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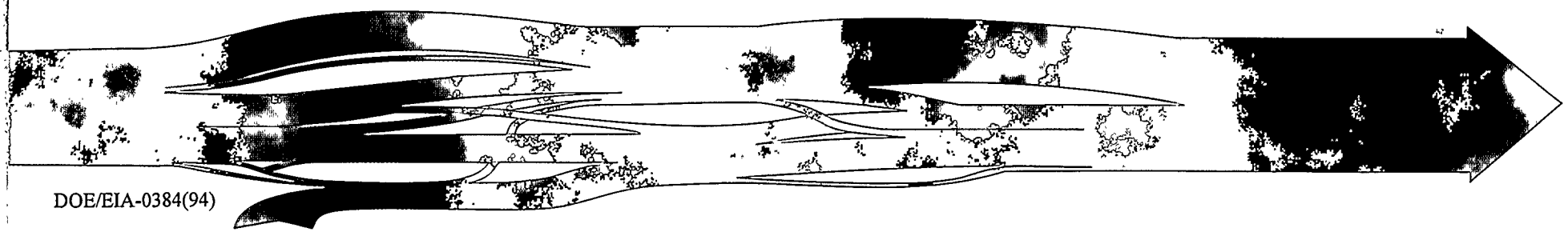

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Annual Energy Review 1994

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Cover: Artist's rendition of U.S. total energy flow. Adapted from Diagram 1 of this report.

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Preface

This thirteenth edition of the *Annual Energy Review* (*AER*) presents the Energy Information Administration's historical energy statistics. For most series, statistics are given for every year from 1949 through 1994. Because coverage spans four and a half decades, the statistics in this report are well-suited to long-term trend analyses.

The *AER* is comprehensive. It covers all major energy activities, including consumption, production, trade, stocks, and prices, for all major energy commodities, including fossil fuels and electricity. The *AER* also presents Energy Information Administration (EIA) statistics on renewable energy sources. In the past, EIA's consumption series have included about half of the renewable energy used in the United States, the amount consumed by electric utilities. This year, for the first time, usage by other consumers has been integrated into EIA's historical consumption series for 1990 forward. Incorporation of non-electric utility data into U.S. energy consumption adds about 3 quadrillion Btu to the total.

Also new in this *AER* is a two-part, comprehensive presentation (Table 5.12) of data on petroleum products supplied by sector for 1949 through 1994. In previous editions of the *AER*, data were presented for only 2 years.

This *AER* is also the first in which data from electric utilities and nonutilities are integrated as "electric power industry" data (Table 8.2). In addition, data on nonutility power gross generation are presented for the first time (Table 8.13).

For the most part, fuel-specific data in the *AER* are expressed in physical units such as barrels, cubic feet, and short tons. The integrated summary data in Section 1 are expressed in Btu. The Btu values are calculated by using the conversion factors in Appendix A. Statistics expressed in Btu are valuable in that they allow for comparisons among different fuels and for the calculation of integrated summary statistics, such as U.S. consumption of energy.

The *AER* emphasizes *domestic* energy statistics. Accordingly, Sections 1 through 10 and 12 of this report are devoted to U.S. statistics, while Section 11 is reserved for most of the international statistics, such as world production of energy. The one exception is trade data. For example, Table 5.4, which presents statistics on petroleum imports by country of origin, is found in Section 5. Table 5.4 statistics cover petroleum imports into the United States from foreign countries. To keep table and figure titles in Sections 1 through 10 and 12 concise, "United States" is usually not specified. Readers interested in more detailed international data than are presented in the *AER* should consult EIA's *International Energy Annual.*

Publication of the *AER* each year is in keeping with responsibilities given EIA in Section 205(a)(2) of the Department of Energy Organization Act, Public Law 95-91. The report is intended for use by Members of Congress, Federal and State agencies, energy analysts, and the general public. EIA welcomes suggestions from readers regarding its energy data series. To make a suggestion or to obtain specific information regarding the contents of the *AER*, readers may call any of the subject specialists listed as contacts on the preceding pages.

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Major Energy Developments in 1994

Energy Demand Sets a New Record

A reviving domestic economy, low energy prices, and cold weather in the first quarter of the year contributed to the third consecutive year of growth in U.S. total energy consumption, which rose to an all-time high of 88 quadrillion Btu in 1994 (1.3).* The increase came as a result of increases in the consumption of all major energy sources—petroleum, natural gas, coal, nuclear electric power, and renewable energy. Integrating the amount of renewable energy consumed outside the electric utility sector into U.S. total energy consumption boosted the total by about 3 quadrillion Btu, but even without that integration, U.S. total energy consumption would have reached a record level in 1994.

Petroleum. The growing economy and continued low prices for crude oil in 1994 led to a modest increase in petroleum consumption (5.12b). Petroleum consumption rose 0.4 million barrels per day from the 1993 level to 18 million barrels per day in 1994, primarily due to increased demand in the transportation and industrial sectors. Those sectors rely on petroleum so heavily that even modest consumption increases affect the total. Residential and commercial consumption of petroleum rose 4.4 percent. Electric utilities consumed slightly less petroleum in 1994 than in 1993.

Consumption of motor gasoline, which consistently accounts for the largest share of all petroleum products supplied, rose 1.5 percent to 7.6 million barrels per day in 1994 (5.11). The improved economy contributed to an increase in distillate fuel oil consumption of 4.3 percent to 3.2 million barrels per day. Consumption of liquefied petroleum gases rose 8.7 percent to 1.9 million barrels per day and consumption of jet fuel rose 4.1 percent to 1.5 million barrels per day. In contrast, residual fuel oil consumption fell 7.4 percent to 1.0 million barrels per day. Demand for residual fuel oil declined because its price was higher due to refiners' use of residual fuel oil to produce other petroleum products.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

Natural gas. Consumption of natural gas in 1994 rose 1.5 percent to 21 trillion cubic feet (6.6). Increased demand in the commercial sector and at electric utilities was responsible for the growth. Natural gas consumption by the residential and transportation sectors was lower in 1994 than in 1993.

Coal. Consumption of coal in 1994 rose 0.4 percent to 930 million short tons (7.3). The increase occurred primarily at electric utilities, where 88 percent of the coal was consumed. Electricity sales of 2.9 trillion kilowatthours were 2.3 percent above 1993 sales (8.6). Sales to the residential sector rose 1.2 percent, and sales to the commercial sector rose 3.5 percent. Electricity sales to the industrial sector rose 2.6 percent.

Integrating the amount of renewable energy consumed outside the electric utility sector into U.S. total energy consumption boosted the total by about 3 quadrillion Btu.

Energy intensity. The energy intensity of the economy, when measured in terms of energy consumption per dollar of gross domestic product (GDP), declined in 1994 for the third year in a row (1.7). About 17 thousand Btu of energy were consumed for each 1987 dollar of GDP in 1994, compared with 23 thousand Btu per 1987 dollar in the early 1970's. The energy intensity of the economy declined during the 1970's, 1980's, and 1990's due to increases in energy efficiency, conservation, the expansion of the service sector, and the shift toward less energy-intensive industries. The Energy Policy Act of 1992 mandates additional energy efficiency standards that may further lower the energy intensity of the economy.

Energy Production Reaches a Near-Record Level

U.S. total energy production in 1994 rose 3.1 percent to 70 quadrillion Btu (1.2). Most of the increase was attributed to higher coal production (which had been depressed in 1993 due to the strike by the United

Mine Workers of America), higher natural gas production, and higher production of nuclear electric power. Coal production rose 1.8 quadrillion Btu from the 1993 level to 22 quadrillion Btu, natural gas production rose 0.6 quadrillion Btu to 19 quadrillion Btu, and nuclear electric power production rose 0.3 quadrillion Btu to 6.8 quadrillion Btu. In contrast, production of crude oil (including lease condensate) fell 0.5 quadrillion Btu to 14 quadrillion Btu (the lowest level in 40 years). Total renewable energy production also declined, by 0.1 quadrillion Btu to 5.8 quadrillion Btu, due to a lower level of conventional hydroelectric power production.

Domestic coal production in 1994 totaled 1,031 million short tons, the highest total ever.

Coal and natural gas production each accounted for a greater share of the U.S. total than did crude oil. Coal production accounted for 31 percent of the U.S. total and dry natural gas production accounted for 27 percent, while crude oil production accounted for 20 percent.

Crude oil production. Crude oil production dropped to 6.6 million barrels per day, down 3.2 percent from the level in 1993 (5.1). Average output from U.S. refineries in 1994 remained at 16 million barrels per day (5.8). Motor gasoline, at 7.2 million barrels per day, was by far the most prevalent product. The refinery utilization rate was 93 percent, the highest rate in 21 years (5.9).

Crude oil stocks. At year end, the Strategic Petroleum Reserve held 592 million barrels of crude oil (5.15), enough to replace petroleum net imports for 74 days. Privately held stocks of crude oil totaled 337 million barrels (5.14).

Natural gas production. Gross withdrawals of natural gas in 1994 totaled 24 trillion cubic feet, up 4.0 percent from the 1993 level, and dry gas production totaled 19 trillion cubic feet (6.2). U.S. total gross withdrawals include a small but rapidly growing amount of methane produced from coalbeds. In 1993, gross withdrawals of coalbed methane totaled about 732 billion cubic feet,[1] an amount equal to over 4 percent of U.S. total dry production. However, the rate of increase in coalbed methane reserves slowed in 1993 as Federal tax incentives for new coalbed methane wells expired. Coalbed methane reserves accounted for 6 percent of U.S. natural gas total reserves in 1993.

Crude oil and natural gas exploration. Exploration for crude oil and natural gas is closely tied to market conditions. In 1994, the continuing low price of crude oil restrained a modest upturn in domestic exploratory activity, which, in 1992, had fallen to the lowest levels in at least 44 years. The number of crews engaged in seismic exploration rose from 76 in 1992 to 79 in 1993 (data are not available for 1994), and rotary rigs in operation rose from 721 to 775 in 1994. However, exploratory wells drilled fell from 3.3 thousand to 3.0 thousand (4.3 and 4.5).

Coal production. Domestic coal production in 1994 totaled 1,031 million short tons, the highest total ever (7.1). Production of western coal rose to 463 million short tons, 45 percent of the total (7.2). The growth in western coal was due in part to environmental concerns that led to increased demand for low-sulfur coal, which is concentrated in the West. In addition, surface mining, with its higher productivity, is much more prevalent in the West.

Coal stocks. Year-end coal stocks rose from 146 million short tons in 1993 to 167 million short tons in 1994 (7.5). In 1993, stocks had been drawn down due to the strike by the United Mine Workers of America against member companies of the Bituminous Coal Operators' Association, which had led to lower coal production.

Hydroelectric and renewable energy power production. Conventional hydroelectric power production at electric utilities (which excludes hydroelectric pumped storage) fell from 269 billion kilowatthours in 1993 to 247 billion kilowatthours in 1994 (8.3). Hydroelectric pumped storage (total production at pumped storage facilities minus the energy used for pumping) was a negative 3 billion kilowatthours. The amount of electricity generated from renewable energy (excluding hydroelectric power) at electric utilities fell from 10 billion kilowattours in 1993 to 9 billion kilowatthours in 1994.

Nuclear electric power. Environmental, safety, and economic concerns have restrained growth in the nuclear industry since the mid-1970's, and the effects of electric utilities' unwillingness to commission new nuclear plants became especially evident in 1992, when the year-end number of operable nuclear generating units declined for only the second time (9.2). The number of operable units remained at 109 in 1992 through 1994. On December 12, 1994, the Tennessee Valley

[1]Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1993 Annual Report*, DOE/EIA-0216(93) (Washington, DC, October 1994), pp. 13 and 39.

Authority (TVA) announced that it was halting construction of three nuclear units, Bellefonte 1 and 2 and Watts Bar 2. TVA may complete the units if partners to help with the financing can be found, but TVA doubts such partners will be found.

Net Energy Imports Reach an All-Time High

U.S. net imports of energy rose to 18 quadrillion Btu in 1994, an increase of 6.6 percent from the 1993 level and the highest net import volume since 1977 (1.4). Changes in the trade volumes of the three major energy sources contributed to the increase. Petroleum net imports rose 4.4 percent to 17 quadrillion Btu, natural gas net imports rose 8.0 percent to 2.4 quadrillion Btu, and coal net exports declined 5.1 percent to 1.7 quadrillion Btu.

Crude oil net imports (including imports for the Strategic Petroleum Reserve) rose to an all-time high in 1994 of 6.9 million barrels per day (5.3 and 5.5), and net imports of petroleum products rose 14 percent to 1.1 million barrels per day. The petroleum products registering the highest volumes of net imports in 1994 were unfinished oils, motor gasoline, and residual fuel oil. Petroleum coke and distillate fuel oil were the primary net exports.

Crude oil net imports rose to an all-time high in 1994 of 6.9 million barrels per day.

U.S. net imports of petroleum totaled 8.0 million barrels per day in 1994 (5.7). Members of the Organization of Petroleum Exporting Countries (OPEC) supplied 4.2 million barrels per day, over half of the total. Net imports from Saudi Arabia, Venezuela, and Nigeria were 1.4 million barrels per day, 1.3 million barrels per day, and 0.6 million barrels per day, respectively.

The remaining 3.8 million barrels per day of U.S. petroleum net imports came primarily from Canada, which supplied 1.2 million barrels per day, and Mexico, which supplied 0.9 million barrels per day. The United Kingdom supplied 0.4 million barrels per day.

U.S. dependence on foreign suppliers of petroleum increased by 1.0 percentage point in 1994 (5.7). Net imports from all countries rose to a 45-percent share of petroleum consumption. Dependence on net imports from OPEC members alone, however, fell 0.9 percentage points to a 24-percent share of petroleum consumption.

Although petroleum dominated U.S. trade in energy, imports and exports of other energy sources played an important role:

- ***Natural Gas.*** Natural gas net imports rose to 2.4 trillion cubic feet, primarily due to increased net imports from Canada (6.3). Trade with Canada was facilitated by the completion of the Iroquois transportation system in January 1992. Canadian natural gas exports to the U.S. market rose 9.0 percent to 2.5 trillion cubic feet. U.S. exports to Canada, however, decreased 2.2 percent to 44 billion cubic feet.
- ***Coal.*** Despite a sharp decline from the 1992 level, coal remained the primary U.S. energy export. Coal exports totaled 71 million short tons in 1994 (7.4). Lower coal exports to Japan, the largest market for U.S. coal, as well as to France and the United Kingdom, offset modest gains elsewhere and brought coal exports to the lowest level since 1979.
- ***Electricity.*** Net imports of electricity totaled 43 billion kilowatthours in 1994 (8.1). Electricity net imports contributed only a small share of U.S electricity consumption.
- ***Uranium.*** Net imports of uranium[2] (U_3O_8) exceeded domestic production of uranium for the fifth consecutive year (9.3). In 1994, uranium net imports totaled an estimated 19 million pounds, compared with domestic production of 3.4 million pounds.

Energy Prices Continue To Fall

Despite political unrest in some oil-producing countries, as well as attempts by OPEC to bolster crude oil prices, the U.S. refiners' composite acquisition cost of crude oil declined to $15.59 per barrel, down for the fourth consecutive year (5.19). The 1994 price was the lowest price (in real terms) in 21 years.

The end-use prices, excluding taxes, of almost all petroleum products also moved downward (5.20). The average price of all types of motor gasoline declined from 76 cents per gallon in 1993 to 74 cents

[2]Imports of uranium are not included in U.S. total energy imports.

per gallon in 1994. Distillate fuel oil and kerosene-type jet fuel average prices, excluding taxes, decreased. In contrast, the average price per gallon, excluding taxes, of residual fuel oil rose 4.5 percent to 35 cents in 1994.

The average wellhead price of all categories of natural gas fell 9.9 percent to $1.83 per thousand cubic feet (6.8). The price per thousand cubic feet of natural gas sold to industrial consumers (excluding lease and plant fuel) fell 1.3 percent to $3.03 (6.9). In contrast, the price of natural gas sold to commercial consumers rose 1.7 percent to $5.31 and the price to residential consumers rose 3.9 percent to $6.40.

The average real price[3] of bituminous coal and lignite at the minemouth fell to $15.41 per short ton, down for the sixteenth year in a row (7.8). The real price of coal at electric utilities, where most coal is consumed, was $22.26 per short ton, down from $23.14 per short ton in 1993.

The weighted average real price of electricity to all sectors declined slightly to 5.5 cents per kilowatthour in 1994 (8.11). The average real price of electricity sold to the residential sector, where prices have usually been the highest, was 6.7 cents per kilowatthour, the same price as in 1993. The commercial sector price also remained at the 1993 level of 6.2 cents per kilowatthour in 1994. Industrial customers continued to pay prices that were favorable compared with prices in other sectors. In 1994, the real price of electricity sold to industrial users was 3.7 cents per kilowatthour, down 5.1 percent from the price in 1993.

[3]Real prices are expressed in 1987 dollars.

1. Energy Overview

Consumption

Energy consumption more than doubled during the 1949-through-1973 period, increasing from 30 quadrillion Btu in 1949 to 74 quadrillion Btu in 1973 (1.3),* and the U.S. economy grew at about the same rate. The domestic energy market was dominated by rapid growth in petroleum and natural gas consumption, which more than tripled during the period. After the 1973 oil price shock, energy consumption fluctuated, influenced by dramatic changes in oil prices, changes in the rate of growth of the domestic economy, and such factors as concerns about the effect of energy use on the environment. The post-1973 low point of energy consumption, 71 quadrillion Btu, occurred in 1983 during a period of very high oil prices. The highest level of energy consumption, 88 quadrillion Btu,[1] occurred in 1994, when oil prices were low.

The composition of demand after 1973 reflected a shift away from petroleum and, to a lesser extent, natural gas towards electricity generated by other fuels. In 1973, petroleum and natural gas accounted for 77 percent of total energy consumption; by 1994, their share had declined to 63 percent.[2]

Production

Historically, three fossil fuels have accounted for the bulk of domestic energy production, which by 1994 totaled 70 quadrillion Btu (1.2). Coal accounted for the largest share of domestic energy production in 1949-1951 and, after a long hiatus, again in 1982 and in 1984 through 1994. In the interim, first crude oil and then natural gas dominated domestic production. In 1994, coal production totaled 22 quadrillion Btu. Dry natural gas production totaled 19 quadrillion Btu and crude oil production totaled 14 quadrillion Btu. Natural gas plant liquids accounted for another 2.4 quadrillion Btu.

Net generation of electricity by electric utilities increased throughout the 1949-through-1994 period (8.1), registering only two year-to-year declines (during the 1982 recession and again in 1992). However, the rate of growth of electricity net generation slowed during the 46-year period. From 1949 through 1979, the annual growth rate averaged 7.1 percent, whereas from 1980 through 1994, the annual growth rate averaged 1.7 percent. After the mid-1970's, coal and nuclear fuels provided increasing shares of fuel input for electricity generation, displacing substantial quantities of both petroleum and natural gas (8.3).

Indicators of Energy Intensity

The relationship between total energy consumption and real gross domestic product (GDP) is a traditional indicator of the energy intensity of the economy. In 1970, 23 thousand Btu of energy were consumed for each 1987 dollar of GDP (1.7). Higher energy prices in the early 1970's led to increases in energy efficiency and a significant restructuring of the energy-intensive activities of the manufacturing sector. The energy intensity of the economy as a whole fell in 1985 to 17 thousand Btu per 1987 dollar, where it remained through 1994.

A second indicator of energy intensity is per capita consumption. Throughout the 1960's and early 1970's, the growth of end-use energy consumption was greater than the growth of the population (1.5). Per capita consumption rose from 212 million Btu in 1960 to a peak of 285 million Btu in 1973. Thereafter, per capita consumption trended downward to as low as 226 million Btu in 1983. In the 1990's, low petroleum prices encouraged energy use, and end-use energy consumption rose to 260 million Btu per capita in 1994.[3]

[3]The inclusion of non-electric utility consumption of renewable energy in the totals of U.S. energy consumption for 1990 through 1994 increased the per capita values.

[1]U.S. total energy consumption in 1990 through 1994 was roughly 3 quadrillion Btu higher due to the expanded coverage of non-electric utility use of renewable energy. Even without the additional renewable energy consumption, however, 1994 U.S. total energy consumption was the highest on record.

[2]The 1994 share was lower than it would have been had non-electric utility consumption of renewable energy not been included in U.S. total energy consumption.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

Hydroelectric generation (conventional and pumped storage) accounted for over 1.4 quadrillion Btu of electricity in 1949 and from the 1970's through 1994 usually provided about 3 quadrillion Btu per year (1.2). However, in 1988, the second year of a drought, hydroelectric generation totaled only 2.3 quadrillion Btu and in 1992, a year of persistent drought in the West, it totaled 2.6 quadrillion Btu.

Renewable energy production totaled 5.8 quadrillion Btu, 8.3 percent of U.S. total energy production.

Other renewable energy sources also contributed to the domestic energy supply. Biofuels, a category which includes wood and waste, contributed 2.8 quadrillion Btu to the 1994 total (1.2). Geothermal, solar, and wind energy combined contributed 0.4 quadrillion Btu. Renewable energy production (including conventional hydroelectric power and excluding hydroelectric pumped storage) totaled 5.8 quadrillion Btu, 8.3 percent of U.S. total energy production.

Energy Prices in a Volatile Market

Since the mid-1970's, changes in fossil fuel prices have become more frequent and more pronounced (3.1). Prior to the Arab oil embargo of 1973-1974, the composite real price[4] per million Btu of crude oil, natural gas, and coal had declined to a post-World War II low of $0.90 in 1969. In 1974, however, the real price rose to $1.51 and eventually peaked at $3.48 in 1981 after a second round of crude oil price increases. Thereafter, overproduction of crude oil began to affect energy prices and, when crude oil prices plunged in 1986, the composite real price of the major fossil fuels fell to $1.71. In 1994, the composite price was $1.21, the lowest in 21 years.

Throughout the 1949-through-1994 period, changes in the real price of oil dominated movements in the composite index. The real price of oil trended downward between 1959 and 1970 and then rose sharply in 1974 and again in 1979 through 1981. Thereafter, in the face of shrinking demand and excess production, price trends reversed sharply. Precipitous declines in 1986 and 1988 brought the real price of crude oil in 1988 to $2.09 per million Btu, the lowest level since 1973. In 1989, the price rose to $2.52. In 1990, the Iraqi invasion of Kuwait contributed to an increase in crude oil prices to $3.05 per million Btu. In 1991, however, the ability of producers to supply replacement oil, coupled with a worldwide economic recession that depressed petroleum demand, led to a decrease in crude oil prices to $2.43 per million Btu. By 1994, the real price of oil had declined to $1.80 per million Btu.

Prices of coal and natural gas were much less volatile than those of oil. Coal markets are generally less vulnerable to supply disruptions than are oil markets, where the output and pricing policies of the Organization of Petroleum Exporting Countries (OPEC) were a major influence during much of the 1973-through-1994 period. Natural gas prices were subject to substantial State and Federal regulation. Throughout the 1970's, regulation dampened the response of natural gas prices relative to the oil price movement. However, the weakening of crude oil prices after 1985 was severe enough to trigger declines in the prices of the other fossil fuels, particularly that of natural gas. The 1994 real price of crude oil per million Btu was $1.80, 59 percent below the 1985 price (3.1). The real price of natural gas was 45 percent lower, and the real price of bituminous coal and lignite was 41 percent lower than their respective prices in 1985.

Changing Patterns of Trade

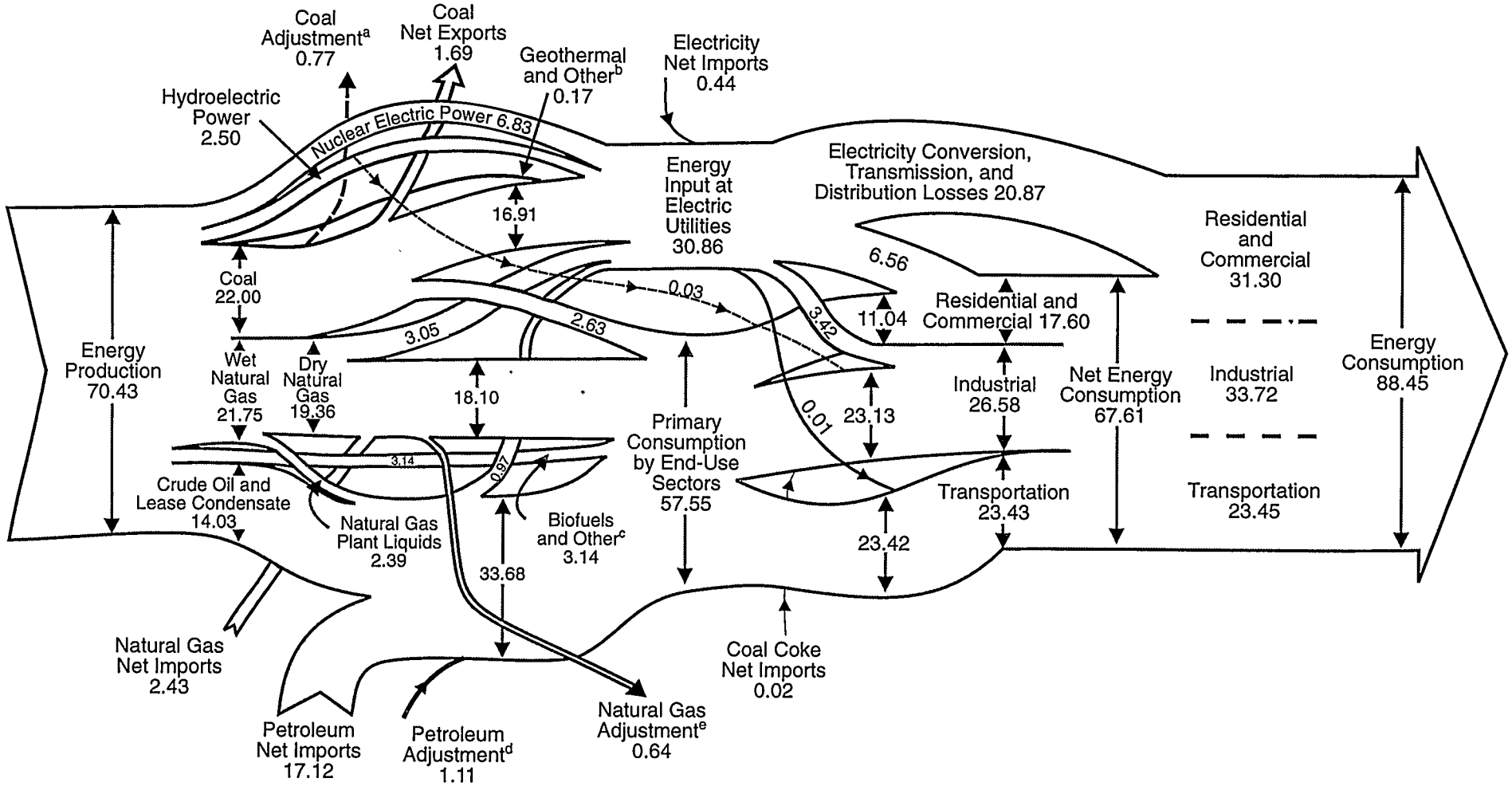
From 1958 forward, the United States consumed more energy than it produced, and the difference was met by energy imports (1.2, 1.3, and 1.4). Net imports of energy (primarily petroleum) grew rapidly through 1973, as demand for cheap foreign oil eroded quotas on petroleum imports. The Arab oil embargo of 1973-1974, coupled with the increase in the price of crude oil, interrupted growth in petroleum net imports; nevertheless, they climbed to a peak of 18 quadrillion Btu in 1977 (1.4). That year, U.S. dependence on foreign sources of crude oil reached an all-time high of 47 percent (5.7). A second round of price increases in 1979 through 1981 suppressed demand for foreign oil. In 1985, petroleum net imports totaled 9.0 quadrillion Btu, and U.S. dependence fell to 27 percent of consumption (1.4 and 5.7). Subsequently, petroleum net imports increased every year through 1989, when U.S. dependence on foreign sources of crude oil reached 42 percent of consumption. In 1994, the fourth consecutive year of low crude oil prices, petroleum net imports rose to 17 quadrillion Btu and U.S. dependence on them equaled 45 percent—the highest level in 17 years.

Natural gas trade was limited to border countries until the advent of shipping natural gas in liquefied form in the late 1960's. In 1994, natural gas net imports reached the record level of 2.4 quadrillion Btu (1.4).

Throughout the 1949-through-1994 period, the United States was a net exporter of coal (1.4). In 1994, coal net exports totaled 1.7 quadrillion Btu.

[4]Real prices are expressed in 1987 dollars.

Diagram 1. Total Energy Flow, 1994
(Quadrillion Btu)



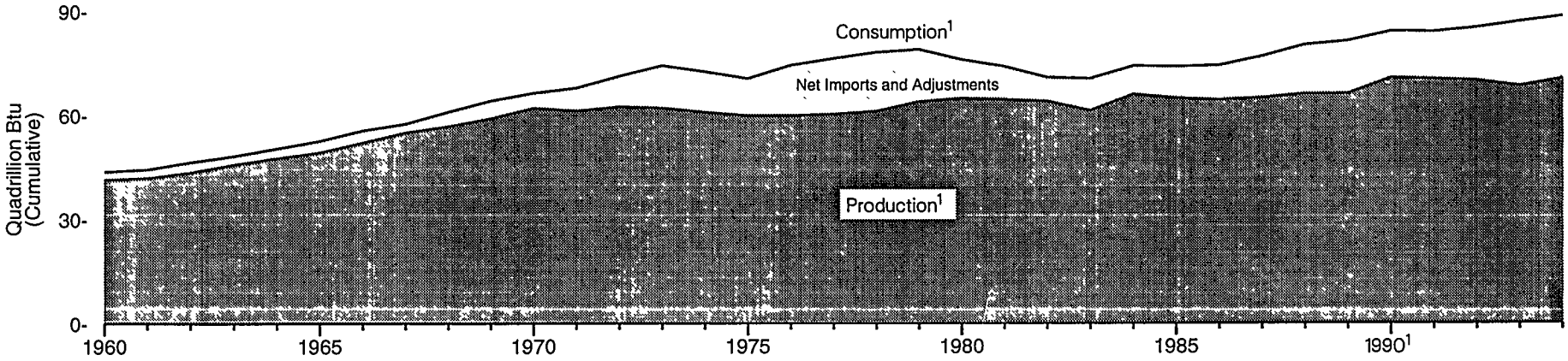
[a]Stock changes, losses, and unaccounted for.
[b]"Other" is biofuels, solar, and wind.
[c]"Other" is geothermal, solar, and wind.
[d]Other liquids, net stock change, refinery processing gain, and unaccounted for.
[e]Supplemental gaseous fuels, net storage withdrawals, and balancing item.

Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding, the use of preliminary conversion factors, and unaccounted for quantities.

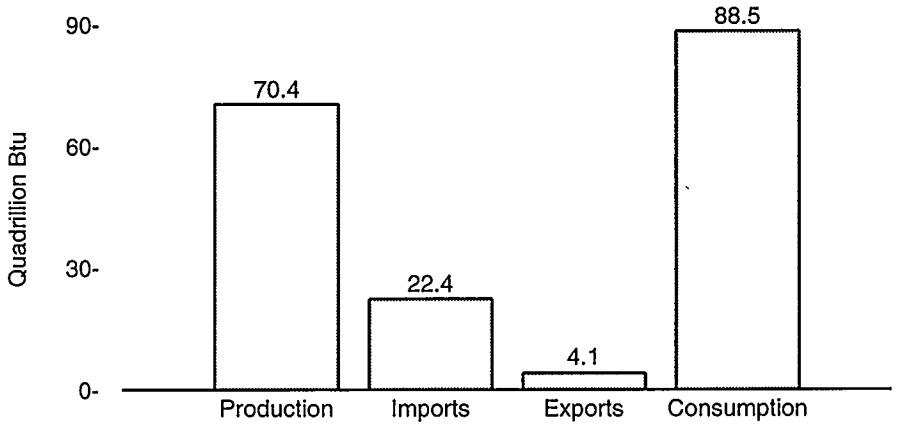
Sources: Tables 1.2 and *Monthly Energy Review*, March 1995, Tables 1.5 and 2.1.

Figure 1.1 Energy Overview, 1960-1994

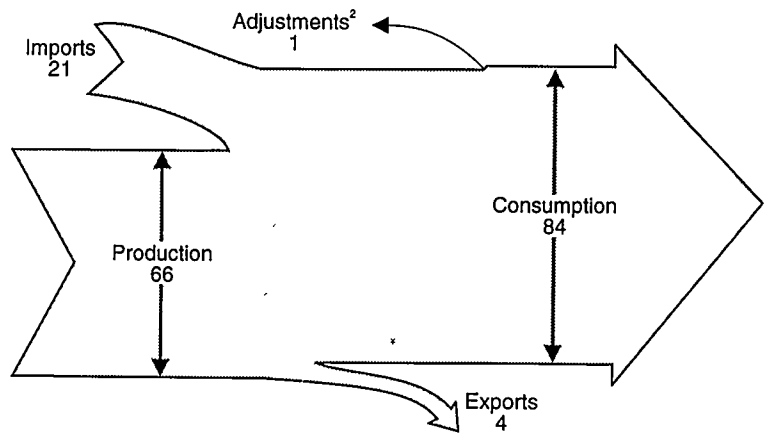
Overview, 1960-1994



Overview, 1994



Energy Flow, 1994
(Quadrillion Btu)



[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.
[2] Stock changes, losses, gains, miscellaneous blending components, and unaccounted for supply

Note: Data for 1994 are preliminary.
Source: Table 1.1.

Table 1.1 Energy Overview, Selected Years, 1960-1994

(Quadrillion Btu)

Activity and Energy Source	1960	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 P
Production	41.49	62.07	59.86	64.76	64.42	63.96	61.28	65.96	64.87	64.35	64.95	66.10	66.13	R,1 70.68	R 70.33	R 69.87	R 68.32	70.43
Fossil Fuels	39.87	59.19	54.73	59.01	58.53	57.46	54.42	58.85	57.54	56.58	57.17	57.87	57.47	58.56	57.83	57.55	R 55.86	57.79
Coal	10.82	14.61	14.99	18.60	18.38	18.64	17.25	19.72	19.33	19.51	20.14	20.74	21.35	22.46	21.59	21.59	R 20.22	22.00
Natural Gas (Dry)	12.66	21.67	19.64	19.91	19.70	18.32	16.59	18.01	16.98	16.54	17.14	17.60	17.85	18.36	18.23	18.38	R 18.74	19.36
Crude Oil 2	14.93	20.40	17.73	18.25	18.15	18.31	18.39	18.85	18.99	18.38	17.67	17.28	16.12	15.57	15.70	15.22	R 14.49	14.03
Natural Gas Plant Liquids	1.46	2.51	2.37	2.25	2.31	2.19	2.18	2.27	2.24	2.15	2.22	2.26	2.16	2.17	2.31	2.36	R 2.41	2.39
Nuclear Electric Power 3	0.01	0.24	1.90	2.74	3.01	3.13	3.20	3.55	4.15	4.47	4.91	5.66	5.68	6.16	6.58	6.61	6.52	6.83
Hydroelectric Pumped Storage 4	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	-0.04	-0.05	-0.04	-0.04	-0.04
Renewable Energy	1.61	2.65	3.23	3.01	2.88	3.37	3.66	3.56	3.18	3.30	2.88	2.57	2.98	1 5.99	5.97	5.75	5.98	5.85
Conventional Hydroelectric Power	1.61	2.63	3.15	2.90	2.76	3.27	3.53	3.39	2.97	3.07	2.63	2.33	2.77	6 3.01	2.98	2.61	2.88	2.67
Geothermal Energy	(s)	0.01	0.07	0.11	0.12	0.10	0.13	0.16	0.20	0.22	0.23	0.22	0.20	1 0.25	0.25	0.26	0.26	0.27
Biofuels 7	(s)	(s)	(s)	(s)	(s)	(s)	(s)	0.01	0.01	0.01	0.02	0.02	0.02	1 2.63	2.64	2.78	2.74	2.80
Solar Energy	0	0	0	0	0	0	0	0	0	0	0	0	0	1 0.07	0.07	0.07	0.07	0.07
Wind Energy	0	0	0	0	0	0	(s)	(s)	(s)	(s)	(s)	(s)	(s)	1 0.02	0.03	0.03	0.03	0.04
Imports	4.23	8.39	14.11	15.97	13.97	12.09	12.03	12.77	12.10	14.44	15.76	17.56	18.95	18.99	18.58	19.65	R 21.53	22.41
Natural Gas	0.16	0.85	0.98	1.01	0.92	0.95	0.94	0.85	0.95	0.75	0.99	1.30	1.39	1.55	1.80	2.16	R 2.40	2.58
Crude Oil 8	2.20	2.81	8.72	11.19	9.34	7.42	7.08	7.30	6.81	9.00	10.07	11.03	12.60	12.77	12.55	13.25	R 14.75	15.26
Petroleum Products 9	1.80	4.66	4.23	3.46	3.30	3.36	3.57	4.13	3.80	4.20	4.10	4.72	4.57	4.35	3.79	3.71	R 3.76	3.84
Other 10	0.07	0.07	0.19	0.31	0.42	0.36	0.44	0.49	0.54	0.49	0.61	0.52	0.40	0.32	0.43	0.52	R 0.62	0.72
Exports	1.48	2.66	2.36	3.72	4.33	4.63	3.72	3.80	4.23	4.06	3.85	4.42	4.77	4.91	5.22	5.02	R 4.35	4.09
Coal	1.02	1.94	1.76	2.42	2.94	2.79	2.04	2.15	2.44	2.25	2.09	2.50	2.64	2.77	2.85	2.68	R 1.96	1.88
Crude Oil	0.43	0.55	0.44	1.16	1.26	1.73	1.57	1.54	1.66	1.67	1.63	1.74	1.84	1.82	2.13	2.01	R 2.12	1.99
Other 11	0.03	0.18	0.16	0.14	0.12	0.11	0.11	0.11	0.14	0.14	0.13	0.18	0.29	0.31	0.24	0.33	R 0.27	0.22
Adjustments 12	-0.43	-1.37	-1.07	-1.05	-0.08	-0.57	0.94	-0.78	1.24	-0.44	0.03	0.96	1.02	-0.67	0.28	0.66	R 1.38	-0.30
Consumption	43.80	66.43	70.55	75.96	73.99	70.85	70.52	74.14	73.98	74.30	76.89	80.22	81.33	R,1 84.09	R 83.96	R 85.16	R 86.88	88.45
Fossil Fuels	42.14	63.52	65.35	69.98	67.75	64.04	63.29	66.62	66.22	66.15	68.63	71.66	72.55	71.96	71.23	72.55	74.13	75.37
Coal	9.84	12.26	12.66	15.42	15.91	15.32	15.89	17.07	17.48	17.26	18.01	18.85	18.93	19.10	18.77	18.87	R 19.43	19.54
Coal Coke Net Imports	-0.01	-0.06	0.01	-0.04	-0.02	-0.02	-0.02	-0.01	-0.01	-0.02	0.01	0.04	0.03	(s)	0.01	0.03	0.02	0.02
Natural Gas 13	12.39	21.79	19.95	20.39	19.93	18.51	17.36	18.51	17.83	16.71	17.74	18.55	19.38	19.30	19.61	20.13	R 20.84	21.16
Petroleum 14	19.92	29.52	32.73	34.20	31.93	30.23	30.05	31.05	30.92	32.20	32.87	34.22	34.21	33.55	32.85	33.53	R 33.84	34.65
Nuclear Electric Power	0.01	0.24	1.90	2.74	3.01	3.13	3.20	3.55	4.15	4.47	4.91	5.66	5.68	6.16	6.58	6.61	6.52	6.83
Hydroelectric Pumped Storage 4	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	-0.04	-0.05	-0.04	-0.04	-0.04
Renewable Energy	1.66	2.67	3.29	3.23	3.23	3.68	4.03	3.97	3.61	3.68	3.36	2.90	3.10	1 6.01	6.20	6.04	6.28	6.28
Conventional Hydroelectric Power 15	1.66	2.65	3.22	3.12	3.11	3.57	3.90	3.80	3.40	3.45	3.12	2.66	2.88	6 3.03	3.21	2.90	3.18	3.11
Geothermal Energy	(s)	0.01	0.07	0.11	0.12	0.10	0.13	0.16	0.20	0.22	0.23	0.22	0.20	1 0.25	0.25	0.26	0.26	0.27
Biofuels 7	(s)	(s)	(s)	(s)	(s)	(s)	(s)	0.01	0.01	0.01	0.02	0.02	0.02	1 2.63	2.64	2.78	2.74	2.80
Solar Energy	0	0	0	0	0	0	0	0	0	0	0	0	0	1 0.07	0.07	0.07	0.07	0.07
Wind Energy	0	0	0	0	0	0	(s)	(s)	(s)	(s)	(s)	(s)	(s)	1 0.02	0.03	0.03	0.03	0.04

[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.
[2] Includes lease condensate.
[3] See Note 1 at end of section.
[4] Represents total pumped storage facility production minus energy used for pumping.
[5] Through 1989, pumped storage is included in conventional hydroelectric power.
[6] There is a discontinuity in this time series between 1989 and 1990; beginning in 1990, pumped storage is removed and expanded coverage of industrial use of hydroelectric power is included.
[7] Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural waste, straw, tires, landfill gases, fish oils, and/or other waste.
[8] Includes imports of crude oil for the Strategic Petroleum Reserve, which began in 1977.
[9] Includes imports of unfinished oils and natural gas plant liquids.
[10] "Other" imports are coal, electricity, and coal coke.
[11] "Other" exports are natural gas, petroleum products, electricity, and coal coke.
[12] A balancing item. Includes stock changes, losses, gains, miscellaneous blending components, and unaccounted for supply.
[13] Includes supplemental gaseous fuels.
[14] Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel.
[15] Includes net imports of electricity.

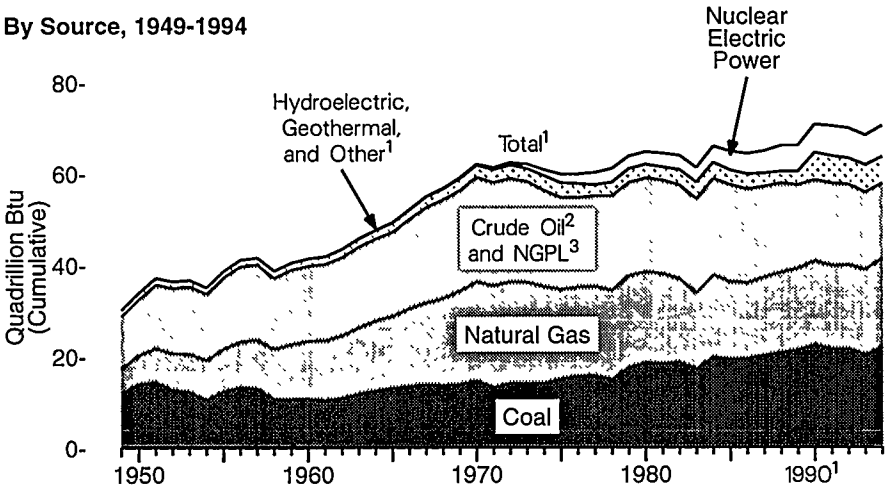
R=Revised data. P=Preliminary data. (s)=Less than 0.005 quadrillion Btu.

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

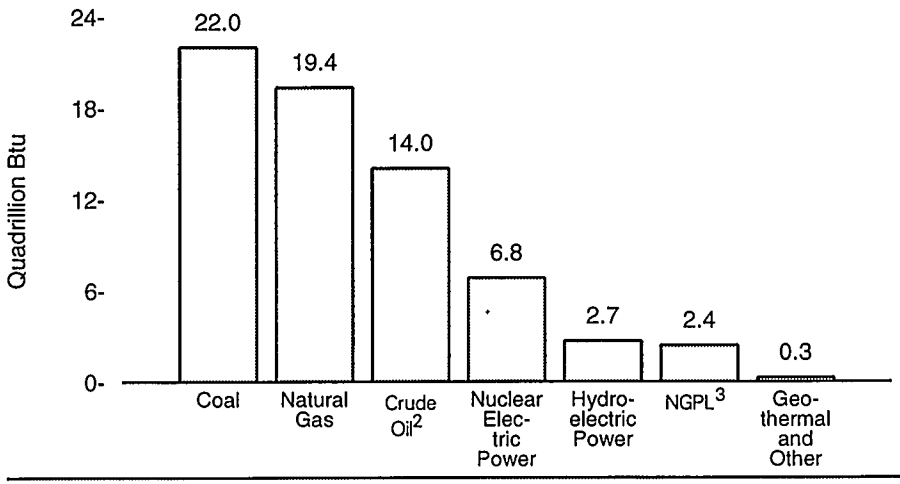
Sources: Tables 5.1, 6.1, 7.1, 7.7, 8.1, 8.4, 10.1a, Energy Information Administration estimates for industrial hydroelectric power, and conversion factors in Appendix A.

Figure 1.2 Energy Production by Source

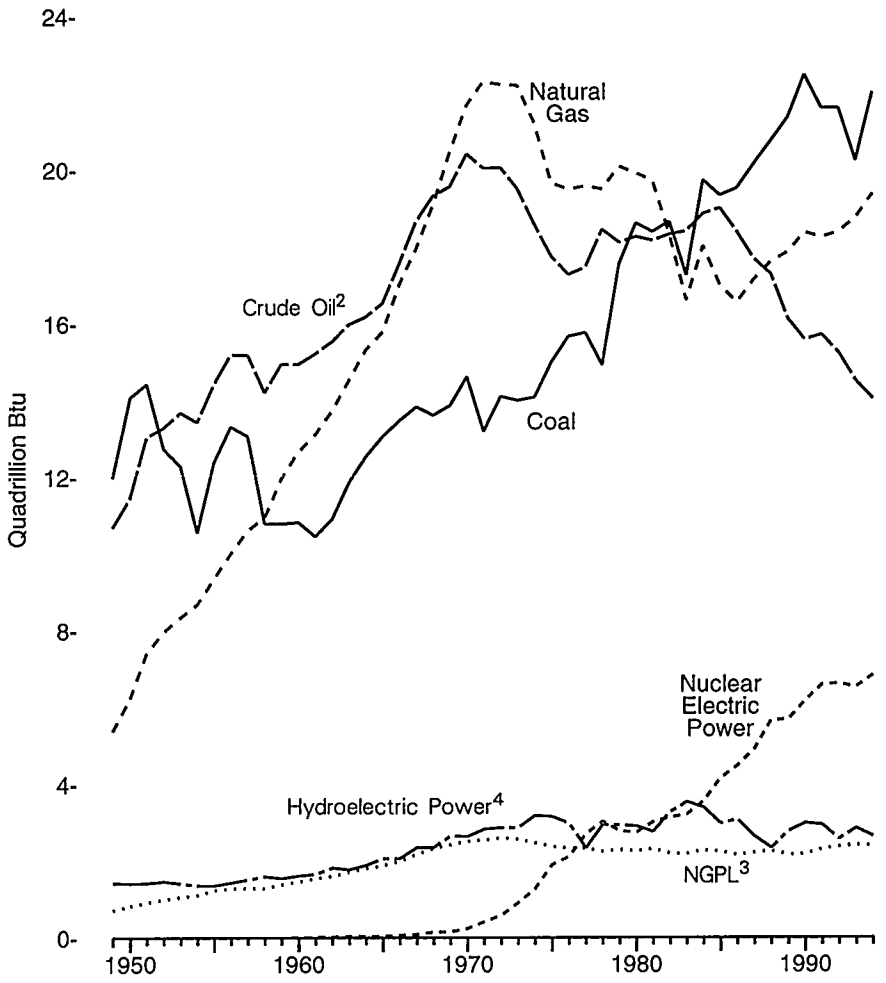
By Source, 1949-1994



By Source, 1994



By Major Source, 1949-1994



[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.
[2] Includes lease condensate.
[3] Natural gas plant liquids.
[4] There is a discontinuity in this time series between 1989 and 1990; beginning in 1990, pumped storage is removed and expanded coverage of industrial use of hydroelectric power is included.
Note: Because vertical scales differ, graphs should not be compared.
Source: Table 1.2.

Table 1.2 Energy Production by Source, 1949-1994

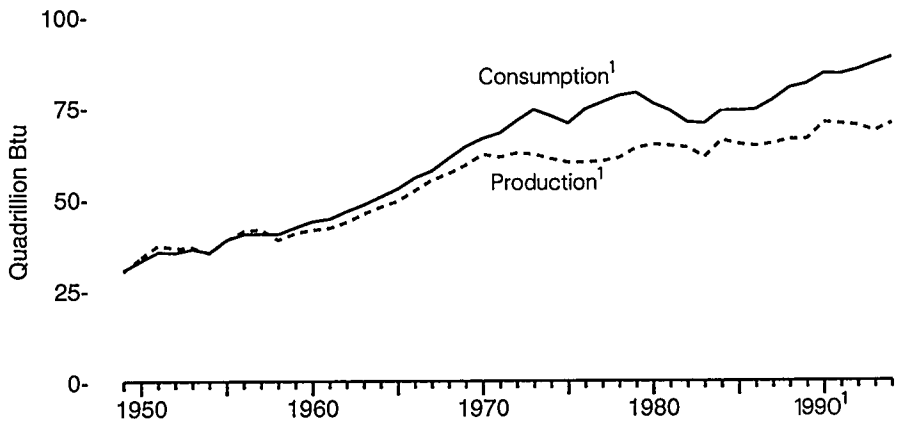
(Quadrillion Btu)

Year	Fossil Fuels					Nuclear Electric Power [2]	Hydroelectric Pumped Storage [3]	Renewable Energy						Total
	Coal	Natural Gas (Dry)	Crude Oil [1]	Natural Gas Plant Liquids	Total Fossil Fuels			Conventional Hydroelectric Power	Geothermal Energy	Biofuels [4]	Solar Energy	Wind Energy	Total Renewable Energy	
1949	11.974	5.377	10.683	0.714	28.748	0	([5])	1.425	0	0.006	0	0	1.431	30.179
1950	14.060	6.233	11.447	0.823	32.563	0	([5])	1.415	0	0.005	0	0	1.421	33.983
1951	14.419	7.416	13.037	0.920	35.792	0	([5])	1.424	0	0.005	0	0	1.429	37.221
1952	12.735	7.964	13.281	0.998	34.977	0	([5])	1.466	0	0.006	0	0	1.472	36.449
1953	12.278	8.339	13.671	1.062	35.349	0	([5])	1.413	0	0.005	0	0	1.418	36.767
1954	10.542	8.682	13.427	1.113	33.764	0	([5])	1.360	0	(s)	0	0	1.363	35.127
1955	12.370	9.345	14.410	1.240	37.364	0	([5])	1.360	0	(s)	0	0	1.363	38.727
1956	13.306	10.002	15.180	1.283	39.771	0	([5])	1.435	0	(s)	0	0	1.436	41.208
1957	13.061	10.605	15.178	1.289	40.133	(s)	([5])	1.516	0	(s)	0	0	1.518	41.651
1958	10.783	10.942	14.204	1.287	37.216	(s)	([5])	1.592	0	(s)	0	0	1.594	38.812
1959	10.778	11.952	14.933	1.383	39.045	(s)	([5])	1.548	0	(s)	0	0	1.550	40.598
1960	10.817	12.656	14.935	1.461	39.869	0.006	([5])	1.608	(s)	(s)	0	0	1.610	41.485
1961	10.447	13.105	15.206	1.549	40.307	0.020	([5])	1.656	(s)	(s)	0	0	1.660	41.987
1962	10.901	13.717	15.522	1.593	41.732	0.026	([5])	1.816	(s)	(s)	0	0	1.820	43.578
1963	11.849	14.513	15.966	1.709	44.037	0.038	([5])	1.771	(s)	(s)	0	0	1.776	45.852
1964	12.524	15.298	16.164	1.803	45.789	0.040	([5])	1.886	0.005	(s)	0	0	1.892	47.721
1965	13.055	15.775	16.521	1.883	47.235	0.043	([5])	2.059	(s)	(s)	0	0	2.066	49.344
1966	13.468	17.011	17.561	1.996	50.036	0.064	([5])	2.062	(s)	(s)	0	0	2.069	52.169
1967	13.826	17.943	18.651	2.177	52.597	0.088	([5])	2.347	0.007	(s)	0	0	2.357	55.043
1968	13.608	19.068	19.308	2.321	54.306	0.142	([5])	2.349	0.009	(s)	0	0	2.362	56.809
1969	13.864	20.446	19.556	2.420	56.286	0.154	([5])	2.648	0.013	(s)	0	0	2.665	59.104
1970	14.607	21.666	20.401	2.512	59.186	0.239	([5])	2.634	0.011	(s)	0	0	2.649	62.074
1971	13.185	22.280	20.033	2.544	58.041	0.413	([5])	2.824	0.012	(s)	0	0	2.839	61.294
1972	14.091	22.208	20.041	2.598	58.938	0.584	([5])	2.864	0.031	(s)	0	0	2.899	62.420
1973	13.993	22.187	19.493	2.569	58.242	0.910	([5])	2.861	0.043	(s)	0	0	2.907	62.060
1974	14.074	21.210	18.575	2.471	56.331	1.272	([5])	3.177	0.053	(s)	0	0	3.232	60.835
1975	14.990	19.640	17.729	2.374	54.734	1.900	([5])	3.155	0.070	(s)	0	0	3.227	59.860
1976	15.654	19.480	17.262	2.327	54.723	2.111	([5])	2.976	0.078	(s)	0	0	3.057	59.892
1977	15.755	19.565	17.454	2.327	55.101	2.702	([5])	2.333	0.077	0.005	0	0	2.416	60.219
1978	14.910	19.485	18.434	2.245	55.074	3.024	([5])	2.937	0.064	(s)	0	0	3.005	61.103
1979	17.539	20.076	18.104	2.286	58.005	2.776	([5])	2.931	0.084	0.005	0	0	3.020	63.801
1980	18.597	19.908	18.249	2.254	59.007	2.739	([5])	2.900	0.110	0.005	0	0	3.014	64.761
1981	18.376	19.699	18.146	2.307	58.529	3.008	([5])	2.758	0.123	(s)	0	0	2.885	64.421
1982	18.639	18.319	18.309	2.191	57.458	3.131	([5])	3.266	0.105	(s)	0	0	3.374	63.962
1983	17.246	16.593	18.392	2.184	54.416	3.203	([5])	3.527	0.129	(s)	0	(s)	3.661	61.279
1984	19.719	18.008	18.848	2.274	58.849	3.553	([5])	3.386	0.165	0.009	0	(s)	3.560	65.962
1985	19.325	16.980	18.992	2.241	57.539	4.149	([5])	2.970	0.198	0.014	0	(s)	3.183	64.871
1986	19.510	16.541	18.376	2.149	56.576	4.471	([5])	3.071	0.219	0.012	0	(s)	3.303	64.350
1987	20.142	17.136	17.675	2.215	57.167	4.906	([5])	2.635	0.229	0.015	0	(s)	2.879	64.952
1988	20.737	17.599	17.279	2.260	57.874	5.661	([5])	2.334	0.217	0.017	0	(s)	2.569	66.105
1989	21.345	17.847	16.117	2.158	57.468	5.677	([5])	2.767	0.197	0.020	0	(s)	2.985	66.129
1990	22.456	18.362	15.571	2.175	58.564	6.161	-0.036	[6]3.012	[7]0.252	[7]2.632	[7]0.067	[7]0.023	[7]5.987	[R,7]70.675
1991	21.594	18.229	15.701	2.306	57.829	6.579	-0.047	2.983	0.249	2.640	0.068	0.027	5.967	[R]70.328
1992	21.593	18.375	15.223	2.363	57.554	6.607	-0.043	2.608	0.257	2.785	0.068	0.030	5.748	[R]69.866
1993	[R]20.221	[R]18.736	[R]14.494	[R]2.408	[R]55.860	6.519	-0.041	2.884	0.260	2.738	0.069	0.031	5.983	[R]68.321
1994[P]	22.004	19.359	14.030	2.393	57.786	6.830	-0.035	2.672	0.265	2.803	0.071	0.035	5.846	70.427

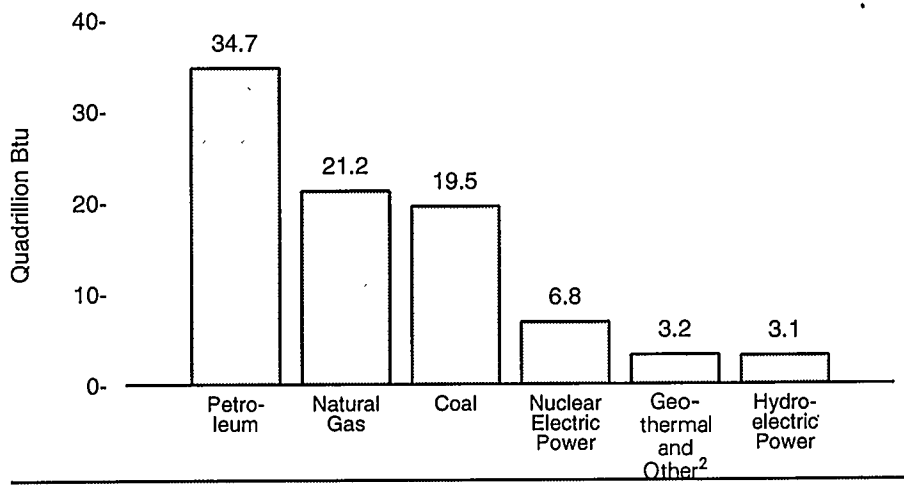
[1] Includes lease condensate.
[2] See Note 1 at end of section.
[3] Represents total pumped storage facility production minus energy used for pumping.
[4] Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural waste, straw, tires, landfill gases, fish oils, and/or other waste.
[5] Through 1989, pumped storage is included in conventional hydroelectric power.
[6] There is a discontinuity in this time series between 1989 and 1990; beginning in 1990, pumped storage is removed and expanded coverage of industrial use of hydroelectric power is included.
[7] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.
R=Revised data. P=Preliminary data. (s)=Less than 0.005 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, 8.4, 10.1a, Energy Information Administration estimates for industrial hydroelectric power, and conversion factors in Appendix A.

Figure 1.3 Energy Consumption by Source

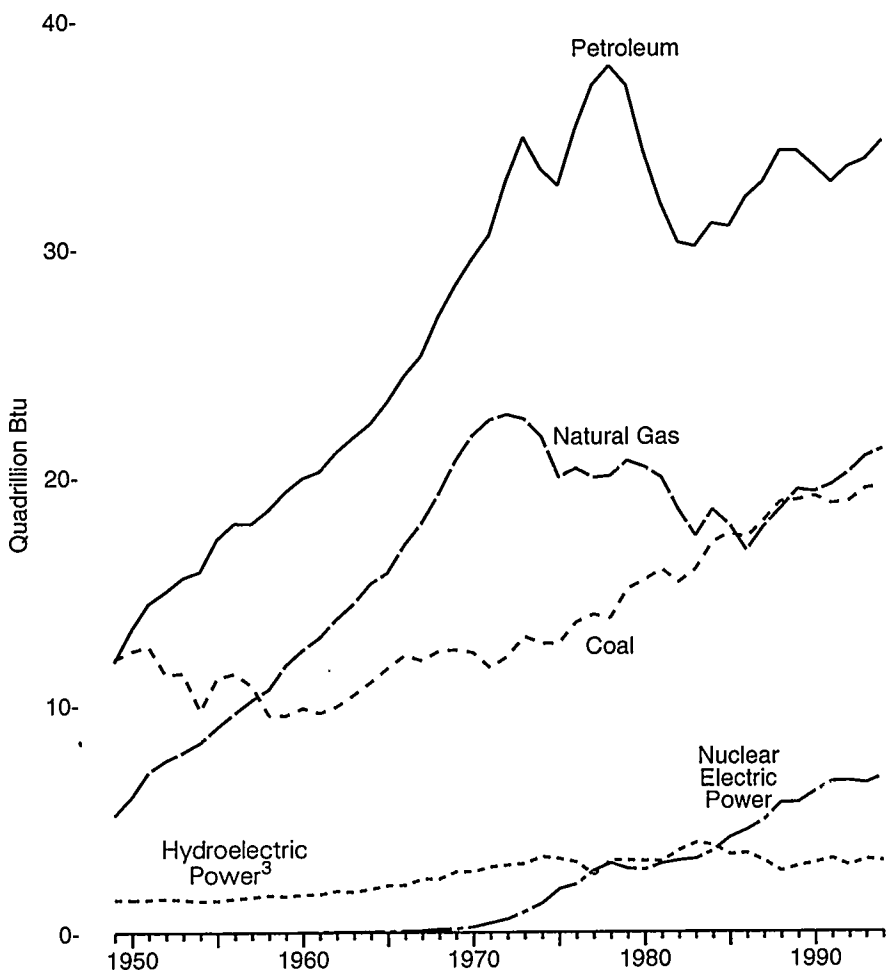
Consumption and Production, 1949-1994



By Source, 1994



By Major Source, 1949-1994



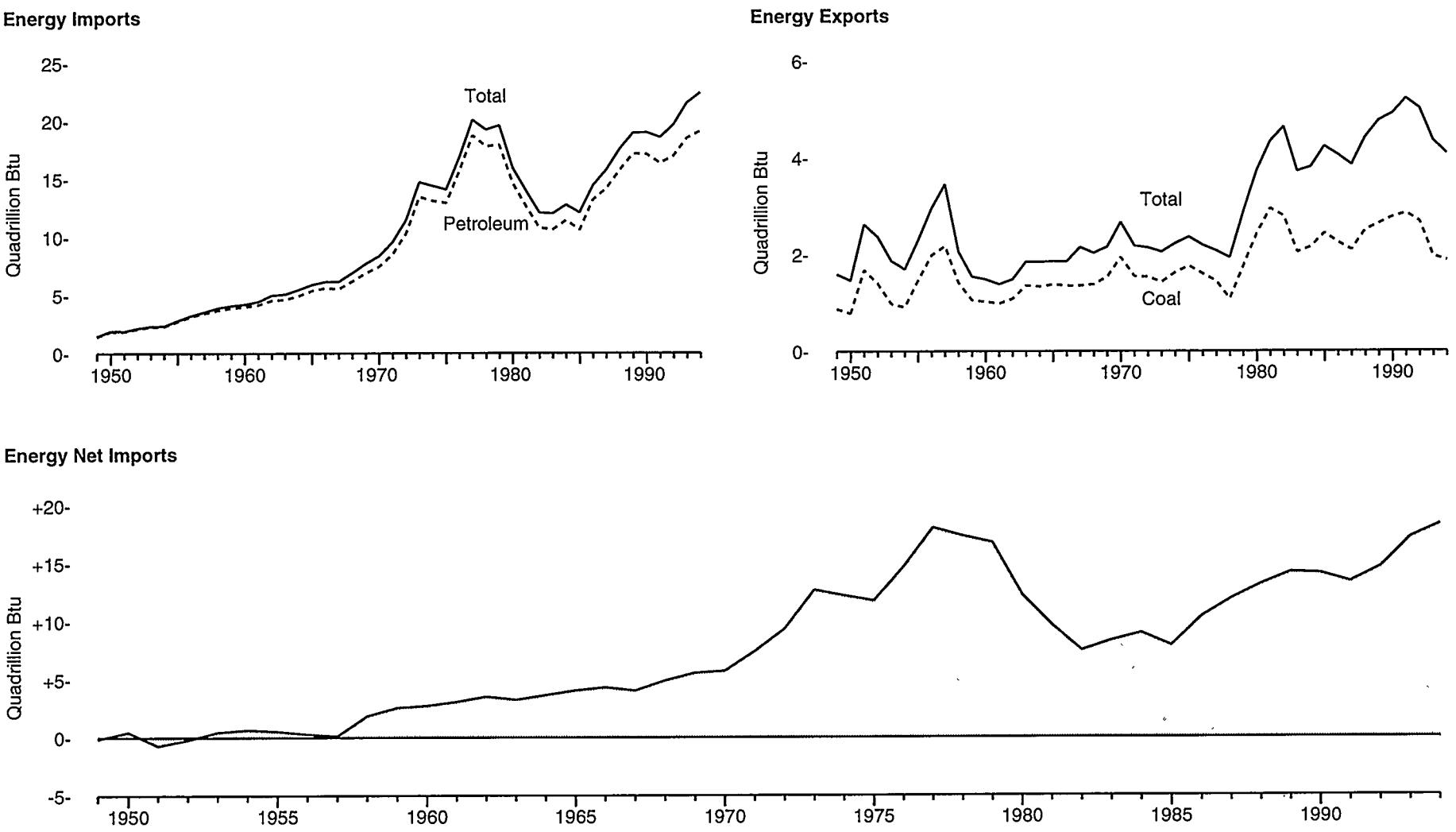
[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric use of renewable energy beginning in 1990.
[2] "Other" is biofuels, solar energy, and wind energy.
[3] There is a discontinuity in this time series between 1989 and 1990; beginning in 1990, pumped storage is removed and expanded coverage of industrial use of hydroelectric power is included.
Note: Because vertical scales differ, graphs should not be compared.
Sources: Tables 1.2 and 1.3.

Table 1.3 Energy Consumption by Source, 1949-1994
(Quadrillion Btu)

Year	Fossil Fuels					Nuclear Electric Power	Hydroelectric Pumped Storage [3]	Renewable Energy						Total
	Coal	Coal Coke Net Imports	Natural Gas [1]	Petroleum [2]	Total Fossil Fuels			Conventional Hydroelectric Power [4]	Geothermal Energy	Biofuels [5]	Solar Energy	Wind Energy	Total Renewable Energy	
1949	11.981	-0.007	5.145	11.883	29.002	0	([6])	1.449	0	0.006	0	0	1.454	30.457
1950	12.347	(s)	5.968	13.315	31.632	0	([6])	1.440	0	0.005	0	0	1.446	33.078
1951	12.553	-0.021	7.049	14.428	34.008	0	([6])	1.454	0	0.005	0	0	1.459	35.467
1952	11.306	-0.012	7.550	14.956	33.800	0	([6])	1.496	0	0.006	0	0	1.503	35.302
1953	11.373	-0.009	7.907	15.556	34.826	0	([6])	1.439	0	0.005	0	0	1.444	36.270
1954	9.715	-0.007	8.330	15.839	33.877	0	([6])	1.388	0	(s)	0	0	1.391	35.269
1955	11.167	-0.010	8.998	17.255	37.410	0	([6])	1.407	0	(s)	0	0	1.411	38.821
1956	11.350	-0.013	9.614	17.937	38.888	0	([6])	1.487	0	(s)	0	0	1.489	40.377
1957	10.821	-0.017	10.191	17.932	38.926	(s)	([6])	1.557	0	(s)	0	0	1.559	40.484
1958	9.533	-0.007	10.663	18.527	38.717	(s)	([6])	1.629	0	(s)	0	0	1.631	40.349
1959	9.518	-0.008	11.717	19.323	40.550	(s)	([6])	1.587	0	(s)	0	0	1.589	42.141
1960	9.838	-0.006	12.385	19.919	42.137	0.006	([6])	1.657	(s)	(s)	0	0	1.659	43.802
1961	9.623	-0.008	12.926	20.216	42.758	0.020	([6])	1.680	(s)	(s)	0	0	1.684	44.462
1962	9.906	-0.006	13.731	21.049	44.681	0.026	([6])	1.822	(s)	(s)	0	0	1.825	46.533
1963	10.413	-0.007	14.403	21.701	46.509	0.038	([6])	1.772	(s)	(s)	0	0	1.777	48.325
1964	10.965	-0.010	15.288	22.301	48.543	0.040	([6])	1.907	0.005	(s)	0	0	1.913	50.496
1965	11.580	-0.018	15.769	23.246	50.576	0.043	([6])	2.058	(s)	(s)	0	0	2.065	52.684
1966	12.143	-0.025	16.995	24.401	53.514	0.064	([6])	2.073	(s)	(s)	0	0	2.081	55.659
1967	11.914	-0.015	17.945	25.284	55.127	0.088	([6])	2.344	0.007	(s)	0	0	2.354	57.569
1968	12.330	-0.017	19.210	26.979	58.502	0.142	([6])	2.342	0.009	(s)	0	0	2.355	60.999
1969	12.382	-0.036	20.678	28.338	61.362	0.154	([6])	2.659	0.013	(s)	0	0	2.676	64.192
1970	12.264	-0.058	21.795	29.521	63.522	0.239	([6])	2.654	0.011	(s)	0	0	2.669	66.431
1971	11.599	-0.033	22.469	30.561	64.596	0.413	([6])	2.861	0.012	(s)	0	0	2.876	67.885
1972	12.077	-0.026	22.698	32.947	67.696	0.584	([6])	2.944	0.031	(s)	0	0	2.979	71.258
1973	12.971	-0.007	22.512	34.840	70.316	0.910	([6])	3.010	0.043	(s)	0	0	3.056	74.282
1974	12.663	0.056	21.732	33.455	67.906	1.272	([6])	3.309	0.053	(s)	0	0	3.365	72.543
1975	12.663	0.014	19.948	32.731	65.355	1.900	([6])	3.219	0.070	(s)	0	0	3.291	70.546
1976	13.584	(s)	20.345	35.175	69.104	2.111	([6])	3.066	0.078	(s)	0	0	3.146	74.362
1977	13.922	0.015	19.931	37.122	70.989	2.702	([6])	2.515	0.077	0.005	0	0	2.597	76.288
1978	13.765	0.125	20.000	37.965	71.856	3.024	([6])	3.141	0.064	(s)	0	0	3.209	78.089
1979	15.039	0.063	20.666	37.123	72.892	2.776	([6])	3.141	0.084	0.005	0	0	3.230	78.898
1980	15.423	-0.035	20.394	34.202	69.984	2.739	([6])	3.118	0.110	0.005	0	0	3.232	75.955
1981	15.907	-0.016	19.928	31.931	67.750	3.008	([6])	3.105	0.123	(s)	0	0	3.232	73.990
1982	15.322	-0.022	18.505	30.232	64.037	3.131	([6])	3.572	0.105	(s)	0	0	3.680	70.848
1983	15.894	-0.016	17.357	30.054	63.290	3.203	([6])	3.899	0.129	(s)	0	(s)	4.032	70.524
1984	17.071	-0.011	18.507	31.051	66.617	3.553	([6])	3.800	0.165	0.009	0	(s)	3.974	74.144
1985	17.478	-0.013	17.834	30.922	66.221	4.149	([6])	3.398	0.198	0.014	0	(s)	3.611	73.981
1986	17.261	-0.017	16.708	32.196	66.148	4.471	([6])	3.446	0.219	0.012	0	(s)	3.678	74.297
1987	18.008	0.009	17.744	32.865	68.626	4.906	([6])	3.117	0.229	0.015	0	(s)	3.362	76.894
1988	18.846	0.040	18.552	34.222	71.660	5.661	([6])	2.662	0.217	0.017	0	(s)	2.897	80.218
1989	18.925	0.030	19.384	34.211	72.551	5.677	([6])	2.881	0.197	0.020	0	(s)	3.098	81.325
1990	19.101	0.005	19.296	33.553	71.955	6.161	-0.036	[7]3.033	[8]0.252	[8]2.632	[8]0.067	[8]0.023	[8]6.007	[R,8]84.087
1991	18.770	0.009	19.606	32.845	71.231	6.579	-0.047	3.214	0.249	2.640	0.068	0.027	6.198	[R]83.960
1992	18.868	0.027	20.131	33.527	72.553	6.607	-0.043	2.900	0.257	2.785	0.068	0.030	6.040	[R]85.157
1993	[R]19.430	0.017	[R]20.841	[R]33.841	74.129	6.519	-0.041	3.177	0.260	2.738	0.069	0.031	6.275	[R]86.882
1994[P]	19.541	0.024	21.156	34.653	75.373	6.830	-0.035	3.107	0.265	2.803	0.071	0.035	6.282	88.450

[1] Includes supplemental gaseous fuels.
[2] Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel.
[3] Represents total pumped storage facility production minus energy used for pumping.
[4] Includes net imports of electricity.
[5] Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural waste, straw, tires, landfill gases, fish oils, and/or other waste.
[6] Through 1989, pumped storage is included in conventional hydroelectric power.
[7] There is a discontinuity in this time series between 1989 and 1990; beginning in 1990, pumped storage is removed and expanded coverage of industrial use of hydroelectric power is included.
[8] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.
R=Revised data. P=Preliminary data. (s)=Less than 0.005 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, 8.3, 10.1a, Energy Information Administration estimates for industrial hydroelectric power, and conversion factors in Appendix A.

Figure 1.4 Energy Imports, Exports, and Net Imports, 1949-1994



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

Source: Table 1.4.

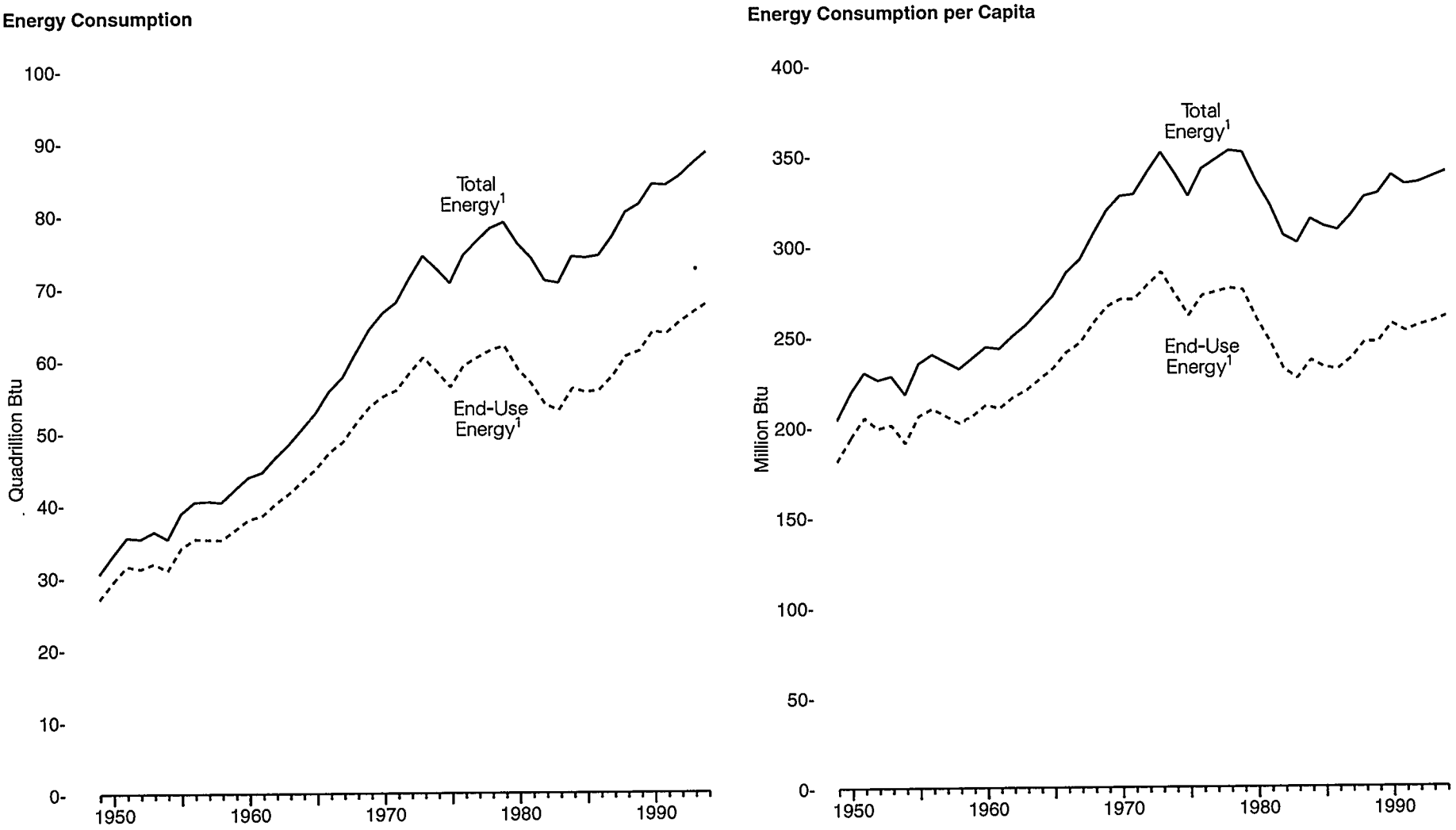
Table 1.4 Energy Imports, Exports, and Net Imports, 1949-1994
(Quadrillion Btu)

Year	Imports					Exports					Net Imports [1]				
	Coal	Natural Gas (Dry)	Petroleum [2]	Other [3]	Total	Coal	Natural Gas (Dry)	Petroleum	Other [3]	Total	Coal	Natural Gas (Dry)	Petroleum [2]	Other [3]	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	0.33	18.95	2.64	0.11	1.84	0.18	4.77	-2.57	1.28	15.33	0.14	14.18
1990	0.07	1.55	17.12	0.25	18.99	2.77	0.09	1.82	0.23	4.91	-2.70	1.46	15.29	0.03	14.08
1991	0.08	1.80	16.35	0.35	18.58	2.85	0.13	2.13	0.11	5.22	-2.77	1.67	14.22	0.24	13.36
1992	0.10	2.16	16.97	0.43	19.65	2.68	0.22	2.01	0.11	5.02	-2.59	1.94	14.96	0.32	14.63
1993	0.18	R2.40	R18.51	R0.44	R21.53	R1.96	0.14	R2.12	R0.13	R4.35	R-1.78	R2.25	R16.40	0.31	R17.18
1994P	0.19	2.58	19.11	0.53	22.41	1.88	0.15	1.99	0.07	4.09	-1.69	2.43	17.12	0.46	18.32

[1] Net imports = imports minus exports.
[2] Includes imports into the Strategic Petroleum Reserve, which began in 1977.
[3] Coal coke and small amounts of electricity transmitted across U.S. borders with Canada and Mexico.
R=Revised data. P=Preliminary data. (s)=Less 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, 5.5, 6.1, 7.1, 7.7, and 8.1 and conversion factors in Appendix A.

Figure 1.5 Energy Consumption and Energy Consumption per Capita, 1949-1994



[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

Source: Table 1.5.

Table 1.5 Energy Consumption and Energy Consumption per Capita, 1949-1994

Year	Total Energy Consumption (quadrillion Btu)	End-Use Energy Consumption [1] (quadrillion Btu)	Population [2] (million)	Consumption per Capita			
				Total Energy		End-Use Energy [1]	
				Quantity (million Btu)	Change from Previous Year (percent) [3]	Quantity (million Btu)	Change from Previous Year (percent) [3]
1949	30.46	26.97	149.3	204	—	181	—
1950	33.08	29.37	151.3	219	7.4	194	7.2
1951	35.47	31.50	154.0	230	5.0	205	5.7
1952	35.30	31.16	156.4	226	-1.7	199	-2.9
1953	36.27	31.87	159.0	228	0.9	201	1.0
1954	35.27	30.92	161.9	218	-4.4	191	-5.0
1955	38.82	34.02	165.1	235	7.8	206	7.9
1956	40.38	35.26	168.1	240	2.1	210	1.9
1957	40.48	35.19	171.2	236	-1.7	206	-1.9
1958	40.35	35.13	174.1	232	-1.7	202	-1.9
1959	42.14	36.53	177.1	238	2.6	206	2.0
1960	43.80	37.96	179.3	244	2.5	212	2.9
1961	44.46	38.46	183.0	243	-0.4	210	-0.9
1962	46.53	40.15	185.8	250	2.9	216	2.9
1963	48.32	41.54	188.5	256	2.4	220	1.9
1964	50.50	43.22	191.1	264	3.1	226	2.7
1965	52.68	44.93	193.5	272	3.0	232	2.7
1966	55.66	47.20	195.6	285	4.8	241	3.9
1967	57.57	48.62	197.5	292	2.5	246	2.1
1968	61.00	51.22	199.4	306	4.8	257	4.5
1969	64.19	53.49	201.4	319	4.2	266	3.5
1970	66.43	54.91	203.2	327	2.5	270	1.5
1971	67.89	55.75	206.8	328	0.3	270	0.0
1972	71.26	58.18	209.3	340	3.7	278	3.0
1973	74.28	60.27	211.4	351	3.2	285	2.5
1974	72.54	58.34	213.3	340	-3.1	273	-4.2
1975	70.55	56.16	215.5	327	-3.8	261	-4.4
1976	74.36	59.12	217.6	342	4.6	272	4.2
1977	76.29	60.22	219.8	347	1.5	274	0.7
1978	78.09	R61.25	222.1	352	1.4	276	0.7
1979	78.90	R61.84	224.6	351	-0.3	275	-0.4
1980	75.96	R58.60	226.5	335	-4.6	259	-5.8
1981	73.99	R56.56	229.6	322	-3.9	246	-5.0
1982	70.85	R53.70	232.0	305	-5.3	231	-6.1
1983	70.52	R52.91	234.3	301	-1.3	R226	R-2.2
1984	74.14	R55.92	236.5	314	4.3	236	R4.4
1985	73.98	R55.39	238.7	310	-1.3	R232	R-1.7
1986	74.30	R55.68	241.1	308	-0.6	R231	R-0.4
1987	76.89	R57.68	243.4	316	2.6	R237	2.6
1988	80.22	R60.37	245.8	326	3.2	R246	R3.8
1989	81.33	R61.07	248.2	328	0.6	R246	0.0
1990	R,4 84.09	R,4 63.74	248.7	4 338	4 3.0	R,4 256	R,4 4.1
1991	R83.96	R63.47	252.1	R333	-1.5	R252	R-1.6
1992	R85.16	R65.04	R255.0	R334	R0.3	R255	R1.2
1993	R86.88	R66.35	R257.8	R337	R0.9	R257	R0.8
1994P	88.45	67.58	260.3	340	0.9	260	1.2

[1] End-use energy consumption is total energy consumption less losses incurred in the generation, transmission, and distribution of electricity, less power plant electricity use and unaccounted for electrical system energy losses. (See Glossary.)

[2] Resident population of the 50 States and the District of Columbia estimated for July 1 of each year, except for the April 1 census count in 1950, 1960, 1970, 1980, and 1990.

[3] Percent change calculated from data prior to rounding.

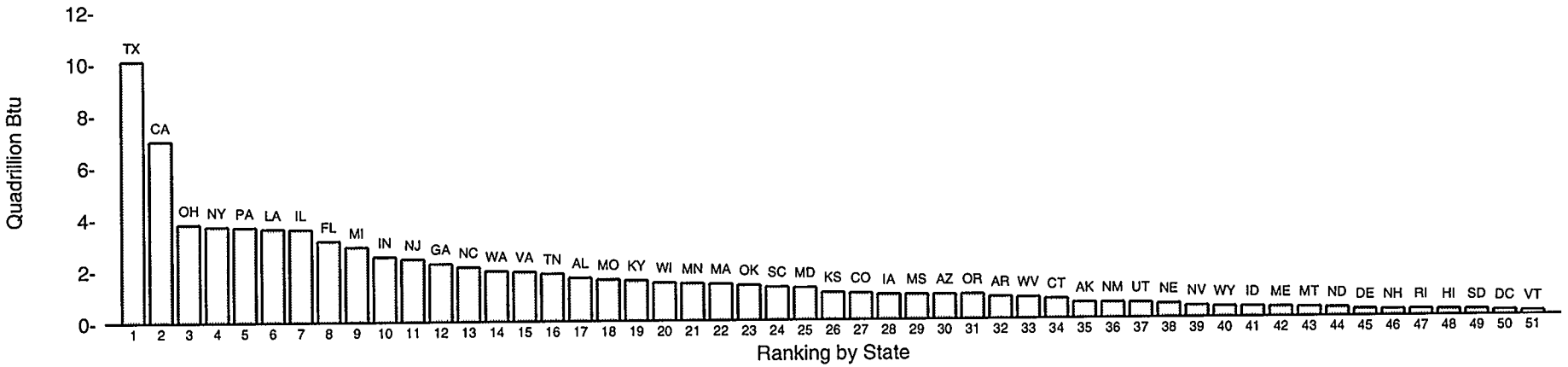
[4] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

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

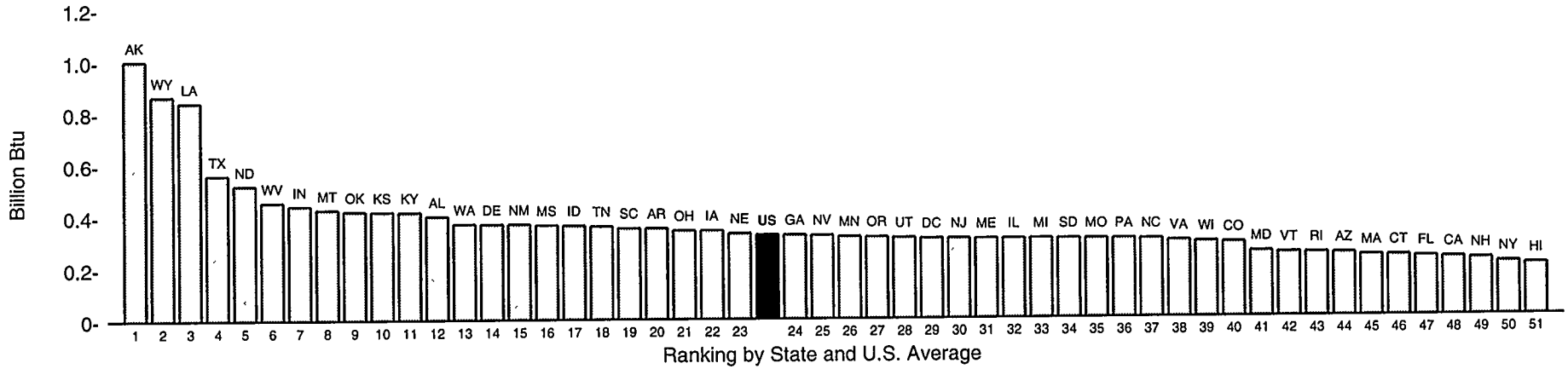
Sources: **Total Energy Consumption:** Table 1.3. **End-Use Energy Consumption:** Table 1.3. **Population:** • 1949—Bureau of the Census, *Current Population Reports,* "Population Estimates and Projections," Series P-25, No. 802, May 1979. • 1950-1980—Bureau of the Census, *Current Population Reports,* "Population Estimates and Projections," Series P-25, No. 990, July 1986. • 1981 forward—unpublished data consistent with the Bureau of the Census Press Release CB94-204, December 1994. **Consumption per Capita:** calculated by Energy Information Administration.

Figure 1.6 Energy Consumption and Consumption per Capita by State, 1993

Consumption



Consumption per Capita



Source: Table 1.6.

Table 1.6 Energy Consumption and Consumption per Capita by State, 1993

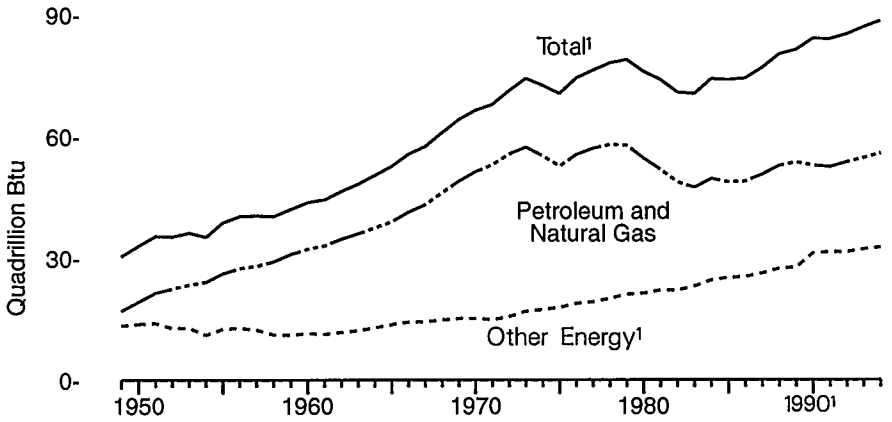
Consumption			Consumption per Capita		
Rank	State	Trillion Btu	Rank	State	Million Btu
1	Texas	10,081.1	1	Alaska	1,001.6
2	California	6,988.4	2	Wyoming	864.6
3	Ohio	3,790.6	3	Louisiana	840.3
4	New York	3,701.7	4	Texas	559.4
5	Pennsylvania	3,665.9	5	North Dakota	519.5
6	Louisiana	3,604.7	6	West Virginia	454.1
7	Illinois	3,582.1	7	Indiana	440.6
8	Florida	3,128.2	8	Montana	425.6
9	Michigan	2,898.7	9	Oklahoma	419.1
10	Indiana	2,513.8	10	Kansas	417.1
11	New Jersey	2,421.9	11	Kentucky	415.7
12	Georgia	2,236.7	12	Alabama	399.3
13	North Carolina	2,103.6	13	Washington	369.6
14	Washington	1,943.6	14	Delaware	368.5
15	Virginia	1,911.4	15	New Mexico	368.2
16	Tennessee	1,832.4	16	Mississippi	364.8
17	Alabama	1,669.4	17	Idaho	362.9
18	Missouri	1,597.4	18	Tennessee	359.7
19	Kentucky	1,577.0	19	South Carolina	352.3
20	Wisconsin	1,464.7	20	Arkansas	351.7
21	Minnesota	1,432.2	21	Ohio	342.7
22	Massachusetts	1,407.9	22	Iowa	342.4
23	Oklahoma	1,354.9	23	Nebraska	330.2
24	South Carolina	1,278.8	24	Georgia	324.1
25	Maryland	1,245.8	25	Nevada	322.8
26	Kansas	1,057.3	26	Minnesota	316.6
27	Colorado	1,023.1	27	Oregon	315.3
28	Iowa	965.8	28	Utah	311.4
29	Mississippi	963.1	29	District of Columbia	308.3
30	Arizona	958.0	30	New Jersey	308.2
31	Oregon	957.0	31	Maine	306.7
32	Arkansas	853.2	32	Illinois	306.5
33	West Virginia	825.5	33	Michigan	306.4
34	Connecticut	761.6	34	South Dakota	305.8
35	Alaska	599.0	35	Missouri	305.1
36	New Mexico	594.9	36	Pennsylvania	304.7
37	Utah	579.1	37	North Carolina	302.6
38	Nebraska	532.6	38	Virginia	295.3
39	Nevada	446.1	39	Wisconsin	290.4
40	Wyoming	406.4	40	Colorado	287.1
41	Idaho	399.2	41	Maryland	251.3
42	Maine	380.3	42	Vermont	246.2
43	Montana	357.9	43	Rhode Island	244.9
44	North Dakota	330.9	44	Arizona	242.8
45	Delaware	257.2	45	Massachusetts	233.9
46	New Hampshire	245.7	46	Connecticut	232.3
47	Rhode Island	244.9	47	Florida	227.9
48	Hawaii	229.3	48	California	223.9
49	South Dakota	219.0	49	New Hampshire	218.6
50	District of Columbia	178.5	50	New York	203.9
51	Vermont	141.8	51	Hawaii	196.6
	United States	[1] 83,957.8		United States	325.7

[1] The U.S. energy consumption total shown here is about 3 quadrillion Btu less than that reported on Tables 1.1, 1.3, 1.5, 1.7, and 2.1; the State-level data have not yet incorporated non-electric utility use of renewable energy.

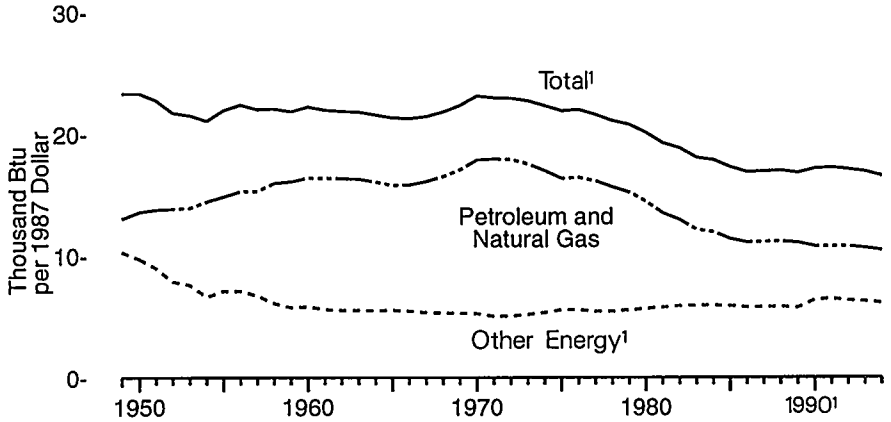
Source: Energy Information Administration, *State Energy Data Report 1993, Consumption Estimates* (June 1995).

