vehicle could be either a dedicated vehicle designed to operate exclusively on alternative fuel or a nondedicated vehicle designed to operate on alternative fuel and/or a traditional fuel.

**Anthracite:** The highest rank of coal; used primarily for residential and commercial space heating. It is a 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 short ton on a moist, mineral-matter-free basis. The heat content of anthracite coal consumed in the United States averages 25 million Btu per short 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 short ton or less.

**Anthracite Culm:** Waste from Pennsylvania anthracite preparation plants, consisting of coarse rock fragments containing as much as 30 percent small-sized coal; sometimes defined as including very fine coal particles called silt. Its heat value ranges from 8 to 17 million Btu per short ton.

**Anthropogenic:** Made or generated by a human or caused by human activity. The term is used in the context of global climate change to refer to

gaseous emissions that are the result of human activities, as well as other potentially climate-altering activities, such as deforestation.

**API:** The American Petroleum Institute, a trade association.

**API Gravity:** American Petroleum Institute measure of specific gravity of crude oil or condensate in degrees. An arbitrary scale expressing the gravity or density of liquid petroleum products. The measuring scale is calibrated in terms of degrees API; it is calculated as follows:  
 $\text{Degrees API} = (141.5 / \text{sp.gr.60 deg.F/60 deg.F}) - 131.5$ .

**Asphalt:** A dark-brown to black cement-like material obtained by petroleum processing and containing bitumens as the predominant component; used primarily for road construction. It includes crude asphalt as well as the following finished products: cements, fluxes, the asphalt content of emulsions (exclusive of water), and petroleum distillates blended with asphalt to make cutback asphalts. *Note:* The conversion factor for asphalt is 5.5 barrels per short ton.

**ASTM:** The acronym for the American Society for Testing and Materials.

**Aviation Gasoline Blending Components:** Naphthas that will be used for blending or compounding into finished aviation gasoline (e.g., straight run gasoline, alkylate, reformate, benzene, toluene, and xylene). Excludes oxygenates (alcohols, ethers), butane, and pentanes plus. Oxygenates are reported as other hydrocarbons, hydrogen, and oxygenates.

**Aviation Gasoline, Finished:** A complex mixture of relatively volatile hydrocarbons with or without small quantities of additives, blended to form a fuel suitable for use in aviation reciprocating engines. Fuel specifications are provided in ASTM Specification D910 and Military Specification MIL-G-5572. *Note:* Data on blending components are not counted in data on finished aviation gasoline. See **Jet Fuel, Finished**; **Jet Fuel, Kerosene-Type**; and **Jet Fuel, Naphtha-Type**.

**Barrel (Petroleum):** A unit of volume equal to 42 U.S. gallons.

**Barrels per Calendar Day:** The amount of input that a distillation facility can process under usual operating conditions. The amount is expressed in terms of capacity during a 24-hour period and reduces the maximum processing capability of all units at the facility under continuous operation to account for the following limitations that may delay, interrupt, or slow down production: 1) the capability of downstream processing units to absorb the output of crude oil processing facilities of a given refinery (no reduction is necessary for intermediate streams that are distributed to other than downstream facilities as part of a refinery's normal operation); 2) the types and grades of inputs to be processed; 3) the types and grades of products expected to be manufactured; 4) the environmental constraints associated with refinery operations; 5) the reduction of capacity for scheduled downtime due to such conditions as routine inspection, maintenance, repairs, and turnaround; and 6) the reduction of capacity for unscheduled downtime due to such conditions as mechanical problems, repairs, and slowdowns.

**Base Gas:** The volume of gas needed as a permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates throughout the withdrawal season. All native gas is included in the base gas volume.

**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 making coke. Bituminous coal is the most abundant coal in active U.S. mining regions. Its moisture content usually is less than 20 percent. The heat content of bituminous coal ranges from 21 to 30 million Btu per short ton on a moist, mineral-matter-free basis. The heat content of bituminous coal consumed in the United States averages 24 million Btu per short ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter).

**Black Liquor (Pulping Liquor):** The alkaline spent liquor removed from the digesters in the process of chemically pulping wood. After evaporation, the liquor is burned as a fuel in a recovery furnace that permits the recovery of certain basic chemicals.

**British Thermal Unit (Btu):** The quantity of heat required to raise the temperature of 1 pound of liquid water by 1 degree Fahrenheit at the temperature at which water has its greatest density (approximately 39 degrees

Fahrenheit). See **Heat Content of a Quantity of Fuel, Gross, and Heat Content of a Quantity of Fuel, Net.**

**Bunker fuels:** Fuel supplied to ships and aircraft, both domestic and foreign, consisting primarily of residual and distillate fuel oil for ships and kerosene-based jet fuel for aircraft. The term "international bunker fuels" is used to denote the consumption of fuel for international transport activities. *Note:* For the purposes of greenhouse gas emissions inventories, data on emissions from combustion of international bunker fuels are subtracted from national emissions totals. Historically, bunker fuels have meant only ship fuel.

**Butane:** A normally gaseous straight-chain or branched-chain hydrocarbon (C<sub>4</sub>H<sub>10</sub>) extracted from natural gas or refinery gas streams. It includes isobutane and normal butane and is designated in ASTM Specification D1835 and Gas Processors Association Specifications for commercial butane. *Isobutane:* A normally gaseous branched-chain hydrocarbon. It is a colorless paraffinic gas that boils at a temperature of 10.9 degrees Fahrenheit. It is extracted from natural gas or refinery gas streams. *Normal Butane:* A normally gaseous straight-chain hydrocarbon. It is a colorless paraffinic gas that boils at a temperature of 31.1 degrees Fahrenheit. It is extracted from natural gas or refinery gas streams.

**Butylene:** An olefinic hydrocarbon (C<sub>4</sub>H<sub>8</sub>) recovered from refinery processes.

**Capacity:** See **Generator Capacity** and **Generator Nameplate Capacity (Installed).**

**Capacity Factor:** The ratio of the electrical energy produced by a generating unit for a given period of time to the electrical energy that could have been produced at continuous full-power operation during the same period.

**Carbon Dioxide:** A colorless, odorless, non-poisonous gas (CO<sub>2</sub>) that is a normal part of Earth's atmosphere. Carbon dioxide is a product of fossil-fuel combustion as well as other processes. It is considered a greenhouse gas as it traps heat (infrared energy) radiated by the Earth into the atmosphere and thereby contributes to the potential for global warming. The global warming potential (GWP) of other greenhouse gases is measured in relation to that of carbon dioxide, which by international scientific



convention is assigned a value of one (1). See **Global warming potential (GWP)** and **Greenhouse gases**.

**Carbon Dioxide Equivalent:** The amount of carbon dioxide by weight emitted into the atmosphere that would produce the same estimated radiative forcing as a given weight of another radiatively active gas. Carbon dioxide equivalents are computed by multiplying the weight of the gas being measured (for example, methane) by its estimated global warming potential (which is 21 for methane). "Carbon equivalent units" are defined as carbon dioxide equivalents multiplied by the carbon content of carbon dioxide (i.e., 12/44).

**Chained Dollars:** A measure used to express real prices. Real prices are those that have been adjusted to remove the effect of changes in the purchasing power of the dollar; they usually reflect buying power relative to a reference year. Prior to 1996, real prices were expressed in constant dollars, a measure based on the weights of goods and services in a single year, usually a recent year. In 1996, the U.S. Department of Commerce introduced the chained-dollar measure. The new measure is based on the average weights of goods and services in successive pairs of years. It is "chained" because the second year in each pair, with its weights, becomes the first year of the next pair. The advantage of using the chained-dollar measure is that it is more closely related to any given period covered and is therefore subject to less distortion over time.

**Chlorofluorocarbon (CFC):** Any of various compounds consisting of carbon, hydrogen, chlorine, and fluorine used as refrigerants. CFCs are now thought to be harmful to the Earth's atmosphere.

**City Gate:** A point or measuring station at which a distribution gas utility receives gas from a natural gas pipeline company or transmission system.

**Climate Change:** A term used to refer to all forms of climatic inconsistency, but especially to significant change from one prevailing climatic condition to another. In some cases, "climate change" has been used synonymously with the term "global warming"; scientists, however, tend to use the term in a wider sense to include natural changes in climate as well as climatic cooling.

**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. See **Coal Rank**.

**Coal Coke:** See **Coke, Coal**.

**Coal Rank:** The classification of coals according to their degree of progressive alteration from lignite to anthracite. In the United States, the standard ranks of coal include lignite, subbituminous coal, bituminous coal, and anthracite and are based on fixed carbon, volatile matter, heating value, and agglomerating (or caking) properties. See **Anthracite, Bituminous Coal, Lignite, and Subbituminous Coal**.

**Coal Stocks:** Coal quantities that are held in storage for future use and disposition. *Note:* When coal data are collected for a particular reporting period (month, quarter, or year), coal stocks are commonly measured as of the last day of this period.

**Coke, Coal:** A solid carbonaceous residue derived from low-ash, low-sulfur bituminous coal from which the volatile constituents are driven off by baking in an oven at temperatures as high as 2,000 degrees Fahrenheit so that the fixed carbon and residual ash are fused together. Coke is used as a fuel and as a reducing agent in smelting iron ore in a blast furnace. Coke from coal is gray, hard, and porous and has a heating value of 24.8 million Btu per short ton.

**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 Heat and Power Plant (CHP):** A plant designed to produce both heat and electricity. If one or more units of the plant is a CHP unit, then the whole plant is designated as a CHP plant. *Note:* This term is being used in place of the term "Cogenerator" that was used by EIA in the past. CHP better describes the facilities because some of the plants included do not produce heat and power in a sequential fashion and, as a result, do not meet the legal definition of cogeneration specified in the Public Utility Regulatory Policies Act (PURPA). See **Cogenerator**.

**Commercial Building:** A building with more than 50 percent of its floorspace used for commercial activities. Commercial buildings include, but are not limited to, stores, offices, schools, churches, gymnasiums, libraries, museums, hospitals, clinics, warehouses, and jails. Government buildings are included, except buildings on military bases or reservations.

**Commercial Sector:** An energy-consuming sector that consists of service-providing facilities and equipment of: businesses; Federal, State, and local governments; and other private and public organizations, such as religious, social, or fraternal groups. The commercial sector includes institutional living quarters. It also includes sewage treatment facilities. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a wide variety of other equipment. *Note:* This sector includes generators that produce electricity and/or useful thermal output primarily to support the activities of the above-mentioned commercial establishments.

**Completion (oil/gas production):** The term refers to the installation of permanent equipment for the production of oil or gas. If a well is equipped to produce only oil or gas from one zone or reservoir, the definition of a "well" (classified as an oil well or gas well) and the definition of a "completion" are identical. However, if a well is equipped to produce oil and/or gas separately from more than one reservoir, a "well" is not synonymous with a "completion." See **Well**.

**Conversion Factor:** A number that translates units of one system into corresponding values of another system. Conversion factors can be used to translate physical units of measure for various fuels into Btu equivalents. See **British Thermal Unit**.

**Cooling Tower:** A common type of environmental equipment installed at power plants used to transfer heat, produced by burning fuel, to the atmosphere. Cooling towers are installed where there is insufficient cooling water available or where waste heat discharged into cooling water would affect marine life.

**Criteria Pollutant:** A pollutant determined to be hazardous to human health and regulated under the Environmental Protection Agency's (EPA) National Ambient Air Quality Standards. The 1970 amendments to the Clean Air Act require EPA to describe the health and welfare impacts of a pollutant as the "criteria" for inclusion in the regulatory regime.

**Crude Oil:** A mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Depending upon the characteristics of the crude stream, it may also include: 1) small amounts of hydrocarbons that exist in gaseous phase in natural underground reservoirs but are liquid at atmospheric pressure after being recovered from oil well (casinghead) gas in lease separators and are subsequently commingled with the crude stream without being separately measured. Lease condensate recovered as a liquid from natural gas wells in lease or field separation facilities and later mixed into the crude stream is also included; 2) small amounts of nonhydrocarbons produced with the oil, such as sulfur and various metals; and 3) drip gases, and liquid hydrocarbons produced from tar sands, gilsonite, and oil shale. Liquids produced at natural gas processing plants are excluded. Crude oil is refined to produce a wide array of petroleum products, including heating oils; gasoline, diesel and jet fuels; lubricants; asphalt; ethane, propane, and butane; and many other products used for their energy or chemical content.

**Crude Oil Landed Cost:** The price of crude oil at the port of discharge, including charges associated with purchasing, transporting, and insuring a cargo from the purchase point to the port of discharge. The cost does not include charges incurred at the discharge port (e.g., import tariffs or fees, wharfage charges, and demurrage).

**Crude Oil Refinery Input:** The total crude oil put into processing units at refineries.

**Crude Oil Stocks:** Stocks of crude oil and lease condensate held at refineries, in pipelines, at pipeline terminals, and on leases.

**Crude Oil Used Directly:** Crude oil consumed as fuel by crude oil pipelines and on crude oil leases.

**Cubic foot (cf), natural gas:** The amount of natural gas contained at standard temperature and pressure (60 degrees Fahrenheit and 14.73 pounds standard per square inch) in a cube whose edges are one foot long.

**Culm:** See **Anthracite Culm**.

**Degree-Days, Cooling (CDD):** A measure of how warm a location is over a period of time relative to a base temperature, most commonly specified

as 65 degrees Fahrenheit. The measure is computed for each day by subtracting the base temperature (65 degrees) from the average of the day's high and low temperatures, with negative values set equal to zero. Each day's cooling degree-days are summed to create a cooling degree-day measure for a specified reference period. Cooling degree-days are used in energy analysis as an indicator of air conditioning energy requirements or use.

**Degree-Days, Heating (HDD):** A measure of how cold a location is over a period of time relative to a base temperature, most commonly specified as 65 degrees Fahrenheit. The measure is computed for each day by subtracting the average of the day's high and low temperatures from the base temperature (65 degrees), with negative values set equal to zero. Each day's heating degree-days are summed to create a heating degree-day measure for a specified reference period. Heating degree-days are used in energy analysis as an indicator of space heating energy requirements or use.

**Degree-Days, Population-Weighted:** Heating or cooling degree-days weighted by the population of the area in which the degree-days are recorded. To compute State population-weighted degree-days, each State is divided into from one to nine climatically homogeneous divisions, which are assigned weights based on the ratio of the population of the division to the total population of the State. Degree-day readings for each division are multiplied by the corresponding population weight for each division and those products are then summed to arrive at the State population-weighted degree-day figure. To compute national population-weighted degree-days, the Nation is divided into nine Census regions, each comprising from three to eight States, which are assigned weights based on the ratio of the population of the region to the total population of the Nation. Degree-day readings for each region are multiplied by the corresponding population weight for each region and those products are then summed to arrive at the national population-weighted degree-day figure.

**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.

**Demonstrated Reserve Base (Coal):** A collective term for the sum of coal in both measured and indicated resource categories of reliability, representing 100 percent of the in-place coal in those categories as of a certain

date. Includes beds of bituminous coal and anthracite 28 or more inches thick and beds of subbituminous coal 60 or more inches thick that can occur at depths of as much as 1,000 feet. Includes beds of lignite 60 or more inches thick that can be surface mined. Includes also thinner and/or deeper beds that currently are being mined or for which there is evidence that they could be mined commercially at a given time. Represents that portion of the identified coal resource from which reserves are calculated.

**Design Electrical Rating (Capacity), Net:** The nominal net electrical output of a nuclear unit as specified by the electric utility for the purpose of plant design.

**Development Well:** A well drilled within the proved area of an oil or gas reservoir to the depth of a stratigraphic horizon known to be productive. See **Well**.

**Distillate Fuel Oil:** A general classification for one of the petroleum fractions produced in conventional distillation operations. It includes diesel fuels and fuel oils. Products known as No. 1, No. 2, and No. 4 diesel fuel are used in on-highway diesel engines, such as those found in cars and trucks, as well as off-highway engines, such as those in railroad locomotives and agricultural machinery. Products known as No. 1, No. 2, and No. 4 fuel oils are used primarily for space heating and electric power generation.

**Distillation Unit (Atmospheric):** The primary distillation unit that processes crude oil (including mixtures of other hydrocarbons) at approximately atmospheric conditions. It includes a pipe still for vaporizing the crude oil and a fractionation tower for separating the vaporized hydrocarbon components in the crude oil into fractions with different boiling ranges. This is done by continuously vaporizing and condensing the components to separate higher boiling point material. The selected boiling ranges are set by the processing scheme, the properties of the crude oil, and the product specifications.

**District Heat:** Steam or hot water from an outside source used as an energy source in a building. The steam or hot water is produced in a central plant and is piped into the building. District heat may be purchased from a utility or provided by a physical plant in a separate building that is part of the same facility (for example, a hospital complex or university).

**Dry Hole:** An exploratory or development well found to be incapable of producing either oil or gas in sufficient quantities to justify completion as an oil or gas well. See **Well**.