Figure 1.7 Energy Consumption per Dollar of Gross Domestic Product

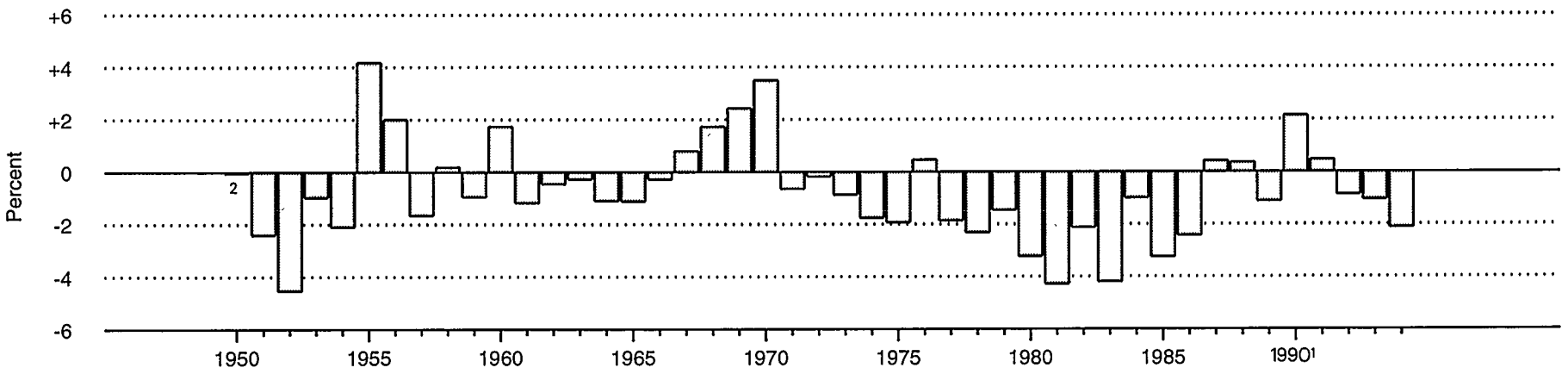
Energy Consumption, 1949-1994



Energy Consumption per Dollar of Gross Domestic Product, 1949-1994



Total Energy Consumption per Dollar of Gross Domestic Product, Change from Previous Year, 1950-1994



[1] There is a discontinuity in this series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

[2] Actual value is -0.04 percent.
Source: Table 1.7.

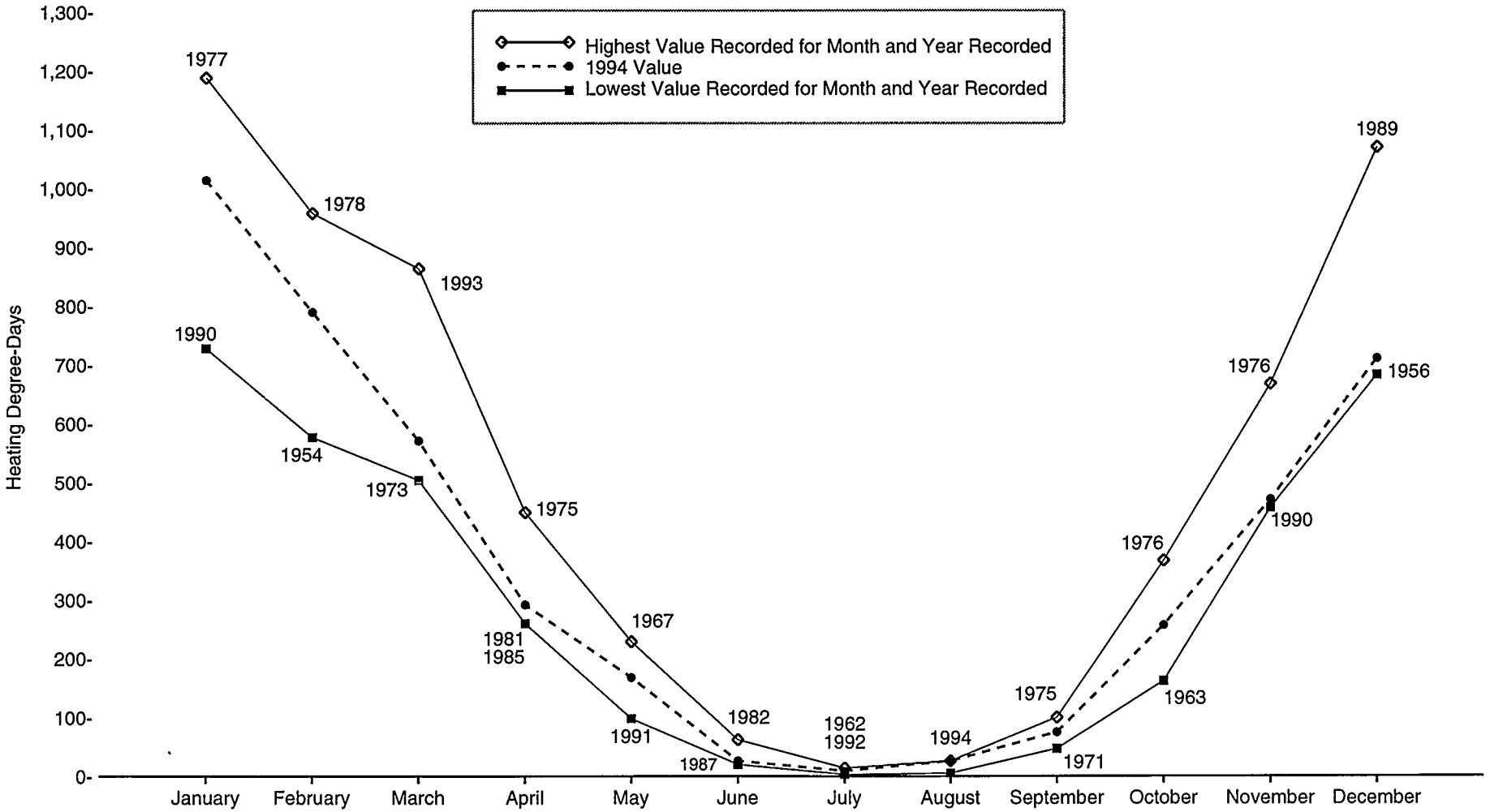
Table 1.7 Energy Consumption per Dollar of Gross Domestic Product, 1949-1994

Year	Energy Consumption			Gross Domestic Product (GDP)	Energy Consumption per Dollar of GDP			
	Petroleum and Natural Gas	Other Energy	Total		Petroleum and Natural Gas	Other Energy	Total	Change from Previous Year
	Quadrillion Btu			Billion 1987 Dollars	Thousand Btu per 1987 Dollar			Percent [1]
1949	17.03	13.43	30.46	1,305.5	13.04	10.29	23.33	—
1950	19.28	13.79	33.08	1,418.5	13.59	9.72	23.32	-0.0
1951	21.48	13.99	35.47	1,558.4	13.78	8.98	22.76	-2.4
1952	22.51	12.80	35.30	1,624.9	13.85	7.88	21.73	-4.5
1953	23.46	12.81	36.27	1,685.5	13.92	7.60	21.52	-1.0
1954	24.17	11.10	35.27	1,673.8	14.44	6.63	21.07	-2.1
1955	26.25	12.57	38.82	1,768.3	14.85	7.11	21.95	4.2
1956	27.55	12.83	40.38	1,803.6	15.28	7.11	22.39	2.0
1957	28.12	12.36	40.48	1,838.2	15.30	6.73	22.02	-1.7
1958	29.19	11.16	40.35	1,829.1	15.96	6.10	22.06	0.2
1959	31.04	11.10	42.14	1,928.8	16.09	5.76	21.85	-1.0
1960	32.30	11.50	43.80	1,970.8	16.39	5.83	22.23	1.7
1961	33.14	11.32	44.46	2,023.8	16.38	5.59	21.97	-1.2
1962	34.78	11.75	46.53	2,128.1	16.34	5.52	21.87	-0.5
1963	36.10	12.22	48.32	2,215.6	16.30	5.52	21.81	-0.3
1964	37.59	12.91	50.50	2,340.6	16.06	5.51	21.57	-1.1
1965	39.01	13.67	52.68	2,470.5	15.79	5.53	21.33	-1.1
1966	41.40	14.26	55.66	2,616.2	15.82	5.45	21.27	-0.3
1967	43.23	14.34	57.57	2,685.2	16.10	5.34	21.44	0.8
1968	46.19	14.81	61.00	2,796.9	16.51	5.30	21.81	1.7
1969	49.02	15.18	64.19	2,873.0	17.06	5.28	22.34	2.4
1970	51.32	15.12	66.43	2,873.9	17.86	5.26	23.12	3.5
1971	53.03	14.85	67.89	2,955.9	17.94	5.03	22.97	-0.6
1972	55.64	15.61	71.26	3,107.1	17.91	5.03	22.93	-0.2
1973	57.35	16.93	74.28	3,268.6	17.55	5.18	22.73	-0.9
1974	55.19	17.36	72.54	3,248.1	16.99	5.34	22.33	-1.8
1975	52.68	17.87	70.55	3,221.7	16.35	5.55	21.90	-1.9
1976	55.52	18.84	74.36	3,380.8	16.42	5.57	22.00	0.5
1977	57.05	19.24	76.29	3,533.3	16.15	5.44	21.59	-1.9
1978	57.97	20.12	78.09	3,703.5	15.65	5.43	21.09	-2.3
1979	57.79	21.11	78.90	3,796.8	15.22	5.56	20.78	-1.5
1980	54.60	21.36	75.96	3,776.3	14.46	5.66	20.11	-3.2
1981	51.86	22.13	73.99	3,843.1	13.49	5.76	19.25	-4.3
1982	48.74	22.11	70.85	3,760.3	12.96	5.88	18.84	-2.1
1983	47.41	23.11	70.52	3,906.6	12.14	5.92	18.05	-4.2
1984	49.56	24.59	74.14	4,148.5	11.95	5.93	17.87	-1.0
1985	48.76	25.22	73.98	4,279.8	11.39	5.89	17.29	-3.2
1986	48.90	25.39	74.30	4,404.5	11.10	5.77	16.87	-2.4
1987	50.61	26.28	76.89	4,539.9	11.15	5.79	16.94	0.4
1988	52.77	27.44	80.22	4,718.6	11.18	5.82	17.00	0.4
1989	53.59	27.73	81.33	4,838.0	11.08	5.73	16.81	-1.1
1990	52.85	R,2 31.24	R,2 84.09	4,897.3	10.79	R,2 6.38	R,2 17.17	R,2 2.1
1991	52.45	R 31.51	R 83.96	R 4,867.6	R 10.78	R 6.47	R 17.25	R 0.5
1992	53.66	R 31.50	R 85.16	R 4,979.3	R 10.78	R 6.33	R 17.10	R -0.9
1993	R 54.68	R 32.20	R 86.88	R 5,134.5	R 10.65	R 6.27	R 16.92	R -1.1
1994 P	55.81	32.64	88.45	5,342.4	10.45	6.11	16.56	-2.1

[1] Percent change calculated from data prior to rounding.
[2] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

R=Revised data. P=Preliminary data. — = Not applicable.
Sources: Tables 1.3 and C1.

Figure 1.8 Heating Degree-Days by Month, 1949-1994



Source: Table 1.8.

Table 1.8 Heating Degree-Days by Month, 1949-1994

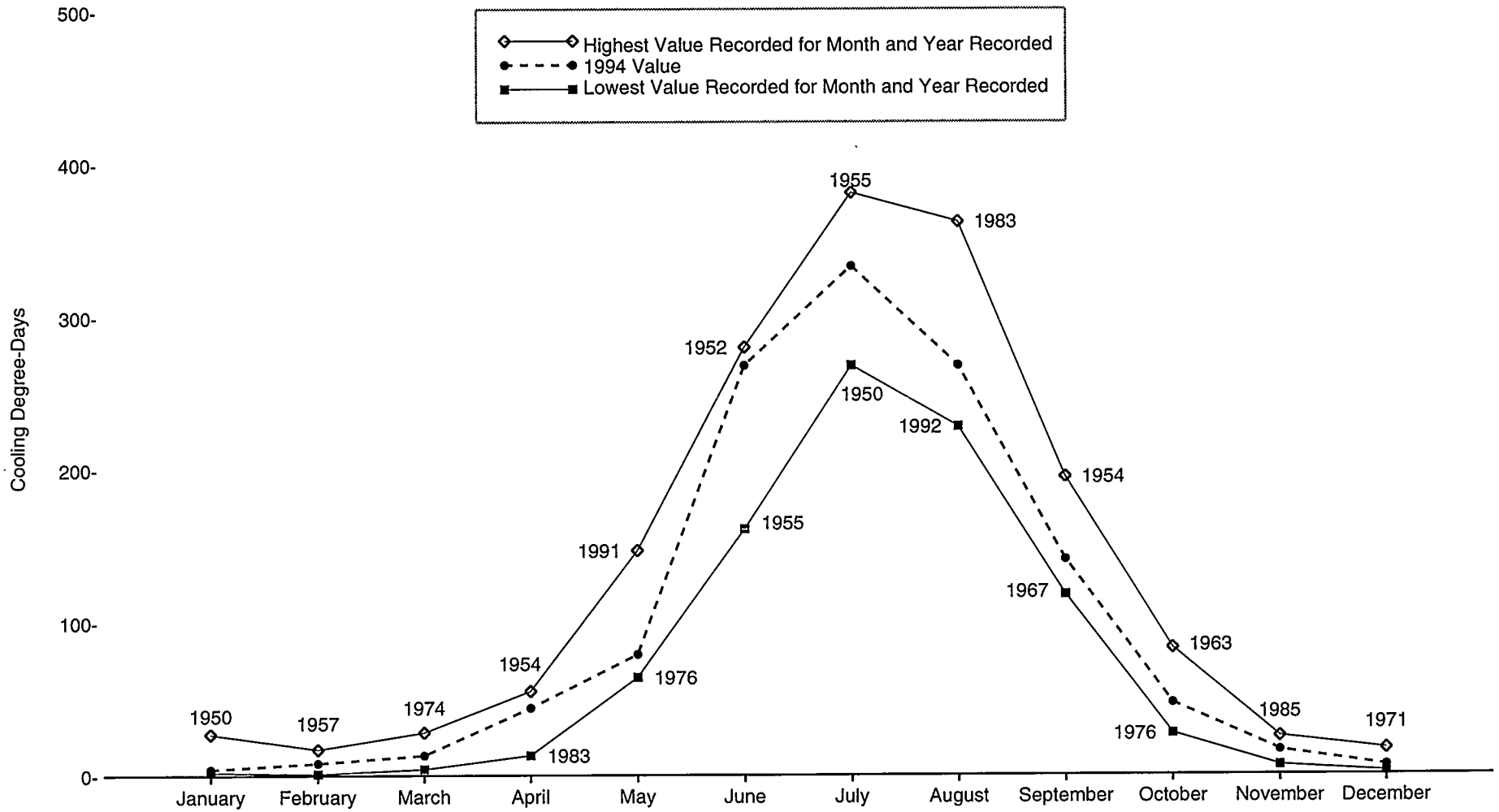
Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1949	858	701	611	330	128	21	7	9	94	209	503	763	4,234
1950	761	721	693	412	162	40	11	18	85	196	565	872	4,536
1951	863	724	632	359	135	45	8	17	74	231	645	814	4,547
1952	807	677	670	315	154	32	5	11	54	324	540	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	R860	R827	R864	R368	R128	R38	R11	R9	R89	R302	R580	R824	R4,900
1994P	1,014	790	571	292	168	26	9	26	75	257	471	711	4,410

R=Revised data. P=Preliminary data.

Notes: • Excludes Alaska and Hawaii. • Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations of the mean daily temperature below 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 statewide 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: • 1949-1993—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-1. • 1994—Energy Information Administration, *Monthly Energy Review*, April 1994-March 1995 issues, Table 1.11, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland.

Figure 1.9 Cooling Degree-Days by Month, 1949-1994



Source: Table 1.9.

Table 1.9 Cooling Degree-Days by Month, 1949-1994

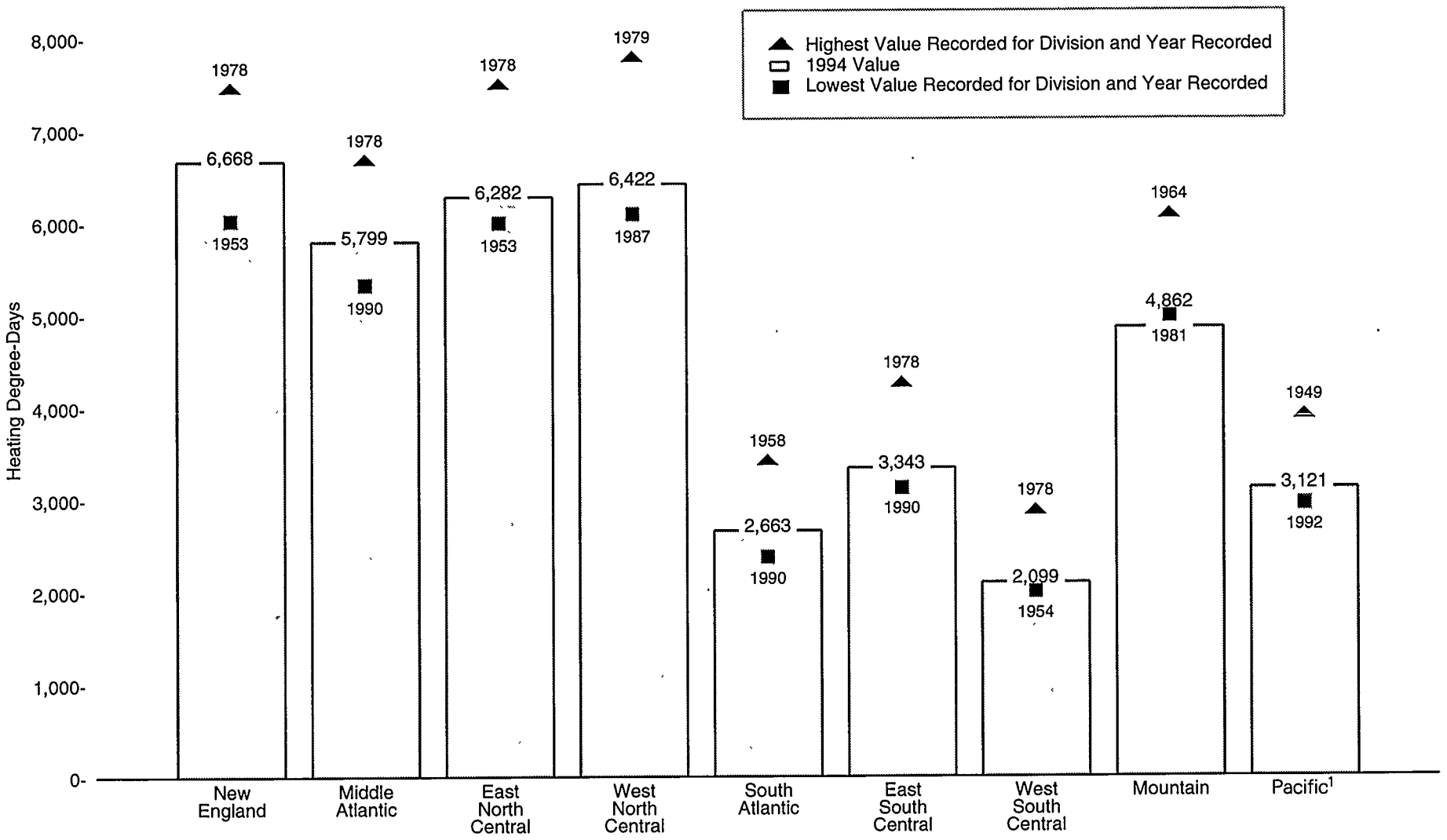
Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1949	16	14	14	27	110	253	367	294	131	70	12	10	1,318
1950	27	12	13	21	105	201	268	244	128	78	9	4	1,110
1951	8	5	15	22	95	198	318	293	158	65	7	11	1,195
1952	17	8	15	20	96	280	368	303	159	38	10	4	1,318
1953	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	R13	R5	R11	R19	R91	R207	R347	R317	R146	R47	R11	R4	R1,218
1994P	4	8	13	44	79	268	333	268	141	47	16	6	1,227

R=Revised data. P=Preliminary data.

Notes: • Excludes Alaska and Hawaii. • Degree-days are relative measurements of outdoor air temperature. Cooling degree-days are deviations of the mean daily temperature above 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 statewide 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: • 1949-1993—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-2. • 1994—Energy Information Administration, *Monthly Energy Review*, April 1994-March 1995 issues, Table 1.11, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland.

Figure 1.10 Heating Degree-Days by Census Division, 1949-1994



[1] Excludes Alaska and Hawaii.
Note: See Appendix F for Census divisions.

Source: Table 1.10.

Table 1.10 Heating Degree-Days by Census Division, 1949-1994

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific [1]	United States [1]
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	R6,728	R5,948	R6,646	R7,168	R2,981	R3,768	R2,489	R5,514	R3,052	R4,900
1994P	6,668	5,799	6,282	6,422	2,663	3,343	2,099	4,862	3,121	4,410

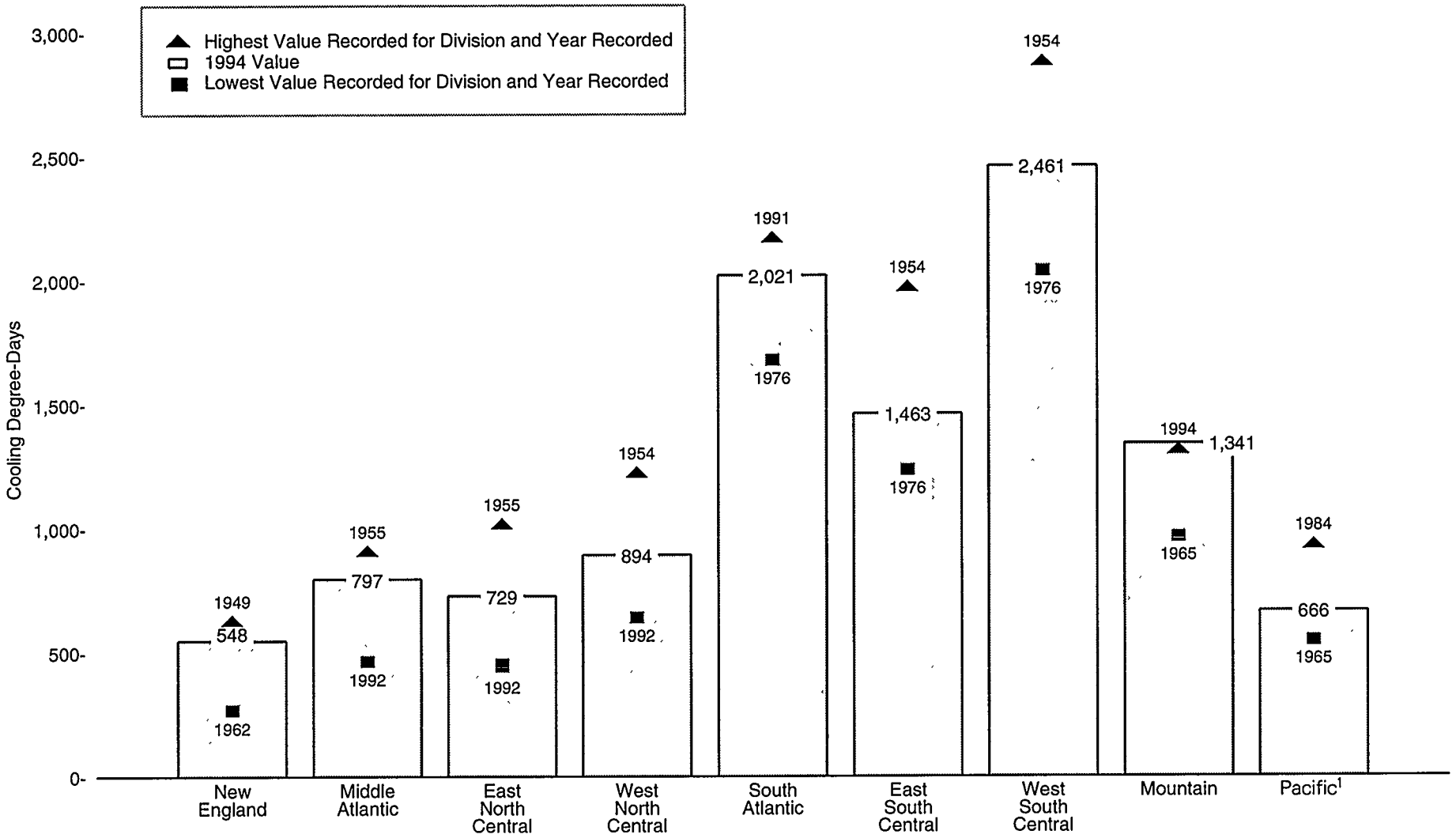
[1] Excludes Alaska and Hawaii.

R=Revised data. P=Preliminary data.

Notes: • Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations of the mean daily temperature below 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 statewide 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 F for Census divisions.

Sources: • 1949-1993—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-1. • 1994—Energy Information Administration, *Monthly Energy Review*, April 1994-March 1995 issues, Table 1.11, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland.

Figure 1.11 Cooling Degree-Days by Census Division, 1949-1994



[1] Excludes Alaska and Hawaii.
Note: See Appendix F for Census divisions.

Source: Table 1.11.

Table 1.11 Cooling Degree-Days by Census Division, 1949-1994

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific [1]	United States [1]
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	R486	R764	R735	R817	R2,092	R1,622	R2,369	R1,113	R708	R1,218
1994P	548	797	729	894	2,021	1,463	2,461	1,341	666	1,227

[1] Excludes Alaska and Hawaii.

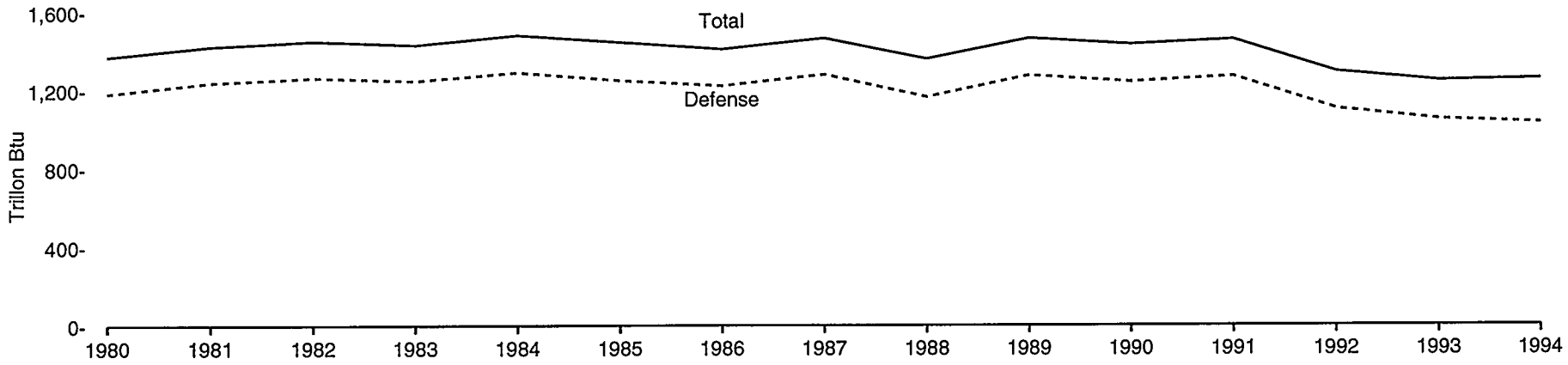
R=Revised data. P=Preliminary data.

Notes: • Degree-days are relative measurements of outdoor air temperature. Cooling degree-days are deviations of the mean daily temperature above 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 statewide 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 F for Census divisions.

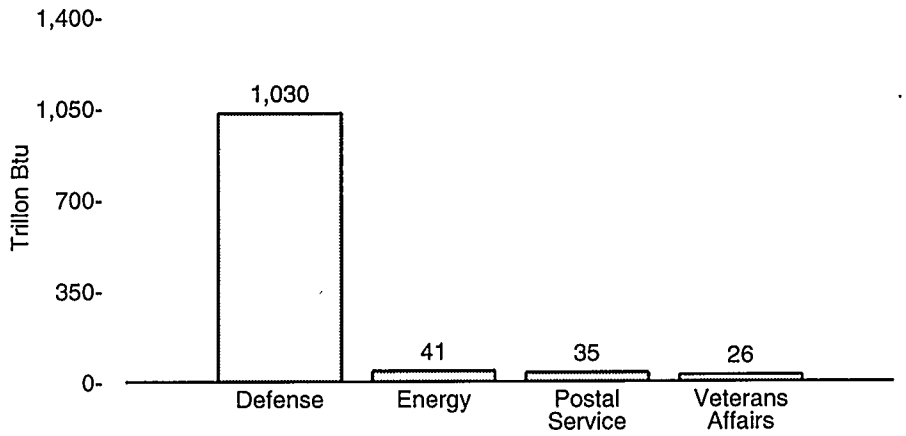
Sources: • 1949-1993—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-2. • 1994—Energy Information Administration, *Monthly Energy Review*, April 1994-March 1995 issues, Table 1.11, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland.

Figure 1.12 U.S. Government Energy Consumption, Fiscal Years

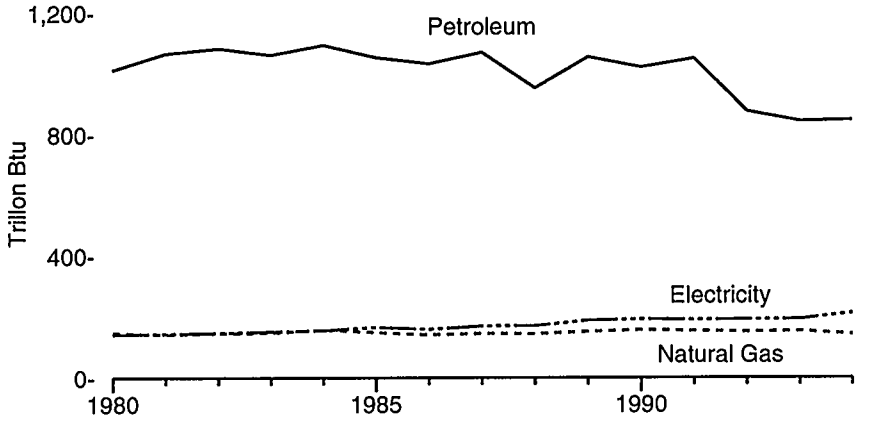
Total and U.S. Department of Defense, 1980-1994



Top Four Consuming Agencies, 1994



By Major Energy Source, 1980-1994



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 1.12.

Table 1.12 U.S. Government Energy Consumption, Fiscal Years 1980-1994

(Trillion Btu)

Category	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 P
Total, All Agencies	1,371.2	1,424.2	1,451.4	1,431.8	1,482.5	R1,445.9	R1,410.1	R1,465.6	1,359.8	R1,463.7	R1,433.0	R1,457.3	R1,292.8	R1,245.5	1,254.7
Defense	1,183.1	1,239.5	1,264.5	1,248.3	1,292.1	1,250.6	1,222.8	1,280.5	1,165.8	1,274.4	1,241.7	1,269.3	1,104.0	R1,048.8	1,030.3
Energy	47.4	47.3	49.0	49.5	51.6	R52.7	49.9	48.2	49.8	43.9	43.4	41.8	44.4	R43.6	41.2
Postal Service	27.2	27.9	27.5	26.5	27.7	27.8	28.0	28.5	29.6	30.3	30.6	30.8	31.7	R33.7	35.0
Veterans Affairs	24.8	24.0	24.2	24.1	24.6	25.1	25.0	24.9	26.3	26.2	24.9	25.3	25.3	R25.7	25.9
Transportation	19.2	18.8	19.1	19.4	19.8	19.5	19.4	19.0	18.7	18.5	19.0	18.8	15.8	R18.4	24.2
General Services Administration	18.1	18.0	18.1	16.1	16.2	R17.3	14.0	13.1	12.4	12.7	14.2	14.0	13.8	R14.1	14.0
NASA	10.4	10.0	10.1	10.3	10.6	R10.8	11.2	11.1	11.2	12.1	12.3	12.4	12.5	R12.4	12.5
Justice	5.7	5.4	5.8	5.5	6.4	8.2	8.6	8.1	9.4	7.7	7.0	8.0	7.5	R9.1	10.3
Agriculture	8.6	7.9	7.6	7.4	7.9	8.4	6.8	R7.3	7.8	R8.7	R9.5	R9.6	9.1	R9.3	9.3
Health and Human Services	6.0	6.7	6.4	6.2	6.4	7.0	6.2	6.6	6.4	6.7	8.0	7.1	8.0	R8.1	8.1
Interior	8.5	7.6	7.4	7.7	8.4	R7.8	6.9	6.6	7.0	7.1	7.4	6.9	7.0	R7.5	4.1
Other [1]	12.3	11.1	11.6	10.8	10.7	10.7	11.3	11.6	15.5	15.3	15.1	13.4	13.8	R14.7	[2]39.8
Total, All Sources	1,371.2	1,424.2	1,451.4	1,431.8	1,482.5	R1,445.9	R1,410.1	R1,465.6	1,359.8	R1,463.7	R1,433.0	R1,457.3	R1,292.8	R1,245.5	1,254.7
Petroleum	1,011.8	1,066.1	1,082.7	1,061.1	1,093.8	1,052.9	R1,032.3	1,069.8	952.3	1,054.4	1,020.5	1,049.4	875.5	R843.0	846.6
Jet Fuel	638.7	653.3	672.7	673.4	693.7	705.7	710.2	702.3	617.2	761.7	732.4	774.5	627.0	R611.4	615.9
Distillate and Residual Fuel Oil	307.7	351.3	349.4	329.5	342.9	R290.8	271.5	319.4	284.7	245.1	244.1	236.1	203.8	R190.7	188.8
Motor Gasoline	56.5	53.2	53.1	51.6	51.2	50.5	45.3	43.1	41.2	41.1	37.2	34.7	35.6	R34.5	35.8
Liquefied Petroleum Gases	4.0	3.7	3.9	4.0	4.1	R4.0	R3.9	4.0	3.2	5.7	6.3	3.7	8.1	R5.7	5.6
Aviation Gasoline	4.9	4.6	3.6	2.6	1.9	1.9	1.4	1.0	6.0	0.8	0.5	0.4	1.0	R0.7	0.5
Electricity	141.9	144.5	147.5	151.5	155.9	R165.9	159.1	169.7	171.1	R188.3	192.4	190.0	191.5	R192.3	[2]211.9
Natural Gas	147.3	142.2	146.2	147.8	157.4	R149.4	141.4	R145.4	144.3	151.9	R157.1	R153.8	R151.2	R153.1	142.9
Coal	63.5	65.1	68.6	62.4	65.3	64.0	63.8	67.0	60.2	48.6	44.2	45.9	51.8	R38.5	35.0
Purchased Steam	6.8	6.2	6.2	9.0	10.1	R13.8	13.5	13.7	31.9	20.6	18.8	18.2	22.8	R18.7	18.3

[1] Includes National Archives and Records Administration, U.S. Department of Commerce, Panama Canal Commission, Tennessee Valley Authority (TVA), U.S. Department of Labor, National Science Foundation (NSF), Federal Trade Commission, Federal Communications Commission, Environmental Protection Agency (EPA), 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 Treasury, Small Business Administration, Office of Personnel Management, Federal Emergency Management Agency, and U.S. Information Agency.

[2] Increase from previous years is result of initial reporting by TVA of electricity consumed for utility station service use.

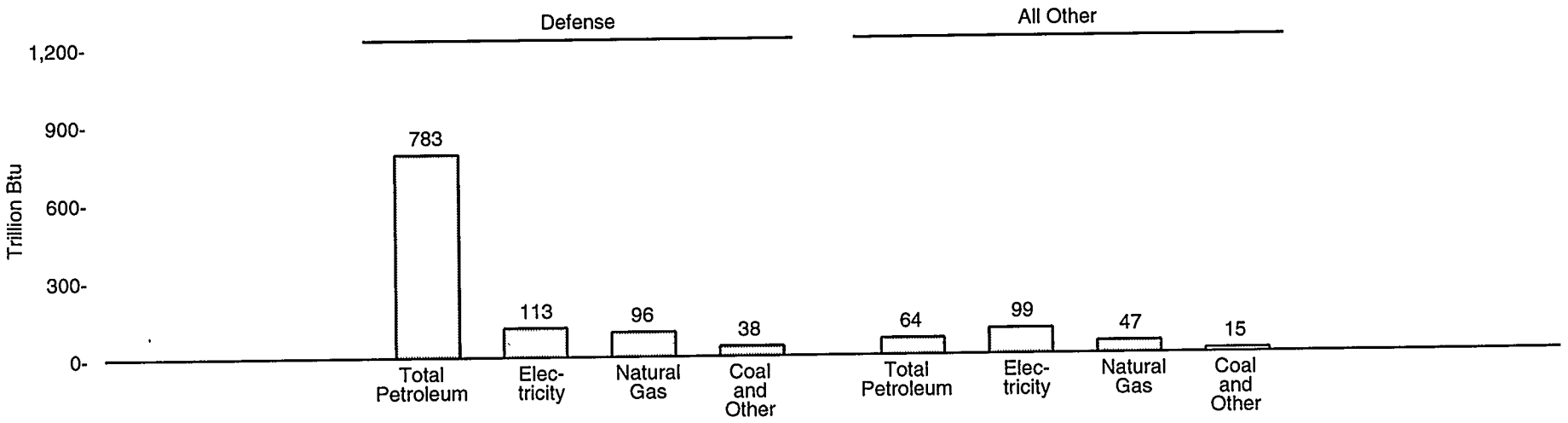
R = Revised data. P Preliminary data. Other estimated data are those of EPA 1982 and 1988, U.S. Department of Treasury 1982 and 1983, and NSF 1988, 1989, and 1990.

Notes: • This table uses a conversion factor for electricity of 3,412 Btu per kilowatthour and a conversion factor for purchased steam of 1,000 Btu per pound. • These 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. However, other energy used by U.S. agencies that produce electricity or enriched uranium is included. • 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.

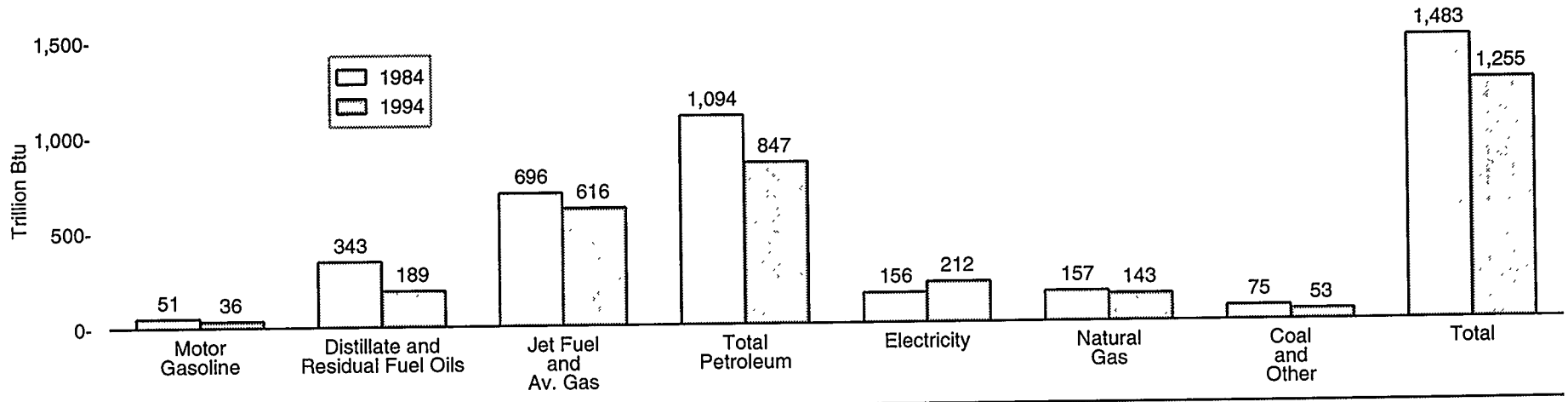
Source: U.S. Department of Energy, Form DOE F 6200.2, "Federal Energy Usage Report," quarterly.

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

By Agency, 1994



By Source, 1984 and 1994



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 1984 and 1994

(Trillion Btu)

Agency	Petroleum					Electricity	Natural Gas	Coal and Other [2]	Total
	Motor Gasoline	Distillate and Residual Fuel Oils	Jet Fuel and Aviation Gas	Other [1]	Total				
Total, 1984	51.2	342.9	695.6	4.1	1,093.8	155.9	157.4	75.4	1,482.5
Defense	25.9	316.2	688.2	2.1	1,032.4	95.9	115.0	48.8	1,292.1
Energy	1.4	3.7	0.4	0.2	5.8	18.3	7.1	20.4	51.6
Postal Service	9.9	2.9	0.0	0.2	12.9	9.4	4.8	0.5	27.7
Veterans Affairs	0.5	2.5	0.0	0.0	3.1	6.3	14.3	1.0	24.6
Transportation	1.4	8.1	5.0	0.0	14.5	3.9	1.2	0.2	19.8
General Services Administration	0.1	1.1	0.0	0.0	1.2	8.6	3.3	3.1	16.2
NASA	0.3	0.8	1.5	0.0	2.6	5.1	2.5	0.4	10.6
Interior	2.2	1.8	0.1	0.9	5.0	1.4	1.8	0.3	8.4
Agriculture	4.3	0.7	0.1	0.3	5.3	1.2	1.4	0.0	7.9
Health and Human Services	0.4	2.6	0.0	0.1	3.1	1.8	1.5	0.0	6.4
Justice	1.8	0.4	0.1	0.1	2.4	1.0	2.6	0.4	6.4
Other [3]	3.0	2.2	0.3	0.1	5.6	3.0	2.0	0.2	10.7
Total, 1994 [P]	35.8	188.8	616.4	5.6	846.6	211.9	142.9	53.3	1,254.7
Defense	10.7	167.2	602.9	2.1	782.8	113.3	95.9	38.4	1,030.3
Energy	1.2	2.4	0.4	0.4	4.3	17.1	9.8	10.0	41.2
Postal Service	11.2	3.2	0.0	0.0	14.3	14.0	6.0	0.6	35.0
Veterans Affairs	0.6	1.9	0.0	0.0	2.5	8.6	13.4	1.4	25.9
Transportation	0.6	6.4	9.4	2.0	18.5	4.2	1.4	0.1	24.2
General Services Administration	0.1	0.4	0.0	0.0	0.5	9.1	2.8	1.5	14.0
NASA	0.3	1.0	1.4	0.0	2.7	7.2	2.4	0.2	12.5
Justice	2.5	0.5	0.8	0.0	3.8	2.6	3.6	0.2	10.3
Agriculture	4.6	0.6	0.1	0.2	5.4	2.1	1.7	0.1	9.3
Health and Human Services	0.2	1.5	0.0	0.3	1.9	3.4	2.7	0.1	8.1
Interior	1.8	1.2	0.2	0.5	3.7	0.0	0.3	0.1	4.1
Other [4]	2.2	2.5	1.3	0.0	6.1	30.3	2.9	0.6	39.8

[1] Includes liquefied petroleum gases and other.

[2] Includes purchased steam, coal, and other.

[3] Includes U.S. Department of Commerce, Panama Canal Commission, Tennessee Valley Authority, U.S. Department of Labor, National Science Foundation, U.S. Department of Housing and Urban Development, Federal Communications Commission, Office of Personnel Management, U.S. Department of State, U.S. Department of Treasury, Small Business Administration, and Environmental Protection Agency.

[4] 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, Panama Canal Commission, Equal Employment Opportunity Commission, Nuclear Regulatory Commission, Office of Personnel Management, U.S. Department of Housing and Urban Development, U.S. Department of Treasury, Railroad Retirement Board, Tennessee Valley Authority, Federal Emergency Management Agency, and U.S. Information Agency.

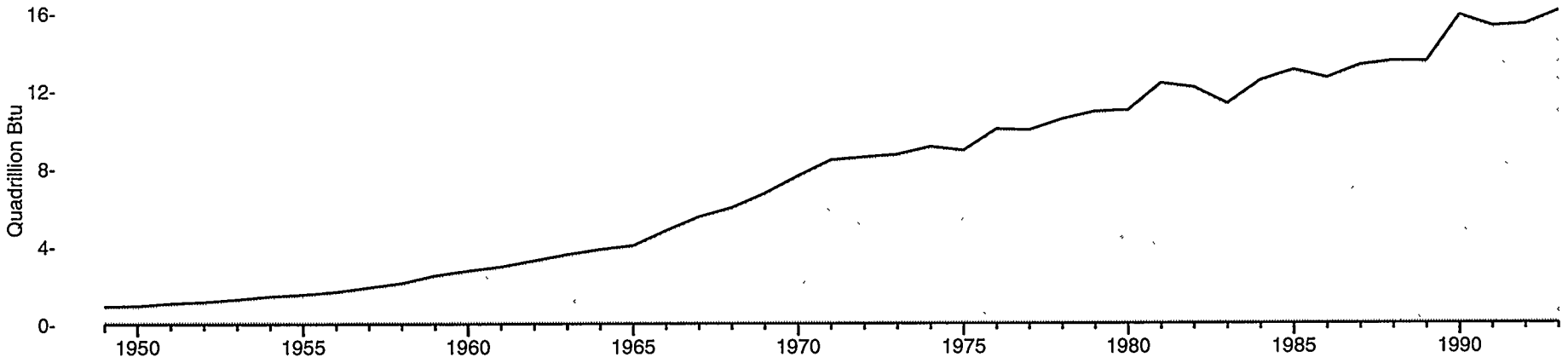
P=Preliminary data.

Notes: • This table uses a conversion factor for electricity of 3,412 Btu per kilowatthour and a conversion factor for purchased steam of 1,000 Btu per pound. • These 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. However, other energy used by U.S. agencies that produce electricity or enriched uranium is included. • 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.

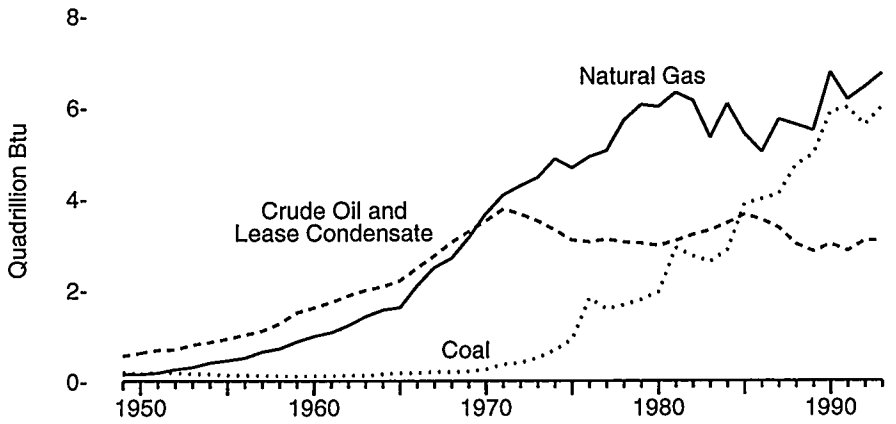
Source: U.S. Department of Energy, Form DOE F 6200.2, "Federal Energy Usage Report," quarterly.

Figure 1.14 Fossil Fuel Production on Federally Administered Lands

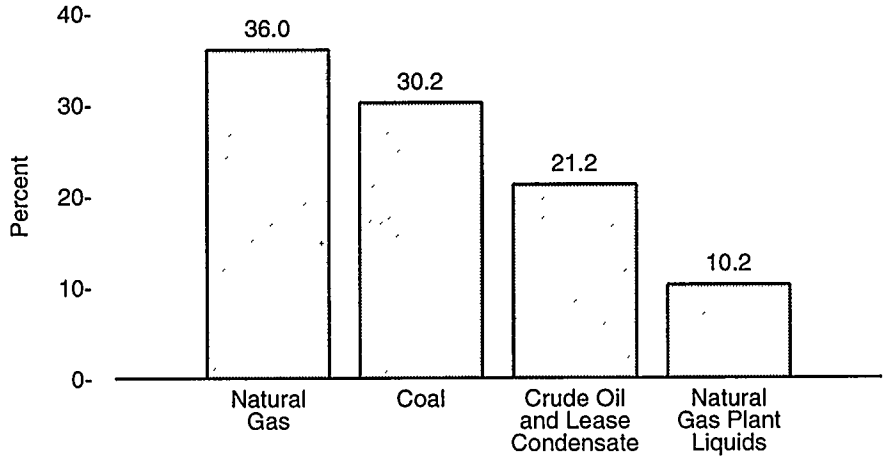
Total, 1949-1993



By Source, 1949-1993



Share of U.S. Total Production by Source, 1993



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

Source: Table 1.14.

Table 1.14 Fossil Fuel Production on Federally Administered Lands, 1949-1993

Year	Crude Oil and Lease Condensate [1]			Natural Gas Plant Liquids [2]			Natural Gas [3]			Coal [4]			Total	
	Million Barrels	Quadrillion Btu	Percent U.S. Total [5]	Million Barrels	Quadrillion Btu	Percent U.S. Total [5]	Trillion Cubic Feet	Quadrillion Btu	Percent U.S. Total [5]	Million Short Tons	Quadrillion Btu	Percent U.S. Total [5]	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	36.0	285.7	6.00	30.2	16.05	28.7

[1] Production from Naval Petroleum Reserve No. 1 (NPR#1) for 1974 and earlier years is for fiscal years (July through June).

[2] 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.

[3] Includes some quantities of natural gas processed into liquids at natural gas processing plants and fractionators.

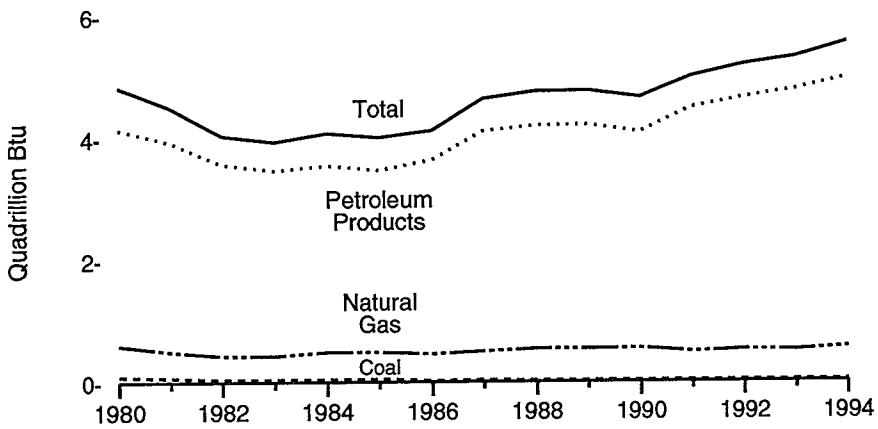
[4] Converted to British thermal units (Btu) on the basis of an estimated heat content of coal produced on federally administered lands of 21.0 million Btu per short ton.

[5] Based on physical units.

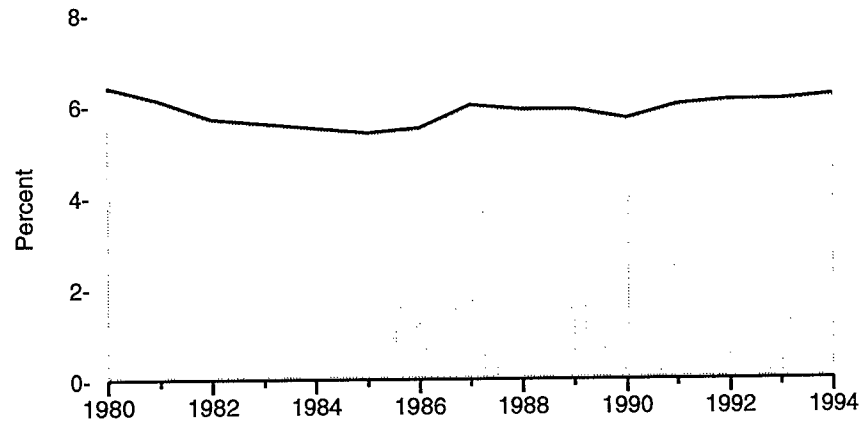
Source: See Note 2 at end of section.

Figure 1.15 Fossil Fuel Consumption for Nonfuel Use

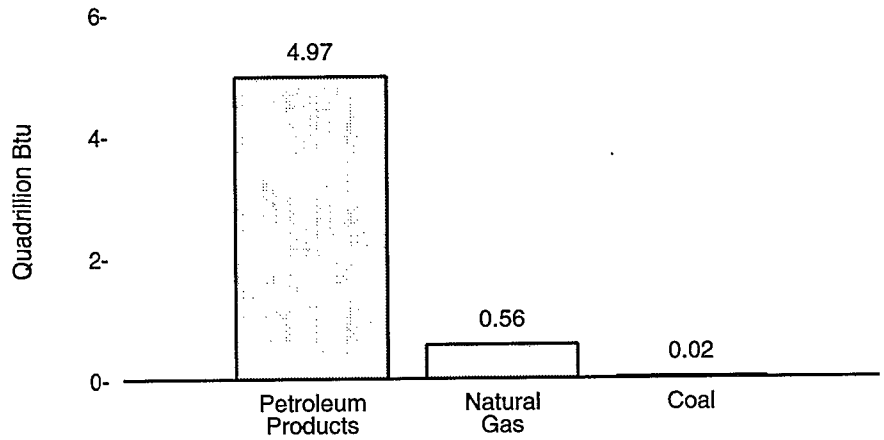
Total, 1980-1994



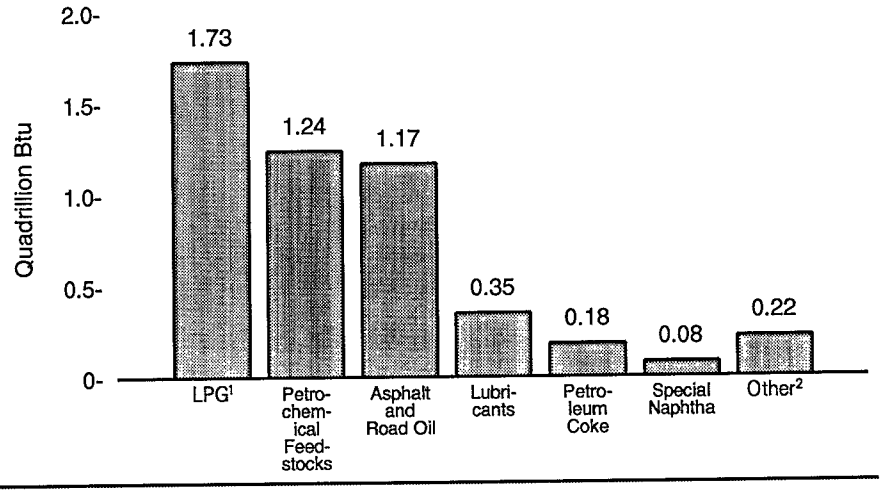
As Share of Total Energy Consumption, 1980-1994



By Fuel, 1994



By Petroleum Product, 1994



[1] Liquefied petroleum gases.
[2] "Other" is distillate fuel oil, residual fuel oil, waxes, and miscellaneous products.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 1.15.

Table 1.15 Fossil Fuel Consumption for Nonfuel Use, 1980-1994

Year	Petroleum Products								Natural Gas	Coal	Total	Percent of Total Energy Consumption
	Asphalt and Road Oil	Liquefied Petroleum Gases	Lubricants	Petro-chemical Feedstocks	Petroleum Coke	Special Naphtha	Other [1]	Total				
	Physical Units [2]											
1980	145	231	58	253	8.2	37	58	790.2	589	2.6	—	—
1981	125	230	56	236	26.2	27	54	754.2	482	2.3	—	—
1982	125	259	51	169	20.2	25	48	697.2	415	1.5	—	—
1983	136	267	53	153	7.2	30	45	691.2	418	1.4	—	—
1984	149	260	57	144	13.9	40	38	701.9	471	1.6	—	—
1985	153	255	53	143	13.8	30	38	685.8	475	1.8	—	—
1986	164	268	47	180	12.8	24	41	736.8	444	0.8	—	—
1987	170	316	59	170	23.5	28	40	806.5	490	0.9	—	—
1988	171	340	56	174	24.7	22	45	832.7	526	0.8	—	—
1989	165	349	58	172	23.1	20	44	831.1	528	0.7	—	—
1990	164	362	60	153	31.5	20	40	830.5	533	0.8	—	—
1991	162	404	53	203	27.0	17	43	909.0	475	0.7	—	—
1992	166	411	54	214	42.3	20	35	942.3	R503	0.8	—	—
1993	R173	R444	56	R214	R30.5	20	R35	R972.5	R495	0.8	—	—
1994 P	176	473	57	220	29.8	15	37	1,007.8	548	0.8	—	—
	Quadrillion Btu											
1980	0.96	0.82	0.35	1.43	0.05	0.19	0.34	4.14	0.60	0.09	4.83	6.4
1981	0.83	0.81	0.34	1.33	0.16	0.14	0.32	3.93	0.50	0.07	4.50	6.1
1982	0.83	0.90	0.31	0.95	0.12	0.13	0.28	3.57	0.43	0.04	4.04	5.7
1983	0.90	0.93	0.32	0.86	0.04	0.16	0.26	3.47	0.43	0.04	3.94	5.6
1984	0.99	0.89	0.35	0.81	0.08	0.21	0.22	3.55	0.49	0.04	4.08	5.5
1985	1.02	0.86	0.32	0.81	0.08	0.16	0.22	3.47	0.49	0.05	4.01	5.4
1986	1.09	0.82	0.29	1.02	0.08	0.13	0.21	3.64	0.46	0.02	4.12	5.5
1987	1.13	1.12	0.35	1.00	0.14	0.14	0.23	4.11	0.50	0.03	4.64	6.0
1988	1.14	1.21	0.35	1.00	0.15	0.11	0.24	4.20	0.54	0.02	4.76	5.9
1989	1.10	1.26	0.35	1.00	0.14	0.11	0.25	4.21	0.54	0.02	4.77	5.9
1990	1.09	1.28	0.37	0.82	0.19	0.11	0.23	4.09	0.55	0.02	4.66	5.7
1991	1.08	1.42	0.33	1.15	0.16	0.09	0.26	4.49	0.49	0.02	5.00	R6.0
1992	1.10	1.45	0.33	1.20	0.26	0.10	0.21	4.65	0.52	0.02	5.19	R6.1
1993	1.15	R1.60	0.34	R1.21	R0.18	0.10	0.20	R4.78	R0.51	0.02	R5.31	R6.1
1994 P	1.17	1.73	0.35	1.24	0.18	0.08	0.22	4.97	0.56	0.02	5.55	6.2

[1] "Other" is distillate fuel oil, residual fuel oil, waxes, and miscellaneous products.
[2] Petroleum - million barrels; natural gas - billion cubic feet; and coal - million short tons.
R=Revised data. P=Preliminary data. — = Not applicable.
Sources: **Petroleum Products:** • 1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual* and *Sales of Liquefied Petroleum Gases and Ethane in 1980.* • 1981-1985—EIA, *Petroleum Supply Annual* and unpublished data. • 1986 forward—EIA, *Petroleum Supply Monthly* 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 estimates. **Coal:** U.S. International Trade Commission, *Synthetic Organic Chemicals, United States Production and Sales, 1993* (January 1995). **Percent of Total Energy Consumption:** Derived by dividing total by total consumption on Table 1.3.

Energy Overview Notes

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.

2. Table 1.14 Sources: **Coal:** • 1949-1980–U.S. Geological Survey, *Coal, Phosphate, Potash, Sodium, and Other Mineral Production, Royalty Income, and Related Statistics*, June 1981. • 1981 forward–U.S. Minerals Management Service, *Mineral Revenues–The 1992 Report on Receipts from Federal and Indian Leases*, and predecessor annual reports. **All Other Data:** • 1949-1980–U.S. Geological Survey, *Oil and Gas Production, Royalty Income, and Related Statistics*, June 1981; Department of Energy, Office of Naval Petroleum and Oil Shale Reserves, unpublished data; and U.S. Geological Survey, National Petroleum Reserve in Alaska, unpublished data. • 1981-1983–U.S. Minerals Management Service, *Mineral Revenues–The 1983 Report on Receipts from Federal and Indian Leases*, and predecessor annual reports; Department of Energy, Office of Naval Petroleum and Oil Shale Reserves, unpublished data; and U.S. Geological Survey, National Petroleum Reserve in Alaska, unpublished data. • 1984 forward–U.S. Minerals Management Service, *Mineral Revenues–The 1992 Report on Receipts from Federal and Indian Leases*, and predecessor annual reports, Department of Energy, Office of Naval Petroleum and Oil Shale Reserves, unpublished data.

2. End-Use Energy Consumption

Types of Consumption Data

The Energy Information Administration publishes two sets of statistics on end-use energy consumption. The first set, based on surveys directed to suppliers and marketers, provides continuous series for the years 1949 through 1994 and allocates U.S. total energy consumption to one of three end-use sectors: industrial, residential and commercial, and transportation. The second set, based on surveys directed to end-users of energy, provides detailed information on the types of energy consumed and the energy-related characteristics of manufacturing establishments, commercial buildings, households, and household vehicles.

End-Use Energy Overview, 1949-1994

Energy consumption by the industrial sector increased throughout the 1960's and in 1973 reached 32 quadrillion Btu. Of the three end-use sectors, the industrial sector proved to be the most responsive to the turmoil in energy markets after the 1973-1974 embargo (2.1).* In 1979, industrial consumption of energy reached the then-record level of 33 quadrillion Btu. In the early 1980's, a stagnant economy restrained industrial consumption, which declined to a 16-year low of 26 quadrillion Btu in 1983. In 1988 and 1989, economic growth spurred demand for energy in the industrial sector, and industrial energy consumption in 1989 rose to 29 quadrillion Btu. Despite slow economic growth in the early 1990's, industrial energy consumption trended upward. In 1994, industrial consumption of energy reached 34 quadrillion Btu, the highest level recorded.

Much of the growth in energy consumption during the 1949-through-1994 period occurred in the residential and commercial sector (2.1). Residential and commercial consumption leveled off in response to higher energy prices in the late 1970's and early 1980's, but lower prices in the 1986-through-1994 period played a role in boosting residential and commercial energy consumption to the record level of 31 quadrillion Btu in 1994.

Energy consumption by the transportation sector was primarily petroleum consumption. Over the 46-year period, the transportation sector's consumption of petroleum more than tripled, but growth was slower during the 1980's than in previous decades. In 1994, consumption of petroleum in the transportation sector totaled 23 quadrillion Btu, also a record level.

Consumption of Energy for Manufacturing in 1991

The U.S. manufacturing sector consumed an estimated 20 quadrillion Btu[1] of energy in 1991. Natural gas accounted for 6.1 quadrillion Btu, a 30-percent share of total energy consumption (2.2). Electricity[2] accounted for 2.4 quadrillion Btu, a 12-percent share, and coal consumption accounted for 2.0 quadrillion Btu, a 10-percent share. Fuel oil consumption of 0.6 quadrillion Btu accounted for a 3.0-percent share.

Of all the industries, the petroleum and coal products industry was the largest user of energy in 1991, consuming 6.0 quadrillion Btu. At 5.1 quadrillion Btu, the chemicals and allied products industry was the second largest user. Together, the two industries accounted for more than half of the energy consumption in the manufacturing sector.

Because the manufacturing sector accounts for a large share of total U.S. energy consumption, manufacturers' ability to cope with fluctuations in energy supplies and prices by switching to alternative sources

Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.

[1]The manufacturing sector is composed of establishments that use mechanical or chemical processes to transform raw materials into intermediate or final products. It does not include the remainder of the industrial sector (construction, mining, agricultural, fishing, and forestry establishments) or electric utilities. The 20 quadrillion Btu total is the *primary consumption of energy*; it includes energy consumed to produce heat and power and to generate electricity, as well as sources of energy consumed as petrochemical feedstocks and raw material inputs, but it excludes byproduct fuels produced from other energy sources.

[2]Net electricity, which 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.

of energy plays a significant role in the Nation's energy security. Fuel switching capability[3] in 1991 was determined for five major energy sources: natural gas, purchased electricity, coal, residual fuel oil, and distillate fuel oil (2.3).

Natural gas was the primary source of energy for space heating and provided the main source of heat in 51 million households in 1993.

Residual fuel oil registered the largest value (45 percent) for switchable consumption as a percentage of actual consumption, indicating substantial fuel-switching capabilities. In addition, almost 20 percent of distillate fuel oil consumption could have been supplied by other sources. It is estimated that about 99 thousand barrels per day of fuel oil (residual and distillate combined) consumed could have been switched to nonpetroleum sources.

Natural gas registered the largest absolute amount of total switchable consumption. Of the 5.5 quadrillion Btu total of natural gas consumption, 1.9 quadrillion Btu (35 percent) could have been switched to other sources. Of the 1.2 quadrillion Btu of coal consumed, 0.5 quadrillion Btu (45 percent) were switchable. Very little (less than 3 percent) of the 2.5 quadrillion Btu of purchased electricity consumed by manufacturers in 1991 could have been switched to other sources if manufacturing output were to be maintained.

Household Uses of Energy in 1993

In 1993, household energy consumption totaled 10 quadrillion Btu and energy consumption per household averaged 104 million Btu (2.9). Household energy consumption is strongly influenced by climate. Households in the West and South consumed the least amount of energy in 1993, an average of 76 million Btu per household in the West and 88 million Btu per household in the South. Consumption in the colder climates was higher in 1993; households in the Midwest averaged 134 million Btu per household and those in the Northeast 122 million Btu per household. Many other factors influence consumption, including the fact that houses in the Northeast and Midwest tend to be larger and older.

Energy consumed by households can be attributed to four primary applications: space heating, air conditioning, water heating, and appliance operation (2.10). In 1993, space heating was the most prevalent application of energy consumed by households and accounted for 5.3 quadrillion Btu. Natural gas was the primary source of energy for space heating and provided the main source of heat in 51 million households (2.11). Natural gas was also the primary source of energy for water heating (2.10).

About 2.4 quadrillion Btu were used to operate appliances and, as would be expected, electricity was the major source of energy for that application. Refrigerators, color television sets, ovens (regular and microwave), and clothes washers were the most common household appliances (2.12).

Electricity was essentially the only source of energy used for air conditioning. Although air conditioning accounted for only 4.6 percent of household energy consumption, it accounted for 9.1 percent ($11.3 billion) of total household energy expenditures of $124 billion (2.10).

The cost of energy used to operate appliances totaled $56 billion in 1993, and the cost for space heating was $40 billion. Energy expenses for water heating came to about $17 billion.

Improvements in Passenger Car Efficiency, 1973–1993

Because motor gasoline consistently accounts for the largest share of all petroleum products supplied (5.11), motor gasoline consumption has a significant effect on U.S. dependence on foreign sources of crude oil. Following the Arab oil embargo in the mid-1970's, concerns about U.S. dependence on foreign oil led to interest in improving motor vehicle efficiency.

In 1973, average annual mileage exceeded 10 thousand miles per passenger car (2.15). The average fuel rate of passenger cars, which make up a sizable proportion of the U.S. motor vehicle fleet, was 13 miles per gallon. That measure of fuel efficiency had declined for the previous several years.

[3]The capability of U.S. manufacturers to switch fuels within 30 days, using only existing equipment and keeping production output constant.

In 1973 and 1974, however, crude oil supply interruptions and rising prices led to public concern over the continued availability of motor gasoline. The immediate effect of higher prices was a decline in mileage to an average of 9.6 thousand miles per passenger car in 1974 (2.15). At the same time, the average fuel rate of the passenger car fleet began to improve. It increased throughout the 1970's and 1980's, reaching an average of 22 miles per gallon in 1991 through 1993. The Federal Corporate Average Fuel Economy standards, which required automobile manufacturers to meet fleet fuel rate minimum averages, played a major role in the increase in fuel rates.

Energy Consumption by Household Vehicles in 1991

In spite of the recent rapid growth in the number of minivans and sport-utility vehicles owned by U.S. households, the average on-road fuel efficiency of the household vehicle fleet rose from 15 miles per gallon in 1983 to 19 miles per gallon in 1991 (2.14). In 1991, nearly 85 million households (out of a U.S. total of 95 million households) owned or had access to at least one vehicle. The 151 million household vehicles traveled a total of 1.6 trillion miles, up from 1.2 trillion miles in 1983.

Conservation Features in Commercial Buildings

Most commercial buildings contained energy conservation features in 1992 (2.22). Conservation features in building shells were pervasive. Conservation features in commercial heating, ventilation, and air conditioning systems were present in 2.6 million of the 4.8 million commercial buildings. Conservation features associated with lighting were present in 1.2 million buildings. A small number of commercial buildings (264 thousand) reported such conservation features as timers on thermostats and zoned heating.

Household vehicles consumed 81 billion gallons of motor gasoline in 1991, of which 96 percent was unleaded. In 1983, by comparison, 59 percent of the 79 billion gallons consumed was unleaded. The average prices of both kinds of motor gasoline were slightly lower in 1991 than in 1983. According to household survey data, leaded motor gasoline averaged $1.10 per gallon and unleaded motor gasoline averaged $1.19 per gallon.

Energy-Related Characteristics of Commercial Buildings in 1992

Commercial buildings are those which house mercantile, service, office, education, and other activities. In 1992, there were approximately 68 billion square feet of commercial floorspace in the United States (2.17). The largest amount of commercial floorspace, 25 billion square feet, was found in the South and accounted for 36 percent of the U.S. total. On the basis of the amount of commercial floorspace in which a given energy source is consumed, electricity was the most prevalent. Electricity was an energy source for almost 67 billion square feet of commercial floorspace. Natural gas was also commonly used and supplied energy for 45 billion square feet. Fuel oil, district heat,[4] and propane were consumed in smaller, but still significant, amounts in commercial buildings.

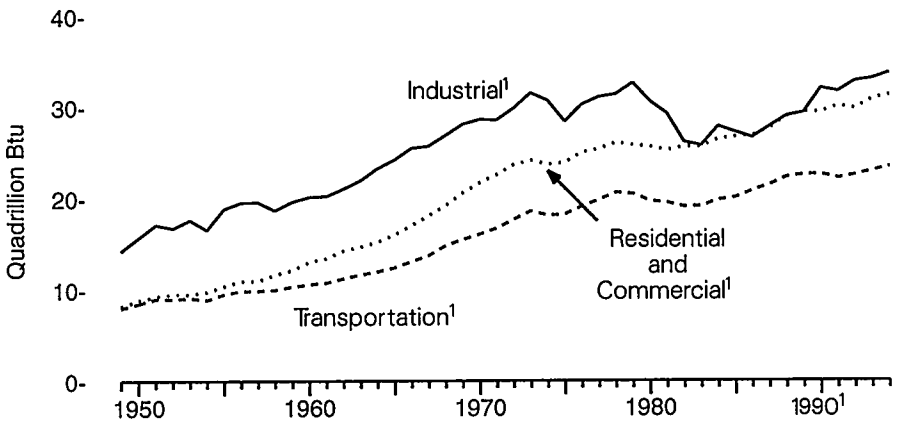
On a Btu basis, electricity and natural gas were the most common sources of energy in commercial buildings (2.20). In 1992, 2.6 quadrillion Btu of electricity and 2.2 quadrillion Btu of natural gas were consumed in commercial buildings. Consumption of district heat totaled 0.4 quadrillion Btu and consumption of fuel oil totaled 0.3 quadrillion Btu. (Propane also supplied small amounts of energy in commercial buildings, but propane data were not collected in 1992.)

Of the $73 billion spent on energy for commercial buildings in 1992, by far the largest amount went for electricity (2.20). Electricity expenditures came to $58 billion, whereas expenditures for natural gas came to $9.9 billion. Expenditures for district heat were $2.9 billion and expenditures for fuel oil were $1.4 billion.

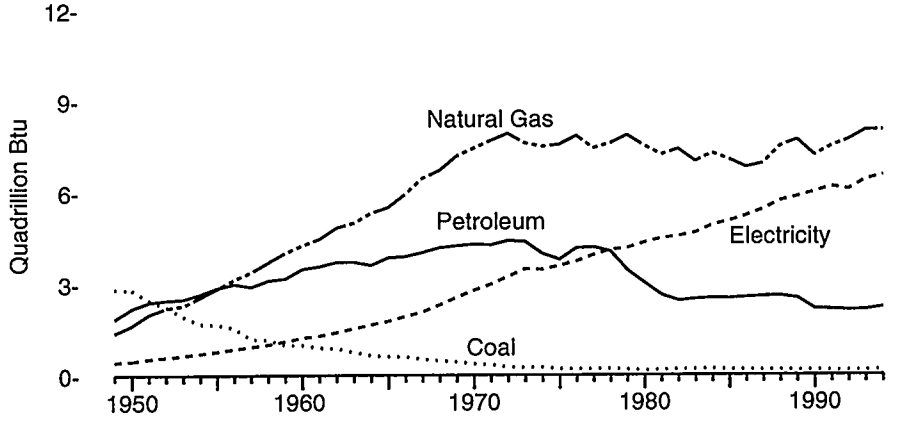
[4]District heat is steam or hot water that circulates from a central plant or utility.

Figure 2.1 Energy Consumption by End-Use Sector, 1949-1994

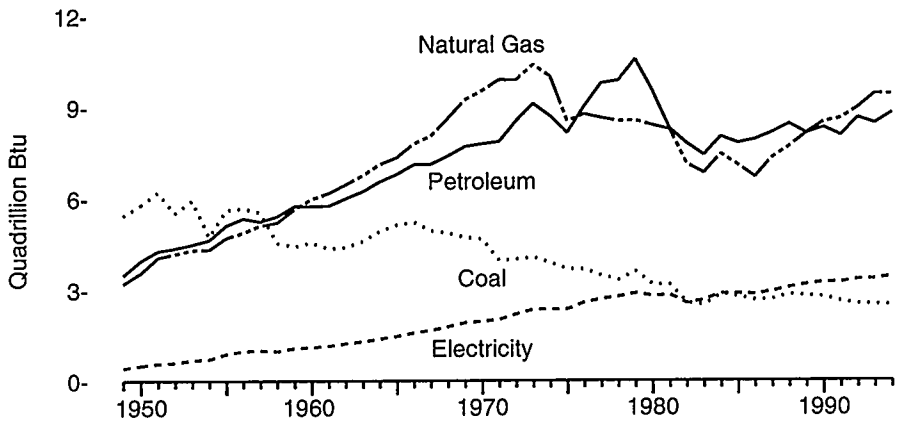
By End-Use Sector



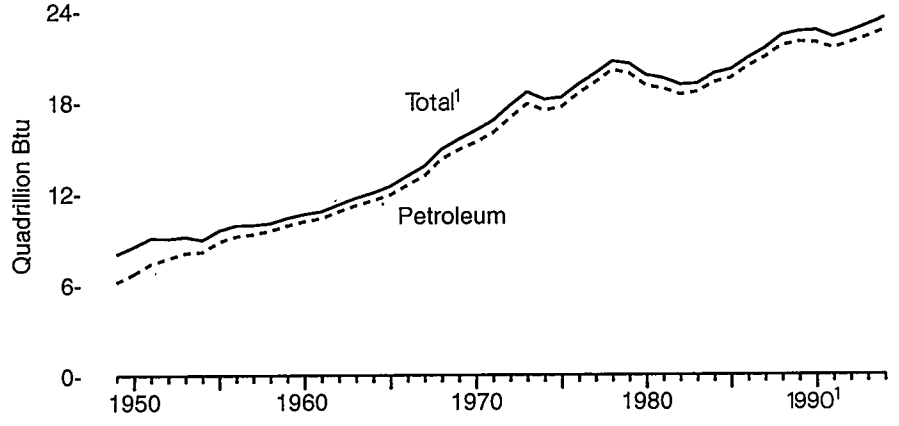
Residential and Commercial Sector



Industrial Sector



Transportation Sector



[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric use of renewable energy beginning in 1990.

Note: Because vertical scales differ, graphs should not be compared
Source: Table 2.1.

Table 2.1 Energy Consumption by End-Use Sector, 1949-1994

(Quadrillion Btu)

	Residential and Commercial						Industrial						Transportation		
Year	Coal	Natural Gas [1]	Petroleum	Electricity	Losses [2]	Total [3]	Coal	Natural Gas [1]	Petroleum	Electricity	Losses [2]	Total [3,4]	Petroleum	Total [3,5]	Total [3]
1949	2.83	1.39	1.85	0.43	1.72	8.21	5.43	3.19	3.47	0.42	1.68	14.26	6.15	7.99	30.46
1950	2.80	1.64	2.20	0.47	1.76	8.87	5.78	3.55	3.95	0.50	1.86	15.71	6.69	8.49	33.08
1951	2.47	2.01	2.40	0.54	1.89	9.30	6.20	4.05	4.27	0.57	2.00	17.13	7.36	9.04	35.47
1952	2.25	2.21	2.46	0.59	2.02	9.54	5.52	4.18	4.36	0.60	2.05	16.76	7.71	9.00	35.30
1953	1.93	2.29	2.50	0.65	2.12	9.50	5.93	4.30	4.48	0.68	2.20	17.65	8.06	9.12	36.27
1954	1.68	2.57	2.67	0.72	2.15	9.78	4.73	4.32	4.63	0.71	2.14	16.58	8.12	8.90	35.27
1955	1.67	2.85	2.87	0.79	2.23	10.41	5.62	4.70	5.11	0.89	2.51	18.86	8.80	9.55	38.82
1956	1.55	3.15	3.00	0.87	2.39	10.96	5.67	4.87	5.34	0.98	2.68	19.55	9.15	9.86	40.38
1957	1.19	3.39	2.91	0.95	2.55	10.98	5.54	5.11	5.24	1.00	2.70	19.60	9.29	9.90	40.48
1958	1.16	3.71	3.12	1.01	2.64	11.65	4.53	5.21	5.41	0.98	2.54	18.70	9.51	10.00	40.35
1959	0.99	4.02	3.18	1.12	2.84	12.15	4.41	5.65	5.74	1.08	2.73	19.64	9.85	10.35	42.14
1960	0.99	4.27	3.49	1.23	3.06	13.04	4.54	5.97	5.75	1.11	2.76	20.16	10.13	10.60	43.80
1961	0.90	4.48	3.58	1.30	3.18	13.44	4.35	6.17	5.75	1.15	2.80	20.25	10.32	10.77	44.46
1962	0.88	4.85	3.72	1.41	3.40	14.27	4.38	6.45	6.00	1.23	2.95	21.04	10.77	11.23	46.53
1963	0.76	5.01	3.72	1.54	3.68	14.71	4.59	6.75	6.23	1.29	3.08	21.95	11.17	11.66	48.32
1964	0.65	5.33	3.62	1.67	3.96	15.23	4.91	7.11	6.55	1.38	3.29	23.27	11.50	12.00	50.50
1965	0.62	5.52	3.87	1.78	4.25	16.03	5.13	7.34	6.79	1.46	3.49	24.22	11.87	12.43	52.68
1966	0.61	5.95	3.91	1.94	4.65	17.06	5.21	7.80	7.11	1.58	3.79	25.50	12.50	13.10	55.66
1967	0.52	6.47	4.04	2.09	4.98	18.10	4.93	8.04	7.12	1.65	3.95	25.72	13.11	13.75	57.57
1968	0.47	6.73	4.20	2.32	5.52	19.23	4.85	8.63	7.39	1.78	4.24	26.90	14.21	14.86	61.00
1969	0.44	7.20	4.26	2.57	6.12	20.59	4.71	9.23	7.70	1.91	4.56	28.10	14.81	15.50	64.19
1970	0.37	7.46	4.31	2.79	6.78	21.71	4.66	9.54	7.79	1.95	4.72	28.63	15.31	16.09	66.43
1971	0.35	7.71	4.29	2.99	7.25	22.59	3.94	9.89	7.86	2.01	4.87	28.57	15.92	16.72	67.89
1972	0.27	7.94	4.43	3.25	7.80	23.69	3.99	9.88	8.53	2.19	5.25	29.86	16.89	17.71	71.26
1973	0.25	7.63	4.39	3.50	8.38	24.14	4.06	10.39	9.10	2.34	5.61	31.53	17.83	18.60	74.28
1974	0.26	7.52	4.00	3.47	8.48	23.72	3.87	10.00	8.69	2.34	5.70	30.70	17.40	18.12	72.54
1975	0.21	7.58	3.80	3.60	8.70	23.90	3.67	8.53	8.15	2.35	5.66	28.40	17.62	18.25	70.55
1976	0.20	7.87	4.18	3.75	9.02	25.02	3.66	8.76	9.01	2.57	6.20	30.24	18.51	19.10	74.36
1977	0.21	7.46	4.21	3.96	9.56	25.39	3.45	8.64	9.78	2.68	6.48	31.08	19.24	19.82	76.29
1978	0.21	7.62	4.07	4.12	10.07	26.09	3.31	8.54	9.87	2.76	6.75	31.39	20.04	20.61	78.09
1979	0.19	7.89	3.45	4.18	10.10	25.81	3.59	8.55	10.57	2.87	6.94	32.61	19.82	20.47	78.90
1980	0.15	7.54	3.04	4.35	10.58	25.65	3.16	8.39	9.53	2.78	6.76	30.61	19.01	19.69	75.96
1981	0.17	7.24	2.63	4.50	10.70	25.24	3.16	8.26	8.29	2.82	6.70	29.24	18.81	19.51	73.99
1982	0.19	7.43	2.45	4.57	11.00	25.63	2.55	7.12	7.80	2.54	6.12	26.14	18.42	19.07	70.85
1983	0.19	7.02	2.50	4.68	11.24	25.63	2.49	6.83	7.42	2.65	6.36	25.75	18.59	19.13	70.52
1984	0.21	7.29	2.54	4.93	11.51	26.48	2.84	7.45	8.01	2.86	6.68	27.86	19.22	19.80	74.14
1985	0.18	7.08	2.52	5.06	11.87	26.70	2.76	7.08	7.81	2.86	6.69	27.22	19.50	20.07	73.98
1986	0.18	6.82	2.56	5.24	12.06	26.85	2.64	6.69	7.92	2.83	6.53	26.63	20.27	20.81	74.30
1987	0.16	6.95	2.59	5.44	12.48	27.62	2.67	7.32	8.15	2.93	6.71	27.83	20.87	21.45	76.89
1988	0.17	7.51	2.60	5.72	12.92	28.92	2.83	7.70	8.43	3.06	6.90	28.99	21.63	22.30	80.22
1989	0.15	7.73	2.53	5.86	13.14	29.40	2.79	8.13	8.13	3.16	7.08	29.35	21.87	22.56	81.33
1990	0.16	7.22	2.17	6.02	13.22	R,6 29.43	2.76	8.50	8.32	3.23	7.09	R,6 32.03	21.81	R,6 22.62	R,6 84.09
1991	0.14	7.51	2.15	6.18	13.44	R 30.10	2.60	8.62	8.06	3.23	7.02	R 31.68	21.46	R 22.19	R 83.96
1992	0.14	7.73	2.13	6.10	13.01	R 29.80	2.51	8.97	8.64	3.32	7.08	R 32.81	21.81	R 22.54	R 85.16
1993	R 0.14	R 8.04	R 2.14	R 6.42	R 13.49	R 30.84	R 2.50	R 9.42	R 8.45	R 3.33	R 7.01	R 33.07	R 22.20	R 22.97	R 86.88
1994 P	0.17	8.05	2.23	6.56	13.70	31.30	2.48	9.41	8.80	3.42	7.14	33.72	22.66	23.45	88.45

[1] Includes supplemental natural gas.

[2] Electrical system energy losses. See Glossary and Diagram 5. Total losses are calculated as the sum of energy consumed at electric utilities to generate electricity, utility purchases of electricity from nonutility power producers, and imported electricity, minus exported electricity and electricity consumed by end users. Total losses are allocated to the end-use sectors in proportion to each sector's share of total electricity use.

[3] Beginning in 1990, includes renewable energy. See Table 10.1b.

[4] Also includes hydroelectric power and net imports of coal coke.

[5] Also includes coal, natural gas, electricity, and electrical system energy losses.

[6] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990. See Table 10.1b for quantities.

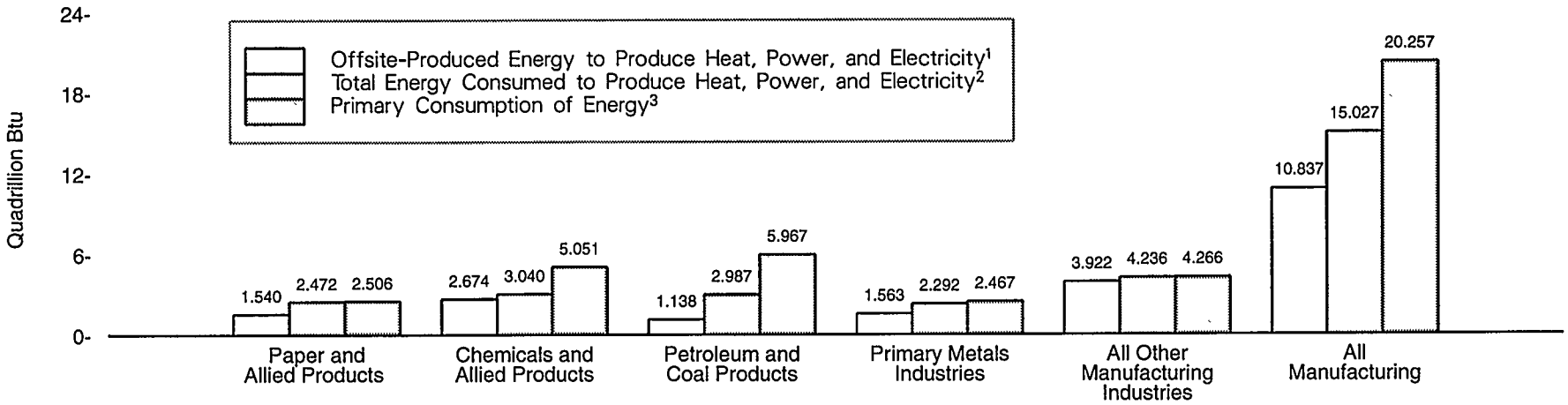
R=Revised data. P=Preliminary data.

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

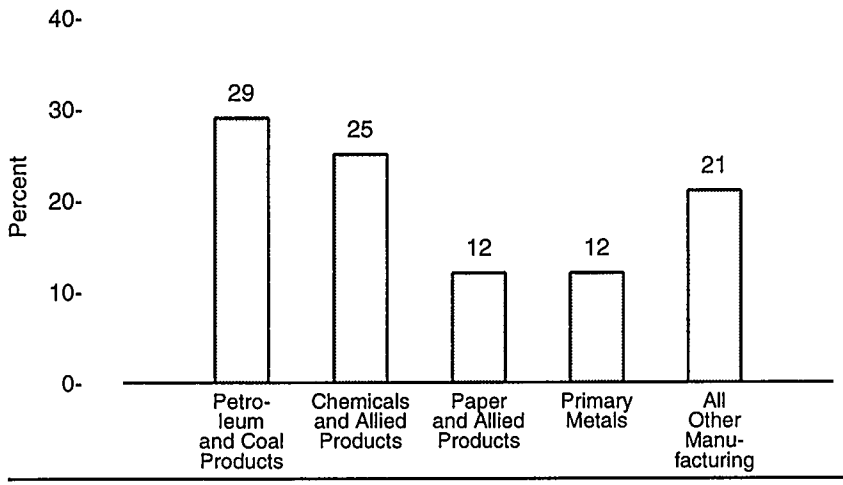
Sources: Tables 5.12a, 5.12b, 6.6, 7.3, 7.7, 8.1, 8.4, 8.6, 10.8, A3-A7, and Energy Information Administration estimates for industrial hydroelectric power. "Other" from Table 8.6 is allocated to the Residential and Commercial Sector, except for approximately 4 percent used by railroads and railways and attributed to the Transportation Sector.

Figure 2.2 Manufacturing Energy Consumption Measures, 1991

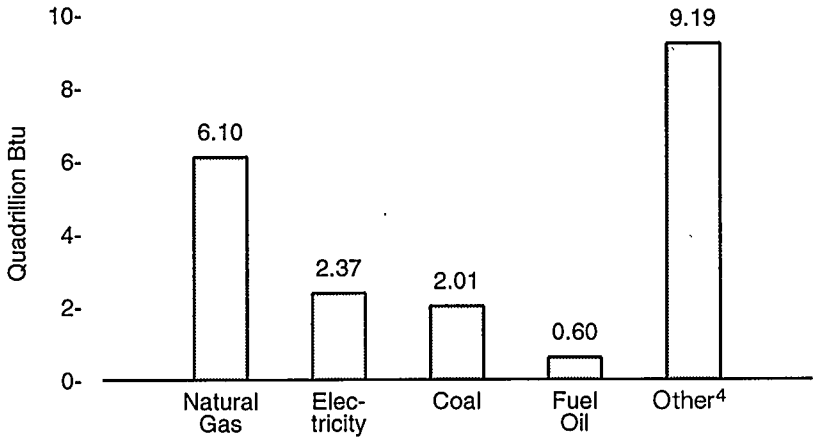
By Industry and Type of Consumption



Primary Energy Consumption by Industry



Primary Energy Consumption by Source



[1] Energy that was produced offsite and then acquired by purchase or transfer and consumed onsite for the production of heat or power.
[2] Includes by-product energy.
[3] Includes feedstocks; does not include by-product fuels.
[4] "Other" includes all other types of energy that respondents indicated were consumed; included are feedstocks and raw materials for nonenergy products, such as asphalt.
Note: Because vertical scales differ, graphs should not be compared.
Source: Table 2.2.

Table 2.2 Manufacturing Energy Consumption Measures, 1991

(Quadrillion Btu, Except as Noted)

Type of Consumption and Selected Industries	Electricity	Fuel Oil	Natural Gas	Coal	Other [1]	Total	Percent
Primary Consumption of Energy [2]	2.370	0.600	6.095	2.006	9.186	20.257	100
Paper and Allied Products	0.201	0.165	W	0.296	W	2.506	12
Chemicals and Allied Products	0.440	W	2.227	W	W	5.051	25
Petroleum and Coal Products [3]	0.105	0.086	0.838	W	W	5.967	29
Primary Metal Industries	0.499	W	0.708	0.853	W	2.467	12
All Other Manufacturing Industries	1.125	W	W	W	W	4.266	21
Total Energy Consumed to Produce Heat, Power, and Electricity [4]	2.370	0.553	5.506	1.184	5.414	15.027	100
Paper and Allied Products	0.201	0.165	0.548	0.296	1.262	2.472	16
Chemicals and Allied Products	0.440	0.060	1.669	0.253	0.618	3.040	20
Petroleum and Coal Products	0.105	0.108	0.838	W	W	2.987	20
Primary Metal Industries	0.499	0.044	0.686	0.046	1.017	2.292	15
All Other Manufacturing Industries	1.125	0.176	1.765	W	W	4.236	28
Offsite-Produced Energy Consumed to Produce Heat, Power, and Electricity [5]	2.451	0.485	5.492	1.175	1.234	10.837	100
Paper and Allied Products	0.222	0.165	0.548	0.292	0.313	1.540	14
Chemicals and Allied Products	0.474	0.059	1.665	0.249	0.227	2.674	25
Petroleum and Coal Products	0.114	0.041	0.830	W	W	1.138	11
Primary Metal Industries	0.502	0.044	0.686	0.046	0.285	1.563	14
All Other Manufacturing Industries	1.139	0.176	1.763	W	W	3.922	36

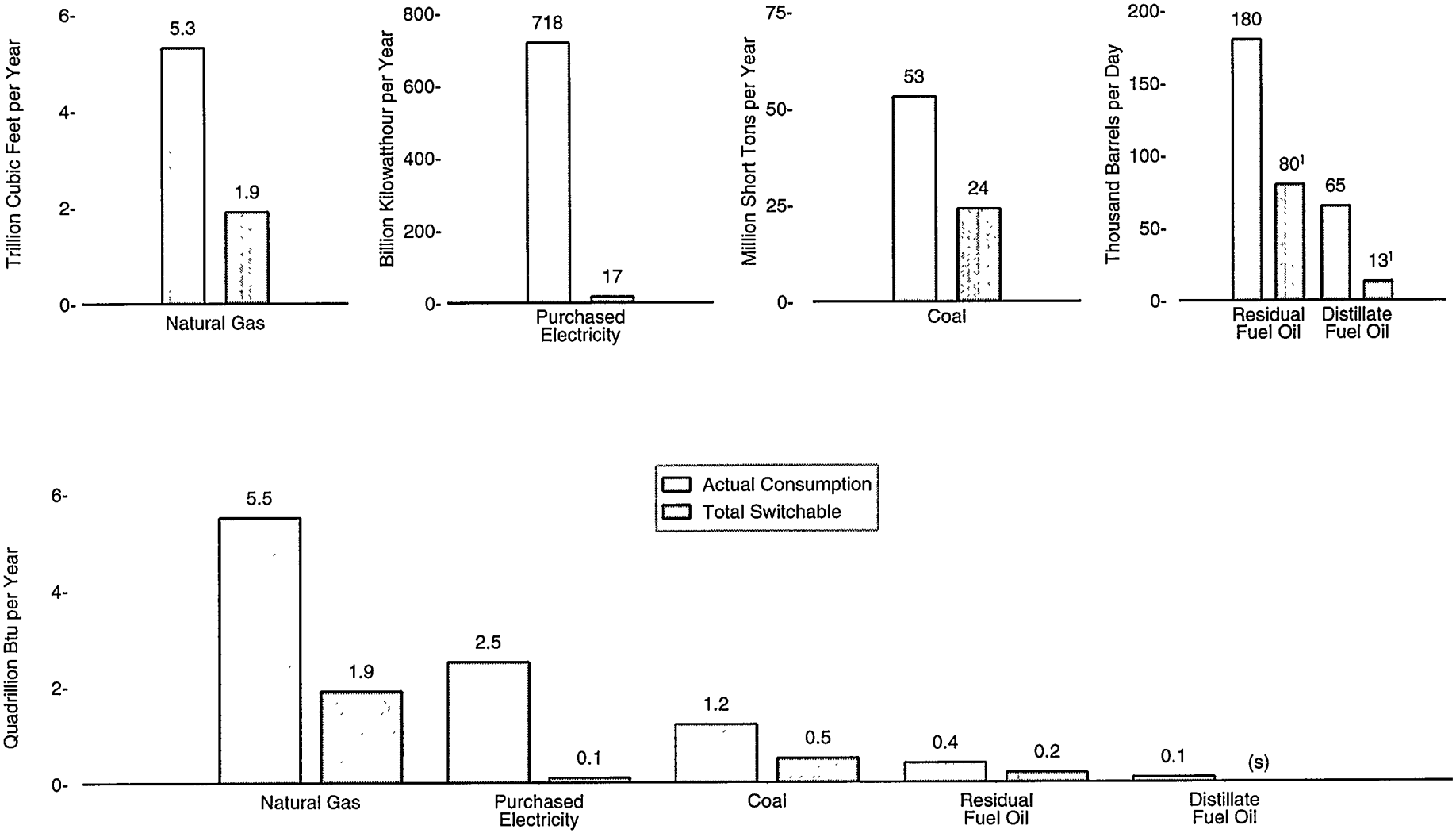
[1] Includes all other types of energy that respondents indicated were consumed.
[2] Includes feedstocks; does not include by-product fuels.
[3] Includes feedstocks and raw materials for the production of nonenergy products, regardless of the type of energy.
[4] Includes by-product energy.
[5] Energy that was produced offsite and then acquired by purchase or transfer and consumed onsite for the production of heat or power.