**Dry Gas Production:** See **Natural Gas (Dry) Production**.

**Dual-Fired Unit:** A generating unit that can produce electricity using two or more input fuels. In some of these units, only the primary fuel can be used continuously; the alternate fuel(s) can be used only as a start-up fuel or in emergencies.

**Eastern Europe and Former U.S.S.R.:** Includes Albania, Azerbaijan, Belarus, Bulgaria, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. See **U.S.S.R.**

**Electric Power Sector:** An energy-consuming sector that consists of electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public--i.e., North American Industry Classification System 22 plants. See also **Combined-Heat-and-Power (CHP) Plant** and **Electricity-Only Plant**.

**Electrical System Energy Losses:** The amount of energy lost during generation, transmission, and distribution of electricity, including plant and unaccounted-for uses.

**Electricity:** A form of energy characterized by the presence and motion of elementary charged particles generated by friction, induction, or chemical change.

**Electricity-only plant:** A plant designed to produce electricity only. See **Combined-heat-and-power (CHP) plant**.

**Electricity Generation:** The process of producing electric energy by transforming other forms of energy; also, the amount of electric energy produced, expressed in kilowatthours.

**Electricity Generation, Gross:** The total amount of electric energy produced by generating units and measured at the generating terminal in kilowatthours (kWh) or megawatthours (MWh).

**Electricity Generation, Net:** The amount of gross generation less the electrical energy consumed at the generating station(s) for station service or auxiliaries. *Note:* Electricity required for pumping at pumped-storage plants is regarded as station use and is deducted from gross generation.

**Electricity 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 sales for public street and highway lighting and other sales to public authorities and railways, and interdepartmental sales.

**Electric Utility:** A corporation, person, agency, authority, or other legal entity or instrumentality aligned with distribution facilities for delivery of electric energy for use primarily by the public. Included are investor-owned electric utilities, municipal and State utilities, Federal electric utilities, and rural electric cooperatives. A few entities that are tariff based and corporately aligned with companies that own distribution facilities are also included. *Note:* Due to the issuance of FERC Order 888 that required traditional electric utilities to functionally unbundle their generation, transmission, and distribution operations, "electric utility" currently has inconsistent interpretations from State to State.

**Eliminations:** Revenues and expenses resulting from transactions between segments of the energy industry. Consolidated company accounts do not include intersegment revenues and expenses. Therefore, such intersegment transactions must be eliminated.

**Emissions:** Anthropogenic releases of gases to the atmosphere. In the context of global climate change, they consist of radiatively important greenhouse gases (e.g., the release of carbon dioxide during fuel combustion).

**End-Use Sectors:** The residential, commercial, industrial, and transportation sectors of the economy.

**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 Consumption:** The use of energy as a source of heat or power or as an input in the manufacturing process.

**Energy Expenditures:** The money spent directly by consumers to purchase energy. Expenditures equal the amount of energy used by the consumer times the price per unit paid by the consumer.

**Energy service provider:** An energy entity that provides service to a retail or end-use customer.

**Energy Source:** Any substance or natural phenomenon that can be consumed or transformed to supply heat or power. Examples include petroleum, coal, natural gas, nuclear, biomass, electricity, wind, sunlight, geothermal, water movement, and hydrogen in fuel cells.

**Ethane:** A normally gaseous straight-chain hydrocarbon (C<sub>2</sub>H<sub>6</sub>). It is a colorless, paraffinic gas that boils at a temperature of -127.48 degrees Fahrenheit. It is extracted from natural gas and refinery gas streams.

**Ethylene:** An olefinic hydrocarbon recovered from refinery processes or petrochemical processes. Ethylene is used as a petrochemical feedstock for numerous chemical applications and the production of consumer goods.

**Exploratory Well:** A well drilled to find and produce oil or gas in an area previously considered unproductive, to find a new reservoir in a known field (i.e., one previously producing oil or gas in another reservoir), or to extend the limit of a known oil or gas reservoir. See **Well**.

**Exports:** Shipments of goods from within the 50 States and the District of Columbia to U.S. possessions and territories or to foreign countries.

**Extraction Loss:** The reduction in volume of natural gas due to the removal of natural gas liquid constituents such as ethane, propane, and butane at natural gas processing plants.

**Federal Energy Administration:** A predecessor of the Energy Information Administration.

**Federal Energy Regulatory Commission (FERC):** The Federal agency with jurisdiction over interstate electricity sales, wholesale electric rates, hydroelectric licensing, natural gas pricing, oil pipeline rates, and gas pipeline certification. FERC is an independent regulatory agency within the Department of Energy and is the successor to the Federal Power Commission.

**Federal Power Commission (FPC):** The predecessor agency of the Federal Energy Regulatory Commission. The Federal Power Commission 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. It was abolished on September 30, 1977, when the Department of Energy was created. Its functions were divided between the Department of Energy and the Federal Energy Regulatory Commission, an independent regulatory agency.

**Financial Reporting System (FRS):** The Energy Information Administration's statutory requirement to identify major energy-producing companies and develop and implement a data-reporting program for energy financial and operating information from these companies. Companies are selected if they are within the top 50 publicly-owned U.S. crude oil producers that have at least 1 percent of either production or reserves of oil, gas, coal, or uranium in the United States, or 1 percent of either refining capacity or petroleum product sales in the United States.

**First Use:** Manufacturing establishments' consumption of the energy that was originally produced offsite or was produced onsite from input materials not classified as energy.

**First Purchase Price:** The marketed first sales price of domestic crude oil, consistent with the removal price defined by the provisions of the Windfall Profits Tax on Domestic Crude Oil (Public Law 96-223, Sec. 4998 [c]).

**Fiscal Year:** The U.S. Government's fiscal year runs from October 1 through September 30. The fiscal year is designated by the calendar year in which it ends; e.g., fiscal year 2000 began on October 1, 1999, and ended on September 30, 2000.

**Flared Natural Gas:** Natural gas burned in flares on the base site or at gas processing plants.



**f.o.b.:** See **Free on Board**.

**Footage Drilled:** Total footage for wells in various categories, as reported for any specified period, includes (1) the deepest total depth (length of well bores) of all wells drilled from the surface, (2) the total of all bypassed footage drilled in connection with reported wells, and (3) all new footage drilled for directional sidetrack wells. Footage reported for directional sidetrack wells does not include footage in the common bore, which is reported as footage for the original well. In the case of old wells drilled deeper, the reported footage is that which was drilled below the total depth of the old well.

**Former U.S.S.R.:** See **U.S.S.R.**

**Forward Costs (Uranium):** The operating and capital costs that will be incurred in any future production of uranium from in-place reserves. Included are costs for labor, materials, power and fuel, royalties, payroll taxes, insurance, and general and administrative costs that are dependent upon the quantity of production and, thus, applicable as variable costs of production. Excluded from forward costs are prior expenditures, if any, incurred for property acquisition, exploration, mine development, and mill construction, as well as income taxes, profit, and the cost of money. *Note:* By use of forward costing, estimates of reserves for ore deposits in differing geological settings can be aggregated and reported as the maximum amount that can theoretically be extracted to recover the specified costs of uranium oxide production under the listed forward cost categories.

**Fossil Fuel:** An energy source formed in the Earth's crust from decayed organic material, such as petroleum, coal, and natural gas.

**Fossil-Fueled Steam-Electric Power Plant:** An electricity generation plant in which the prime mover is a turbine rotated by high-pressure steam produced in a boiler by heat from burning fossil fuels.

**Fractionation:** The process by which saturated hydrocarbons are removed from natural gas and separated into distinct parts, or "fractions" such as propane, butane, and ethane.

**Free Alongside Ship (f.a.s.):** The value of a commodity at the port of exportation, generally including the purchase price plus all charges incurred in placing the commodity alongside the carrier at the port of exportation.

**Free on Board (f.o.b.):** A sales transaction in which the seller makes the product available for pick up at a specified port or terminal at a specified price and the buyer pays for the subsequent transportation and insurance.

**Fuel Ethanol:** An anhydrous, denatured aliphatic alcohol (C<sub>2</sub>H<sub>5</sub>OH) intended for motor gasoline blending. See **Oxygenates**.

**Full-Power Operation:** Operation of a nuclear generating unit at 100 percent of its design capacity. Full-power operation precedes commercial operation.

**Gas Well:** A well completed for the production of natural gas from one or more gas zones or reservoirs. (Wells producing both crude oil and natural gas are classified as oil wells.)

**Gas Well Productivity:** Derived annually by dividing gross natural gas withdrawals from gas wells by the number of producing gas wells on December 31 and then dividing the quotient by the number of days in the year.

**Generator capacity:** The maximum output, commonly expressed in megawatts (MW), that generating equipment can supply to system load, adjusted for ambient conditions.

**Generator nameplate capacity (installed):** The maximum rated output of a generator, prime mover, or other electric power production equipment under specific conditions designated by the manufacturer. Installed generator nameplate capacity is commonly expressed in megawatts (MW) and is usually indicated on a nameplate physically attached to the generator.

**Geothermal Energy:** Hot water or steam extracted from geothermal reservoirs in the Earth's crust and used for geothermal heat pumps, water heating, or electricity generation.

**Global Warming:** An increase in the near-surface temperature of the Earth. Global warming has occurred in the distant past as the result of natural influences, but the term is today most often used to refer to the warming some scientists predict will occur as a result of increased anthropogenic emissions of greenhouse gases. See **Greenhouse Gases** and **Climate Change**.

**Global Warming Potential (GWP):** An index used to compare the relative radiative forcing of different gases without directly calculating the changes in atmospheric concentrations. GWPs are calculated as the ratio of the radiative forcing that would result from the emission of one kilogram of a greenhouse gas to that from the emission of one kilogram of carbon dioxide over a period of time, such as 100 years.

**Greenhouse Gases:** Those gases, such as water vapor, carbon dioxide, nitrous oxide, methane, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride, that are transparent to solar (short-wave) radiation but opaque to long-wave radiation, thus preventing long-wave radiant energy from leaving the Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.

**Gross Domestic Product (GDP):** The total value of goods and services produced by labor and property located in the United States. As long as the labor and property are located in the United States, the supplier (that is, the workers and, for property, the owners) may be either U.S. residents or residents of foreign countries.

**Gross Domestic Product (GDP) Implicit Price Deflator:** A measure used to convert nominal prices to real prices. See **Chained Dollars**.

**Gross Electricity Generation:** See **Electricity Generation, Gross**.

**Gross Withdrawals:** See **Natural Gas Gross Withdrawals**.

**Gross Input to Atmospheric Crude Oil Distillation Units:** Total input to atmospheric crude oil distillation units. Includes all crude oil, lease condensate, natural gas plant liquids, unfinished oils, liquefied refinery gases, slop oils, and other liquid hydrocarbons produced from tar sands, gilsonite, and oil shale.

**Heat Content of a Quantity of Fuel, Gross:** The total amount of heat released when a fuel is burned. Coal, crude oil, and natural gas all include chemical compounds of carbon and hydrogen. When those fuels are burned, the carbon and hydrogen combine with oxygen in the air to produce carbon dioxide and water. Some of the energy released in burning goes into transforming the water into steam and is usually lost. The amount of heat spent in transforming the water into steam is counted as part of gross heat content but is not counted as part of net content. Gross heat

content is also referred to as the higher heating value. Btu conversion factors typically used by Energy Information Administration represent gross heat content.

**Heat Content of a Quantity of Fuel, Net:** The amount of usable heat energy released when a fuel is burned under conditions similar to those in which it is normally used. Net heat content is also referred to as the lower heating value. Btu conversion factors typically used by the Energy Information Administration represent gross heat content.

**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. Includes fuel oil numbers 4, 5, and 6; crude; and topped crude.

**Household:** A family, an individual, or a group of up to nine unrelated persons occupying the same housing unit. "Occupy" means the housing unit was the person's usual or permanent place of residence.

**Housing Unit:** A house, an apartment, a group of rooms, or a single room if it is either occupied or intended for occupancy as separate living quarters by a family, an individual, or a group of one to nine unrelated persons. Separate living quarters means the occupants (1) live and eat separately from other persons in the house or apartment and (2) have direct access from the outside of the buildings or through a common hall--that is, they can get to it without going through someone else's living quarters. Housing units do not include group quarters such as prisons or nursing homes where ten or more unrelated persons live. A common dining area used by residents is an indication of group quarters. Hotel and motel rooms are considered housing units if occupied as the usual or permanent place of residence.

**Hydrocarbon:** An organic chemical compound of hydrogen and carbon in the gaseous, liquid, or solid phase. The molecular structure of hydrocarbon compounds varies from the simplest (methane, a constituent of natural gas) to the very heavy and very complex.

**Hydroelectric Power:** The use of flowing water to produce electrical energy.

**Hydroelectric Pumped Storage 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.

**Hydrofluorocarbons (HFCs):** A group of man-made chemicals composed of one or two carbon atoms and varying numbers of hydrogen and fluorine atoms. Most HFCs have 100-year Global Warming Potentials in the thousands.

**Implicit Price Deflator:** See **Chained Dollars**.

**Imports:** Receipts of goods into the 50 States and the District of Columbia from U.S. possessions and territories or from foreign countries.

**Independent Power Producer:** A corporation, person, agency, authority, or other legal entity or instrumentality that owns or operates facilities for the generation of electricity for use primarily by the public, and that is not an electric utility.

**Indicated Resources, Coal:** Coal for which estimates of the rank, quality, and quantity are based partly on sample analyses and measurements and partly on reasonable geologic projections. Indicated resources are computed partly from specified measurements and partly from projection of visible data for a reasonable distance on the basis of geologic evidence. The points of observation are ½ to 1½ miles apart. Indicated coal is projected to extend as a ½-mile-wide belt that lies more than ¼ mile from the outcrop or points of observation or measurement.

**Industrial Sector:** An energy-consuming sector that consists of all facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses the following types of activity: manufacturing (NAICS codes 31-33); agriculture, forestry, and fisheries (NAICS code 11); mining, including oil and gas extraction (NAICS code 21); natural gas transmission (NAICS code 2212); and construction (NAICS code 23). Overall energy use in this sector is largely for process heat and cooling and powering machinery, with lesser amounts used for facility heating, air conditioning, and lighting. Fossil fuels are also used as raw material inputs to manufactured products. *Note:* This sector includes generators that produce electricity and/or useful thermal output primarily to support the above-mentioned industrial activities.

**Jet Fuel:** A refined petroleum product used in jet aircraft engines. It includes kerosene-type jet fuel and naphtha-type jet fuel.

**Jet Fuel, Kerosene-Type:** A kerosene-based product with a maximum distillation temperature of 400 degrees Fahrenheit at the 10-percent recovery point and a final maximum boiling point of 572 degrees Fahrenheit and meeting ASTM Specification 1655 and Military Specifications MIL-T-5624P and MIL-T-83133D (Grades JP-5 and JP-8). It is used for commercial and military turbojet and turboprop aircraft engines.

**Jet Fuel, Naphtha-Type:** A fuel in the heavy naphtha boiling range, with an average gravity of 52.8° API, 20 to 90 percent distillation temperature of 290 to 470 degrees Fahrenheit, and meeting Military Specification MIL-T-5624L (Grade JP-4). It is used primarily for military turbojet and turboprop aircraft engines because it has a lower freeze point than other aviation fuels and meets engine requirements at high altitudes and speeds.

**Kerosene:** A light petroleum distillate that is used in space heaters, cook stoves, and water heaters and is suitable for use as a light source when burned in wick-fed lamps. Kerosene has a maximum distillation temperature of 400 degrees Fahrenheit at the 10-percent recovery point, a final boiling point of 572 degrees Fahrenheit, and a minimum flash point of 100 degrees Fahrenheit. Included are No. 1-K and No. 2-K, the two grades recognized by ASTM Specification D3699 as well as all other grades of kerosene called range or stove oil, which have properties similar to those of No. 1 fuel oil. See **Jet Fuel, Kerosene-Type**.

**Kilowatthour (kWh):** A measure of electricity defined as a unit of work or energy, measured as 1 kilowatt (1,000 watts) of power expended for 1 hour. One kilowatthour is equivalent to 3,412 Btu.

**Landed Cost:** See **Crude Oil Landed Cost**.

**Lease and Plant Fuel:** Natural gas used in well, field, and lease operations (such as gas used in drilling operations, heaters, dehydrators, and field compressors) and used as fuel in natural gas processing plants.

**Lease Condensate:** A mixture consisting primarily of pentanes and heavier hydrocarbons which is recovered as a liquid from natural gas in lease separation facilities. This category excludes natural gas plant



liquids, such as butane and propane, which are recovered at downstream natural gas processing plants or facilities.

**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. Includes fuel oil numbers 1 and 2, kerosene, and jet fuel.

**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 short ton on a moist, mineral-matter-free basis. The heat content of lignite consumed in the United States averages 13 million Btu per short ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter).

**Liquefied Natural Gas (LNG):** Natural gas (primarily methane) that has been liquefied by reducing its temperature to -260 degrees Fahrenheit at atmospheric pressure.