W=Withheld to avoid disclosing data for individual establishments. Data are included in higher level totals.

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

Source: Energy Information Administration, *Manufacturing Consumption of Energy 1991* (December 1994).

Figure 2.3 Manufacturing Fuel-Switching Capability Within 30 Days, 1991



[1]The quantity of residual and distillate fuel oils that is switchable to nonpetroleum alternative fuels is 99 thousand barrels per day, if all possible switching from nonpetroleum fuels took place.

(s)=Less than 0.05 quadrillion Btu.
Source: Table 2.3.

Table 2.3 Manufacturing Fuel-Switching Capability Within 30 Days, 1991

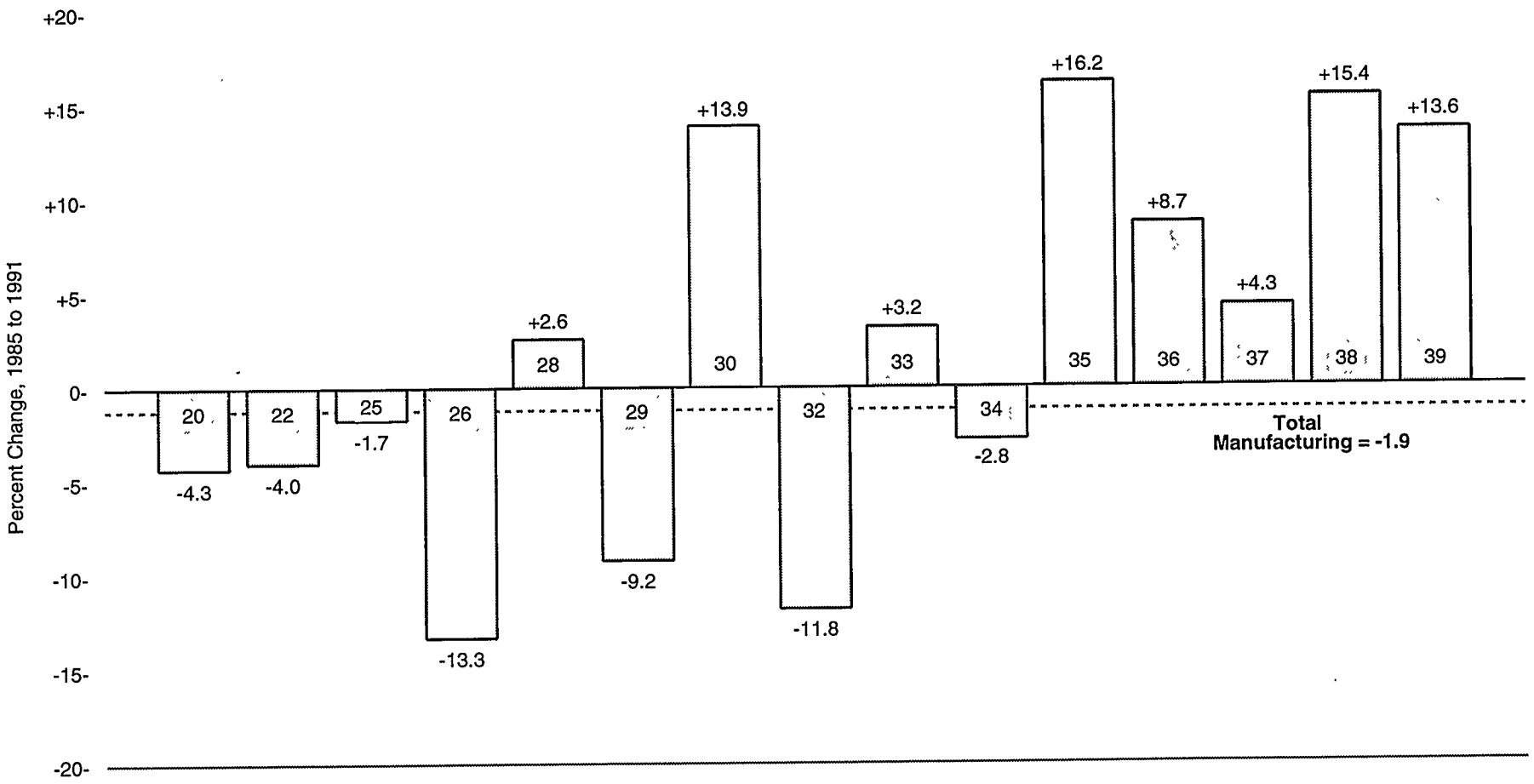
Measure of Consumption	Natural Gas		Purchased Electricity [1]		Coal		Residual Fuel Oil		Distillate Fuel Oil	
	Billion Cubic Feet per Year	Quadrillion Btu per Year	Million Kilowatt-hours per Year	Quadrillion Btu per Year	Thousand Short Tons per Year	Quadrillion Btu per Year	Thousand Barrels per Day	Quadrillion Btu per Year	Thousand Barrels per Day	Quadrillion Btu per Year
Actual	5,345	5.505	718,480	2.451	53,035	1.181	180	0.414	65	0.139
Minimum [2]	3,485	3.590	701,478	2.393	29,425	0.655	100	0.229	52	0.111
Maximum [3]	5,887	6.064	766,887	2.617	58,996	1.314	553	1.269	551	1.171
Total Switchable [4]	1,860	1.916	17,003	0.058	23,610	0.526	[5] 80	0.185	[5] 13	0.028

[1] Those quantities for which payment was made and that were available onsite for consumption.
[2] The amount of fuel actually consumed, minus the amount actually consumed that could have been replaced by other fuels.
[3] The amount of fuel actually consumed, plus the amount of additional fuels consumed that could have occurred if all possible switching from other fuels took place.
[4] The amount of fuels actually consumed that could have been replaced by other fuels.
[5] The quantity of residual fuel oil and distillate fuel oil that is switchable to nonpetroleum alternative fuels is 99 thousand barrels per day, if all possible switching from nonpetroleum fuels took place.

Note: Consumption includes energy consumed for heat, power, and onsite electricity generation. It excludes energy consumed as petrochemical feedstocks and raw material inputs.

Source: Energy Information Administration, *Manufacturing Consumption of Energy 1991* (December 1994).

Figure 2.4 Manufacturing Offsite Energy Intensity Change by Industry Group, 1985 to 1991



Note: Numbers that appear within each bar are the Standard Industrial Classification (SIC) codes for industry groups.

Source: Table 2.4.

Table 2.4 Manufacturing Energy Intensity by Industry Group, 1985, 1988, and 1991

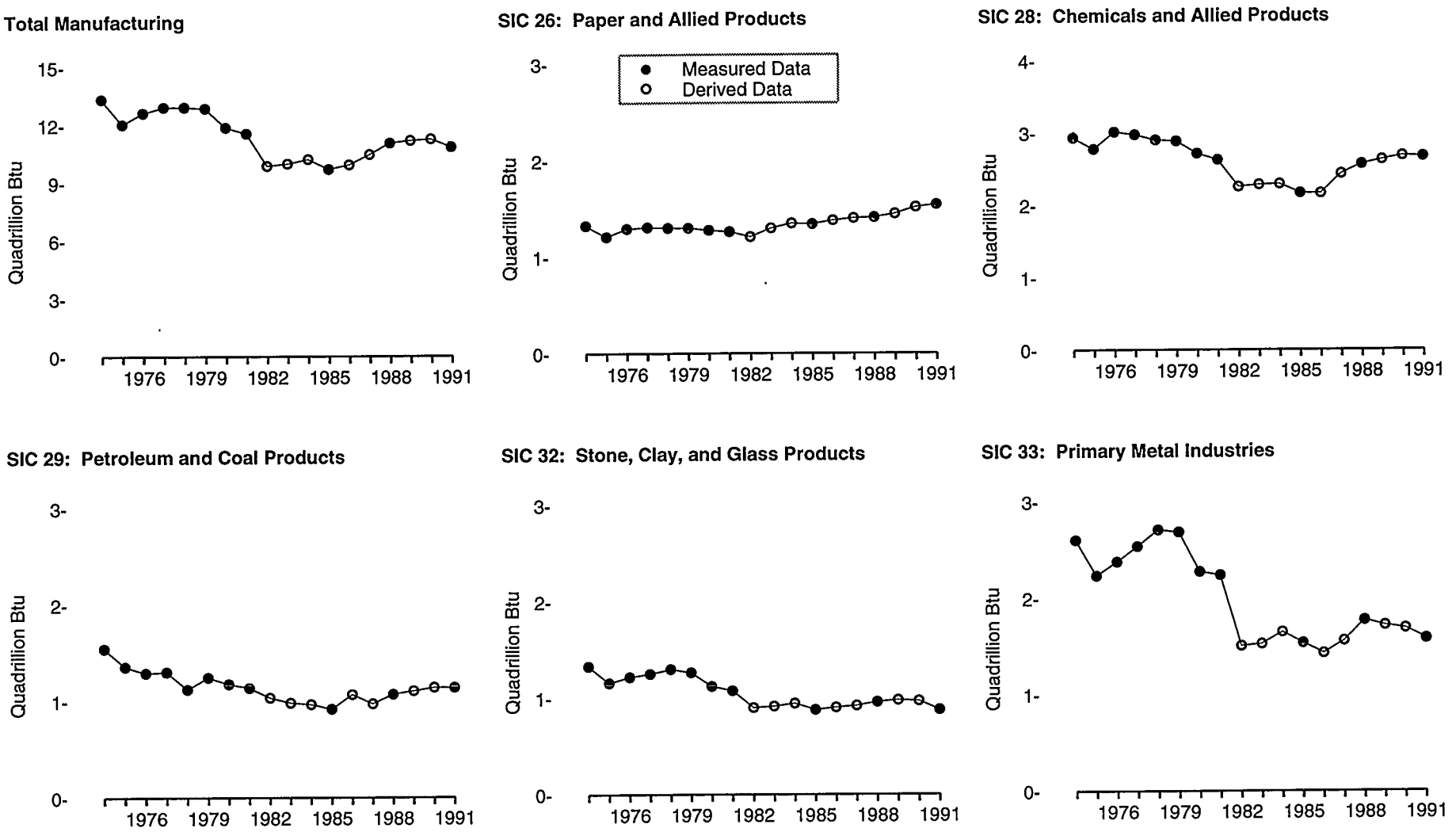
SIC [2] Code	Industry Group	Offsite Energy Intensity Ratios [3]			Offsite Energy Intensity Change [1] (percent)		
		1985	1988	1991	1985 to 1988	1985 to 1991	1988 to 1991
20	Food and Kindred Products	2.53	2.79	2.64	-10.1	-4.3	5.3
21	Tobacco Products	NA	NA	NA	NA	NA	NA
22	Textile Mill Products	4.49	4.54	4.67	-1.1	-4.0	-2.9
23	Apparel and Other Textile Products	NA	NA	NA	NA	NA	NA
24	Lumber and Wood Products	NA	NA	NA	NA	NA	NA
25	Furniture and Fixtures	1.37	1.48	1.39	-8.2	-1.7	6.1
26	Paper and Allied Products	12.27	11.29	13.90	8.0	-13.3	-23.1
27	Printing and Publishing	NA	NA	NA	NA	NA	NA
28	Chemicals and Allied Products	11.85	11.28	11.55	4.8	2.6	-2.3
29	Petroleum and Coal Products	7.63	7.83	8.33	-2.6	-9.2	-6.4
30	Rubber and Misc. Plastics Products	3.04	3.05	2.62	-0.5	13.9	14.3
31	Leather and Leather Products	NA	NA	NA	NA	NA	NA
32	Stone, Clay, and Glass Products	15.52	16.39	17.35	-5.6	-11.8	-5.8
33	Primary Metal Industries	13.84	13.66	13.40	1.3	3.2	1.9
34	Fabricated Metal Products	2.18	2.33	2.24	-6.8	-2.8	3.8
35	Industrial Machinery and Equipment	1.20	1.10	1.00	7.8	16.2	9.0
36	Electronic and Other Electric Equipment	1.15	1.21	1.05	-4.8	8.7	12.9
37	Transportation Equipment	1.04	0.97	1.00	6.8	4.3	-2.7
38	Instruments and Related Products	1.05	0.91	0.89	13.2	15.4	2.5
39	Miscellaneous Manufacturing Industries	1.25	1.27	1.08	-1.4	13.6	14.9
—	Total Manufacturing	4.35	4.26	4.44	2.1	-1.9	-4.1

[1] A decrease in the energy intensity ratio results in an increase in energy efficiency represented by a positive value.
[2] Based on 1987 Standard Industrial Classification system.
[3] Thousand Btu per constant (1987) dollar of value of shipments and receipts.
NA=Not available.

Note: Data for 1985 and 1988 are different from previously published data due to deflator and SIC adjustments.

Sources: • 1985—Energy Information Administration (EIA), Form EIA-846, "1985 Manufacturing Energy Consumption Survey." • 1988—EIA, Form EIA-846, "1988 Manufacturing Energy Consumption Survey." • 1991—EIA, Form EIA-846, "1991 Manufacturing Energy Consumption Survey."

Figure 2.5 Offsite-Produced Energy Consumed for Heat and Power by Selected Industry Group, 1974-1991



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

Source: Table 2.5.

Table 2.5 Offsite-Produced Energy Consumed for Heat and Power by Selected Industry Group, 1974-1991

(Trillion Btu)

Year	Data Source [2]	Industry Group by SIC Code [1]													
		SIC 20	SIC 22	SIC 26	SIC 28	SIC 29	SIC 30	SIC 32	SIC 33	SIC 34	SIC 35	SIC 36	SIC 37	Others [3]	Total
1974	ASM	959	323	1,327	2,937	1,545	247	1,332	2,604	408	367	251	375	661	13,337
1975	ASM	916	307	1,210	2,780	1,357	227	1,159	2,235	367	330	227	348	575	12,037
1976	ASM	938	329	1,295	3,017	1,292	237	1,220	2,380	381	330	233	380	594	12,625
1977	CM	952	339	1,308	2,979	1,303	272	1,252	2,539	395	340	249	390	610	12,929
1978	ASM	980	327	1,301	2,905	1,123	261	1,300	2,711	400	351	255	398	617	12,929
1979	ASM	949	315	1,300	2,889	1,245	249	1,266	2,689	386	353	250	385	592	12,867
1980	ASM	948	295	1,278	2,717	1,178	223	1,122	2,277	359	334	240	344	558	11,874
1981	ASM	913	292	1,262	2,630	1,137	223	1,077	2,241	352	325	235	329	546	11,563
1982	Derived	*900*	*256*	*1,210*	*2,258*	*1,035*	*231*	*901*	*1,507*	*298*	*278*	*218*	*293*	*496*	*9,881*
1983	Derived	*889*	*274*	*1,299*	*2,285*	*982*	*238*	*916*	*1,528*	*288*	*257*	*229*	*307*	*499*	*9,990*
1984	Derived	*898*	*266*	*1,349*	*2,295*	*966*	*236*	*945*	*1,650*	*319*	*268*	*235*	*325*	*510*	*10,221*
1985	MECS	876	247	1,340	2,170	917	211	878	1,537	297	241	209	322	452	9,698
1986	Derived	*894*	*258*	*1,379*	*2,167*	*1,068*	*232*	*903*	*1,431*	*302*	*243*	*219*	*339*	*502*	*9,935*
1987	Derived	*921*	*278*	*1,402*	*2,436*	*972*	*250*	*921*	*1,560*	*323*	*261*	*207*	*348*	*583*	*10,461*
1988	MECS	946	276	1,409	2,568	1,070	251	959	1,773	343	278	215	350	616	11,052
1989	Derived	*946*	*280*	*1,446*	*2,630*	*1,105*	*259*	*978*	*1,720*	*345*	*284*	*217*	*356*	*617*	*11,183*
1990	Derived	*942*	*273*	*1,514*	*2,683*	*1,140*	*255*	*970*	*1,690*	*335*	*277*	*215*	*352*	*612*	*11,256*
1991	MECS	922	272	1,540	2,674	1,138	235	877	1,563	305	236	196	318	561	10,837

[1] Standard Industrial Classification (SIC) code industry groups displayed are:
SIC 20 Food and Kindred Products
SIC 22 Textile Mill Products
SIC 26 Paper and Allied Products
SIC 28 Chemicals and Allied Products
SIC 29 Petroleum and Coal Products
SIC 30 Rubber and Misc. Plastics Products
SIC 32 Stone, Clay, and Glass Products
SIC 33 Primary Metal Industries
SIC 34 Fabricated Metal Products
SIC 35 Industrial Machinery and Equipment
SIC 36 Electronic and Other Electric Equipment
SIC 37 Transportation Equipment.

[2] ASM = U.S. Department of Commerce, Bureau of the Census, *Annual Survey of Manufactures: Fuels and Electric Energy Consumed, 1974-1976* and *1978-1981.*
CM = U.S. Department of Commerce, Bureau of the Census, *Census of Manufactures: Fuels and Electric Energy Consumed, 1977.*
MECS = Energy Information Administration, Office of Energy Markets and End Use, *Manufacturing Energy Consumption Survey: Consumption of Energy, 1985* and *1988.*
Derived = Estimates derived by using consumption data from MECS and ASM and Federal Reserve Board production indices from the *Statistical Abstract of the United States, 1984, 1990,* and *1993.*

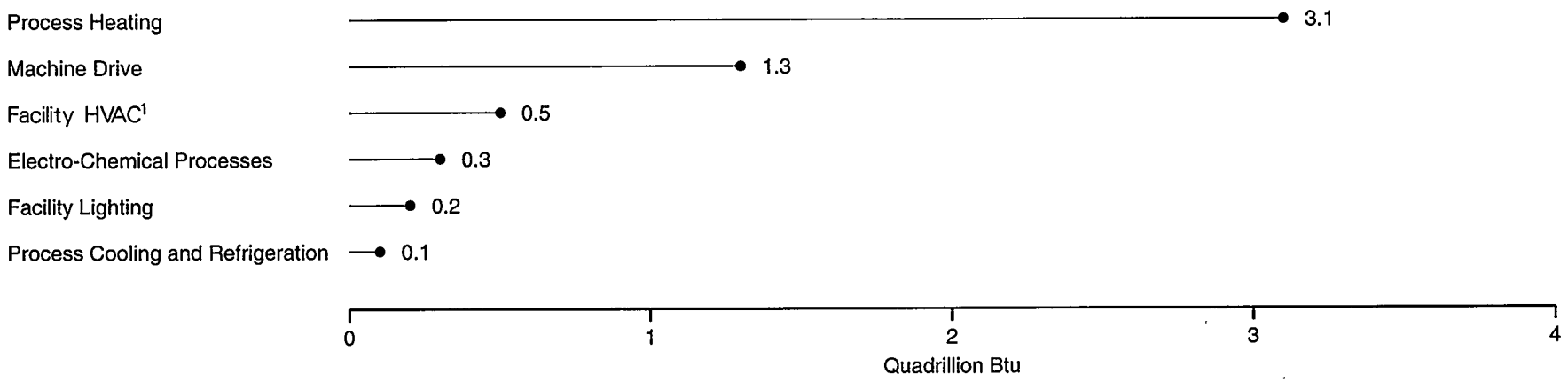
[3] Others are SIC 21 Tobacco Products; SIC 23 Apparel and Other Textile Products; SIC 24 Lumber and Wood Products; SIC 25 Furniture and Fixtures; SIC 27 Printing and Publishing; SIC 31 Leather and Leather Products; SIC 38 Instruments and Related Products; and SIC 39 Miscellaneous Manufacturing Industries.

Note: • Totals may not equal sum of components due to independent rounding. • Data represent the purchased consumption, defined as consumption of energy that was originally produced offsite and acquired as a result of a purchase or transfer and consumed onsite for the production of heat and power. • 1974-1986 data based on 1972 Standard Industrial Classification system. 1987-1991 data based on 1987 Standard Industrial Classification system.

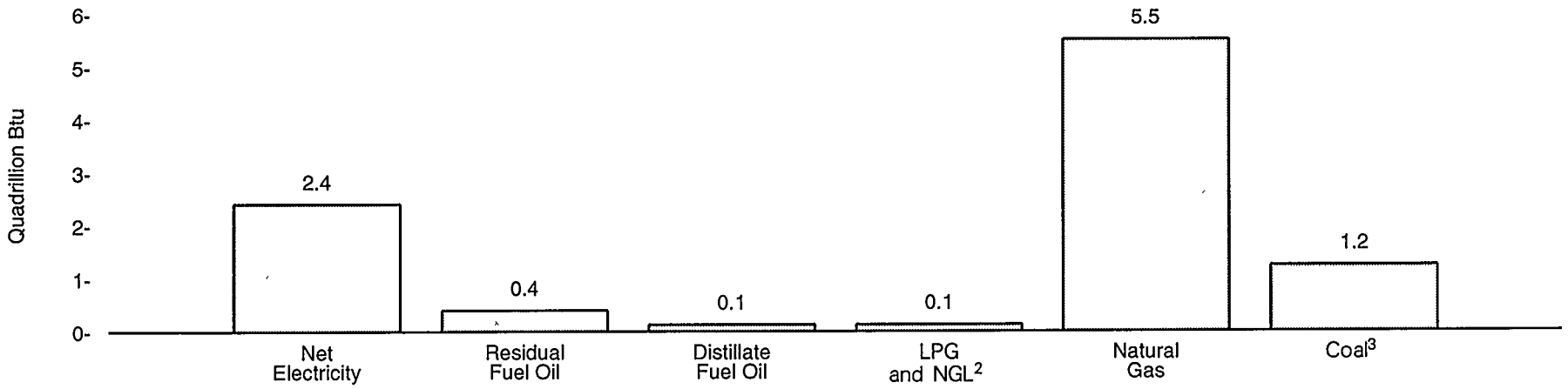
Sources: • 1974-1988—Energy Information Administration (EIA), *Derived Annual Estimates of Manufacturing Energy Consumption, 1974-1988* (August 1992), Table 1. • 1989-forward—EIA, Form EIA-846, "1991 Manufacturing Energy Consumption Survey."

Figure 2.6 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation, 1991

By Selected End Uses



By Energy Source



[1] Heating, ventilation, and air conditioning.
[2] Liquefied petroleum gases and natural gas liquids.
[3] Excluding coal coke and breeze.
Source: Table 2.6.

Table 2.6 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation by Energy Source, 1991

End-Use Category	Net Electricity [1]	Residual Fuel Oil	Distillate Fuel Oil [2]	LPG and NGL [3]	Natural Gas [4]	Coal (Excluding Coal Coke and Breeze)	Total [5]
	Million Kilowatthours	Thousand Barrels			Billion Cubic Feet	Thousand Short Tons	
Indirect End Use (Boiler Fuel)	W	47,009	6,850	4,928	2,037	38,473	
Direct End Use							
All Process Uses	546,382	17,342	5,800	16,908	2,503	14,075	
Process Heating [6]	68,853	16,959	3,177	12,704	2,312	14,075	
Process Cooling and Refrigeration	36,330	6	30	18	13	0	
Machine Drive	347,899	353	2,398	4,093	123	0	
Electro-Chemical Processes	89,005	—	—	—	—	—	
Other Process Uses	4,295	24	196	93	55	(s)	
All Non-Process Uses	116,156	1,148	9,134	5,105	682	W	
Facility Heating, Ventilation, and Air Conditioning [6]	56,165	673	1,372	731	275	15	
Facility Lighting	47,309	—	—	—	—	—	
Other Facility Support	10,537	W	81	62	22	0	
Onsite Transportation	1,114	—	6,533	4,242	(s)	—	
Conventional Electricity Generation	—	325	734	41	337	W	
Other Non-Process Use	1,031	W	413	30	48	0	
End Use Not Reported	W	339	2,101	1,028	124	W	
Total	694,702	65,837	23,885	27,970	5,345	53,035	
	Trillion Btu						
Indirect End Use (Boiler Fuel)	W	296	40	18	2,098	859	W
Direct End Use							
All Process Uses	1,864	109	34	64	2,578	314	4,963
Process Heating [6]	235	107	19	49	2,382	314	3,106
Process Cooling and Refrigeration	124	(s)	(s)	(s)	13	0	137
Machine Drive	1,187	2	14	15	127	0	1,345
Electro-Chemical Processes	304	—	—	—	—	—	304
Other Process Uses	15	(s)	1	(s)	56	(s)	72
All Non-Process Uses	396	7	53	19	702	W	W
Facility Heating, Ventilation, and Air Conditioning [6]	192	4	8	3	283	(s)	490
Facility Lighting	161	—	—	—	—	—	161
Other Facility Support	36	W	(s)	(s)	23	0	W
Onsite Transportation	4	—	38	16	(s)	—	58
Conventional Electricity Generation	—	2	4	(s)	347	W	W
Other Non-Process Use	4	W	2	(s)	49	0	W
End Use Not Reported	W	2	12	4	128	W	W
Total	2,370	414	139	105	5,506	1,184	9,718

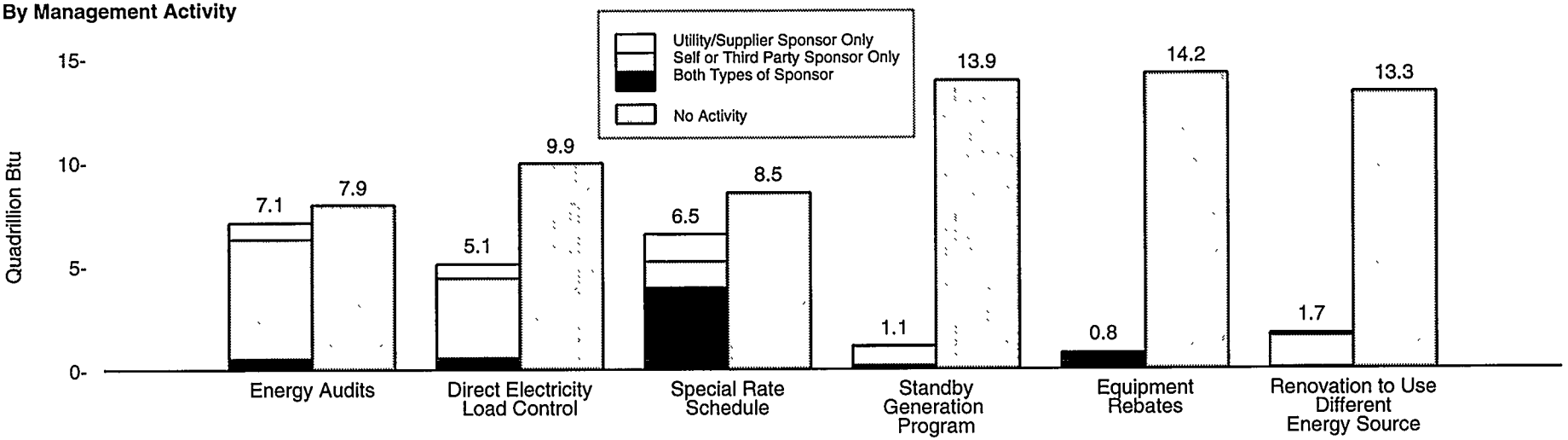
[1] "Net Electricity" is obtained by summing purchases, transfers in, and generation from noncombustible renewable resources, minus quantitities sold and transferred out.
[2] Includes fuel oil nos. 1, 2, and 4, and diesel fuel nos. 1, 2, and 4.
[3] Liquefied petroleum gases and natural gas liquids.
[4] Includes natural gas obtained from utilities, transmission pipelines, any other supplier(s), such as brokers and producers.
[5] Total of major energy sources. The top half of the "Total" column is blank because different physical units cannot be added.
[6] Excludes steam and hot water.
— = Estimation of energy input quantity is not applicable. W=Withheld to avoid disclosing data for individual establishments. Data are included in higher level totals. (s)=Less than 0.5 rounded to zero.

Notes: • Totals may not equal sum of components due to independent rounding. • The estimates of combustible energy presented in this table are for the total consumption of energy for the production of heat and power, regardless of where the energy was produced. Specifically, the estimates include the quantities of energy that were originally produced offsite 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.

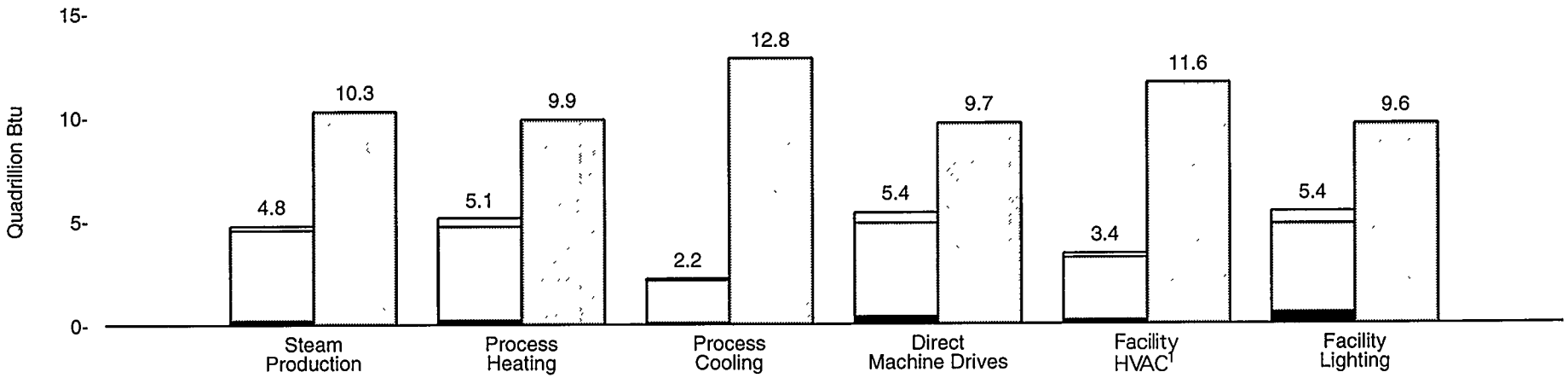
Source: Energy Information Administration, Form EIA-846, "1991 Manufacturing Energy Consumption Survey."

Figure 2.7 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation in 1991 by Energy Management Activity Present from 1989-1991

By Management Activity



Equipment Installation or Retrofit for the Primary Purpose of Improving Energy Efficiency Affecting:



[1] Heating, ventilation, and air conditioning.
Note: These energy management activities are commonly called demand-side management programs when conducted by utility or supplier.
Source: Table 2.7.

Table 2.7 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation in 1991 by Energy Management Activity Present from 1989-1991

Sponsorship [1]	Energy Audits	Direct Electricity Load Control	Special Rate Schedule [2]	Standby Generation Program	Equipment Rebates	Equipment Installation or Retrofit for the Primary Purpose of Improving Energy Efficiency Affecting: Steam Production [3]	Process Heating	Process Cooling	Direct Machine Drives [4]	Facility HVAC [5]	Facility Lighting	Renovation to Use Different Energy Source [6]	Other [7]
	Quadrillion Btu												
Any Type of Sponsor	7.083	5.086	6.517	1.133	0.783	4.757	5.146	2.212	5.354	3.424	5.405	1.693	0.376
Utility/Supplier Sponsor Only [8]	0.532	0.565	3.939	0.176	0.582	0.200	0.209	0.069	0.351	0.175	0.518	0.049	0.056
Self or Third Party Sponsor Only	5.757	3.853	1.269	0.918	0.095	4.360	4.517	2.059	4.511	3.061	4.285	1.525	0.271
Both	0.793	0.668	1.310	0.038	0.106	0.197	0.419	0.084	0.493	0.187	0.602	0.120	0.049
No Activity	7.944	9.941	8.509	13.894	14.244	10.269	9.881	12.815	9.672	11.603	9.622	13.333	14.651
Total	15.027	15.027	15.027	15.027	15.027	15.027	15.027	15.027	15.027	15.027	15.027	15.027	15.027
	Percent												
Any Type of Sponsor	47.1	33.8	43.4	7.5	5.2	31.7	34.2	14.7	35.6	22.8	36.0	11.3	2.5
Utility/Supplier Sponsor Only [8]	3.5	3.8	26.2	1.2	3.9	1.3	1.4	0.5	2.3	1.2	3.4	0.3	0.4
Self or Third Party Sponsor Only	38.3	25.6	8.4	6.1	0.6	29.0	30.1	13.7	30.0	20.4	28.5	10.1	1.8
Both	5.3	4.4	8.7	0.3	0.7	1.3	2.8	0.6	3.3	1.2	4.0	0.8	0.3
No Activity	52.9	66.2	56.6	92.5	94.8	63.3	65.8	85.3	64.4	77.2	64.0	88.7	97.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

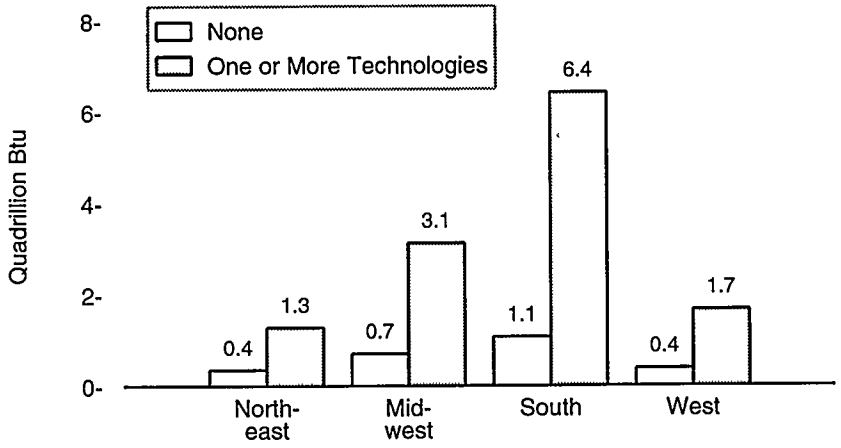
[1] Sponsorship of an energy management activity was determined by the manufacturing establishment.
[2] For example, interruptible or time-of-use rates.
[3] For example, boilers or nozzles.
[4] For example, adjustable-speed drives, motors, and pumps.
[5] Heating, ventilation, and air conditioning.
[6] Equipment retrofit or installation for the primary purpose of using different energy source (e.g., electrification).
[7] Included are power factor corrections, improvements in operating procedures, and other energy management activities reported by survey respondents.
[8] These energy management activities are commonly called demand-side management programs when conducted by utility or supplier.

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

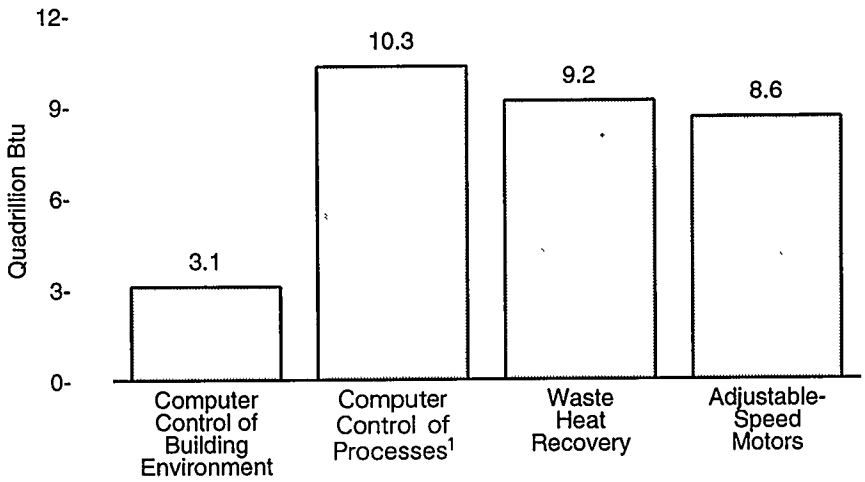
Source: Energy Information Administration, Form EIA-846, "1991 Manufacturing Energy Consumption Survey."

Figure 2.8 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation by Technology, 1991

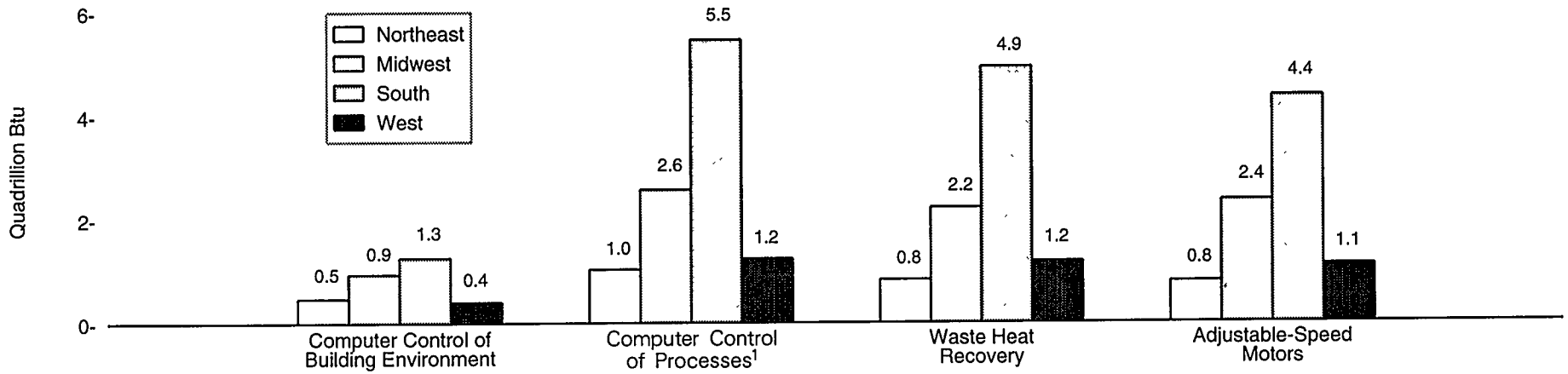
Either No Presence or Presence of Energy-Related Technologies,by Region



Energy-Related Technologies by Technology Type



Energy-Related Technologies by Technology Type by Region



[1] Or major energy-using equipment.
Notes: • See Appendix F for Census regions.

• Because vertical scales differ, graphs should not be compared.
Source: Table 2.8.

Table 2.8 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation by Technology, 1991

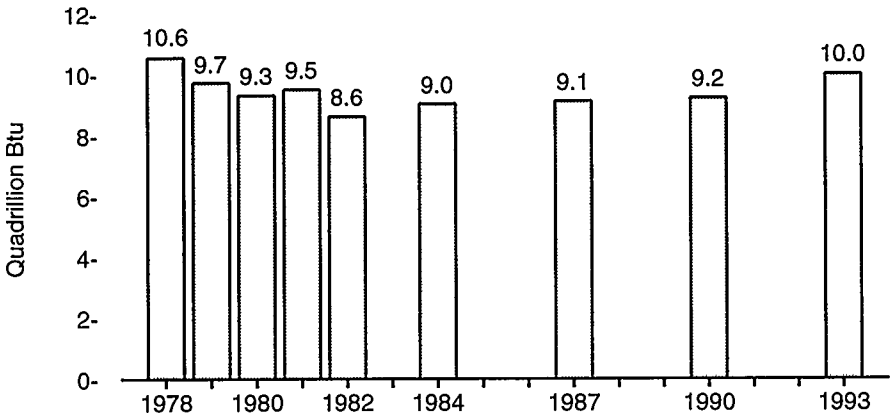
Census Region [1]	Total	No Presence of Selected Technologies [2]	Presence of One or More Selected Technologies [2]	Types of General Energy-Related Technologies			
				Computer Control of Building Environment [3]	Computer Control of Processes or Major Energy-Using Equipment [4]	Waste Heat Recovery	Adjustable-Speed Motors
	Quadrillion Btu						
Northeast	1.635	0.352	1.282	0.473	1.033	0.828	0.791
Midwest	3.833	0.703	3.130	0.942	2.570	2.219	2.356
South	7.507	1.078	6.429	1.260	5.463	4.931	4.365
West	2.052	0.383	1.669	0.406	1.235	1.180	1.112
United States	**15.027**	**2.516**	**12.510**	**3.081**	**10.300**	**9.158**	**8.623**
	Percent						
Northeast	10.9	14.0	10.2	15.4	10.0	9.0	9.2
Midwest	25.5	27.9	25.0	30.6	25.0	24.2	27.3
South	50.0	42.8	51.4	40.9	53.0	53.8	50.6
West	13.7	15.2	13.3	13.2	12.0	12.9	12.9
United States	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

[1] See Appendix F for Census regions.
[2] "Selected Technologies" include both general and industry-specific technologies.
[3] For example, space heating or cooling and lighting.
[4] For example, boilers, furnaces, and conveyers.

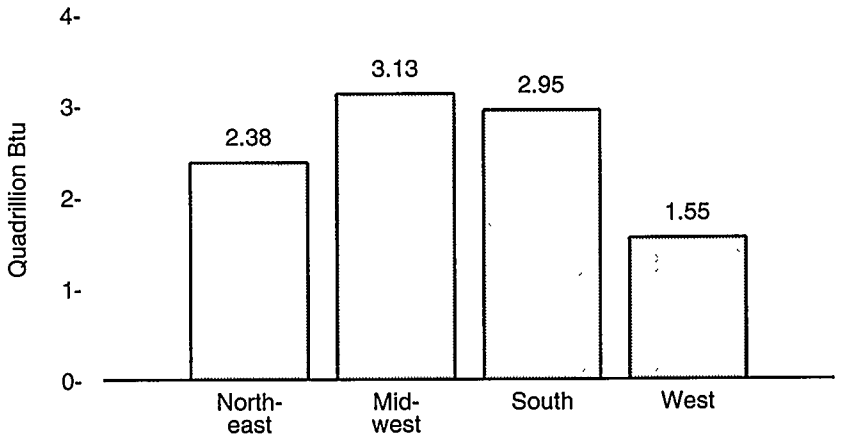
Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Form EIA-846, "1991 Manufacturing Energy Consumption Survey."

Figure 2.9 Household Energy Consumption

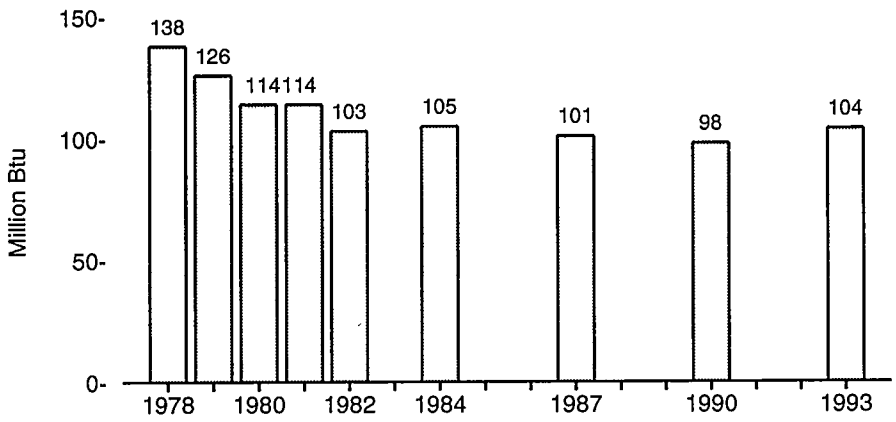
Consumption by All Households, Selected Years, 1978-1993



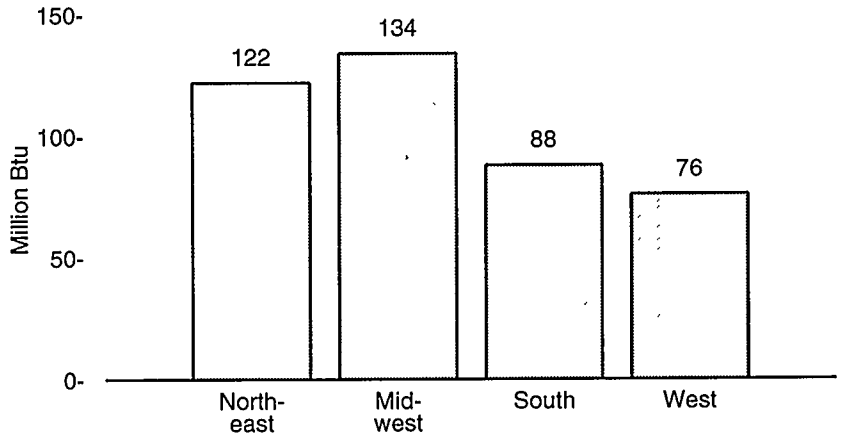
Consumption by All Households, by Census Region, 1993



Consumption per Household, Selected Years, 1978-1993



Consumption per Household, by Census Region, 1993



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, and 1993 are for the calendar year. • Because vertical scales differ, graphs should not be compared.

Source: Table 2.9. See Appendix F for Census regions.

Table 2.9 Household Energy Consumption by Census Region, Selected Years, 1978-1993

(Quadrillion Btu, Except as Noted)

Census Region [1]	1978	1979	1980	1981	1982	1984	1987	1990	1993
Northeast	**2.89**	**2.50**	**2.43**	**2.47**	**2.18**	**2.29**	**2.37**	**2.30**	**2.38**
Natural Gas	1.14	1.05	0.92	1.06	0.99	0.93	1.03	1.03	1.11
Electricity [2]	0.39	0.39	0.39	0.42	0.38	0.41	0.44	0.47	0.47
Distillate Fuel Oil and Kerosene	1.32	1.03	1.09	0.96	0.79	0.93	0.87	0.78	0.78
Liquefied Petroleum Gases	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.02	0.03
Consumption per Household (million Btu)	166	145	138	138	122	125	124	120	122
Midwest	**3.70**	**3.48**	**2.92**	**3.12**	**2.60**	**2.80**	**2.73**	**2.81**	**3.13**
Natural Gas	2.53	2.48	2.02	2.24	1.76	1.99	1.83	1.88	2.07
Electricity [2]	0.60	0.59	0.60	0.57	0.57	0.55	0.61	0.66	0.74
Distillate Fuel Oil and Kerosene	0.46	0.31	0.16	0.17	0.15	0.13	0.16	0.12	0.13
Liquefied Petroleum Gases	0.12	0.10	0.15	0.13	0.11	0.13	0.13	0.13	0.19
Consumption per Household (million Btu)	180	168	139	147	122	129	123	122	134
South	**2.43**	**2.30**	**2.59**	**2.46**	**2.46**	**2.50**	**2.61**	**2.60**	**2.95**
Natural Gas	0.96	0.91	1.11	1.16	1.13	1.15	1.09	1.03	1.18
Electricity [2]	1.00	0.97	1.06	1.03	1.05	1.06	1.22	1.36	1.51
Distillate Fuel Oil and Kerosene	0.32	0.28	0.27	0.16	0.17	0.16	0.17	0.11	0.13
Liquefied Petroleum Gases	0.15	0.14	0.15	0.12	0.12	0.12	0.12	0.10	0.13
Consumption per Household (million Btu)	99	92	96	89	88	85	84	81	88
West	**1.54**	**1.47**	**1.38**	**1.47**	**1.38**	**1.45**	**1.42**	**1.51**	**1.55**
Natural Gas	0.95	0.88	0.89	0.93	0.89	0.91	0.88	0.92	0.91
Electricity [2]	0.48	0.47	0.41	0.46	0.42	0.47	0.48	0.54	0.56
Distillate Fuel Oil and Kerosene	0.09	0.09	0.04	0.03	0.03	0.04	0.02	0.00	0.03
Liquefied Petroleum Gases	0.03	0.04	0.04	0.04	0.04	0.03	0.05	0.03	0.04
Consumption per Household (million Btu)	110	100	86	90	84	85	78	78	76
United States	**10.56**	**9.74**	**9.32**	**9.51**	**8.62**	**9.04**	**9.13**	**9.22**	**10.01**
Natural Gas	5.58	5.31	4.94	5.39	4.77	4.98	4.83	4.86	5.27
Electricity [2]	2.47	2.42	2.46	2.48	2.42	2.48	2.76	3.03	3.28
Distillate Fuel Oil and Kerosene	2.19	1.71	1.55	1.33	1.14	1.26	1.22	1.04	1.07
Liquefied Petroleum Gases	0.33	0.31	0.36	0.31	0.29	0.31	0.32	0.28	0.38
Consumption per Household (million Btu) [3]	138	126	114	114	103	105	101	98	104

[1] See Appendix F for Census regions.

[2] Includes electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

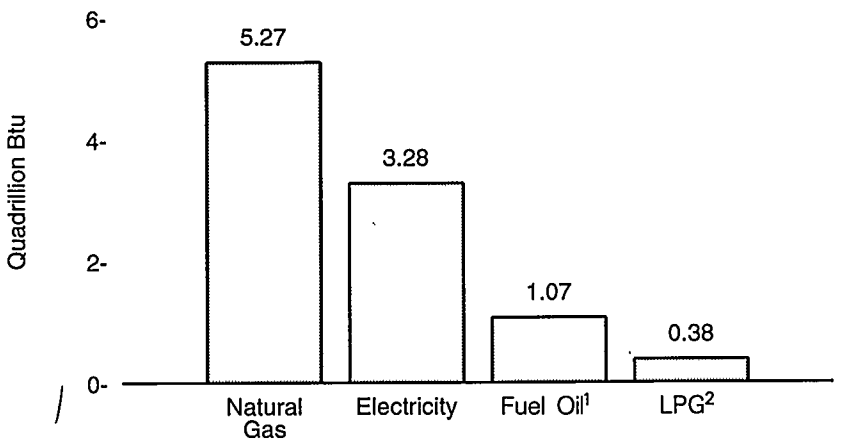
[3] Data not adjusted to account for more severe winter weather in earlier years when the survey was fielded. 1993 weather was normal, similar to that for 1982 and 1984.

Notes: • This table shows major energy items only. • No data are available for years not shown. • One Btu of electricity = 0.000293 (1 ÷ 3,412) kWh. • Data for 1978-1984 are for April of year shown through March of following year; data for 1987, 1990, and 1993 are for the calendar year. • Totals may not equal sum of components due to independent rounding.

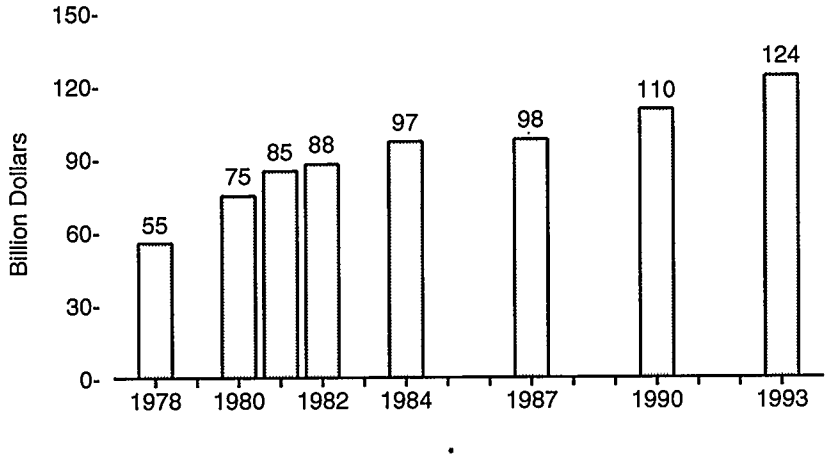
Sources: • 1978 and 1979—Energy Information Administration (EIA), Form EIA-84, "Residential Energy Consumption Survey." • 1980 forward—EIA, Form EIA-457, "Residential Energy Consumption Survey."

Figure 2.10 Household Energy Consumption and Expenditures

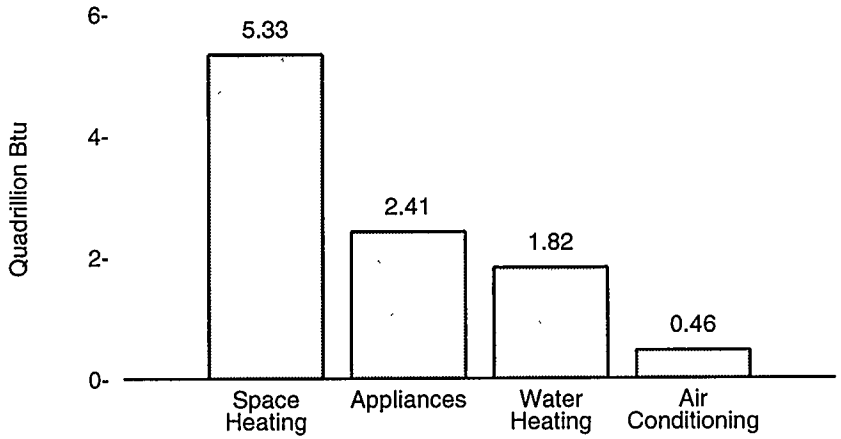
Consumption by Energy Source, 1993



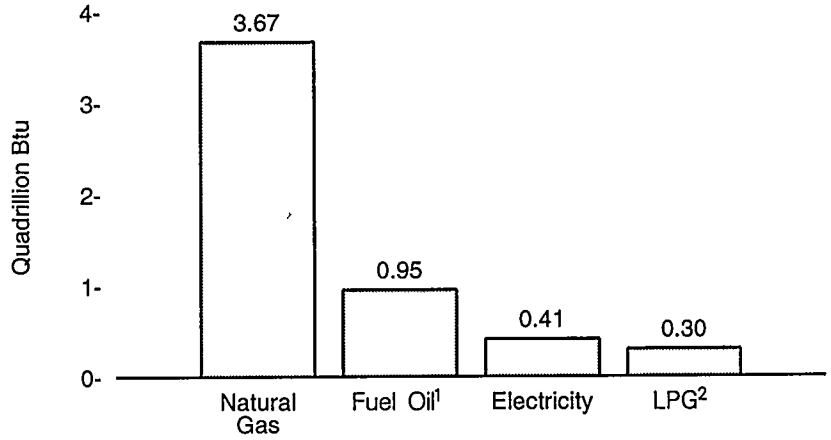
Expenditures, Selected Years, 1978-1993



Consumption by End Use, 1993



Consumption for Space Heating, 1993



[1] Fuel oil is distillate fuel oil and kerosene.
[2] Liquefied petroleum gases.
Notes: • No data are available for years not shown.

• Because vertical scales differ, graphs should not be compared.
Source: Table 2.10.

Table 2.10 Household Energy Consumption and Expenditures by End Use and Energy Source, Selected Years, 1978-1993

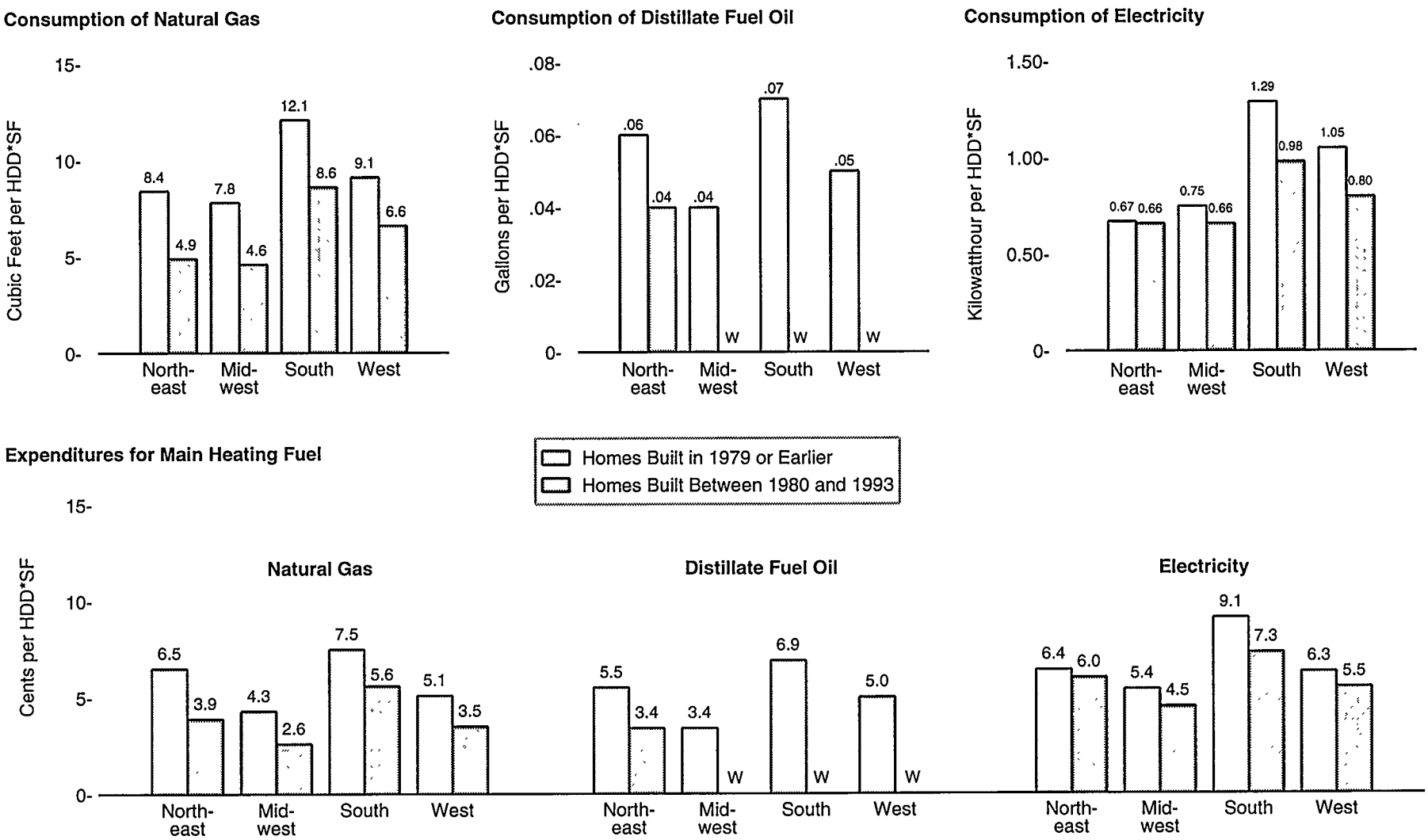
Year	Space Heating				A/C [1,2]	Water Heating				Appliances [3]			Total [2]			
	Natural Gas	Electricity [4]	Fuel Oil [5]	LPG [6]	Electricity [4]	Natural Gas	Electricity [4]	Fuel Oil [5]	LPG [6]	Natural Gas	Electricity [4]	LPG [6]	Natural Gas	Electricity [4]	Fuel Oil [5]	LPG [6]
	Consumption (quadrillion Btu)															
1978	4.26	0.41	2.05	0.23	0.31	1.04	0.29	0.14	0.06	0.28	1.46	0.03	5.58	2.47	2.19	0.33
1980	3.32	0.28	1.32	0.25	0.32	1.24	0.31	0.24	0.07	0.38	1.55	0.04	4.94	2.46	1.55	0.36
1981	3.81	0.30	1.13	0.22	0.33	1.10	0.33	0.21	0.06	0.49	1.53	0.03	5.39	2.48	1.33	0.31
1982	3.31	0.27	1.05	0.19	0.30	1.08	0.33	0.09	0.06	0.39	1.52	0.04	4.77	2.42	1.14	0.29
1984	3.51	0.30	1.10	0.21	0.36	1.10	0.32	0.15	0.06	0.35	1.53	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	0.94	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	2.09	0.03	5.27	3.28	1.07	0.38
	Expenditures (billion dollars)															
1978	11.49	3.53	8.06	1.05	3.97	2.88	3.15	0.56	0.36	0.93	19.24	0.25	15.30	29.89	8.62	1.66
1980	12.80	3.71	10.59	1.90	5.07	4.79	4.54	1.89	0.59	1.71	26.82	0.41	19.30	40.14	12.48	2.89
1981	17.07	4.60	9.99	1.84	5.96	4.93	5.32	1.83	0.53	2.50	30.02	0.37	24.50	45.90	11.82	2.74
1982	18.55	4.45	8.84	1.68	6.05	6.08	5.90	0.75	0.57	2.42	32.02	0.47	27.06	48.42	9.59	2.72
1984	20.66	5.71	8.51	2.00	7.51	6.63	6.44	1.09	0.58	2.31	34.95	0.54	29.80	54.50	9.60	3.10
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	11.19	6.59	7.21	0.83	0.64	2.03	46.95	0.48	27.26	71.54	8.25	3.14
1993	21.95	8.66	6.25	2.81	11.30	8.08	7.58	0.73	0.58	1.98	53.53	0.42	32.04	81.08	6.98	3.81

[1] A/C = Air conditioning.
[2] A small amount of natural gas used for air conditioning is included in "Natural Gas" under "Total."
[3] Includes refrigerators.
[4] Includes electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal electricity.
[5] Fuel oil is distillate fuel oil and kerosene.
[6] Liquefied petroleum gases.

Notes: • No data are available for years not shown. Consumption totals for 1979 are available on Table 2.9. • One Btu of electricity = 0.000293 (1 ÷ 3,412) kWh. • Totals may not equal sum of components due to independent rounding.

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

Figure 2.11 Household Energy Consumption and Expenditure Indicators by Census Region and Vintage of Housing Unit, 1993



W=Data withheld because fewer than 10 housing units were sampled. NC=No cases in sample

Note: HDD*SF=heating degree-days times square footage.
Source: Table 2.11. See Appendix F for Census regions.

Table 2.11 Household Energy Consumption and Expenditure Indicators by Census Region and Vintage of Housing Unit, 1993

Source and Indicator (Units)	Census Regions [1]								United States	
	Northeast		Midwest		South		West			
	Built in 1979 or Earlier	Built Between 1980-1993	Built in 1979 or Earlier	Built Between 1980-1993	Built in 1979 or Earlier	Built Between 1980-1993	Built in 1979 or Earlier	Built Between 1980-1993	Built in 1979 or Earlier	Built Between 1980-1993
Natural Gas										
Households Using Natural Gas as Main Space Heating Source (million)	8.2	1.3	14.4	2.5	9.7	3.3	9.6	2.5	41.8	9.6
Annual Consumption per Household for Main Space Heating (1,000 cubic feet)	83.2	54.9	93.1	70.9	60.9	46.7	43.5	46.8	72.3	54.2
Annual Expenditures per Household for Main Space Heating (dollars)	640	440	513	398	378	303	241	251	445	333
Annual Heating Degree-Days (degree-days)	5,749	6,058	6,586	6,684	3,277	2,974	3,161	3,888	4,869	4,598
Average Heated Floor Space (square feet)	1,718	1,846	1,808	2,287	1,530	1,822	1,508	1,839	1,657	1,952
Consumption per 1,000 Square Foot * HDD (cubic feet)	8.4	4.9	7.8	4.6	12.1	8.6	9.1	6.6	9.0	6.0
Expenditures per 1,000 Square Foot * HDD (cents)	6.5	3.9	4.3	2.6	7.5	5.6	5.1	3.5	5.5	3.7
Electricity [2]										
Households Using Electricity as Main Space Heating Source (million)	1.3	0.7	1.7	1.2	7.5	7.1	3.8	1.8	14.3	10.7
Annual Consumption per Household for Main Space Heating (kWh)	5,492	6,137	8,215	5,571	4,395	3,638	4,632	3,127	5,001	3,928
Annual Expenditures per Household for Main Space Heating (dollars)	527	557	589	376	311	271	279	214	354	291
Annual Heating Degree-Days (degree-days)	6,026	6,076	6,445	5,994	2,451	2,434	3,943	3,008	3,633	3,157
Average Heated Floor Space (square feet)	1,368	1,536	1,695	1,407	1,390	1,527	1,124	1,294	1,352	1,476
Consumption per 1,000 Square Foot * HDD (kWh)	0.67	0.66	0.75	0.66	1.29	0.98	1.05	0.80	1.02	0.84
Expenditures per 1,000 Square Foot * HDD (cents)	6.4	6.0	5.4	4.5	9.1	7.3	6.3	5.5	7.2	6.2
Distillate Fuel Oil										
Households Using Oil as Main Space Heating Source (million)	6.3	0.7	1.3	W	1.4	W	0.4	W	9.4	0.8
Annual Consumption per Household for Main Space Heating (gallons)	653	555	690	W	515	W	535	W	633	532
Annual Expenditures per Household for Main Space Heating (dollars)	586	505	592	W	494	W	543	W	571	483
Annual Heating Degree-Days (degree-days)	5,926	6,511	7,747	W	3,852	W	5,380	W	5,841	6,322
Average Heated Floor Space (square feet)	1,813	2,282	2,246	W	1,846	W	2,009	W	1,885	2,222
Consumption per 1,000 Square Foot * HDD (gallons)	0.06	0.04	0.04	W	0.07	W	0.05	W	0.06	0.04
Expenditures per 1,000 Square Foot * HDD (cents)	5.5	3.4	3.4	W	6.9	W	5.0	W	5.2	3.4
Liquefied Petroleum Gases (LPG)										
Households Using LPG as Main Space Heating Source (million)	W	0.1	1.4	0.3	1.8	0.5	0.2	0.1	3.5	1.1
Annual Consumption per Household for Main Space Heating (gallons)	W	608	1,001	707	425	435	867	432	692	541
Annual Expenditures per Household for Main Space Heating (dollars)	W	609	762	564	406	417	791	426	581	489
Annual Heating Degree-Days (degree-days)	W	7,075	6,939	6,884	2,827	3,033	6,452	4,552	4,824	4,930
Average Heated Floor Space (square feet)	W	1,667	2,134	1,938	1,291	1,456	1,599	1,399	1,646	1,624
Consumption per 1,000 Square Foot * HDD (gallons)	W	0.05	0.07	0.05	0.12	0.10	0.08	0.07	0.09	0.07
Expenditures per 1,000 Square Foot * HDD (cents)	W	5.2	5.1	4.2	11.1	9.4	7.7	6.7	7.3	6.1

[1] See Appendix F for Census regions.

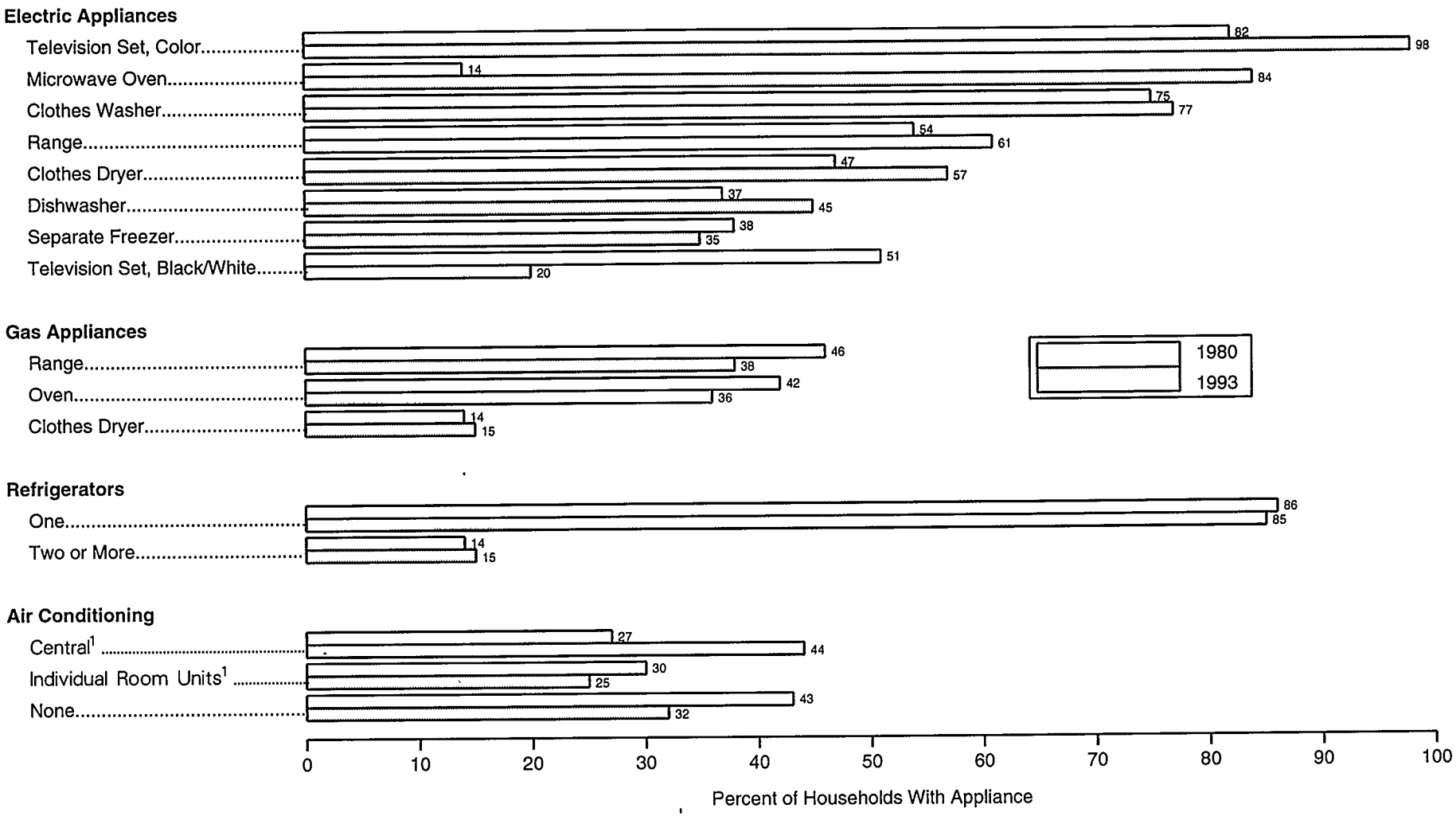
[2] Includes electricity generated for distribution from geothermal, wood, waste, wind, photovoltaic, and solar thermal energy sources.

W=Data withheld because fewer than 10 housing units were sampled.

Notes: • HDD = heating degree-days to base 65 °F. • One Btu of electricity = 0.000293 (1 ÷ 3,412) kWh. • Averages are for households using the fuel as the main space heating fuel. Space heating consumption and expenditures in this table do not show the small amounts of fuel used by households that use the fuel only as a secondary space heating fuel. • Space heating does not include electricity used by the fan that circulates warm air through the ducts. • HDD are for 1993.

Source: Energy Information Administration, Form EIA-457, "Residential Energy Consumption Survey."

Figure 2.12 Households With Selected Appliances, 1980 and 1993



[1] Households with both central and individual room units are counted only under "central." Source: Table 2.12.

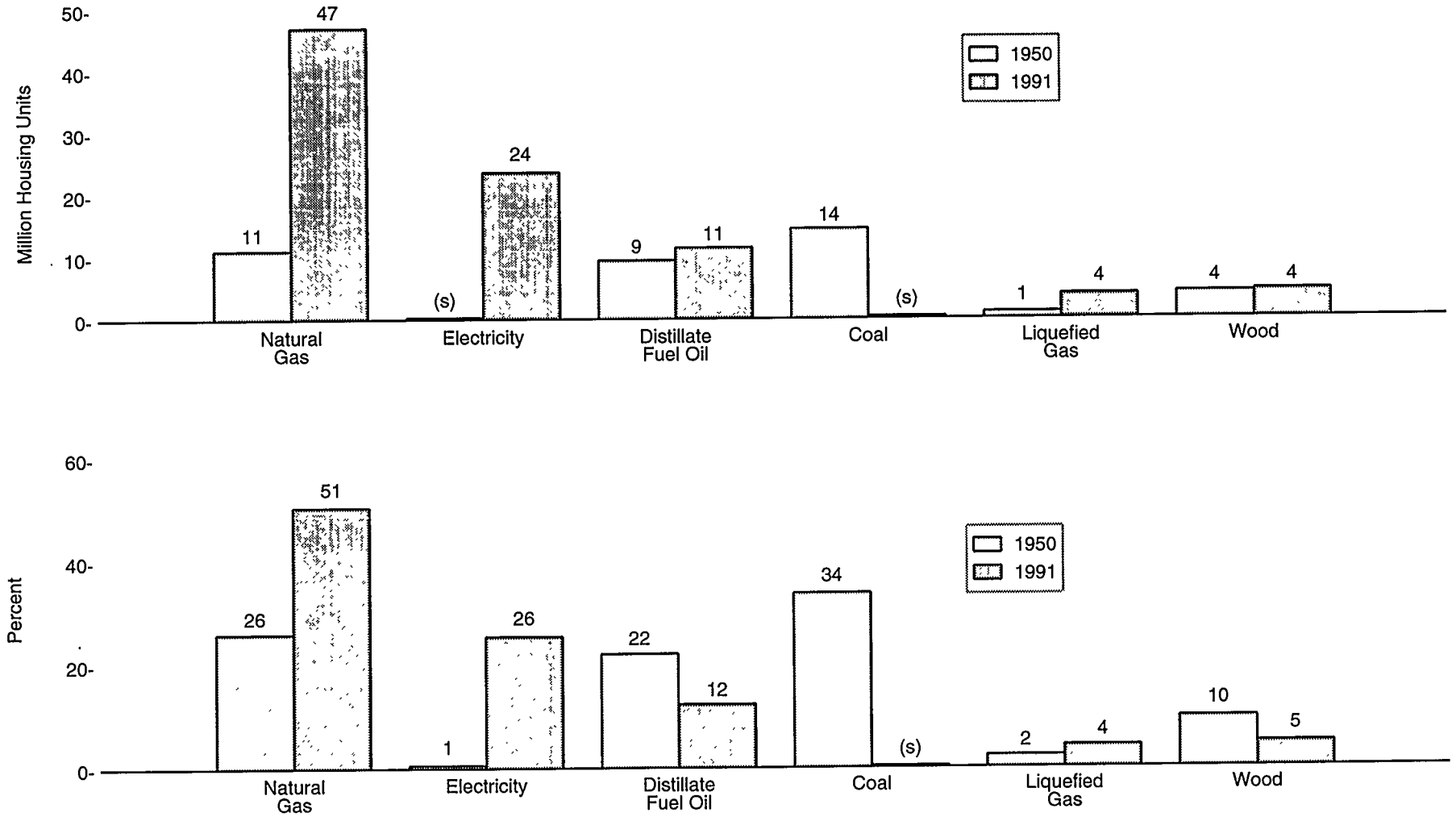
Table 2.12 Households With Selected Appliances, Selected Years, 1978-1993

Appliance	Percent of Households									Change
	1978	1979	1980	1981	1982	1984	1987	1990	1993	1980 to 1993
Total Households	100	100	100	100	100	100	100	100	100	—
Type of Appliances										
Electric Appliances										
Television Set (Color)	NA	NA	82	82	85	88	93	96	98	16
Television Set (B/W)	NA	NA	51	48	47	43	36	31	20	-31
Clothes Washer	75	NA	75	74	72	74	76	76	77	2
Range (Stove-Top Burner)	53	NA	54	54	53	54	57	58	61	7
Oven, Regular or Microwave	54	NA	59	58	59	63	79	88	91	32
Oven, Microwave	8	NA	14	17	21	34	61	79	84	70
Clothes Dryer	45	NA	47	45	45	46	51	53	57	10
Separate Freezer	35	NA	38	38	37	37	34	35	35	-3
Dishwasher	35	NA	37	37	36	38	43	45	45	8
Dehumidifier	NA	NA	9	9	9	9	10	12	9	(s)
Waterbed Heaters	NA	NA	NA	NA	NA	10	14	15	12	NA
Window or Ceiling Fan	NA	NA	NA	NA	28	35	46	51	60	NA
Whole House Fan	NA	NA	NA	NA	8	8	9	10	4	NA
Evaporative Cooler	NA	NA	4	4	4	4	3	4	3	-1
Personal Computer	NA	NA	NA	NA	NA	NA	NA	16	23	NA
Pump for Well Water	NA	NA	NA	NA	NA	NA	NA	15	13	NA
Swimming-Pool Pump [1]	NA	NA	4	4	3	NA	NA	5	5	1
Gas Appliances [2]										
Range (Stove-Top or Burner)	48	NA	46	46	47	45	43	42	38	-8
Oven	47	NA	42	40	42	42	41	41	36	-6
Clothes Dryer	14	NA	14	16	15	16	15	16	15	1
Outdoor Gas Grill	NA	NA	9	9	11	13	20	26	29	20
Outdoor Gas Light	2	NA	2	2	2	1	1	1	1	-1
Swimming Pool Heater [3]	NA	NA	NA	NA	NA	1	1	2	1	NA
Refrigerators [4]										
One	86	NA	86	87	86	88	86	84	85	-1
Two or More	14	NA	14	13	13	12	14	15	15	1
Air Conditioning (A/C)										
Central [5]	23	24	27	27	28	30	36	39	44	17
Individual Room Units [5]	33	31	30	31	30	30	30	29	25	-5
None	44	45	43	42	42	40	36	32	32	-11
Portable Kerosene Heaters	(s)	NA	(s)	1	3	6	6	5	2	2

[1] All reported swimming pools were assumed to have an electric pump for filtering and circulating the water, except for 1993 when a filtering system was made explicit.
[2] Includes natural gas or liquefied petroleum gases.
[3] In 1984 and 1987, also includes heaters for jacuzzis and hot tubs.
[4] Fewer than 0.5 percent of the households do not have a refrigerator.
[5] Households with both central and individual room units are counted only under "Central."

NA=Not available. — = Not applicable. (s)=Less than 0.5 percent.
Note: No data are available for years not shown.
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 2.13 Type of Heating in Occupied Housing Units, 1950 and 1991



(s)=Less than 0.5.

Source: Table 2.13.

Table 2.13 Type of Heating in Occupied Housing Units, Selected Years, 1950-1991

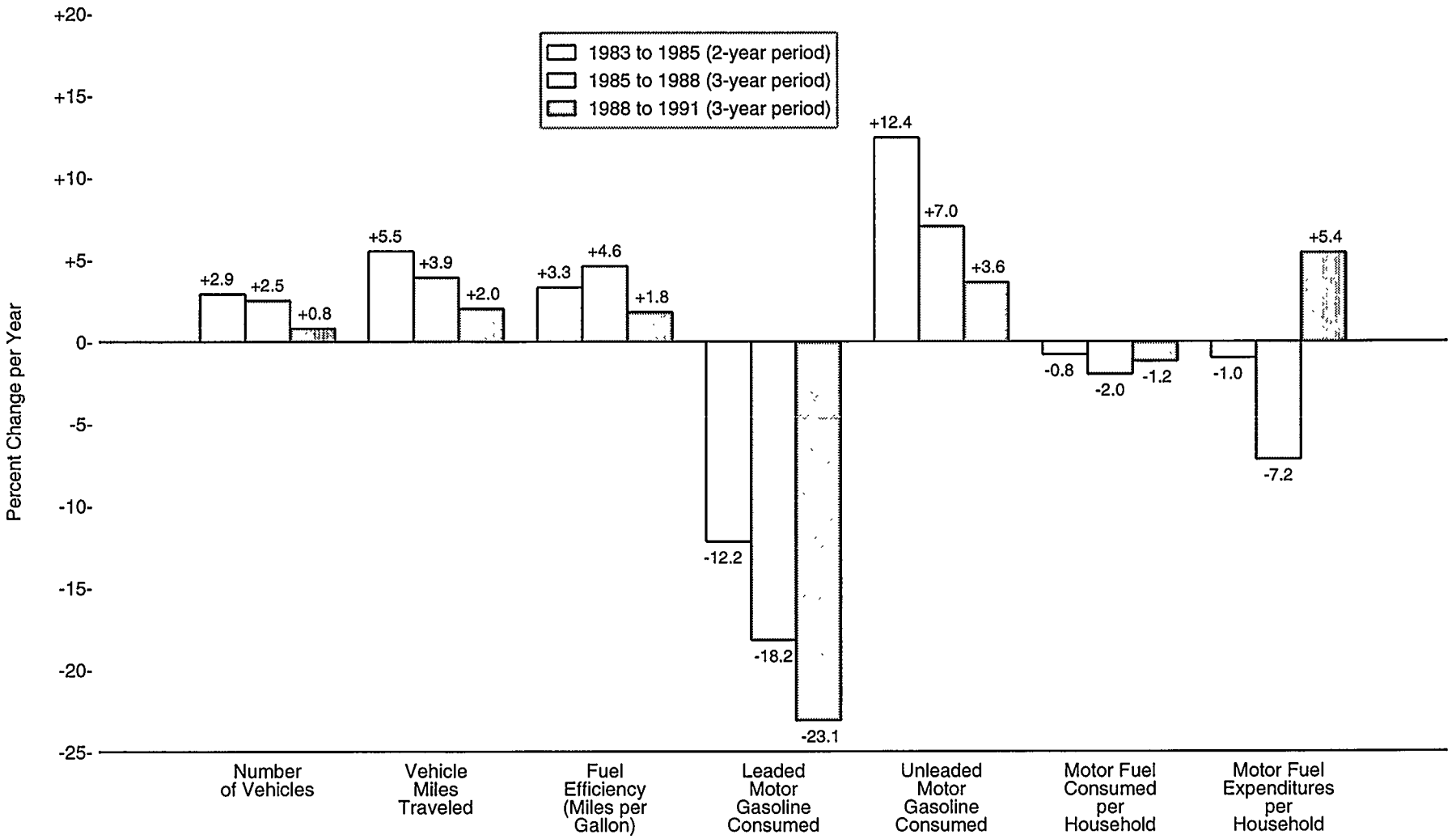
Year	Coal [1]	Natural Gas	Liquefied Gas	Distillate Fuel Oil	Kerosene	Electricity	Wood	Solar	Other	None [2]	Total
	Million										
1950	14.48	11.12	0.98	9.46	([3])	0.28	4.17	NA	0.77	1.57	42.83
1960	6.46	22.85	2.69	17.16	([3])	0.93	2.24	NA	0.22	0.48	53.02
1970	1.82	35.01	3.81	16.47	([3])	4.88	0.79	NA	0.27	0.40	63.45
1973	0.80	38.46	4.42	17.24	([3])	7.21	0.60	NA	0.15	0.45	69.34
1974	0.74	39.47	4.14	16.84	([3])	8.41	0.66	NA	0.09	0.48	70.83
1975	0.57	40.93	4.15	16.30	([3])	9.17	0.85	NA	0.08	0.47	72.52
1976	0.48	41.22	4.24	16.45	([3])	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 [4]	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	(s)	0.40	0.66	93.68
1991	0.32	47.02	3.88	11.47	0.99	23.71	4.44	(s)	0.41	0.86	93.15
	Percent										
1950	33.8	26.0	2.3	22.1	([3])	0.6	9.7	NA	1.8	3.7	100.0
1960	12.2	43.1	5.1	32.4	([3])	1.8	4.2	NA	0.4	0.9	100.0
1970	2.9	55.2	6.0	26.0	([3])	7.7	1.3	NA	0.4	0.6	100.0
1973	1.2	55.5	6.4	24.9	([3])	10.4	0.9	NA	0.2	0.7	100.0
1974	1.0	55.7	5.8	23.8	([3])	11.9	0.9	NA	0.1	0.7	100.0
1975	0.8	56.4	5.7	22.5	([3])	12.6	1.2	NA	0.1	0.6	100.0
1976	0.7	55.7	5.7	22.2	([3])	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 [4]	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

[1] Includes coal coke.
[2] Includes nonreporting units in 1950 and 1960, which totaled 997 and 2,000 units, respectively.
[3] Included in distillate fuel oil.
[4] Since 1983, the *American Housing Survey for the United States* has been a biennial survey.
NA=Not available. (s)=Less than 0.05 million or less than 0.1 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 in 1991*, Table 2-5.

Figure 2.14 Household Motor Vehicle Data



Note: The percent changes are of all income categories; they are simple average annual percent changes (computed as the 3-year percent change divided by 3) and will differ slightly from compound average annual percent changes.
Source: Table 2.14.

Table 2.14 Household Motor Vehicle Data, 1983, 1985, 1988, and 1991

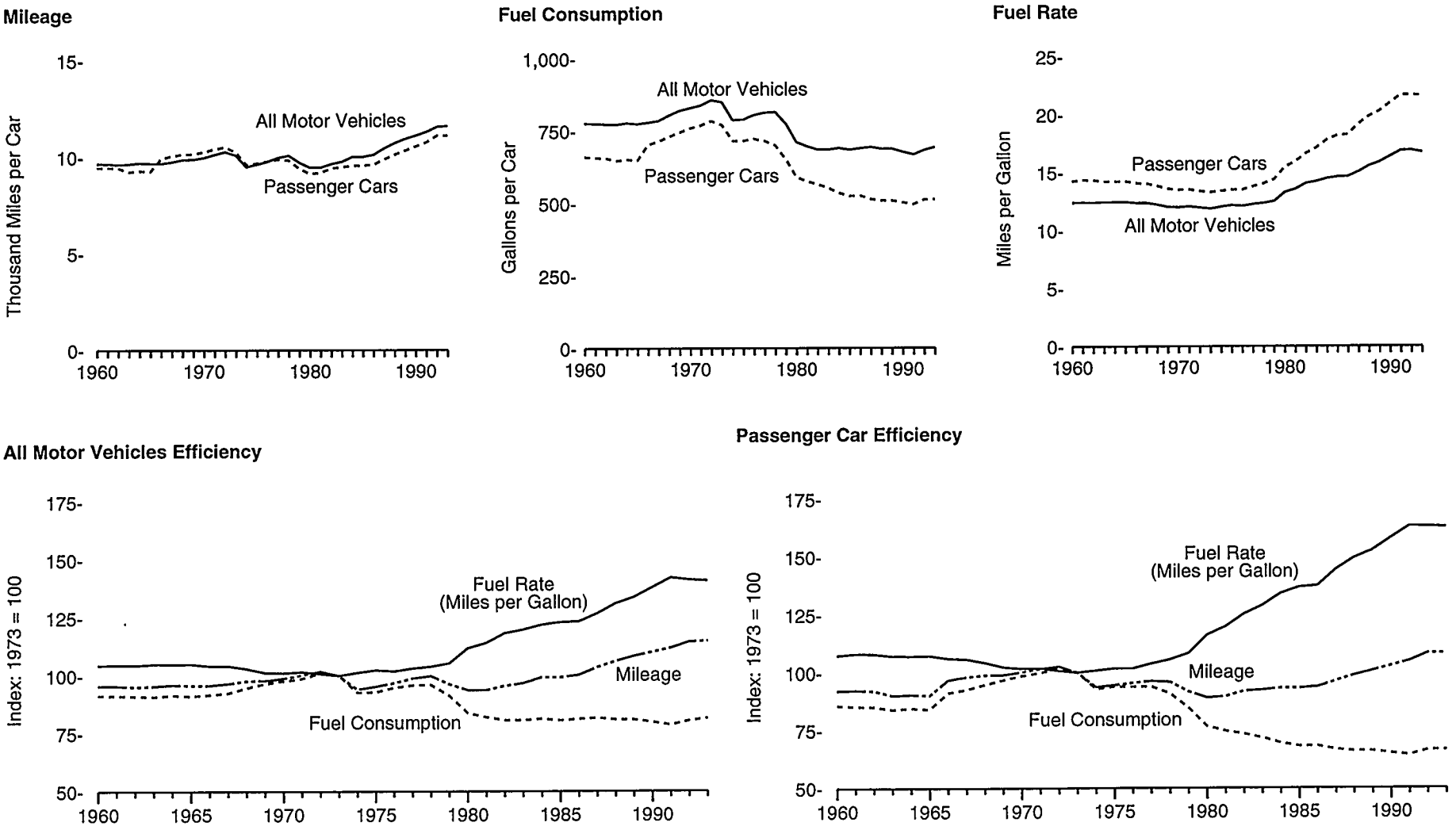
Unit of Measure	Family Income											
	Less than $25,000				$25,000 or More				All Income Categories			
	1983	1985	1988	1991	1983	1985	1988	1991	1983	1985	1988	1991
Households with Vehicles (millions)	42.9	43.3	38.9	36.5	30.5	34.5	42.2	48.2	73.4	77.7	81.3	84.6
Vehicles (millions)	66.7	65.4	58.7	52.7	63.0	71.9	88.8	98.5	129.7	137.3	147.5	151.2
Vehicle Miles Traveled (billions)	589	587	550	488	630	766	960	1,114	1,219	1,353	1,511	1,602
Motor Fuel Consumed (billion gallons)	40.8	38.2	31.4	26.9	39.8	45.7	51.0	55.9	80.5	83.9	82.4	82.8
Motor Gasoline Consumed (billion gallons)												
Leaded	19.2	13.5	5.4	1.8	13.2	11.0	5.8	1.6	32.4	24.5	11.1	3.4
Unleaded	20.9	24.2	25.7	24.7	25.3	33.7	44.3	52.9	46.3	57.8	69.9	77.5
Motor Fuel Expenditures (billion dollars)	48.1	44.8	30.7	31.7	47.3	54.3	50.3	66.6	95.4	99.1	81.1	98.2
Averages per Household with Vehicles												
Vehicles	1.6	1.5	1.5	1.4	2.1	2.1	2.1	2.0	1.8	1.8	1.8	1.8
Vehicle Miles Traveled (thousands)	13.7	13.6	14.1	13.4	20.7	22.2	22.7	23.1	16.6	17.4	18.6	18.9
Motor Fuel Consumed (gallons)	950	883	807	737	1,305	1,326	1,205	1,160	1,097	1,079	1,014	979
Motor Fuel Expenditures (dollars)	1,121	1,035	789	869	1,552	1,575	1,191	1,382	1,300	1,274	998	1,161
Averages per Vehicle												
Vehicle Miles Traveled (thousands)	8.8	9.0	9.4	9.3	10.0	10.7	10.8	11.3	9.4	9.9	10.3	10.6
Motor Fuel Consumed (gallons)	612	585	536	510	631	636	574	568	621	611	559	548
Motor Fuel Expenditures (dollars)	722	685	524	602	751	755	567	676	736	722	550	650
Fuel Efficiency (miles per gallon)	14.4	15.3	17.5	18.1	15.8	16.8	18.8	19.9	15.1	16.1	18.3	19.3
Price of Motor Gasoline (dollars per gallon)												
Leaded	1.14	1.11	0.90	1.10	1.14	1.11	0.90	1.10	1.14	1.11	0.90	R 1.10
Unleaded	1.22	1.20	0.99	1.18	1.22	1.21	1.00	1.19	1.22	1.21	1.00	1.19

R=Revised data.

Notes: • Included are automobiles, station wagons, passenger vans, cargo vans, motor homes, pickup trucks, and sport-utility vehicles (i.e., jeeplike vehicles, usually four-wheel drive). Excluded are motorcycles, mopeds, large trucks, and buses. • Motor fuel includes motor gasoline and a small amount of other fuels, such as diesel, gasohol, and propane. These data for 1983 differ from previously published 1983 data in that the basis for estimating the number of vehicle-owning households was changed to conform with that being used for 1985. • Totals may not equal sum of components due to independent rounding.

Sources: **Fuel Efficiency:** • 1983 and 1985—Energy Information Administration (EIA), "Residential Transportation Energy Consumption Survey" purchase diaries. • 1988 and 1991—Environmental Protection Agency Certification Files, adjusted for on-road driving. **Price of Motor Gasoline:** • 1983 and 1985—EIA, "Residential Transportation Energy Consumption Survey" purchase diaries. • 1988 and 1991—Bureau of Labor Statistics Gasoline Pump Price Series and Lundberg Inc. price series. **All Other Data:** EIA, Form EIA-876A/C, "Residential Transportation Energy Consumption Survey."

Figure 2.15 Motor Vehicle Efficiency, 1960-1993



Source. Table 2.15.

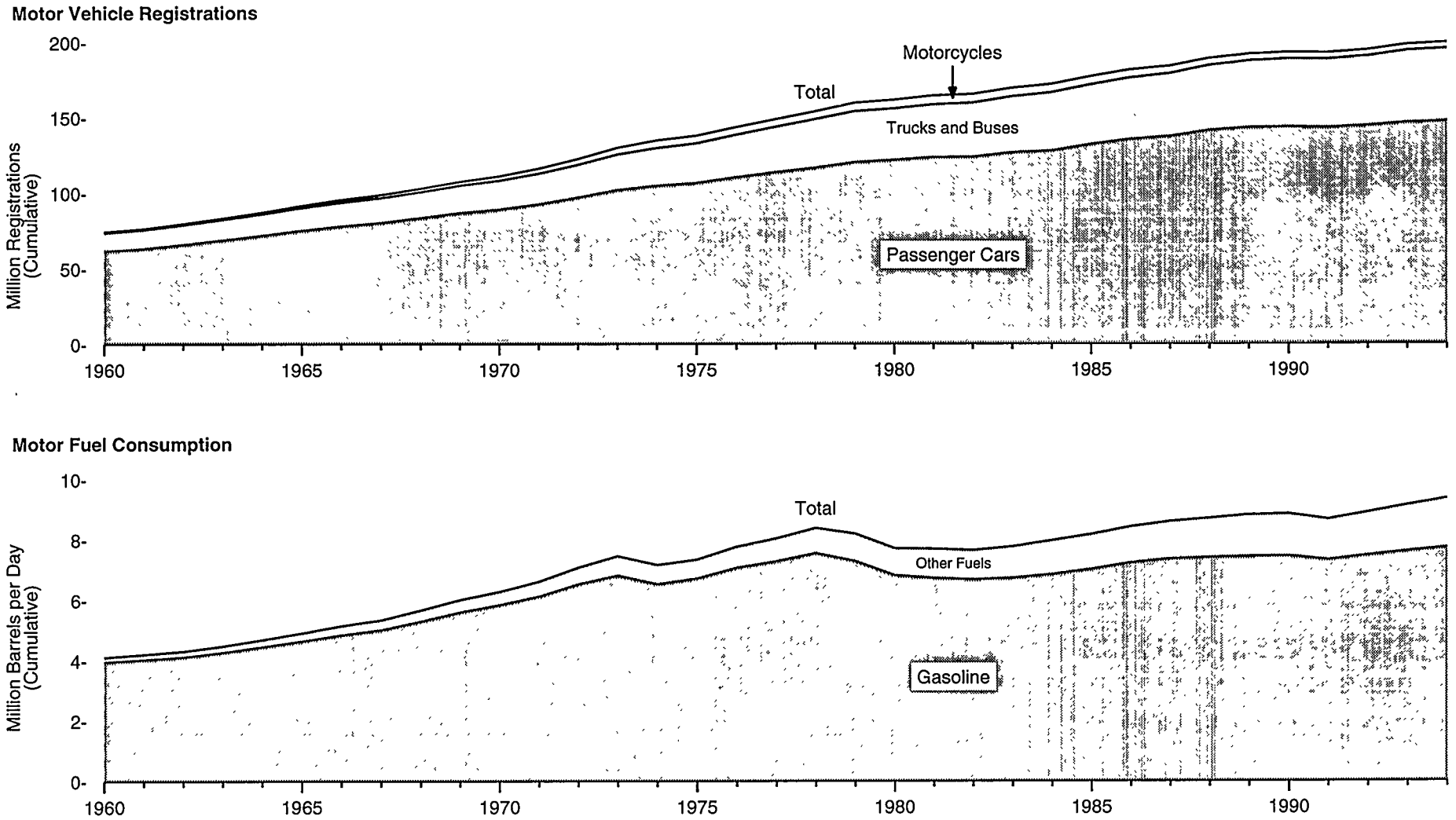
Table 2.15 Motor Vehicle Efficiency, 1960-1993

Year	Passenger Cars [1]						All Motor Vehicles [2]					
	Mileage		Fuel Consumption		Fuel Rate		Mileage		Fuel Consumption		Fuel Rate	
	Miles per Car	Index 1973 = 100.0	Gallons per Car	Index 1973 = 100.0	Miles per Gallon	Index 1973 = 100.0	Miles per Vehicle	Index 1973 = 100.0	Gallons per Vehicle	Index 1973 = 100.0	Miles per Gallon	Index 1973 = 100.0
1960	9,446	92.1	661	85.7	14.28	107.4	9,652	95.6	777	91.4	12.42	104.4
1961	9,465	92.3	658	85.3	14.38	108.1	9,648	95.5	776	91.3	12.44	104.6
1962	9,441	92.1	657	85.2	14.37	108.0	9,618	95.2	774	91.1	12.43	104.5
1963	9,240	90.1	648	84.0	14.26	107.2	9,646	95.5	773	90.9	12.48	105.0
1964	9,286	90.5	652	84.6	14.25	107.1	9,698	96.0	778	91.5	12.47	104.9
1965	9,255	90.2	649	84.2	14.27	107.3	9,674	95.8	775	91.2	12.48	105.0
1966	9,923	96.8	703	91.2	14.11	106.1	9,675	95.8	780	91.8	12.40	104.2
1967	10,060	98.1	715	92.7	14.07	105.8	9,751	96.6	786	92.5	12.40	104.2
1968	10,144	98.9	731	94.8	13.87	104.3	9,864	97.7	805	94.7	12.25	103.0
1969	10,158	99.0	746	96.8	13.62	102.4	9,885	97.9	821	96.6	12.05	101.3
1970	10,272	100.2	760	98.6	13.52	101.7	9,976	98.8	830	97.7	12.02	101.1
1971	10,422	101.6	770	99.9	13.54	101.8	10,133	100.3	839	98.7	12.08	101.6
1972	10,521	102.6	785	101.8	13.40	100.8	10,279	101.8	857	100.1	11.99	100.8
1973	10,256	100.0	771	100.0	13.30	100.0	10,099	100.0	850	100.0	11.89	100.0
1974	9,606	93.7	716	92.9	13.42	100.9	9,493	94.0	788	92.7	12.05	101.3
1975	9,690	94.5	716	93.9	13.52	101.7	9,627	95.3	790	92.9	12.18	102.4
1976	9,785	95.4	723	93.8	13.53	101.7	9,774	96.8	806	94.8	12.12	101.9
1977	9,879	96.3	716	93.9	13.80	103.8	9,978	98.8	814	95.8	12.26	103.1
1978	9,835	95.9	701	90.9	14.04	105.6	10,077	99.8	816	96.0	12.35	103.9
1979	9,403	91.7	653	84.7	14.41	108.3	9,722	96.3	776	91.3	12.52	105.3
1980	9,141	89.1	591	76.7	15.46	116.2	9,458	93.7	712	83.8	13.29	111.8
1981	9,186	89.6	576	74.7	15.94	119.8	9,462	93.7	697	82.0	13.57	114.1
1982	9,428	91.9	566	73.4	16.65	125.2	9,644	95.5	686	80.7	14.07	118.3
1983	9,475	92.4	553	71.7	17.14	128.9	9,761	96.7	686	80.7	14.24	119.8
1984	9,558	93.2	536	69.5	17.83	134.1	10,017	99.2	691	81.3	14.49	121.9
1985	9,560	93.2	525	68.1	18.20	136.8	10,018	99.2	685	80.6	14.62	123.0
1986	9,608	93.7	526	68.2	18.27	137.4	10,117	100.2	690	81.2	14.66	123.3
1987	9,878	96.3	514	66.7	19.20	144.4	10,449	103.5	694	81.6	15.07	126.7
1988	10,121	98.7	509	66.0	19.87	149.4	10,720	106.1	688	80.9	15.58	131.0
1989	10,332	100.7	509	66.0	20.31	152.7	10,936	108.3	688	80.9	15.90	133.7
1990	10,548	102.8	502	65.1	21.02	158.0	11,107	110.0	677	79.8	16.40	137.9
1991	10,757	104.9	496	64.3	21.69	163.1	11,294	111.8	668	78.6	16.90	142.1
1992	R11,100	R108.2	512	66.4	R21.68	R163.0	R11,558	R114.4	R683	R80.4	R16.91	R141.2
1993P	11,099	108.2	513	66.5	21.64	162.7	11,596	114.8	693	81.5	16.74	140.8

[1] From 1960 to 1965, passenger cars category also include motorcycles.
[2] Passenger cars, motorcycles, buses, and trucks.
R=Revised data. P=Preliminary data.

Sources: • 1960-1985—Federal Highway Administration, *Highway Statistics Summary to 1985*, Table VM-201A. • 1986 forward—Federal Highway Administration, *Highway Statistics*, annual, Table VM-1.

Figure 2.16 Motor Vehicle Registrations and Motor Fuel Consumption, 1960-1994



Source: Table 2.16.

Table 2.16 Motor Vehicle Registrations and Motor Fuel Consumption, 1960-1994

Year	Motor Vehicle Registrations (millions)					Motor Fuel Consumption [1] (thousand barrels per day)		
	Passenger Cars	Motorcycles	Buses	Trucks	Total	Gasoline [2]	Other Fuels [3]	Total [4]
1960	61.7	0.6	0.3	11.9	74.4	3,953	159	4,112
1961	63.4	0.6	0.3	12.3	76.6	4,034	176	4,210
1962	66.1	0.7	0.3	12.8	79.8	4,120	192	4,312
1963	69.0	0.8	0.3	13.4	83.5	4,274	211	4,485
1964	72.0	1.0	0.3	14.0	87.3	4,454	236	4,690
1965	75.3	1.4	0.3	14.8	91.7	4,644	269	4,913
1966	78.1	1.8	0.3	15.5	95.7	4,846	306	5,152
1967	80.4	2.0	0.3	16.2	98.9	5,014	329	5,343
1968	83.6	2.1	0.4	16.9	103.0	5,300	370	5,670
1969	86.9	2.3	0.4	17.9	107.4	5,604	413	6,017
1970	89.2	2.8	0.4	18.8	111.2	5,845	439	6,284
1971	92.7	3.3	0.4	19.9	116.3	6,125	494	6,619
1972	97.1	3.8	0.4	21.3	122.6	6,529	554	7,083
1973	102.0	4.4	0.4	23.2	130.0	6,819	642	7,460
1974	104.9	5.0	0.4	24.6	134.9	6,531	639	7,170
1975	106.7	5.0	0.5	25.8	137.9	6,719	628	7,347
1976	110.4	5.0	0.5	27.7	143.5	7,075	697	7,772
1977	113.7	5.0	0.5	29.6	148.8	7,287	760	8,046
1978	116.6	5.1	0.5	31.7	153.9	7,555	837	8,392
1979	120.2	5.5	0.5	33.3	159.6	7,291	913	8,204
1980	121.7	5.7	0.5	33.6	161.6	6,820	896	7,716
1981	123.5	5.8	0.5	34.5	164.3	6,726	969	7,695
1982	123.7	5.7	0.6	35.3	165.3	6,679	972	7,651
1983	126.7	5.6	0.6	36.5	169.4	6,731	1,043	7,774
1984	127.9	5.5	0.6	38.0	172.0	6,850	1,127	7,977
1985	132.1	5.4	([5])	39.6	177.1	7,020	1,158	8,178
1986	135.4	5.3	([5])	40.8	181.5	7,229	1,202	8,431
1987	137.3	4.9	([5])	41.7	183.9	7,359	1,242	8,601
1988	141.3	4.6	([5])	43.1	189.0	7,405	1,306	8,711
1989	143.1	4.4	([5])	44.2	191.7	7,437	1,385	8,822
1990	143.5	4.3	([5])	45.1	192.9	7,454	1,396	8,849
1991	143.0	4.2	([5])	45.4	192.5	7,323	1,349	8,672
1992	144.2	4.1	([5])	46.1	194.4	7,472	1,430	8,902
1993	R146.3	4.0	([5])	R47.7	R198.0	R7,607	R1,534	R9,141
1994E	147.2	3.9	([5])	48.3	199.4	7,733	1,630	9,362

[1] Includes only motor fuel taxed at the prevailing tax rates in each State. Excludes motor fuel exempt from tax payment, subject to tax refund, or taxed at rates other than the prevailing tax rate. Experience has shown that the total motor fuel consumption quantity cited here equals more than 99.0 percent of gross reported motor fuel consumption.

[2] Motor gasoline, aviation gasoline, and gasohol.

[3] Distillate fuel oil (diesel oil), liquefied gases, and kerosene when they are used to operate vehicles on highways. Excludes jet fuel beginning in 1962.

[4] Excludes losses allowed for evaporation, handling, etc.

[5] Included in trucks.

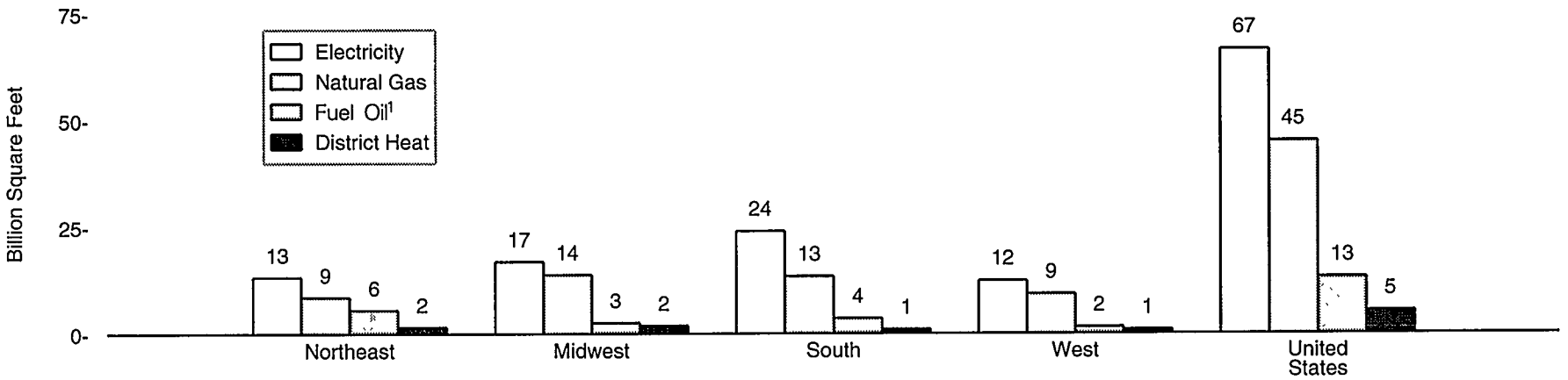
R=Revised data. E=Estimate.

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

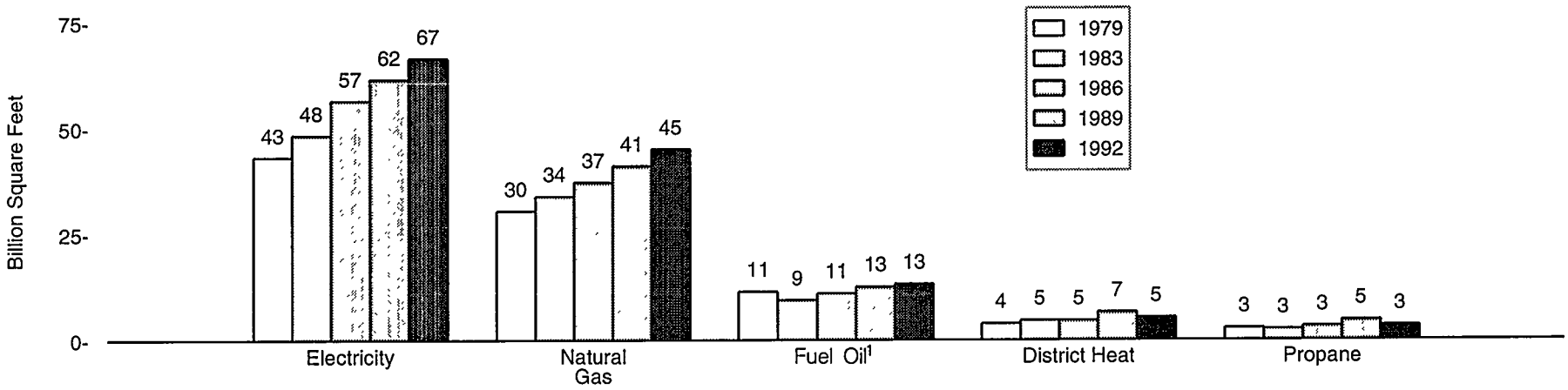
Sources: • 1960-1975—Federal Highway Administration, *Highway Statistics Summary to 1975*, Tables MV-201 and MF-221. • 1976-1986—Federal Highway Administration, *Highway Statistics Annual*, Tables MV-1, MF-21, and MF-25. • 1987 forward—Federal Highway Administration, *Selected Highway Statistics and Charts 1993*.

Figure 2.17 Commercial Buildings Characteristics by Energy Source

By Census Region, 1992



By Survey Year



[1] Distillate fuel oil, residual fuel oil, and kerosene.

Source: Table 2.17. See Appendix F for Census regions.

Table 2.17 Commercial Buildings Characteristics by Energy Source, Selected Years, 1979-1992

(Billion Square Feet)

Energy Source and Year	Square Footage Category			Principal Building Activity				Census Region [1]				All Buildings
	1,001 to 10,000	10,001 to 100,000	Over 100,000	Mercantile and Service	Office	Education	All Other	Northeast	Midwest	South	West	
All Buildings												
1979	9.21	20.89	13.44	9.96	6.99	5.97	20.63	9.53	14.20	13.66	6.16	43.55
1983	9.26	22.35	17.86	10.32	8.31	6.04	24.80	10.25	15.25	16.61	7.36	49.47
1986	13.07	26.34	18.79	12.81	9.55	7.29	28.56	11.83	16.03	19.40	10.94	58.20
1989	13.32	28.32	21.54	12.37	11.80	8.08	30.94	13.57	15.96	22.04	11.62	63.18
1992	14.53	28.51	24.84	12.40	12.32	8.47	34.69	13.40	17.28	24.58	12.62	67.88
Electricity												
1979	8.99	20.76	13.41	9.92	6.98	5.97	20.29	9.46	14.16	13.42	6.11	43.15
1983	8.86	21.79	17.68	10.24	8.27	6.03	23.78	9.98	14.88	16.22	7.24	48.33
1986	12.49	25.52	18.50	12.71	9.50	7.20	27.10	11.43	15.68	18.75	10.65	56.51
1989	12.71	27.58	21.28	12.36	11.80	8.07	29.34	13.33	15.70	21.22	11.32	61.56
1992	14.05	27.89	24.61	12.39	12.32	8.47	33.37	13.24	16.91	23.99	12.42	66.55
Natural Gas												
1979	5.58	14.41	10.50	7.56	4.61	4.17	14.13	6.75	11.81	7.77	4.15	30.48
1983	5.53	14.82	13.58	7.90	5.50	4.45	16.09	6.95	12.79	9.17	5.02	33.94
1986	7.03	16.15	14.09	8.74	5.73	5.52	17.28	6.89	12.42	10.43	7.53	37.26
1989	7.38	17.41	16.36	8.79	7.22	6.64	18.49	8.52	12.81	11.66	8.15	41.14
1992	8.03	19.11	17.96	9.38	7.86	6.85	21.01	8.56	13.84	13.41	9.29	45.10
Fuel Oil [2]												
1979	1.92	4.73	4.75	2.09	1.75	2.28	5.28	4.41	2.97	2.97	1.04	11.40
1983	1.21	3.36	4.83	1.50	1.59	1.43	4.89	4.21	1.77	2.84	0.60	9.41
1986	1.71	3.97	5.33	2.42	1.76	1.68	5.14	5.09	2.04	2.52	1.36	11.01
1989	1.52	4.49	6.59	1.62	2.91	2.21	5.87	5.13	3.20	2.84	1.43	12.60
1992	1.75	3.89	7.57	2.11	3.60	1.84	5.67	5.53	2.54	3.58	1.56	13.22
District Heat [3]												
1979	Q	1.17	2.64	Q	1.19	0.40	1.98	1.26	1.58	0.65	0.39	3.88
1983	Q	1.39	3.16	Q	1.25	0.45	2.46	1.37	1.93	0.80	0.53	4.64
1986	0.10	1.49	3.04	0.16	1.45	0.83	2.18	1.38	1.80	0.71	0.74	4.63
1989	0.15	1.88	4.55	Q	2.32	1.13	3.02	2.24	1.51	1.58	1.25	6.58
1992	0.13	1.65	3.56	0.15	1.71	0.69	2.79	1.56	1.88	0.98	0.91	5.34
Propane												
1979	0.66	1.21	0.93	0.63	0.14	0.47	1.56	0.44	0.73	1.40	0.23	2.80
1983	0.59	0.89	1.07	Q	Q	0.35	1.54	0.47	0.44	1.59	Q	2.56
1986	1.08	1.61	0.52	0.64	Q	0.37	2.10	0.78	0.66	1.35	0.42	3.21
1989	1.04	1.95	1.71	0.91	Q	1.14	2.52	1.07	1.06	1.74	Q	4.69
1992	1.04	1.37	0.99	0.74	0.21	0.47	1.97	1.04	0.58	1.51	0.26	3.39

[1] See Appendix F for Census regions.

[2] Distillate fuel oil, residual fuel oil, and kerosene.

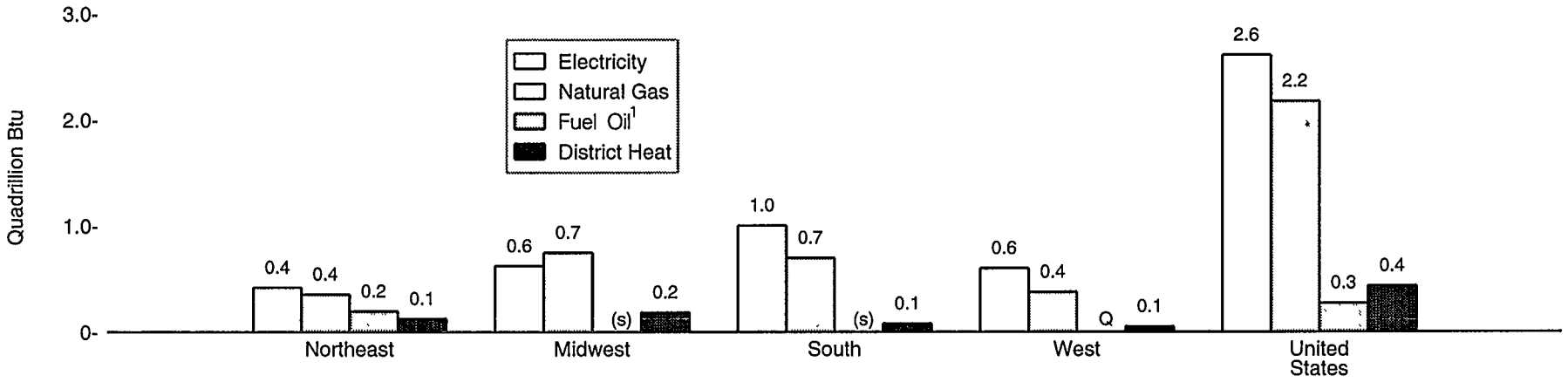
[3] For 1979 and 1983, includes only purchased steam. For 1986, 1989, and 1992, includes purchased and nonpurchased steam and purchased and nonpurchased hot water.

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

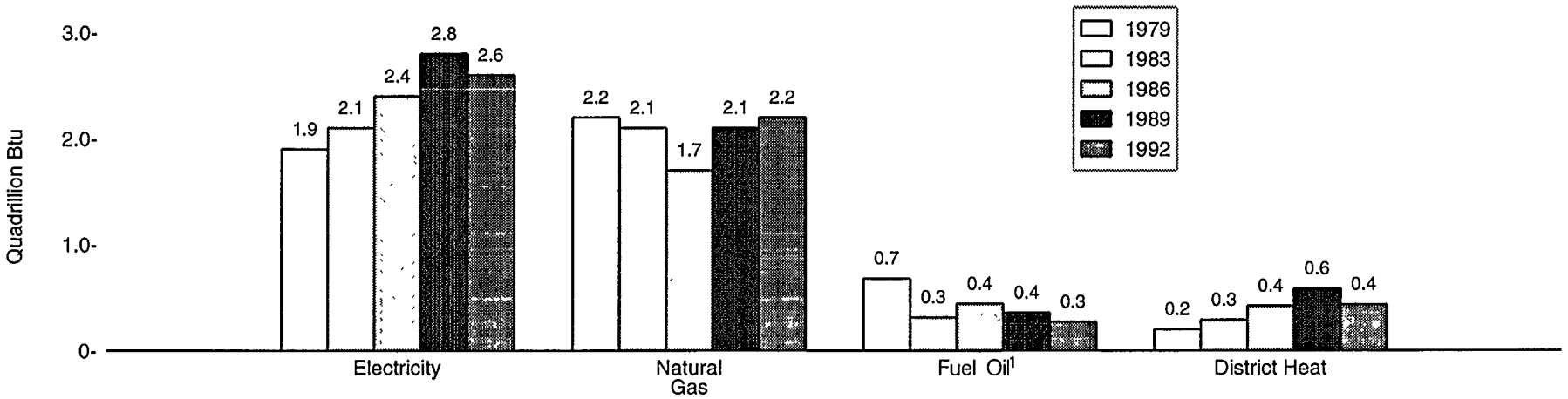
Sources: • 1979—Energy Information Administration (EIA), Form EIA-143, "Nonresidential Buildings Energy Consumption Survey." • 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." • 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." • 1989 and 1992—EIA,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

Figure 2.18 Commercial Buildings Consumption by Energy Source

By Census Region, 1992



By Survey Year



[1] 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 50 trillion Btu.
Source: Table 2.18. See Appendix F for Census regions.

Table 2.18 Commercial Buildings Consumption by Energy Source, Selected Years, 1979-1992

(Trillion Btu)

Energy Source and Year	Square Footage Category			Principal Building Activity				Census Region [1]				All Buildings
	1,001 to 10,000	10,001 to 100,000	Over 100,000	Mercantile and Service	Office	Education	All Other	Northeast	Midwest	South	West	
Major Sources [2]												
1979	1,254.87	2,202.11	1,507.75	893.53	860.79	511.16	2,699.24	1,216.88	1,826.47	1,395.20	526.17	4,964.73
1983	1,241.81	1,934.59	1,646.28	811.84	1,017.68	480.23	2,512.93	858.31	1,820.50	1,461.69	682.18	4,822.68
1986	1,273.19	2,007.53	1,696.22	985.45	1,008.28	632.50	2,350.71	1,037.29	1,584.59	1,459.28	895.77	4,976.94
1989	1,258.94	2,402.15	2,127.04	1,048.25	1,229.56	704.04	2,806.28	1,354.47	1,659.46	1,648.41	1,125.79	5,788.13
1992 [3]	1,257.72	2,300.92	1,931.60	892.21	1,247.15	636.81	2,714.06	1,089.60	1,577.74	1,824.96	997.93	5,490.23
Electricity												
1979	428.52	872.29	607.67	360.61	423.66	162.78	961.43	425.35	593.38	662.32	227.43	1,908.48
1983	468.59	902.63	757.78	425.83	509.43	152.36	1,041.38	324.49	672.66	800.58	331.27	2,129.01
1986	653.77	927.31	809.30	535.95	640.76	178.93	1,034.74	429.52	583.72	866.88	510.26	2,390.38
1989	571.75	1,145.23	1,056.09	549.67	781.48	216.76	1,225.16	585.62	608.95	974.78	603.72	2,773.06
1992	585.59	990.55	1,032.54	444.42	703.57	234.55	1,226.13	418.83	621.53	1,001.85	566.47	2,608.68
Natural Gas												
1979	645.58	996.40	532.42	422.38	272.28	213.89	1,265.85	442.76	1,006.52	469.81	255.31	2,174.40
1983	684.01	809.44	597.16	327.32	365.21	245.63	1,152.45	278.27	978.41	522.97	310.96	2,090.61
1986	484.73	715.33	522.77	331.91	258.26	253.64	879.03	243.78	741.89	425.76	311.40	1,722.84
1989	567.66	835.57	669.82	416.67	238.00	323.46	1,094.92	353.10	830.93	497.67	391.35	2,073.05
1992 [3]	571.69	1,016.68	585.93	380.66	387.58	291.30	1,114.76	354.20	747.35	697.14	375.60	2,174.30
Fuel Oil [4]												
1979	176.90	272.35	231.47	103.07	106.69	107.16	363.81	284.83	133.42	236.70	25.76	680.72
1983	84.92	139.79	89.78	43.13	75.30	61.30	134.76	171.70	28.23	104.31	Q	314.49
1986	114.40	206.12	121.19	105.42	38.74	103.23	194.31	269.64	63.16	86.10	22.80	441.70
1989	100.50	169.85	86.48	75.50	43.16	70.96	167.21	236.57	60.72	50.20	Q	356.83
1992	86.19	111.29	75.00	54.80	47.14	61.53	109.01	193.53	26.08	47.68	Q	272.48
District Heat [5]												
1979	Q	61.08	136.18	Q	58.17	27.33	108.15	63.94	93.15	Q	Q	201.12
1983	Q	82.73	201.56	Q	67.74	20.94	184.34	83.85	141.18	33.83	29.71	288.58
1986	Q	158.76	242.96	12.17	70.52	96.71	242.64	94.35	195.82	80.53	51.32	422.01
1989	19.02	251.50	314.66	Q	166.92	Q	318.99	179.19	158.86	125.76	121.38	585.18
1992	Q	182.40	238.12	Q	108.86	49.43	264.15	123.04	182.78	78.30	50.66	434.78
Propane [6]												
1979	23.21	15.20	4.89	10.01	Q	2.24	29.19	Q	15.72	14.55	9.71	43.30
1983	20.05	11.99	1.64	5.91	Q	1.56	23.86	Q	7.04	20.93	Q	33.68
1986	43.83	18.27	1.13	16.93	Q	2.53	42.11	8.84	18.83	25.78	Q	63.23

[1] See Appendix F for Census regions.

[2] Includes electricity, natural gas, fuel oil, and district heat.

[3] These estimates have been revised and will differ from those reported in *Commercial Buildings Energy Consumption and Expenditures 1992*. Energy Information Administration (EIA) reviewed and modified data for several buildings with unusually high natural gas consumption that were discovered after the publication of the report.

[4] Distillate fuel oil, residual fuel oil, and kerosene.

[5] For 1979 and 1983, includes only purchased steam. For 1986, 1989, and 1992, includes purchased and nonpurchased steam and purchased and nonpurchased hot water.

[6] After 1986, propane data were no longer collected.

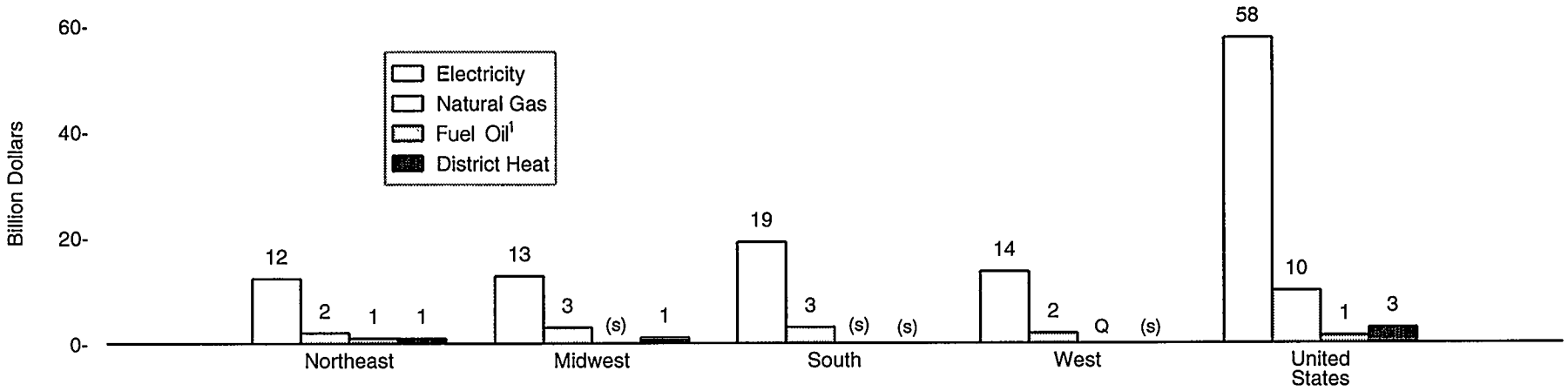
NA=Not available. Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.

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.

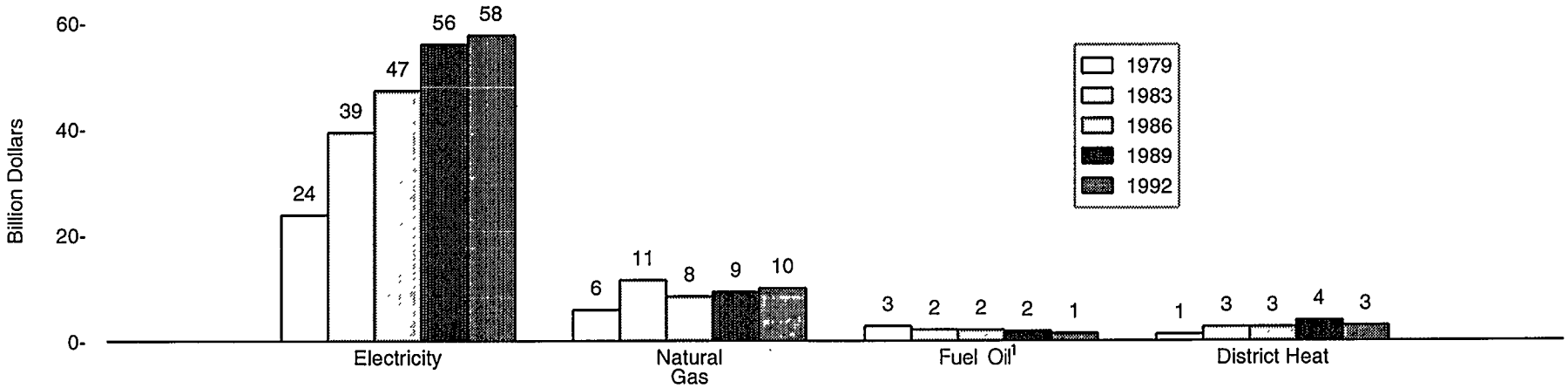
Sources: • 1979—EIA, Form EIA-143, "Nonresidential Buildings Energy Consumption Survey." • 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." • 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." • 1989 and 1992—EIA, Form EIA-871, "Commercial Buildings Energy Consumption Survey."

Figure 2.19 Commercial Buildings Expenditures by Energy Source

By Census Region, 1992



By Survey Year



[1] Distillate fuel oil, residual fuel oil, and kerosene.
(s)=Less than 500 million dollars. Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.
Source: Table 2.19. See Appendix F for Census regions.

Table 2.19 Commercial Buildings Expenditures by Energy Source, Selected Years, 1979-1992

(Million Dollars)

Energy Source and Year	Square Footage Category			Principal Building Activity				Census Region [1]				All Buildings
	1,001 to 10,000	10,001 to 100,000	Over 100,000	Mercantile and Service	Office	Education	All Other	Northeast	Midwest	South	West	
Major Sources [2]												
1979	8,587	15,120	9,889	6,384	7,438	3,051	16,723	9,405	10,661	10,106	3,424	33,596
1983	13,891	22,978	18,582	9,958	12,814	4,786	27,892	12,399	18,009	17,868	7,174	55,451
1986	17,411	23,512	19,296	13,091	14,763	5,762	26,604	14,269	15,718	17,725	12,508	60,219
1989	17,472	28,943	24,411	13,527	18,323	6,589	32,386	17,505	16,468	21,759	15,093	70,826
1992 [3]	18,554	28,473	24,794	12,907	18,102	7,389	33,423	16,226	16,957	22,843	15,795	71,821
Electricity												
1979	5,958	10,994	6,799	4,655	5,862	1,936	11,298	6,493	7,009	7,756	2,493	23,751
1983	9,338	16,779	13,162	7,602	9,651	2,925	19,101	8,406	11,594	14,176	5,103	39,279
1986	14,137	18,046	15,003	10,781	12,884	3,606	19,915	10,886	10,869	14,856	10,575	47,186
1989	13,824	22,770	19,349	11,116	15,757	4,391	24,679	13,188	11,697	18,409	12,649	55,943
1992	14,872	22,183	20,565	10,583	15,511	5,526	25,999	12,250	12,745	19,097	13,527	57,619
Natural Gas												
1979	1,804	2,654	1,356	1,231	728	551	3,304	1,320	2,547	1,255	692	5,814
1983	3,886	4,485	3,071	1,904	1,999	1,317	6,223	1,874	5,172	2,675	1,721	11,443
1986	2,522	3,543	2,289	1,706	1,178	1,189	4,282	1,472	3,400	1,958	1,524	8,355
1989	2,924	3,760	2,520	1,931	1,128	1,309	4,836	1,807	3,381	2,293	1,724	9,204
1992 [3]	3,058	4,625	2,218	1,899	1,618	1,271	5,114	2,014	3,011	2,998	1,878	9,901
Fuel Oil [4]												
1979	798	1,117	850	457	443	396	1,469	1,149	569	932	116	2,765
1983	630	947	525	319	501	387	896	1,141	198	688	75	2,102
1986	616	970	473	516	194	448	901	1,272	278	394	115	2,059
1989	582	862	378	430	232	331	829	1,225	310	241	Q	1,822
1992	516	561	323	318	245	277	560	989	132	257	Q	1,400
District Heat [5]												
1979	Q	355	885	Q	405	169	652	444	535	163	124	1,267
1983	Q	767	1,823	Q	664	157	1,673	977	1,045	329	275	2,627
1986	Q	953	1,530	88	507	519	1,506	639	1,170	516	294	2,620
1989	141	1,551	2,165	Q	1,207	Q	2,042	1,286	1,081	816	Q	3,857
1992	Q	1,688	1,689	Q	728	315	1,751	973	1,069	492	368	2,901
Propane [6]												
1979	123	80	22	52	Q	10	153	Q	76	81	47	225
1983	190	109	14	56	Q	12	222	Q	62	201	Q	313
1986	370	163	10	140	Q	20	368	93	131	221	Q	543

[1] See Appendix F for Census regions.

[2] Includes electricity, natural gas, fuel oil, and district heat.

[3] These estimates have been revised and will differ from those reported in *Commercial Buildings Energy Consumption and Expenditures 1992*. Energy Information Administration (EIA) reviewed and modified data for several buildings with unusually high natural gas consumption that were discovered after the publication of the report.

[4] Distillate fuel oil, residual fuel oil, and kerosene.

[5] For 1979 and 1983, includes only purchased steam. For 1986, 1989, and 1992, includes purchased and nonpurchased steam and purchased and nonpurchased hot water.

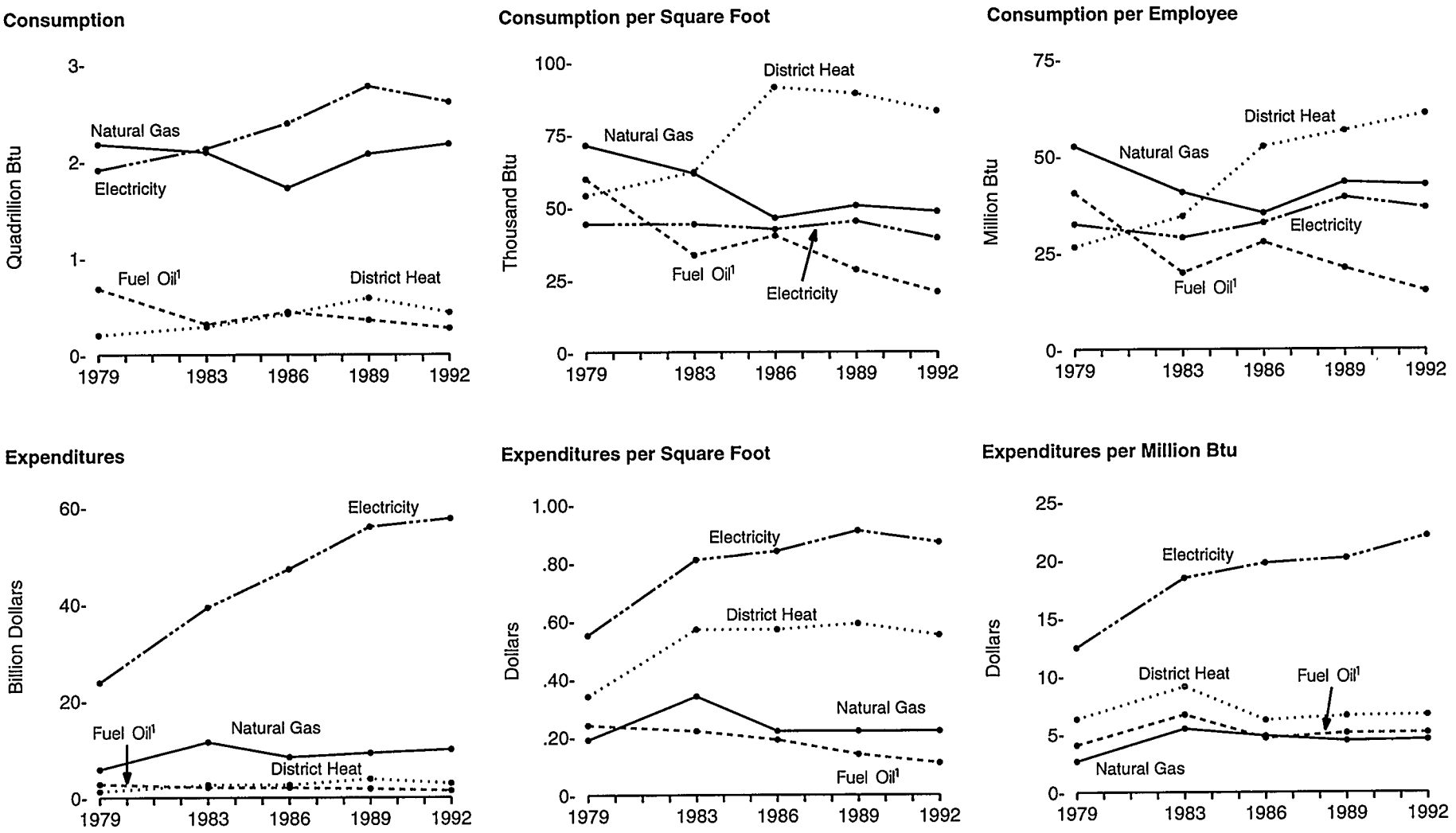
[6] After 1986, propane data were no longer collect.

NA=Not available. Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.

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.

Sources: • 1979—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 and 1992—EIA, Form EIA-871, "Commercial Buildings Energy Consumption Survey."

Figure 2.20 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years, 1979-1992



[1] Distillate fuel oil, residual fuel oil, and kerosene.

Notes: • No data are available for 1980-1982, 1984-1985, 1987-1988, and 1990-1991. • Because vertical scales differ, graphs should not be compared.

Source: Table 2.20.

Table 2.20 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years, 1979-1992

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)	Per Building (thousand dollars)	Per Square Foot (dollars)	Per Million Btu (dollars)
Major Sources [1]											
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 [2]	4,806	67,876	14.1	5,490	1,142	80.9	77.1	71,821	14.9	1.06	13.08
Electricity											
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
Natural Gas											
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]	2,657	44,994	16.9	2,174	818	48.3	42.5	9,901	3.7	0.22	4.55
Fuel Oil [3]											
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
District Heat [4]											
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
Propane											
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

[1] For 1979, 1983 and 1986, includes electricity, natural gas, fuel oil, district heat, and propane. For 1989 and 1992, includes electricity, natural gas, fuel oil, and district heat. Propane consumption statistics were not collected in 1989 or 1992.

[2] These estimates have been revised and will differ from those reported in *Commercial Buildings Energy Consumption and Expenditures 1992*. Energy Information Administration (EIA) reviewed and modified data for several buildings with unusually high natural gas consumption that were discovered after the publication of the report.

[3] Distillate fuel oil, residual fuel oil, and kerosene.

[4] For 1979 and 1983, includes only purchased steam. For 1986, 1989, and 1992, includes purchased and nonpurchased steam and purchased and nonpurchased hot water.

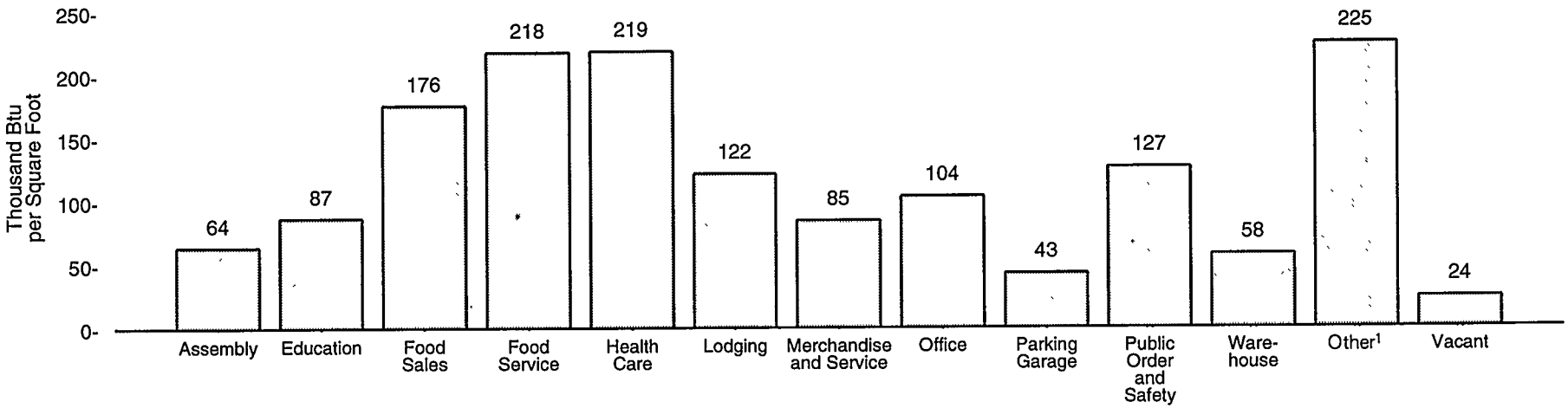
NA=Not available.

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.

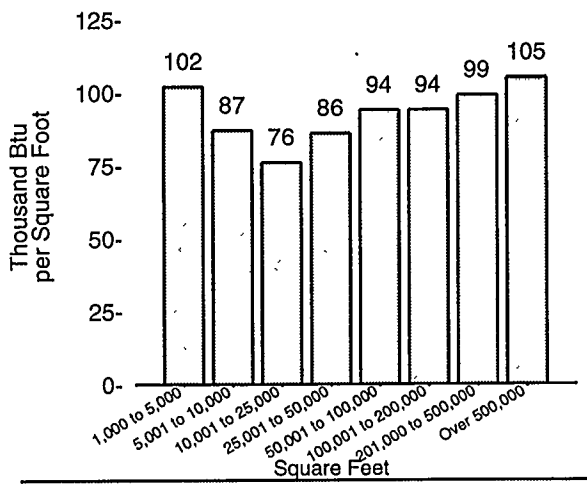
Sources: • 1979—EIA, Form EIA-143, "Nonresidential Buildings Energy Consumption Survey." • 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." • 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." • 1989 and 1992—EIA, Form EIA-871, "Commercial Buildings Energy Consumption Survey."

Figure 2.21 Commercial Buildings Energy Intensities by Building Characteristic, 1989

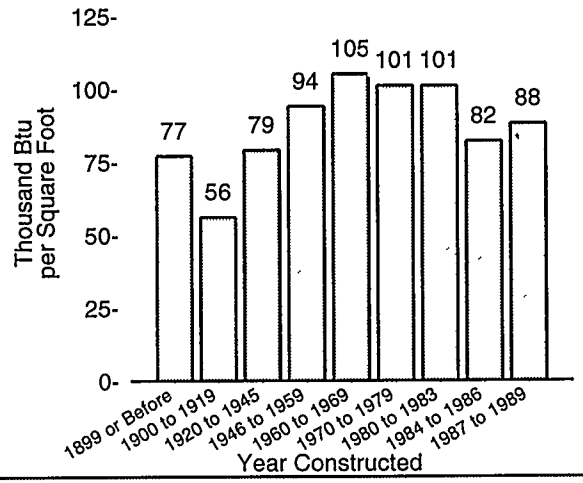
By Principal Building Activity



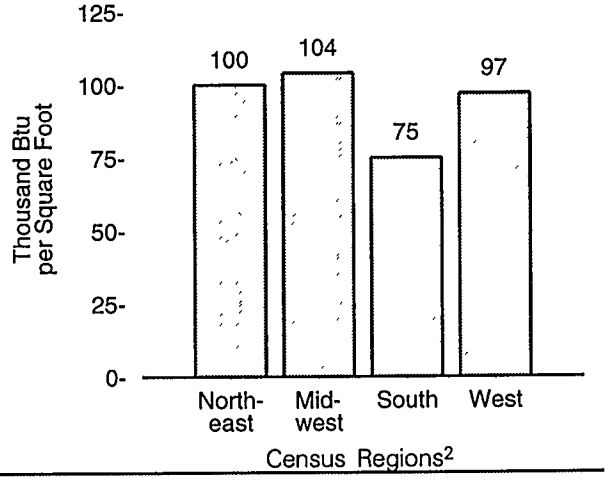
By Building Floorspace



By Year Constructed



By Census Region



[1]Includes buildings that do not fit into any of the other named categories.
[2]See Appendix F for Census regions.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 2.21.

Table 2.21 Commercial Buildings Energy Intensities by Building Characteristic, 1989

(Thousand Btu per Square Foot)

Building Characteristic	Space Heating	Cooling	Ventilation	Water Heating	Lighting	Cooking	Refrigeration	Office Equipment	Other [1]	All End Uses
All Buildings	31.9	4.8	4.4	7.9	16.2	4.3	3.0	6.0	13.2	91.6
Building Floorspace (square feet)										
1,001 to 5,000	37.7	6.5	4.2	11.1	14.2	7.3	4.9	7.7	8.3	101.9
5,001 to 10,000	35.1	5.0	3.2	8.1	12.7	2.6	2.5	6.3	11.4	86.8
10,001 to 25,000	31.5	3.9	2.6	5.5	12.0	2.0	2.9	7.0	8.9	76.1
25,001 to 50,000	36.2	3.9	2.9	4.8	14.4	2.5	3.1	5.2	12.9	85.9
50,001 to 100,000	32.8	4.0	4.3	7.7	17.7	2.7	3.4	4.9	16.3	93.7
100,001 to 200,000	32.2	4.4	5.2	7.9	18.5	4.5	2.3	5.6	13.2	93.9
200,001 to 500,000	28.5	5.1	7.1	8.1	21.5	3.1	2.2	5.6	18.2	99.4
Over 500,000	19.4	6.9	6.9	12.6	20.2	Q	2.5	6.0	17.5	104.5
Principal Building Activity										
Assembly	32.9	3.7	3.7	2.9	9.1	2.6	1.6	0.9	6.4	63.8
Education	46.7	3.2	3.0	5.0	14.1	Q	1.3	1.3	6.1	87.2
Food Sales	25.5	20.0	10.1	2.8	23.4	27.0	56.5	1.3	9.0	175.6
Food Service	41.5	16.5	11.0	42.4	23.0	50.5	13.7	1.5	18.3	218.4
Health Care	38.3	16.1	10.2	59.9	33.0	21.9	3.0	2.6	33.5	218.7
Lodging	39.3	4.9	5.8	35.9	13.5	9.2	4.5	0.4	8.8	122.4
Mercantile and Service	28.9	4.3	2.1	4.5	16.2	1.9	1.0	9.3	16.5	84.8
Office	30.7	7.5	11.3	4.0	23.1	0.7	2.9	13.9	9.9	104.2
Parking Garage	19.9	0.4	0.4	Q	8.4	Q	0.9	1.1	7.6	42.6
Public Order and Safety	67.6	2.3	3.7	Q	20.5	1.3	2.9	2.2	18.6	127.0
Warehouse	23.9	0.6	0.4	0.7	11.1	0.1	2.6	6.2	12.3	57.9
Other [2]	56.0	9.4	0.4	9.7	49.4	Q	4.5	Q	82.7	224.8
Vacant	9.6	0.6	0.1	Q	3.2	Q	0.5	0.5	7.2	23.5
Year Constructed										
1899 or Before	52.7	1.1	1.5	7.2	5.1	2.2	1.5	1.8	4.0	77.2
1900 to 1919	26.1	1.2	1.5	3.7	6.7	2.0	0.9	2.3	11.9	56.4
1920 to 1945	35.2	3.2	3.6	7.9	9.4	3.5	1.7	2.9	11.0	78.5
1946 to 1959	37.5	4.4	4.0	8.6	15.0	Q	2.0	5.1	10.8	94.0
1960 to 1969	38.6	5.3	4.5	9.5	18.0	3.1	2.7	5.9	17.3	104.8
1970 to 1979	29.9	6.4	5.3	8.8	20.7	5.3	3.9	7.0	13.4	100.7
1980 to 1983	21.5	7.3	5.3	6.1	22.9	4.0	3.8	10.9	19.3	101.2
1984 to 1986	18.0	5.1	6.5	6.6	18.3	3.7	4.5	8.9	10.3	81.9
1987 to 1989	23.7	4.5	3.8	6.4	17.1	4.1	6.5	8.7	12.8	87.7
Census Region [3]										
Northeast	41.8	3.1	4.2	8.5	16.8	3.5	2.6	6.8	12.7	99.8
Midwest	46.0	3.5	3.7	10.4	15.1	4.3	3.0	4.9	13.1	104.0
South	19.2	6.2	4.2	5.1	15.5	2.8	3.0	5.5	13.2	74.8
West	25.3	6.0	6.0	8.9	18.4	Q	3.3	7.4	13.7	96.9

[1] 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.

[2] Includes buildings that do not fit into any of the other named categories.

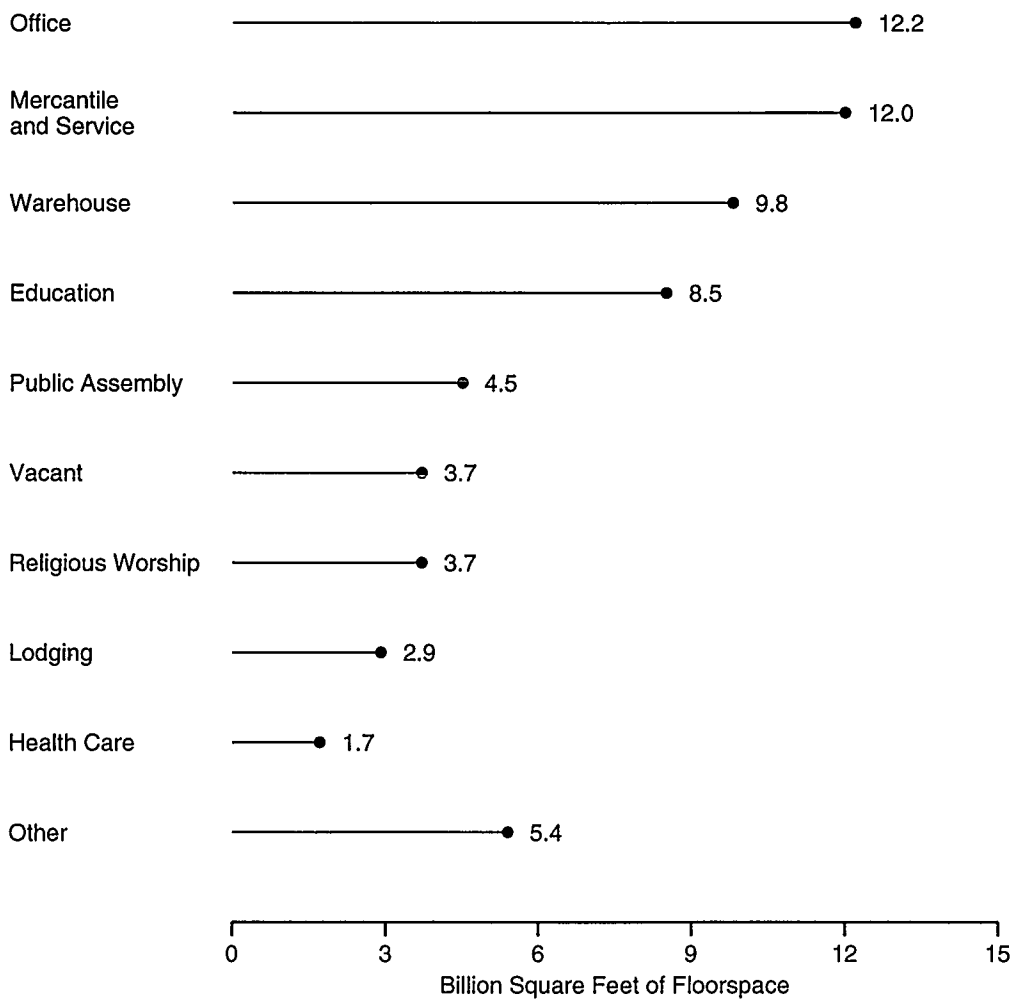
[3] See Appendix F for Census regions.

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

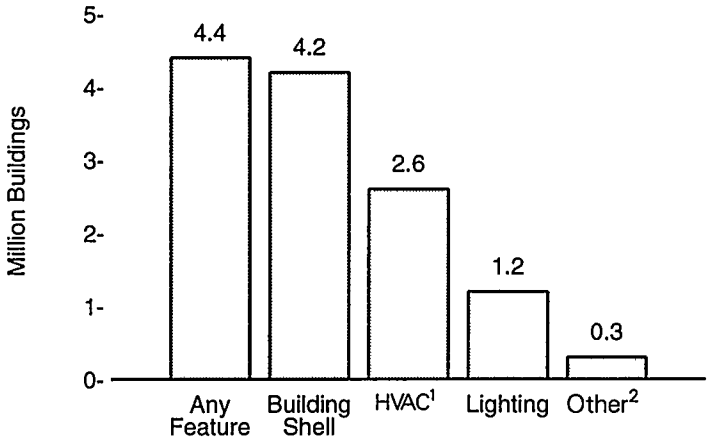
Source: Energy Information Administration, *Energy End-Use Intensities in Commercial Buildings* (September 1994), Table B2.

Figure 2.22 Commercial Buildings With Energy Conservation Features, 1992

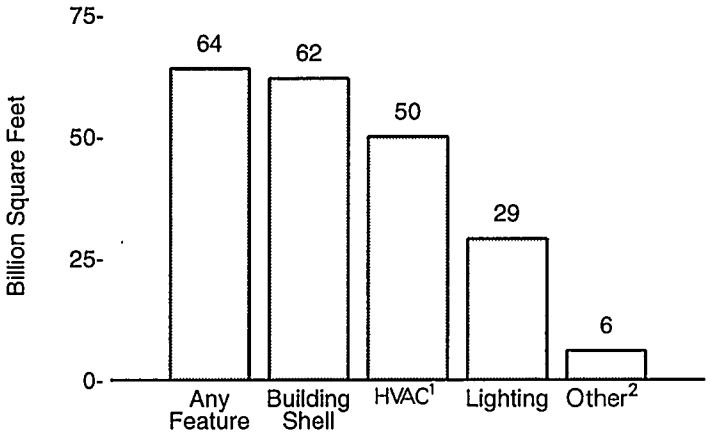
Any Type of Conservation Feature by Principal Building Activity



Number of Buildings by Type of Conservation Feature



Total Floorspace by Type of Conservation Feature



[1] Heating, ventilation, and air conditioning.
[2] Examples of "other" include timers on thermostats, zoned heating, reclaimed heat, and architectural design of the building.

Note: More than one conservation feature may apply to a building.
Source: Table 2.22.

Table 2.22 Commercial Buildings With Energy Conservation Features, 1992

Building Characteristic	Number of Buildings (thousands)						Total Floorspace (million square feet)					
	Total	Conservation Features [1]					Total	Conservation Features [1]				
		Any	Building Shell	HVAC [2]	Lighting	Other [3]		Any	Building Shell	HVAC [2]	Lighting	Other [3]
All Buildings	4,806	4,357	4,223	2,604	1,178	264	67,876	64,403	62,056	50,281	29,453	5,952
Building Floorspace (square feet)												
1,001 to 5,000	2,681	2,376	2,305	1,194	452	102	7,327	6,575	6,375	3,370	1,302	291
5,001 to 10,000	975	887	864	569	275	62	7,199	6,566	6,405	4,221	2,066	467
10,001 to 25,000	647	610	587	447	241	50	10,375	9,788	9,403	7,257	3,952	821
25,001 to 50,000	280	268	259	208	106	25	10,069	9,597	9,270	7,503	3,884	896
50,001 to 100,000	116	113	111	98	47	14	8,062	7,874	7,683	6,797	3,420	917
100,001 to 200,000	71	68	66	57	36	8	9,678	9,271	8,935	7,699	4,821	1,020
200,001 to 500,000	26	25	23	23	14	2	7,889	7,479	7,098	6,946	4,557	740
Over 500,000	9	9	9	9	7	1	7,278	7,254	6,887	6,488	5,452	799
Principal Building Activity												
Education	301	300	296	245	74	27	8,470	8,457	8,379	7,719	3,297	922
Food Sales	130	119	114	70	20	Q	757	695	656	510	197	Q
Food Service	260	251	245	166	92	Q	1,491	1,465	1,451	1,073	546	Q
Health Care	63	63	63	47	26	6	1,763	1,735	1,735	1,664	1,304	368
Lodging	154	152	150	120	51	12	2,891	2,868	2,825	2,585	1,340	379
Mercantile and Service	1,272	1,186	1,141	643	293	56	12,402	12,038	11,667	8,905	5,339	1,003
Office	749	727	722	534	220	41	12,319	12,239	12,185	11,004	7,042	904
Parking	24	20	16	10	5	Q	1,652	1,303	678	753	748	Q
Public Assembly	278	269	262	175	96	21	4,556	4,501	4,341	3,959	2,969	410
Public Order and Safety	60	59	59	46	19	Q	820	818	818	762	205	Q
Religious Worship	366	355	347	199	101	31	3,747	3,707	3,657	2,759	1,652	526
Warehouse	761	555	511	256	135	30	11,484	9,764	9,082	5,812	3,323	711
Other [4]	69	58	56	34	22	Q	1,130	1,099	1,032	968	589	Q
Vacant	319	242	240	60	25	Q	4,396	3,716	3,550	1,808	901	Q
Year Constructed												
1899 or Before	169	159	155	95	65	Q	1,721	1,662	1,620	1,229	659	Q
1900 to 1919	255	235	230	137	65	20	3,608	3,325	3,269	2,662	1,368	406
1920 to 1945	724	641	615	328	173	31	8,712	7,841	7,532	5,313	2,943	604
1946 to 1959	880	782	761	445	169	41	10,421	9,752	9,484	6,726	3,384	677
1960 to 1969	783	716	697	442	180	38	12,612	12,053	11,695	9,812	5,219	1,247
1970 to 1979	982	889	850	556	235	59	14,014	13,464	12,754	10,636	6,680	1,430
1980 to 1989	884	812	797	526	243	55	14,287	13,886	13,365	11,800	7,572	1,185
1990 to 1992	128	121	117	76	48	9	2,502	2,419	2,338	2,103	1,627	275
Census Region [5]												
Northeast	771	711	693	504	241	57	13,400	12,891	12,612	10,840	6,727	1,626
Midwest	1,202	1,097	1,076	626	295	67	17,280	16,619	16,031	13,100	7,790	1,575
South	1,963	1,737	1,667	980	375	85	24,577	22,659	21,758	16,864	8,307	1,757
West	870	812	787	494	268	55	12,619	12,234	11,655	9,477	6,628	993

[1] More than one conservation feature may apply to a building.
[2] Heating, ventilation, and air conditioning.
[3] Examples of "other" include timers on thermostats, zoned heating, reclaimed heat, and architectural design of the building.
[4] Includes buildings that do not fit into any of the other named categories.
[5] See Appendix F for Census regions.

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

Source: Energy Information Administration, Form EIA-871A, "Commercial Buildings Energy Consumption Survey for 1992."

3. Financial Indicators

Fossil Fuel Prices Down From Record Levels

From the 1949 level of $1.32 per million Btu, real prices[1] of fossil fuels[2] trended downward to a low of $0.90 in 1969 (3.1).* Thereafter, prices began to escalate, sometimes abruptly. In 1974, the composite price of fossil fuels jumped from the 1973 level of $0.96 to $1.51, surpassing the 1949 level for the first time and registering the largest year-to-year increase (56 percent) of the 1949-to-1994 period. The peak of $3.48 was reached in 1981. Thereafter, the price declined each year through 1988, plunging 36 percent in 1986 alone. Although prices recovered somewhat in 1989 and 1990, they then declined to a 21-year low of $1.21 in 1994.

Crude oil was the most expensive of the fossil fuels over the entire period, with the exception of anthracite in 1975 through 1977. At its peak in 1981, the real price of crude oil reached $6.94 per million Btu, more than triple the price of natural gas and more than quadruple the price of nonanthracitic coal.

Energy Expenditures Level in 1992

The energy expenditure measure is the product of energy consumption and energy prices. In 1992, although energy prices declined, end-use energy consumption increased 2.5 percent (1.5). As a result, expenditures rose 1.2 percent to $473 billion (3.6).

End-use expenditures of $222 billion for petroleum products accounted for 47 percent of total energy expenditures in 1992 (3.8). Expenditures for natural gas showed the largest year-to-year increase. The 1992 total of $68 billion was $3.7 billion (5.7 percent) above the 1991 total. Expenditures for coal were $27 billion. Sales of electricity (net of expenditures by electric utilities for most fuels used to generate electricity) totaled $151 billion. Nuclear fuel and biomass fuels used at electric utilities accounted for $3.9 billion.

[1]Real prices are expressed in 1987 dollars.
[2]Crude oil, natural gas, and coal.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

Energy Industry Financial Performance

In 1993, the 25 major energy companies included in the Financial Reporting System (FRS)[3] accounted for 52 percent of U.S. crude oil and natural gas liquids production, 42 percent of dry natural gas production, and 21 percent of coal production (3.9). They also accounted for 71 percent of refinery capacity. The FRS companies continued to play a significant role in the U.S. economy. In 1993, their sales were equal to 19 percent of the sales of the *Fortune* 500 largest U.S. industrial corporations.[4]

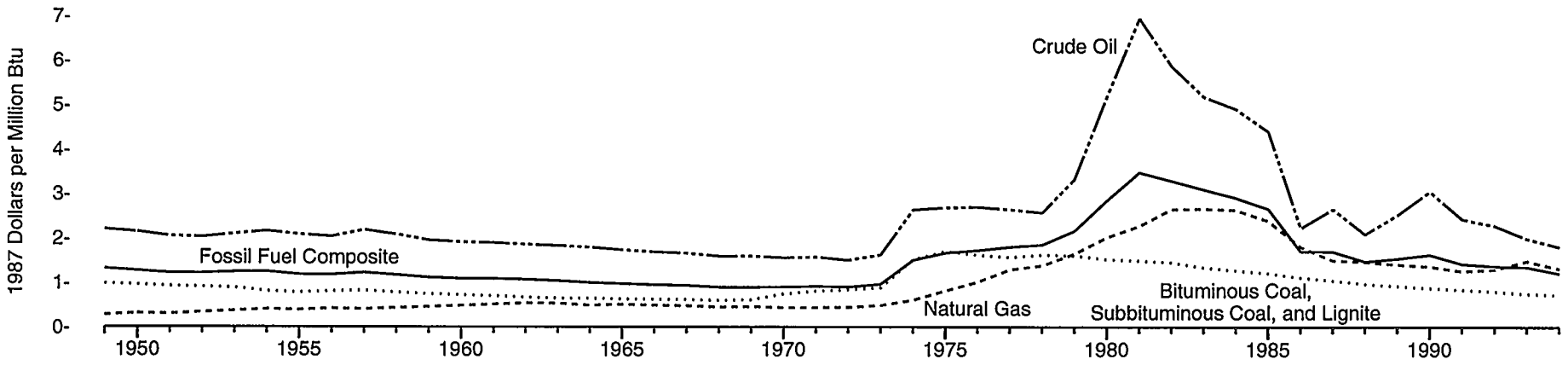
Low oil prices and continued economic expansion led to record demand for motor gasoline in 1993.

Despite the decline in crude oil prices—the composite refiner acquisition cost of crude oil of $16.41 per barrel in 1993 was the lowest since 1988 (5.19)—the FRS companies' net income rose to $16 billion (3.9). Although low crude oil prices affected the net income from domestic petroleum and natural gas production, which fell from $5.6 billion in 1992 to $4.8 billion in 1993, foreign petroleum and natural gas production posted gains in net income of $0.5 billion to $5.2 billion in 1993 (3.10). Net income from domestic refining and marketing rose from a negative $0.2 billion (the first negative return since 1977[5]) to $1.7 billion in 1993 (3.10). Low oil prices and continued expansion of the domestic economy led to record levels of demand for motor gasoline and increased demand for other petroleum products (5.11). Net income from foreign refining and marketing also increased, from $2.2 billion in 1992 to $3.2 billion in 1993. Net income from the nonenergy line of business rose from 1.2 billion in 1992 to $2.7 billion in 1993 and net income from coal rose from a negative $0.5 billion to $0.4 billion (3.10). FRS companies' additions to investment in place totaled $40 billion in 1993, down from $42 billion in 1992 (3.12). Petroleum and natural gas accounted for $32 billion of the 1993 total. For the second year in a row, additions to investment in foreign petroleum and natural gas production exceeded additions to investment in domestic production.

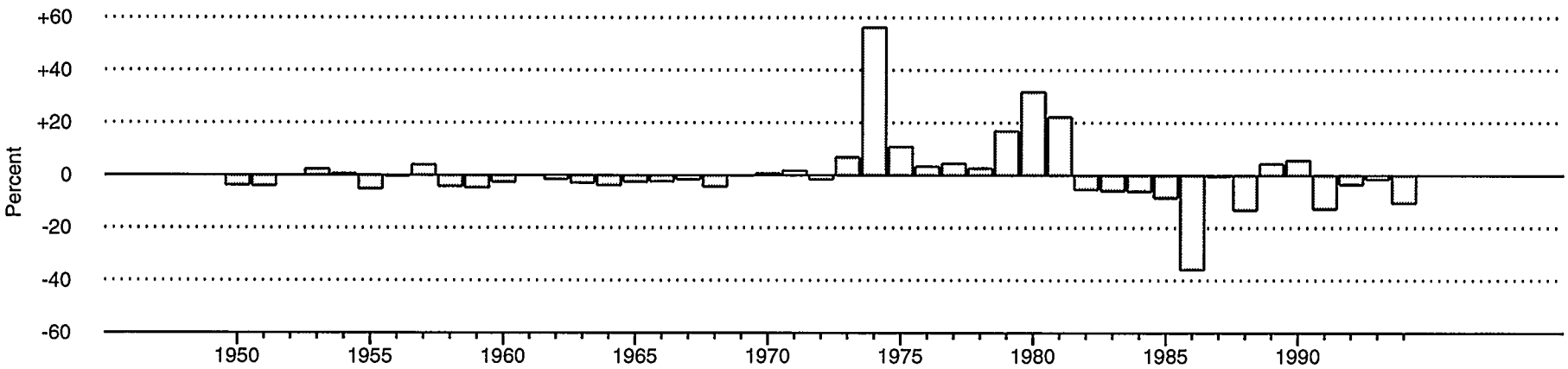
[3]The FRS collects financial data from the major energy-producing companies. See Note at end of section.
[4]Energy Information Administration, *Performance Profiles of Major Energy Producers 1993*, DOE/EIA-0206(93) (Washington DC, January 1995), p. 5.
[5]Collection of complete FRS data began in 1977; partial data were collected for 1974 through 1976.

Figure 3.1 Fossil Fuel Production Prices

Prices, 1949-1994



Fossil Fuel Composite Price, Change from Previous Year, 1950-1994



Source: Table 3.1.

Table 3.1 Fossil Fuel Production Prices, 1949-1994

(Cents per Million Btu)

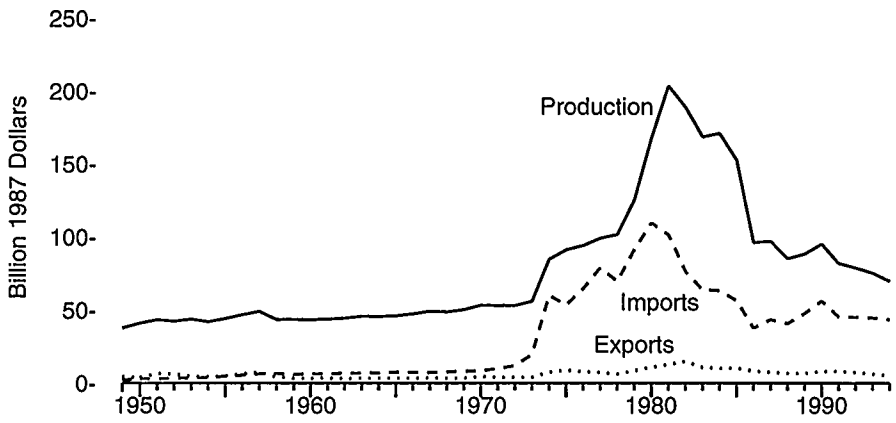
Year	Crude Oil [1]		Natural Gas [2]		Bituminous Coal, Subbituminous Coal, and Lignite [3]		Anthracite [4]		Fossil Fuel Composite [5]		
	Nominal	Real [6]	Nominal	Real [6]	Nominal	Real [6]	Nominal	Real [6]	Nominal	Real [6]	Percent Change
1949	43.8	220.1	5.4	27.1	19.5	98.0	36.4	182.9	26.2	131.7	–
1950	43.3	214.4	6.3	31.2	19.3	95.5	37.9	187.6	25.6	126.7	-3.8
1951	43.6	204.7	6.3	29.6	19.6	92.0	40.7	191.1	25.9	121.6	-4.0
1952	43.6	202.8	7.2	33.5	19.5	90.7	39.3	182.8	26.1	121.4	-0.2
1953	46.2	210.0	8.1	36.8	19.5	88.6	40.7	185.0	27.3	124.1	2.2
1954	47.9	215.8	9.0	40.5	18.0	81.1	36.1	162.6	27.7	124.8	0.6
1955	47.8	208.7	8.9	38.9	17.8	77.7	33.1	144.5	27.1	118.3	-5.2
1956	48.1	203.8	9.9	41.9	19.1	80.9	34.9	147.9	27.8	117.8	-0.4
1957	53.3	218.4	9.9	40.6	20.1	82.4	38.3	157.0	29.9	122.5	4.0
1958	51.9	208.4	10.8	43.4	19.4	77.9	38.0	152.6	29.2	117.3	-4.2
1959	50.0	195.3	11.7	45.7	19.1	74.6	35.9	140.2	28.6	111.7	-4.8
1960	49.7	191.2	12.6	48.5	18.8	72.3	33.8	130.0	28.3	108.8	-2.6
1961	49.8	189.4	13.5	51.3	18.4	70.0	34.6	131.6	28.6	108.7	-0.1
1962	50.0	185.9	14.5	53.9	18.0	66.9	33.6	124.9	28.8	107.1	-1.5
1963	49.8	183.1	14.5	53.3	17.6	64.7	36.6	134.6	28.3	104.0	-2.9
1964	49.7	179.4	13.6	49.1	17.9	64.6	38.0	137.2	27.7	100.0	-3.8
1965	49.3	173.6	14.5	51.1	17.9	63.0	36.3	127.8	27.7	97.5	-2.5
1966	49.7	169.0	14.5	49.3	18.4	62.6	34.8	118.4	28.0	95.2	-2.4
1967	50.3	166.0	14.5	47.9	18.8	62.0	36.0	118.8	28.4	93.7	-1.6
1968	50.7	159.4	14.3	45.0	19.1	60.1	39.2	123.3	28.5	89.6	-4.4
1969	53.3	159.6	15.4	46.1	20.5	61.4	44.0	131.7	29.9	89.5	-0.1
1970	54.8	155.7	15.4	43.8	26.2	74.4	48.8	138.6	31.7	90.1	0.7
1971	58.4	157.4	16.3	43.9	30.1	81.1	53.2	143.4	34.0	91.6	1.7
1972	58.4	150.5	17.3	44.6	32.7	84.3	55.3	142.5	35.0	90.2	-1.5
1973	67.1	162.5	20.1	48.7	36.5	88.4	61.7	149.4	39.8	96.4	6.9
1974	118.4	263.7	27.3	60.8	68.2	151.9	102.2	227.6	67.6	150.6	56.2
1975	132.2	268.7	40.2	81.7	83.9	170.5	149.5	303.9	82.1	166.9	10.8
1976	141.2	270.0	53.1	101.5	85.0	162.5	153.9	294.3	90.2	172.5	3.4
1977	147.8	264.4	72.3	129.3	87.7	156.9	153.8	275.1	100.8	180.3	4.5
1978	155.2	257.4	83.6	138.6	97.9	162.4	152.7	253.2	111.6	185.1	2.7
1979	217.9	332.7	108.1	165.0	105.3	160.8	177.2	270.5	141.7	216.3	16.9
1980	372.2	519.1	144.8	202.0	109.4	152.6	185.9	259.3	204.2	284.8	31.7
1981	547.8	694.3	179.5	227.5	117.9	149.4	190.1	240.9	274.5	347.9	22.2
1982	491.7	586.8	222.2	265.2	122.1	145.7	214.0	255.4	275.7	329.0	-5.4
1983	451.6	517.9	232.3	266.4	117.2	134.4	230.0	263.8	270.1	309.7	-5.9
1984	446.2	490.3	239.9	263.6	115.9	127.4	208.7	229.3	264.6	290.8	-6.1
1985	415.3	439.9	225.7	239.1	114.8	121.6	204.2	216.3	251.2	266.1	-8.5
1986	215.7	222.6	174.8	180.4	108.2	111.7	191.1	197.2	165.3	170.6	-35.9
1987	265.5	265.5	150.2	150.2	104.9	104.9	188.9	188.9	170.0	170.0	-0.4
1988	216.9	208.8	152.4	146.7	100.8	97.0	189.8	182.7	153.3	147.5	-13.2
1989	273.4	252.0	152.7	140.7	100.0	92.2	183.6	169.2	167.1	154.0	4.4
1990	345.3	304.8	154.6	136.5	99.5	87.8	174.5	154.0	184.3	162.7	5.6
1991	285.2	R242.5	148.0	R125.9	98.9	R84.1	161.0	R136.9	167.0	R142.0	R-12.7
1992	275.7	R228.0	156.8	R129.7	96.9	R80.1	151.7	R125.5	165.8	R137.1	-3.5
1993	R245.7	R198.9	R183.5	R148.6	R92.6	R75.0	R145.7	R118.0	R166.8	R135.1	R-1.5
1994P	227.4	180.3	165.5	131.2	91.0	72.2	143.1	113.5	152.3	120.8	-10.6

[1] Domestic first purchase prices.
[2] Wellhead prices.
[3] Prices are the basis of free-on-board (f.o.b.) mines.
[4] Through 1978, prices are f.o.b. preparation plants; for 1979 forward, prices are f.o.b. mines.
[5] 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.
[6] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

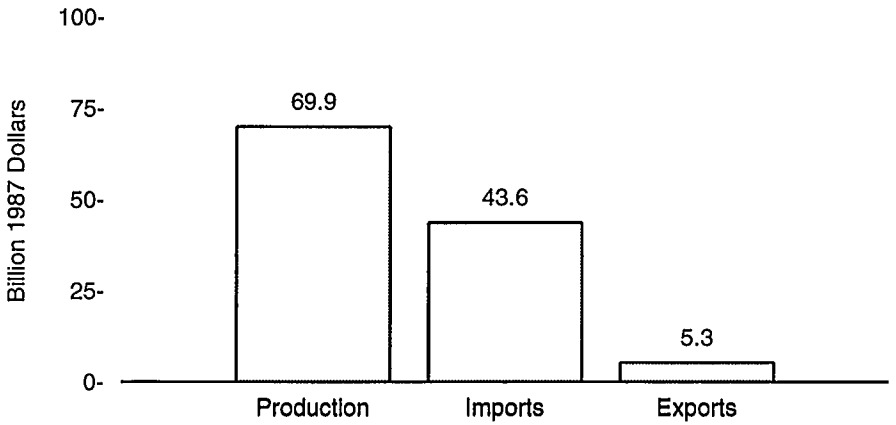
R=Revised data. P=Preliminary data. — = Not applicable.
Sources: Tables 5.16, 6.8, and 7.8 and Appendices A and E.

Figure 3.2 Value of Fossil Fuel Production

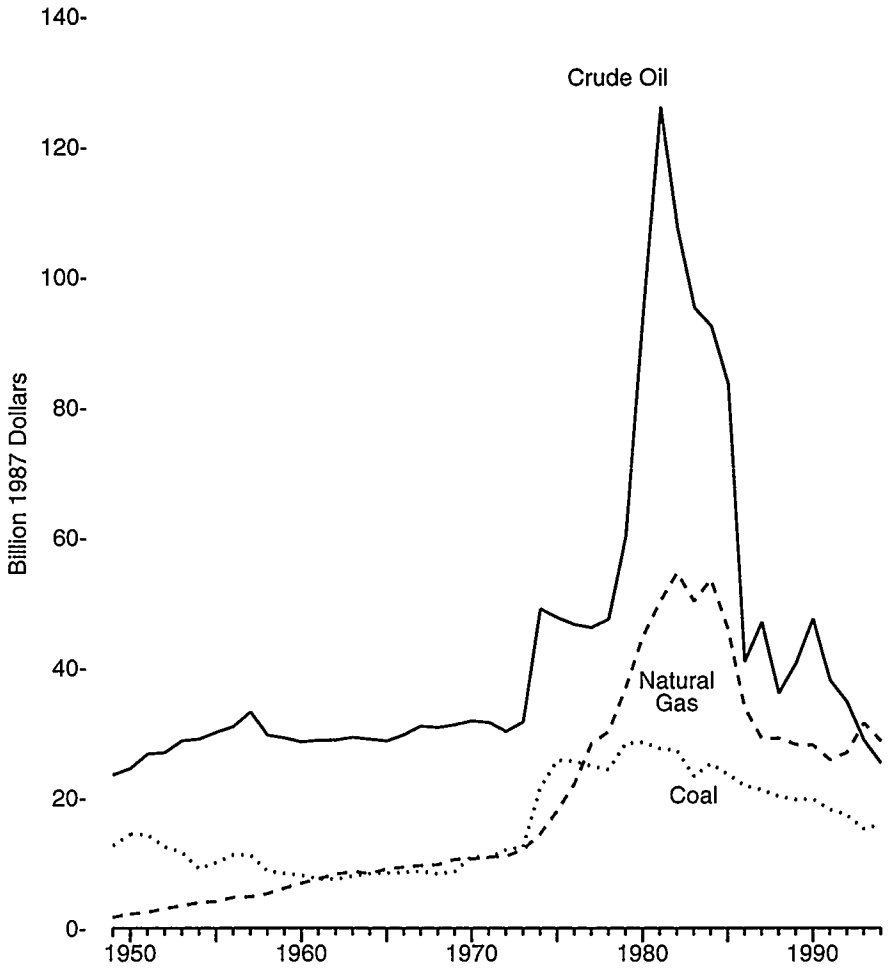
Overview, 1949-1994



Overview, 1994



Production by Fuel, 1949-1994



Notes: • Prices are in 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

• Because vertical scales differ, graphs should not be compared.
Sources: Tables 3.2, 3.3, and 3.4.

Table 3.2 Value of Fossil Fuel Production, 1949-1994

(Billion Dollars)

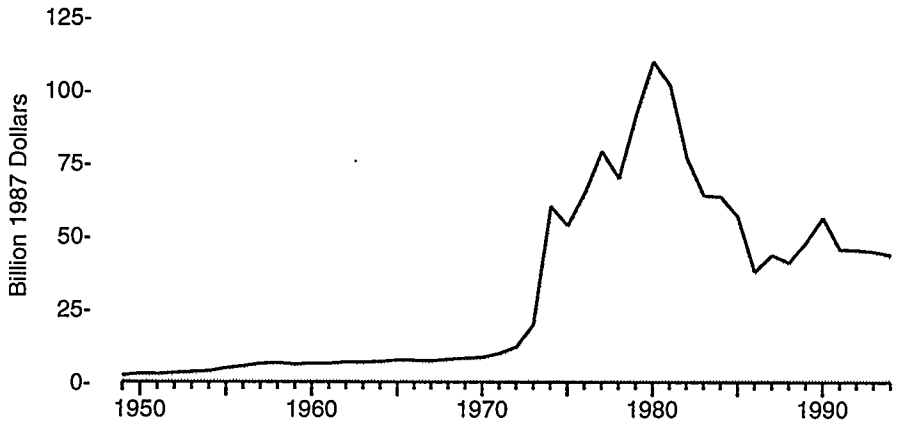
Year	Crude Oil [1]		Natural Gas (Marketed Production)		Coal						Total	
					Bituminous Coal, Subbituminous Coal, and Lignite		Anthracite		Total			
	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]
1949	4.68	23.52	0.33	1.66	2.14	10.75	0.38	1.91	2.52	12.66	7.53	37.84
1950	4.95	24.50	0.44	2.18	2.50	12.38	0.41	2.03	2.91	14.41	8.30	41.09
1951	5.69	26.71	0.52	2.44	2.63	12.35	0.42	1.97	3.05	14.32	9.26	43.47
1952	5.79	26.93	0.64	2.98	2.29	10.65	0.39	1.81	2.68	12.46	9.11	42.37
1953	6.32	28.73	0.76	3.45	2.25	10.23	0.31	1.41	2.56	11.64	9.64	43.82
1954	6.44	29.01	0.87	3.92	1.77	7.97	0.25	1.13	2.02	9.10	9.33	42.03
1955	6.88	30.04	0.94	4.10	2.09	9.13	0.21	0.92	2.30	10.05	10.12	44.19
1956	7.30	30.93	1.11	4.70	2.41	10.21	0.24	1.02	2.65	11.23	11.06	46.86
1957	8.09	33.16	1.17	4.80	2.50	10.25	0.23	0.94	2.73	11.19	11.99	49.15
1958	7.37	29.60	1.32	5.30	1.99	7.99	0.19	0.76	2.18	8.75	10.87	43.65
1959	7.47	29.18	1.57	6.13	1.97	7.70	0.18	0.70	2.15	8.40	11.19	43.71
1960	7.42	28.54	1.79	6.88	1.95	7.50	0.15	0.58	2.10	8.08	11.31	43.50
1961	7.58	28.82	1.99	7.57	1.85	7.03	0.14	0.53	1.99	7.56	11.56	43.95
1962	7.76	28.85	2.22	8.25	1.89	7.03	0.13	0.48	2.02	7.51	12.00	44.61
1963	7.96	29.26	2.36	8.68	2.01	7.39	0.16	0.59	2.17	7.98	12.49	45.92
1964	8.03	28.99	2.33	8.41	2.17	7.83	0.15	0.54	2.32	8.37	12.68	45.77
1965	8.15	28.70	2.57	9.05	2.27	7.99	0.13	0.46	2.40	8.45	13.12	46.20
1966	8.72	29.66	2.75	9.35	2.42	8.23	0.10	0.34	2.52	8.57	13.99	47.58
1967	9.39	30.99	2.91	9.60	2.55	8.42	0.10	0.33	2.65	8.75	14.95	49.34
1968	9.79	30.79	3.09	9.72	2.55	8.02	0.10	0.31	2.65	8.33	15.53	48.84
1969	10.42	31.20	3.52	10.54	2.80	8.38	0.10	0.30	2.90	8.68	16.84	50.42
1970	11.19	31.79	3.73	10.60	3.77	10.71	0.11	0.31	3.88	11.02	18.80	53.41
1971	11.71	31.56	4.05	10.92	3.90	10.51	0.11	0.30	4.01	10.81	19.77	53.29
1972	11.71	30.18	4.28	11.03	4.56	11.75	0.09	0.23	4.65	11.98	20.64	53.19
1973	13.07	31.65	4.98	12.06	5.05	12.23	0.09	0.22	5.14	12.45	23.19	56.16
1974	22.00	49.00	6.48	14.43	9.50	21.16	0.15	0.33	9.65	21.49	38.13	84.92
1975	23.45	47.66	8.85	17.99	12.47	25.35	0.20	0.41	12.67	25.76	44.97	91.41
1976	24.37	46.60	11.57	22.12	13.19	25.22	0.21	0.40	13.40	25.62	49.34	94.34
1977	25.79	46.14	15.82	28.30	13.70	24.51	0.20	0.36	13.90	24.87	55.51	99.31
1978	28.60	47.43	18.18	30.15	14.49	24.03	0.18	0.30	14.67	24.33	61.45	101.91
1979	39.45	60.23	24.16	36.89	18.36	28.03	0.20	0.31	18.56	28.34	82.17	125.46
1980	67.93	94.74	32.09	44.76	20.20	28.17	0.26	0.36	20.46	28.53	120.48	168.03
1981	99.40	125.98	39.51	50.08	21.51	27.26	0.24	0.30	21.75	27.56	160.66	203.62
1982	90.03	107.43	45.71	54.55	22.62	26.99	0.23	0.27	22.85	27.26	158.59	189.24
1983	83.05	95.24	43.73	50.15	20.11	23.06	0.21	0.24	20.32	23.30	147.10	168.69
1984	84.10	92.42	48.69	53.51	22.75	25.00	0.20	0.22	22.95	25.22	155.74	171.15
1985	78.88	83.56	43.35	45.92	22.06	23.37	0.22	0.23	22.28	23.60	144.51	153.08
1986	39.63	40.90	32.71	33.76	21.00	21.67	0.19	0.20	21.19	21.87	93.53	96.53
1987	46.93	46.93	29.11	29.11	21.05	21.05	0.16	0.16	21.21	21.21	97.25	97.25
1988	37.48	36.07	30.28	29.14	20.83	20.05	0.16	0.15	20.99	20.20	88.75	85.41
1989	44.07	40.62	30.58	28.18	21.27	19.60	0.14	0.13	21.41	19.73	96.06	88.53
1990	53.77	47.46	31.80	28.07	22.27	19.66	0.14	0.12	22.41	19.78	107.98	95.31
1991	44.77	R38.07	30.39	R25.84	21.29	R18.10	0.13	0.11	21.42	R18.21	96.58	R82.12
1992	41.97	R34.71	32.56	R26.93	20.86	R17.25	0.12	0.10	20.98	R17.35	95.51	R78.99
1993	R35.61	R28.83	R38.83	R31.44	R18.62	R15.08	0.14	0.11	R18.76	R15.19	R93.20	R75.46
1994P	31.91	25.31	36.18	28.69	19.95	15.82	0.12	0.10	20.07	15.92	88.16	69.92

[1] Includes lease condensate.
[2] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
R=Revised data. P=Preliminary data.

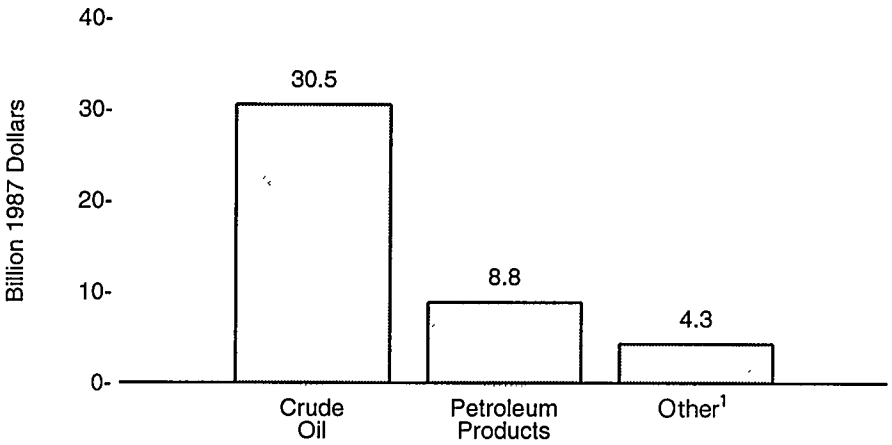
Note: Value is based on fuel prices taken as closely as possible to the point of production.
Sources: Tables 5.1, 5.16, 6.2, 6.8, 7.2, and 7.8 and Appendix E.

Figure 3.3 Value of Fossil Fuel Imports

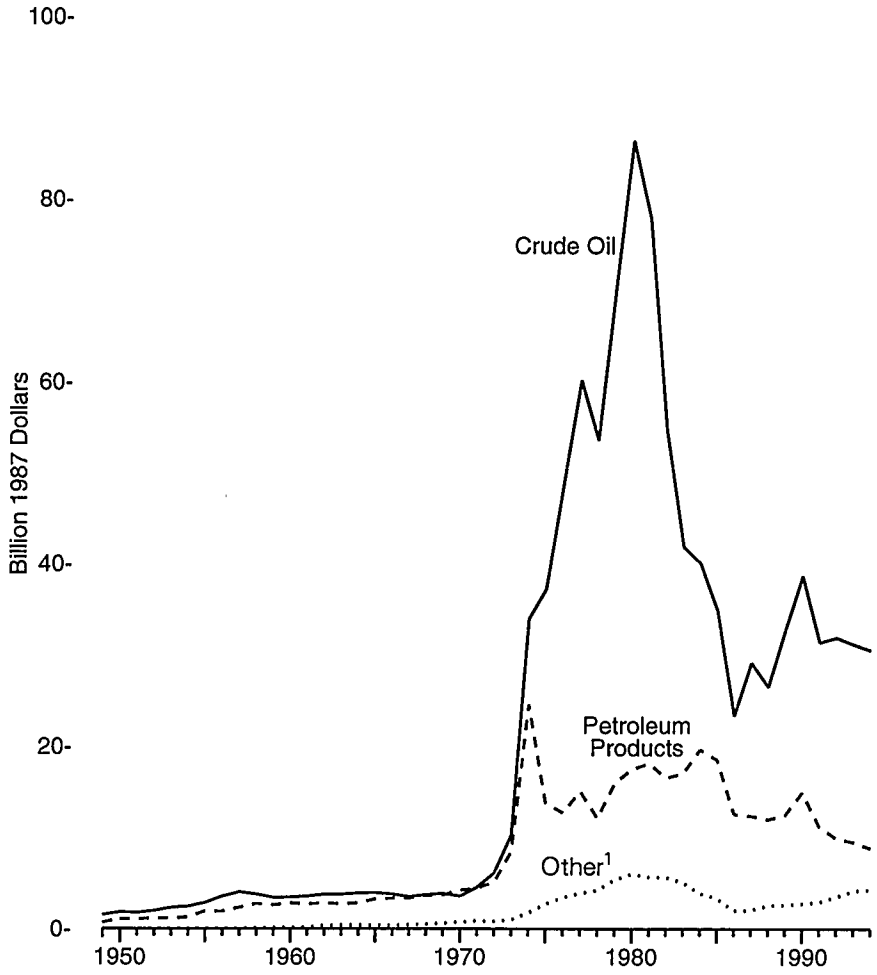
Total, 1949-1994



By Fuel, 1994



By Fuel, 1949-1994



[1] "Other" is natural gas, coal, and coal coke.
Notes: • Prices are in 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

• Because vertical scales differ, graphs should not be compared.
Source: Table 3.3.