**Liquefied Petroleum Gases (LPG):** A group of hydrocarbon-based gases derived from crude oil refining or natural gas fractionation. They include ethane, ethylene, propane, propylene, normal butane, butylene, isobutane, and isobutylene. For convenience of transportation, these gases are liquefied through pressurization.

**Liquefied Refinery Gases (LRG):** Liquefied petroleum gases fractionated from refinery or still gases. Through compression and/or refrigeration, they are retained in the liquid state. The reported categories are ethane/ethylene, propane/propylene, normal butane/butylene, and isobutane. Excludes still gas.

**Losses:** See **Electrical System Energy Losses**.

**Low-Power Testing:** The period of time between a nuclear generating unit's initial fuel loading date and the issuance of its operating (full-power) license. The maximum level of operation during that period is 5 percent of the unit's design thermal rating.

**Lubricants:** Substances used to reduce friction between bearing surfaces or incorporated into other materials used as processing aids in the

manufacture of other products, or used as carriers of other materials. Petroleum lubricants may be produced either from distillates or residues. Lubricants include all grades of lubricating oils, from spindle oil to cylinder oil, and those used in greases.

**Major Energy Producers:** The top publicly-owned crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System. See **Financial Reporting System**.

**Manufacturing:** An energy-consuming subsector of the industrial sector that consists of all facilities and equipment engaged in the mechanical, physical, chemical, or electronic transformation of materials, substances, or components into new products. Assembly of component parts of products is included, except for that which is included in construction.

**Marketed Production, Natural Gas:** Gross withdrawals less gas used for repressuring, quantities vented and flared, and nonhydrocarbon gases removed in treating or processing operations. Includes all quantities of gas used in field and processing operations.

**Measured Resources, Coal:** Coal resources for which estimates of the rank, quality, and quantity have been computed, within a margin of error of less than 20 percent, from sample analyses and measurements from closely spaced and geologically well known sample sites. Measured resources are computed from dimensions revealed in outcrops, trenches, mine workings, and drill holes. The points of observation and measurement are so closely spaced and the thickness and extent of coals are so well defined that the tonnage is judged to be accurate within 20 percent. Although the spacing of the point of observation necessary to demonstrate continuity of the coal differs from region to region, according to the character of the coalbeds, the points of observation are no greater than ½ mile apart. Measured coal is projected to extend as a belt ¼ mile wide from the outcrop or points of observation or measurement.

**Methane:** A colorless, flammable, odorless hydrocarbon gas (CH<sub>4</sub>), which is the major component of natural gas. It is also an important source of hydrogen in various industrial processes.

**Methanol:** A light, volatile alcohol (CH<sub>3</sub>OH) eligible for motor gasoline blending. See **Oxygenates**.

**Miscellaneous Petroleum Products:** All finished petroleum products not classified elsewhere—for example, petrolatum, lube refining byproducts (aromatic extracts and tars), absorption oils, ram-jet fuel, petroleum rocket fuels, synthetic natural gas feedstocks, and specialty oils.

**Motor Gasoline Blending Components:** Naphthas (e.g., straight-run gasoline, alkylate, reformate, benzene, toluene, xylene) used for blending or compounding into finished motor gasoline. These components include reformulated gasoline blendstock for oxygenate blending (RBOB) but exclude oxygenates (alcohols, ethers), butane, and pentanes plus. *Note:* Oxygenates are reported as individual components and are included in the total for other hydrocarbons, hydrogens, and oxygenates.

**Motor Gasoline, Conventional:** Finished motor gasoline not included in the oxygenated or reformulated gasoline categories. *Note:* This category excludes reformulated gasoline blendstock for oxygenate blending (RBOB) as well as other blendstock. Conventional motor gasoline can be leaded or unleaded; regular, midgrade, or premium. See **Motor Gasoline Grades**.

**Motor Gasoline Grades:** The classification of gasoline by octane ratings. Each type of gasoline (conventional, oxygenated, and reformulated; leaded or unleaded) is classified by three grades: regular, midgrade, and premium. *Note:* Gasoline sales are reported by grade in accordance with their classification at the time of sale. In general, automotive octane requirements are lower at high altitudes. Therefore, in some areas of the United States, such as the Rocky Mountain States, the octane ratings for the gasoline grades may be 2 or more octane points lower.

*Regular Gasoline:* Gasoline having an antiknock index, i.e., octane rating, greater than or equal to 85 and less than 88.

*Midgrade Gasoline:* Gasoline having an antiknock index, i.e., octane rating, greater than or equal to 88 and less than or equal to 90.

*Premium Gasoline:* Gasoline having an antiknock index, i.e., octane rating, greater than 90.

**Motor Gasoline, Oxygenated:** Finished motor gasoline other than reformulated gasoline, having an oxygen content of 2.7 percent or higher by weight and required by the U.S. Environmental Protection Agency (EPA) to be sold in areas designated by EPA as carbon monoxide (CO)

nonattainment areas. *Note:* Oxygenated gasoline excludes reformulated gasoline, oxygenated fuels program reformulated gasoline (OPRG), and reformulated gasoline blendstock for oxygenated blending (RBOB). It can be formulated for regular, midgrade, or premium grade. See **Motor Gasoline Grades**.

**Motor Gasoline, Reformulated:** Finished motor gasoline formulated for use in motor vehicles, the composition and properties of which meet the requirements of the reformulated gasoline regulations promulgated by the U.S. Environmental Protection Agency under Section 211(k) of the Clean Air Act. *Note:* This category includes oxygenated fuels program reformulated gasoline (OPRG) but excludes reformulated gasoline blendstock for oxygenate blending (RBOB). It can be formulated for regular, midgrade, and premium grades. See **Motor Gasoline Grades**.

**NAICS:** See **North American Industry Classification System**.

**Natural Gas:** A gaseous mixture of hydrocarbon compounds, the primary one being methane. *Note:* The Energy Information Administration measures wet natural gas and its two sources of production, associated/dissolved natural gas and nonassociated natural gas, and dry natural gas, which is produced from wet natural gas.

**Wet natural gas:** A mixture of hydrocarbon compounds and small quantities of various nonhydrocarbons existing in the gaseous phase or in solution with crude oil in porous rock formations at reservoir conditions. The principal hydrocarbons normally contained in the mixture are methane, ethane, propane, butane, and pentane. Typical nonhydrocarbon gases that may be present in reservoir natural gas are water vapor, carbon dioxide, hydrogen sulfide, nitrogen and trace amounts of helium. Under reservoir conditions, natural gas and its associated liquefiable portions occur either in a single gaseous phase in the reservoir or in solution with crude oil and are not distinguishable at the time as separate substances. *Note:* The Securities and Exchange Commission and the Financial Accounting Standards Board refer to this product as natural gas.

- **Associated-dissolved natural gas:** Natural gas that occurs in crude oil reservoirs either as free gas (associated) or as gas in solution with crude oil (dissolved gas).
- **Nonassociated natural gas:** Natural gas that is not in contact with significant quantities of crude oil in the reservoir.

**Dry natural gas:** Natural gas which remains after: 1) the liquefiable hydrocarbon portion has been removed from the gas stream (i.e., gas after lease, field, and/or plant separation); and 2) any volumes of nonhydrocarbon gases have been removed where they occur in sufficient quantity to render the gas unmarketable. *Note:* Dry natural gas is also known as consumer-grade natural gas. The parameters for measurement are cubic feet at 60 degrees Fahrenheit and 14.73 pounds per square inch absolute.

**Natural Gas Gross Withdrawals:** Full well stream volume of produced natural gas, excluding condensate separated at the lease.

**Natural Gas Liquids (NGL):** A general term for all liquid products separated from natural gas in gas processing or cycling plants. They include natural gas plant liquids and lease condensate.

**Natural Gas Marketed Production:** See **Marketed Production, Natural Gas**.

**Natural Gas Plant Liquids (NGPL):** Those hydrocarbons in natural gas that are separated as liquids at downstream gas processing plants, fractionating and cycling plants, and in some instances at field facilities. Lease condensate is excluded. Products obtained include liquefied petroleum gases and pentanes plus.

**Natural Gas Wellhead Price:** Price of natural gas calculated by dividing the total reported value at the wellhead by the total quantity produced as reported by the appropriate agencies of individual producing States and the U.S. Mineral Management Service. The price includes all costs prior to shipment from the lease, including gathering and compression costs, in addition to State production, severance, and similar charges.

**NERC:** See **North American Electric Reliability Council**.

**Net Electricity Generation:** See **Electricity Generation, Net**.

**Net Income:** Operating income plus other income and extraordinary income less operating expenses, taxes, interest charges, other deductions, and extraordinary deductions.

**Net Investment in Place:** Net property, plant, and equipment plus investments and advances to unconsolidated affiliates.