Table 3.3 Value of Fossil Fuel Imports, 1949-1994

(Billion Dollars)

Year	Coal		Coal Coke		Natural Gas		Crude Oil [1]		Petroleum Products		Total	
	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]
1949	(s)	0.01	(s)	0.02	0.00	0.00	0.30	1.53	0.14	0.69	0.45	2.25
1950	(s)	0.01	0.01	0.03	0.00	0.00	0.37	1.83	0.21	1.06	0.59	2.93
1951	(s)	0.01	(s)	0.01	0.00	0.00	0.37	1.76	0.23	1.06	0.61	2.84
1952	(s)	0.01	(s)	0.02	(s)	(s)	0.42	1.97	0.25	1.17	0.68	3.18
1953	(s)	0.01	(s)	0.01	(s)	0.01	0.51	2.32	0.25	1.14	0.77	3.48
1954	(s)	0.01	(s)	0.01	(s)	(s)	0.54	2.45	0.28	1.28	0.83	3.75
1955	(s)	0.01	(s)	0.01	(s)	0.01	0.65	2.86	0.44	1.93	1.10	4.81
1956	(s)	0.01	(s)	0.01	(s)	(s)	0.84	3.55	0.45	1.90	1.29	5.47
1957	(s)	0.01	(s)	0.01	(s)	0.01	0.98	4.02	0.57	2.33	1.56	6.38
1958	(s)	0.01	(s)	0.01	0.02	0.09	0.94	3.77	0.68	2.75	1.65	6.63
1959	(s)	0.01	(s)	0.01	0.03	0.10	0.87	3.41	0.66	2.59	1.57	6.12
1960	(s)	0.01	(s)	0.01	0.03	0.11	0.90	3.44	0.73	2.81	1.66	6.38
1961	(s)	0.01	(s)	0.01	0.04	0.17	0.93	3.55	0.71	2.70	1.69	6.43
1962	(s)	0.01	(s)	0.01	0.09	0.32	1.01	3.76	0.75	2.80	1.86	6.90
1963	(s)	0.01	(s)	0.01	0.10	0.36	1.03	3.77	0.74	2.71	1.87	6.86
1964	(s)	0.01	(s)	0.01	0.10	0.36	1.08	3.90	0.78	2.83	1.97	7.10
1965	(s)	0.01	(s)	(s)	0.11	0.37	1.12	3.94	0.92	3.25	2.15	7.58
1966	(s)	0.01	(s)	0.01	0.11	0.36	1.12	3.79	0.99	3.36	2.21	7.52
1967	(s)	0.01	(s)	0.01	0.13	0.43	1.06	3.51	1.02	3.35	2.21	7.30
1968	(s)	0.01	(s)	0.01	0.15	0.46	1.18	3.72	1.16	3.66	2.50	7.86
1969	(s)	(s)	(s)	0.01	0.20	0.58	1.30	3.89	1.24	3.71	2.74	8.19
1970	(s)	(s)	(s)	0.01	0.26	0.73	1.26	3.58	1.48	4.21	3.00	8.53
1971	(s)	(s)	0.01	0.01	0.31	0.84	1.69	4.55	1.66	4.46	3.66	9.87
1972	(s)	(s)	(s)	0.01	0.31	0.81	2.37	6.11	1.99	5.13	4.68	12.06
1973	(s)	(s)	0.04	0.10	0.36	0.88	4.24	10.27	3.50	8.47	8.14	19.71
1974	0.06	0.13	0.19	0.43	0.53	1.18	15.25	33.97	11.01	24.53	27.05	60.24
1975	0.02	0.04	0.16	0.32	1.15	2.34	18.29	37.18	6.77	13.76	26.39	53.63
1976	0.02	0.03	0.11	0.21	1.66	3.17	25.46	48.67	6.65	12.72	33.90	64.81
1977	0.04	0.07	0.13	0.23	2.00	3.58	33.59	60.09	8.42	15.06	44.18	79.03
1978	0.07	0.12	0.41	0.68	2.06	3.42	32.30	53.56	7.30	12.11	42.15	69.89
1979	0.05	0.08	0.34	0.52	3.13	4.77	46.06	70.32	10.45	15.95	60.03	91.64
1980	0.03	0.04	0.05	0.07	4.21	5.88	61.90	86.33	12.54	17.49	78.74	109.81
1981	0.03	0.04	0.04	0.05	4.41	5.59	61.46	77.89	14.30	18.12	80.24	101.70
1982	0.02	0.03	0.01	0.01	4.69	5.60	45.72	54.56	13.86	16.54	64.31	76.74
1983	0.04	0.05	(s)	(s)	4.39	5.03	36.49	41.85	14.84	17.02	55.77	63.95
1984	0.05	0.05	0.05	0.05	3.44	3.78	36.44	40.05	17.87	19.63	57.84	63.56
1985	0.07	0.07	0.04	0.05	3.05	3.23	32.90	34.85	17.47	18.50	53.53	56.71
1986	0.08	0.08	0.03	0.03	1.82	1.88	22.61	23.33	12.18	12.57	36.72	37.89
1987	0.06	0.06	0.05	0.05	1.93	1.93	29.13	29.13	12.37	12.37	43.54	43.54
1988	0.06	0.06	0.19	0.19	2.38	2.29	27.55	26.51	12.43	11.97	42.62	41.02
1989	0.10	0.09	0.22	0.20	2.51	2.31	35.53	32.75	13.50	12.44	51.85	47.79
1990	0.09	0.08	0.07	0.06	2.97	2.62	43.78	38.65	16.90	14.92	63.83	56.33
1991	0.11	0.10	0.09	0.08	3.24	2.75	36.90	R31.38	13.17	R11.20	53.51	R45.50
1992	0.13	0.11	0.14	0.12	3.96	3.27	38.55	R31.89	11.98	R9.91	54.77	R45.30
1993	0.22	0.18	0.12	0.09	R4.77	R3.86	R38.47	R31.15	R11.74	R9.51	R55.31	R44.79
1994P	0.23	0.18	0.13	0.10	5.03	3.99	38.46	30.50	11.12	8.81	54.97	43.59

[1] Includes imports into the Strategic Petroleum Reserve, which began in 1977.

[2] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

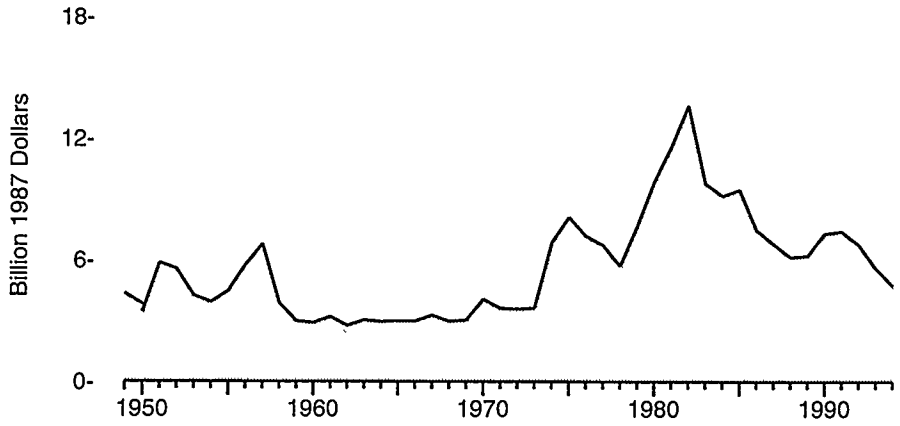
R=Revised data. P=Preliminary data. (s)=Less than $5 million.

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.

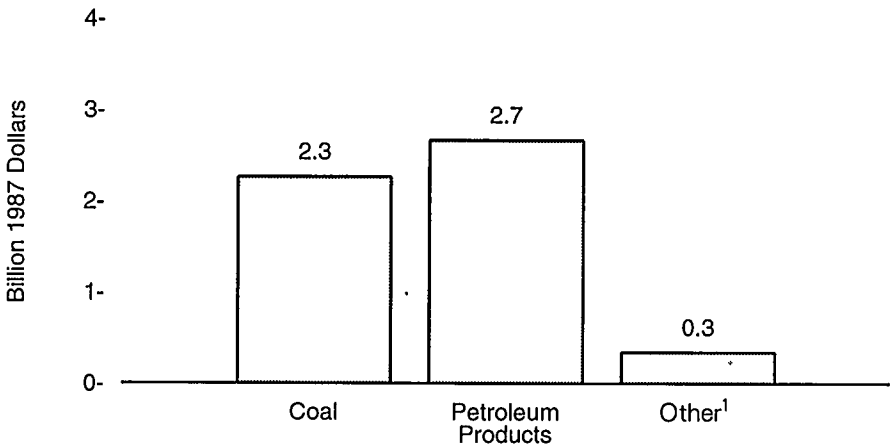
Sources: **Natural Gas:** • 1949-1962—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT110. • 1963—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT125. • 1964-1971—Bureau of the Census, *U.S. Imports for Consumption and General Imports*, FT246. • 1972 and 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. • 1978-1981—Energy Information Administration (EIA), *U.S. Imports and Exports of Natural Gas*, annual. • 1982-1993—EIA, *Natural Gas Monthly*. • 1994—EIA estimates. **All Other Data:** • 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, *Advanced Report on U.S. Merchandise Trade*, FT900 Adv. (94-12).

Figure 3.4 Value of Fossil Fuel Exports

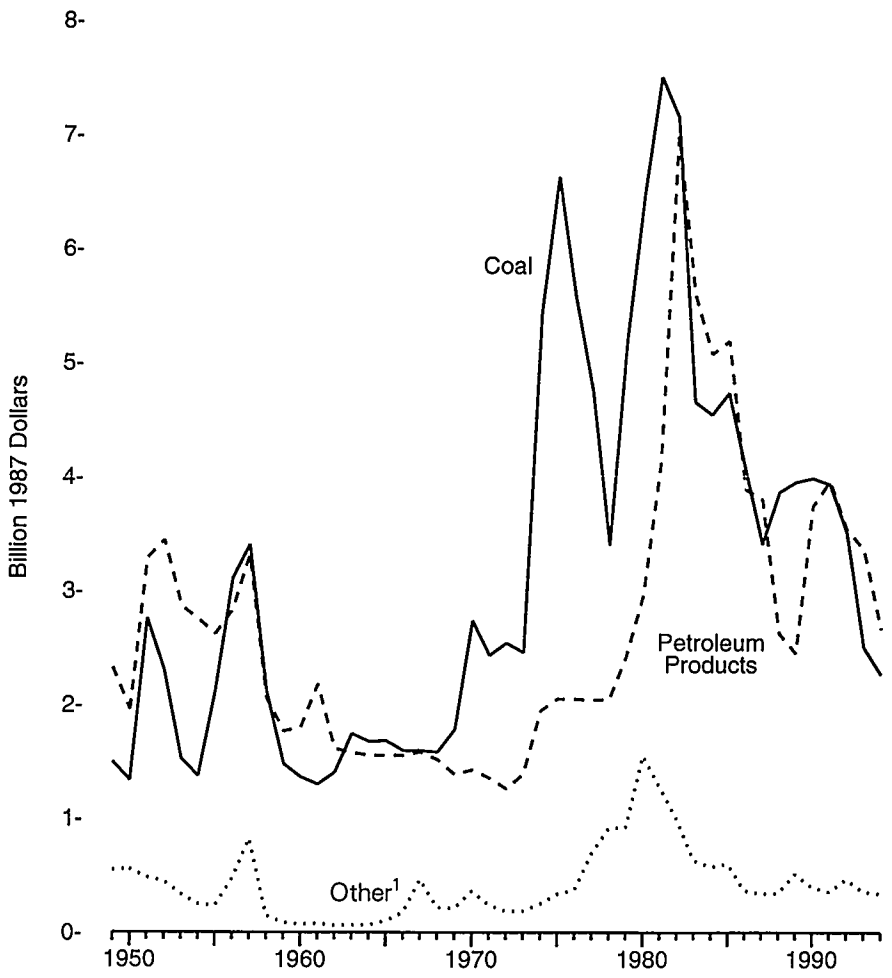
Total, 1949-1994



By Fuel, 1994



By Fuel, 1949-1994



[1] "Other" is natural gas, crude oil, and coal coke.
Notes: • Prices are in 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

• Because vertical scales differ, graphs should not be compared.
Source: Table 3.4.

Table 3.4 Value of Fossil Fuel Exports, 1949-1994

(Billion Dollars)

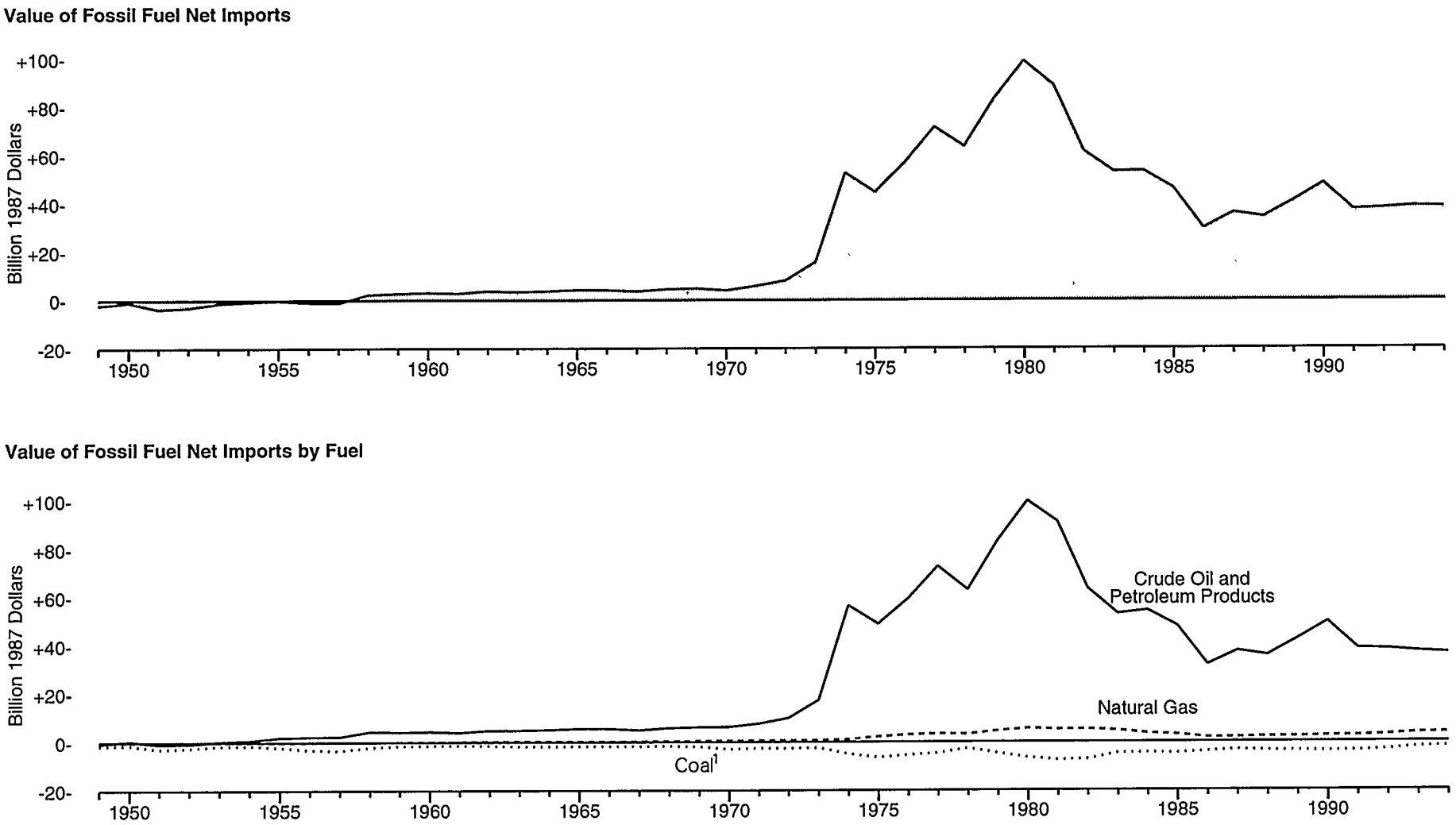
Year	Coal		Coal Coke		Natural Gas		Crude Oil		Petroleum Products		Total	
	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]
1949	0.30	1.49	0.01	0.04	(s)	0.01	0.10	0.49	0.46	2.32	0.87	4.36
1950	0.27	1.33	0.01	0.03	(s)	0.02	0.10	0.51	0.39	1.95	0.78	3.84
1951	0.59	2.75	0.02	0.08	(s)	0.02	0.08	0.38	0.70	3.28	1.39	6.52
1952	0.49	2.30	0.01	0.06	(s)	0.02	0.08	0.36	0.74	3.44	1.33	6.18
1953	0.34	1.52	0.01	0.04	(s)	0.02	0.06	0.27	0.63	2.86	1.04	4.72
1954	0.30	1.37	0.01	0.03	(s)	0.02	0.05	0.20	0.61	2.74	0.97	4.36
1955	0.48	2.12	0.01	0.04	0.01	0.03	0.04	0.17	0.60	2.62	1.14	4.97
1956	0.73	3.10	0.01	0.05	0.01	0.04	0.09	0.38	0.67	2.82	1.51	6.40
1957	0.83	3.40	0.01	0.06	0.01	0.05	0.17	0.71	0.81	3.31	1.84	7.53
1958	0.53	2.11	0.01	0.03	0.01	0.06	0.01	0.06	0.51	2.05	1.07	4.31
1959	0.38	1.48	0.01	0.03	0.01	0.02	0.01	0.03	0.45	1.76	0.85	3.33
1960	0.35	1.36	0.01	0.03	(s)	0.01	0.01	0.03	0.47	1.80	0.84	3.23
1961	0.34	1.30	0.01	0.03	(s)	0.01	0.01	0.03	0.57	2.18	0.93	3.55
1962	0.38	1.40	0.01	0.03	(s)	0.01	0.01	0.02	0.43	1.61	0.83	3.07
1963	0.47	1.74	0.01	0.03	(s)	0.02	(s)	0.02	0.43	1.58	0.92	3.38
1964	0.46	1.67	0.01	0.04	(s)	0.02	(s)	0.01	0.43	1.55	0.91	3.29
1965	0.48	1.68	0.02	0.06	0.01	0.03	(s)	0.02	0.44	1.55	0.95	3.33
1966	0.47	1.59	0.02	0.08	0.02	0.06	0.01	0.03	0.46	1.55	0.97	3.32
1967	0.48	1.59	0.02	0.05	0.03	0.11	0.09	0.30	0.48	1.58	1.10	3.64
1968	0.50	1.58	0.02	0.06	0.04	0.12	0.01	0.04	0.48	1.51	1.05	3.31
1969	0.59	1.78	0.04	0.12	0.03	0.08	0.01	0.02	0.46	1.38	1.13	3.37
1970	0.96	2.73	0.08	0.22	0.03	0.09	0.02	0.05	0.50	1.42	1.59	4.52
1971	0.90	2.43	0.04	0.12	0.04	0.10	0.01	0.02	0.50	1.35	1.49	4.02
1972	0.98	2.54	0.03	0.08	0.04	0.10	(s)	(s)	0.49	1.26	1.55	3.98
1973	1.01	2.45	0.03	0.08	0.04	0.10	(s)	0.01	0.57	1.39	1.66	4.03
1974	2.44	5.43	0.04	0.10	0.05	0.12	0.01	0.03	0.87	1.94	3.42	7.62
1975	3.26	6.62	0.07	0.15	0.09	0.18	(s)	(s)	1.01	2.05	4.43	9.01
1976	2.91	5.56	0.07	0.13	0.10	0.19	0.03	0.05	1.07	2.05	4.17	7.98
1977	2.66	4.75	0.07	0.13	0.11	0.19	0.21	0.37	1.14	2.04	4.18	7.48
1978	2.05	3.40	0.05	0.08	0.11	0.19	0.39	0.65	1.23	2.04	3.83	6.36
1979	3.40	5.19	0.08	0.12	0.13	0.19	0.39	0.60	1.58	2.42	5.58	8.53
1980	4.63	6.45	0.13	0.18	0.23	0.32	0.75	1.05	2.12	2.96	7.86	10.96
1981	5.92	7.50	0.07	0.09	0.35	0.44	0.58	0.73	3.24	4.10	10.16	12.87
1982	5.99	7.15	0.06	0.07	0.30	0.36	0.47	0.56	5.86	6.99	12.68	15.14
1983	4.06	4.65	0.05	0.05	0.28	0.32	0.22	0.26	4.88	5.59	9.48	10.87
1984	4.13	4.54	0.07	0.08	0.27	0.30	0.19	0.20	4.62	5.07	9.27	10.19
1985	4.47	4.73	0.08	0.08	0.26	0.28	0.23	0.24	4.90	5.19	9.93	10.52
1986	3.93	4.06	0.07	0.07	0.17	0.18	0.12	0.12	3.77	3.89	8.05	8.31
1987	3.40	3.40	0.05	0.05	0.17	0.17	0.13	0.13	3.80	3.80	7.54	7.54
1988	4.01	3.86	0.08	0.07	0.20	0.19	0.08	0.07	2.72	2.62	7.09	6.83
1989	4.29	3.95	0.08	0.07	0.27	0.25	0.21	0.19	2.65	2.45	7.49	6.91
1990	4.51	3.98	0.05	0.04	0.27	0.23	0.14	0.12	4.23	3.74	9.20	8.12
1991	4.62	R3.93	0.05	0.04	0.33	0.28	0.03	0.03	4.65	R3.96	9.69	R8.24
1992	4.24	R3.51	0.04	0.04	0.49	0.40	0.03	0.03	4.27	R3.53	9.07	R7.50
1993	3.09	R2.50	0.06	0.05	R0.36	R0.29	0.02	0.02	4.15	R3.36	R7.68	R6.22
1994P	2.85	2.26	0.04	0.03	0.35	0.27	0.04	0.03	3.36	2.66	6.63	5.26

[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
R=Revised data. P=Preliminary data. (s)=Less than $5 million.

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. • 1978-1981—Energy Information Administration (EIA), *U.S. Imports and Exports of Natural Gas*, annual. • 1982-1993—EIA, *Natural Gas Monthly*. • 1994—EIA estimates. **All Other Data:** • 1949-1988—Bureau of the Census, *U.S. Exports*, FT410. • 1989 forward—Bureau of the Census, *Advanced Report on U.S. Merchandise Trade*, FT900 Adv. (94-12).

Figure 3.5 Value of Fossil Fuel Net Imports, 1949-1994



[1] Includes small amounts of coal coke.
Notes: • Negative net imports are net exports. • Prices are in 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
Source: Table 3.5.

Table 3.5 Value of Fossil Fuel Net Imports, 1949-1994

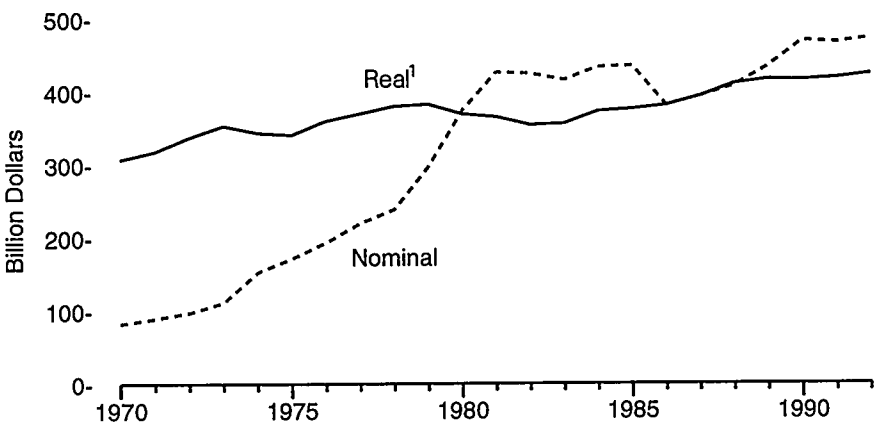
(Billion Dollars)

Year	Coal		Coal Coke		Natural Gas		Crude Oil		Petroleum Products		Total	
	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]
1949	-0.29	-1.48	(s)	-0.02	(s)	-0.01	0.21	1.04	-0.32	-1.63	-0.42	-2.11
1950	-0.27	-1.32	(s)	(s)	(s)	-0.02	0.27	1.32	-0.18	-0.89	-0.18	-0.91
1951	-0.58	-2.74	-0.02	-0.07	(s)	-0.02	0.29	1.38	-0.47	-2.22	-0.78	-3.67
1952	-0.49	-2.29	-0.01	-0.04	(s)	-0.02	0.34	1.60	-0.49	-2.27	-0.65	-3.01
1953	-0.33	-1.51	-0.01	-0.03	(s)	-0.01	0.45	2.04	-0.38	-1.72	-0.27	-1.23
1954	-0.30	-1.36	(s)	-0.02	(s)	-0.01	0.50	2.25	-0.32	-1.46	-0.14	-0.61
1955	-0.48	-2.10	-0.01	-0.03	-0.01	-0.02	0.62	2.69	-0.16	-0.69	-0.04	-0.16
1956	-0.73	-3.09	-0.01	-0.04	-0.01	-0.03	0.75	3.17	-0.22	-0.93	-0.22	-0.93
1957	-0.83	-3.38	-0.01	-0.05	-0.01	-0.04	0.81	3.31	-0.24	-0.99	-0.28	-1.15
1958	-0.52	-2.10	-0.01	-0.02	0.01	0.03	0.92	3.71	0.17	0.70	0.58	2.32
1959	-0.38	-1.47	-0.01	-0.03	0.02	0.08	0.87	3.38	0.21	0.83	0.71	2.79
1960	-0.35	-1.35	-0.01	-0.02	0.02	0.10	0.89	3.41	0.26	1.02	0.82	3.15
1961	-0.34	-1.29	-0.01	-0.03	0.04	0.16	0.92	3.52	0.14	0.52	0.76	2.88
1962	-0.38	-1.39	-0.01	-0.02	0.08	0.31	1.01	3.74	0.32	1.19	1.03	3.82
1963	-0.47	-1.73	-0.01	-0.02	0.09	0.34	1.02	3.75	0.31	1.14	0.95	3.48
1964	-0.46	-1.66	-0.01	-0.03	0.10	0.34	1.08	3.89	0.35	1.27	1.06	3.81
1965	-0.48	-1.67	-0.01	-0.05	0.10	0.35	1.11	3.93	0.48	1.70	1.21	4.25
1966	-0.47	-1.59	-0.02	-0.07	0.09	0.30	1.11	3.76	0.53	1.81	1.24	4.21
1967	-0.48	-1.59	-0.01	-0.05	0.10	0.32	0.97	3.21	0.54	1.77	1.11	3.67
1968	-0.50	-1.57	-0.02	-0.05	0.11	0.34	1.17	3.69	0.68	2.15	1.45	4.55
1969	-0.59	-1.77	-0.04	-0.11	0.17	0.51	1.29	3.87	0.78	2.33	1.61	4.82
1970	-0.96	-2.73	-0.08	-0.21	0.23	0.65	1.24	3.53	0.98	2.79	1.41	4.02
1971	-0.90	-2.43	-0.04	-0.11	0.27	0.74	1.68	4.53	1.15	3.11	2.17	5.85
1972	-0.98	-2.53	-0.03	-0.07	0.28	0.71	2.37	6.10	1.50	3.87	3.13	8.08
1973	-1.01	-2.45	0.01	0.01	0.32	0.78	4.24	10.26	2.93	7.08	6.48	15.68
1974	-2.38	-5.30	0.15	0.33	0.48	1.06	15.24	33.94	10.14	22.58	23.63	52.62
1975	-3.24	-6.58	0.08	0.17	1.06	2.15	18.29	37.18	5.76	11.71	21.96	44.63
1976	-2.89	-5.53	0.04	0.08	1.56	2.98	25.43	48.62	5.58	10.67	29.72	56.83
1977	-2.62	-4.68	0.06	0.11	1.89	3.39	33.38	59.72	7.28	13.02	40.00	71.55
1978	-1.98	-3.28	0.36	0.60	1.95	3.23	31.91	52.92	6.07	10.07	38.31	63.54
1979	-3.35	-5.11	0.26	0.40	3.00	4.58	45.66	69.72	8.87	13.54	54.44	83.12
1980	-4.60	-6.41	-0.08	-0.11	3.98	5.56	61.15	85.28	10.42	14.53	70.88	98.85
1981	-5.89	-7.46	-0.03	-0.04	4.06	5.15	60.88	77.16	11.06	14.02	70.09	88.83
1982	-5.97	-7.12	-0.05	-0.06	4.39	5.24	45.25	54.00	8.00	9.55	51.63	61.61
1983	-4.01	-4.60	-0.04	-0.05	4.11	4.71	36.27	41.59	9.96	11.43	46.28	53.08
1984	-4.09	-4.49	-0.02	-0.02	3.17	3.48	36.26	39.85	13.25	14.56	48.57	53.37
1985	-4.39	-4.66	-0.03	-0.04	2.79	2.95	32.68	34.62	12.57	13.32	43.60	46.19
1986	-3.85	-3.97	-0.04	-0.04	1.65	1.70	22.49	23.21	8.42	8.68	28.67	29.58
1987	-3.35	-3.35	0.01	0.01	1.76	1.76	29.00	29.00	8.57	8.57	36.00	36.00
1988	-3.95	-3.80	0.12	0.11	2.18	2.10	27.47	26.44	9.71	9.35	35.53	34.19
1989	-4.19	-3.86	0.14	0.13	2.24	2.06	35.32	32.56	10.85	10.00	44.35	40.88
1990	-4.42	-3.90	0.02	0.02	2.71	2.39	43.65	38.52	12.67	11.18	54.63	48.22
1991	-4.51	-3.83	0.04	0.04	2.90	R2.47	36.87	R31.35	8.52	7.24	43.82	R37.26
1992	-4.11	R-3.40	0.10	0.08	3.47	2.87	38.52	R31.86	7.72	R6.38	45.70	R37.80
1993	-2.87	R-2.32	0.06	0.05	R4.41	R3.57	R38.45	R31.13	R7.59	R6.15	R47.64	R38.57
1994P	-2.62	-2.08	0.09	0.07	4.69	3.72	38.42	30.47	7.76	6.15	48.34	38.33

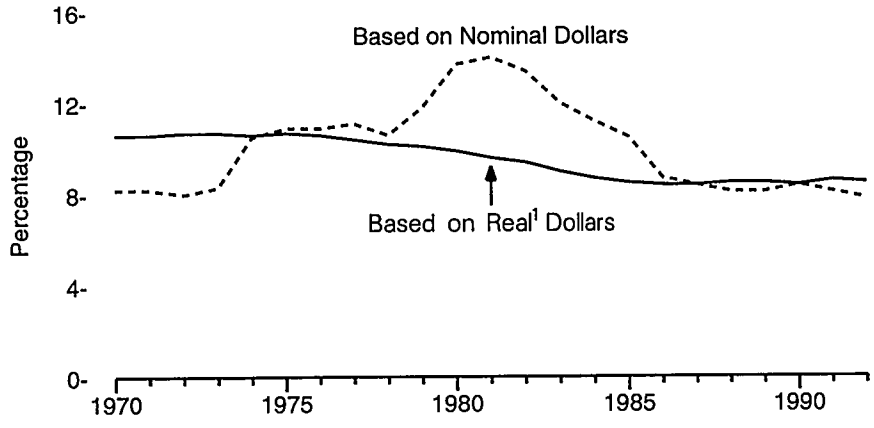
[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
R=Revised data. P=Preliminary data. (s)=Less than $5 million.
Notes: • Net imports = imports minus exports. • Totals may not equal sum of components due to independent rounding. Data on this table may not equal data on Table 3.3 minus data on Table 3.4 due to independent rounding.
Sources: Tables 3.3 and 3.4.

Figure 3.6 Energy Expenditures and Price Indices, 1970-1992

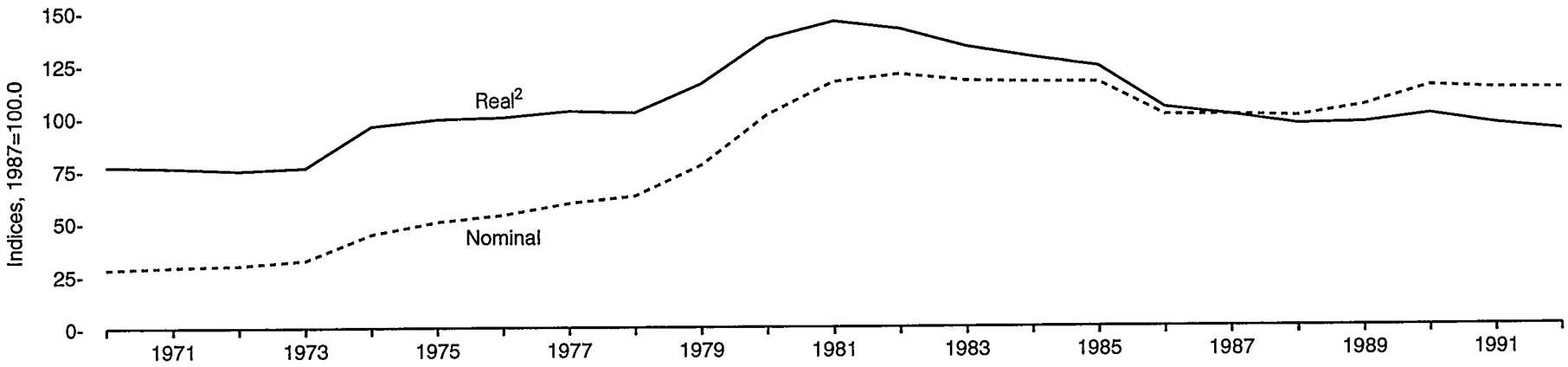
Energy Expenditures



Energy Expenditures as a Share of Gross Domestic Purchases



Energy Price Indices



[1] In 1987 dollars.
[2] For explanation, see Table 3.6, footnote 4.

Source: Table 3.6.

Table 3.6 Energy Expenditures and Price Indices, 1970-1992

Year	Energy Expenditures [1]		Gross Domestic Purchases [2]		Energy Expenditures as a Share of Gross Domestic Purchases [3]		Energy Expenditure Price Index [4]	
	Billion Dollars	Billion 1987 Dollars	Billion Dollars	Billion 1987 Dollars	Percentage Based on Billion Dollars	Percentage Based on Billion 1987 Dollars	Nominal (1987 = 100.0)	Real (1987 = 100.0)
1970	82.6	307.5	1,009.5	2,909.1	8.2	10.6	27.8	76.7
1971	89.8	318.5	1,100.2	3,001.8	8.2	10.6	29.0	76.0
1972	97.8	337.7	1,215.0	3,163.6	8.0	10.7	29.7	74.7
1973	111.6	353.5	1,349.0	3,302.7	8.3	10.7	32.1	76.1
1974	153.1	344.0	1,461.8	3,252.2	10.5	10.6	44.4	95.7
1975	171.8	341.3	1,572.3	3,198.6	10.9	10.7	50.2	98.9
1976	193.7	360.4	1,770.7	3,387.1	10.9	10.6	53.5	99.8
1977	220.2	370.3	1,997.8	3,561.1	[R]11.1	10.4	59.0	102.7
1978	238.9	380.5	2,258.8	3,733.3	10.6	10.2	62.4	101.9
1979	297.0	382.9	2,512.5	3,807.4	11.8	10.1	76.9	115.5
1980	373.9	369.4	2,722.8	3,745.7	13.7	9.9	100.7	136.8
1981	426.4	365.4	3,045.3	3,821.2	14.0	9.6	116.3	145.0
1982	424.8	354.4	3,170.2	3,767.7	13.4	9.4	119.8	141.3
1983	415.8	356.2	3,456.5	3,962.8	12.0	9.0	116.6	132.8
1984	433.5	373.1	3,879.9	4,270.5	11.2	8.7	116.0	127.7
1985	435.4	376.1	4,154.3	4,425.1	10.5	8.5	115.8	123.3
1986	381.3	381.2	4,401.2	4,559.6	8.7	8.4	100.1	103.6
1987	393.5	393.5	4,683.0	4,683.0	8.4	8.4	100.0	100.0
1988	407.6	410.6	5,008.4	4,822.6	8.1	8.5	99.3	95.5
1989	[R]434.4	416.6	5,330.5	4,911.7	8.1	8.5	104.3	96.1
1990	[R]469.4	415.8	[R]5,617.5	[R]4,951.9	8.4	8.4	113.4	[R]100.0
1991	[R]467.0	[R]418.5	[R]5,744.7	[R]4,887.2	[R]8.1	8.6	112.1	[R]95.3
1992	472.8	423.9	6,050.5	5,011.6	7.8	8.5	111.9	92.3

[1] Based on end-user prices and net energy consumption estimates.

[2] Represents all purchases of goods and services in the U.S. domestic economy. The data are not the same as the gross domestic product implicit price deflators (GDP) due to differences in coverage of imports and exports. The GDP represents the value of all goods and services produced in the United States, including exports and excluding imports. Gross domestic purchases represents the value of all goods and services consumed in the United States, including imports and excluding exports. Thus, the value of goods and services produced in the United States and consumed abroad is reflected in the GDP but not in gross domestic purchases, and the value of goods and services produced abroad and consumed in the United States is reflected in gross domestic purchases but not in the GDP.

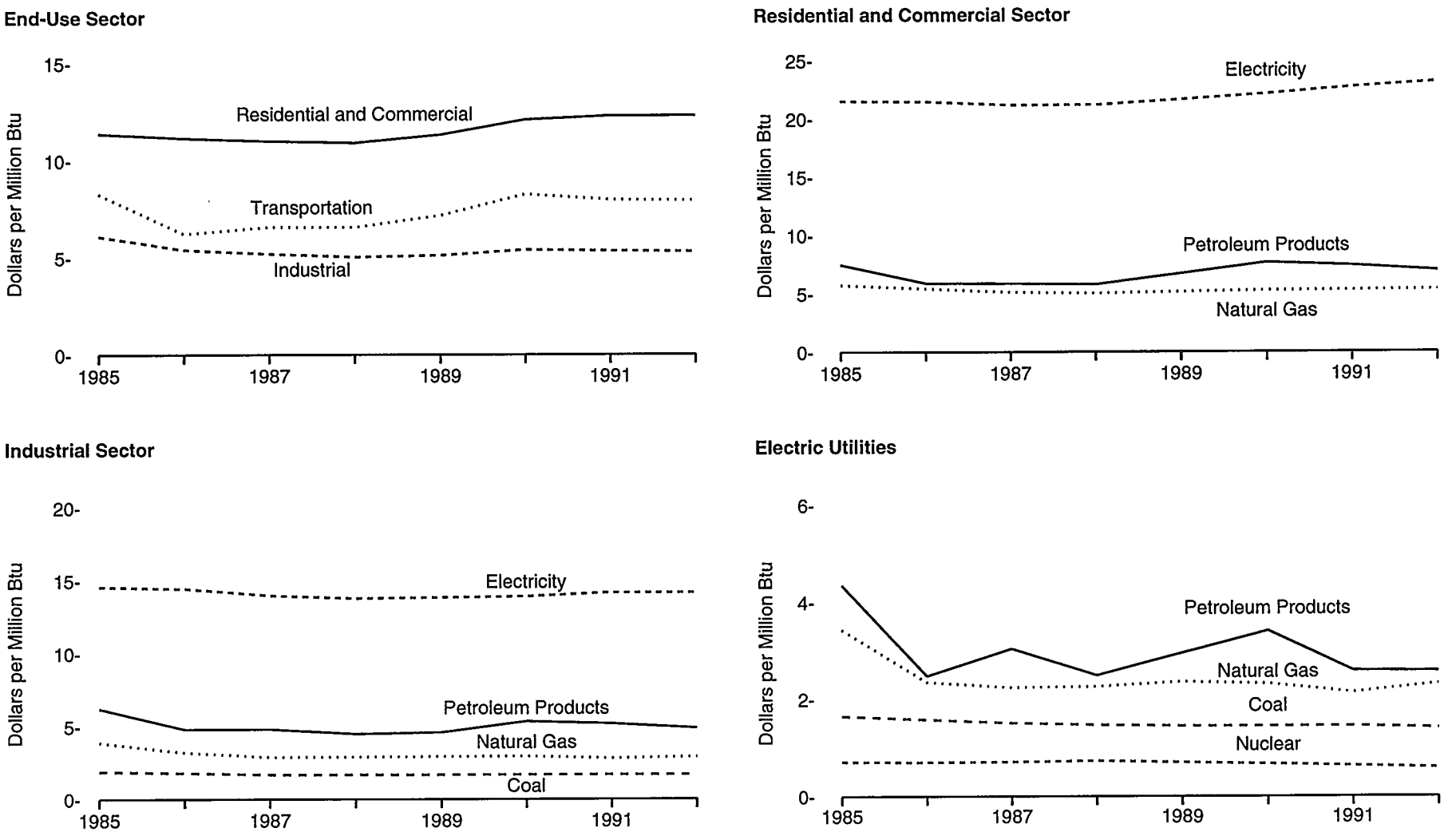
[3] Calculations based on unrounded data.

[4] The nominal energy expenditure price index is a weighted measure of the change in end-use prices of energy products with the product mix of energy expenditures in the base year 1987 held constant. The real energy expenditure price index is calculated by deflating the nominal energy expenditure price index by the gross domestic purchases benchmark-years-weighted price index developed by the Department of Commerce. The weights for the latter price index are based on average gross domestic purchases for successive pairs of benchmark years.

R=Revised data.

Source: Energy Information Administration, *State Energy Price and Expenditure Report 1992*, Appendix D, "Additional Measures of Energy Consumption, Expenditures, and Prices" (December 1994), Tables D2, D3, D5, and D8.

Figure 3.7 Energy Price Estimates by Sector, 1985-1992



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

Source: Table 3.7.

Table 3.7 Energy Price Estimates by Sector, 1970, 1980, and 1985-1992

(Dollars per Million Btu)

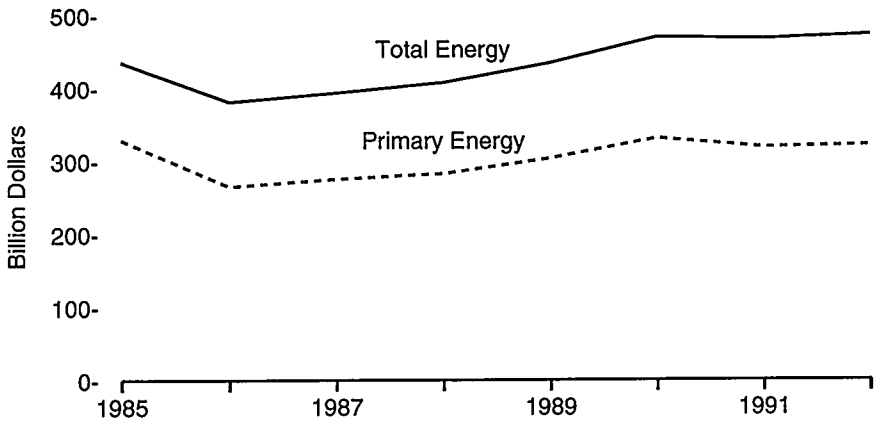
Sector	1970	1980	1985	1986	1987	1988	1989	1990	1991	1992
Residential and Commercial Sector	2.07	7.68	11.37	11.14	10.99	10.90	11.31	12.09	12.29	12.29
Primary Energy	1.08	4.36	6.12	5.49	5.27	5.17	5.49	5.78	5.71	5.66
Coal	0.73	2.10	2.37	2.23	2.03	1.97	1.99	2.17	2.17	2.11
Natural Gas	0.96	3.50	5.73	5.42	5.12	5.03	5.16	5.28	5.30	5.36
Petroleum Products [1]	1.32	6.58	7.47	5.89	5.87	5.79	6.72	7.67	7.40	6.97
Distillate Fuel Oil	1.32	6.86	7.32	5.70	5.49	5.49	6.20	7.30	6.90	6.38
Liquefied Petroleum Gases	1.98	7.50	9.02	8.51	8.49	8.35	9.92	10.59	10.65	10.09
Motor Gasoline	2.86	9.77	9.01	6.77	7.22	7.33	8.03	9.15	8.98	9.07
Residual Fuel Oil	0.45	4.12	4.50	2.70	3.10	2.52	2.92	3.41	2.61	2.68
Electricity	6.33	15.86	21.50	21.45	21.18	21.19	21.64	22.12	22.70	23.15
Industrial Sector	0.83	4.71	6.09	5.40	5.19	5.03	5.11	5.40	5.34	5.29
Primary Energy [2]	0.60	3.77	4.49	3.65	3.50	3.34	3.37	R3.69	R3.56	3.51
Coal	0.45	1.87	1.89	1.80	1.68	1.68	1.68	1.69	1.69	1.69
Coking Coal	0.45	2.10	2.03	1.90	1.74	1.79	1.78	1.79	1.83	1.83
Steam Coal	0.44	1.56	1.81	1.75	1.64	1.61	1.61	1.63	1.62	1.62
Natural Gas	0.38	2.52	3.87	3.20	2.88	2.90	2.93	2.95	2.80	2.91
Petroleum Products [3]	0.96	5.59	6.20	4.80	4.80	4.48	R4.59	R5.34	R5.18	4.87
Asphalt and Road Oil	0.68	3.68	4.77	4.34	3.56	3.39	2.95	3.02	3.14	2.50
Distillate Fuel Oil	0.72	5.54	6.10	3.76	4.16	3.83	4.78	5.68	5.14	4.92
Liquefied Petroleum Gases	1.10	5.18	5.66	5.63	5.16	4.97	R4.06	R5.37	R5.42	4.90
Lubricants	5.08	14.36	17.61	15.59	12.70	14.61	13.30	13.40	15.42	17.88
Residual Fuel Oil	0.46	3.69	4.24	2.51	2.87	2.34	2.75	3.10	2.44	2.46
Electricity	2.99	10.81	14.57	14.45	13.98	13.78	13.85	13.92	14.18	14.18
Transportation Sector	2.31	8.61	8.26	6.22	6.57	6.56	7.16	8.26	7.97	7.93
Primary Energy	2.31	8.60	8.25	6.21	6.56	6.55	7.15	8.25	7.96	7.92
Coal	0.41	([4])	([4])	([4])	([4])	([4])	([4])	([4])	([4])	([4])
Petroleum Products [5]	2.31	8.60	8.25	6.21	6.56	6.55	7.15	8.25	7.96	7.92
Distillate Fuel Oil	1.31	7.19	7.50	6.36	6.75	6.59	7.16	8.46	8.11	8.01
Jet Fuel	0.73	6.36	5.91	3.92	4.03	3.80	4.39	5.68	4.83	4.52
Motor Gasoline	2.85	9.84	9.01	6.79	7.22	7.32	8.01	9.12	8.93	8.96
Residual Fuel Oil	0.38	3.31	4.36	2.11	2.64	2.22	2.47	2.98	2.83	2.48
Electricity	4.65	14.71	19.74	19.63	23.03	22.05	22.99	23.49	R23.79	25.36
Electric Utilities	0.32	1.75	1.85	1.55	1.51	1.45	1.48	1.46	1.37	1.34
Coal	0.31	1.35	1.65	1.58	1.51	1.47	1.45	1.45	1.45	1.41
Natural Gas	0.28	2.20	3.43	2.35	2.24	2.26	2.36	2.32	2.14	2.32
Petroleum Products [6]	0.42	4.34	4.35	2.48	R3.04	2.49	2.95	3.41	2.59	2.58
Heavy Oil [7]	0.41	4.25	4.24	2.42	2.97	2.41	2.85	3.30	2.46	2.48
Nuclear Fuel	0.18	0.43	0.71	0.70	0.71	0.73	0.70	0.67	0.63	0.59
Biomass Fuels	0.65	1.74	0.79	0.32	0.95	0.87	0.69	0.52	0.55	0.52

[1] In addition to listed products, includes kerosene.
[2] In addition to listed energy sources, includes imports and exports of coal coke.
[3] In addition to listed products, includes kerosene, motor gasoline, still gas, special naphthas, petrochemical feedstocks, petroleum coke, wax, pentanes plus, and miscellaneous products.
[4] Not applicable.
[5] In addition to listed products, includes aviation gasoline, liquefied petroleum gases, and lubricants.
[6] In addition to listed products, includes fuel oil nos. 1 and 2, kerosene, jet fuel, and petroleum coke.
[7] Heavy oil includes fuel oil nos. 4, 5, and 6, and residual fuel oils.
R=Revised data.

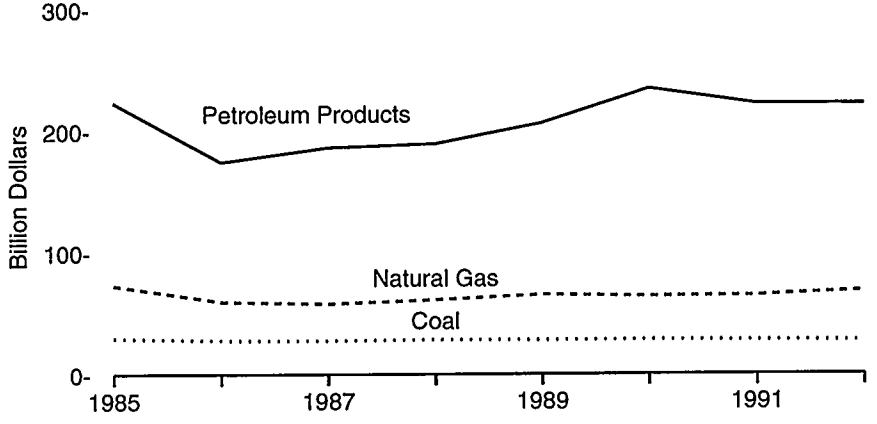
Sources: **Residential and Commercial Sector:** Energy Information Administration (EIA), "State Energy Price and Expenditure Data System 1992." **All Other Data:** EIA, *State Energy Price and Expenditure Report 1992* (December 1994), p.22.

Figure 3.8 Energy Expenditure Estimates, 1985-1992

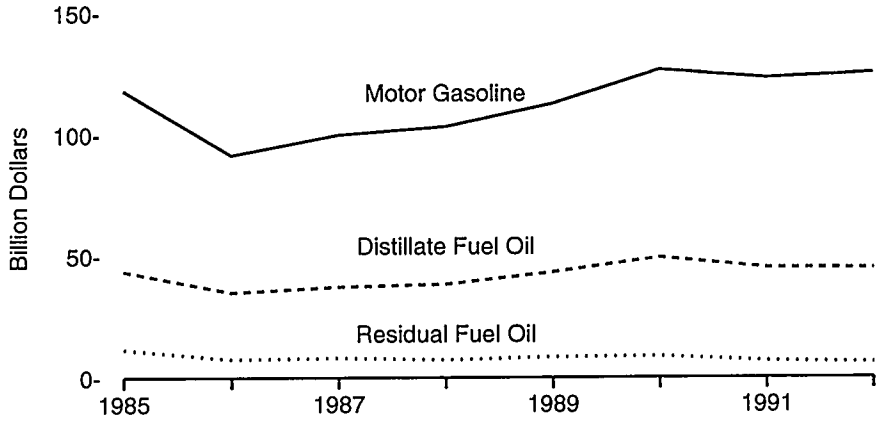
Total



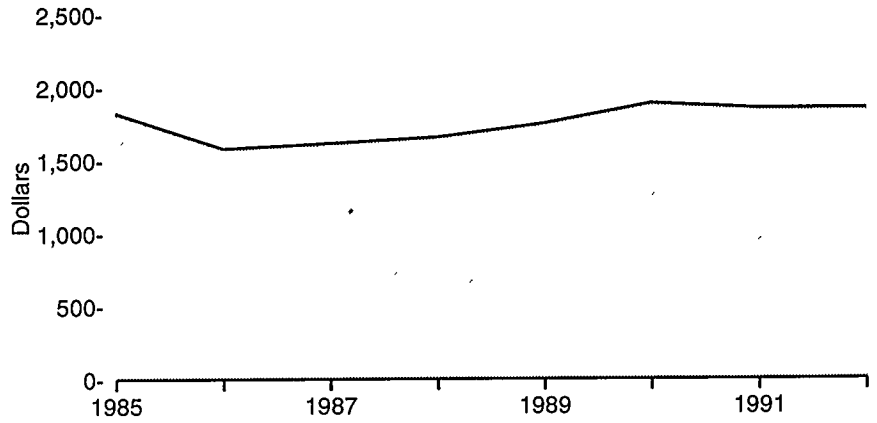
By Fossil Fuel



By Selected Petroleum Product



Per Capita



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

Source: Table 3.8.

Table 3.8 Energy Expenditure Estimates, 1970, 1980, and 1985-1992

(Billion Dollars, Except as Noted)

Energy Source	1970	1980	1985	1986	1987	1988	1989	1990	1991	1992
Coal	4.6	22.6	29.7	27.9	27.6	28.4	28.1	28.4	27.9	27.4
Coking Coal	1.2	3.8	2.2	1.8	1.7	2.0	1.9	1.9	1.7	1.6
Steam Coal	3.4	18.9	27.5	26.1	25.9	26.4	26.2	26.5	26.2	25.8
Natural Gas	10.9	51.1	72.9	59.7	58.0	61.1	65.4	64.1	64.7	68.4
Petroleum Products	48.1	238.4	223.2	174.5	186.4	189.3	206.3	234.5	R221.9	221.8
Asphalt and Road Oil	0.7	3.5	4.9	4.7	4.0	3.8	3.2	3.5	3.4	2.8
Aviation Gasoline	0.2	0.6	0.5	0.5	0.3	0.4	0.4	0.4	0.4	0.4
Distillate Fuel Oil	6.3	40.8	43.6	35.0	R37.3	38.4	43.3	49.3	45.1	44.9
Jet Fuel	1.4	13.9	14.7	10.5	11.4	11.3	13.4	17.8	14.6	13.6
Kerosene	0.6	2.3	1.9	1.3	1.2	1.2	1.2	0.7	0.8	0.6
Liquefied Petroleum Gases	2.4	10.9	13.1	12.3	12.4	12.3	11.8	13.2	R14.4	13.6
Lubricants	1.5	5.1	5.7	4.9	4.5	5.0	4.7	4.9	5.0	5.9
Motor Gasoline	31.6	124.4	118.0	91.5	99.8	103.2	112.6	126.5	123.1	125.2
Residual Fuel Oil	2.0	21.6	11.5	7.5	8.1	7.3	8.4	8.7	6.8	6.1
Other Petroleum Products [1]	1.2	15.3	9.2	6.3	7.3	6.4	7.3	9.5	8.5	8.8
Nuclear Fuel	(s)	1.2	2.9	3.1	3.5	4.1	4.0	4.1	4.2	3.9
Biomass Fuels at Utilities	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)
Imports of Coal Coke	(s)	0.1	(s)	(s)	0.1	0.2	0.2	0.1	0.1	0.1
Exports of Coal Coke [2]	-0.1	-0.1	-0.1	-0.1	(s)	-0.1	-0.1	-0.1	-0.1	(s)
Total Primary Energy [3]	63.5	313.2	328.8	265.2	275.5	283.0	303.9	R331.1	R318.7	321.6
Electric Utility Fuel [2,4]	-4.3	-37.4	-42.6	-35.8	-36.7	-37.4	-38.9	-38.4	-36.5	-35.8
Electricity Purchased by End Users [5]	23.4	98.1	149.2	151.8	154.7	162.1	169.3	176.7	184.8	187.0
Total Energy	82.6	373.9	435.4	381.3	393.5	407.6	R434.4	R469.4	R467.0	472.8
Total Energy per Capita (Dollars)	406	1,650	1,824	1,581	1,617	1,658	1,750	R1,887	R1,852	1,853

[1] Pentanes plus, petrochemical feedstocks, special naphthas, petroleum coke, still gas, wax, and miscellaneous products.

[2] In determining total energy expenditures, this is a negative quantity.

[3] Biomass fuels are not included, except those consumed at electric utilities and those added to motor gasoline.

[4] There are no direct fuel costs for hydroelectric, geothermal, centralized solar, or wind energy.

[5] These are sales. In determining total energy expenditures, this is a positive quantity.

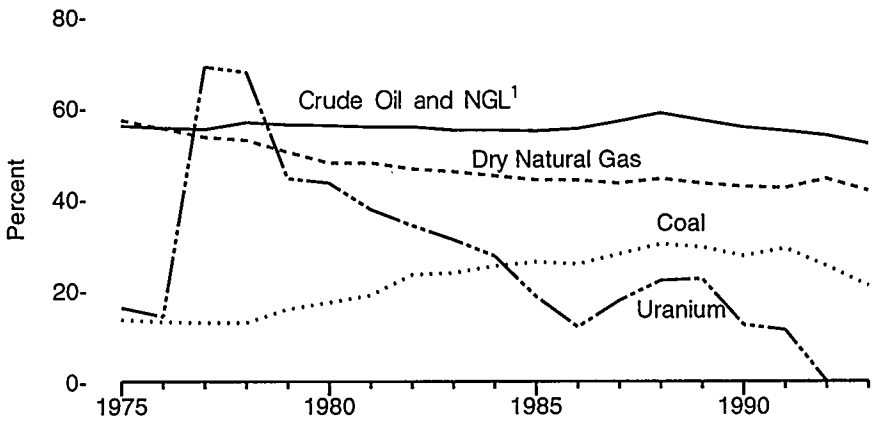
R=Revised data. (s)=Less than $0.05 billion.

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

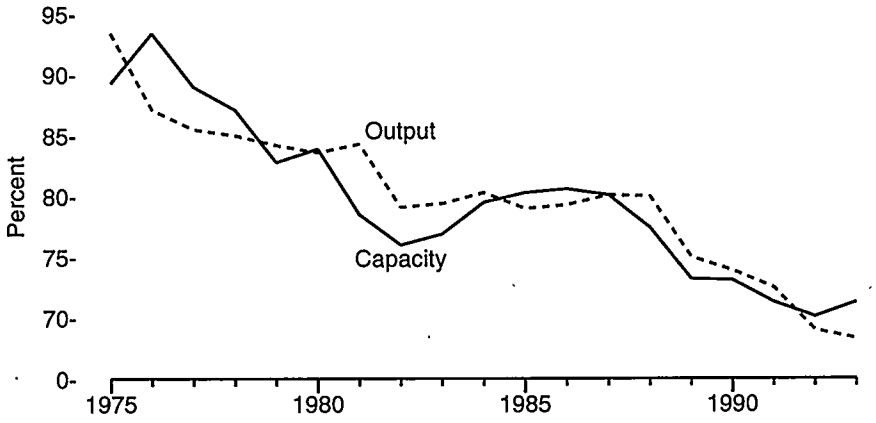
Sources: **Expenditures:** Energy Information Administration (EIA), *State Energy Price and Expenditure Report (SEPER) 1992* (December 1994), p. 21. **Total Energy per Capita:** EIA, *SEPER 1992* (December 1994), p. 5.

Figure 3.9 FRS Companies' Operations, Selected Statistics, 1975-1993

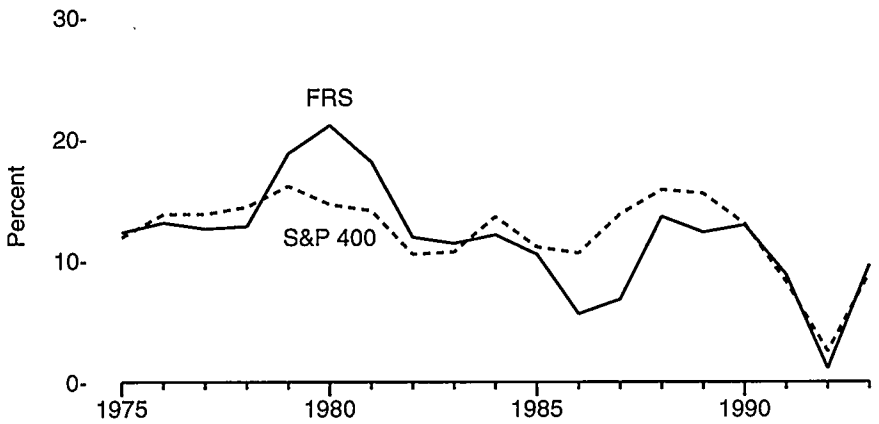
FRS Shares of U.S. Total Production



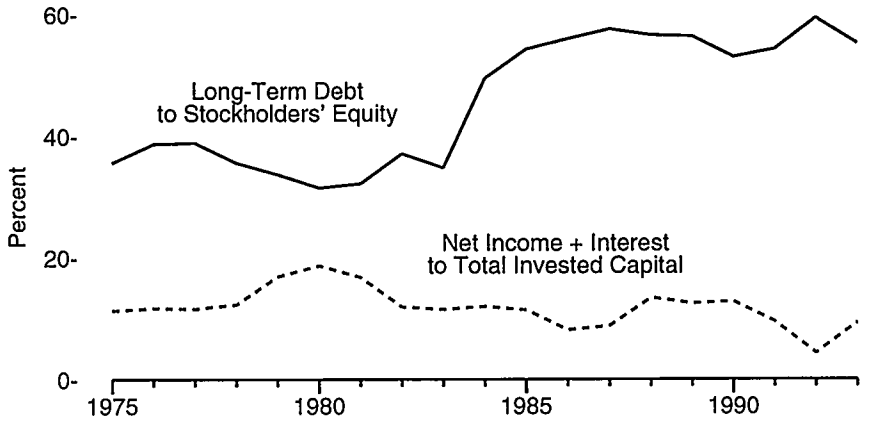
FRS Shares of U.S. Refining Capacity and Output



FRS Companies' Net Income to Stockholders' Equity



FRS Companies' Indicators



[1] Natural gas liquids.
Notes: • FRS is the Financial Reporting System (see Note at end of section).

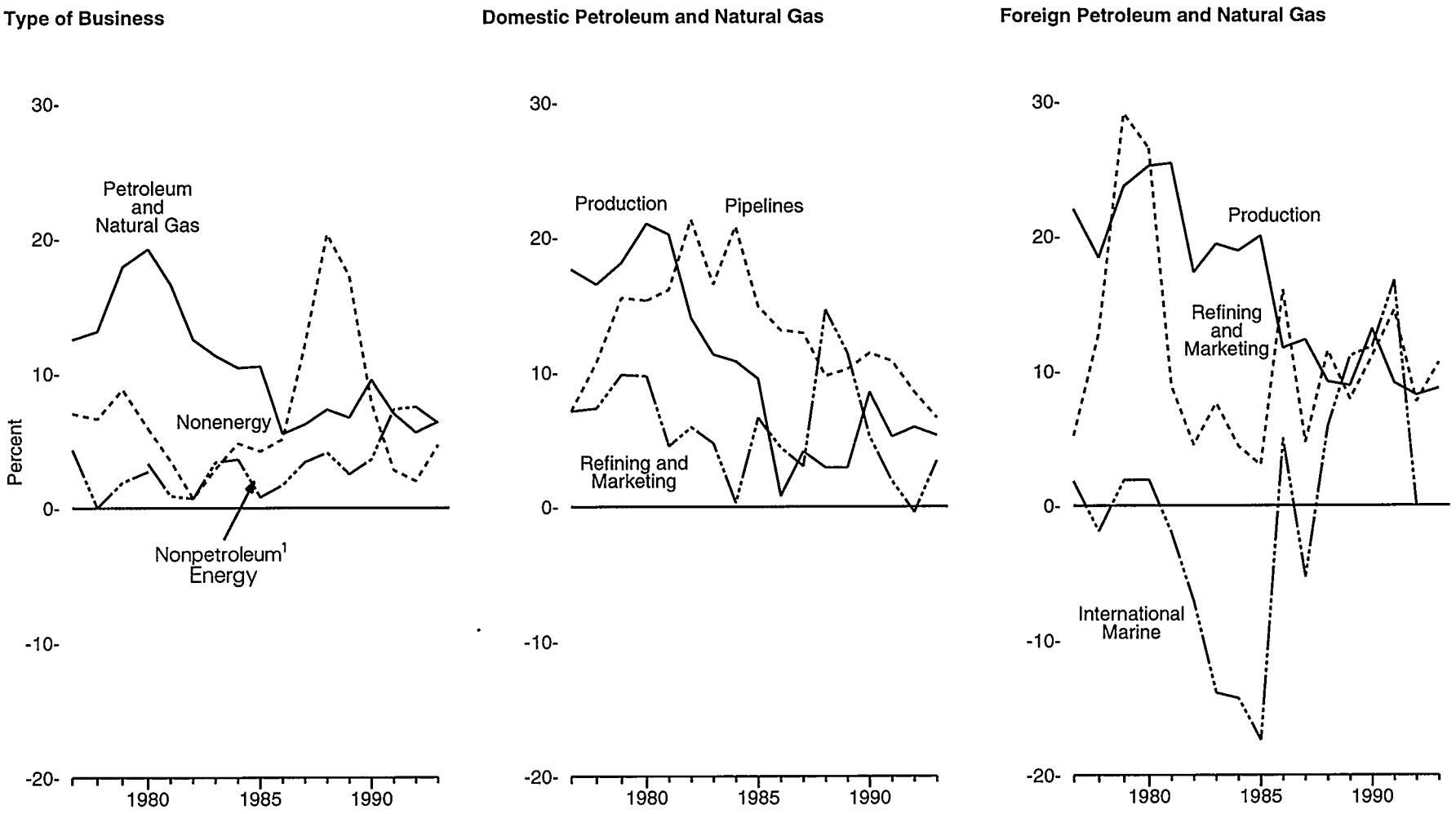
• Because vertical scales differ, graphs should not be compared.
Source: Table 3.9.

Table 3.9 FRS Companies' Operations, Selected Statistics, 1975-1993

	Production				Refining		Financial Indicators				
Year	Crude Oil and Natural Gas Liquids	Dry Natural Gas	Coal [1]	Uranium	Capacity [2]	Output	Net Income	Net Income to Stockholders' Equity	Net Income to Stockholders' Equity for S & P 400 [3]	Net Income Plus Interest to Total Invested Capital	Long-Term Debt to Stockholders' Equity
	Million Barrels	Trillion Cubic Feet	Million Short Tons	Million Pounds U_3O_8	Million Barrels per Day		Billion Dollars	Percent			
1975	2,049.9	11.0	88.1	4.3	13.4	12.8	10.3	12.3	11.9	11.3	35.6
1976	1,983.4	10.6	89.0	3.3	14.2	12.8	12.0	13.1	13.8	11.7	38.7
1977	1,991.2	10.3	89.1	16.0	14.6	13.6	12.7	12.6	13.8	11.6	38.9
1978	2,131.4	10.1	85.5	17.3	14.8	13.6	13.9	12.8	14.4	12.3	35.6
1979	2,081.7	9.9	123.3	16.7	14.4	13.3	23.5	18.8	16.1	16.9	33.7
1980	2,087.5	9.3	142.3	19.0	15.1	12.2	31.0	21.1	14.6	18.7	31.5
1981	2,072.4	9.2	154.8	14.5	14.6	11.8	30.0	18.1	14.1	16.8	32.2
1982	2,079.1	8.3	195.2	9.2	13.6	10.6	21.8	11.9	10.5	11.9	37.1
1983	2,059.3	7.4	185.2	6.6	13.0	10.4	21.9	11.4	10.7	11.5	34.8
1984	2,088.8	7.9	226.0	4.1	12.8	11.0	21.3	12.1	13.6	12.0	49.5
1985	2,120.5	7.3	230.4	2.1	12.6	10.9	17.4	10.5	11.1	11.4	54.3
1986	2,089.6	7.1	227.6	1.6	12.5	11.5	9.2	5.6	10.6	8.1	56.0
1987	2,069.5	7.2	255.3	2.3	12.5	11.7	11.3	6.8	13.8	8.8	57.6
1988	2,102.1	7.6	285.3	2.9	12.3	12.0	22.3	13.6	15.8	13.4	56.6
1989	1,911.1	7.5	286.9	3.1	11.5	11.4	19.8	12.3	15.5	12.5	56.4
1990	1,814.0	7.6	282.0	1.1	11.4	11.3	21.6	12.9	13.0	12.8	53.0
1991	1,818.1	7.5	289.6	0.9	11.2	11.1	14.7	8.8	8.2	9.5	54.3
1992	1,750.2	7.9	251.9	0.0	11.0	11.0	1.8	1.1	R 2.5	4.3	59.4
1993	1,632.5	7.7	197.3	0.0	10.7	10.8	15.5	9.6	8.9	9.3	55.2
	Percent of U.S. Total										
1975	56.1	57.3	13.6	16.2	89.3	93.4					
1976	55.6	55.5	13.1	14.3	93.4	87.1					
1977	55.3	53.6	12.9	69.0	89.0	85.5					
1978	56.8	52.9	12.9	67.8	87.1	85.0					
1979	56.3	50.3	15.9	44.5	82.8	84.2					
1980	56.1	47.9	17.3	43.5	83.9	83.6					
1981	55.8	47.9	18.9	37.7	78.5	84.3					
1982	55.8	46.6	23.4	34.2	76.0	79.1					
1983	55.1	46.0	23.8	31.1	76.9	79.4					
1984	55.1	45.1	25.3	27.5	79.5	80.3					
1985	54.9	44.2	26.2	18.6	80.3	79.0					
1986	55.4	44.1	25.7	11.9	80.6	79.3					
1987	57.0	43.4	27.9	17.7	80.1	80.1					
1988	58.8	44.4	30.1	22.1	77.4	80.0					
1989	57.2	43.4	29.4	22.5	73.2	75.0					
1990	55.7	42.7	27.5	12.4	73.1	73.9					
1991	54.9	42.4	29.2	11.3	71.3	72.5					
1992	53.9	44.4	25.3	0.0	70.1	69.0					
1993	52.1	41.8	21.0	0.0	71.3	68.3					

[1] Bituminous coal, subbituminous coal, and lignite.
[2] Operable capacity as of January 1 of the following year.
[3] Standard and Poors' 400.
R=Revised data.
Notes: • FRS is the Financial Reporting System (see Note at end of section). • FRS Crude Oil and NGL and Natural Gas (Dry Marketed) production are on a net ownership interest basis (see Glossary).
Sources: **FRS Company Statistics:** Energy Information Administration, *Performance Profiles of Major Energy Producers* report series. **U.S. Production Data for Calculation of Shares:** Tables 5.1, 5.8, 5.9, 6.1, 7.2, and 9.3.

Figure 3.10 FRS Companies' Return on Investment by Type of Business, 1977-1993



[1] Coal, nuclear, and other energy.
Notes: • FRS is the Financial Reporting System (see Note at end of section).
• Return on investment=Net income as a percent of net investment in place.
Sources: Tables 3.10 and 3.11.

Table 3.10 FRS Companies' Net Income, 1975-1993

(Billion Dollars)

Year	Type of Business					Domestic Petroleum and Natural Gas				Foreign Petroleum and Natural Gas			
	Petroleum and Natural Gas	Coal	Nuclear and Other Energy	Non-energy	Total [1]	Production	Refining and Marketing	Rate Regulated Pipelines	Total [1]	Production	Refining and Marketing	International Marine	Total [1]
1975	NA	NA	NA	NA	10.3	NA	NA	NA	NA	NA	NA	NA	NA
1976	NA	NA	NA	NA	12.0	NA	NA	NA	NA	NA	NA	NA	NA
1977	13.0	0.2	(s)	1.7	12.7	6.4	1.5	0.8	8.6	3.6	0.7	0.1	4.4
1978	14.7	0.1	-0.1	1.8	13.9	6.7	1.6	1.2	9.5	3.5	1.8	-0.1	5.2
1979	23.0	0.3	-0.1	2.8	23.5	9.4	2.3	1.7	13.4	5.2	4.3	0.1	9.7
1980	29.1	0.3	(s)	2.3	31.0	13.8	2.5	1.7	17.9	6.9	4.3	0.1	11.2
1981	29.5	0.4	-0.3	1.6	30.0	16.8	1.3	1.8	19.9	8.0	1.6	-0.1	9.6
1982	25.0	0.4	-0.3	0.4	21.8	14.1	1.9	2.3	18.3	6.1	0.8	-0.3	6.7
1983	24.0	0.5	(s)	1.8	21.9	12.2	1.6	2.0	15.9	7.2	1.3	-0.5	8.2
1984	23.6	0.6	-0.1	2.9	21.3	13.3	0.1	2.5	15.8	7.5	0.7	-0.4	7.8
1985	24.8	0.4	-0.3	2.5	17.4	12.1	2.3	2.3	16.7	8.0	0.5	-0.4	8.1
1986	12.9	0.2	(s)	2.8	9.2	0.9	1.6	2.6	5.2	4.7	2.9	0.1	7.7
1987	14.8	0.4	(s)	7.1	11.3	4.7	1.1	2.6	8.4	5.4	1.0	-0.1	6.4
1988	17.5	0.6	-0.1	10.8	22.3	3.2	5.4	2.0	10.6	4.3	2.4	0.1	6.9
1989	16.2	0.4	-0.1	8.7	19.8	3.1	4.5	1.9	9.5	4.7	1.8	0.2	6.7
1990	23.4	0.3	0.1	4.3	21.6	8.7	2.2	2.1	12.9	7.4	2.8	0.2	10.5
1991	17.7	0.6	0.1	1.6	14.7	5.1	0.9	2.0	7.9	5.4	4.1	0.3	9.8
1992	14.4	-0.5	0.1	1.2	1.8	5.6	-0.2	2.1	7.5	4.7	2.2	(s)	6.9
1993	16.5	0.4	0.1	2.7	15.5	4.8	1.7	1.6	8.1	5.2	3.2	(s)	8.4

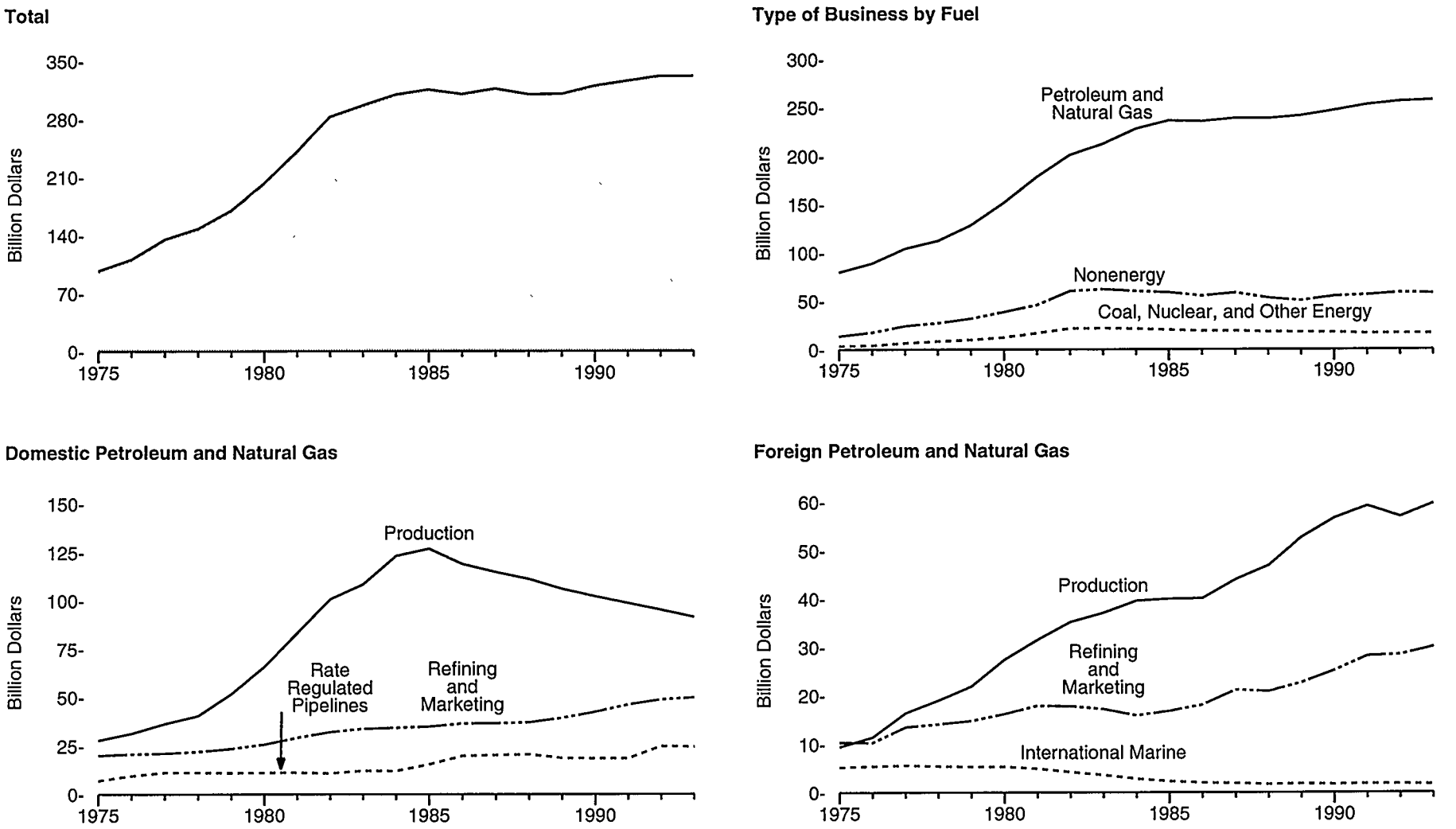
[1] Total is sum of components shown, plus eliminations and nontraceables, which are defined in the glossary.

NA=Not available. (s)=Less than $50 million in absolute value.

Note: FRS is the Financial Reporting System (see Note at end of section).

Source: Energy Information Administration, *Performance Profiles of Major Energy Producers*, various issues.

Figure 3.11 FRS Companies' Net Investment in Place, 1975-1993



Notes: • FRS is the Financial Reporting System (see Note at end of section).
• Because vertical scales differ, graphs should not be compared.

Source: Table 3.11.

Table 3.11 FRS Companies' Net Investment in Place, 1975-1993

(Billion Dollars)

Year	Type of Business						Domestic Petroleum and Natural Gas				Foreign Petroleum and Natural Gas			
	Petroleum and Natural Gas	Coal	Nuclear and Other Energy	Non-energy	Non-traceables	Total	Production	Refining and Marketing	Rate Regulated Pipelines	Total	Production	Refining and Marketing	International Marine	Total
1975	79.8	1.6	0.8	13.7	1.0	97.3	27.8	20.0	7.0	54.8	9.4	10.3	5.2	24.9
1976	88.9	2.0	1.0	17.6	1.1	111.1	31.4	20.7	9.5	61.7	11.4	10.3	5.4	27.1
1977	104.2	2.8	1.9	24.3	1.9	135.2	36.4	21.1	11.2	68.7	16.4	13.5	5.6	35.5
1978	112.2	3.3	3.1	27.3	2.1	148.1	40.5	22.0	11.2	73.7	19.0	14.1	5.4	38.5
1979	128.3	4.1	3.3	31.9	2.4	169.9	51.8	23.5	11.0	86.3	21.9	14.8	5.3	42.0
1980	151.4	5.0	4.0	38.7	3.4	202.6	65.8	25.7	11.1	102.5	27.4	16.2	5.3	48.9
1981	178.0	7.2	4.5	45.9	5.2	240.8	83.2	29.2	11.2	123.6	31.5	17.9	4.9	54.3
1982	200.7	9.3	5.3	60.3	6.9	282.5	100.7	32.1	10.8	143.6	35.2	17.8	4.2	57.2
1983	212.2	9.4	5.1	62.2	7.4	296.3	108.4	33.8	12.1	154.4	37.1	17.2	3.6	57.9
1984	227.8	9.2	4.7	60.3	7.4	309.4	123.1	34.3	12.0	169.4	39.6	15.9	2.8	58.4
1985	236.2	9.1	3.7	58.9	7.5	315.4	126.8	34.9	15.4	177.1	40.0	16.8	2.3	59.0
1986	235.4	8.4	3.3	55.4	7.4	309.9	118.9	R36.5	19.8	175.1	40.1	18.1	2.0	60.3
1987	238.7	8.6	3.3	58.5	7.3	316.4	114.7	36.6	20.2	171.6	44.0	21.2	1.9	67.1
1988	238.4	8.7	3.4	53.1	6.0	309.6	111.1	37.1	20.6	168.8	46.9	20.9	1.7	69.6
1989	241.3	8.7	3.1	50.5	6.2	309.9	106.0	39.4	18.7	164.1	52.7	22.7	1.8	77.2
1990	246.7	8.2	3.0	55.1	6.5	319.6	102.1	42.5	18.5	163.1	56.7	25.2	1.7	83.6
1991	252.6	6.7	2.9	R56.3	7.0	325.6	98.6	46.2	18.5	163.4	59.2	28.2	1.8	89.2
1992	256.0	5.2	2.8	58.7	8.7	331.5	95.1	48.8	24.7	168.6	57.0	28.5	1.8	87.4
1993	257.1	4.9	3.0	58.0	8.6	331.5	91.4	49.8	24.4	165.6	59.7	30.1	1.7	91.5

R=Revised data.

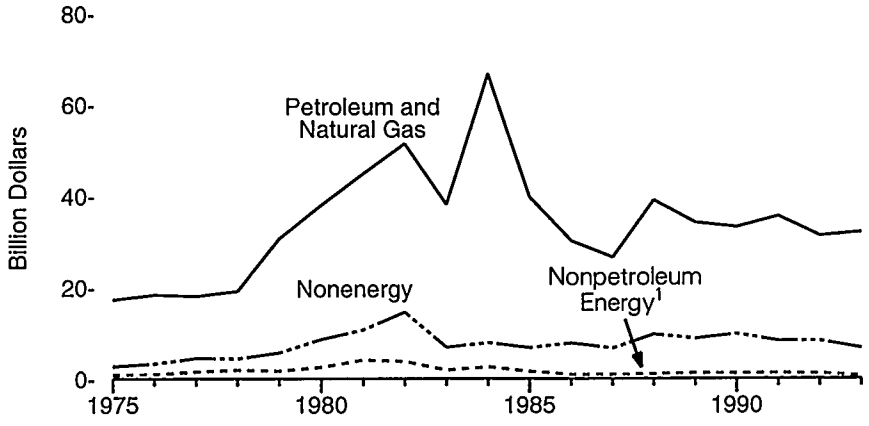
Notes: • FRS is the Financial Reporting System (see Note at end of section). • Net investment in place is net property, plant, and equipment, plus investments and advances. • Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, *Performance Profiles of Major Energy Producers*, various issues.

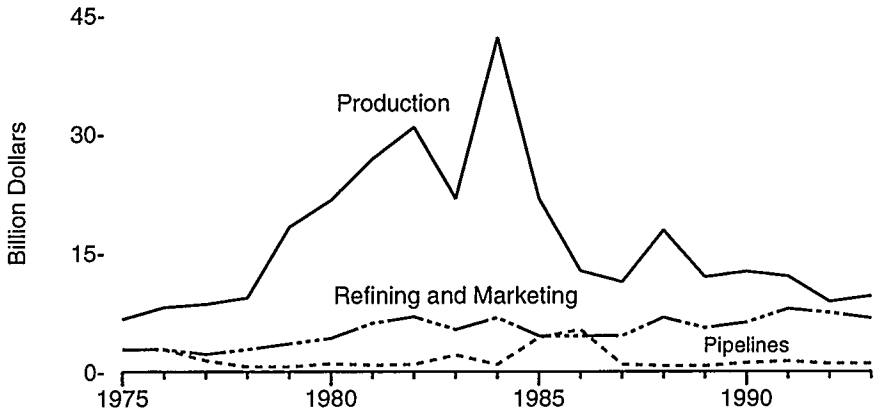
Figure 3.12 FRS Companies' Additions to Investment in Place, 1975-1993

Type of Business, Total

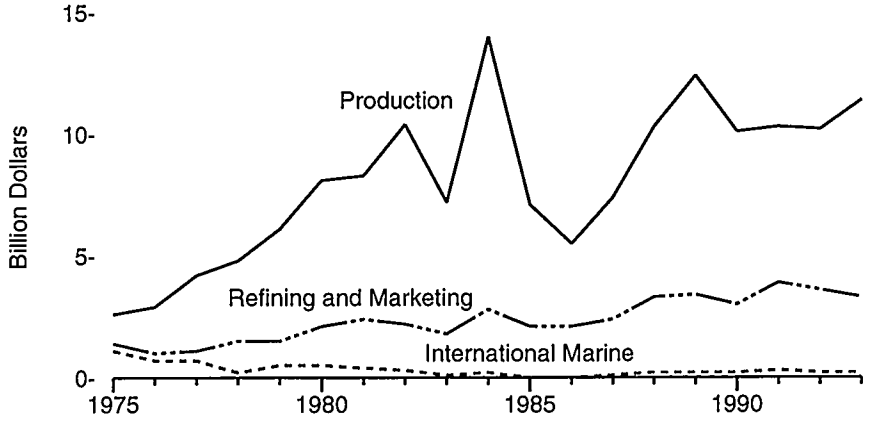
Type of Business by Fuel



Domestic Petroleum and Natural Gas



Foreign Petroleum and Natural Gas



[1] Coal, nuclear, and other energy.
Notes: • FRS is the Financial Reporting System (see Note at end of section).

• Because vertical scales differ, graphs should not be compared.
Source: Table 3.12.

Table 3.12 FRS Companies' Additions to Investment in Place, 1975-1993

(Billion Dollars)

Year	Type of Business					Domestic Petroleum and Natural Gas				Foreign Petroleum and Natural Gas			
	Petroleum and Natural Gas	Coal	Nuclear and Other Energy	Non-energy	Total [1]	Production	Refining and Marketing	Rate Regulated Pipelines	Total	Production	Refining and Marketing	International Marine	Total
1975	17.3	0.5	0.3	2.7	21.1	6.6	2.8	2.8	12.2	2.6	1.4	1.1	5.1
1976	18.4	0.5	0.5	3.3	23.1	8.1	2.8	2.8	13.8	2.9	1.0	0.7	4.6
1977	18.1	0.9	0.6	4.5	24.3	8.5	2.2	1.4	12.1	4.2	1.1	0.7	6.0
1978	19.2	1.0	0.9	4.4	25.6	9.3	2.8	0.6	12.7	4.8	1.5	0.2	6.5
1979	30.7	0.8	0.9	5.7	38.5	18.2	3.5	0.6	22.5	6.1	1.5	0.5	8.2
1980	38.0	1.3	1.2	8.6	50.1	21.6	4.2	1.0	26.9	8.1	2.1	0.5	11.1
1981	44.9	2.9	1.2	10.7	60.8	26.8	6.1	0.8	33.8	8.3	2.4	0.4	11.1
1982	51.5	2.1	1.7	14.6	72.6	30.8	6.9	0.9	38.6	10.4	2.2	0.3	12.8
1983	38.2	1.1	0.8	6.9	48.0	21.8	5.3	2.1	29.2	7.2	1.8	0.1	9.1
1984	66.8	1.6	1.0	7.9	78.7	42.1	6.8	0.9	49.7	14.0	2.8	0.2	17.1
1985	39.8	1.5	0.1	6.8	49.2	21.8	4.5	4.3	30.6	7.1	2.1	(s)	9.3
1986	30.2	0.7	0.2	7.8	39.7	12.7	4.5	5.3	22.5	5.5	2.1	(s)	7.7
1987	26.6	0.6	0.3	6.7	34.8	11.3	4.5	0.9	16.7	7.4	2.4	0.1	9.9
1988	39.1	0.6	0.4	9.7	49.7	17.8	6.8	0.7	25.3	10.3	3.3	0.2	13.7
1989	34.2	1.0	0.2	8.8	45.0	11.9	5.5	0.7	18.2	12.4	3.4	0.2	16.0
1990	33.2	0.9	0.2	9.8	45.5	12.6	6.2	1.1	20.0	10.1	3.0	0.2	13.2
1991	35.6	1.0	0.2	8.3	46.4	12.0	7.9	1.3	21.2	10.3	3.9	0.3	14.4
1992	31.3	0.9	0.2	8.3	42.0	8.8	7.4	1.0	17.3	10.2	3.6	0.2	14.0
1993	32.1	0.2	0.4	6.7	40.4	9.5	6.7	1.0	17.1	11.4	3.3	0.2	15.0

[1] Total is sum of components shown, plus nontraceables, which are defined in the glossary. Totals may not equal sum of components due to independent rounding.

(s)=Less than $50 million.

Notes: • FRS is the Financial Reporting System (see Note at end of section). • Additions to investment in place is property, plant, and equipment, plus investments and advances.

Source: Energy Information Administration, *Performance Profiles of Major Energy Producers*, various issues.

Financial Indicators Note

The Financial Reporting System (FRS) data system is designed to permit review of the financial performance of energy companies. Data are disaggregated both by line of business and by geographic area of operation. Domestic operations include Puerto Rico and the Virgin Islands; foreign operations exclude these areas.

The 25 companies included in the FRS for the 1993 reporting year are the following:

Amerada Hess Corporation
Amoco Corporation
Anadarko Petroleum, Inc.
Ashland Oil Inc.
Atlantic Richfield Company
BP America Inc.
Burlington Resources Inc.
Chevron Corporation
Coastal Corporation
E.I. du Pont de Nemours and Company (Du Pont)
Enron Corporation
Exxon Corporation
Fina Inc.
Kerr-McGee Corporation
Mobil Corporation
Nerco Inc.
Occidental Petroleum Corporation
Oryx Energy Company
Phillips Petroleum Company
Shell Oil Company
Sun Company, Inc.
Texaco Inc.
Union Pacific Corporation
Unocal Corporation
USX Corporation

4. Energy Resources

Crude Oil and Natural Gas Resources

The most recent U.S. Geological Survey assessment[1] of U.S. undiscovered recoverable resources provides a mean estimate for 1987 of 49 billion barrels of crude oil (4.1).* Alaska, including its Federal offshore region, accounted for one-third of all U.S. undiscovered, recoverable crude oil resources. The Survey's mean estimate of natural gas undiscovered, recoverable resources was 399 trillion cubic feet. The Gulf Coast and the Federal offshore region in the Gulf of Mexico accounted for nearly one-half and Alaska's onshore and offshore regions accounted for nearly one-fifth of the U.S. total.

Crude Oil and Natural Gas Proved Reserves

The combined oil-equivalent proved reserves of crude oil, natural gas, and natural gas liquids increased every year from 1949 until 1968 (4.9), when, for the first time, production exceeded net additions to proved reserves. Except for the addition of Alaska's North Slope reserves in 1970, proved reserves trended downward, falling to 57 billion barrels oil equivalent in 1993. At the end of 1993, proved reserves were 24 billion barrels of crude oil (including lease condensate) and 171 trillion cubic feet of natural gas (4.2). Through 1993, crude oil cumulative production of 169 billion barrels from 39,570 fields equaled about 88 percent of estimated ultimate recovery, while natural gas cumulative production of 857 trillion cubic feet from 35,089 fields equaled about 83 percent of ultimate recovery.

Coal Reserves

The Energy Information Administration has estimated that the demonstrated reserve base of coal contained 474 billion short tons at the beginning of 1993 (4.10). Although recoverability rates differ from site to site, about 56 percent of the demonstrated reserve base is estimated to be recoverable.

[1]The 1989 assessment will soon be replaced by the 1995 assessment.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

Uranium Resources

At the end of 1993, uranium reserves with forward costs (those yet to be incurred in production) of up to $30 per pound totaled 292 million pounds of uranium oxide (U_3O_8), 41 percent of which was in Wyoming (4.12). Estimated additional resources and speculative resources in the $30-per-pound category in 1993 totaled 2.2 billion pounds and 1.3 billion pounds, respectively.