**Net Summer Capacity:** The maximum output, commonly expressed in megawatts (MW), that generating equipment can supply to system load, as demonstrated by a multi-hour test, at the time of summer peak demand (period of May 1 through October 31). This output reflects a reduction in capacity due to electricity use for station service or auxiliaries.

**Neutral Zone:** A 6,200 square-mile area shared equally between Kuwait and Saudi Arabia under a 1992 agreement.

**Nitrogen Oxides (No<sub>x</sub>):** Compounds of nitrogen and oxygen produced by the burning of fossil fuels.

**Nominal Dollars:** A measure used to express nominal price.

**Nominal Price:** The price paid for a product or service at the time of the transaction. Nominal prices are those that have not been adjusted to remove the effect of changes in the purchasing power of the dollar; they reflect buying power in the year in which the transaction occurred.

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

**Nonhydrocarbon Gases:** Typical nonhydrocarbon gases that may be present in reservoir natural gas, such as carbon dioxide, helium, hydrogen sulfide, and nitrogen.

**Nontraceables:** Energy companies' revenues, costs, assays, and liabilities that cannot be directly attributed to a type of business by use of a reasonable allocation method developed on the basis of operating-level utilities.

**Nonutility Power Producer:** A corporation, person, agency, authority, or other legal entity or instrumentality that owns or operates facilities for electric generation and is not an electric utility. Nonutility power producers include qualifying cogenerators, qualifying small power producers, and other nonutility generators (including independent power producers). Nonutility

power producers are without a designated franchised service area and do not file forms listed in the Code of Federal Regulations, Title 18, Part 141.

**North American Electric Reliability Council (NERC):** A council formed in 1968 by the electric utility industry to promote the reliability and adequacy of bulk power supply in the electric utility systems of North America. NERC consists of regional reliability councils and encompasses essentially all the power regions of the contiguous United States, Canada, and Mexico. See the various NERC Regional Reliability Councils at <http://www.eia.doe.gov/neic/pubstyle/nerc.htm>.

**North American Industry Classification System (NAICS):** A coding system developed jointly by the United States, Canada, and Mexico to classify businesses and industries according to the type of economic activity in which they are engaged. NAICS replaces the Standard Industrial Classification (SIC) codes.

**Nuclear Electric Power (nuclear power):** Electricity generated by the use of the thermal energy released from the fission of nuclear fuel in a reactor.

**OECD:** See **Organization for Economic Cooperation and Development**.

**Offshore:** That geographic area that lies seaward of the coastline. In general, the coastline is the line of ordinary low water along with that portion of the coast that is in direct contact with the open sea or the line marking the seaward limit of inland water. If a state agency uses a different basis for classifying onshore and offshore areas, the state classification is used (e.g., Cook Inlet in Alaska is classified as offshore; for Louisiana, the coastline is defined as the Chapman Line, as modified by subsequent adjudication).

**Oil:** See **Crude Oil**.

**Oil Well:** A well completed for the production of crude oil from one or more oil zones or reservoirs. Wells producing both crude oil and natural gas are classified as oil wells.

**Operable Nuclear Unit:** In the United States, a nuclear generating unit that has completed low-power testing and is in possession of a full-power operating license issued by the Nuclear Regulatory Commission.

**Operable Refineries:** Refineries that were in one of the following three categories at the beginning of a given year: in operation; not in operation and not under active repair, but capable of being placed into operation within 30 days; or not in operation, but under active repair that could be completed within 90 days.

**Operating Income:** Operating revenues less operating expenses. Excludes items of other revenue and expense, such as equity in earnings of unconsolidated affiliates, dividends, interest income and expense, income taxes, extraordinary items, and cumulative effect of accounting changes.

**Organization for Economic Cooperation and Development (OECD):** An international organization helping governments tackle the economic, social and governance challenges of a globalized economy. Its membership comprises about 30 member countries. With active relationships with some 70 other countries, NGOs and civil society, it has a global reach. For details about the organization, see <http://www.oecd.org>.

**Organization of Petroleum Exporting Countries (OPEC):** Countries that have organized for the purpose of negotiating with oil companies on matters of oil production, prices, and future concession rights. Current members (as of the date of writing this definition) are Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela. See OPEC's site at <http://www.opec.org> for more information.

**Other Hydrocarbons:** Materials received by a refinery and consumed as a raw material. Includes hydrogen, coal tar derivatives, gilsonite, and natural gas received by the refinery for reforming into hydrogen. Natural gas to be used as fuel is excluded.

**Oxygenated Motor Gasoline:** See **Motor Gasoline, Oxygenated**.

**Oxygenates:** Substances which, when added to motor gasoline, increase the amount of oxygen in that gasoline blend. Ethanol, methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), and methanol are common oxygenates. See **Motor Gasoline, Oxygenated**.

**Ozone:** A molecule made up of three atoms of oxygen. Occurs naturally in the stratosphere and provides a protective layer shielding the Earth from harmful ultraviolet radiation. In the troposphere, it is a chemical oxidant, a greenhouse gas, and a major component of photochemical smog.

**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.

**Pentanes Plus:** A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas. Includes isopentane, natural gasoline, and plant condensate.

**Perfluorocarbons (PFCs):** A group of man-made chemicals composed of one or two carbon atoms and four to six fluorine atoms, containing no chlorine. PFCs have no commercial uses and are emitted as a byproduct of aluminum smelting and semiconductor manufacturing. PFCs have very high 100-year Global Warming Potentials and are very long-lived in the atmosphere.

**Petrochemical Feedstocks:** Chemical feedstocks derived from petroleum principally for the manufacture of chemicals, synthetic rubber, and a variety of plastics.

**Petroleum:** A broadly defined class of liquid hydrocarbon mixtures. Included are crude oil, lease condensate, unfinished oils, refined products obtained from the processing of crude oil, and natural gas plant liquids. *Note:* Volumes of finished petroleum products include nonhydrocarbon compounds, such as additives and detergents, after they have been blended into the products.

**Petroleum Coke:** See **Coke, Petroleum.**

**Petroleum Consumption:** The sum of all refined petroleum products supplied. For each refined petroleum product, the amount supplied is calculated by adding production and imports, then subtracting changes in primary stocks (net withdrawals are a plus quantity and net additions are a minus quantity) and exports.

**Petroleum Imports:** Imports of petroleum into the 50 States and the District of Columbia from foreign countries and from Puerto Rico, the Virgin Islands, and other U.S. territories and possessions. Included are imports for the Strategic Petroleum Reserve and withdrawals from bonded warehouses for onshore consumption, offshore bunker use, and military use. Excluded are receipts of foreign petroleum into bonded warehouses and into U.S. territories and U.S. Foreign Trade Zones.

**Petroleum Products:** Petroleum products are obtained from the processing of crude oil (including lease condensate), natural gas, and other hydrocarbon compounds. Petroleum products include unfinished oils, liquefied petroleum gases, pentanes plus, aviation gasoline, motor gasoline, naphtha-type jet fuel, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt, road oil, still gas, and miscellaneous products.

**Petroleum Products Supplied:** An approximate measure of consumption. It measures the disappearance of the products from primary sources, i.e., refineries, blending plants, and bulk terminals. In general, products supplied in any given period are computed as follows: field production, plus imports, plus unaccounted-for crude oil (plus net receipts when calculated on a PAD District basis) minus stock change, minus crude oil losses, minus refinery inputs, and minus exports. See also **Petroleum Consumption.**

**Petroleum Stocks, Primary:** For individual products, quantities that are held at refineries, in pipelines, and at bulk terminals that have a capacity of 50,000 barrels or more, or that are in transit thereto. Stocks held by product retailers and resellers, as well as tertiary stocks held at the point of consumption, are excluded. Stocks of individual products held at gas processing plants are excluded from individual product estimates but are included in other oil estimates and total.

**Photovoltaic Energy:** Direct-current electricity generated from sunlight through solid-state semiconductor devices that have no moving parts.

**Photovoltaic Module:** An integrated assembly of interconnected photovoltaic cells designed to deliver a selected level of working voltage and current at its output terminals, packaged for protection against environmental degradation, and suited for incorporation in photovoltaic power systems.



**Pipeline Fuel:** Gas consumed in the operation of pipelines, primarily in compressors.

**Pipeline, Natural Gas:** A continuous pipe conduit, complete with such equipment as valves, compressor stations, communications systems, and meters, for transporting natural gas and/or supplemental gaseous fuels from one point to another, usually from a point in or beyond the producing field or processing plant to another pipeline or to points of utilization. Also refers to a company operating such facilities.