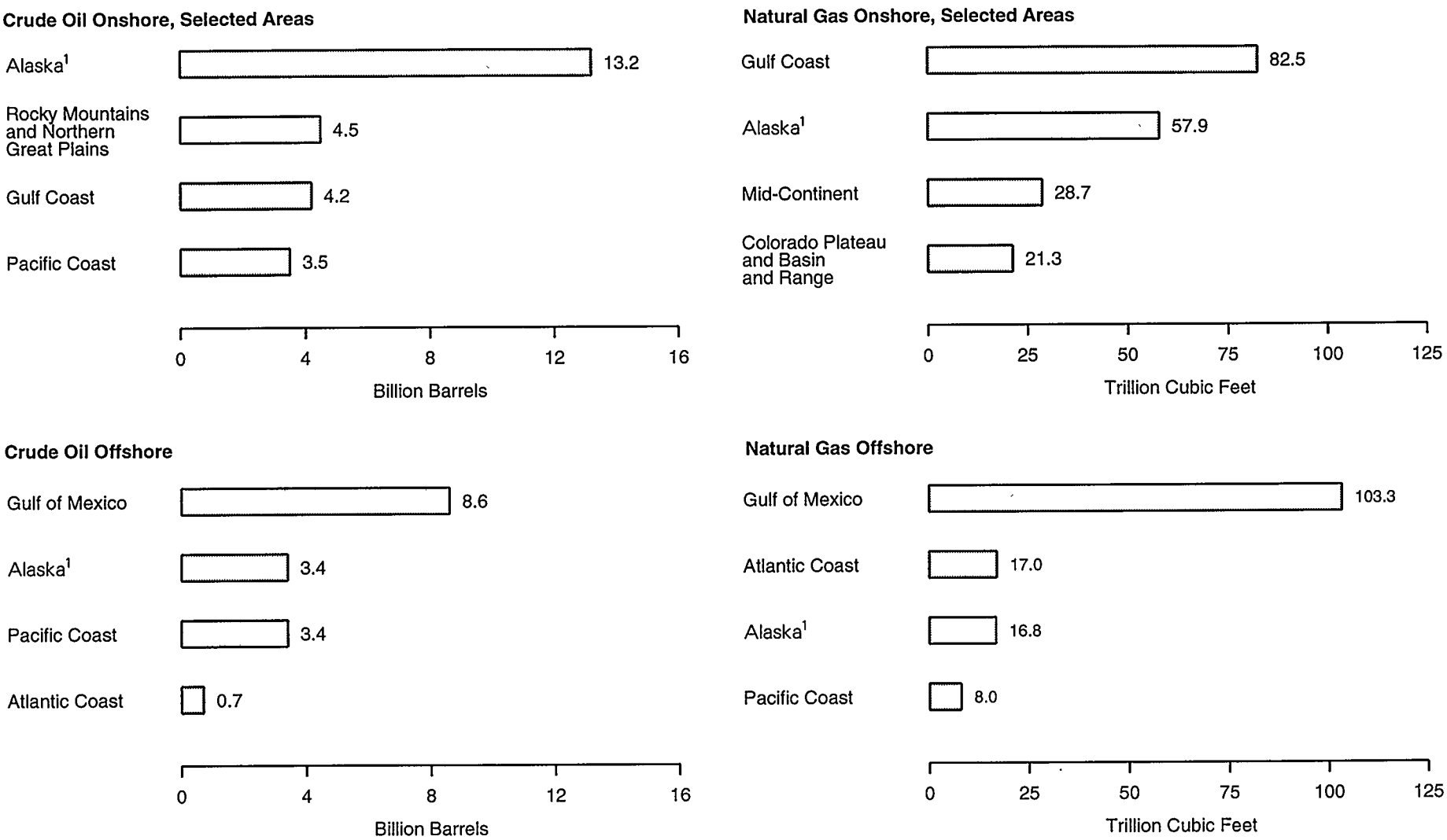
Exploring for Energy Resources

Exploration for oil and gas is closely tied to market conditions, particularly to the price of crude oil. When the price rose in 1981, three indicators of exploratory activity all rose to record levels: crews engaged in seismic exploration rose to 681, rotary rigs in operation rose to 3,970, and exploratory wells drilled rose to 17.5 thousand (4.3 and 4.5). Subsequently, prices declined and then collapsed, leading to drastic cutbacks in exploration. By 1992, crews engaged in seismic exploration had declined to 76, rotary rigs in operation had declined to 721, and exploratory wells drilled had declined to 3.3 thousand, the lowest levels in at least 44 years. However, the low 1992 annual average for rotary rigs in operation masked a year-end surge that may be explained by the existence of tax incentives for natural gas production from nonconventional sources. The incentives apply to wells completed by the end of 1992. Those wells will remain eligible for the tax credits through 2002.[2] In 1993 and 1994, despite further declines in oil prices, two indicators of exploratory activity rose slightly: crews engaged in seismic exploration rose from 76 to 79 in 1993 (data are not available for 1994) and rotary rigs in operation rose from 721 to 775 in 1994. However, exploratory wells drilled declined from 3.3 thousand to 3.0 thousand.

Exploration for uranium also reflects changes in energy markets. The number of exploratory and development holes drilled peaked in 1978 at 104 thousand (4.11). As uranium market conditions deteriorated after 1978, the number plunged to fewer than 4 thousand in 1985. In 1993, the number of holes drilled totaled 2.0 thousand.

[2]Energy Information Administration, *Short-Term Energy Outlook* First Quarter 1993, DOE/EIA-0202 (93/1Q) (Washington, DC, February 1993), pp. 1, 6, and 15.

Figure 4.1 Crude Oil and Natural Gas Estimated Undiscovered Recoverable Resources, January 1, 1987



[1] Includes Alaska Wildlife Refuge.
Note: Values plotted are the calculated means.

Source: Table 4.1.

Table 4.1 Crude Oil and Natural Gas Estimated Undiscovered Recoverable Resources, January 1, 1987

Region	Crude Oil (billion barrels)			Natural Gas [1] (trillion cubic feet)		
		Estimated Range [2]			Estimated Range [2]	
	Mean [3]	Low	High	Mean [3]	Low	High
Onshore and State Waters	**33.3**	**19.6**	**51.9**	**254.0**	**178.7**	**346.7**
Alaska [4]	13.2	3.6	31.3	57.9	15.6	138.6
Pacific Coast	3.5	1.5	6.6	11.0	5.5	19.1
Colorado Plateau and Basin and Range	1.5	0.5	3.4	21.3	9.6	39.3
Rocky Mountains and Northern Great Plains	4.5	2.7	6.9	15.2	7.0	27.8
West Texas and Eastern New Mexico	2.6	1.5	4.0	20.1	11.9	31.3
Gulf Coast	4.2	2.4	6.7	82.5	51.2	123.6
Mid-Continent	1.9	1.2	2.7	28.7	16.2	46.0
Eastern Interior [5]	1.8	1.3	2.4	17.2	10.8	25.7
Atlantic Coast	0.2	0.1	0.5	(s)	(s)	(s)
Federal Offshore [6]	**16.1**	**9.2**	**25.6**	**145.1**	**97.8**	**204.8**
Alaska [4,7]	3.4	0.6	9.4	16.8	4.7	39.4
Pacific Coast	3.4	0.9	8.3	8.0	3.5	15.1
Gulf of Mexico	8.6	4.9	13.6	103.3	63.0	156.9
Atlantic Coast	0.7	0.1	2.3	17.0	6.8	33.7
United States Total	**49.4**	**33.2**	**69.9**	**399.1**	**306.8**	**507.2**

[1] There are numerous more recent, nongovernment-generated natural gas resource estimates that are larger, in part because (a) they include natural gas from such sources, as coalbeds and tight sands, beyond the conventionally producible reservoirs that were included in the 1987 Department of the Interior estimate, and (b) they reflect larger estimates of ultimate recovery appreciation. For example, the Potential Gas Committee's latest mean estimate published in "Potential Supply of Natural Gas in the United States, December 31, 1992," is 1,001 trillion cubic feet. The National Petroleum Council's one-time, 1992 mean estimate, published in "The Potential for Natural Gas in the United States: Source and Supply," was 1,065 trillion cubic feet.

The Department of the Interior will publish a new Government-generated estimate in late 1995. The onshore and State waters portion is reported in U.S. Geological Survey Circular 1118, *1995 National Assessment of United States Oil and Gas Resources.* The Minerals Management Service, responsible for the offshore portion, has not yet issued its report. Both will be summarized in the Department of the Interior report.

[2] The low value of the range is the quantity associated with a 95 percent probability (19 in 20 chance) that there is at least this amount. The high value is the quantity with a 5 percent probability (1 in 20 chance) that there is at least this amount. Totals for the low and high values are not obtained by arithmetic summation; they are derived by statistical methods.

[3] The arithmetic average of all possible outcomes.

[4] Includes Alaska National Wildlife Refuge.

[5] Includes the Michigan Basin and Appalachians.

[6] Includes only the area encompassed by the Federally Controlled Outer Continental Shelf.

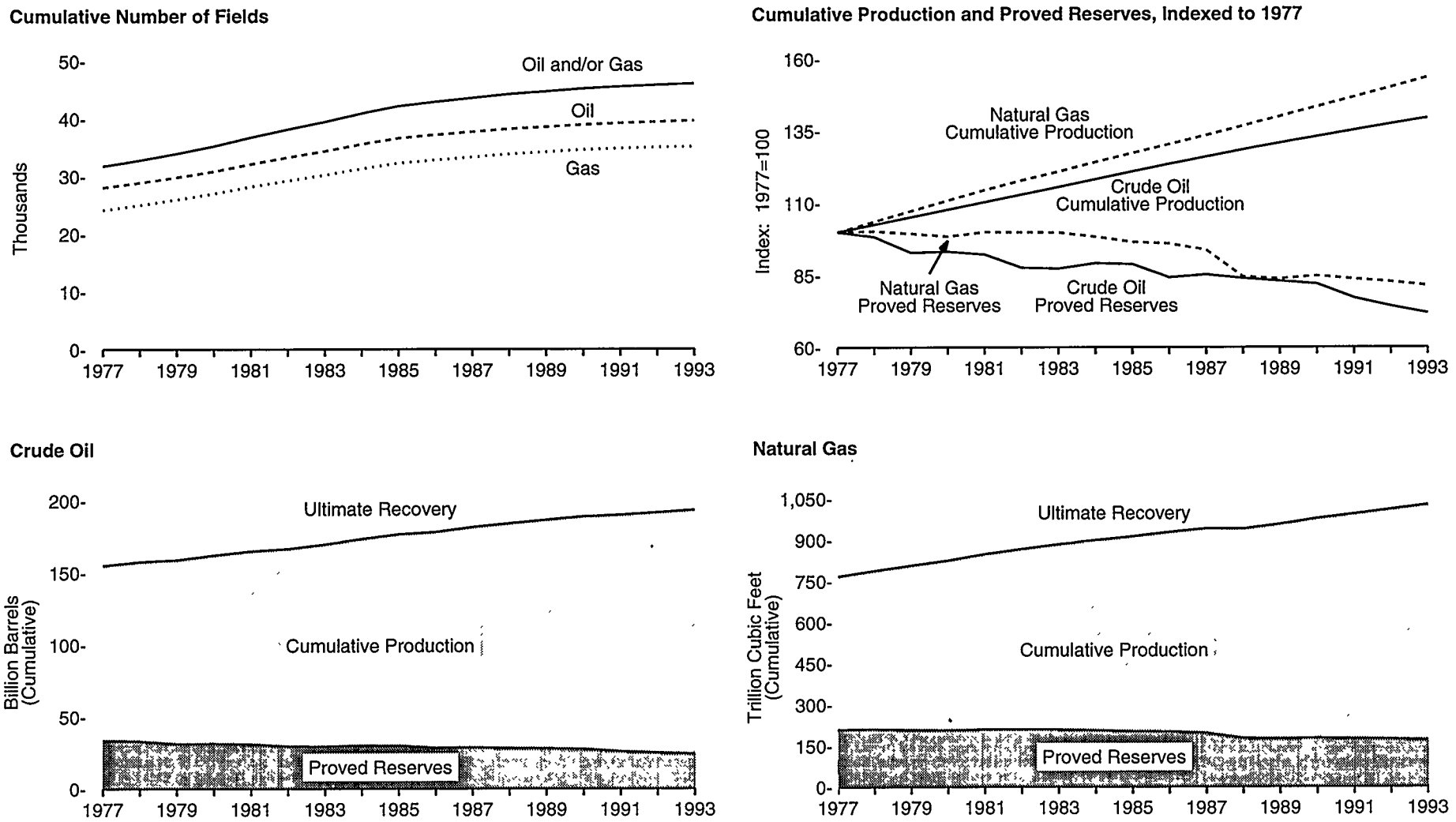
[7] Includes quantities considered recoverable only if technology permits their exploitation beneath Arctic ice — a condition not yet met.

(s)=Less than 0.1 trillion cubic feet.

Note: The estimates are risked. The methodology computes the marginal probability that economically recoverable hydrocarbons exist in the area. When applied to the mean volume, the methodology adjusts the figure to reflect the probability that the area may be nonproductive.

Source: U.S. Department of the Interior, U.S. Geological Survey and Minerals Management Service, *Estimates of Undiscovered Recoverable Conventional Oil and Gas Resources in the United States - A Part of the Nation's Energy Endowment, 1989.*

Figure 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery, 1977-1993



Notes. • Crude oil includes lease condensate. • Natural gas is wet, after lease separation.

Source: Table 4.2.

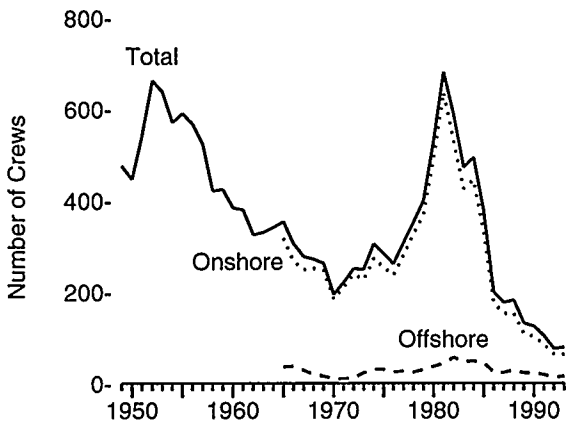
Table 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery, 1977-1993

Year	Cumulative Number of Fields with Oil and/or Gas [3]	Cumulative Number of Fields with Oil [3]	Crude Oil [1] (billion barrels)			Cumulative Number of Fields with Gas [3]	Natural Gas [2] (trillion cubic feet)		
			Cumulative Production	Proved Reserves	Ultimate Recovery		Cumulative Production	Proved Reserves	Ultimate Recovery
1977	31,785	28,090	121.4	33.6	155.0	24,178	558.3	209.5	767.8
1978	32,813	28,909	124.6	33.1	157.6	25,032	578.4	210.1	788.5
1979	33,955	29,834	127.7	31.2	158.9	25,999	599.1	208.3	807.4
1980	35,245	30,876	130.8	31.3	162.2	27,023	619.4	206.3	825.6
1981	36,769	32,135	133.9	31.0	165.0	28,213	639.4	209.4	848.9
1982	38,147	33,295	137.1	29.5	166.6	29,245	658.1	209.3	867.4
1983	39,438	34,351	140.3	29.3	169.6	30,214	675.1	209.0	884.1
1984	40,892	35,559	143.5	30.0	173.5	31,302	693.5	206.0	899.5
1985	42,147	36,589	146.8	29.9	176.7	32,274	710.9	202.2	913.1
1986	42,896	37,186	150.0	28.3	178.3	32,811	727.8	201.1	928.9
1987	43,562	37,692	153.0	28.7	181.7	33,314	745.4	196.4	941.8
1988	44,225	38,202	156.0	28.2	184.2	33,838	763.4	177.0	940.4
1989	44,677	38,536	158.8	27.9	186.7	34,203	781.7	175.4	957.1
1990	45,158	38,896	161.5	27.6	189.0	34,572	800.4	177.6	978.0
1991	45,500	39,171	164.2	25.9	190.1	34,805	819.1	175.3	994.4
1992	45,768	39,386	166.8	25.0	191.8	34,971	838.0	173.3	1,011.3
1993	45,982	39,570	169.3	24.1	193.4	35,089	857.4	170.5	1,027.9

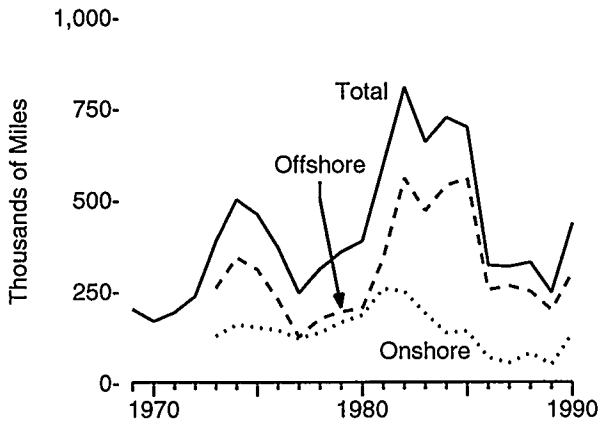
[1] Includes lease condensate.
[2] Wet, after lease separation.
[3] The field-count historical data are all revised to reflect up-to-date redeterminations of the limits of distinct oil and gas fields and improved information concerning their discovery dates.
R=Revised data.
Sources: **1992:** Energy Information Administration (EIA), Office of Oil and Gas, Oil and Gas Integrated Field File (OGIFF), (July 1994). **1977-1991 and 1993:** • Crude Oil Cumulative Production—EIA, *Petroleum Supply Annual 1993 Volume 1* (June 1994). • Natural Gas Cumulative Production—EIA, *Natural Gas Annual 1993* (October 1994). • Proved Reserves—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1993 Annual Report* (October 1994). • Field Counts—EIA, *Oil and Gas Field Code Master List 1994* (January 1995) and OGIFF.

Figure 4.3 Oil and Gas Drilling Activity Measurements

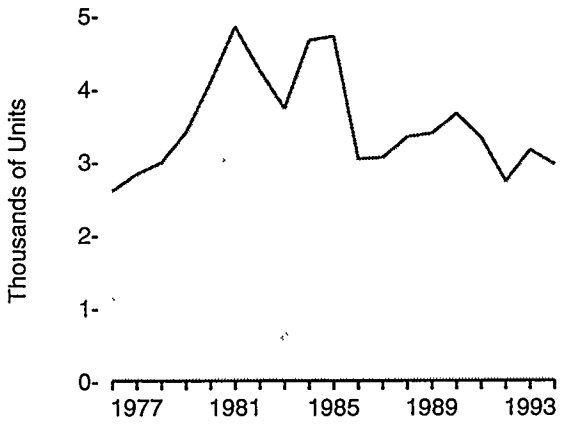
Crews Engaged in Seismic Exploration, 1949-1993



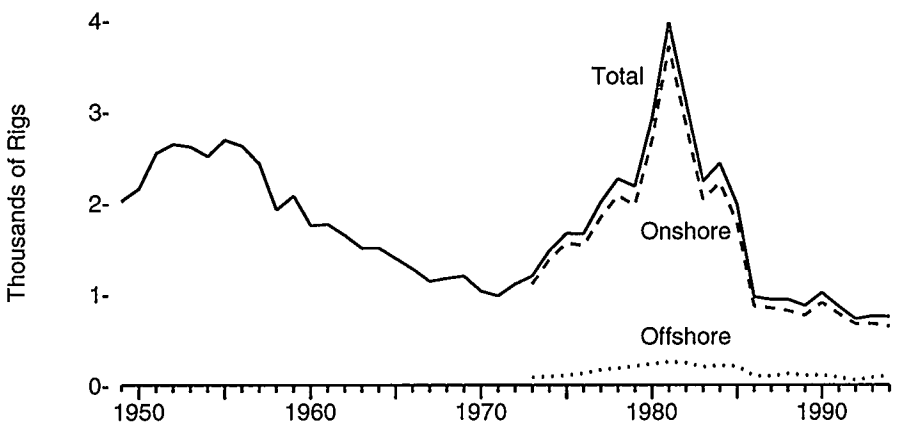
Line Miles of Seismic Surveys, 1969-1990



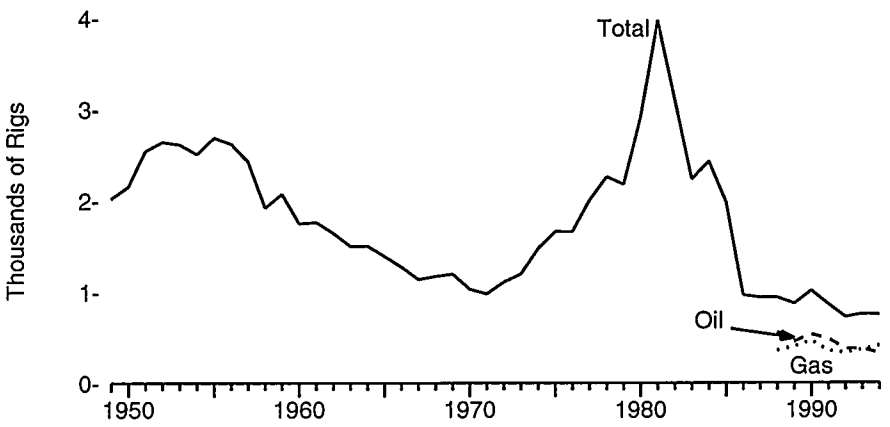
Active Well Servicing Units, 1976-1994



Rotary Rigs in Operation By Site, 1949-1994



Rotary Rigs in Operation By Type, 1949-1994



Source: Table 4.3.

Table 4.3 Oil and Gas Drilling Activity Measurements, 1949-1994

Year	Crews Engaged In Seismic Exploration			Line Miles of Seismic Surveys (thousand)			Rotary Rigs In Operation [1]					Active Well Servicing Units
							By Site		By Type			
	Offshore	Onshore	Total	Offshore	Onshore	Total	Offshore	Onshore	Oil	Gas	Total [2]	
1949	NA	NA	476	NA	NA	NA	NA	NA	NA	NA	2,017	NA
1950	NA	NA	448	NA	NA	NA	NA	NA	NA	NA	2,154	NA
1951	NA	NA	545	NA	NA	NA	NA	NA	NA	NA	2,543	NA
1952	NA	NA	663	NA	NA	NA	NA	NA	NA	NA	2,641	NA
1953	NA	NA	639	NA	NA	NA	NA	NA	NA	NA	2,613	NA
1954	NA	NA	572	NA	NA	NA	NA	NA	NA	NA	2,508	NA
1955	NA	NA	591	NA	NA	NA	NA	NA	NA	NA	2,686	NA
1956	NA	NA	568	NA	NA	NA	NA	NA	NA	NA	2,620	NA
1957	NA	NA	524	NA	NA	NA	NA	NA	NA	NA	2,426	NA
1958	NA	NA	422	NA	NA	NA	NA	NA	NA	NA	1,922	NA
1959	NA	NA	425	NA	NA	NA	NA	NA	NA	NA	2,071	NA
1960	NA	NA	385	NA	NA	NA	NA	NA	NA	NA	1,748	NA
1961	NA	NA	380	NA	NA	NA	NA	NA	NA	NA	1,761	NA
1962	NA	NA	326	NA	NA	NA	NA	NA	NA	NA	1,641	NA
1963	NA	NA	331	NA	NA	NA	NA	NA	NA	NA	1,499	NA
1964	NA	NA	342	NA	NA	NA	NA	NA	NA	NA	1,501	NA
1965	36	318	354	NA	NA	NA	NA	NA	NA	NA	1,388	NA
1966	38	268	306	NA	NA	NA	NA	NA	NA	NA	1,272	NA
1967	29	249	278	NA	NA	NA	NA	NA	NA	NA	1,135	NA
1968	20	252	272	NA	NA	NA	NA	NA	NA	NA	1,169	NA
1969	16	247	263	NA	NA	199.9	NA	NA	NA	NA	1,194	NA
1970	10	185	195	NA	NA	167.3	NA	NA	NA	NA	1,028	NA
1971	10	211	221	NA	NA	191.7	NA	NA	NA	NA	976	NA
1972	12	239	251	NA	NA	235.7	NA	NA	NA	NA	1,107	NA
1973	23	227	250	258.9	127.2	386.1	84	1,110	NA	NA	1,194	NA
1974	31	274	305	341.8	158.6	500.4	94	1,378	NA	NA	1,472	NA
1975	30	254	284	309.3	150.7	460.0	106	1,554	NA	NA	1,660	NA
1976	25	237	262	226.3	142.9	369.2	129	1,529	NA	NA	1,658	2,601
1977	27	281	308	124.7	120.1	244.7	167	1,834	NA	NA	2,001	2,828
1978	25	327	352	174.6	135.9	310.5	185	2,074	NA	NA	2,259	2,988
1979	30	370	400	193.2	163.9	357.1	207	1,970	NA	NA	2,177	3,399
1980	37	493	530	202.7	184.1	386.8	231	2,678	NA	NA	2,909	4,089
1981	44	637	681	338.2	256.2	594.4	256	3,714	NA	NA	3,970	4,850
1982	57	531	588	558.5	248.5	806.9	243	2,862	NA	NA	3,105	4,248
1983	47	426	473	469.2	188.5	657.7	199	2,033	NA	NA	2,232	3,732
1984	49	445	494	538.5	185.9	724.4	213	2,215	NA	NA	2,428	4,663
1985	45	333	378	557.7	140.0	697.7	206	1,774	NA	NA	1,980	4,716
1986	24	176	200	252.6	67.6	320.2	99	865	NA	NA	964	3,036
1987	24	153	177	263.7	52.7	316.5	95	841	NA	NA	936	3,060
1988	29	153	182	248.6	79.5	328.1	123	813	554	354	936	3,341
1989	23	109	132	197.4	48.0	245.5	105	764	453	401	869	3.391
1990	23	102	125	300.2	134.2	434.5	108	902	532	464	1,010	3,658
1991	19	85	104	NA	NA	NA	81	779	482	351	860	3,331
1992	12	64	76	NA	NA	NA	52	669	373	331	721	2,732
1993	16	63	79	NA	NA	NA	82	672	373	364	754	3,158
1994	NA	NA	NA	NA	NA	NA	102	673	335	427	775	2,961

[1] Data are not for the exact calendar year but for the 52 or 53 consecutive whole weeks that most nearly coincide with the calendar year.

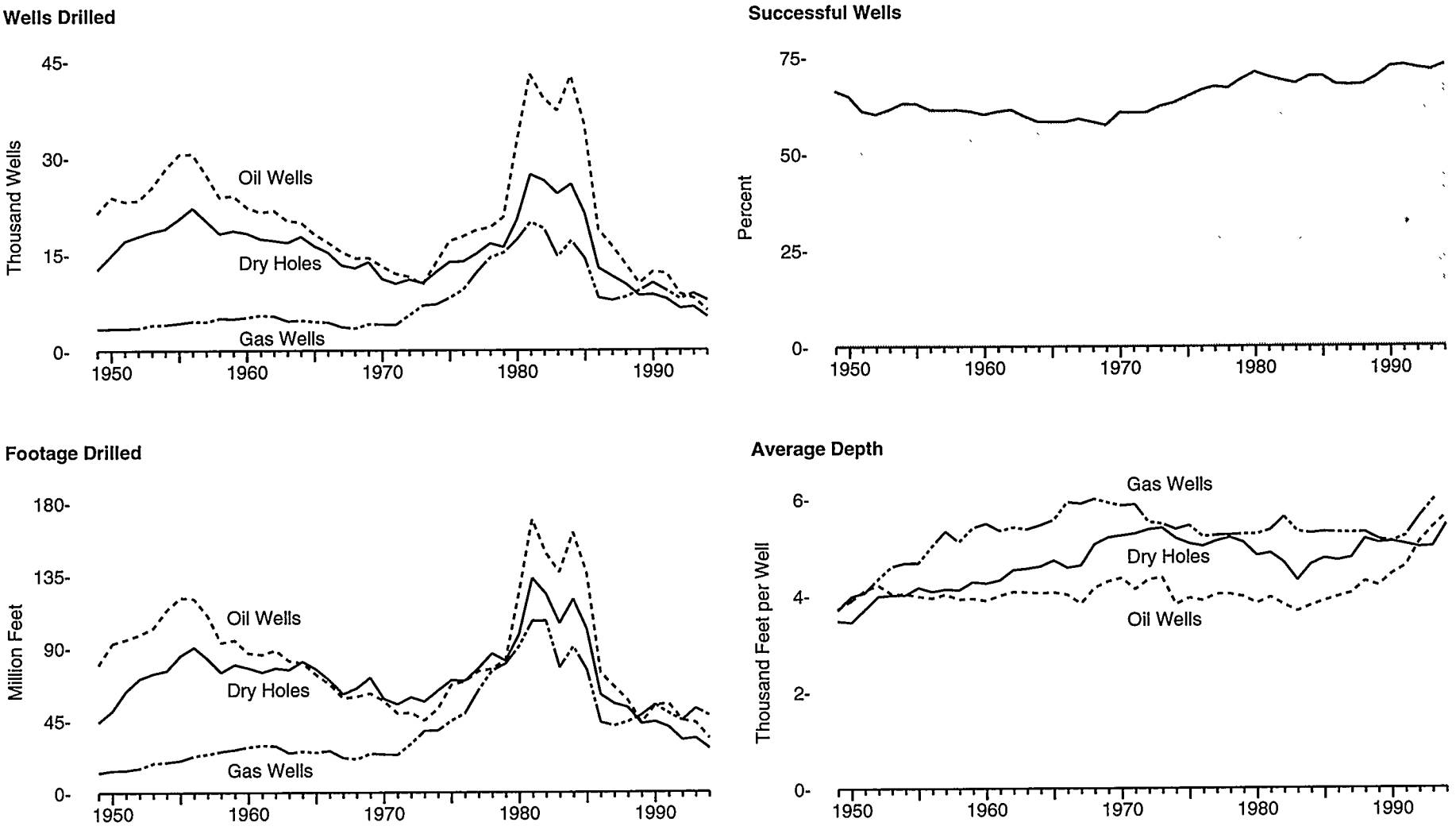
[2] Sum of oil, gas, and miscellaneous other rigs, which is not shown.

NA=Not available.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding.

Sources: **Crews Engaged in Seismic Exploration and Line Miles of Seismic Surveys:** Society of Exploration Geophysicists, Tulsa, Oklahoma, *SEG News Release,* and *Geophysics: The Leading Edge of Exploration,* monthly. **Rotary Rigs in Operation:** Baker Hughes, Inc., Houston, Texas, *Rotary Rigs Running—By State.* **Active Well Servicing Units:** American Association of Oilwell Servicing Contractors, Dallas, Texas, *Well Servicing.*

Figure 4.4 Oil and Gas Exploratory and Development Wells, 1949-1994



Source: Table 4.4.

Table 4.4 Oil and Gas Exploratory and Development Wells, 1949-1994

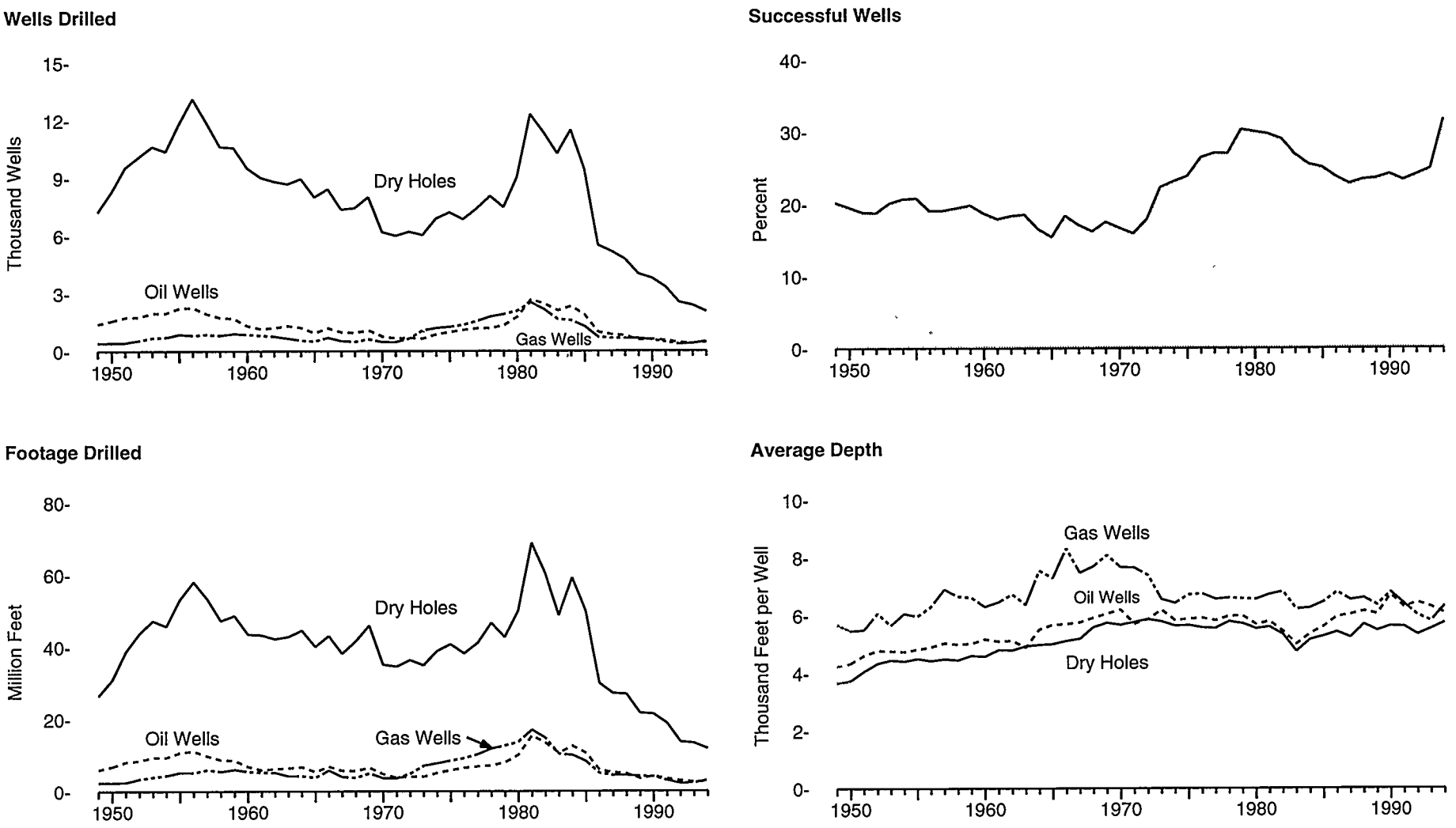
Year	Wells Drilled (thousands)				Successful Wells (percent)	Footage Drilled (million feet)				Average Depth (feet per well)			
	Oil	Gas	Dry Holes	Total		Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total
1949	21.35	3.36	12.60	37.31	66.2	79.4	12.4	43.8	135.6	3,720	3,698	3,473	3,635
1950	23.81	3.44	14.80	42.05	64.8	92.7	13.7	51.0	157.4	3,893	3,979	3,445	3,742
1951	23.18	3.44	17.03	43.64	61.0	95.1	13.9	63.1	172.1	4,103	4,056	3,706	3,944
1952	23.29	3.51	17.76	44.56	60.1	98.1	15.3	70.7	184.1	4,214	4,342	3,983	4,132
1953	25.32	3.97	18.45	47.74	61.4	102.1	18.2	73.9	194.2	4,033	4,599	4,004	4,069
1954	28.14	4.04	18.93	51.11	63.0	113.4	18.9	75.8	208.0	4,028	4,670	4,004	4,070
1955	30.43	4.27	20.45	55.15	62.9	121.1	19.9	85.1	226.2	3,981	4,672	4,161	4,101
1956	30.53	4.53	22.11	57.17	61.3	120.4	22.7	90.2	233.3	3,942	5,018	4,079	4,080
1957	27.36	4.48	20.16	52.00	61.2	110.0	23.8	83.2	217.0	4,021	5,326	4,126	4,174
1958	23.77	5.01	18.16	46.94	61.3	93.1	25.6	74.6	193.3	3,916	5,106	4,110	4,118
1959	24.04	4.93	18.59	47.56	60.9	94.6	26.6	79.5	200.7	3,935	5,396	4,275	4,220
1960	22.26	5.15	18.21	45.62	60.1	86.6	28.2	77.4	192.2	3,889	5,486	4,248	4,213
1961	21.44	5.49	17.33	44.25	60.8	85.6	29.3	74.7	189.6	3,994	5,339	4,311	4,285
1962	21.73	5.35	17.08	44.16	61.3	88.4	28.9	77.3	194.6	4,070	5,408	4,524	4,408
1963	20.14	4.57	16.76	41.47	59.6	81.8	24.5	76.3	182.6	4,063	5,368	4,552	4,405
1964	19.91	4.69	17.69	42.29	58.2	80.5	25.6	81.4	187.4	4,042	5,453	4,598	4,431
1965	18.07	4.48	16.23	38.77	58.2	73.3	24.9	76.6	174.9	4,059	5,562	4,723	4,510
1966	16.78	4.38	15.23	36.38	58.1	67.3	25.9	69.6	162.9	4,013	5,928	4,573	4,478
1967	15.33	3.66	13.25	32.23	58.9	58.6	21.6	61.1	141.4	3,825	5,898	4,616	4,385
1968	14.33	3.46	12.81	30.60	58.1	59.5	20.7	64.7	145.0	4,153	5,994	5,053	4,738
1969	14.37	4.08	13.74	32.19	57.3	61.6	24.2	71.4	157.1	4,286	5,918	5,195	4,881
1970	13.04	4.03	11.10	28.17	60.6	56.8	23.6	58.1	138.6	4,357	5,859	5,236	4,918
1971	11.90	3.98	10.38	26.27	60.5	49.1	23.4	54.8	127.3	R4,121	5,880	5,276	4,845
1972	11.44	5.48	11.01	27.93	60.6	49.5	30.3	59.1	138.8	4,327	5,517	5,362	4,969
1973	10.25	6.98	10.47	27.69	62.2	44.8	38.2	56.5	139.4	4,366	5,478	5,394	5,035
1974	13.66	7.17	12.21	33.04	63.1	52.1	38.5	63.2	153.8	3,811	5,369	5,180	4,655
1975	16.98	8.17	13.74	38.89	64.7	66.9	44.5	69.6	181.0	3,942	5,445	5,069	4,656
1976	17.70	9.44	13.81	40.94	66.3	68.8	49.2	69.3	187.3	3,889	5,213	5,017	4,575
1977	18.70	12.12	15.04	45.86	67.2	75.2	63.5	77.0	215.7	4,021	5,240	5,121	4,704
1978	19.07	14.41	16.59	50.06	66.9	76.6	75.6	86.2	238.4	4,019	R5,247	5,194	4,762
1979	20.70	15.17	16.04	51.91	69.1	82.1	79.9	81.7	243.7	3,967	5,266	R5,092	4,694
1980	32.28	17.22	20.34	69.84	70.9	123.6	90.7	98.1	312.3	3,829	5,264	4,821	4,472
1981	42.84	19.91	27.28	90.03	69.7	169.4	106.5	132.9	408.8	3,955	5,350	4,871	4,541
1982	39.14	18.94	26.38	84.47	68.8	148.6	106.5	123.3	378.4	3,797	5,621	R4,674	4,480
1983	37.20	14.56	24.34	76.09	68.0	R136.6	R77.6	R104.9	R319.1	R3,665	R5,315	R4,305	R4,185
1984	42.59	17.01	25.80	85.39	69.8	R161.3	R90.3	R119.8	R371.5	R3,781	R5,279	R4,635	R4,338
1985	35.02	14.25	21.21	70.48	69.9	R136.1	R75.9	R101.2	R313.2	R3,879	R5,309	R4,759	R4,433
1986	18.70	8.14	12.77	39.60	67.8	R74.2	R43.3	R60.6	R178.2	R3,963	R5,297	R4,717	R4,481
1987	16.19	7.76	11.48	35.42	67.6	R65.5	R41.2	R55.0	R161.6	R4,038	R5,290	R4,773	R4,551
1988	13.32	8.24	10.24	31.80	67.8	R56.9	43.7	R52.5	R153.1	R4,284	R5,302	R5,160	R4,830
1989	10.34	9.23	8.49	28.06	69.7	R43.0	R47.8	R42.5	133.4	R4,193	R5,156	R5,082	R4,780
1990E	12.15	10.44	8.61	31.20	72.4	R53.9	R54.2	R43.7	R151.8	R4,439	R5,103	R5,104	R4,846
1991E	11.91	R9.24	R7.93	R29.08	R72.7	R54.9	R48.9	R40.3	R144.1	R4,599	R5,223	R5,048	R4,921
1992E	R8.70	7.95	R6.48	R23.12	R72.0	R44.5	44.4	R32.4	R121.4	R5,090	R5,611	R4,987	R5,239
1993E	R8.04	R8.75	R6.69	R23.48	71.5	R43.0	R51.8	R33.4	R128.2	R5,398	R5,949	R5,000	R5,490
1994E	6.15	7.72	5.15	19.02	72.9	33.3	47.5	27.1	107.9	5,661	6,227	5,459	5,841

R=Revised data. E=Estimate. See Note at end of section.

Notes: • 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 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 forward—Energy Information Administration computations based on well reports submitted to the American Petroleum Institute.

Figure 4.5 Oil and Gas Exploratory Wells, 1949-1994



Source. Table 4.5.

Table 4.5 Oil and Gas Exploratory Wells, 1949-1994

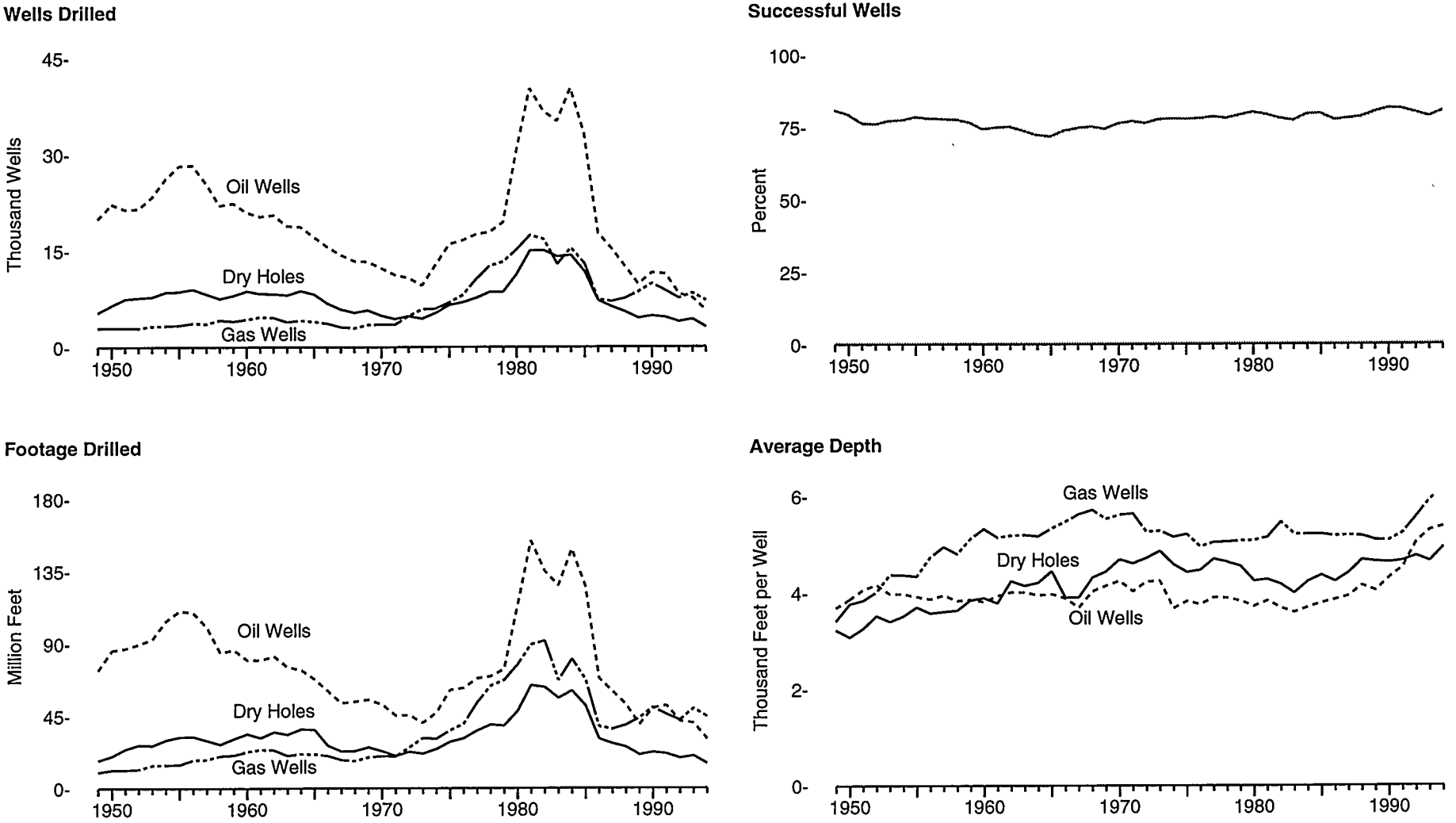
Year	Wells Drilled (thousands)				Successful Wells (percent)	Footage Drilled (million feet)				Average Depth (feet per well)			
	Oil	Gas	Dry Holes	Total		Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total
1949	1.41	0.42	7.23	9.06	20.2	6.0	2.4	26.4	34.8	4,232	5,682	3,658	3,842
1950	1.58	0.43	8.29	10.31	19.5	6.9	2.4	31.0	40.2	4,335	5,466	3,733	3,898
1951	1.76	0.45	9.54	11.76	18.9	8.1	2.5	38.7	49.3	4,609	5,497	4,059	4,197
1952	1.78	0.56	10.09	12.43	18.8	8.5	3.4	43.7	55.6	4,781	6,071	4,334	4,476
1953	1.98	0.70	10.63	13.31	20.1	9.4	4.0	47.3	60.7	4,761	5,654	4,447	4,557
1954	1.99	0.73	10.39	13.10	20.7	9.4	4.4	45.8	59.6	4,740	6,059	4,408	4,550
1955	2.24	0.87	11.83	14.94	20.8	10.8	5.2	53.2	69.2	4,819	5,964	4,498	4,632
1956	2.27	0.82	13.12	16.21	19.1	11.1	5.2	58.0	74.3	4,901	6,301	4,425	4,587
1957	1.95	0.87	11.90	14.71	19.1	9.8	6.0	53.4	69.2	5,036	6,898	4,488	4,702
1958	1.75	0.82	10.63	13.20	19.4	8.7	5.5	47.3	61.5	4,993	6,657	4,449	4,658
1959	1.70	0.91	10.58	13.19	19.8	8.5	6.0	48.7	63.3	5,021	6,613	4,602	4,795
1960	1.32	0.87	9.52	11.70	18.7	6.8	5.5	43.5	55.8	5,170	6,298	4,575	4,770
1961	1.16	0.81	9.02	10.99	17.9	5.9	5.2	43.3	54.4	5,099	6,457	4,799	4,953
1962	1.21	0.77	8.82	10.80	18.4	6.2	5.2	42.2	53.6	5,124	6,728	4,790	4,966
1963	1.31	0.66	8.69	10.66	18.5	6.4	4.2	42.8	53.5	4,878	6,370	4,933	5,016
1964	1.22	0.56	8.95	10.73	16.6	6.7	4.2	44.6	55.5	5,509	7,547	4,980	5,174
1965	0.95	0.52	8.01	9.47	15.4	5.4	3.8	40.1	49.2	5,672	7,295	5,007	5,198
1966	1.20	0.70	8.42	10.31	18.4	6.8	5.8	43.1	55.7	5,700	8,321	5,117	5,402
1967	0.99	0.53	7.36	8.88	17.1	5.7	4.0	38.2	47.8	5,758	7,478	5,188	5,388
1968	0.95	0.49	7.44	8.88	16.2	5.6	3.7	41.6	51.0	5,914	7,697	5,589	5,739
1969	1.08	0.62	8.00	9.70	17.5	6.6	5.0	45.9	57.5	6,054	8,092	5,739	5,924
1970	0.76	0.48	6.19	7.43	16.7	4.7	3.7	35.1	43.5	6,198	R7,669	5,671	5,854
1971	0.66	0.47	6.00	7.13	15.9	3.8	3.6	34.6	42.0	R5,702	R7,654	5,765	5,885
1972	0.69	0.66	6.20	7.55	17.9	4.0	4.9	36.4	45.3	R5,858	R7,393	5,863	5,996
1973	0.65	1.08	6.04	7.77	22.3	4.0	7.1	34.9	46.0	R6,187	R6,556	5,785	5,926
1974	0.87	1.21	6.89	8.97	23.1	5.1	7.7	38.9	51.7	5,826	6,425	5,637	5,761
1975	0.99	1.26	7.21	9.46	23.8	5.8	8.5	40.8	55.1	5,875	R6,714	5,655	5,819
1976	1.10	1.36	6.85	9.32	26.4	6.5	9.2	38.2	53.9	R5,903	R6,748	R5,575	5,785
1977	1.18	1.56	7.40	10.15	27.1	6.9	10.2	41.1	58.3	5,821	R6,562	R5,557	5,743
1978	1.19	1.79	8.05	11.04	27.0	7.1	11.8	46.6	65.6	R5,974	6,604	5,787	5,940
1979	1.34	1.92	7.48	10.73	30.3	8.0	12.6	42.7	63.4	R5,985	6,579	5,715	5,903
1980	1.78	2.09	9.04	12.91	30.0	10.1	13.7	50.1	73.9	5,684	R6,558	5,540	5,725
1981	2.67	2.53	12.30	17.50	29.7	15.4	17.0	68.8	101.3	5,789	6,724	5,598	5,790
1982	2.47	2.17	11.35	15.98	29.0	13.5	14.8	60.5	88.8	5,446	6,819	R5,334	5,553
1983	2.11	1.66	10.27	14.04	26.9	R10.6	10.3	R48.8	69.6	R4,995	R6,211	R4,744	R4,955
1984	2.34	1.60	11.48	15.42	25.5	12.5	10.0	R59.2	R81.7	5,354	R6,253	R5,151	R5,296
1985	1.88	1.28	9.45	12.61	25.1	R10.6	8.3	R49.9	R68.7	R5,604	R6,456	R5,273	R5,443
1986	0.99	0.73	5.51	7.23	23.8	5.9	5.0	R29.9	R40.8	R5,948	R6,801	R5,415	R5,628
1987	0.86	0.67	5.18	6.71	22.8	5.2	4.4	27.1	R36.7	R6,022	R6,531	R5,231	R5,462
1988	0.79	0.66	4.77	6.22	23.4	4.9	4.4	R26.9	36.2	R6,137	R6,596	R5,679	R5,837
1989	0.58	0.65	4.00	R5.24	R23.6	3.5	R4.2	R21.7	29.3	R6,039	R6,349	R5,468	R5,643
1990E	0.62	R0.59	3.78	R4.99	R24.1	4.1	R4.0	R21.4	R29.5	R6,700	R6,796	R5,620	R5,892
1991E	R0.55	0.46	R3.32	R4.33	R23.3	3.4	R3.0	R18.8	R25.2	R6,266	R6,388	R5,601	R5,767
1992E	R0.45	0.36	R2.54	R3.34	R24.1	R2.9	2.1	R13.6	R18.6	R6,437	R5,995	R5,324	R5,542
1993E	R0.39	0.39	R2.38	R3.16	R24.9	2.5	2.3	R13.3	R18.1	R6,283	R5,789	R5,519	R5,647
1994E	0.46	0.50	2.05	3.01	31.7	2.7	3.0	11.8	17.5	6,068	6,316	5,735	5,878

R=Revised data. E=Estimate. See Note at end of section.

Notes: • 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 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 forward—Energy Information Administration computations based on well reports submitted to the American Petroleum Institute.

Figure 4.6 Oil and Gas Development Wells, 1949-1994



Source: Table 4.6.

Table 4.6 Oil and Gas Development Wells, 1949-1994

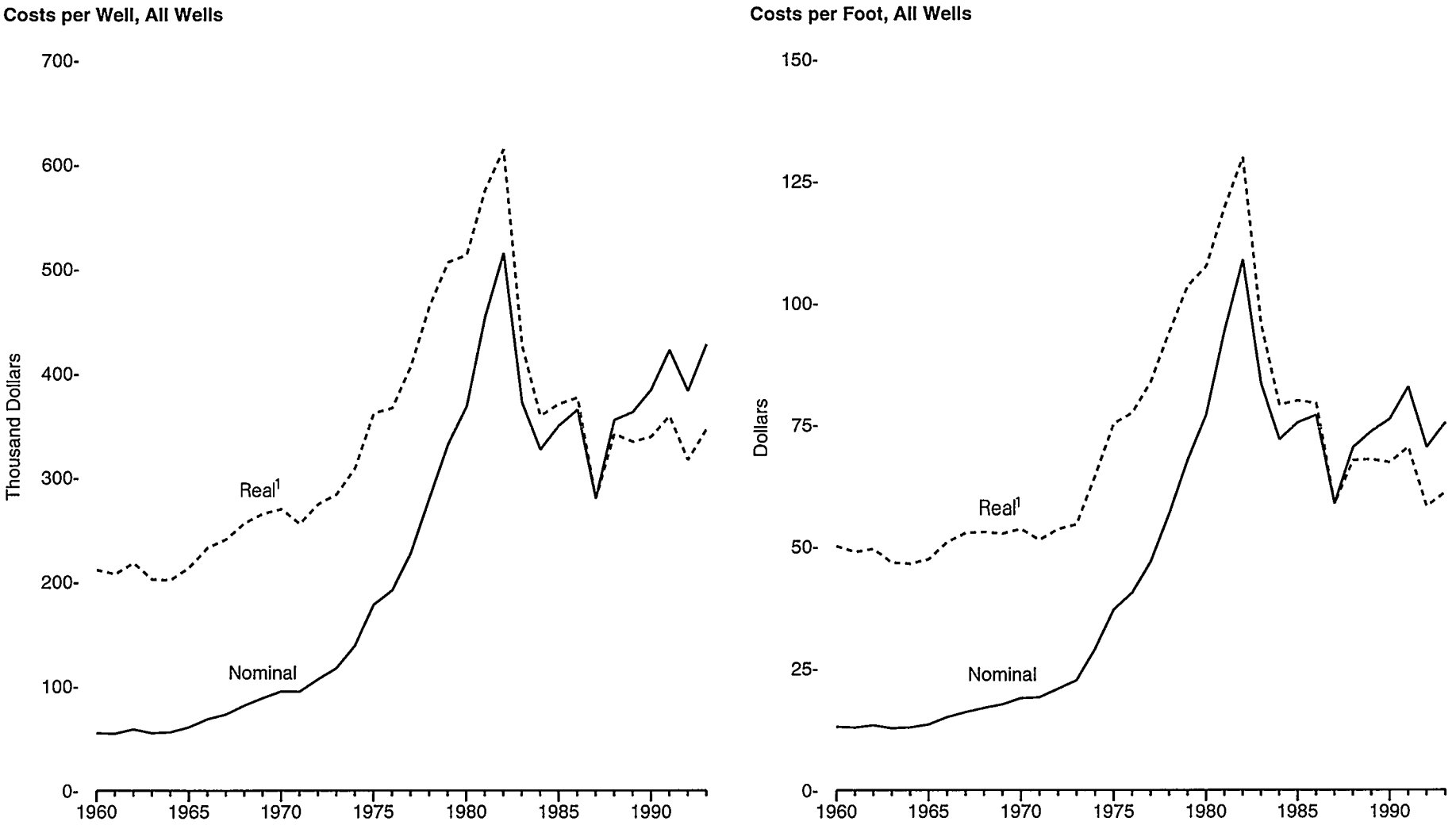
Year	Wells Drilled (thousands)				Successful Wells (percent)	Footage Drilled (million feet)				Average Depth (feet per well)			
	Oil	Gas	Dry Holes	Total		Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total
1949	19.95	2.94	5.37	28.25	81.0	73.5	10.0	17.3	100.8	3,684	3,412	3,225	3,568
1950	22.23	3.01	6.51	31.74	79.5	85.8	11.3	20.0	117.2	3,861	3,766	3,077	3,691
1951	21.42	2.98	7.49	31.89	76.5	87.0	11.5	24.4	122.8	4,061	3,837	3,255	3,851
1952	21.51	2.96	7.67	32.14	76.1	89.7	11.9	27.0	128.5	4,167	4,015	3,520	3,999
1953	23.34	3.27	7.82	34.43	77.3	92.7	14.3	26.6	133.6	3,972	4,373	3,401	3,880
1954	26.16	3.31	8.54	38.01	77.5	104.0	14.5	30.0	148.4	3,974	4,365	3,512	3,905
1955	28.20	3.39	8.62	40.21	78.6	110.4	14.7	31.9	157.0	3,915	4,339	3,699	3,904
1956	28.26	3.71	8.99	40.96	78.0	109.2	17.6	32.1	158.9	3,865	4,734	3,574	3,880
1957	25.42	3.61	8.25	37.28	77.9	100.2	17.9	29.7	147.9	3,944	4,950	3,605	3,966
1958	22.03	4.18	7.53	33.74	77.7	84.4	20.1	27.3	131.8	3,831	4,801	3,631	3,907
1959	22.34	4.02	8.01	34.37	76.7	86.1	20.6	30.8	137.4	3,852	5,120	3,844	3,999
1960	20.94	4.28	8.70	33.92	74.4	79.7	22.8	33.8	136.3	3,809	5,321	3,889	4,020
1961	20.28	4.67	8.31	33.26	75.0	79.7	24.0	31.4	135.2	3,931	5,145	3,782	4,064
1962	20.52	4.58	8.26	33.36	75.2	82.2	23.8	35.0	141.0	4,008	5,186	4,239	4,227
1963	18.82	3.91	8.08	30.80	73.8	75.4	20.3	33.5	129.2	4,006	5,198	4,143	4,193
1964	18.69	4.14	8.74	31.57	72.3	73.7	21.4	36.8	131.9	3,947	5,171	4,207	4,179
1965	17.12	3.97	8.22	29.31	71.9	68.0	21.2	36.5	125.7	3,970	5,337	4,446	4,288
1966	15.58	3.68	6.81	26.07	73.9	60.5	20.1	26.6	107.2	3,884	5,474	3,900	4,112
1967	14.34	3.13	5.89	23.36	74.8	53.0	17.6	23.0	93.5	3,692	5,629	3,901	4,004
1968	13.38	2.97	5.37	21.72	75.3	53.9	17.0	23.2	94.0	4,027	5,716	4,311	4,328
1969	13.28	3.47	5.74	22.49	74.5	55.0	19.2	25.4	99.6	4,142	5,531	4,437	4,431
1970	12.28	3.55	4.91	20.74	76.3	52.1	20.0	23.0	95.0	4,243	5,615	4,686	4,583
1971	11.24	3.51	4.39	19.14	77.1	45.3	19.8	20.2	85.3	4,028	5,641	4,608	4,457
1972	10.75	4.83	4.81	20.38	76.4	45.4	25.4	22.7	93.5	4,228	5,261	4,716	4,588
1973	9.60	5.90	4.43	19.92	77.8	40.7	31.1	21.5	93.4	4,242	5,281	4,861	4,687
1974	12.79	5.97	5.31	24.07	77.9	47.0	30.8	24.4	102.1	3,674	5,156	4,587	4,243
1975	15.99	6.91	6.53	29.42	77.8	61.1	36.0	28.9	126.0	3,822	5,213	4,423	4,282
1976	16.60	8.08	6.95	31.62	78.0	62.3	40.0	31.1	133.4	3,756	4,954	4,468	4,218
1977	17.52	10.56	7.63	35.71	78.6	68.3	53.3	35.9	157.4	3,899	5,044	4,699	4,409
1978	17.87	12.61	8.54	39.02	78.1	69.5	63.8	39.6	172.8	3,889	5,055	4,634	4,429
1979	19.37	13.25	8.56	41.18	79.2	74.1	67.3	38.9	180.3	3,828	5,076	4,549	4,379
1980	30.50	15.13	11.30	56.93	80.1	113.5	76.9	48.0	238.4	3,721	5,085	4,246	4,188
1981	40.18	17.37	14.99	72.54	79.3	154.0	89.5	64.1	307.5	3,833	5,149	4,275	4,240
1982	36.67	16.78	15.04	68.48	78.0	135.2	91.7	62.8	289.7	3,686	5,466	4,176	4,230
1983	35.09	12.90	14.07	62.05	77.3	126.1	R67.2	56.1	R249.5	R3,594	R5,213	R3,992	R4,020
1984	40.25	15.41	14.32	69.98	79.5	148.8	R80.3	R60.6	R289.8	R3,698	R5,211	R4,235	R4,141
1985	33.14	12.97	11.76	57.88	79.7	125.6	R67.6	R51.3	R244.5	R3,788	R5,213	R4,364	R4,225
1986	17.71	7.40	7.26	32.37	77.6	68.3	R38.4	R30.7	R137.4	R3,859	R5,181	R4,235	R4,245
1987	15.33	7.08	6.30	28.71	78.1	60.3	R36.8	R27.8	R124.9	R3,934	R5,194	R4,414	R4,350
1988	12.53	7.58	5.48	25.58	78.6	52.0	R39.2	R25.6	R116.9	R4,152	R5,181	R4,683	R4,570
1989	9.76	8.57	4.49	22.82	80.3	39.5	43.6	R20.9	R104.0	R4,046	R5,093	R4,649	R4,558
1990E	11.53	R9.85	4.83	R26.22	81.6	49.7	R50.1	R22.4	R122.2	R4,312	R5,089	R4,628	R4,662
1991E	11.36	R8.77	R4.61	R24.75	R81.4	51.4	R46.0	R21.5	R118.9	R4,527	R5,238	R4,664	R4,805
1992E	R8.26	7.59	R3.94	R19.78	R80.1	41.7	42.3	R18.8	R102.7	R5,048	R5,576	R4,763	R5,194
1993E	R7.65	R8.36	R4.32	R20.32	R78.8	40.5	R49.5	R20.1	R110.2	R5,301	R5,928	R4,656	R5,422
1994E	5.69	7.22	3.10	16.01	80.6	30.6	44.5	15.3	90.4	5,375	6,155	4,947	5,644

E=Estimate. See Note at end of section.

Notes: • 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 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 forward—Energy Information Administration computations based on well reports submitted to the American Petroleum Institute.

Figure 4.7 Costs of Wells Drilled, 1960-1993



[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

Source: Table 4.7.

Table 4.7 Costs of Oil and Gas Wells Drilled, 1960-1993

Year	Costs per Well (thousand dollars)					Costs per Foot (dollars)				
	Oil (nominal)	Gas (nominal)	Dry Holes (nominal)	All		Oil (nominal)	Gas (nominal)	Dry Holes (nominal)	All	
				(nominal)	(real) [1]				(nominal)	(real) [1]
1960	52.2	102.7	44.0	54.9	211.3	13.22	18.57	10.56	13.01	50.04
1961	51.3	94.7	45.2	54.5	207.3	13.11	17.65	10.56	12.85	48.86
1962	54.2	97.1	50.8	58.6	218.0	13.41	18.10	11.20	13.31	49.48
1963	51.8	92.4	48.2	55.0	202.3	13.20	17.19	10.58	12.69	46.65
1964	50.6	104.8	48.5	55.8	201.5	13.12	18.57	10.64	12.86	46.43
1965	56.6	101.9	53.1	60.6	213.5	13.94	18.35	11.21	13.44	47.32
1966	62.2	133.8	56.9	68.4	232.6	15.04	21.75	12.34	14.95	50.85
1967	66.6	141.0	61.5	72.9	240.6	16.61	23.05	12.87	15.97	52.71
1968	79.1	148.5	66.2	81.5	256.2	18.63	24.05	12.88	16.83	52.92
1969	86.5	154.3	70.2	88.6	265.1	19.28	25.58	13.23	17.56	52.57
1970	86.7	160.7	80.9	94.9	269.6	19.29	26.75	15.21	18.84	53.52
1971	78.4	166.6	86.8	94.7	255.3	18.41	27.70	16.02	19.03	51.29
1972	93.5	157.8	94.9	106.4	274.3	20.77	27.78	17.28	20.76	53.51
1973	103.8	155.3	105.8	117.2	283.7	22.54	27.46	19.22	22.50	54.48
1974	110.2	189.2	141.7	138.7	308.9	27.82	34.11	26.76	28.93	64.43
1975	138.6	262.0	177.2	177.8	361.4	34.17	46.23	33.86	36.99	75.18
1976	151.1	270.4	190.3	191.6	366.4	37.35	49.78	36.94	40.46	77.36
1977	170.0	313.5	230.2	227.2	406.4	41.16	57.57	43.49	46.81	83.74
1978	208.0	374.2	281.7	280.0	464.3	49.72	68.37	52.55	56.63	93.91
1979	243.1	443.1	339.6	331.4	505.9	58.29	80.66	64.60	67.70	103.36
1980	272.1	536.4	376.5	367.7	512.8	66.36	95.16	73.70	77.02	107.42
1981	336.3	698.6	464.0	453.7	575.0	80.40	122.17	90.03	94.30	119.52
1982	347.4	864.3	515.4	514.4	613.8	86.34	146.20	104.09	108.73	129.75
1983	283.8	608.1	366.5	371.7	426.3	72.65	108.37	79.10	83.34	95.57
1984	262.1	489.8	329.2	326.5	358.8	66.32	88.80	67.18	71.90	79.01
1985	270.4	508.7	372.3	349.4	370.1	66.78	93.09	73.69	75.35	79.82
1986	284.9	522.9	389.2	364.6	376.2	68.35	93.02	76.53	76.88	79.34
1987	246.0	380.4	259.1	279.6	279.6	58.35	69.55	51.05	58.71	58.71
1988	279.4	460.3	366.4	354.7	341.4	62.28	84.65	66.96	70.23	67.59
1989	282.3	457.8	355.4	362.2	333.9	64.92	86.86	67.61	73.55	67.79
1990	321.8	471.3	367.5	383.6	338.6	69.17	90.73	67.49	76.07	67.14
1991	346.9	506.6	441.2	421.5	R358.4	73.75	93.10	83.05	82.64	R70.27
1992	362.3	426.1	357.6	382.6	R316.5	69.50	72.83	67.82	70.27	R58.12
1993	356.6	521.2	387.7	426.8	345.6	67.52	83.15	72.56	75.30	60.97

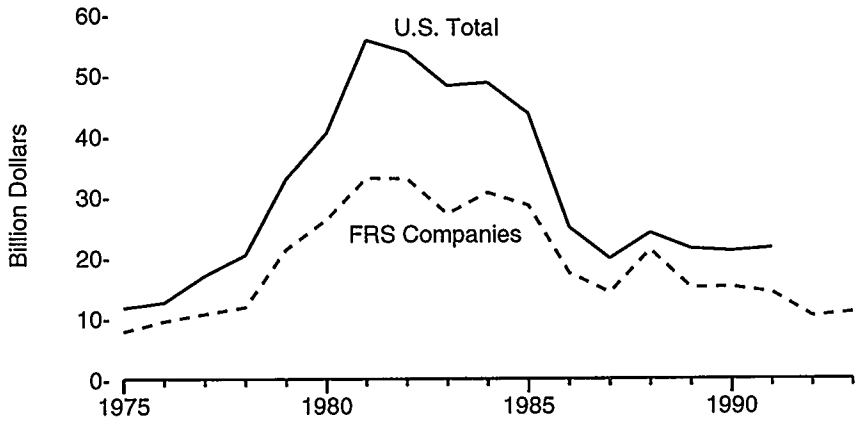
[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
R=Revised data.

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.

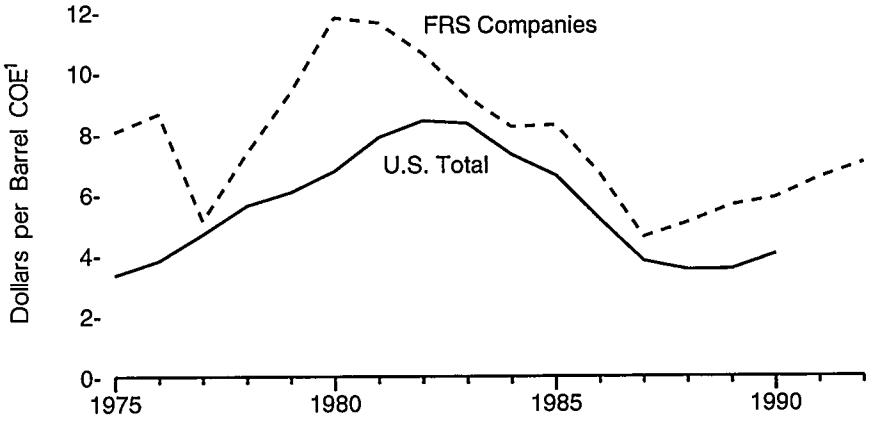
Source: American Petroleum Institute, Independent Petroleum Association of America, Mid-Continent Oil and Gas Association, *1993 Joint Association Survey on Drilling Costs.*

Figure 4.8 U.S. Exploration and Development Expenditures, Gross Additions to Proved Reserves, and Production of Liquid and Gaseous Hydrocarbons by FRS Companies and U.S. Industry

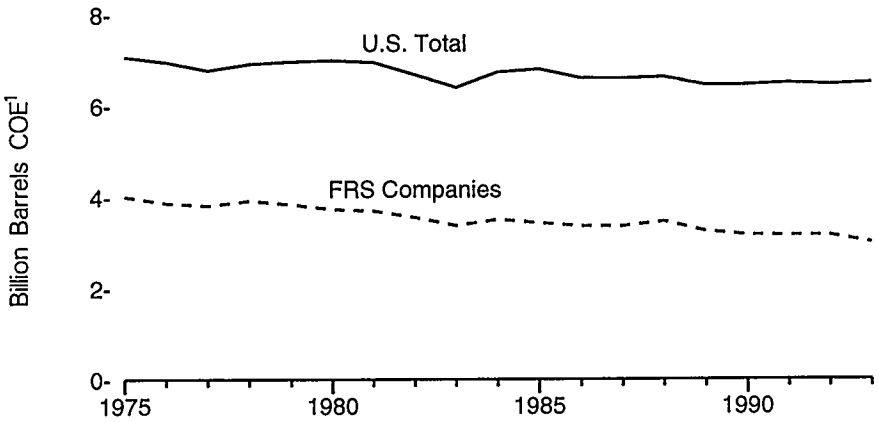
Exploration and Development Expenditures, 1975-1993



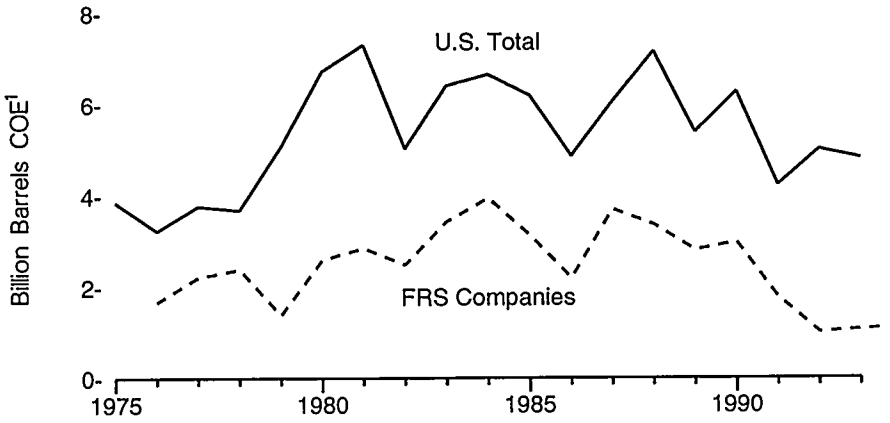
Expenditures per Barrel of Gross Reserve Additions, 1975-1992 (3-year weighted average)



Production, 1975-1993



Gross Additions to Proved Reserves, 1975-1993



[1] COE=crude oil equivalent.
Note: FRS is the Financial Reporting System (see Note at end of Section 3).

Source: Table 4.8.

Table 4.8 U.S. Exploration and Development Expenditures, Gross Additions to Proved Reserves, and Production of Liquid and Gaseous Hydrocarbons by FRS Companies and U.S. Industry, 1975-1993

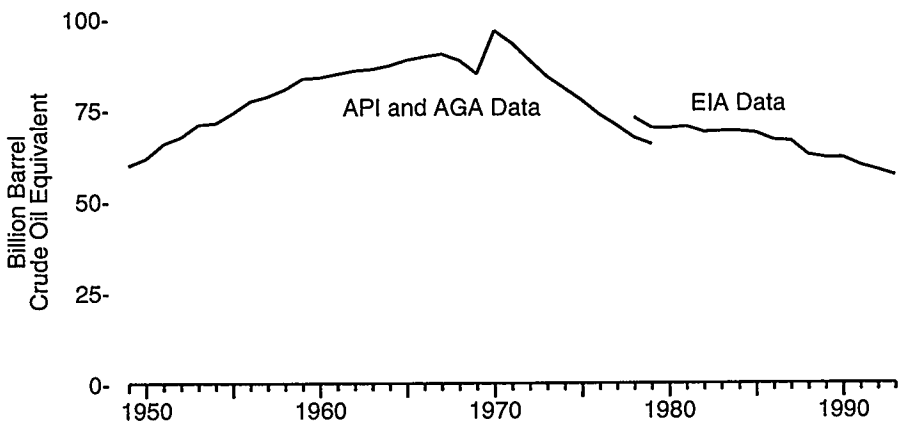
Year	Exploration and Development Expenditures (billion dollars)		Gross Additions to Proved Reserves [1] of Liquid and Gaseous Hydrocarbons [2] (million barrels COE [3])		Expenditures per Barrel of Reserve Additions, Three-Year Weighted Average (dollars per barrel COE [3])		Production of Liquid and Gaseous Hydrocarbons [2] (million barrels COE [3])	
	FRS Companies [4]	U.S. Total	FRS Companies [5,6]	U.S. Total [6]	FRS Companies [4,5]	U.S. Total	FRS Companies [5]	U.S. Total
1975	7.8	11.7	NA	3,846	8.05	3.34	4,006	7,071
1976	9.5	12.6	1,663	3,224	8.64	3.81	3,863	6,958
1977	10.7	17.0	2,210	3,765	5.12	4.68	3,809	6,777
1978	11.8	20.4	2,383	3,679	7.34	5.62	3,916	6,918
1979	21.3	32.9	1,378	5,071	9.34	6.06	3,834	6,970
1980	26.2	40.4	2,590	6,723	11.80	6.76	3,727	6,995
1981	33.0	55.7	2,848	7,304	11.63	7.86	3,694	6,954
1982	32.9	53.7	2,482	5,030	10.62	8.41	3,551	6,682
1983	27.1	48.2	3,427	6,412	9.20	8.32	3,370	6,399
1984	30.6	48.7	3,941	6,653	8.21	7.30	3,503	6,736
1985	28.5	43.6	3,129	6,190	8.27	6.61	3,427	6,798
1986	17.4	24.9	2,187	4,866	6.67	5.16	3,361	6,602
1987	14.2	19.8	3,698	6,059	4.58	3.79	3,354	6,596
1988	21.2	24.0	3,359	7,156	5.05	3.50	3,460	R6,627
1989	15.0	21.4	2,798	5,385	R5.62	3.52	3,243	R6,446
1990	15.1	21.0	2,979	6,271	5.87	4.02	3,163	6,453
1991	14.2	21.5	1,772	4,227	6.52	NA	3,155	6,497
1992	10.3	NA	R1,332	5,006	R7.02	NA	3,152	6,459
1993	10.9	NA	1,945	4,814	NA	NA	2,994	6,504

[1] Gross additions to proved reserves equal annual change in proved reserves plus annual production.
[2] Liquid and gaseous hydrocarbons include crude oil, natural gas liquids, and natural gas.
[3] Crude oil equivalent: converted to Btu on the basis of annual average conversion factors. See Appendix A.
[4] FRS data for 1982 and 1984 are adjusted to exclude purchases of proved reserves associated with mergers among the FRS companies.
[5] Based on net ownership interest (see Glossary).
[6] Downward revisions of Alaska North Slope natural gas reserves are excluded.
R=Revised data. NA=Not available.
Notes: • FRS is the Financial Reporting System (see Note at end of Section 3). • Data in this table are for U.S. domestic operations only.

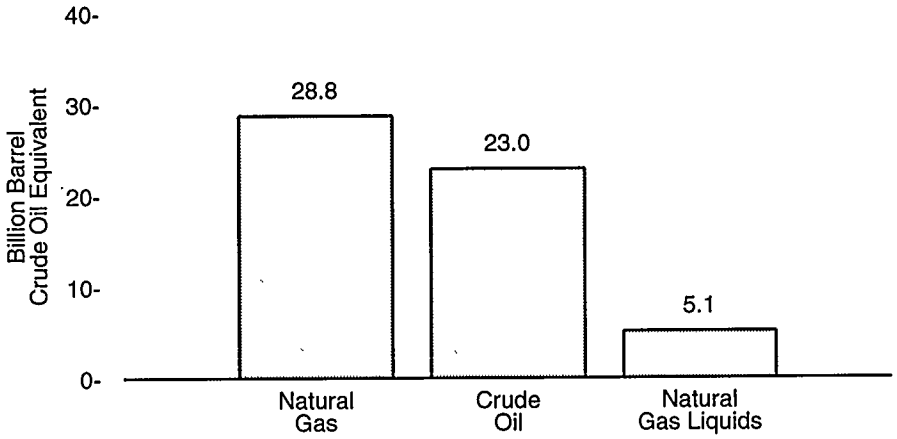
Sources: **FRS Companies:** Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System." **U.S. Total, Exploration and Development Expenditures:** • 1975-1982—Bureau of the Census, *Annual Survey of Oil and Gas.* • 1983-1992—American Petroleum Institute, *Survey on Oil and Gas Expenditures 1993.* **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, 1993 Annual Report (November 1994).* **U.S. Total, Production of Liquid and Gaseous Hydrocarbons:** • 1975-1992—Tables 5.1 and 6.1. • 1993—EIA, *Monthly Energy Review* (February 1995).

Figure 4.9 Liquid and Gaseous Hydrocarbon Proved Reserves, End of Year

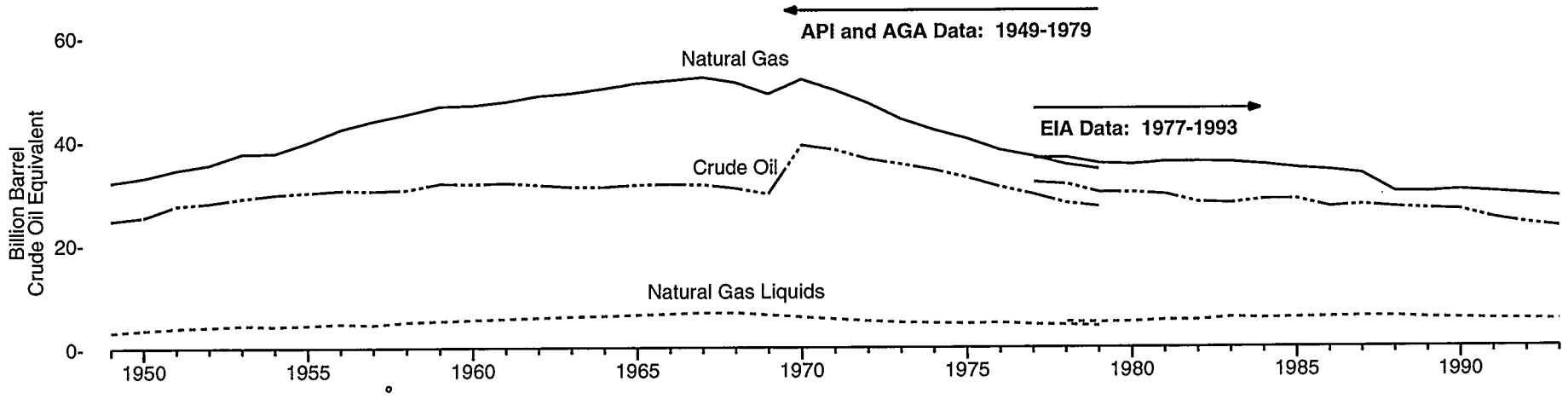
Total, 1949-1993



By Type, 1993



By Type, 1949-1993



Notes: • API=American Petroleum Institute. AGA=American Gas Association. EIA=Energy Information Administration.

• Because vertical scales differ, graphs should not be compared.
Source: Table 4.9.

Table 4.9 Liquid and Gaseous Hydrocarbon Proved Reserves, End of Year 1949-1993

Year	Crude Oil	Natural Gas		Natural Gas Liquids		Total
	Billion Barrels	Trillion Cubic Feet [1]	Billion Barrels COE [2]	Billion Barrels	Billion Barrels COE [2]	Billion Barrels COE [2]
	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

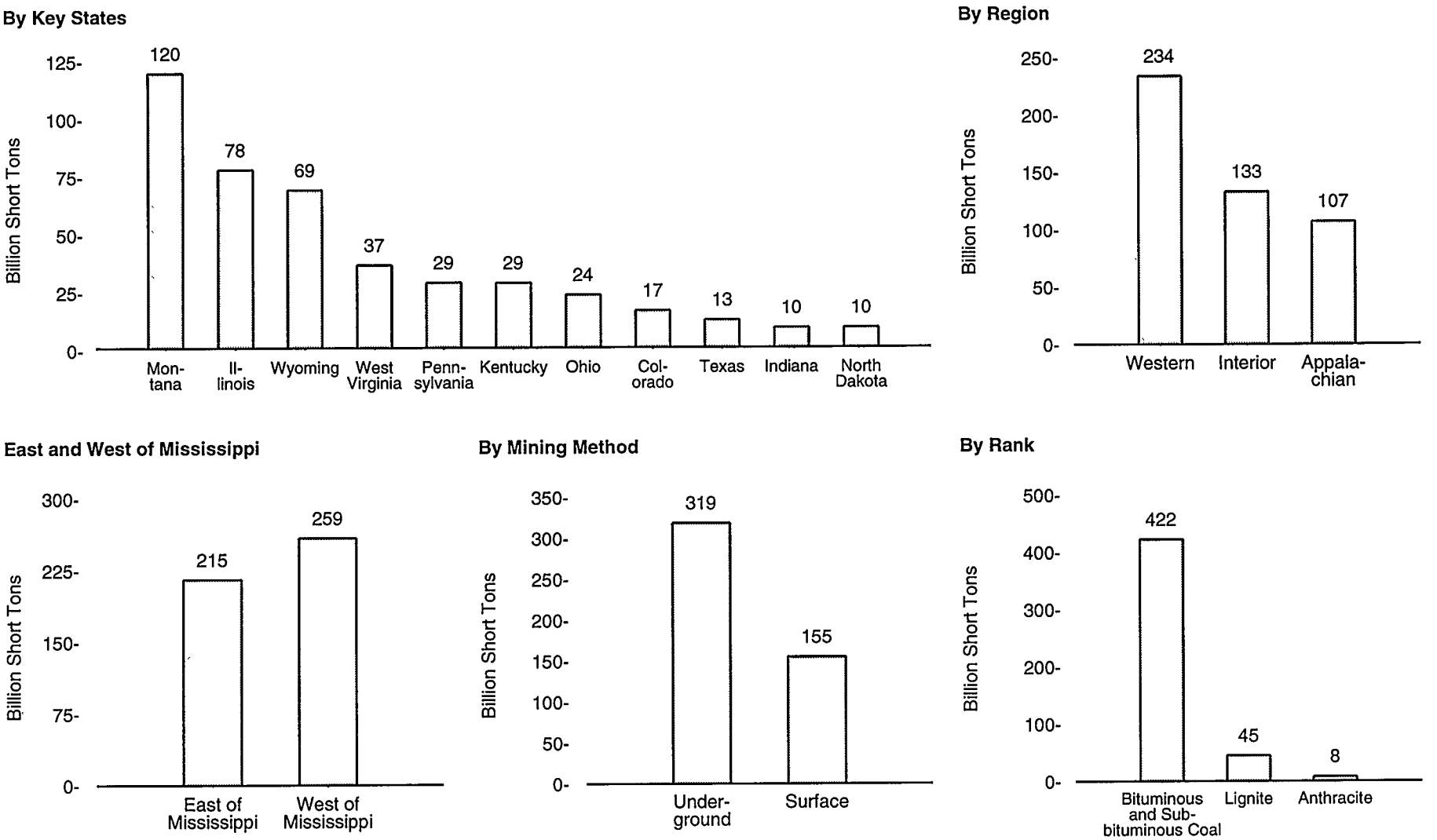
[1] The American Gas Association estimates of natural gas proved reserves include volumes of gas held in underground storage. In 1979, this volume amounted to 4.9 trillion cubic feet. Energy Information Administration (EIA) data do not include gas in underground storage.

[2] 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.

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**—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 1993 Annual Report* (October 1994), Table 1.

Figure 4.10 Coal Demonstrated Reserve Base, January 1, 1993



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

Source: Table 4.10.

Table 4.10 Coal Demonstrated Reserve Base, January 1, 1993

(Billion Short Tons)

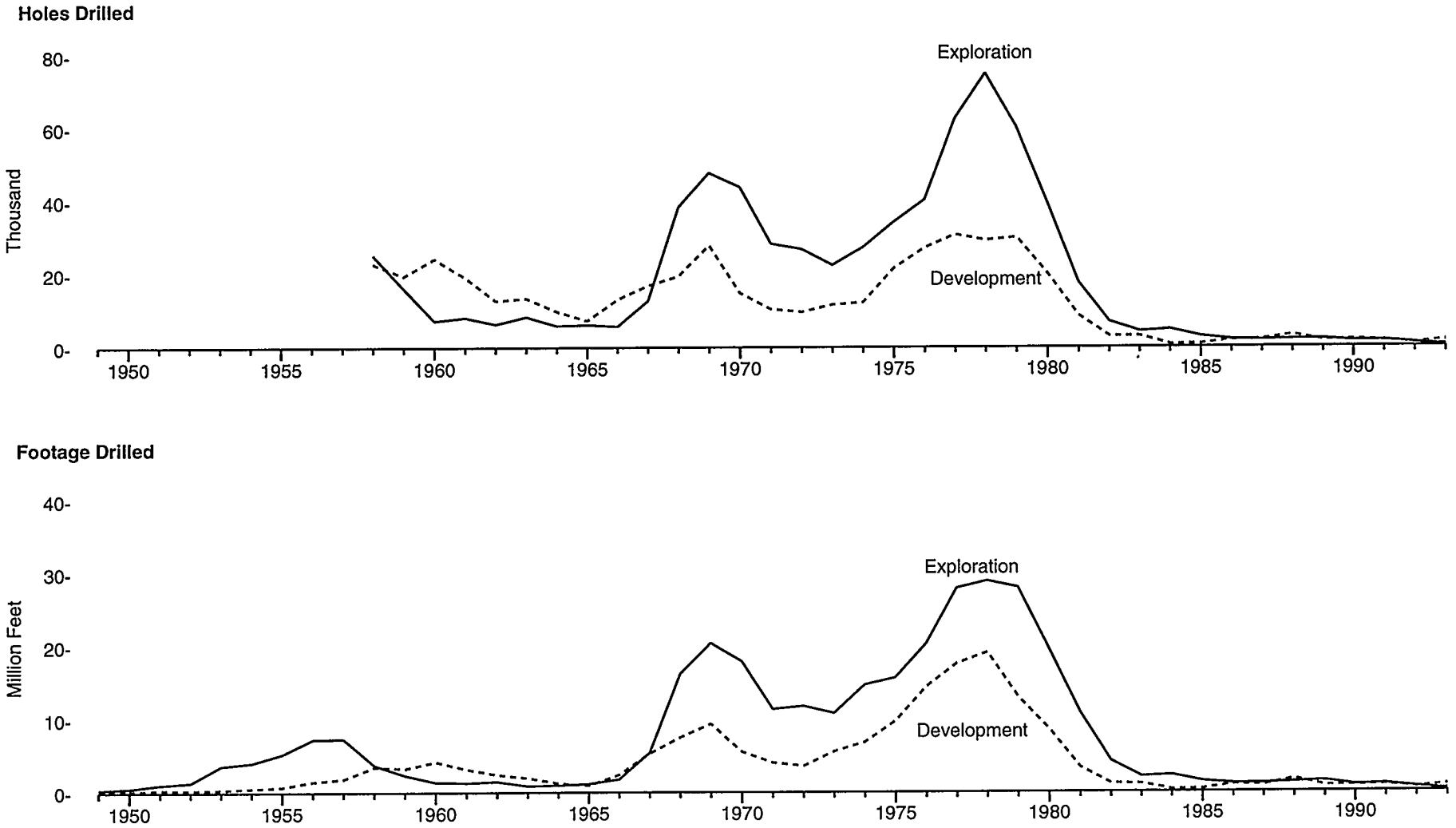
Region and State	Anthracite	Bituminous Coal [1]		Lignite	Total		
	Underground and Surface [2]	Underground	Surface	Surface [3]	Underground	Surface	Total
Appalachian	7.4	81.8	16.6	1.1	85.7	21.1	106.8
Alabama	0	1.4	2.2	1.1	1.4	3.3	4.7
Kentucky, Eastern	0	7.1	1.5	0	7.1	1.5	8.6
Ohio	0	17.9	6.0	0	17.9	6.0	23.8
Pennsylvania	7.2	20.7	1.1	0	24.6	4.5	29.1
Virginia	0.1	1.6	0.7	0	1.7	0.7	2.5
West Virginia	0	31.8	4.7	0	31.8	4.7	36.5
Other [4]	0	1.2	0.4	0	1.2	0.4	1.6
Interior	0.1	92.7	26.7	13.7	92.8	40.4	133.3
Illinois	0	62.6	15.4	0	62.6	15.4	78.0
Indiana	0	8.9	1.2	0	8.9	1.2	10.1
Iowa	0	1.7	0.5	0	1.7	0.5	2.2
Kentucky, Western	0	16.4	3.8	0	16.4	3.8	20.2
Missouri	0	1.5	4.5	0	1.5	4.5	6.0
Oklahoma	0	1.2	0.3	0	1.2	0.3	1.6
Texas	0	0	0	13.2	0	13.2	13.2
Other [5]	0.1	0.3	1.1	0.5	0.4	1.6	2.0
Western	(s)	140.3	63.7	29.9	140.4	93.6	234.0
Alaska	0	5.4	0.7	(s)	5.4	0.7	6.1
Colorado	(s)	12.0	0.6	4.2	12.0	4.8	16.8
Montana	(s)	71.0	33.2	15.8	71.0	48.9	119.9
New Mexico	0	2.1	2.3	0	2.1	2.3	4.4
North Dakota	0	0	0	9.6	0	9.6	9.6
Utah	0	5.8	0.3	0	5.8	0.3	6.0
Washington	0	1.3	0.1	(s)	1.3	0.1	1.4
Wyoming	0	42.5	26.5	0	42.5	26.5	69.1
Other [6]	0	0.1	0.1	0.4	0.1	0.5	0.6
U.S. Total	7.5	314.8	107.1	44.7	318.9	155.1	474.1
States East of the Mississippi River	7.4	169.9	36.9	1.1	173.8	41.4	215.2
States West of the Mississippi River	0.1	145.0	70.1	43.6	145.1	113.7	258.8

[1] Includes subbituminous coal.
[2] Includes 3,396.4 million short tons of surface mine reserves, of which 3,380.8 million tons are in Pennsylvania and 15.6 million tons are in Arkansas.
[3] There are no underground demonstrated reserves of lignite.
[4] Georgia, Maryland, North Carolina, and Tennessee.
[5] Arkansas, Kansas, Louisiana, and Michigan.
[6] Arizona, Idaho, Oregon, and South Dakota.
(s)=Less than 0.05 billion short tons.

Notes: • Data represent 100 percent of known measured and indicated coal, with qualifying seam thicknesses and depths, in place as of January 1, 1993. Recoverability varies from less than 40 percent to more than 90 percent for individual deposits. Fifty-six 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.

Sources: Energy Information Administration (EIA), *Coal Production 1992* (October 1993), Tables A1, A2, A3, and A4, and EIA, *U.S. Coal Reserves: An Update by Heat and Sulfur Content* (February 1994), page 23.

Figure 4.11 Uranium Exploration and Development Drilling, 1949-1993



Source: Table 4.11.

Table 4.11 Uranium Exploration and Development Drilling, 1949-1993

Year	Exploration [1]		Development [2]		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	1.96
1988	2.03	1.28	3.18	1.73	5.21	3.01
1989	2.09	1.43	1.75	0.80	3.84	2.22
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

[1] 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.

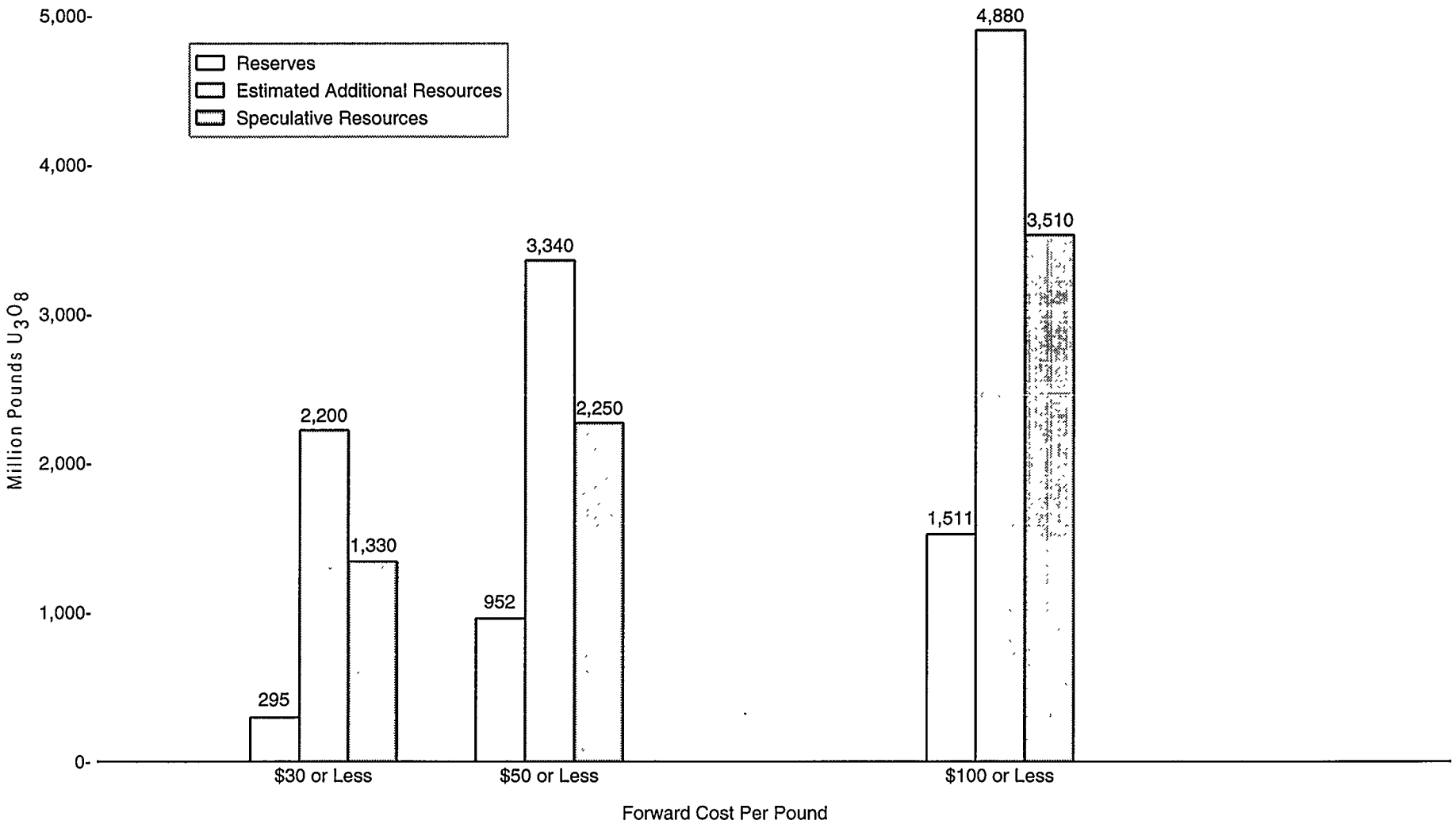
[2] Includes all surface drilling on an ore deposit to determine more precisely size, grade, and configuration subsequent to the time that commercial exploitation is deemed feasible.