**Pipeline, Petroleum:** Crude oil and product pipelines used to transport crude oil and petroleum products, respectively (including interstate, intrastate, and intracompany pipelines), within the 50 states and the District of Columbia.

**Plant Condensate:** One of the natural gas liquids, mostly pentanes and heavier hydrocarbons, recovered and separated as liquids at gas inlet separators or scrubbers in processing plants.

**Process Fuel:** All energy consumed in the acquisition, processing, and transportation of energy. Quantifiable process fuel includes three categories: natural gas lease and plant operations, natural gas pipeline operations, and oil refinery operations.

**Processing Gain:** The volumetric amount by which total output is greater than input for a given period of time. This difference is due to the processing of crude oil into products which, in total, have a lower specific gravity than the crude oil processed.

**Processing Loss:** The volumetric amount by which total refinery output is less than input for a given period of time. This difference is due to the processing of crude oil into products which, in total, have a higher specific gravity than the crude oil processed.

**Processing Plant (Natural Gas):** A surface installation designed to separate and recover natural gas liquids from a stream of produced natural gas through the processes of condensation, absorption, refrigeration, or other methods, and to control the quality of natural gas marketed or returned to oil or gas reservoirs for pressure maintenance, repressuring, or cycling.

**Propane:** A normally gaseous straight-chain hydrocarbon ( $C_3H_8$ ). It is a colorless paraffinic gas that boils at a temperature of  $-43.67$  degrees Fahrenheit. It is extracted from natural gas or refinery gas streams. It includes all products designated in ASTM Specification D1835 and Gas Processors Association Specifications for commercial propane and HD-5 propane.

**Propylene:** An olefinic hydrocarbon ( $C_3H_6$ ) recovered from refinery processes or petrochemical processes.

**Proved Reserves, Crude Oil:** The estimated quantities of all liquids defined as crude oil that geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

**Proved Reserves, Lease Condensate:** The volumes of lease condensate expected to be recovered in future years in conjunction with the production of proved reserves of natural gas based on the recovery efficiency of lease and/or field separation facilities installed.

**Proved Reserves, Natural Gas:** The estimated quantities of natural gas that analysis of geological and engineering data demonstrates with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

**Proved Reserves, Natural Gas Liquids:** Those volumes of natural gas liquids (including lease condensate) demonstrated with reasonable certainty to be separable in the future from proved natural gas reserves, under existing economic and operating conditions.

**Pumped Storage:** See **Hydroelectric Pumped Storage**.

**Real Price:** A price that has been adjusted to remove the effect of changes in the purchasing power of the dollar. Real prices, which are expressed in constant dollars, usually reflect buying power relative to a base year. See **Chained Dollars**.

**Refiner Acquisition Cost of Crude Oil:** The cost of crude oil to the refiner, including transportation and other fees. The composite cost is the weighted average of domestic and imported crude oil costs. The refiner acquisition cost does not include the cost of crude oil purchased for the Strategic Petroleum Reserve.

**Refinery Input:** The raw materials and intermediate materials processed at refineries to produce finished petroleum products. They include crude oil, products of natural gas processing plants, unfinished oils, other hydrocarbons and alcohol, motor gasoline and aviation gasoline blending components, and finished petroleum products.

**Refinery Output:** The total amount of petroleum products produced at a refinery. Includes petroleum consumed by the refinery.

**Refinery (Petroleum):** An installation that manufactures finished petroleum products from crude oil, unfinished oils, natural gas liquids, other hydrocarbons, and alcohol.

**Renewable Energy:** Energy obtained from sources that are essentially inexhaustible (unlike, for example, fossil fuels, which are in finite supply). Renewable sources of energy include conventional hydroelectric power, wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

**Repressuring:** The injection of gas into oil or gas formations to effect greater ultimate recovery.

**Residential Sector:** An energy-consuming sector that consists of living quarters for private households. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a variety of other appliances. The residential sector excludes institutional living quarters. *Note:* Various EIA programs differ in sectoral coverage. For further explanation see <http://www.eia.doe.gov/neic/datadefinitions/Guideforwebres.htm>.

**Residual Fuel Oil:** The heavier oils, known as No. 5 and No. 6 fuel oils, that remain after the distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations. It conforms to ASTM Specifications D396 and D975 and Federal Specification VV-F-815C. No. 5, a residual fuel oil of medium viscosity, is also known as Navy Special and is defined in Military Specification MIL-F-859E, including Amendment 2 (NATO Symbol F-770). It is used in steam-powered vessels in government service and inshore powerplants. No. 6 fuel oil includes Bunker C fuel oil and is used for the production of electric power, space heating, vessel bunkering, and various industrial purposes.

**Road Oil:** Any heavy petroleum oil, including residual asphaltic oil, used as a dust palliative and surface treatment on roads and highways. It is generally produced in six grades, from 0, the most liquid, to 5, the most viscous.

**Rotary Rig:** A machine used for drilling wells that employs a rotating tube attached to a bit for boring holes through rock.

**Royalty Interest:** An interest in a mineral property provided through a royalty contract.

**Short Ton (Coal):** A unit of weight equal to 2,000 pounds.

**Solar Energy:** The radiant energy of the sun, which can be converted into other forms of energy, such as heat or electricity.

**Solar Thermal Collector:** A device designed to receive solar radiation and convert it to thermal energy. Normally, a solar thermal collector includes a frame, glazing, and an absorber, together with appropriate insulation. The heat collected by the solar thermal collector may be used immediately or stored for later use. Solar collectors are used for space heating, domestic hot water heating, and heating swimming pools, hot tubs, or spas.

**Space Heating:** The use of energy to generate heat for warmth in housing units using space-heating equipment. The equipment could be the main space-heating equipment or secondary space-heating equipment. It does not include the use of energy to operate appliances (such as lights, televisions, and refrigerators) that give off heat as a byproduct.

**Special Naphthas:** All finished products within the naphtha boiling range that are used as paint thinners, cleaners, or solvents. Those products are refined to a specified flash point. Special naphthas include all commercial hexane and cleaning solvents conforming to ASTM Specifications D1836 and D484, respectively. Naphthas to be blended or marketed as motor gasoline or aviation gasoline or that are to be used as petrochemical and synthetic natural gas (SNG) feedstocks are excluded.

**Spent Liquor:** The liquid residue left after an industrial process; can be a component of waste materials used as fuel.

**Spot Market Price:** See **Spot Price**.

**Spot Price:** The price for a one-time open market transaction for immediate delivery of the specific quantity of product at a specific location where the commodity is purchased “on the spot” at current market rates.

**Steam-Electric Power Plant:** 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.

**Still Gas (Refinery Gas):** Any form or mixture of gases produced in refineries by distillation, cracking, reforming, and other processes. The principal constituents are methane, ethane, ethylene, normal butane, butylene, propane, propylene, etc. Still gas is used as a refinery fuel and a petrochemical feedstock. The conversion factor is 6 million Btus per fuel oil equivalent barrel.

**Strategic Petroleum Reserve (SPR):** Petroleum stocks maintained by the Federal Government for use during periods of major supply interruption.

**Stocks:** Inventories of fuel stored for future use.

**Subbituminous Coal:** A coal with properties ranging from those of lignite to those of bituminous coal and 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 short 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 short ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter).

**Sulfur Dioxide (SO<sub>2</sub>):** A toxic, irritating, colorless gas soluble in water, alcohol, and ether. Used as a chemical intermediate, in paper pulping and ore refining, and as a solvent.

**Sulfur Hexafluoride (SF<sub>6</sub>):** A colorless gas soluble in alcohol and ether, and slightly less soluble in water. It is used as a dielectric in electronics. It possesses the highest 100-year Global Warming Potential of any gas (23,900).

**Supplemental Gaseous Fuels:** Any gaseous substance introduced into or commingled with natural gas that increased the volume available for disposition. Such substances include, but are not limited to, propane-air, refinery gas, coke-oven gas, still gas, manufactured gas, biomass gas, or air or inerts added for Btu stabilization.

**Synthetic Natural Gas (SNG):** (Also referred to as substitute natural gas) A manufactured product, chemically similar in most respects to natural gas, resulting from the conversion or reforming of petroleum hydrocarbons that may easily be substituted for or interchanged with pipeline-quality natural gas.

**Transportation Sector:** An energy-consuming sector that consists of all vehicles whose primary purpose is transporting people and/or goods from one physical location to another. Included are automobiles; trucks; buses; motorcycles; trains, subways, and other rail vehicles; aircraft; and ships, barges, and other waterborne vehicles. Vehicles whose primary purpose is not transportation (e.g., construction cranes and bulldozers, farming vehicles, and warehouse tractors and forklifts) are classified in the sector of their primary use. *Note:* Various EIA programs differ in sectoral coverage. For more information see <http://www.eia.doe.gov/neic/datadefinitions/Guideforwebtrans.htm>.