NA=Not available.

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

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). • 1982 forward—Energy Information Administration, *Uranium Industry Annual 1993* (September 1994), Table 4.

Figure 4.12 Uranium Reserves and Resources, December 31, 1993



Source: Table 4.12.

Table 4.12 Uranium Reserves and Resources, December 31, 1993

(Million Pounds U_3O_8)

Resource Category and State	Forward Cost Category (dollars per pound) [1]		
	$30 or Less	$50 or Less	$100 or Less
Reserves [2]	292	952	1,511
New Mexico	84	350	588
Wyoming	121	395	623
Texas	13	32	53
Arizona, Colorado, Utah	43	119	165
Others [3]	31	55	81
Potential Resources [4]			
Estimated Additional Resources	2,200	3,340	4,880
Speculative Resources	1,330	2,250	3,510

[1] 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.

[2] The Energy Information Administration category of uranium reserves is equivalent to the internationally reported category of Reasonably Assured Resources (RAR).

[3] California, Idaho, Nebraska, Nevada, North Dakota, Oregon, South Dakota, and Washington.

[4] Shown are the mean values for the distribution of estimates for each forward-cost category, rounded to the nearest 10 million pounds U_3O_8.

Source: Energy Information Administration, *Uranium Industry Annual 1993* (September 1994), Tables 10 and B.4.

Energy Resources Note

For 1970 forward, annual well completions are estimated by the Energy Information Administration (EIA) by using the American Petroleum Institute's drilling data files. For more recent years, these files are not complete, due to delays in the reporting of wells drilled. Based on statistical analysis, EIA employs an adjustment process to impute missing data to show total well completions and footages for current years.

5. Petroleum

Fluctuations in Prices

After successive price hikes had brought the real price[1] of crude oil to a peak in 1981, oil prices began trending downward in 1982, and then plummeted in 1986 (5.19).* The average annual composite refiner acquisition cost of a barrel of crude oil fell from $28.34 in 1985 to $15.02 in 1986. Of the several factors contributing to the unprecedented decline in crude oil prices during 1986, the most important was increased worldwide production, primarily by members of the Organization of Petroleum Exporting Countries (OPEC) seeking to regain market share.

After 1986, crude oil prices fluctuated. In 1990, the Iraqi invasion of Kuwait drove up the real price of a barrel of crude oil to $19.61. In 1991, oil-producing nations' ability to replace Iraqi and Kuwaiti oil, coupled with an economic recession that restrained petroleum demand, caused the real price to decline to $16.21 per barrel. In 1992, despite political unrest in several oil-producing countries (most notably Russia) and the oil sales embargo on Iraq, as well as attempts by OPEC to bolster crude oil prices, the real price of crude oil declined to $15.24 per barrel. In 1993, due to restrained demand and increased production worldwide, the real price of crude oil fell to $13.29. In 1994, the real price of crude oil fell to $12.36, the lowest annual average in 21 years.

The end-use prices, excluding taxes, of almost all petroleum products also declined in 1994 (5.20). The average price of all types of motor gasoline declined from 76 cents per gallon in 1993 to 74 cents per gallon in 1994. Distillate fuel oil and kerosene-type jet fuel average prices, excluding taxes, decreased. In contrast, the average price per gallon, excluding taxes, of residual fuel oil rose 4.5 percent to 35 cents in 1994.

[1]Real prices are expressed in 1987 dollars.

**Numbers in parentheses indicate related tables. Annual data are the most available; they frequently are preliminary and may be revised in future public Percentages and numbers in text are calculated by using data in the tables.*

Consumption of Petroleum Products

Consumption of petroleum products (petroleum products supplied) increased throughout the 1949-to-1973 period at an average annual rate of 4.7 percent, and, by 1973, consumption of petroleum products totaled 17 million barrels per day (5.1). In 1974, however, marked increases in the price of crude oil, coupled with a petroleum supply interruption, resulted in a 3.8-percent decline in petroleum consumption. Although demand recovered during the late 1970's, peaking at 19 million barrels per day in 1978, by 1983 it had declined to 15 million barrels per

Petroleum Stocks and the Strategic Petroleum Reserve

The U.S. Government established the Strategic Petroleum Reserve (SPR) in response to the oil supply disruptions of the early 1970's. Intended to minimize the effects of any future disruptions, the SPR began storing crude oil in 1977, and by the end of 1989, it held 580 million barrels (5.15). The first sales of SPR crude oil occurred following the Iraqi invasion of Kuwait in August 1990. In addition, SPR purchases were suspended in August 1990 due to concern about world crude oil supplies. Purchases resumed in 1992 and, at the end of 1994, the SPR held 592 million barrels.

One measure of the SPR's adequacy is the number of days of petroleum net imports it could provide in the event of an oil supply interruption. Through 1985, that measure of energy security increased every year, due to additions to the SPR and a decline in the level of net imports. In 1986, however, the measure declined for the first time, from 115 days in 1985 to 94 days in 1986. In 1994, the measure was 74 days, the lowest in 12 years.

At the end of 1994, SPR stocks, plus 337 million barrels of privately held crude oil stocks, totaled 929 million barrels (5.14). Private stocks of crude oil were less than the 340-million-barrel level recorded in 1977, when filling of the SPR began. At 725 million barrels, private stocks of petroleum products in 1994 remained considerably below the record level of 964 million barrels recorded in 1977.

day. After 1983, lower crude oil prices tended to promote consumption, which reached 17.3 million barrels per day in 1989. In 1990 and 1991, however, warm winters and a stagnant economy combined to restrain petroleum consumption, which fell to 16.7 million barrels per day in 1991. During the next 3 years, economic recovery contributed to an increase in consumption to 18 million barrels per day in 1994.

In 1994, U.S. oil production totaled 6.6 million barrels per day, the lowest level in 40 years.

Consumption of motor gasoline, distillate fuel oil, jet fuel, and liquefied petroleum gases was higher in 1994 than in 1993 (5.11). Consumption of motor gasoline, which consistently accounts for the largest share of all petroleum products supplied, rose 1.5 percent to 7.6 million barrels per day. Distillate fuel oil consumption rose 4.3 percent to 3.2 million barrels per day, consumption of jet fuel rose 4.1 percent to 1.5 million barrels per day, and consumption of liquefied petroleum gases rose 8.7 percent to 1.9 million barrels per day in 1994. By contrast, consumption of residual fuel oil fell 7.4 percent to 1.0 million barrels per day, the lowest level since at least 1949. Demand for residual fuel oil declined because its price was higher due to refiners' use of residual fuel oil to produce other petroleum products.

Production and Productivity

During much of the 1950's and 1960's, production capacity exceeded demand to such an extent that mechanisms such as production prorationing and import ceilings were implemented to protect domestic production. By the 1970's, however, petroleum demand had increased, the average productivity of wells began to decline, and oil production leveled off (5.2). Increases in Alaskan production at the end of the 1970's and through 1988 partially counteracted declines in Lower-48 production. In 1989, however, even Alaskan production declined. In 1994, U.S. oil production totaled 6.6 million barrels per day, the lowest level in 40 years.

Of total U.S. production in 1994, 80 percent came from onshore wells and 20 percent from offshore. The 582 thousand producing wells attained an average productivity of 11 barrels per day per well, down 2.6 percent from the 1993 level and significantly below peak productivity of over 18 barrels attained in the early 1970's.

Imports and Exports

Despite import quotas, net imports of low-priced petroleum increased throughout most of the 1949-to-1973 period, and in 1973 totaled 6.0 million barrels per day (5.1). Thereafter, net imports fluctuated, peaking at 8.6 million barrels per day in 1977, then declining to 4.3 million barrels per day in 1985. In 1986, excess world production drove prices down, inhibiting domestic production and boosting demand. Those factors, as well as stockbuilding, resulted in an increase in net imports in 1986 to 5.4 million barrels per day. Subsequently, with prices significantly below peak levels, net imports rose to 7.2 million barrels per day in 1989 and 1990. In 1991, lower demand for petroleum due to the economic recession contributed to a decline in petroleum imports. In addition, in 1991, the United States exported a record level of petroleum products, and petroleum net imports declined to 6.6 million barrels per day. In 1992 through 1994, petroleum net imports rose; the 1994 level of 8.0 million barrels per day was the highest in 15 years.

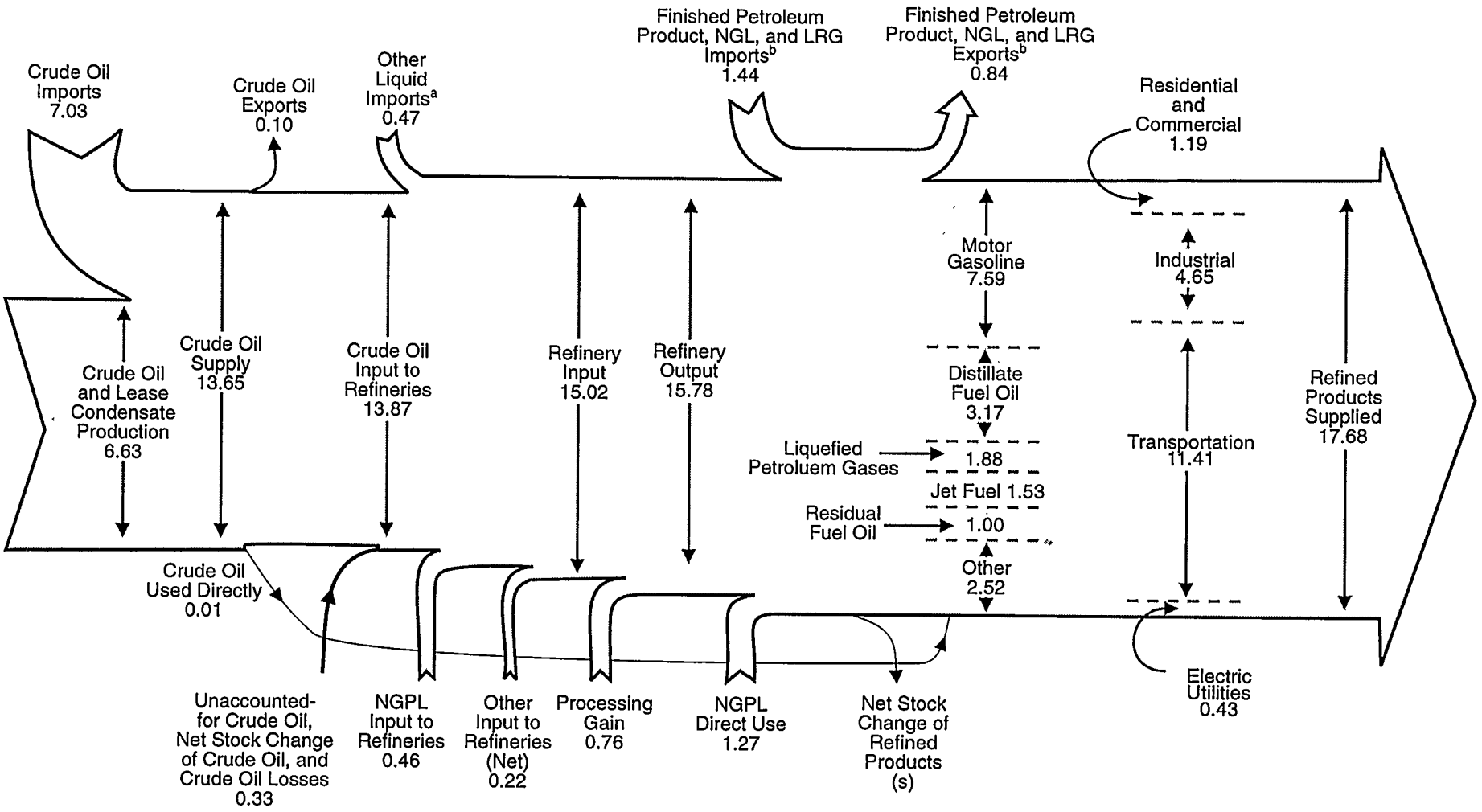
U.S. dependence on petroleum net imports peaked at 47 percent of consumption in 1977, then fell in 1985 to 27 percent, the lowest level since 1971 (5.7). In 1994, dependence on petroleum net imports reached a 17-year high of 45 percent. Saudi Arabia, Venezuela, Canada, Mexico, and Nigeria were the primary foreign suppliers of petroleum to the United States.

The Refining Industry in a Changing Market

The average daily output from U.S. refineries trended upward from 1949 through 1978, when it peaked at 16 million barrels per day (5.8). During the next 5 years, output declined, falling to 13 million barrels per day in 1983. As crude oil prices declined in the mid-1980's and the demand for petroleum rose, refinery output began to recover. In 1994, it averaged 16 million barrels per day.

The rate of refinery utilization fell below 80 percent in 1980 through 1985, despite deactivation of refinery capacity (5.9). Thereafter, the utilization rate improved. In 1986, the rate was 83 percent, well above its nadir of 69 percent in 1981. In 1987 through 1990, strong product demand contributed to even higher utilization rates, which reached 87 percent in 1990. By 1994, the utilization rate had climbed to 93 percent.

Diagram 2. Petroleum Flow, 1994
(Million Barrels per Day)

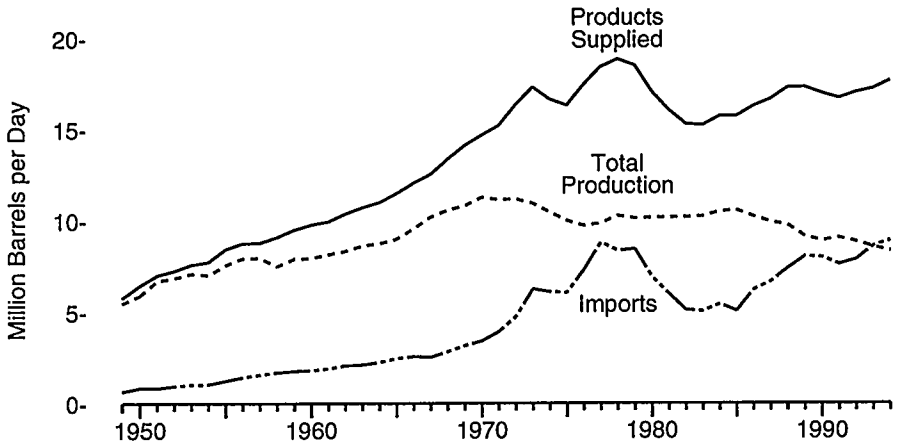


[a]Unfinished oils, motor gasoline and aviation gasoline blending components, and other hydrocarbons/ alcohol.
[b]Natural gas liquids and liquid refinery gas.
(s)=Less than 5 thousand barrels per day.

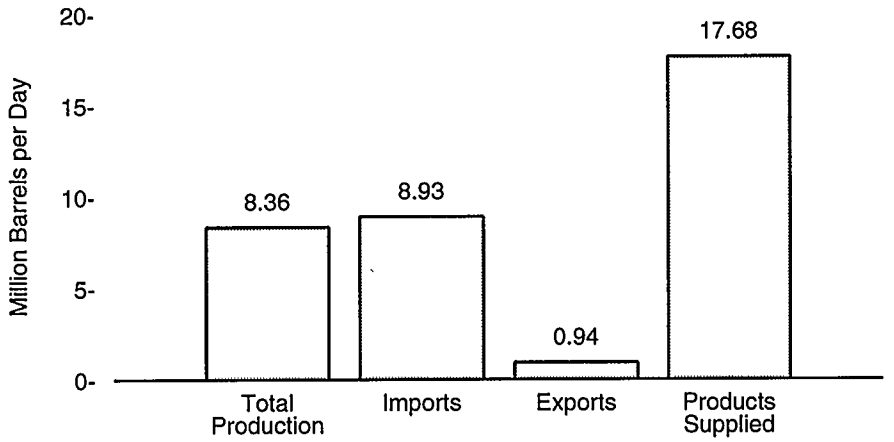
Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.
Sources: Tables 5.1, 5.5, 5.8, 5.11, 5.12a, and 5.12b, and *Petroleum Supply Monthly*, February 1995, Table 3.

Figure 5.1 Petroleum Overview

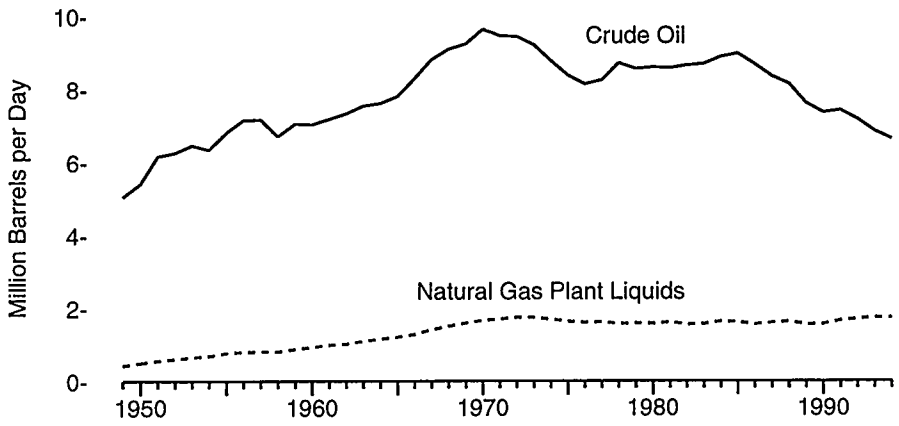
Overview, 1949-1994



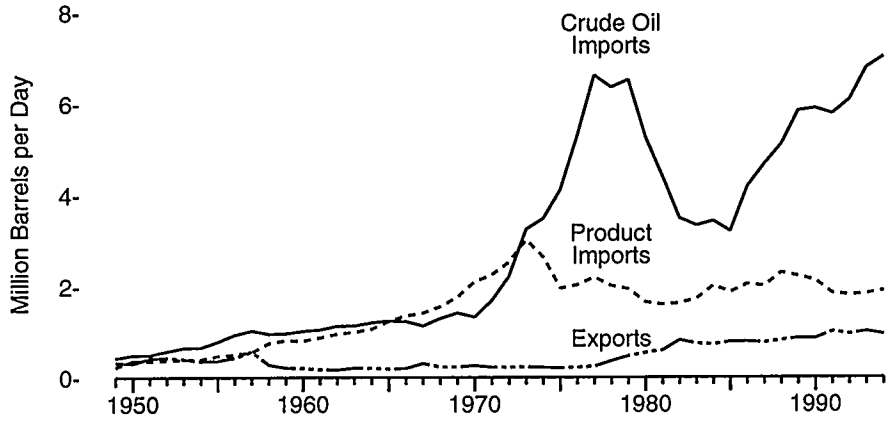
Overview, 1994



Production, 1949-1994



Trade, 1949-1994



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

Source: Table 5.1.

Table 5.1 Petroleum Overview, 1949-1994

(Million Barrels per Day)

Year	Production			Other Domestic Supply [2]	Trade					Crude Oil Losses	Change In Stocks [6]	Petroleum Products Supplied
	Crude Oil [1]	Natural Gas Plant Liquids	Total Production		Crude Oil Imports [3]	Petroleum Product Imports [4]	Total Imports	Exports	Net Imports [5]			
1949	5.05	0.43	5.48	(s)	0.42	0.22	0.65	0.33	0.32	0.04	0.01	5.76
1950	5.41	0.50	5.91	(s)	0.49	0.36	0.85	0.30	0.55	0.05	0.06	6.46
1951	6.16	0.56	6.72	0.01	0.49	0.35	0.84	0.42	0.42	0.03	-0.10	7.02
1952	6.26	0.61	6.87	0.01	0.57	0.38	0.95	0.43	0.52	0.02	-0.11	7.27
1953	6.46	0.65	7.11	0.02	0.65	0.39	1.03	0.40	0.63	0.02	-0.14	7.60
1954	6.34	0.69	7.03	0.02	0.66	0.40	1.05	0.36	0.70	0.03	0.03	7.76
1955	6.81	0.77	7.58	0.04	0.78	0.47	1.25	0.37	0.88	0.04	(s)	8.46
1956	7.15	0.80	7.95	0.04	0.93	0.50	1.44	0.43	1.01	0.05	-0.18	8.78
1957	7.17	0.81	7.98	0.04	1.02	0.55	1.57	0.57	1.01	0.05	-0.17	8.81
1958	6.71	0.81	7.52	0.06	0.95	0.75	1.70	0.28	1.42	0.03	0.14	9.12
1959	7.05	0.88	7.93	0.09	0.97	0.81	1.78	0.21	1.57	0.01	-0.05	9.53
1960	7.04	0.93	7.96	0.15	1.02	0.80	1.81	0.20	1.61	0.01	0.08	9.80
1961	7.18	0.99	8.17	0.18	1.05	0.87	1.92	0.17	1.74	0.01	-0.11	9.98
1962	7.33	1.02	8.35	0.18	1.13	0.96	2.08	0.17	1.91	0.01	-0.03	10.40
1963	7.54	1.10	8.64	0.20	1.13	0.99	2.12	0.21	1.91	0.01	(s)	10.74
1964	7.61	1.15	8.77	0.22	1.20	1.06	2.26	0.20	2.06	0.01	-0.01	11.02
1965	7.80	1.21	9.01	0.22	1.24	1.23	2.47	0.19	2.28	0.01	0.01	11.51
1966	8.30	1.28	9.58	0.25	1.22	1.35	2.57	0.20	2.37	0.01	-0.10	12.08
1967	8.81	1.41	10.22	0.29	1.13	1.41	2.54	0.31	2.23	0.01	-0.17	12.56
1968	9.10	1.50	10.60	0.35	1.29	1.55	2.84	0.23	2.61	0.01	-0.15	13.39
1969	9.24	1.59	10.83	0.34	1.41	1.76	3.17	0.23	2.93	0.01	0.05	14.14
1970	9.64	1.66	11.30	0.35	1.32	2.10	3.42	0.26	3.16	0.01	-0.10	14.70
1971	9.46	1.69	11.16	0.44	1.68	2.25	3.93	0.22	3.70	0.01	-0.07	15.21
1972	9.44	1.74	11.18	0.44	2.22	2.53	4.74	0.22	4.52	0.01	0.23	16.37
1973	9.21	1.74	10.95	0.49	3.24	3.01	6.26	0.23	6.02	0.01	-0.14	17.31
1974	8.77	1.69	10.46	0.49	3.48	2.64	6.11	0.22	5.89	0.01	-0.18	16.65
1975	8.37	1.63	10.01	0.51	4.10	1.95	6.06	0.21	5.85	0.01	-0.03	16.32
1976	8.13	1.60	9.74	0.59	5.29	2.03	7.31	0.22	7.09	0.01	0.06	17.46
1977	8.24	1.62	9.86	0.57	6.61	2.19	8.81	0.24	8.56	0.02	-0.55	18.43
1978	8.71	1.57	10.27	0.49	6.36	2.01	8.36	0.36	8.00	0.02	0.09	18.85
1979	8.55	1.58	10.14	0.58	6.52	1.94	8.46	0.47	7.99	0.02	-0.17	18.51
1980	8.60	1.57	10.17	0.68	5.26	1.65	6.91	0.54	6.36	0.01	-0.14	17.06
1981	8.57	1.61	10.18	0.64	4.40	1.60	6.00	0.59	5.40	(s)	-0.16	16.06
1982	8.65	1.55	10.20	0.65	3.49	1.63	5.11	0.82	4.30	(s)	0.15	15.30
1983	8.69	1.56	10.25	0.65	3.33	1.72	5.05	0.74	4.31	(s)	0.02	15.23
1984	8.88	1.63	10.51	0.78	3.43	2.01	5.44	0.72	4.72	(s)	-0.28	15.73
1985	8.97	1.61	10.58	0.76	3.20	1.87	5.07	0.78	4.29	(s)	0.10	15.73
1986	8.68	1.55	10.23	0.81	4.18	2.05	6.22	0.78	5.44	(s)	-0.20	16.28
1987	8.35	1.60	9.94	0.85	4.67	2.00	6.68	0.76	5.91	(s)	-0.04	16.67
1988	8.14	1.62	9.76	0.90	5.11	2.30	7.40	0.82	6.59	(s)	0.03	17.28
1989	7.61	1.55	9.16	0.92	5.84	2.22	8.06	0.86	7.20	(s)	0.04	17.33
1990	7.36	1.56	8.91	1.02	5.89	2.12	8.02	0.86	7.16	(s)	0.11	16.99
1991	7.42	1.66	9.08	1.00	5.78	1.84	7.63	1.00	6.63	(s)	-0.01	16.71
1992	7.17	1.70	8.87	1.16	6.08	1.80	7.89	0.95	6.94	(s)	0.07	17.03
1993	R6.85	R1.74	R8.58	R1.19	R6.79	R1.83	R8.62	1.00	R7.62	(s)	0.15	R17.24
1994P	6.63	1.73	8.36	1.36	7.03	1.90	8.93	0.94	7.99	(s)	0.02	17.68

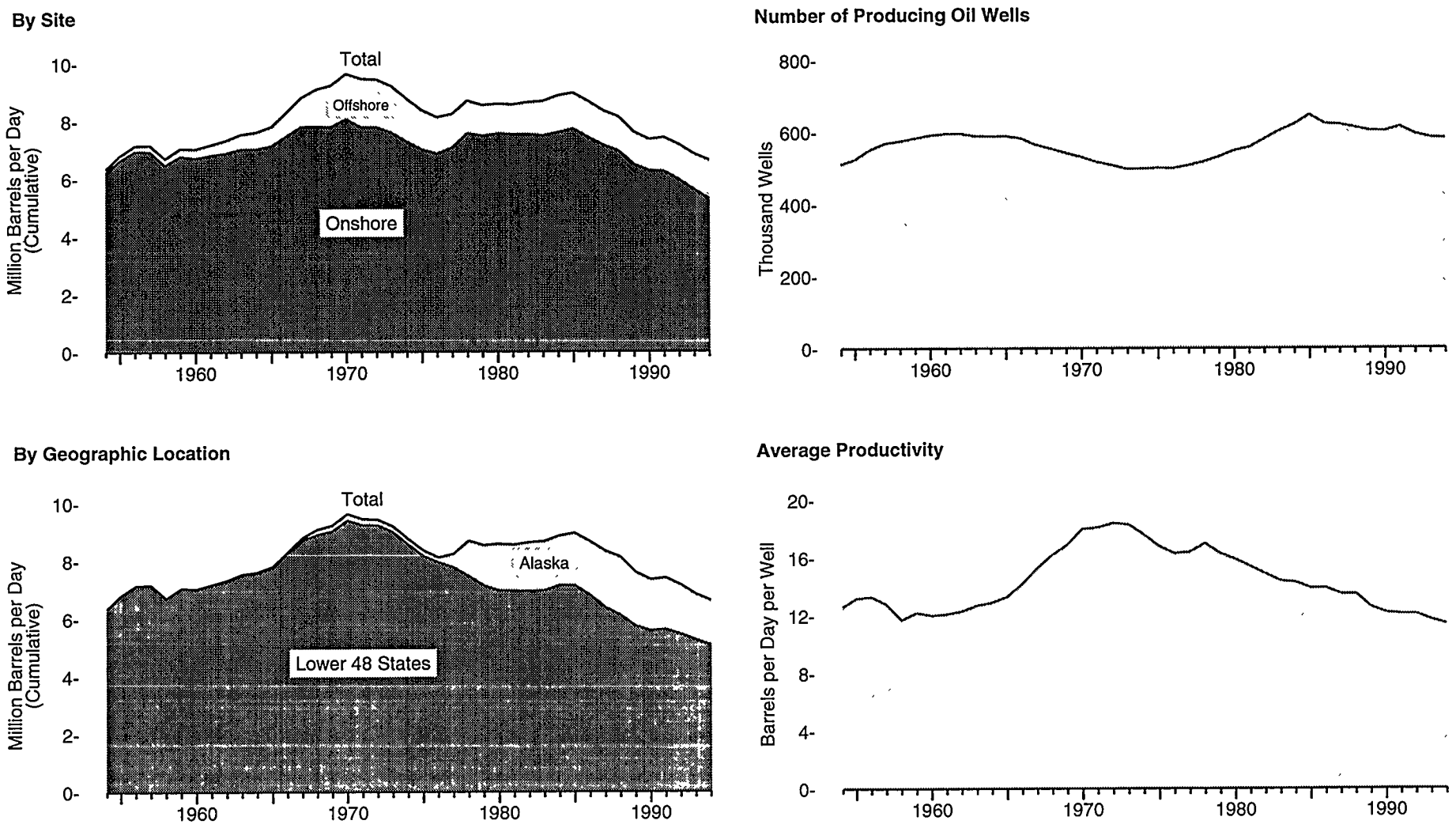
[1] Includes lease condensate.
[2] Includes benzol, other hydrocarbons, oxygenates, gasoline blending components, finished petroleum products, hydrogen, alcohol, processing gains, and unaccounted-for crude oil.
[3] Includes imports for the Strategic Petroleum Reserve, which began in 1977.
[4] For 1981 forward, includes motor gasoline blending components and aviation gasoline blending components.
[5] Net trade = imports minus exports.
[6] Negative numbers denote a net addition to stocks or a reduction in supply. Positive numbers denote a net withdrawal from stocks or an addition to supply.

R=Revised data. P=Preliminary data. (s)=Less than 5,000 barrels per day.

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

Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.2 Crude Oil and Lease Condensate Production and Oil Well Productivity, 1954-1994



Source: Table 5.2.

Table 5.2 Crude Oil and Lease Condensate Production and Oil Well Productivity, 1954-1994

(Thousand Barrels per Day, Except as Noted)

Year	Geographic Location		Site		Type		Total Production	Oil Well Productivity	
	Lower 48	Alaska	Onshore	Offshore	Crude Oil	Lease Condensate		Producing Wells [1] (thousands)	Average Productivity [2] (barrels per day per well)
1954	6,342	0	6,209	133	6,342	(3)	6,342	511	12.6
1955	6,807	0	6,645	162	6,807	(3)	6,807	524	13.2
1956	7,151	0	6,951	201	7,151	(3)	7,151	551	13.3
1957	7,170	0	6,940	229	7,170	(3)	7,170	569	12.8
1958	6,710	0	6,473	236	6,710	(3)	6,710	575	11.7
1959	7,053	1	6,779	274	7,054	(3)	7,054	583	12.2
1960	7,034	2	6,716	319	7,035	(3)	7,035	591	12.0
1961	7,166	17	6,817	365	7,183	(3)	7,183	595	12.1
1962	7,304	28	6,888	444	7,332	(3)	7,332	596	12.3
1963	7,512	29	7,026	515	7,542	(3)	7,542	589	12.7
1964	7,584	30	7,027	587	7,614	(3)	7,614	588	12.9
1965	7,774	30	7,140	665	7,804	(3)	7,804	589	13.3
1966	8,256	39	7,473	823	8,295	(3)	8,295	583	14.2
1967	8,730	80	7,802	1,009	8,810	(3)	8,810	565	15.3
1968	8,915	181	7,808	1,287	8,660	436	9,096	554	16.2
1969	9,035	203	7,797	1,441	8,778	460	9,238	542	16.9
1970	9,408	229	8,060	1,577	9,180	457	9,637	531	18.0
1971	9,245	218	7,779	1,684	9,032	431	9,463	517	18.1
1972	9,242	199	7,780	1,660	8,998	443	9,441	508	18.4
1973	9,010	198	7,592	1,616	8,784	424	9,208	497	18.3
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	16.4
1978	7,478	1,229	7,571	1,136	8,353	355	8,707	517	17.0
1979	7,151	1,401	7,485	1,067	8,181	371	8,552	531	16.3
1980	6,980	1,617	7,562	1,034	8,210	386	8,597	548	15.9
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	(3)	8,688	603	14.4
1984	7,157	1,722	7,596	1,283	8,879	(3)	8,879	621	14.3
1985	7,146	1,825	7,722	1,250	8,971	(3)	8,971	647	13.9
1986	6,814	1,867	7,426	1,254	8,680	(3)	8,680	623	13.9
1987	6,387	1,962	7,153	1,196	8,349	(3)	8,349	620	13.5
1988	6,123	2,017	6,949	1,191	8,140	(3)	8,140	612	13.5
1989	5,739	1,874	6,486	1,127	7,613	(3)	7,613	603	12.6
1990	5,582	1,773	6,273	1,082	7,355	(3)	7,355	602	12.2
1991	5,618	1,798	6,245	1,172	7,417	(3)	7,417	614	12.1
1992	5,457	1,714	5,953	1,218	7,171	(3)	7,171	594	12.1
1993	R5,264	R1,582	R5,606	R1,241	R6,847	(3)	R6,847	584	11.7
1994P	5,070	1,557	5,277	1,350	6,627	(3)	6,627	582	11.4

[1] As of December 31.

[2] 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.

[3] Included in crude oil.

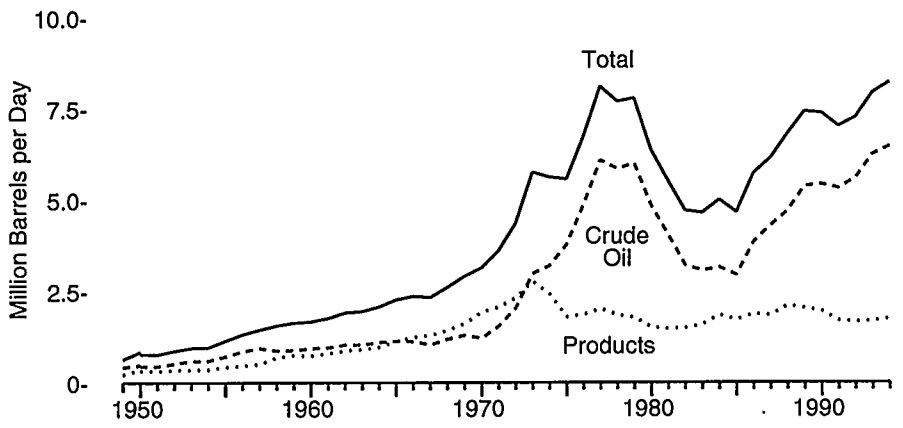
R=Revised data. P=Preliminary data.

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

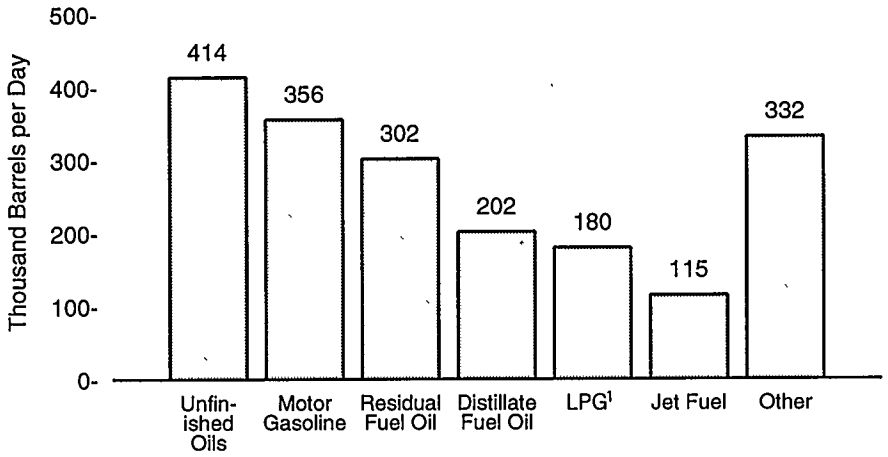
Sources: **Offshore:** • 1954-1969—U.S. Geological Survey, *Outer Continental Shelf Statistics*, June 1979. • 1970-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995). **Oil Well Productivity:** • 1954-1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—Independent Petroleum Association of America, *The Oil Producing Industry in Your State.* • 1994—*World Oil*, February 1995. **All Other Data:** • 1954-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.3 Petroleum Imports by Type

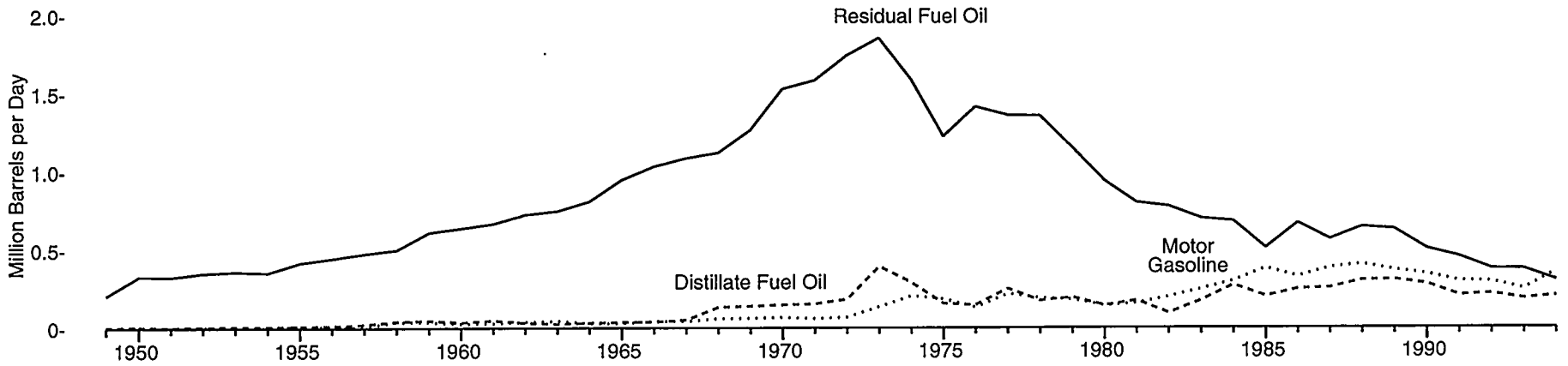
Total, 1949-1994



By Product, 1994



By Selected Product, 1949-1994



[1] Liquefied petroleum gases.
Note: Because vertical scales differ, graphs should not be compared.

Source. Table 5.3.

Table 5.3 Petroleum Imports by Type, 1949-1994

(Thousand Barrels per Day)

Year	Crude Oil [1]	Petroleum Products									Total Petroleum
		Distillate Fuel Oil	Jet Fuel [2]	Liquefied Petroleum Gases		Motor Gasoline [4]	Residual Fuel Oil	Unfinished Oils	Other Products [5]	Total	
				Propane [3]	Total						
1949	421	5	NA	0	0	0	206	10	3	224	645
1950	487	7	NA	0	0	(s)	329	21	6	363	850
1951	491	5	NA	0	0	1	326	14	7	354	844
1952	573	7	NA	0	0	5	351	9	7	380	952
1953	648	9	NA	0	0	1	360	9	7	386	1,034
1954	656	9	NA	0	0	3	354	21	9	396	1,052
1955	782	12	NA	0	0	13	417	15	9	466	1,248
1956	934	14	21	0	0	5	445	7	10	502	1,436
1957	1,023	23	25	0	0	8	475	3	18	552	1,574
1958	953	41	57	0	0	38	499	92	21	747	1,700
1959	965	48	37	0	0	37	610	63	19	814	1,780
1960	1,015	35	34	NA	4	27	637	45	17	799	1,815
1961	1,045	48	28	NA	5	29	666	69	26	872	1,917
1962	1,126	32	30	NA	6	38	724	89	36	955	2,082
1963	1,131	25	41	NA	7	44	747	87	41	992	2,123
1964	1,198	32	33	NA	11	29	808	89	58	1,060	2,259
1965	1,238	36	81	NA	21	28	946	92	27	1,229	2,468
1966	1,225	38	86	NA	29	43	1,032	97	24	1,348	2,573
1967	1,128	51	89	11	27	42	1,085	97	20	1,409	2,537
1968	1,291	132	105	15	32	59	1,120	80	22	1,549	2,840
1969	1,409	139	125	14	35	62	1,265	106	25	1,757	3,166
1970	1,324	147	144	26	52	67	1,528	108	49	2,095	3,419
1971	1,681	153	180	32	70	59	1,583	124	76	2,245	3,926
1972	2,216	182	194	43	89	68	1,742	125	126	2,525	4,741
1973	3,244	392	212	71	132	134	1,853	137	152	3,012	6,256
1974	3,477	289	163	59	123	204	1,587	121	148	2,635	6,112
1975	4,105	155	133	60	112	184	1,223	36	108	1,951	6,056
1976	5,287	146	76	68	130	131	1,413	32	97	2,026	7,313
1977	6,615	250	75	86	161	217	1,359	31	99	2,193	8,807
1978	6,356	173	86	57	123	190	1,355	27	53	2,008	8,363
1979	6,519	193	78	88	217	181	1,151	59	58	1,937	8,456
1980	5,263	142	80	69	216	140	939	55	76	1,646	6,909
1981	4,396	173	38	70	244	157	800	112	76	1,599	5,996
1982	3,488	93	29	63	226	197	776	174	131	1,625	5,113
1983	3,329	174	29	44	190	247	699	234	148	1,722	5,051
1984	3,426	272	62	67	195	299	681	231	272	2,011	5,437
1985	3,201	200	39	67	187	381	510	318	232	1,866	5,067
1986	4,178	247	57	110	242	326	669	250	254	2,045	6,224
1987	4,674	255	67	88	190	384	565	299	243	2,004	6,678
1988	5,107	302	90	106	209	405	644	360	285	2,295	7,402
1989	5,843	306	106	111	181	369	629	348	280	2,217	8,061
1990	5,894	278	108	115	188	342	504	413	291	2,123	8,018
1991	5,782	205	67	91	147	297	453	413	262	1,844	7,627
1992	6,083	216	82	85	131	294	375	443	264	1,805	7,888
1993	R6,787	184	R100	R103	R160	247	R373	R491	R278	R1,833	R8,620
1994P	7,027	202	115	122	180	356	302	414	332	1,902	8,929

[1] Includes imports for the Strategic Petroleum Reserve, which began in 1977.

[2] Prior to 1965, imports of kerosene-type jet fuel were included with kerosene, which is listed under "Other Products."

[3] Includes propylene.

[4] Excludes motor gasoline blending components after 1980. Prior to 1964, motor gasoline data were for total gasoline, including motor gasoline, aviation gasoline, and special naphthas.

[5] Aviation gasoline, motor gasoline blending components, aviation gasoline blending components, kerosene, petrochemical feedstocks, special naphthas, lubricants, wax, asphalt and road oil, petroleum coke, pentanes plus, and miscellaneous products.

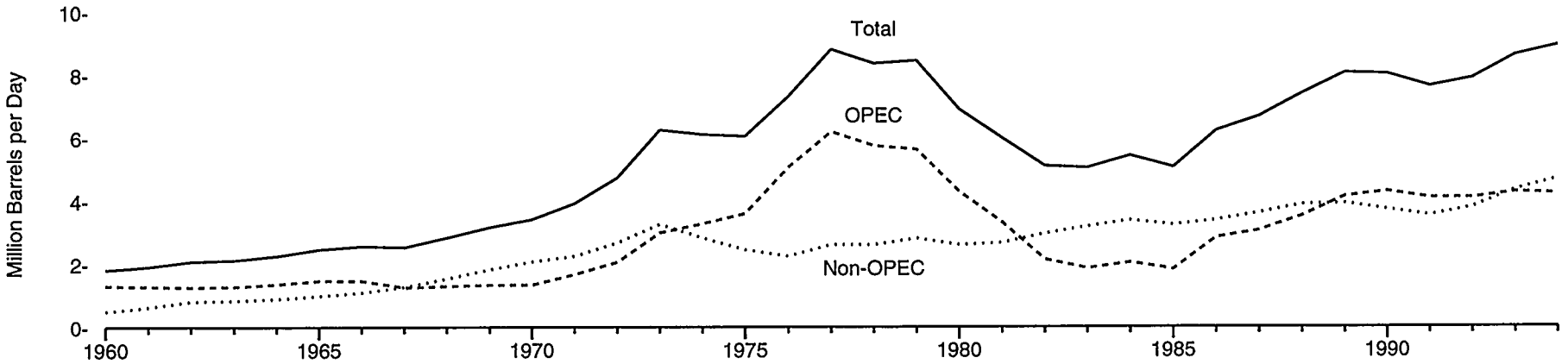
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 500 barrels per day.

Notes: • Includes imports from U.S. possessions and territories. • Totals may not equal sum of components due to independent rounding.

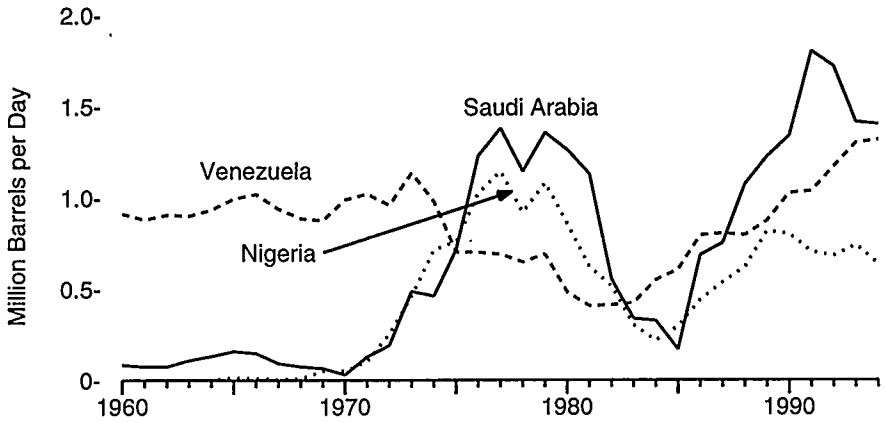
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.4 Petroleum Imports by Country of Origin, 1960-1994

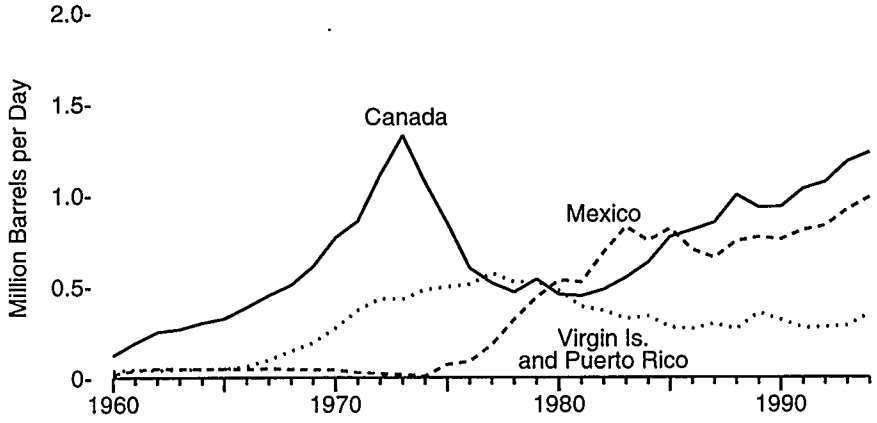
Total, OPEC, and Non-OPEC



Selected OPEC Countries



Selected Non-OPEC Countries



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

Source: Table 5.4.

Table 5.4 Petroleum Imports by Country of Origin, 1960-1994

Year	OPEC [1]						Non-OPEC					Total Imports	Imports from Arab OPEC as Share of Total Imports	Imports from OPEC as Share of Total Imports
	Nigeria	Saudi Arabia	Venezuela	Other [2]	Total [3]	Arab OPEC [4]	Canada	Mexico	United Kingdom	Virgin Islands and Puerto Rico	Other			
	Thousand Barrels per Day												Percent	
1960	0	84	911	319	1,314	292	120	16	(s)	36	328	1,815	16.1	72.4
1961	0	73	879	335	1,286	284	190	40	1	44	357	1,917	14.8	67.1
1962	0	74	906	286	1,265	241	250	49	2	41	475	2,082	11.6	60.8
1963	0	108	900	275	1,283	258	265	48	3	44	480	2,123	12.2	60.5
1964	0	131	933	296	1,361	293	299	47	(s)	47	505	2,259	13.0	60.2
1965	15	158	994	309	1,476	324	323	48	(s)	47	574	2,468	13.1	59.8
1966	11	147	1,018	295	1,471	300	384	45	6	61	606	2,573	11.7	57.2
1967	5	92	938	224	1,259	177	450	49	11	96	673	2,537	7.0	49.6
1968	9	74	886	333	1,302	272	506	45	28	145	814	2,840	9.6	45.9
1969	49	65	875	347	1,336	276	608	43	20	189	971	3,166	8.7	42.2
1970	50	30	989	275	1,343	196	766	42	11	271	985	3,419	5.7	39.3
1971	102	128	1,020	423	1,673	327	857	27	10	368	991	3,926	8.3	42.6
1972	251	190	959	663	2,063	530	1,108	21	9	432	1,108	4,741	11.2	43.5
1973	459	486	1,135	913	2,993	915	1,325	16	15	429	1,479	6,256	14.6	47.8
1974	713	461	979	1,126	3,280	752	1,070	8	8	481	1,265	6,112	12.3	53.7
1975	762	715	702	1,422	3,601	1,383	846	71	14	496	1,026	6,056	22.8	59.5
1976	1,025	1,230	700	2,111	5,066	2,424	599	87	31	510	1,019	7,313	33.2	69.3
1977	1,143	1,380	690	2,979	6,193	3,185	517	179	126	571	1,221	8,807	36.2	70.3
1978	919	1,144	646	3,043	5,751	2,963	467	318	180	522	1,126	8,363	35.4	68.8
1979	1,080	1,356	690	2,511	5,637	3,058	538	439	202	523	1,116	8,456	36.2	66.7
1980	857	1,261	481	1,701	4,300	2,551	455	533	176	476	969	6,909	36.9	62.2
1981	620	1,129	406	1,168	3,323	1,848	447	522	375	389	939	5,996	30.8	55.4
1982	514	552	412	668	2,146	854	482	685	456	366	979	5,113	16.7	42.0
1983	302	337	422	801	1,862	632	547	826	382	322	1,111	5,051	12.5	36.9
1984	216	325	548	960	2,049	819	630	748	402	336	1,273	5,437	15.1	37.7
1985	293	168	605	765	1,830	472	770	816	310	275	1,066	5,067	9.3	36.1
1986	440	685	793	918	2,837	1,162	807	699	350	265	1,267	6,224	18.7	45.6
1987	535	751	804	970	3,060	1,274	848	655	352	294	1,469	6,678	19.1	45.8
1988	618	1,073	794	1,034	3,520	1,839	999	747	315	264	1,557	7,402	24.8	47.6
1989	815	1,224	873	1,228	4,140	2,130	931	767	215	353	1,654	8,061	26.4	51.4
1990	800	1,339	1,025	1,132	4,296	2,244	934	755	189	315	1,529	8,018	28.0	53.6
1991	703	1,802	1,035	553	4,092	2,064	1,033	807	138	270	1,287	7,627	27.1	53.7
1992	681	1,720	1,170	521	4,092	1,974	1,069	830	230	275	1,392	7,888	25.0	51.9
1993	R740	R1,414	R1,300	820	R4,273	R2,000	R1,181	919	R350	283	R1,614	R8,620	23.2	49.6
1994P	637	1,402	1,317	876	4,232	1,971	1,231	985	458	348	1,675	8,929	22.1	47.4

[1] Organization of Petroleum Exporting Countries. See Glossary for membership.

[2] Algeria, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Qatar, United Arab Emirates, and, through 1992, Ecuador, which withdrew from OPEC on December 31, 1992. Beginning with 1993, imports from Ecuador are included in the Non-OPEC "Other" column. Prior to 1988, imports from the Neutral Zone between Kuwait and Saudi Arabia were included in imports from Saudi Arabia. From 1988 forward, those imports have been included in imports from "Other."

[3] Total OPEC imports exclude petroleum imported into the United States indirectly from OPEC countries, primarily from Caribbean and West European refining areas, as petroleum products that were refined from crude oil produced in OPEC countries.

[4] Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates. Imports from the Neutral Zone are included in imports from "Arab OPEC."

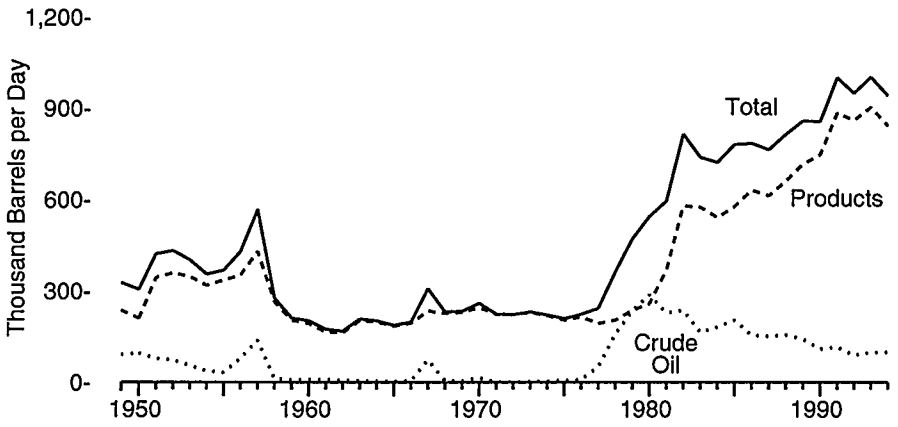
R=Revised data. P=Preliminary data. (s)=Less than 500 barrels per day.

Notes: • Data include imports for the Strategic Petroleum Reserve, which began in 1977. • Totals may not equal sum of components due to independent rounding.

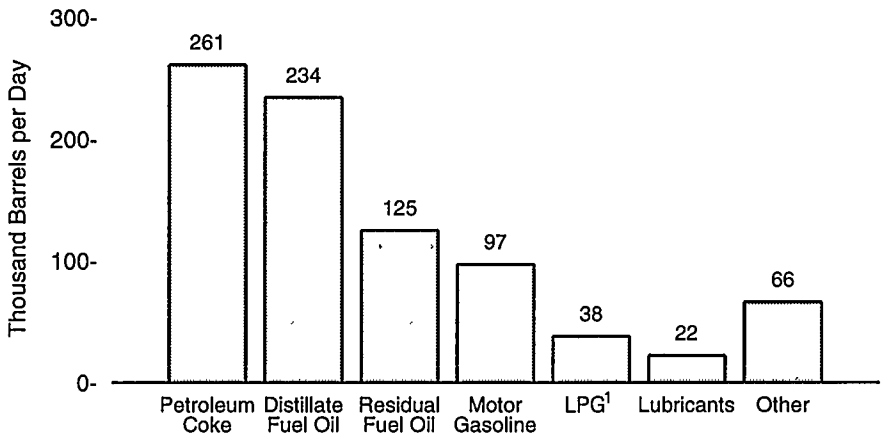
Sources: • 1960-1975—Bureau of Mines, *Minerals Yearbook,* "Crude Petroleum and Petroleum Products" chapter. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *P.A.D. Districts Supply/Demand, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.5 Petroleum Exports by Type

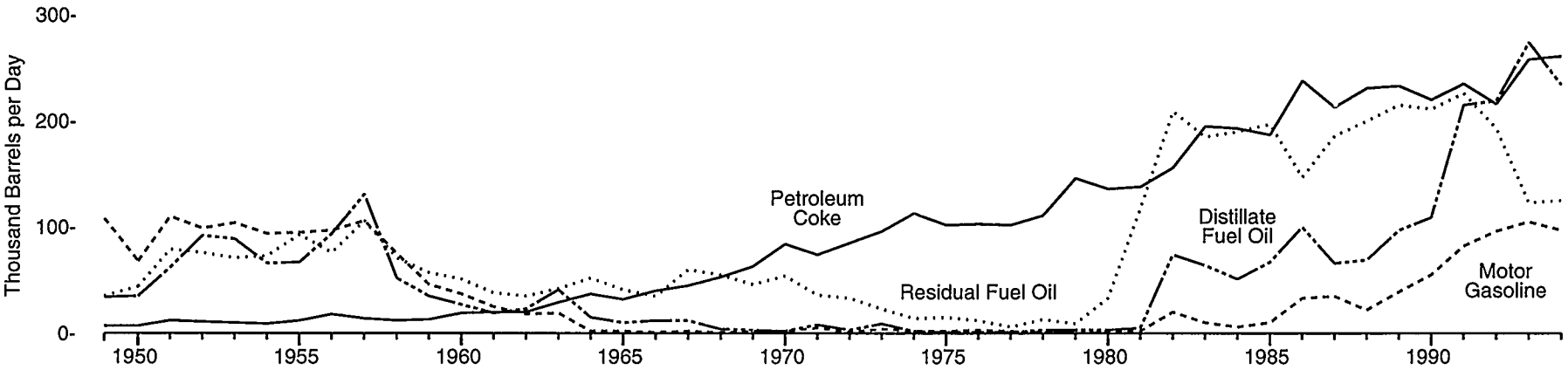
Total, 1949-1994



By Product, 1994



By Selected Product, 1949-1994



[1] Liquefied petroleum gases.
Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.5.

Table 5.5 Petroleum Exports by Type, 1949-1994

(Thousand Barrels per Day)

Year	Crude Oil	Petroleum Products										Total Petroleum
		Distillate Fuel Oil	Liquefied Petroleum Gases		Lubricants	Motor Gasoline [2]	Petroleum Coke	Petrochemical Feedstocks	Residual Fuel Oil	Other Products [3]	Total	
			Propane [1]	Total								
1949	91	34	NA	4	35	108	7	0	35	15	236	327
1950	95	35	NA	4	39	68	7	0	44	12	210	305
1951	78	62	NA	6	48	110	12	0	79	27	344	422
1952	73	92	NA	7	44	99	11	0	76	31	359	432
1953	55	89	NA	8	36	104	10	0	71	29	347	402
1954	37	66	NA	11	41	94	9	0	73	23	318	355
1955	32	67	NA	12	39	95	12	0	93	18	336	368
1956	78	94	NA	12	38	97	18	0	76	17	352	430
1957	138	131	NA	12	38	106	14	0	106	23	430	568
1958	12	52	NA	8	36	75	12	0	71	11	264	276
1959	7	35	NA	6	38	46	13	0	57	9	204	211
1960	8	27	NA	8	43	37	19	0	51	9	193	202
1961	9	19	NA	10	47	25	20	0	38	7	165	174
1962	5	23	NA	11	48	18	20	0	35	8	163	168
1963	5	41	NA	13	50	19	29	0	42	9	203	208
1964	4	15	NA	15	50	2	37	0	52	28	198	202
1965	3	10	NA	21	45	2	32	5	41	27	184	187
1966	4	12	NA	22	47	1	40	7	35	29	194	198
1967	73	12	5	25	51	2	45	8	60	31	234	307
1968	5	4	7	29	49	1	53	8	55	27	226	231
1969	4	3	7	35	45	2	63	11	46	24	229	233
1970	14	2	6	27	44	2	84	10	54	21	245	259
1971	1	8	13	26	43	5	74	14	36	17	223	224
1972	1	3	18	31	41	1	85	13	33	15	222	222
1973	2	9	15	27	35	4	96	19	23	16	229	231
1974	3	2	14	25	33	2	113	15	14	14	218	221
1975	6	1	13	26	25	2	102	22	15	11	204	209
1976	8	1	13	25	26	3	103	30	12	15	215	223
1977	50	1	10	18	26	2	102	24	6	12	193	243
1978	158	3	9	20	27	1	111	23	13	6	204	362
1979	235	3	8	15	23	(s)	146	31	9	9	236	471
1980	287	3	10	21	23	1	136	29	33	10	258	544
1981	228	5	18	42	19	2	138	26	118	17	367	595
1982	236	74	31	65	16	20	156	24	209	15	579	815
1983	164	64	43	73	16	10	195	20	185	12	575	739
1984	181	51	30	48	15	6	193	21	190	17	541	722
1985	204	67	48	62	15	10	187	19	197	19	577	781
1986	154	100	28	42	23	33	238	22	147	26	631	785
1987	151	66	24	38	23	35	213	20	186	33	613	764
1988	155	69	31	49	26	22	231	23	200	41	661	815
1989	142	97	24	35	19	39	233	26	215	54	717	859
1990	109	109	28	40	20	55	220	26	211	67	748	857
1991	116	215	28	41	18	82	235	0	226	67	885	1,001
1992	89	219	33	49	16	96	216	0	193	73	861	950
1993	98	274	26	43	19	105	258	0	123	83	R904	1,003
1994P	99	234	24	38	22	97	261	0	125	66	843	942

[1] Includes propylene.
[2] Includes aviation gasoline for the years 1949-1963.
[3] Aviation gasoline (for 1964 forward), motor gasoline blending components, jet fuel, kerosene, special naphthas, wax, asphalt, road oil, pentanes plus, and miscellaneous products.

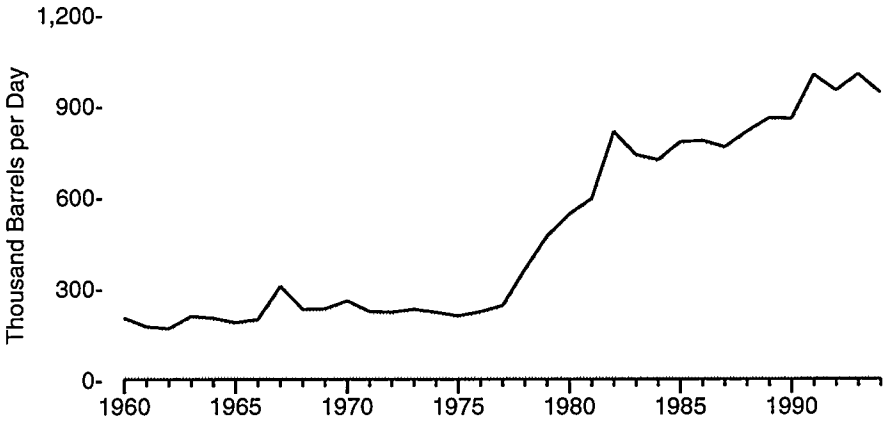
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 500 barrels per day.

Notes: • Includes exports to U.S. possessions and territories. • Totals may not equal sum of components due to independent rounding.

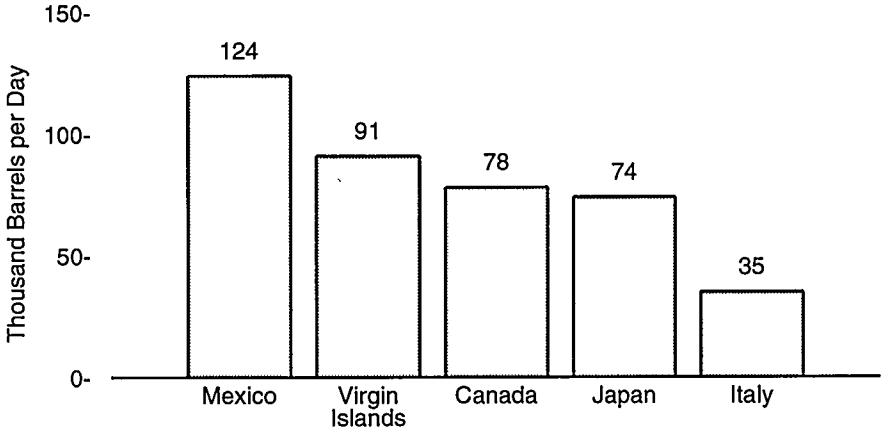
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.6 Petroleum Exports by Country of Destination

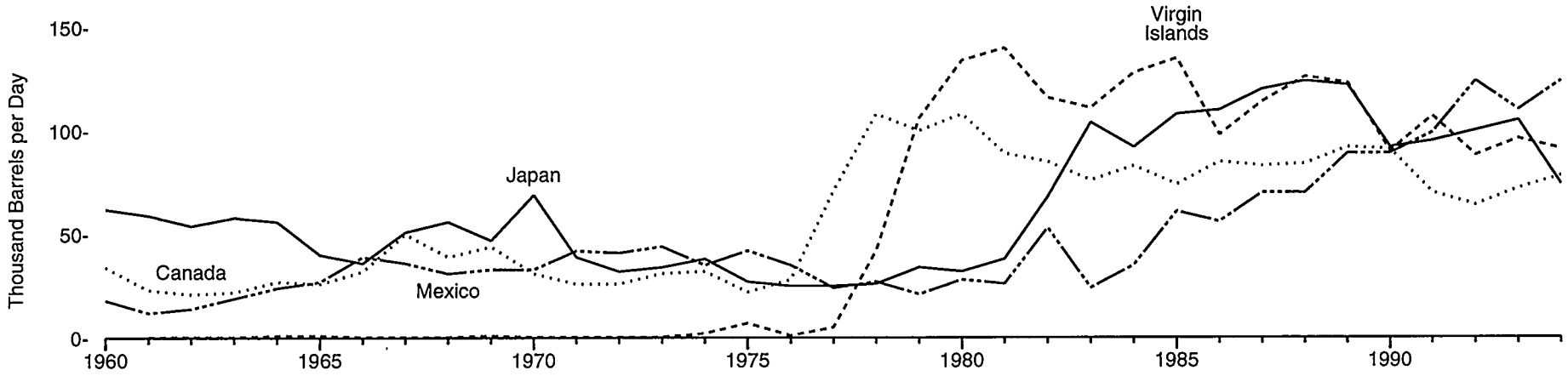
Total, 1960-1994



By Selected Countries, 1994



By Selected Countries, 1960-1994



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

Source Table 5.6.

Table 5.6 Petroleum Exports by Country of Destination, 1960-1994

(Thousand Barrels per Day)

Year	Canada	Mexico	Japan	Netherlands	Belgium [1]	Italy	United Kingdom	France	Brazil	Puerto Rico	Virgin Islands	Other	Total
1960	34	18	62	6	3	6	12	4	4	1	NA	52	202
1961	23	12	59	4	4	5	10	4	4	1	(s)	48	174
1962	21	14	54	5	3	5	8	3	5	1	(s)	50	168
1963	22	19	58	13	9	8	11	4	4	1	(s)	59	208
1964	27	24	56	9	4	8	10	4	4	1	1	55	202
1965	26	27	40	10	3	7	12	3	3	1	1	54	187
1966	32	39	36	9	3	7	12	4	4	3	(s)	49	198
1967	50	36	51	13	5	9	62	3	6	7	(s)	65	307
1968	39	31	56	10	4	8	14	4	8	2	(s)	55	231
1969	44	33	47	9	4	9	13	4	7	2	1	59	233
1970	31	33	69	15	5	10	12	5	7	1	(s)	71	259
1971	26	42	39	11	7	8	9	5	9	3	(s)	67	224
1972	26	41	32	12	13	9	10	5	9	3	(s)	63	222
1973	31	44	34	13	15	9	9	5	8	3	(s)	60	231
1974	32	35	38	17	13	9	6	4	9	4	2	52	221
1975	22	42	27	23	9	10	7	6	6	5	7	44	209
1976	28	35	25	22	12	10	13	6	7	21	1	43	223
1977	71	24	25	17	16	10	9	9	6	6	5	44	243
1978	108	27	26	18	15	10	7	9	8	44	42	47	362
1979	100	21	34	28	19	15	7	13	7	64	106	57	471
1980	108	28	32	23	20	14	7	11	4	86	134	79	544
1981	89	26	38	42	12	22	5	15	1	81	140	124	595
1982	85	53	68	85	17	32	14	24	8	95	116	216	815
1983	76	24	104	49	22	35	8	23	2	33	111	251	739
1984	83	35	92	37	21	39	14	18	1	24	128	229	722
1985	74	61	108	44	26	30	14	11	3	26	135	248	781
1986	85	56	110	58	30	39	8	11	3	14	98	273	785
1987	83	70	120	39	17	42	6	12	2	22	114	236	764
1988	84	70	124	26	25	29	9	12	3	21	126	286	815
1989	92	89	122	36	23	37	9	11	5	18	123	294	859
1990	91	89	92	54	20	48	11	17	2	11	90	332	857
1991	70	99	95	72	22	55	13	27	13	10	107	418	1,001
1992	64	124	100	52	22	38	12	9	20	7	88	415	950
1993	72	110	105	45	21	34	10	8	16	[R]12	96	474	1,003
1994[P]	78	124	74	30	26	35	10	11	15	12	91	435	942

[1] Including Luxembourg.

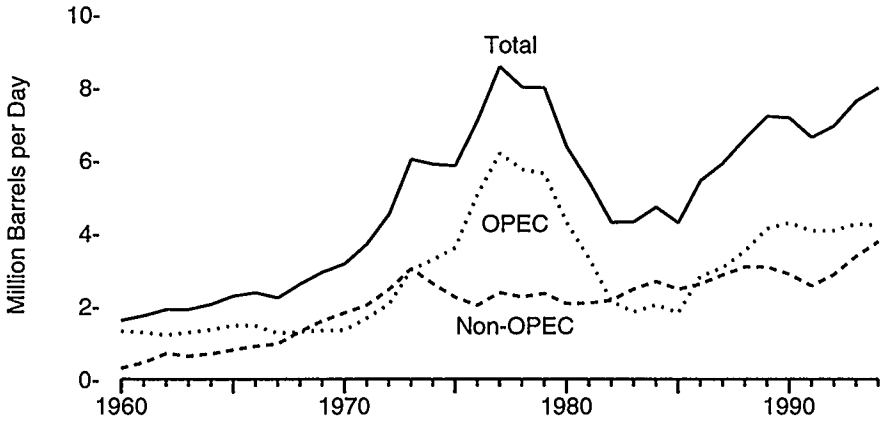
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 500 barrels per day.

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

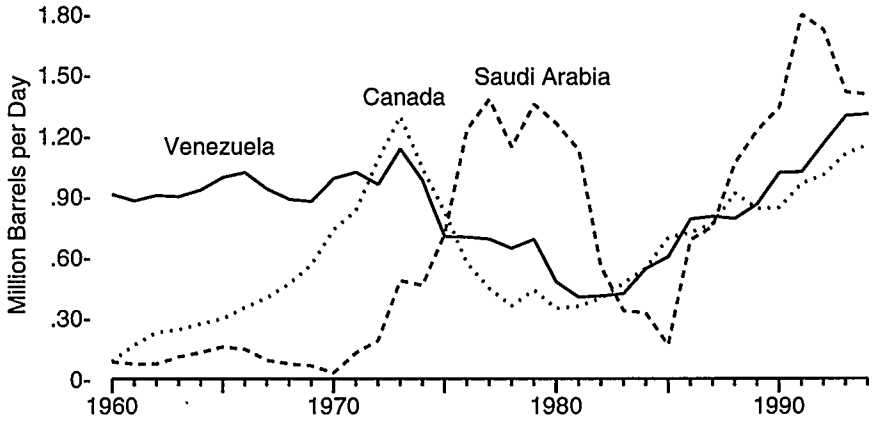
Sources: • 1960-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.7 Petroleum Net Imports by Country of Origin, 1960-1994

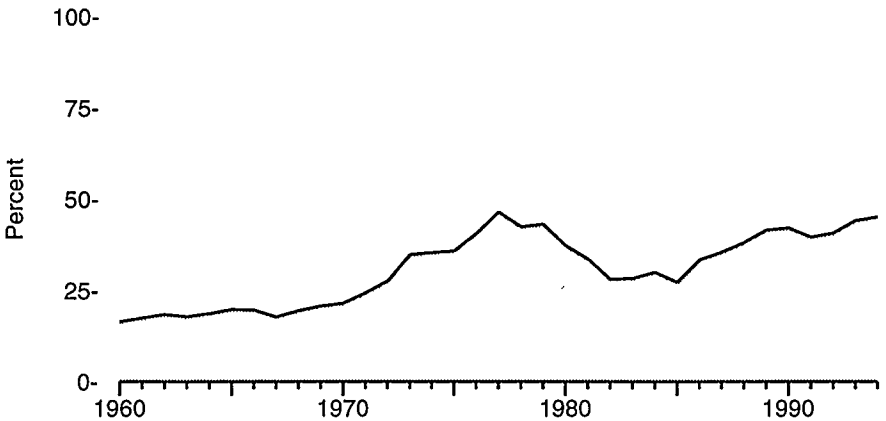
Total, OPEC, and Non-OPEC



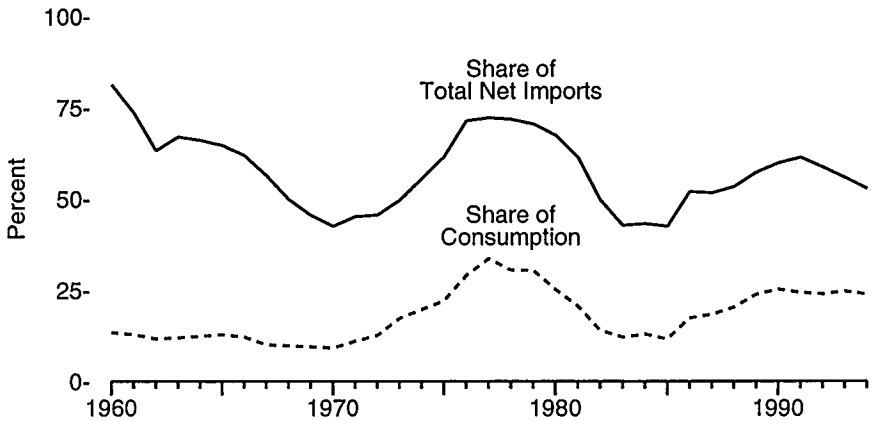
By Selected Country



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, 1960-1994

Year	OPEC [1]						Non-OPEC					Total Net Imports	Total Net Imports as Share of Consumption [5]	Net Imports from OPEC	
	Nigeria	Saudi Arabia	Venezuela	Other [2]	Total [3]	Arab OPEC [4]	Canada	Mexico	United Kingdom	Virgin Islands and Puerto Rico	Other			Share of Total Net Imports [6]	Share of Consumption [7]
	Thousand Barrels per Day												Percent		
1960	0	84	910	317	1,311	292	86	-2	-12	34	195	1,613	16.5	81.3	13.4
1961	0	73	878	333	1,283	284	167	27	-10	42	232	1,743	17.5	73.6	12.9
1962	0	74	905	232	1,210	241	229	35	-6	40	405	1,913	18.4	63.3	11.6
1963	0	108	899	274	1,282	258	243	29	-7	43	325	1,915	17.8	67.0	11.9
1964	0	131	932	296	1,359	293	272	23	-9	45	368	2,057	18.7	66.1	12.3
1965	15	158	994	308	1,475	324	297	21	-11	45	454	2,281	19.8	64.7	12.8
1966	11	147	1,018	295	1,470	291	352	6	-6	58	494	2,375	19.7	61.9	12.2
1967	5	92	937	224	1,258	177	400	13	-51	89	521	2,230	17.8	56.4	10.0
1968	9	74	886	332	1,302	272	468	15	13	143	668	2,609	19.5	49.9	9.7
1969	49	65	875	346	1,336	276	564	10	7	186	831	2,933	20.8	45.5	9.5
1970	50	30	989	274	1,343	196	736	9	-1	270	804	3,161	21.5	42.5	9.1
1971	102	128	1,019	422	1,671	327	831	-14	1	365	848	3,701	24.3	45.2	11.0
1972	251	189	959	662	2,061	529	1,082	-20	-1	428	969	4,519	27.6	45.6	12.6
1973	459	485	1,134	913	2,991	914	1,294	-28	(s)	426	1,343	6,025	34.8	49.6	17.3
1974	713	461	978	1,125	3,277	752	1,038	-27	1	475	1,127	5,892	35.4	55.6	19.7
1975	762	714	702	1,421	3,599	1,382	824	29	7	484	904	5,846	35.8	61.6	22.1
1976	1,025	1,229	699	2,110	5,063	2,423	571	53	24	488	891	7,090	40.6	71.4	29.0
1977	1,143	1,379	689	2,978	6,190	3,184	446	155	117	560	1,097	8,565	46.5	72.3	33.6
1978	919	1,142	644	3,042	5,747	2,962	359	291	173	436	996	8,002	42.5	71.8	30.5
1979	1,080	1,354	688	2,510	5,633	3,054	438	418	196	353	948	7,985	43.1	70.5	30.4
1980	857	1,259	478	1,699	4,293	2,549	347	506	169	256	794	6,365	37.3	67.5	25.2
1981	620	1,128	403	1,165	3,315	1,844	358	497	370	169	693	5,401	33.6	61.4	20.6
1982	512	551	409	663	2,136	852	397	632	442	154	538	4,298	28.1	49.7	14.0
1983	299	336	420	788	1,843	630	471	802	374	178	644	4,312	28.3	42.7	12.1
1984	215	324	544	953	2,037	817	547	714	388	184	847	4,715	30.0	43.2	13.0
1985	293	167	602	759	1,821	470	696	755	295	114	605	4,286	27.3	42.5	11.6
1986	440	685	788	915	2,828	1,160	721	642	342	152	753	5,439	33.4	52.0	17.4
1987	535	751	801	968	3,055	1,273	765	585	346	158	1,006	5,914	35.5	51.7	18.3
1988	618	1,064	790	1,041	3,513	1,837	916	677	306	117	1,058	6,587	38.1	53.3	20.3
1989	815	1,224	861	1,224	4,124	2,128	839	678	206	212	1,143	7,202	41.6	57.3	23.8
1990	800	1,339	1,016	1,130	4,285	2,243	843	666	179	213	976	7,161	42.2	59.8	25.2
1991	703	1,796	1,020	546	4,065	2,057	963	707	125	153	612	6,626	39.6	61.3	24.3
1992	680	1,720	1,161	510	4,071	1,972	1,005	706	219	180	757	6,938	40.7	58.7	23.9
1993	R736	R1,413	R1,296	R808	R4,253	R1,995	R1,109	R809	R340	R175	R932	R7,618	R44.2	R55.8	R24.7
1994P	637	1,401	1,305	871	4,215	1,968	1,153	861	448	244	1,066	7,986	45.2	52.8	23.8

[1] Organization of Petroleum Exporting Countries. See Glossary for membership.

[2] Algeria, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Qatar, United Arab Emirates, and, through 1992, Ecuador, which withdrew from OPEC on December 31, 1992. Beginning with 1993, net imports from Ecuador are included in the Non-OPEC "Other" column. Prior to 1988, imports from the Neutral Zone between Kuwait and Saudi Arabia were included in imports from Saudi Arabia. From 1988 forward, those imports have been included in imports from "Other."

[3] Total OPEC imports exclude petroleum imported into the United States indirectly from OPEC countries, primarily from Caribbean and West European refining areas, as petroleum products that were refined from crude oil produced in OPEC countries.

[4] Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates. Imports from the Neutral Zone are included in imports from "Arab OPEC."

[5] Calculated by dividing total net petroleum imports by total U.S. petroleum products supplied (consumption).

[6] Calculated by dividing net petroleum imports from OPEC countries by total net petroleum imports.

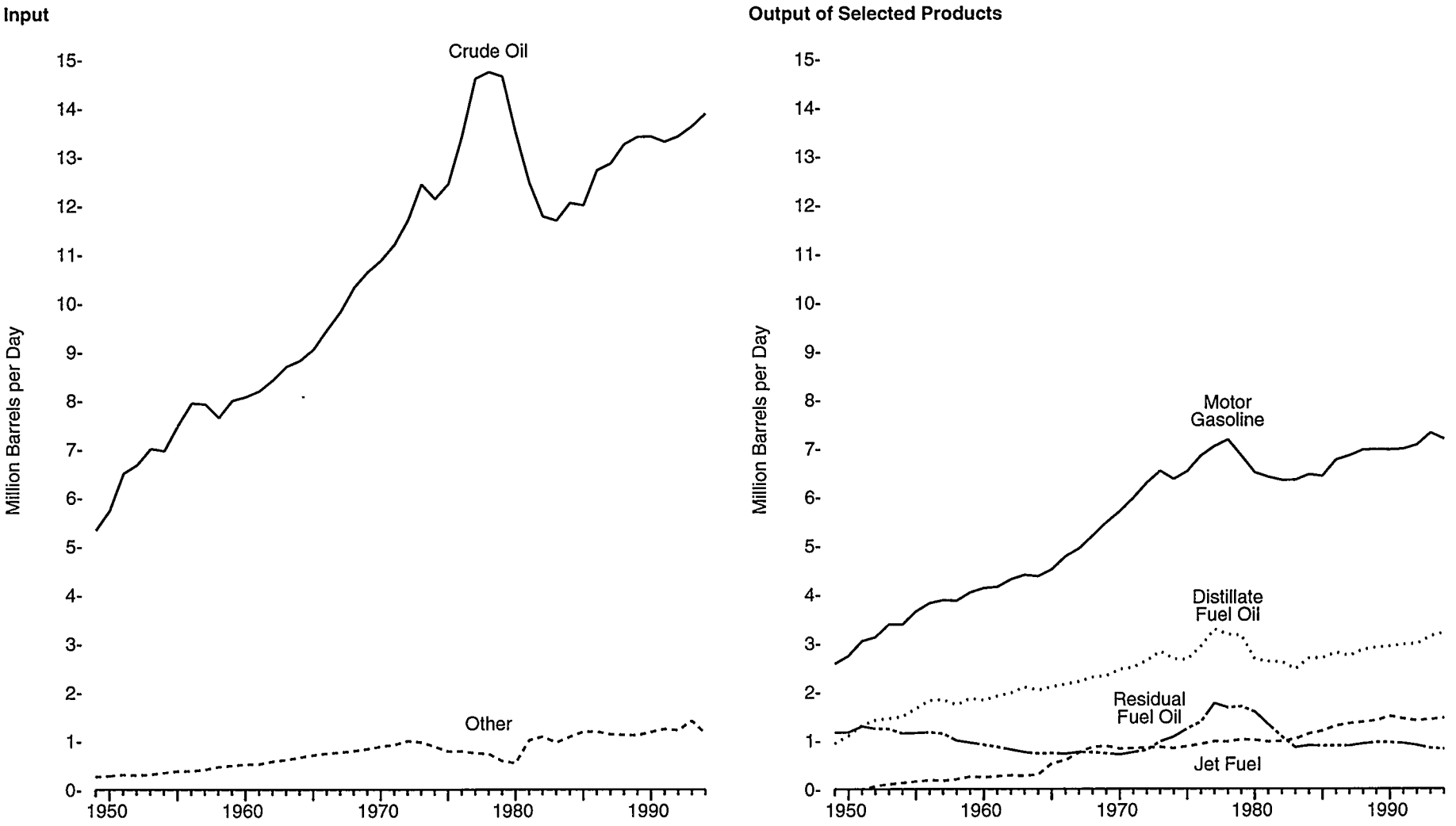
[7] Calculated by dividing net petroleum imports from OPEC countries by total U.S. petroleum product supplied (consumption).

R=Revised data. P=Preliminary data. (s)=Less than 500 barrels per day.

Notes: • Net imports are imports minus exports; negative numbers indicate that exports exceed imports. • Data include imports for the Strategic Petroleum Reserve, which began in 1977. • Totals may not equal sum of components due to independent rounding.

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.* • 1981-1993—EIA, *Petroleum Supply Annual* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.8 Refinery Input and Output, 1949-1994



Source: Table 5.8.

Table 5.8 Refinery Input and Output, 1949-1994

(Million Barrels per Day)

Year	Input				Output							Processing Gain
	Crude Oil	Natural Gas Plant Liquids	Other Liquids [1]	Total Input	Motor Gasoline [2]	Jet Fuel [2]	Distillate Fuel Oil	Residual Fuel Oil	Liquefied Petroleum Gases	Other Products [3]	Total Output	
1949	5.33	0.23	0.03	5.59	2.57	NA	0.93	1.16	0.06	0.85	5.59	(s)
1950	5.74	0.26	0.02	6.02	2.74	NA	1.09	1.16	0.08	0.95	6.02	(s)
1951	6.49	0.27	0.03	6.80	3.04	NA	1.30	1.29	0.09	1.09	6.80	0.01
1952	6.67	0.28	0.01	6.97	3.12	0.06	1.42	1.24	0.08	1.06	6.97	0.01
1953	7.00	0.30	(s)	7.31	3.38	0.10	1.45	1.23	0.09	1.08	7.33	0.02
1954	6.96	0.32	0.02	7.30	3.38	0.13	1.49	1.14	0.09	1.10	7.32	0.02
1955	7.48	0.34	0.03	7.86	3.65	0.16	1.65	1.15	0.12	1.17	7.89	0.03
1956	7.94	0.37	0.01	8.32	3.82	0.18	1.82	1.17	0.14	1.24	8.36	0.04
1957	7.92	0.41	(s)	8.33	3.88	0.17	1.83	1.14	0.15	1.20	8.37	0.04
1958	7.64	0.37	0.09	8.11	3.87	0.20	1.73	1.00	0.16	1.22	8.17	0.06
1959	7.99	0.42	0.07	8.48	4.04	0.25	1.86	0.95	0.19	1.28	8.57	0.09
1960	8.07	0.45	0.06	8.58	4.13	0.24	1.82	0.91	0.21	1.42	8.73	0.15
1961	8.18	0.46	0.06	8.71	4.15	0.26	1.91	0.86	0.22	1.49	8.89	0.18
1962	8.41	0.50	0.08	8.99	4.30	0.28	1.97	0.81	0.21	1.59	9.16	0.18
1963	8.69	0.52	0.09	9.30	4.39	0.27	2.09	0.76	0.26	1.72	9.50	0.20
1964	8.81	0.58	0.07	9.46	4.37	0.29	2.03	0.73	0.29	1.97	9.68	0.22
1965	9.04	0.62	0.09	9.75	4.51	0.52	2.10	0.74	0.29	1.81	9.97	0.22
1966	9.44	0.65	0.09	10.18	4.77	0.59	2.15	0.72	0.29	1.90	10.43	0.25
1967	9.82	0.67	0.09	10.58	4.94	0.75	2.20	0.76	0.31	1.92	10.87	0.29
1968	10.31	0.71	0.08	11.10	5.20	0.86	2.29	0.75	0.32	1.99	11.42	0.32
1969	10.63	0.72	0.11	11.46	5.47	0.88	2.32	0.73	0.34	2.06	11.79	0.34
1970	10.87	0.76	0.12	11.75	5.70	0.83	2.45	0.71	0.35	2.08	12.11	0.36
1971	11.20	0.78	0.14	12.12	5.97	0.83	2.50	0.75	0.36	2.09	12.50	0.38
1972	11.70	0.83	0.17	12.69	6.28	0.85	2.63	0.80	0.36	2.17	13.08	0.39
1973	12.43	0.82	0.15	13.40	6.53	0.86	2.82	0.97	0.37	2.30	13.85	0.45
1974	12.13	0.75	0.14	13.02	6.36	0.84	2.67	1.07	0.34	2.23	13.50	0.48
1975	12.44	0.71	0.07	13.23	6.52	0.87	2.65	1.24	0.31	2.10	13.68	0.46
1976	13.42	0.73	0.06	14.20	6.84	0.92	2.92	1.38	0.34	2.28	14.68	0.48
1977	14.60	0.67	0.07	15.35	7.03	0.97	3.28	1.75	0.35	2.49	15.87	0.52
1978	14.74	0.64	0.09	15.47	7.17	0.97	3.17	1.67	0.35	2.64	15.97	0.50
1979	14.65	0.51	0.08	15.24	6.84	1.01	3.15	1.69	0.34	2.74	15.76	0.53
1980	13.48	0.46	0.08	14.02	6.49	1.00	2.66	1.58	0.33	2.56	14.62	0.60
1981	12.47	0.52	0.49	13.48	6.40	0.97	2.61	1.32	0.31	2.37	13.99	0.51
1982	11.77	0.52	0.57	12.86	6.34	0.98	2.61	1.07	0.27	2.13	13.39	0.53
1983	11.69	0.46	0.50	12.65	6.34	1.02	2.46	0.85	0.33	2.14	13.14	0.49
1984	12.04	0.50	0.58	13.13	6.45	1.13	2.68	0.89	0.36	2.16	13.68	0.55
1985	12.00	0.51	0.68	13.19	6.42	1.19	2.69	0.88	0.39	2.18	13.75	0.56
1986	12.72	0.48	0.71	13.91	6.75	1.29	2.80	0.89	0.42	2.37	14.52	0.62
1987	12.85	0.47	0.67	13.99	6.84	1.34	2.73	0.89	0.45	2.38	14.63	0.64
1988	13.25	0.51	0.61	14.37	6.96	1.37	2.86	0.93	0.50	2.42	15.02	0.66
1989	13.40	0.50	0.61	14.51	6.96	1.40	2.90	0.95	0.55	2.40	15.17	0.66
1990	13.41	0.47	0.71	14.59	6.96	1.49	2.92	0.95	0.50	2.45	15.27	0.68
1991	13.30	0.47	0.77	14.54	6.98	1.44	2.96	0.93	0.54	2.41	15.26	0.71
1992	13.41	0.47	0.75	14.63	7.06	1.40	2.97	0.89	0.61	2.47	15.40	0.77
1993	13.61	0.49	R0.92	R15.02	R7.30	1.42	R3.13	R0.84	R0.59	2.50	R15.79	R0.77
1994P	13.87	0.46	0.68	15.02	7.18	1.45	3.21	0.82	0.61	2.51	15.78	0.76

[1] Prior to 1981, included unfinished oils (net), hydrogen, and hydrocarbons not included elsewhere. 1981 forward has 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.

[2] Prior to 1964, motor gasoline data were for total gasoline, including motor gasoline, aviation gasoline, and special naphthas. Prior to 1965, kerosene-type jet fuel was included in kerosene.

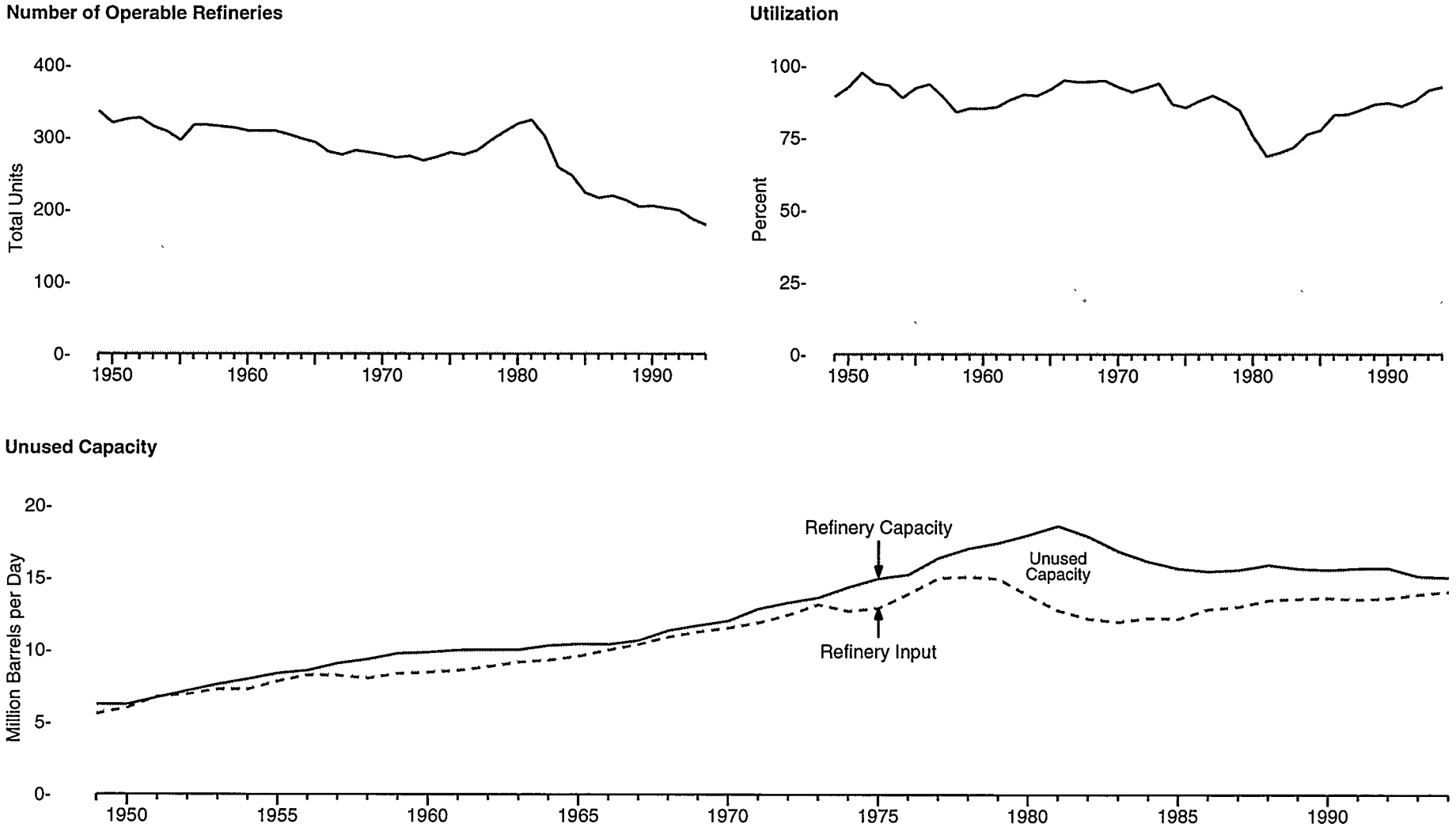
[3] Kerosene, petrochemical feedstocks, lubricants, wax, petroleum coke, asphalt, road oil, still gas, and miscellaneous products. Since 1964, aviation gasoline and special naphthas have been included.