**Unaccounted-for Crude Oil:** Represents the arithmetic difference between the calculated supply and the calculated disposition of crude oil. The calculated supply is the sum of crude oil production plus imports minus changes in crude oil stocks. The calculated disposition of crude oil is the sum of crude oil input to refineries, crude oil exports, crude oil burned as fuel, and crude oil losses.

**Unaccounted-for Natural Gas:** Represents differences between the sum of the components of natural gas supply and the sum of components of natural gas disposition. These differences may be due to quantities lost or to the effects of data reporting problems. Reporting problems include differences due to the net result of conversions of flow data metered at varying temperatures and pressure bases and converted to a standard temperature and pressure base; the effect of variations in company accounting and billing practices; differences between billing cycle and calendar-period time frames; and imbalances resulting from the merger of data reporting systems that vary in scope, format, definitions, and type of respondents.



**Underground Gas Storage:** The use of sub-surface facilities for storing gas that has been transferred from its original location. The facilities are usually hollowed-out salt domes, geological reservoirs (depleted oil or gas fields) or water-bearing sands topped by an impermeable cap rock (aquifer).

**Undiscovered Recoverable Reserves (Crude Oil and Natural Gas):** Those economic resources of crude oil and natural gas, yet undiscovered, that are estimated to exist in favorable geologic settings.

**Unfinished Oils:** All oils requiring further processing, except those requiring only mechanical blending. Unfinished oils are produced by partial refining of crude oil and include naphthas and lighter oils, kerosene and light gas oils, heavy gas oils, and residuum.

**Unfractionated Streams:** Mixtures of unsegregated natural gas liquid components, excluding those in plant condensate. This product is extracted from natural gas.

**United States:** The 50 States and the District of Columbia. *Note:* The United States has varying degrees of jurisdiction over a number of territories and other political entities outside the 50 States and the District of Columbia, including Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, Johnston Atoll, Midway Islands, Wake Island, and the Northern Mariana Islands. EIA data programs may include data from some or all of these areas in U.S. Totals. For these programs, data products will contain notes explaining the extent of geographic coverage included under the term "United States."

**Uranium:** A heavy, naturally radioactive, metallic element (atomic number 92). Its two principally occurring isotopes are uranium-235 and uranium-238. Uranium-235 is indispensable to the nuclear industry because it is the only isotope existing in nature, to any appreciable extent, that is fissionable by thermal neutrons. Uranium-238 is also important because it absorbs neutrons to produce a radioactive isotope that subsequently decays to the isotope plutonium-239, which also is fissionable by thermal neutrons.

**Uranium Concentrate:** A yellow or brown powder obtained by the milling of uranium ore, processing of in situ leach mining solutions, or as a by-product of phosphoric acid production.

**Uranium Ore:** Rock containing uranium mineralization in concentrations that can be mined economically, typically one to four pounds of  $U_3O_8$  per ton or 0.05 percent to 0.2 percent  $U_3O_8$ .

**Uranium oxide:** Uranium concentrate or yellowcake. Abbreviated as  $U_3O_8$ .

**Uranium Resource Categories:** Three categories of uranium resources defined by the international community to reflect differing levels of confidence in the existence of the resources. Reasonably assured resources (RAR), estimated additional resources (EAR), and speculative resources (SR) are described below.

**Reasonably assured resources (RAR):** Uranium that occurs in known mineral deposits of such size, grade, and configuration that it could be recovered within the given production cost ranges, with currently proven mining and processing technology. Estimates of tonnage and grade are based on specific sample data and measurements of the deposits and on knowledge of deposit characteristics. *Note:* RAR corresponds to DOE's uranium reserves category.

**Estimated additional resources (EAR):** Uranium in addition to RAR that is expected to occur, mostly on the basis of geological evidence, in extensions of well-explored deposits, in little-explored deposits, and in undiscovered deposits believed to exist along well-defined geological trends with known deposits. This uranium can subsequently be recovered within the given cost ranges. Estimates of tonnage and grade are based on available sampling data and on knowledge of the deposit characteristics, as determined in the best-known parts of the deposit or in similar deposits. *Note:* EAR corresponds to DOE's probable potential resources category.

**Speculative resources (SR):** Uranium in addition to EAR that is thought to exist, mostly on the basis of indirect evidence and geological extrapolations, in deposits discoverable with existing exploration techniques. The location of deposits in this category can generally be specified only as being somewhere within given regions or geological trends. The estimates in this category are less reliable than estimates of RAR and EAR. *Note:* SR corresponds to the combination of DOE's possible potential resources and speculative potential resources categories.

**Useful Thermal Output:** The thermal energy made available in a combined-heat-and-power system for use in any industrial or commercial process, heating or cooling application, or delivered to other end users, i.e., total thermal energy made available for processes and applications other than electrical generation.

**U.S.S.R.:** The Union of Soviet Socialist Republics consisted of 15 constituent republics: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. As a political entity, the U.S.S.R. ceased to exist as of December 31, 1991.

**Vented Natural Gas:** Gas released into the air on the production site or at processing plants.

**Vessel Bunkering:** Includes sales for the fueling of commercial or private boats, such as pleasure craft, fishing boats, tugboats, and ocean-going vessels, including vessels operated by oil companies. Excluded are volumes sold to the U.S. Armed Forces.

**Waste Energy:** Municipal solid waste, landfill gas, methane, digester gas, liquid acetonitrile waste, tall oil, waste alcohol, medical waste, paper pellets, sludge waste, solid byproducts, tires, agricultural byproducts, closed loop biomass, fish oil, and straw used as fuel.

**Waxes:** Solid or semi-solid materials derived from petroleum distillates or residues by such treatments as chilling, precipitating with a solvent, or de-oiling. It is a light-colored, more-or-less translucent crystalline mass, slightly greasy to the touch, consisting of a mixture of solid hydrocarbons in which the paraffin series predominates. Includes all marketable wax, whether crude scale or fully refined. The three grades included are microcrystalline, crystalline-fully refined, and crystalline-other. The conversion factor is 280 pounds per 42 U.S. gallons per barrel.

**Well:** A hole drilled in the Earth for the purpose of (1) finding or producing crude oil or natural gas; or (2) producing services related to the production of crude or natural gas.

**Wellhead:** The point at which the crude (and/or natural gas) exits the ground. Following historical precedent, the volume and price for crude oil production are labeled as "wellhead," even though the cost and volume are

now generally measured at the lease boundary. In the context of domestic crude price data, the term "wellhead" is the generic term used to reference the production site or lease property.

**Wellhead price:** The value of crude oil or natural gas at the mouth of the well. See **Natural Gas Wellhead Price**.

**Well Servicing Unit:** Truck-mounted equipment generally used for downhole services after a well is drilled. Services include well completions and recompletions, maintenance, repairs, workovers, and well plugging and abandonments. Jobs range from minor operations, such as pulling the rods and rod pumps out of an oil well, to major workovers, such as milling out and repairing collapsed casing. Well depth and characteristics determine the type of equipment used.

**Western Europe:** Includes Austria, Belgium, Bosnia and Herzegovina, Croatia, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Macedonia (The Former Yugoslav Republic of), Malta, Netherlands, Norway, Portugal, Serbia and Montenegro, Slovenia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

**Wind Energy:** Energy present in wind motion that can be converted to mechanical energy for driving pumps, mills, and electric power generators. Wind pushes against sails, vanes, or blades radiating from a central rotating shaft.

**Wood Energy:** Wood and wood products used as fuel, including round wood (cord wood), limb wood, wood chips, bark, sawdust, forest residues, charcoal, pulp waste, and spent pulping liquor.

**Working Gas:** The volume of gas in the reservoir that is in addition to the cushion or base gas. It may or may not be completely withdrawn during any particular withdrawal season. Conditions permitting, the total working capacity could be used more than once during any season.

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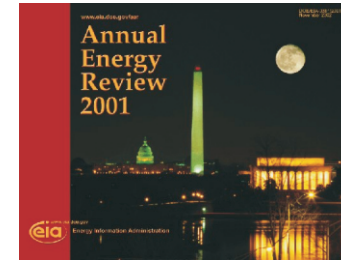
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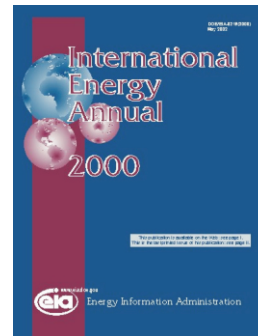
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