R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 5,000 barrels per day.

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

Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.9 Refinery Capacity and Utilization, 1949-1994



Source: Table 5.9.

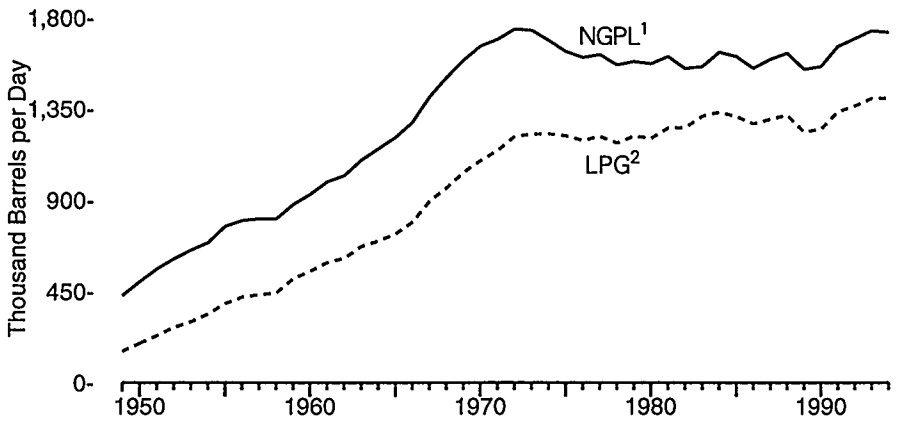
Table 5.9 Refinery Capacity and Utilization, 1949-1994

Year	Operable Refineries		Gross Input to Distillation Units [3] (million barrels per day)	Utilization [4] (percent)
	Number [1]	Capacity [2] (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	[R]13.85	[R]91.5
1994[P]	179	15.03	14.04	92.6

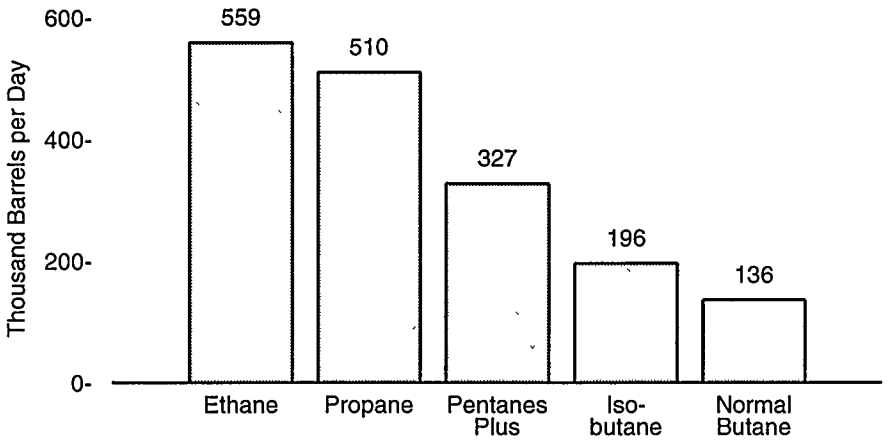
[1] Prior to 1956, the number of refineries included only those in operation on January 1. For 1957 forward, the number of refineries has included all operable refineries on January 1 (see Glossary).
[2] Capacity in million barrels per calendar day on January 1.
[3] See Note 2 at end of section.
[4] 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 has been derived by averaging reported monthly utilization.
R=Revised data. P=Preliminary data.
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.* • 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.* **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.* • 1978-1980—EIA, Energy Data Reports, *Petroleum Refineries in the United States and U.S. Territories.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995). **Utilization:** • 1949-1980—calculated. • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.10 Natural Gas Plant Liquids Production

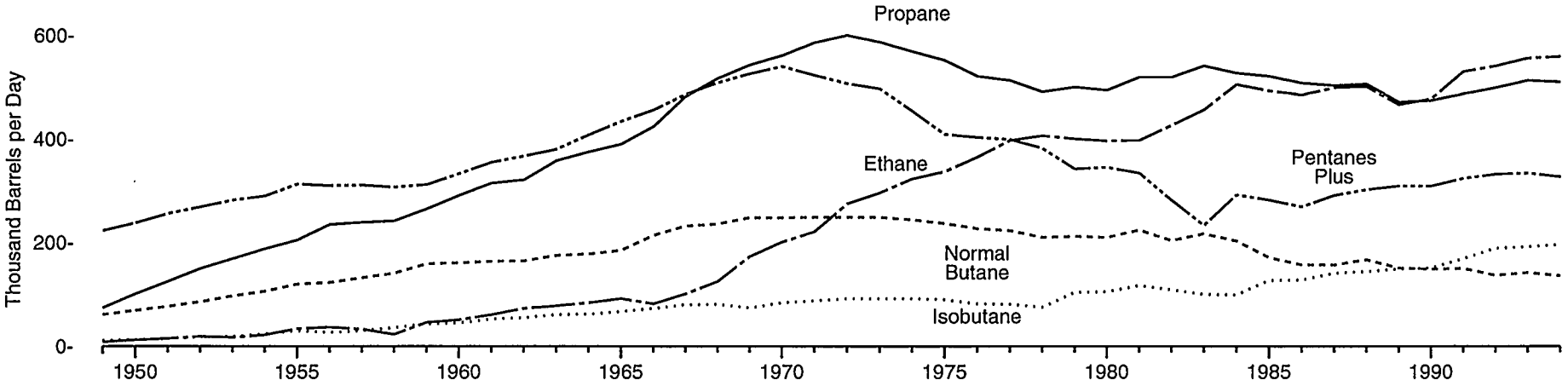
Total, 1949-1994



By Product, 1994



By Selected Product, 1949-1994



[1] Natural gas plant liquids. [2] 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, 1949-1994

(Thousand Barrels per Day)

Year	Liquefied Petroleum Gases					Pentanes Plus [3]	Finished Petroleum Products [4]	Total
	Ethane [1]	Propane [1,2]	Normal Butane [2]	Isobutane	Total			
1949	8	74	61	11	155	223	53	430
1950	12	101	69	13	195	238	66	499
1951	15	125	77	15	232	256	73	561
1952	19	150	86	18	273	269	70	611
1953	17	169	97	19	301	282	71	654
1954	22	188	106	24	339	290	61	691
1955	34	205	120	30	390	313	68	771
1956	37	235	123	27	422	310	68	800
1957	33	239	132	30	434	311	63	808
1958	23	242	141	36	442	307	58	808
1959	46	265	159	43	514	312	54	879
1960	51	291	161	45	549	333	47	929
1961	61	315	164	53	593	355	43	991
1962	73	321	165	55	614	367	41	1,021
1963	78	358	175	61	672	380	47	1,098
1964	84	375	178	62	699	408	48	1,154
1965	92	390	185	67	734	434	41	1,210
1966	82	424	214	73	792	456	37	1,284
1967	101	482	232	80	895	486	29	1,409
1968	125	517	236	81	960	509	35	1,504
1969	173	543	248	74	1,037	526	27	1,590
1970	201	561	248	84	1,095	540	25	1,660
1971	221	586	249	88	1,144	523	25	1,693
1972	275	600	249	92	1,215	507	21	1,744
1973	296	587	249	92	1,225	497	16	1,738
1974	323	569	244	92	1,227	454	7	1,688
1975	337	552	237	90	1,217	409	7	1,633
1976	365	521	227	82	1,195	403	6	1,604
1977	397	513	223	81	1,214	399	5	1,618
1978	406	491	210	75	1,182	382	3	1,567
1979	400	500	212	104	1,216	342	26	1,584
1980	396	494	210	105	1,205	345	23	1,573
1981	397	519	224	117	1,256	334	18	1,609
1982	426	519	204	109	1,258	282	11	1,550
1983	456	541	217	100	1,314	233	12	1,559
1984	505	527	203	99	1,334	292	4	1,630
1985	493	521	171	127	1,313	282	14	1,609
1986	485	508	157	128	1,277	269	4	1,551
1987	499	503	157	141	1,300	291	4	1,595
1988	501	506	167	144	1,319	302	4	1,625
1989	466	471	151	149	1,237	309	(5)	1,546
1990	477	474	149	151	1,250	309	(5)	1,559
1991	530	487	150	169	1,336	324	(5)	1,659
1992	541	499	137	189	1,365	332	(5)	1,697
1993	R556	R513	R142	192	R1,402	R334	(5)	R1,736
1994P	559	510	136	196	1,402	327	(5)	1,728

[1] Reported production of ethane-propane mixtures has been allocated 70 percent ethane and 30 percent propane.

[2] Reported production of butane-propane mixtures has been allocated 60 percent butane and 40 percent propane.

[3] Prior to 1984, this category was reported separately as natural gasoline, isopentane, and plant condensate.

[4] Motor gasoline, aviation gasoline, special naphthas, distillate fuel oil, and miscellaneous products.

[5] Beginning in 1989, data on finished petroleum products production from natural gas processing plants were no longer available.

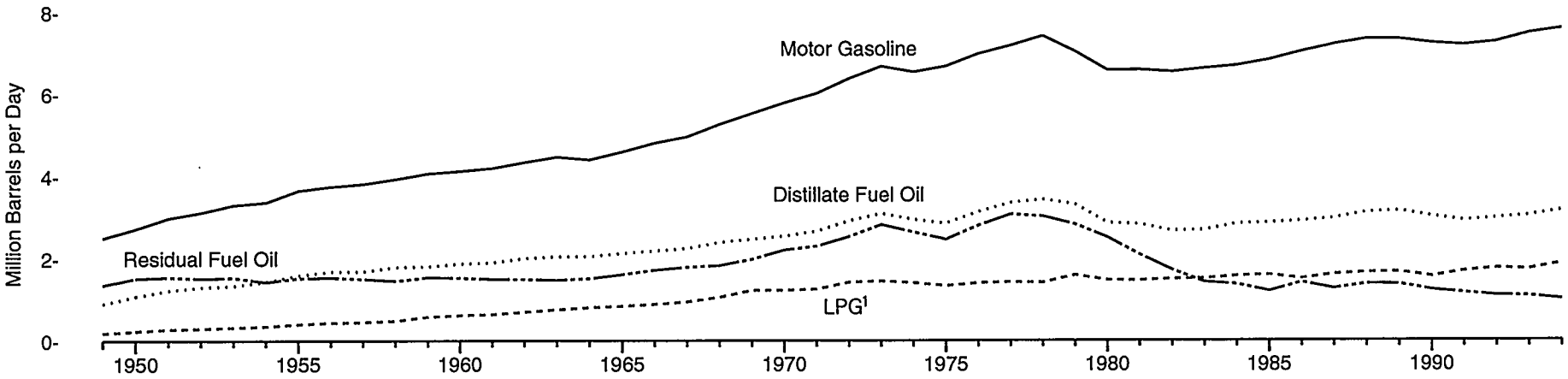
R=Revised data. P=Preliminary data.

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

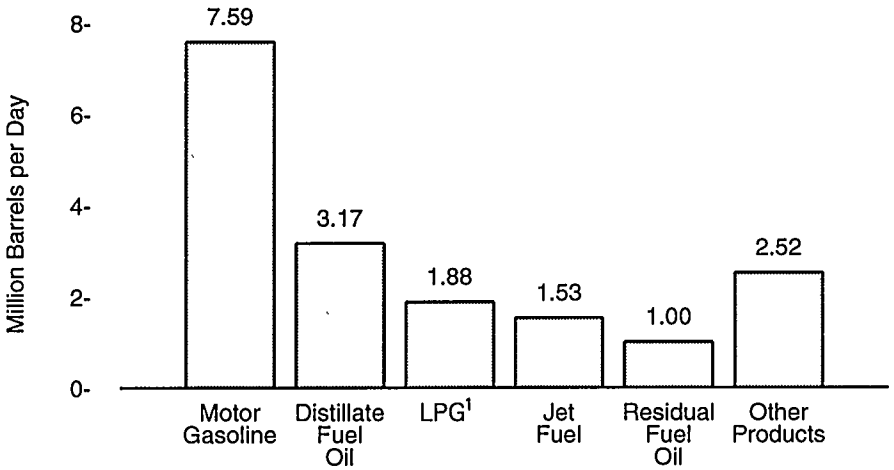
Sources: • 1949-1968—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1969-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.11 Petroleum Products Supplied by Type

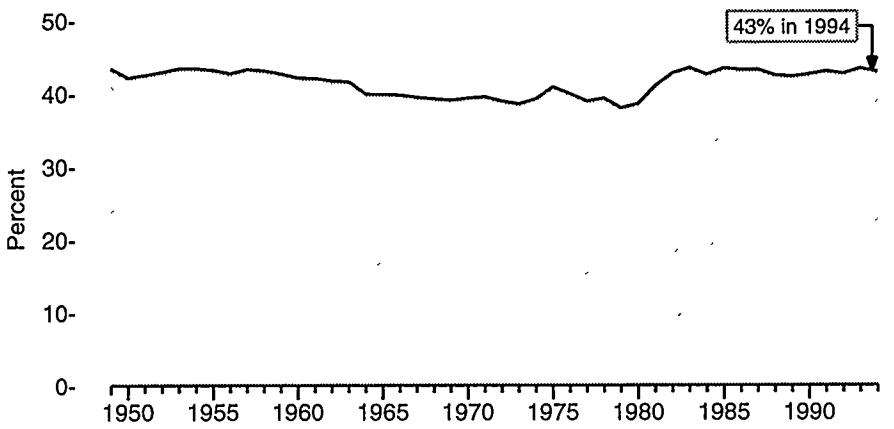
By Selected Product, 1949-1994



By Product, 1994



Motor Gasoline's Share of Total Petroleum Products Supplied, 1949-1994



[1] Liquefied petroleum gases.

Source: Table 5.11.

Table 5.11 Petroleum Products Supplied by Type, 1949-1994

(Million Barrels per Day)

Year	Motor Gasoline [1]	Jet Fuel	Distillate Fuel Oil	Residual Fuel Oil	Liquefied Petroleum Gases		Other Products [3]	Total Products	Percentage Change from Previous Year [4]
					Propane [2]	Total			
1949	2.50	NA	0.90	1.36	NA	0.19	0.81	5.76	—
1950	2.72	NA	1.08	1.52	NA	0.23	0.90	6.46	12.1
1951	2.99	NA	1.23	1.55	NA	0.28	0.98	7.02	8.6
1952	3.12	0.05	1.30	1.52	NA	0.30	0.98	7.27	3.9
1953	3.30	0.09	1.34	1.54	NA	0.33	1.00	7.60	4.3
1954	3.37	0.13	1.44	1.43	NA	0.35	1.03	7.76	2.1
1955	3.66	0.15	1.59	1.53	NA	0.40	1.12	8.46	9.0
1956	3.75	0.20	1.68	1.54	NA	0.44	1.16	8.78	4.1
1957	3.82	0.20	1.69	1.50	NA	0.45	1.15	8.81	0.1
1958	3.93	0.26	1.79	1.45	NA	0.49	1.19	9.12	3.5
1959	4.07	0.29	1.81	1.54	NA	0.58	1.24	9.53	4.5
1960	4.13	0.28	1.87	1.53	NA	0.62	1.36	9.80	3.1
1961	4.20	0.29	1.90	1.50	NA	0.64	1.44	9.98	1.5
1962	4.34	0.31	2.01	1.50	NA	0.70	1.55	10.40	4.2
1963	4.47	0.32	2.05	1.48	NA	0.76	1.68	10.74	3.3
1964	4.40	0.32	2.05	1.52	NA	0.81	1.92	11.02	2.9
1965	4.59	0.60	2.13	1.61	NA	0.84	1.74	11.51	4.2
1966	4.81	0.67	2.18	1.72	NA	0.89	1.82	12.08	5.0
1967	4.96	0.82	2.24	1.79	0.62	0.94	1.81	12.56	3.9
1968	5.26	0.95	2.39	1.83	0.69	1.05	1.91	13.39	6.9
1969	5.53	0.99	2.47	1.98	0.78	1.22	1.95	14.14	5.3
1970	5.78	0.97	2.54	2.20	0.78	1.22	1.98	14.70	4.0
1971	6.01	1.01	2.66	2.30	0.79	1.25	1.98	15.21	3.5
1972	6.38	1.05	2.91	2.53	0.89	1.42	2.08	16.37	7.9
1973	6.67	1.06	3.09	2.82	0.87	1.45	2.21	17.31	5.5
1974	6.54	0.99	2.95	2.64	0.83	1.41	2.13	16.65	-3.8
1975	6.67	1.00	2.85	2.46	0.78	1.33	2.00	16.32	-2.0
1976	6.98	0.99	3.13	2.80	0.83	1.40	2.16	17.46	7.3
1977	7.18	1.04	3.35	3.07	0.82	1.42	2.37	18.43	5.3
1978	7.41	1.06	3.43	3.02	0.78	1.41	2.51	18.85	2.3
1979	7.03	1.08	3.31	2.83	0.85	1.59	2.67	18.51	-1.8
1980	6.58	1.07	2.87	2.51	0.75	1.47	2.57	17.06	-7.6
1981	6.59	1.01	2.83	2.09	0.77	1.47	2.08	16.06	-6.1
1982	6.54	1.01	2.67	1.72	0.80	1.50	1.86	15.30	-4.7
1983	6.62	1.05	2.69	1.42	0.75	1.51	1.94	15.23	-0.4
1984	6.69	1.18	2.84	1.37	0.83	1.57	2.07	15.73	3.5
1985	6.83	1.22	2.87	1.20	0.88	1.60	2.01	15.73	-0.3
1986	7.03	1.31	2.91	1.42	0.83	1.51	2.09	16.28	3.5
1987	7.21	1.38	2.98	1.26	0.92	1.61	2.22	16.67	2.4
1988	7.34	1.45	3.12	1.38	0.92	1.66	2.34	17.28	4.0
1989	7.33	1.49	3.16	1.37	0.99	1.67	2.31	17.33	-0.0
1990	7.23	1.52	3.02	1.23	0.92	1.56	2.43	16.99	-1.9
1991	7.19	1.47	2.92	1.16	0.98	1.69	2.29	16.71	-1.6
1992	7.27	1.45	2.98	1.09	1.03	1.76	2.48	17.03	2.2
1993	7.48	1.47	R3.04	R1.08	R1.01	R1.73	R2.44	R17.24	R0.9
1994P	7.59	1.53	3.17	1.00	1.08	1.88	2.52	17.68	2.6

[1] Prior to 1964, motor gasoline data were for total gasoline, including motor gasoline, aviation gasoline, and special naphthas.

[2] Includes propylene.

[3] Kerosene, petrochemical feedstocks, lubricants, wax, petroleum coke, asphalt, road oil, still gas, pentanes plus, and miscellaneous products. Since 1964, aviation gasoline and special naphthas have been included. Prior to 1965, kerosene-type jet fuel was included in kerosene. For 1981 forward, other products include 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, product supplied has also included crude oil burned as fuel.

[4] Percent change from previous year calculated from data prior to rounding.

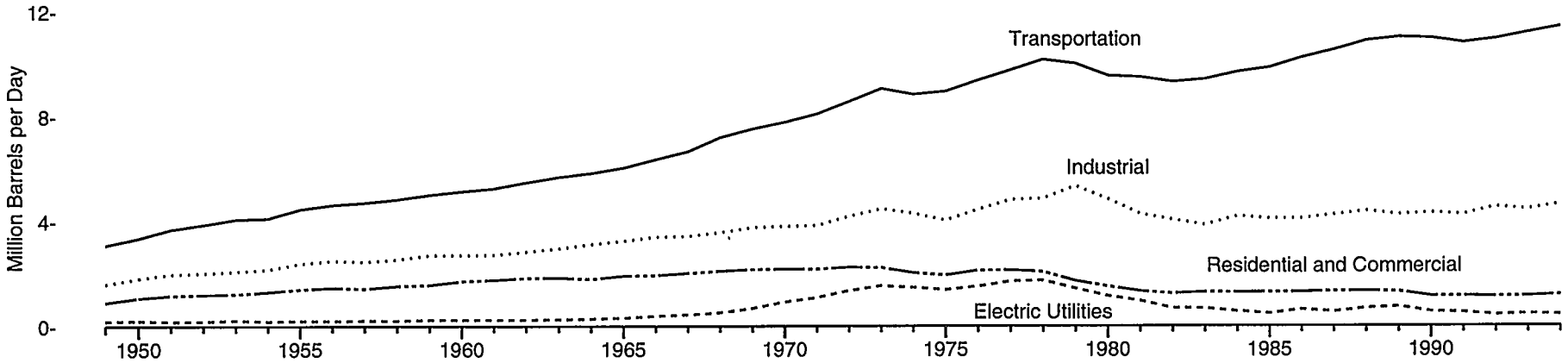
R=Revised data. P=Preliminary. NA=Not available. — = Not applicable.

Notes: • For the definition of petroleum products supplied, see Notes 1, 3, and 4 at end of section. • Totals may not equal sum of components due to independent rounding.

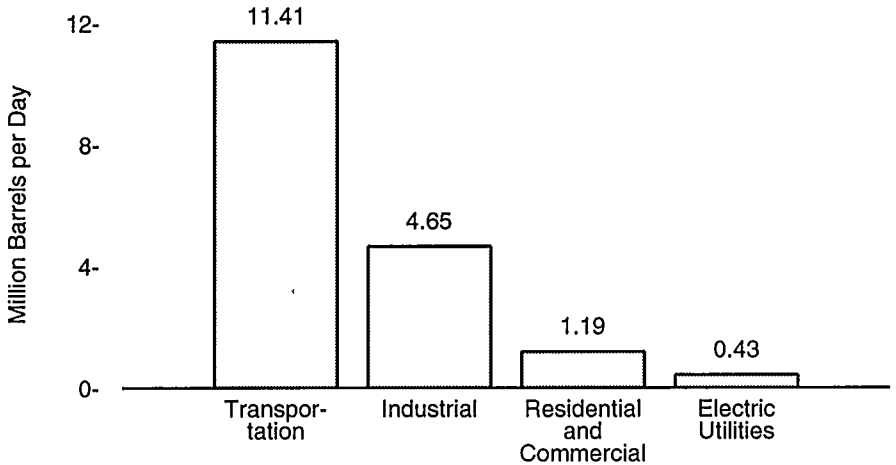
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.12a Petroleum Products Supplied by Sector

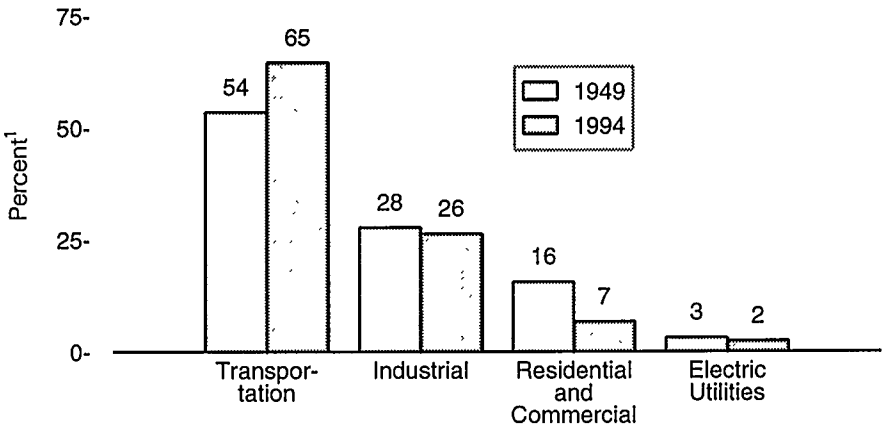
By Sector, 1949-1994



By Sector, 1994



Shares by Sector, 1949 and 1994

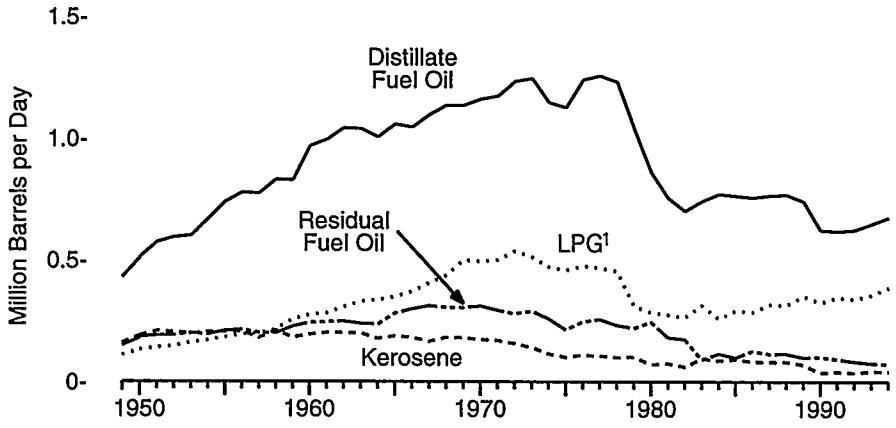


[1] Calculations based on data prior to rounding.
Note: See related Figure 5.12b.

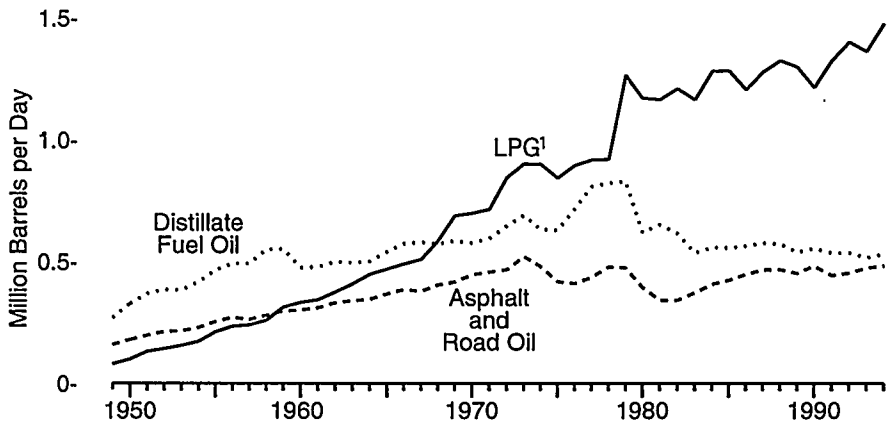
Sources: Tables 5.12a and 5.12b.

Figure 5.12b Petroleum Products Supplied by Product by Sector, 1949-1994

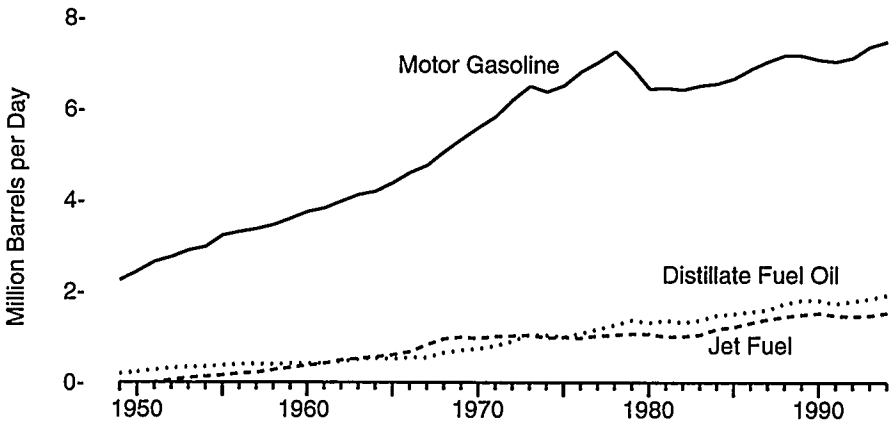
Residential and Commercial Sector, Selected Products



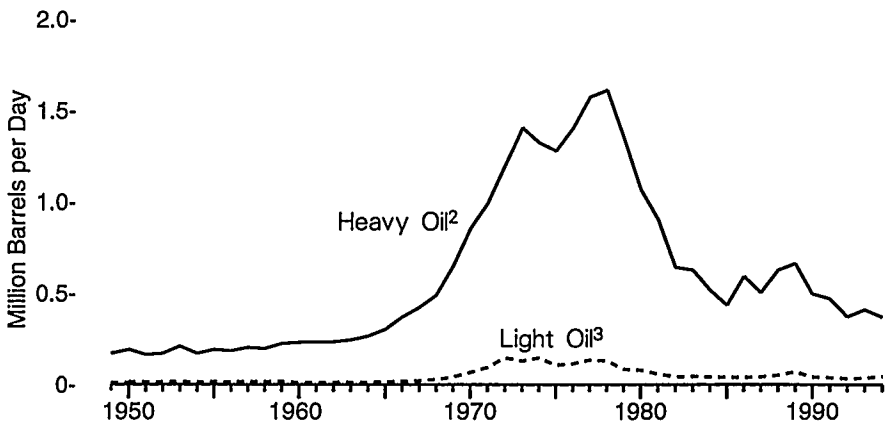
Industrial Sector, Selected Products



Transportation Sector, Selected Products



Electric Utilities, Selected Products



[1]Liquefied petroleum gases.
[2]Prior to 1980, based on oil used in steam plants. Since 1980, heavy oil includes fuel oil nos. 4, 5, and 6, and residual fuel oils.
[3]Prior to 1980, based on oil used in internal combustion and gas turbine engine plants. Since 1980, light oil includes fuel oil nos. 1 and 2, kerosene, and jet fuel.

Notes: • See related Figure 5.12a. • Because vertical scales differ, graphs should not be compared.

Sources: Tables 5.12a and 5.12b.

Table 5.12a Petroleum Products Supplied by the Residential and Commercial Sector and the Industrial Sector, 1949-1994

(Million Barrels per Day)

	Residential and Commercial						Industrial								
Year	Distillate Fuel Oil	Kerosene	Liquefied Petroleum Gases	Motor Gasoline	Residual Fuel Oil	Total	Asphalt and Road Oil	Distillate Fuel Oil	Kerosene	Liquefied Petroleum Gases	Lubricants	Motor Gasoline	Residual Fuel Oil	Other [1]	Total
1949	0.43	0.16	0.11	0.05	0.15	0.90	0.16	0.27	0.12	0.08	0.04	0.12	0.53	0.28	1.60
1950	0.51	0.19	0.13	0.05	0.18	1.07	0.18	0.33	0.13	0.10	0.04	0.13	0.62	0.29	1.82
1951	0.57	0.21	0.14	0.06	0.19	1.17	0.20	0.37	0.13	0.13	0.05	0.14	0.63	0.33	1.98
1952	0.59	0.21	0.15	0.06	0.19	1.20	0.21	0.39	0.13	0.14	0.04	0.15	0.63	0.33	2.02
1953	0.60	0.20	0.16	0.06	0.20	1.22	0.22	0.38	0.12	0.16	0.04	0.16	0.65	0.36	2.08
1954	0.67	0.20	0.17	0.06	0.19	1.30	0.23	0.42	0.12	0.17	0.04	0.16	0.64	0.37	2.16
1955	0.74	0.20	0.18	0.07	0.21	1.40	0.25	0.47	0.12	0.21	0.05	0.17	0.69	0.43	2.39
1956	0.78	0.21	0.20	0.07	0.21	1.46	0.27	0.49	0.11	0.23	0.05	0.18	0.70	0.45	2.49
1957	0.77	0.18	0.20	0.07	0.20	1.43	0.26	0.49	0.10	0.24	0.05	0.18	0.66	0.48	2.46
1958	0.83	0.21	0.21	0.07	0.20	1.53	0.28	0.55	0.08	0.26	0.04	0.19	0.64	0.50	2.54
1959	0.83	0.18	0.26	0.08	0.23	1.57	0.30	0.55	0.08	0.31	0.05	0.19	0.70	0.52	2.71
1960	0.97	0.19	0.27	0.03	0.24	1.71	0.30	0.48	0.08	0.33	0.05	0.20	0.69	0.58	2.71
1961	0.99	0.20	0.28	0.04	0.25	1.76	0.31	0.48	0.06	0.34	0.05	0.19	0.66	0.76	2.72
1962	1.04	0.20	0.31	0.04	0.25	1.84	0.33	0.50	0.07	0.38	0.05	0.19	0.67	0.65	2.84
1963	1.04	0.20	0.33	0.04	0.24	1.84	0.34	0.50	0.07	0.41	0.05	0.18	0.67	0.74	2.96
1964	1.00	0.18	0.34	0.04	0.24	1.79	0.35	0.50	0.08	0.45	0.06	0.18	0.68	0.84	3.12
1965	1.06	0.19	0.35	0.04	0.28	1.91	0.37	0.54	0.08	0.47	0.06	0.18	0.69	0.86	3.25
1966	1.04	0.18	0.37	0.04	0.30	1.94	0.39	0.58	0.09	0.49	0.06	0.17	0.71	0.92	3.40
1967	1.10	0.16	0.41	0.04	0.31	2.02	0.38	0.58	0.11	0.51	0.06	0.16	0.69	0.94	3.43
1968	1.14	0.18	0.44	0.04	0.31	2.10	0.41	0.57	0.10	0.59	0.07	0.16	0.68	1.01	3.58
1969	1.13	0.18	0.50	0.04	0.30	2.16	0.42	0.59	0.10	0.69	0.07	0.15	0.69	1.06	3.76
1970	1.16	0.17	0.49	0.05	0.31	2.18	0.45	0.58	0.09	0.70	0.07	0.15	0.71	1.07	3.81
1971	1.17	0.17	0.50	0.04	0.29	2.18	0.46	0.60	0.08	0.71	0.07	0.14	0.71	1.08	3.84
1972	1.23	0.16	0.54	0.05	0.28	2.25	0.47	0.65	0.08	0.85	0.07	0.13	0.77	1.18	4.19
1973	1.24	0.14	0.51	0.05	0.29	2.23	0.52	0.69	0.08	0.90	0.09	0.13	0.81	1.26	4.48
1974	1.15	0.12	0.47	0.04	0.26	2.04	0.48	0.63	0.06	0.90	0.08	0.12	0.75	1.26	4.30
1975	1.13	0.10	0.46	0.05	0.21	1.95	0.42	0.63	0.06	0.84	0.07	0.12	0.66	1.25	4.04
1976	1.24	0.11	0.48	0.05	0.25	2.12	0.41	0.72	0.06	0.90	0.07	0.11	0.79	1.39	4.45
1977	1.26	0.11	0.47	0.05	0.26	2.14	0.44	0.81	0.07	0.92	0.08	0.10	0.84	1.56	4.82
1978	1.23	0.10	0.45	0.06	0.23	2.07	0.48	0.82	0.08	0.92	0.09	0.09	0.75	1.64	4.87
1979	1.04	0.10	0.31	0.05	0.22	1.73	0.48	0.83	0.09	1.27	0.09	0.08	0.72	1.79	5.34
1980	0.86	0.07	0.28	0.06	0.25	1.52	0.40	0.62	0.09	1.17	0.08	0.08	0.59	1.81	4.84
1981	0.75	0.07	0.28	0.05	0.18	1.33	0.34	0.65	0.05	1.17	0.08	0.08	0.47	1.43	4.27
1982	0.70	0.06	0.26	0.05	0.17	1.24	0.34	0.62	0.07	1.21	0.07	0.07	0.46	1.22	4.06
1983	0.74	0.10	0.31	0.05	0.09	1.29	0.37	0.54	0.03	1.17	0.08	0.06	0.34	1.27	3.85
1984	0.77	0.09	0.26	0.06	0.12	1.29	0.41	0.56	0.03	1.28	0.08	0.08	0.39	1.36	4.19
1985	0.76	0.09	0.29	0.05	0.10	1.30	0.43	0.56	0.02	1.29	0.07	0.11	0.33	1.29	4.10
1986	0.76	0.08	0.29	0.06	0.13	1.31	0.45	0.56	0.02	1.21	0.07	0.11	0.32	1.37	4.11
1987	0.76	0.08	0.32	0.06	0.11	1.33	0.47	0.58	0.01	1.28	0.08	0.11	0.25	1.47	4.25
1988	0.77	0.08	0.31	0.06	0.11	1.34	0.47	0.57	0.01	1.33	0.08	0.10	0.24	1.59	4.39
1989	0.74	0.07	0.35	0.05	0.10	1.32	0.45	0.54	0.01	1.30	0.08	0.10	0.18	1.58	4.26
1990	0.62	0.04	0.32	0.06	0.10	1.14	0.48	0.56	0.01	1.22	0.08	0.10	0.18	1.70	4.32
1991	0.62	0.04	0.35	0.04	0.09	1.14	0.44	0.54	0.01	1.33	0.08	0.10	0.15	1.62	4.25
1992	0.62	0.04	0.34	0.04	0.08	1.12	0.45	0.54	(s)	1.40	0.08	0.10	0.17	1.80	4.55
1993	0.65	0.04	0.36	0.02	0.08	1.14	0.47	0.52	0.01	1.36	0.08	0.09	0.20	1.72	4.45
1994[E]	0.67	0.04	0.39	0.02	0.07	1.19	0.48	0.53	0.01	1.48	0.08	0.09	0.18	1.80	4.65

[1] "Other" is petrochemical feedstocks, special naphthas, waxes, petroleum coke, still gas, natural gasoline, pentanes plus, crude oil, and miscellaneous products.

E=Estimate. (s)=Less than 5,000 barrels per day.

Notes: • See Table 5.12b for the transportation sector, electric utilities, and overall total. • See Notes 1 and 3 at end of section for comments on the calculation of products supplied.

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

Sources: • 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* and Energy Information Administration (EIA) estimates. • 1960-1993—EIA, State Energy Data System 1993. • 1994—EIA, Integrated Modeling Data System output for the *Monthly Energy Review* (March 1995).

Table 5.12b Petroleum Products Supplied by the Transportation Sector, Electric Utilities, and Total, 1949-1994

(Million Barrels per Day)

Year	Transportation								Electric Utilities				Total
	Aviation Gasoline	Distillate Fuel Oil	Jet Fuel	Liquefied Petroleum Gases	Lubricants	Motor Gasoline	Residual Fuel Oil	Total	Heavy Oil [1]	Light Oil [2]	Petroleum Coke	Total	
1949	0.09	0.19	0.00	(s)	0.05	2.24	0.50	3.08	0.17	0.01	0.00	0.18	5.76
1950	0.11	0.23	0.00	(s)	0.06	2.43	0.52	3.36	0.19	0.01	0.00	0.21	6.46
1951	0.15	0.27	0.00	(s)	0.07	2.64	0.56	3.69	0.16	0.01	0.00	0.18	7.02
1952	0.17	0.31	0.05	0.01	0.06	2.75	0.52	3.87	0.17	0.01	0.00	0.18	7.27
1953	0.19	0.34	0.09	0.01	0.07	2.89	0.48	4.07	0.21	0.02	0.00	0.23	7.60
1954	0.18	0.34	0.13	0.01	0.06	2.97	0.43	4.11	0.17	0.01	0.00	0.18	7.76
1955	0.19	0.37	0.15	0.01	0.07	3.22	0.44	4.46	0.19	0.01	0.00	0.21	8.46
1956	0.20	0.40	0.20	0.01	0.07	3.30	0.44	4.62	0.18	0.01	0.00	0.20	8.78
1957	0.20	0.41	0.22	0.01	0.07	3.36	0.44	4.71	0.20	0.02	0.00	0.22	8.81
1958	0.22	0.39	0.27	0.01	0.06	3.45	0.41	4.83	0.20	0.02	0.00	0.21	9.12
1959	0.21	0.41	0.33	0.01	0.07	3.59	0.39	5.01	0.22	0.02	0.00	0.24	9.53
1960	0.16	0.42	0.37	0.01	0.07	3.74	0.37	5.14	0.23	0.01	0.00	0.24	9.80
1961	0.16	0.42	0.42	0.01	0.07	3.82	0.36	5.25	0.23	0.01	0.00	0.24	9.98
1962	0.14	0.45	0.49	0.02	0.07	3.97	0.34	5.48	0.23	0.01	0.00	0.24	10.40
1963	0.14	0.50	0.52	0.02	0.07	4.11	0.33	5.68	0.24	0.01	0.00	0.26	10.74
1964	0.13	0.53	0.56	0.02	0.07	4.19	0.34	5.83	0.26	0.01	0.00	0.28	11.02
1965	0.12	0.51	0.60	0.02	0.07	4.37	0.34	6.04	0.30	0.01	0.00	0.32	11.51
1966	0.11	0.55	0.67	0.03	0.07	4.60	0.34	6.36	0.37	0.02	0.00	0.39	12.08
1967	0.09	0.54	0.82	0.03	0.06	4.76	0.36	6.66	0.42	0.02	0.00	0.44	12.56
1968	0.08	0.65	0.95	0.03	0.07	5.06	0.35	7.20	0.49	0.03	0.00	0.52	13.39
1969	0.07	0.70	0.99	0.03	0.07	5.33	0.33	7.52	0.65	0.04	0.00	0.69	14.14
1970	0.05	0.74	0.97	0.03	0.07	5.59	0.33	7.78	0.85	0.07	0.01	0.93	14.70
1971	0.05	0.80	1.01	0.04	0.07	5.83	0.31	8.09	0.99	0.09	0.01	1.09	15.21
1972	0.05	0.91	1.02	0.04	0.07	6.20	0.28	8.57	1.20	0.15	0.01	1.36	16.37
1973	0.05	1.05	1.04	0.04	0.07	6.50	0.32	9.05	1.41	0.13	0.01	1.54	17.31
1974	0.04	1.04	0.98	0.03	0.07	6.37	0.30	8.84	1.32	0.15	0.01	1.48	16.65
1975	0.04	1.00	0.99	0.03	0.07	6.51	0.31	8.95	1.28	0.11	(s)	1.39	16.32
1976	0.04	1.07	0.98	0.03	0.08	6.82	0.36	9.37	1.40	0.11	(s)	1.52	17.46
1977	0.04	1.17	1.02	0.04	0.08	7.02	0.40	9.76	1.57	0.13	(s)	1.71	18.43
1978	0.04	1.26	1.04	0.04	0.08	7.26	0.43	10.16	1.61	0.13	0.01	1.75	18.85
1979	0.04	1.37	1.07	0.02	0.09	6.90	0.54	10.01	1.35	0.08	(s)	1.44	18.51
1980	0.03	1.31	1.06	0.01	0.08	6.44	0.61	9.55	1.07	0.08	(s)	1.15	17.06
1981	0.03	1.36	1.01	0.02	0.07	6.46	0.53	9.49	0.90	0.06	(s)	0.96	16.06
1982	0.03	1.31	1.01	0.02	0.07	6.42	0.44	9.31	0.64	0.04	(s)	0.69	15.30
1983	0.03	1.37	1.05	0.03	0.07	6.51	0.36	9.41	0.63	0.05	(s)	0.68	15.23
1984	0.02	1.47	1.18	0.03	0.08	6.55	0.35	9.68	0.52	0.04	(s)	0.56	15.73
1985	0.03	1.51	1.22	0.02	0.07	6.67	0.34	9.85	0.44	0.04	(s)	0.48	15.73
1986	0.03	1.55	1.31	0.02	0.07	6.87	0.38	10.23	0.59	0.04	(s)	0.64	16.28
1987	0.02	1.59	1.38	0.02	0.08	7.04	0.39	10.53	0.50	0.04	(s)	0.55	16.67
1988	0.03	1.73	1.45	0.02	0.08	7.18	0.40	10.87	0.63	0.05	0.01	0.68	17.28
1989	0.03	1.81	1.49	0.02	0.08	7.17	0.43	11.01	0.66	0.07	0.01	0.74	17.33
1990	0.02	1.80	1.52	0.02	0.08	7.08	0.45	10.97	0.50	0.04	0.01	0.55	16.99
1991	0.02	1.73	1.47	0.02	0.07	7.04	0.45	10.80	0.47	0.04	0.01	0.52	16.71
1992	0.02	1.79	1.45	0.01	0.07	7.13	0.47	10.95	0.37	0.03	0.01	0.42	17.03
1993	0.02	1.84	1.47	0.01	0.07	7.37	0.40	11.18	0.41	0.04	0.02	0.46	17.24
1994[E]	0.02	1.92	1.53	0.02	0.08	7.48	0.38	11.41	0.37	0.04	0.01	0.43	17.68

[1] Prior to 1980, based on oil used in steam plants. Since 1980, heavy oil has included fuel oil nos. 4, 5, and 6, and residual fuel oils.

[2] Prior to 1980, based on oil used in internal combustion and gas turbine engine plants. Since 1980, light oil has included fuel oil nos. 1 and 2, kerosene, and jet fuel.

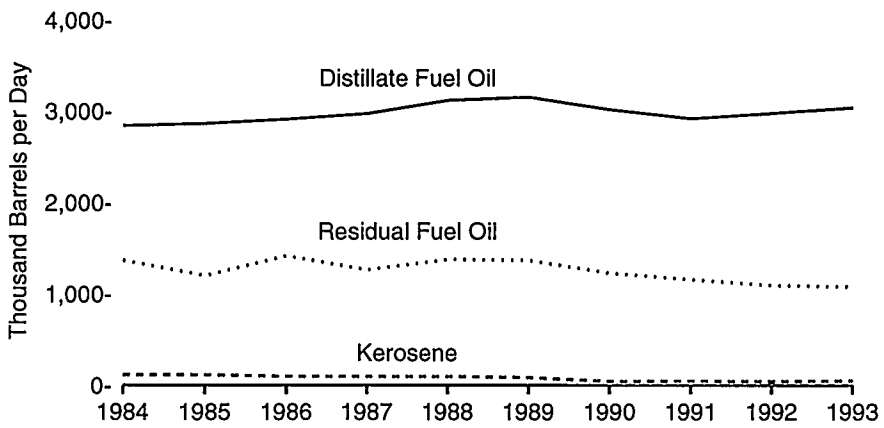
E=Estimate. (s)=Less than 5,000 barrels per day.

Notes: • See Table 5.12a for the residential and commercial sector and the industrial sector. • See Notes 1 and 3 at end of section for comments on the calculation of products supplied. • Totals may not equal sum of components due to independent rounding.

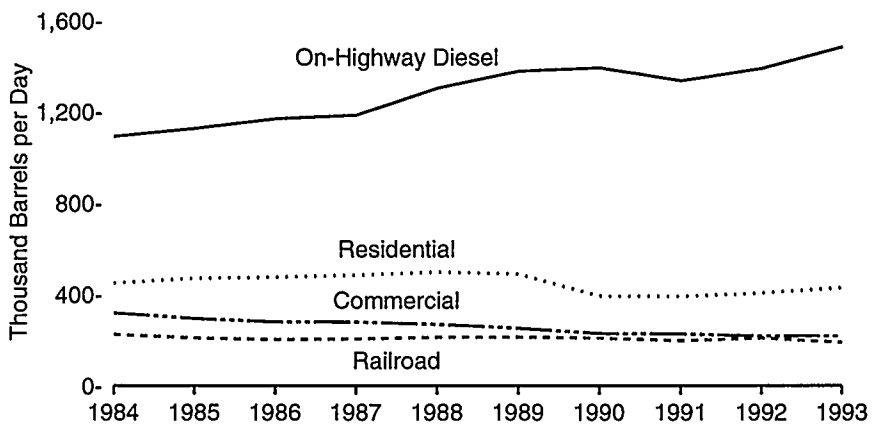
Sources: • 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* and Energy Information Administration (EIA) estimates. • 1960-1993—EIA, State Energy Data System 1993. • 1994—EIA, Integrated Modeling Data System output for the *Monthly Energy Review* (March 1995).

Figure 5.13 Fuel Oil and Kerosene Adjusted Sales, 1984-1993

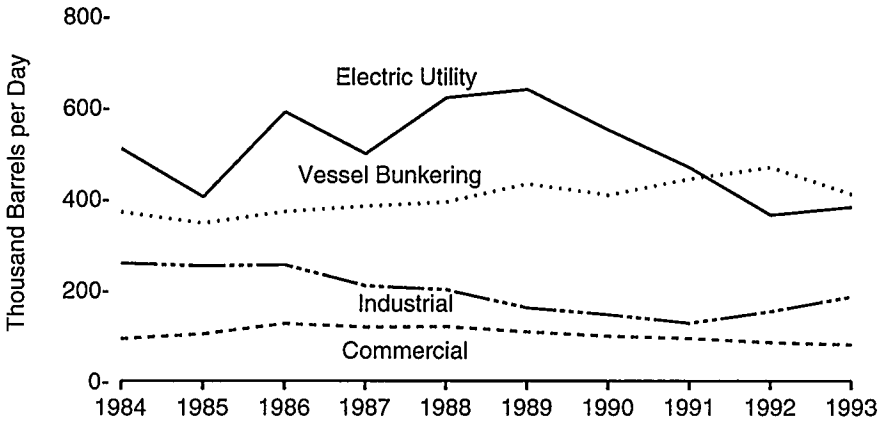
Total by Fuel



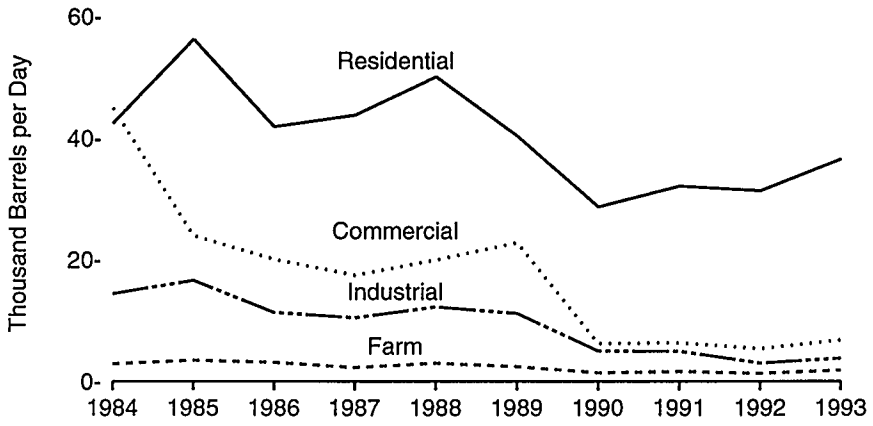
Distillate Fuel Oil, Major End Uses



Residual Fuel Oil, 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, 1984-1993

(Thousand Barrels per Day)

Year	Residential	Commercial	Industrial	Oil Company	Farm	Electric Utility	Railroad	Vessel Bunkering	On-Highway Diesel	Military	Off-Highway Diesel	All 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	489	252	167	55	209	70	213	154	1,378	61	107	2	3,157
1990	393	228	160	63	215	48	209	143	1,393	51	116	(s)	3,021
1991	391	226	152	59	214	39	197	141	1,336	54	110	(s)	2,921
1992	407	218	145	51	229	31	210	146	1,394	42	113	(s)	2,987
1993	429	218	128	50	211	38	190	133	1,485	31	127	(s)	3,041
						Residual Fuel Oil							
1984	—	92	258	76	—	509	([1])	370	—	14	—	50	1,369
1985	—	103	252	71	—	403	([1])	346	—	13	—	15	1,202
1986	—	126	254	51	—	590	([1])	371	—	12	—	15	1,418
1987	—	118	208	42	—	498	([1])	383	—	E12	—	3	1,264
1988	—	119	200	34	—	621	([1])	392	—	9	—	4	1,378
1989	—	108	160	22	—	639	([1])	432	—	7	—	2	1,370
1990	—	98	145	21	—	550	([1])	408	—	5	—	2	1,229
1991	—	93	126	20	—	468	NA	443	—	8	—	1	1,158
1992	—	84	152	19	—	364	NA	470	—	7	—	1	1,097
1993	—	79	184	21	—	381	NA	409	—	6	—	(s)	1,080
						Kerosene							
1984	42	45	14	—	3	—	—	—	—	—	—	11	115
1985	56	24	17	—	3	—	—	—	—	—	—	14	114
1986	42	20	11	—	3	—	—	—	—	—	—	22	98
1987	44	17	10	—	2	—	—	—	—	—	—	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)	42
1993	37	7	4	—	2	—	—	—	—	—	—	1	50

[1] Included in "All Other."

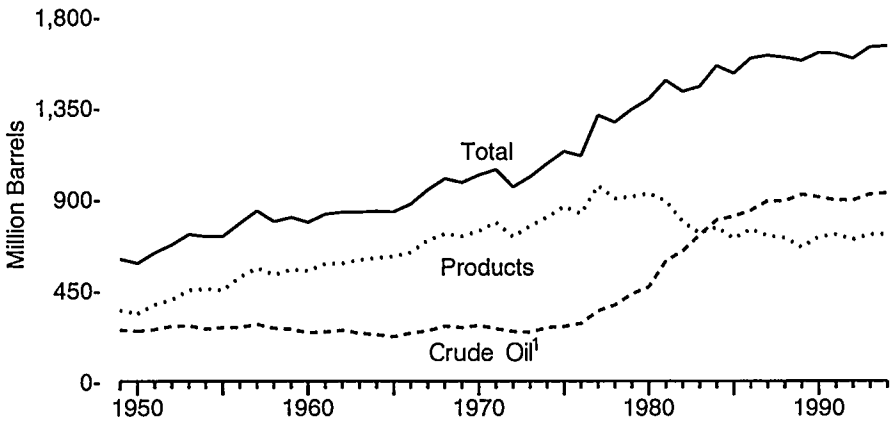
E = Annual estimate based on eleven months of data. NA=Not available. — = Not applicable. (s)=Less than 0.5 thousand barrels per day.

Notes: • Distillate fuel oil and kerosene data are sales data that were adjusted at the Petroleum Administration for Defense district level to equal Energy Information Administration (EIA) volume estimates of products supplied in the U.S. marketplace. The residual fuel data are sales data adjusted at the national level to equal the EIA volume estimate of residual fuel oil products supplied. Additional information is available in EIA's report *Fuel Oil and Kerosene Sales 1993* (October 1994). • Totals may not equal sum of components due to independent rounding.

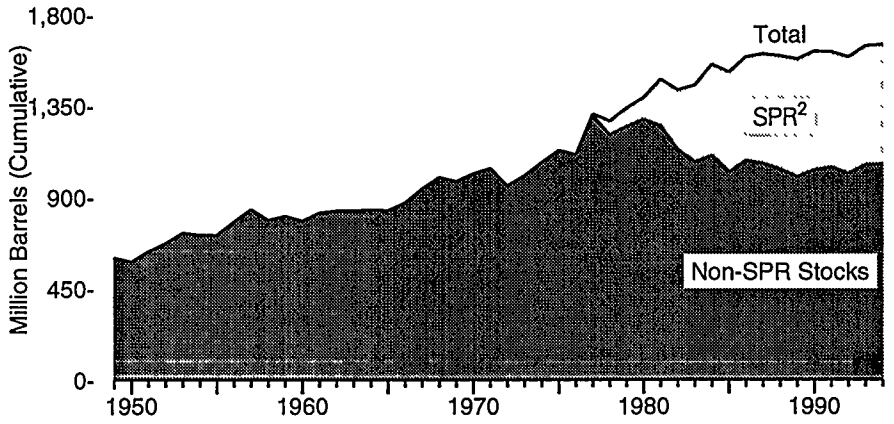
Sources: **Distillate Fuel Oil and Kerosene:** • 1984—EIA, *Petroleum Marketing Annual 1988*, Tables A13 and A15. • 1985—EIA, *Fuel Oil and Kerosene Sales 1989* (January 1991), Tables 13 and 15. • 1986-1988—EIA, *Fuel Oil and Kerosene Sales 1990* (October 1991), Tables 13 and 15. • 1989 forward—EIA, *Fuel Oil and Kerosene Sales 1993* (September 1994), Tables 13 and 15. **Residual Fuel Oil:** • 1984—EIA, *Petroleum Marketing Annual 1988*, Table A14. • 1985-1986—EIA, *Fuel Oil and Kerosene Sales 1990* (October 1991), Table A1. • 1987—EIA, *Fuel Oil and Kerosene Sales 1991* (November 1992), Table 14. • 1988—EIA, *Fuel Oil and Kerosene Sales 1992* (October 1993), Table 14. • 1989 forward—EIA, *Fuel Oil and Kerosene Sales 1993* (September 1994), Table 14.

Figure 5.14 Petroleum Primary Stocks by Type, End of Year

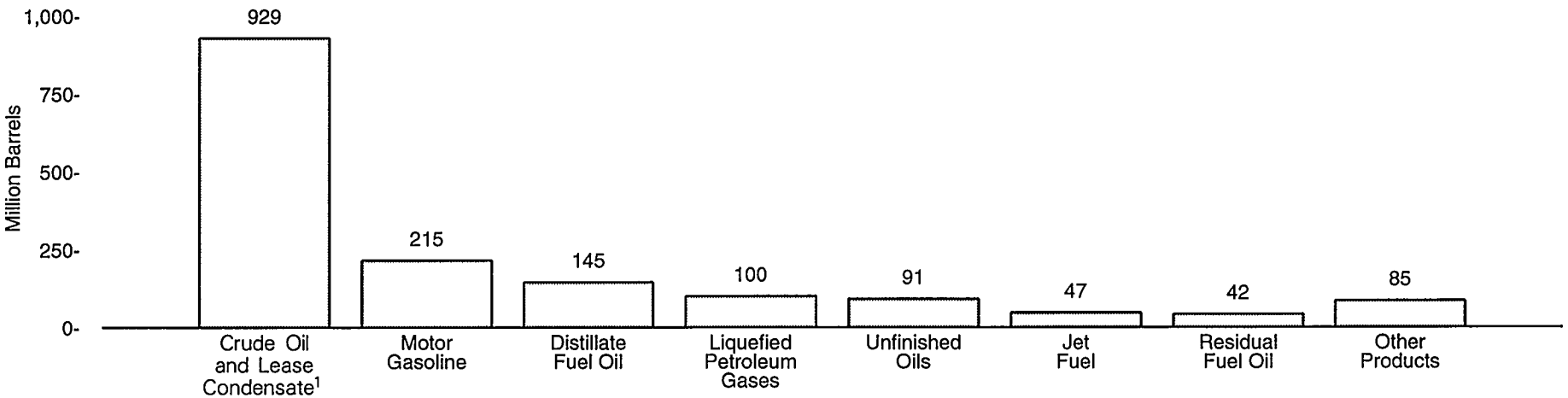
Total, Products, and Crude Oil,[1] 1949-1994



SPR,[2] Non-SPR, and Total Stocks, 1949-1994



By Type, 1994



[1] Includes crude oil stored in the Strategic Petroleum Reserve (SPR).
[2] See Figure 5.15 for additional Strategic Petroleum Reserve information.

Note: Because vertical scales differ, graphs should not be compared.
Sources: Tables 5.14 and 5.15.

Table 5.14 Petroleum Primary Stocks by Type, End of Year 1949-1994

(Million Barrels)

Year	Crude Oil and Lease Condensate			Petroleum Products										Total Petroleum
	Strategic Petroleum Reserve	Other Primary	Total	Motor Gasoline [1]	Jet Fuel	Distillate Fuel Oil		Residual Fuel Oil	Liquefied Petroleum Gases		Unfinished Oils	Other Products [4]	Total Products	
						Low Sulfur [2]	Total		Propane [3]	Total				
1949	0	253	253	110	NA	NA	75	60	([5])	1	66	37	350	603
1950	0	248	248	116	NA	NA	72	41	([5])	2	70	34	334	583
1951	0	256	256	135	NA	NA	87	43	([5])	2	67	45	378	634
1952	0	272	272	135	2	NA	99	49	([5])	3	62	53	402	674
1953	0	274	274	158	3	NA	112	49	([5])	4	69	56	451	726
1954	0	258	258	155	3	NA	108	52	([5])	7	74	57	457	715
1955	0	266	266	165	3	NA	111	39	([5])	7	68	55	449	715
1956	0	266	266	187	5	NA	134	44	([5])	14	67	63	514	780
1957	0	282	282	197	5	NA	149	60	([5])	14	69	66	560	841
1958	0	263	263	187	6	NA	125	60	([5])	16	70	63	526	789
1959	0	257	257	188	8	NA	151	54	([5])	19	67	66	552	809
1960	0	240	240	195	7	NA	138	45	([5])	23	62	76	545	785
1961	0	245	245	184	8	NA	152	45	([5])	31	79	81	580	825
1962	0	252	252	189	10	NA	144	50	([5])	25	82	83	582	834
1963	0	237	237	191	9	NA	157	48	([5])	28	82	85	598	836
1964	0	230	230	186	19	NA	156	40	([5])	30	87	92	609	839
1965	0	220	220	175	19	NA	155	56	([5])	30	89	92	616	836
1966	0	238	238	186	19	NA	154	61	([5])	35	89	91	636	874
1967	0	249	249	200	22	NA	160	66	([5])	64	90	93	695	944
1968	0	272	272	204	24	NA	173	67	([5])	76	93	89	727	1,000
1969	0	265	265	211	28	NA	172	58	([5])	60	98	88	715	980
1970	0	276	276	209	28	NA	195	54	([5])	67	99	89	741	1,018
1971	0	260	260	219	28	NA	191	60	([5])	95	101	92	784	1,044
1972	0	246	246	213	25	NA	154	55	([5])	86	95	84	713	959
1973	0	242	242	209	29	NA	196	53	([5])	99	99	80	766	1,008
1974	0	265	265	218	29	NA	200	60	([5])	113	106	82	809	1,074
1975	0	271	271	235	30	NA	209	74	([5])	125	106	82	862	1,133
1976	0	285	285	231	32	NA	186	72	([5])	116	110	78	826	1,112
1977	7	340	348	258	35	NA	250	90	([5])	136	113	82	964	1,312
1978	67	309	376	238	34	NA	216	90	([5])	132	109	82	901	1,278
1979	91	339	430	237	39	NA	229	96	([5])	111	118	82	911	1,341
1980	108	358	466	261	42	NA	205	92	([5])	120	124	82	926	1,392
1981	230	363	594	253	41	NA	192	78	([5])	135	111	80	890	1,484
1982	294	350	644	235	37	NA	179	66	([5])	94	105	70	786	1,430
1983	379	344	723	222	39	NA	140	49	([5])	101	108	72	731	1,454
1984	451	345	796	243	42	NA	161	53	58	101	94	67	760	1,556
1985	493	321	814	223	40	NA	144	50	39	74	107	67	705	1,519
1986	512	331	843	233	50	NA	155	47	63	103	94	68	750	1,593
1987	541	349	890	226	50	NA	134	47	48	97	93	70	718	1,607
1988	560	330	890	228	44	NA	124	45	50	97	100	70	707	1,597
1989	580	341	921	213	41	NA	106	44	32	80	106	70	660	1,581
1990	586	323	908	220	52	NA	132	49	49	98	99	63	712	1,621
1991	569	325	893	219	49	NA	144	50	48	92	98	72	724	1,617
1992	575	318	893	216	43	NA	141	43	39	89	95	73	699	1,592
1993	587	335	922	R226	40	R64	141	44	51	R106	88	78	R725	R1,647
1994P	592	337	929	215	47	72	145	42	47	100	91	85	725	1,654

[1] Prior to 1964, motor gasoline data were for total gasoline, which included motor gasoline, aviation gasoline, and special naphthas. For 1981 forward, includes motor gasoline blending components.

[2] Sulfur content of 0.05 percent or less by weight.

[3] Includes propylene.

[4] 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.

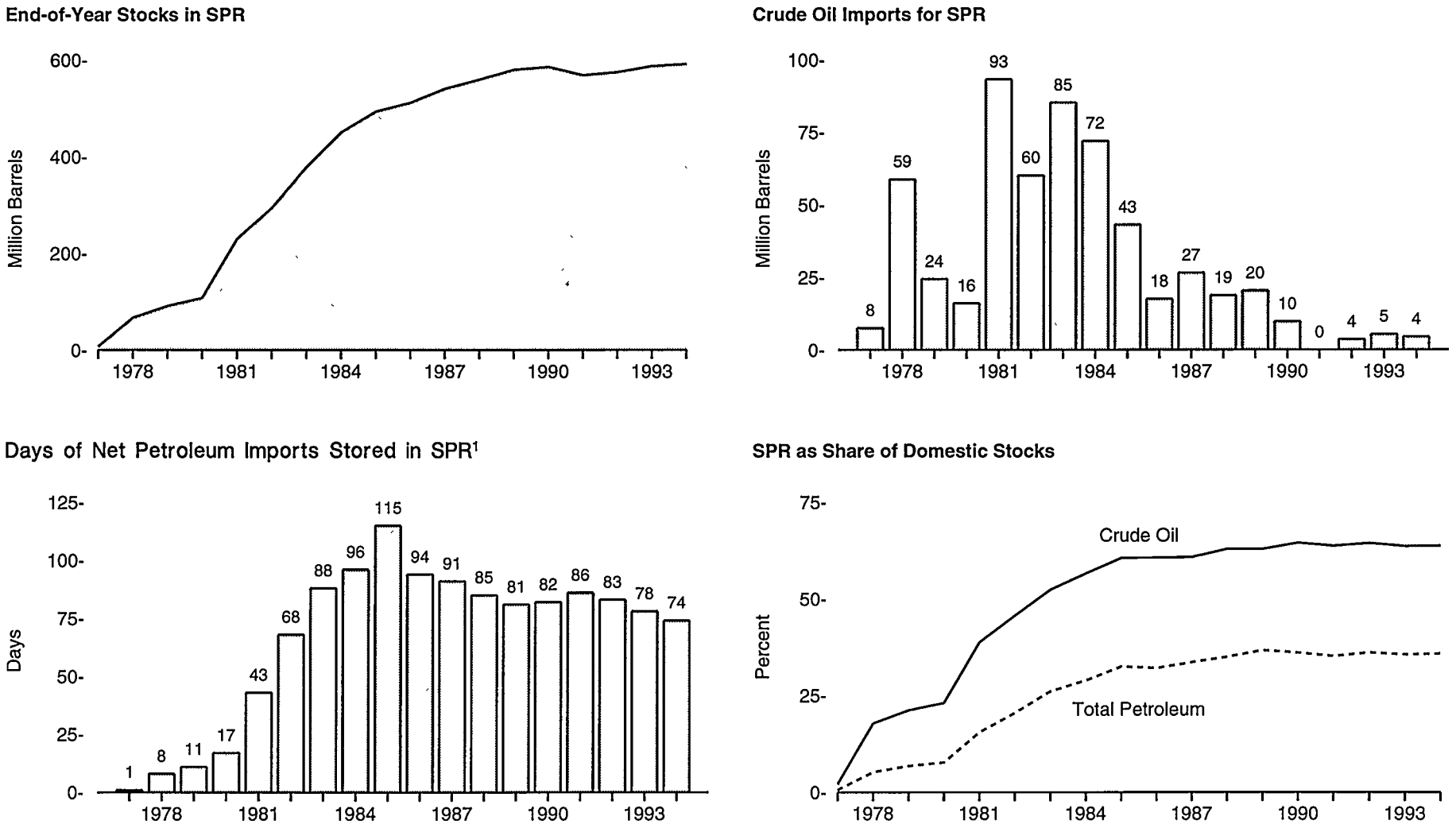
[5] Included in liquefied petroleum gases total.

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

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

Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.15 Strategic Petroleum Reserve, 1977-1994



[1] Derived by dividing end-of-year Strategic Petroleum Reserve 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, 1977-1994

(Million Barrels, Except as Noted)

Year	Crude Oil Imports	Domestic Crude Oil Deliveries	Domestic Crude Oil Sales	End-of-Year Stocks			Days of Net Petroleum Imports [3]
				Quantity [1]	Share of Crude Oil [2] Stocks (percent)	Share of Total Petroleum Stocks (percent)	
1977	7.54	[4]0.37	0.00	7.46	2.1	0.6	1
1978	58.80	0.00	0.00	66.86	17.8	5.2	8
1979	24.43	(s)	0.00	91.19	21.2	6.8	11
1980	16.07	1.30	0.00	107.80	23.1	7.7	17
1981	93.30	28.79	0.00	230.34	38.8	15.5	43
1982	60.19	3.79	0.00	293.83	45.7	20.5	68
1983	85.29	0.42	0.00	379.09	52.4	26.1	88
1984	72.04	0.05	0.00	450.51	56.6	28.9	96
1985	43.12	0.17	0.00	493.32	60.6	32.5	115
1986	17.56	1.21	0.00	511.57	60.7	32.1	94
1987	26.52	2.69	0.00	540.65	60.8	33.6	91
1988	18.76	0.01	0.00	559.52	62.9	35.0	85
1989	20.35	0.00	0.00	579.86	62.9	36.7	81
1990	9.77	0.00	3.91	585.69	64.5	36.1	82
1991	0.00	0.00	17.22	568.51	63.7	35.2	86
1992	3.59	2.60	0.00	574.72	64.4	36.1	83
1993	5.37	6.96	0.00	587.08	63.6	[R]35.6	78
1994	4.49	0.11	0.00	591.67	63.7	35.8	74

[1] Stocks do not include imported quantities in transit to Strategic Petroleum Reserve terminals, pipeline fill, and above-ground storage.

[2] Including lease condensate stocks.

[3] Derived by dividing end-of-year Strategic Petroleum Reserve stocks by annual average daily net imports of all petroleum. Calculated prior to rounding.

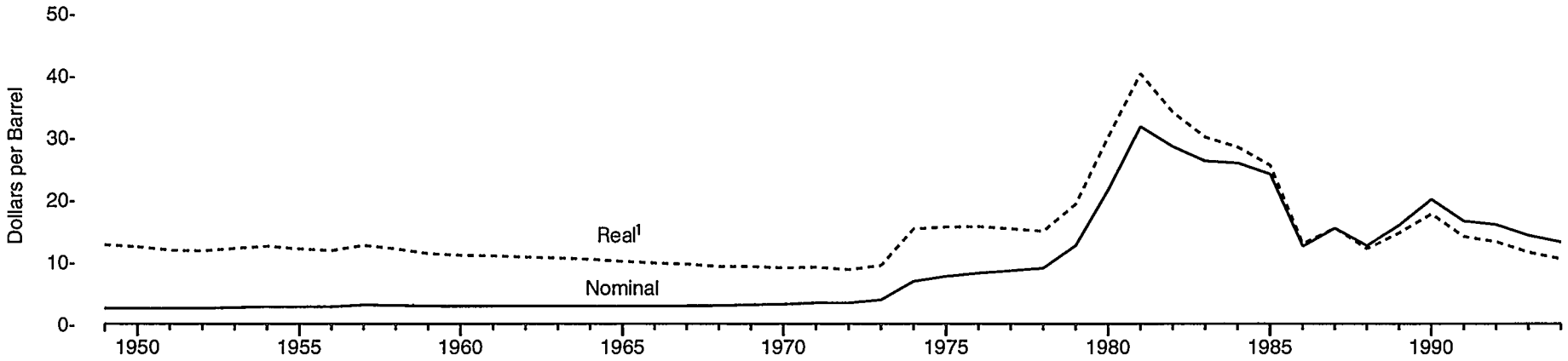
[4] The quantity of domestic fuel oil which was in storage prior to injection of foreign crude oil.

(s)=Less than 0.005 million barrels.

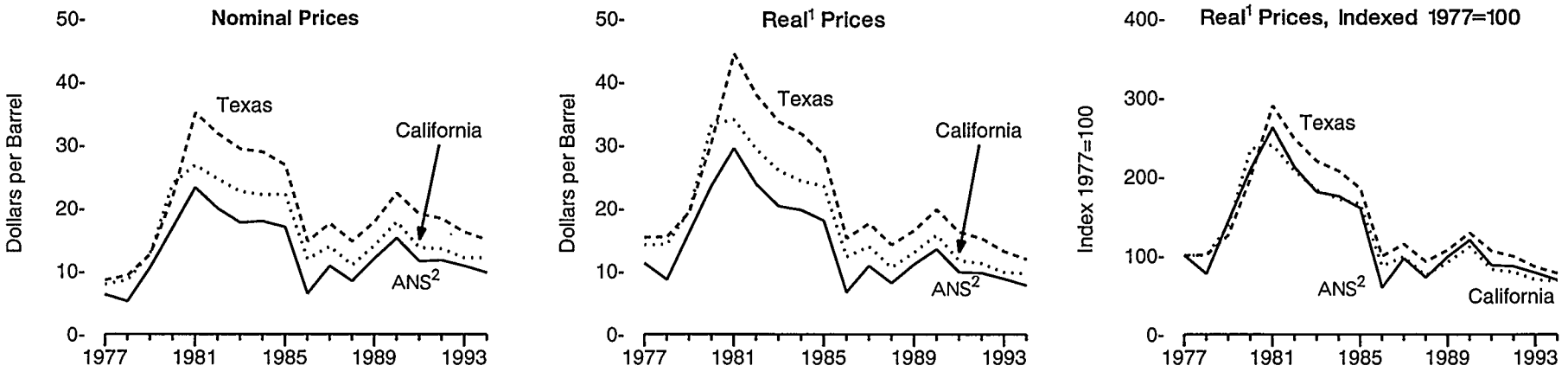
Sources: **Domestic Crude Oil Deliveries and Domestic Crude Oil Sales:** U.S. Department of Energy, Assistant Secretary for Fossil Energy, unpublished data. **All Other Data:** • 1977-1980—Energy Information Administration (EIA), Energy Data Report, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.16 Crude Oil Domestic First Purchase Prices

U.S. Average Real[1] and Nominal Prices, 1949-1994



Alaska North Slope, California, and Texas, 1977-1994



[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

[2] Alaska North Slope.
Source: Table 5.16.

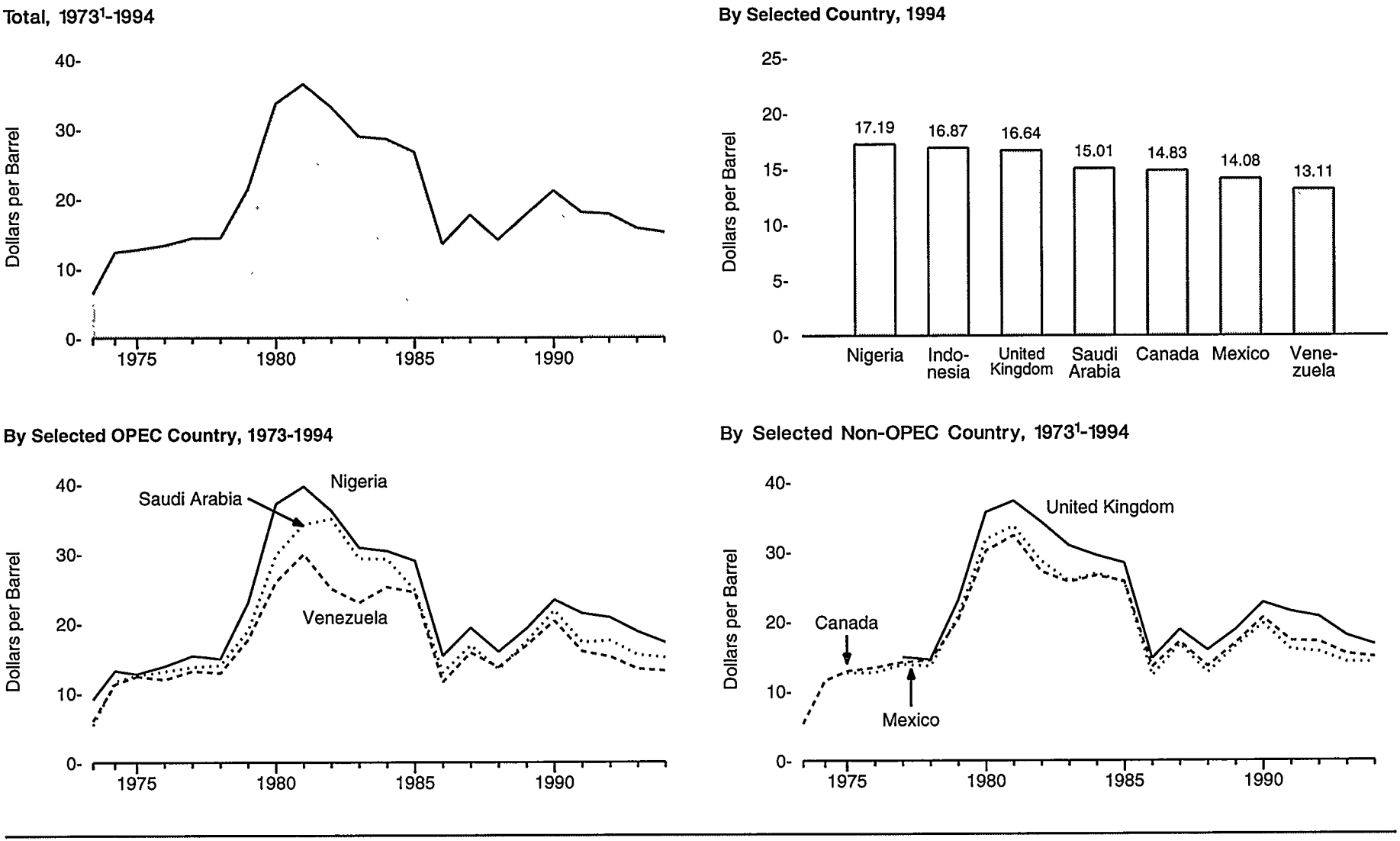
Table 5.16 Crude Oil Domestic First Purchase Prices, 1949-1994

(Dollars per Barrel)

Year	Alaska North Slope		California		Texas		U.S. Average	
	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]
1949	—	—	—	—	—	—	2.54	12.76
1950	—	—	—	—	—	—	2.51	12.43
1951	—	—	—	—	—	—	2.53	11.88
1952	—	—	—	—	—	—	2.53	11.77
1953	—	—	—	—	—	—	2.68	12.18
1954	—	—	—	—	—	—	2.78	12.52
1955	—	—	—	—	—	—	2.77	12.10
1956	—	—	—	—	—	—	2.79	11.82
1957	—	—	—	—	—	—	3.09	12.66
1958	—	—	—	—	—	—	3.01	12.09
1959	—	—	—	—	—	—	2.90	11.33
1960	—	—	—	—	—	—	2.88	11.08
1961	—	—	—	—	—	—	2.89	10.99
1962	—	—	—	—	—	—	2.90	10.78
1963	—	—	—	—	—	—	2.89	10.63
1964	—	—	—	—	—	—	2.88	10.40
1965	—	—	—	—	—	—	2.86	10.07
1966	—	—	—	—	—	—	2.88	9.80
1967	—	—	—	—	—	—	2.92	9.64
1968	—	—	—	—	—	—	2.94	9.25
1969	—	—	—	—	—	—	3.09	9.25
1970	—	—	—	—	—	—	3.18	9.03
1971	—	—	—	—	—	—	3.39	9.14
1972	—	—	—	—	—	—	3.39	8.74
1973	—	—	—	—	—	—	3.89	9.42
1974	—	—	—	—	—	—	6.87	15.30
1975	—	—	—	—	—	—	7.67	15.59
1976	—	—	—	—	—	—	8.19	15.66
1977	R,2 6.29	2 11.25	7.92	14.17	8.58	15.35	8.57	15.33
1978	5.21	8.64	8.58	14.23	9.29	15.41	9.00	14.93
1979	10.57	16.14	12.78	19.51	12.65	19.31	12.64	19.30
1980	16.87	23.53	23.87	33.29	21.84	30.46	21.59	30.11
1981	23.23	29.44	26.80	33.97	35.06	44.44	31.77	40.27
1982	19.92	23.77	24.58	29.33	31.77	37.91	28.52	34.03
1983	17.69	20.29	22.61	25.93	29.35	33.66	26.19	30.03
1984	17.91	19.68	22.09	24.27	28.87	31.73	25.88	28.44
1985	16.98	17.99	22.14	23.45	26.80	28.39	24.09	25.52
1986	6.45	6.66	11.90	12.28	14.73	15.20	12.51	12.91
1987	10.83	10.83	13.92	13.92	17.55	17.55	15.40	15.40
1988	8.43	8.11	10.97	10.56	14.71	14.16	12.58	12.11
1989	12.00	11.06	14.06	12.96	17.81	16.41	15.86	14.62
1990	15.23	13.44	17.81	15.72	22.37	19.74	20.03	17.68
1991	11.57	R 9.84	13.72	R 11.67	19.04	R 16.19	16.54	R 14.06
1992	11.73	R 9.70	13.55	R 11.21	18.32	R 15.15	15.99	R 13.23
1993	R 10.84	R 8.78	R 12.11	R 9.81	R 16.19	R 13.11	R 14.25	R 11.54
1994 P	9.77	7.75	12.12	9.61	14.98	11.88	13.19	10.46

[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
[2] Average for July through December only.
R=Revised data. P=Preliminary data. — = Not applicable.
Note: For the definition of crude oil domestic first purchase prices, see Note 5 at end of section.
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 September 1979—FEA, Form FEA-P-124, "Domestic Crude Oil Purchaser's Monthly Report." • October 1979 through 1982—Economic Regulatory Administration, Form ERA-182, "Domestic Crude Oil First Purchase Report." • 1983 forward—Energy Information Administration, Form EIA-182, "Domestic Crude Oil First Purchase Report."

Figure 5.17 Landed Costs of Crude Oil Imports from Selected Countries



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

Source: Table 5.17.

Table 5.17 Landed Costs of Crude Oil Imports from Selected Countries, 1973-1994

(Dollars per Barrel)

Year	OPEC [1]								Non-OPEC				Total
	Algeria	Indonesia	Nigeria	Saudi Arabia	Venezuela	Other [2]	Total [3]	Arab OPEC [4]	Canada	Mexico	United Kingdom	Other	
1973[5]	8.39	7.22	9.08	5.37	5.99	6.55	6.85	5.92	5.33	NA	NA	7.51	6.41
1974	13.97	13.20	13.16	11.63	11.25	12.61	12.49	12.39	11.48	W	NA	12.98	12.32
1975	12.86	13.83	12.70	12.50	12.36	12.66	12.70	12.71	12.84	12.61	NA	12.41	12.70
1976	13.90	13.85	13.81	13.06	11.89	13.16	13.32	13.31	13.36	12.64	W	13.48	13.32
1977	15.24	14.65	15.29	13.69	13.11	14.25	14.35	14.30	14.13	13.82	14.83	14.70	14.36
1978	14.93	14.65	14.88	13.94	12.84	14.31	14.34	14.36	14.41	13.56	14.53	14.74	14.35
1979	21.88	20.63	22.97	18.95	17.65	23.12	21.29	20.79	20.22	20.77	22.97	23.21	21.45
1980	37.92	33.92	37.15	29.80	25.92	36.08	33.56	32.97	30.11	31.77	35.68	36.16	33.67
1981	40.46	37.31	39.66	34.20	29.91	39.06	36.60	36.22	32.32	33.70	37.29	38.08	36.47
1982	35.35	36.70	36.16	34.99	24.93	34.13	34.81	35.15	27.15	28.63	34.25	33.87	33.18
1983	31.26	31.57	30.85	29.27	22.94	29.29	29.84	29.87	25.63	25.78	30.87	29.87	28.93
1984	29.06	30.87	30.36	29.20	25.19	28.85	29.06	29.10	26.56	26.85	29.45	29.33	28.54
1985	27.51	28.67	28.96	24.72	24.43	26.58	26.86	25.90	25.71	25.63	28.36	27.47	26.67
1986	14.82	14.63	15.29	12.84	11.52	13.42	13.46	13.14	13.43	12.17	14.63	14.49	13.49
1987	17.87	18.49	19.32	16.81	15.76	18.12	17.64	17.32	17.04	16.69	18.78	18.43	17.65
1988	W	15.15	15.88	13.37	13.66	13.83	14.18	13.60	13.50	12.58	15.82	14.88	14.08
1989	19.13	18.35	19.19	17.34	16.78	17.56	17.78	17.41	16.81	16.35	18.74	18.51	17.68
1990	W	22.50	23.33	21.82	20.31	18.65	21.23	20.64	20.48	19.64	22.65	21.96	21.13
1991	W	20.20	21.39	17.22	15.92	18.91	18.08	17.45	17.16	15.89	21.37	19.90	18.02
1992	W	18.76	20.78	17.48	15.13	19.15	17.81	17.63	17.04	15.60	20.63	19.29	17.75
1993	17.34	R18.55	R18.73	R15.40	R13.39	R15.45	R15.68	R15.28	15.27	14.11	R17.92	R16.98	R15.72
1994P	W	16.87	17.19	15.01	13.11	15.15	15.01	14.91	14.83	14.08	16.64	16.23	15.13

[1] Organization of Petroleum Exporting Countries (OPEC). See Glossary for membership.

[2] Gabon, Iran, Iraq, Kuwait, Libya, Qatar, and United Arab Emirates; Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. Prior to 1988, imports from the Neutral Zone between Kuwait and Saudi Arabia were included in imports from Saudi Arabia. From 1988 forward, those imports have been included in imports from "Other."

[3] Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. Total OPEC imports exclude petroleum imported into the United States indirectly from OPEC countries, primarily from Caribbean and West European refining areas, as petroleum products that were refined from crude oil produced in OPEC countries.

[4] Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates. Imports from the Neutral Zone are included in imports from "Arab OPEC."

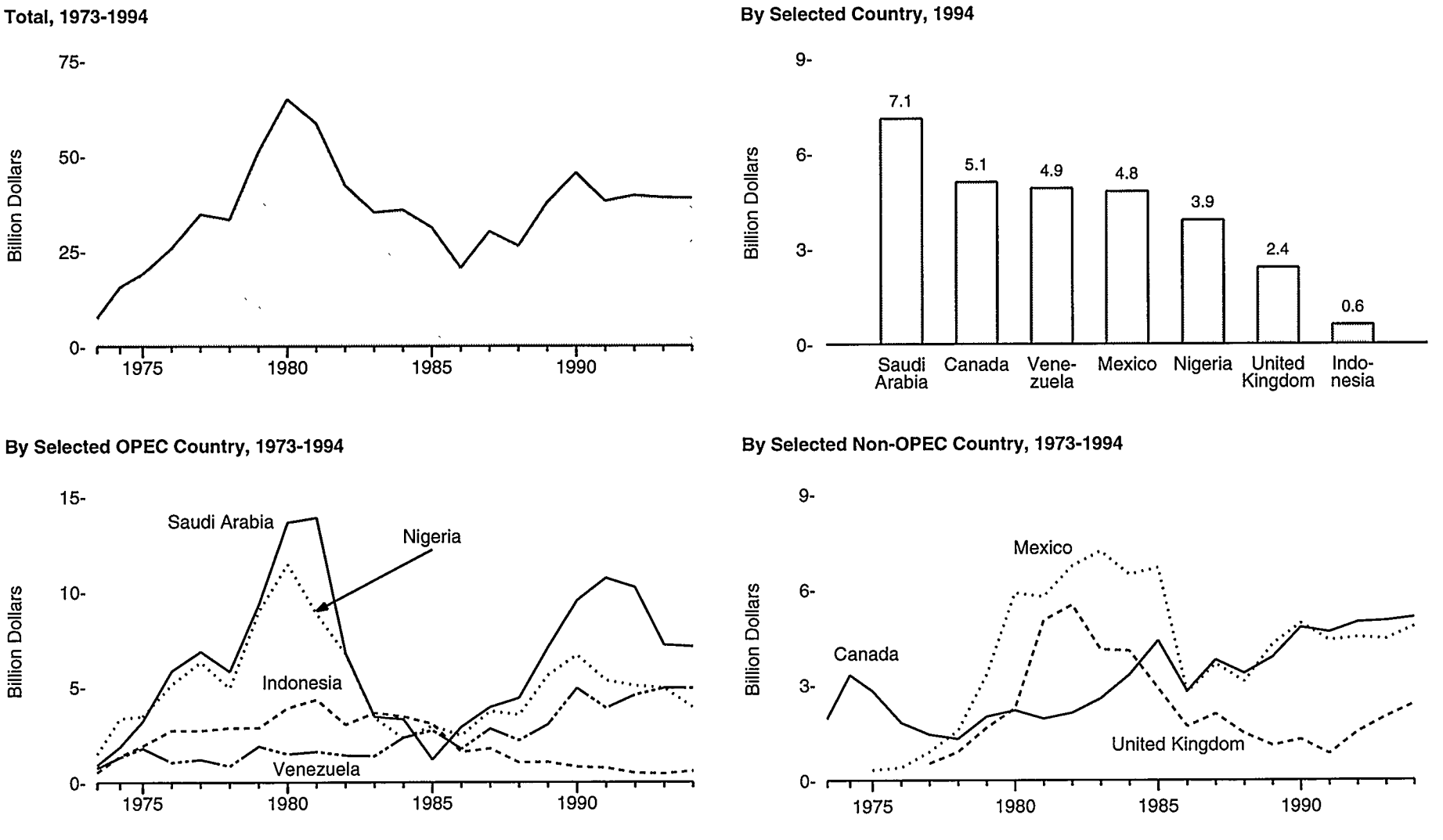
[5] Based on October, November, and December data only.

R=Revised data. P=Preliminary data. NA=Not available, included in "Other Non-OPEC." W=Value withheld to avoid disclosure of individual company data.

Notes: • Data include imports for the Strategic Petroleum Reserve, which began in 1977. • Totals may not equal sum of components due to independent rounding.

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, "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 from Selected Countries



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

Source: Table 5.18.

Table 5.18 Value of Crude Oil Imports from Selected Countries, 1973-1994

(Billion Dollars)

	OPEC [1]								Non-OPEC				
Year	Algeria	Indonesia	Nigeria	Saudi Arabia	Venezuela	Other [2]	Total [3]	Arab OPEC [4]	Canada	Mexico	United Kingdom	Other	Total [5]
1973	0.4	0.5	1.5	0.9	0.8	1.2	5.2	1.8	1.9	NA	NA	0.4	7.6
1974	0.9	1.4	3.3	1.9	1.3	2.9	11.6	3.2	3.3	W	NA	0.7	15.6
1975	1.2	1.9	3.5	3.2	1.8	3.4	14.9	6.2	2.8	0.3	NA	1.0	19.0
1976	2.1	2.7	5.1	5.8	1.0	5.4	22.2	11.6	1.8	0.4	W	1.3	25.8
1977	3.0	2.7	6.3	6.9	1.2	9.6	29.6	16.4	1.4	0.9	0.5	2.2	34.7
1978	3.5	2.9	4.9	5.8	0.8	9.3	27.1	15.4	1.3	1.6	0.9	2.4	33.3
1979	4.9	2.9	9.0	9.3	1.9	12.0	39.7	22.8	2.0	3.3	1.7	4.2	51.0
1980	6.3	3.9	11.4	13.6	1.5	11.2	47.5	30.2	2.2	5.9	2.3	6.9	64.9
1981	3.9	4.3	8.8	13.9	1.6	6.7	39.0	23.4	1.9	5.8	5.0	6.5	58.5
1982	1.2	3.0	6.7	6.8	1.4	2.8	22.0	9.4	2.1	6.7	5.5	5.6	42.2
1983	2.0	3.6	3.4	3.4	1.4	2.1	16.1	5.8	2.6	7.2	4.1	4.9	35.2
1984	2.1	3.4	2.3	3.3	2.3	2.6	16.1	6.7	3.3	6.5	4.1	5.8	35.8
1985	0.8	3.1	3.0	1.2	2.7	2.1	12.9	2.8	4.4	6.7	2.9	4.3	31.2
1986	0.4	1.6	2.4	2.9	1.8	1.3	10.4	4.1	2.8	2.8	1.7	2.9	20.6
1987	0.7	1.8	3.7	3.9	2.8	2.4	15.5	6.1	3.8	3.7	2.1	5.1	30.1
1988	W	1.0	3.5	4.4	2.2	2.5	14.0	7.0	3.4	3.1	1.5	4.4	26.3
1989	0.4	1.1	5.6	7.1	3.0	4.8	21.9	11.4	3.9	4.3	1.1	6.5	37.7
1990	W	0.8	6.7	9.5	4.9	4.8	27.2	14.0	4.8	4.9	1.3	7.2	45.5
1991	W	0.8	5.3	10.7	3.9	1.2	22.3	11.2	4.7	4.4	0.8	5.8	38.0
1992	W	0.5	5.1	10.2	4.6	1.6	22.2	10.7	5.0	R4.5	1.5	R6.3	39.5
1993	R0.2	0.4	4.9	7.2	4.9	2.9	R20.7	9.3	5.0	R4.4	2.0	R6.8	R38.9
1994P	W	0.6	3.9	7.1	4.9	2.8	19.6	8.9	5.1	4.8	2.4	6.9	38.8

[1] Organization of Petroleum Exporting Countries. See Glossary for membership.

[2] Gabon, Iran, Iraq, Kuwait, Libya, Qatar, and United Arab Emirates; Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. Prior to 1988, imports from the Neutral Zone between Kuwait and Saudi Arabia were included in imports from Saudi Arabia. From 1988 forward, those imports have been included in imports from "Other."

[3] Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. Total OPEC imports exclude petroleum imported into the United States indirectly from OPEC countries, primarily from Caribbean and West European refining areas, as petroleum products that were refined from crude oil produced in OPEC countries.

[4] Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates. Imports from the Neutral Zone are included in imports from "Arab OPEC."

[5] 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.

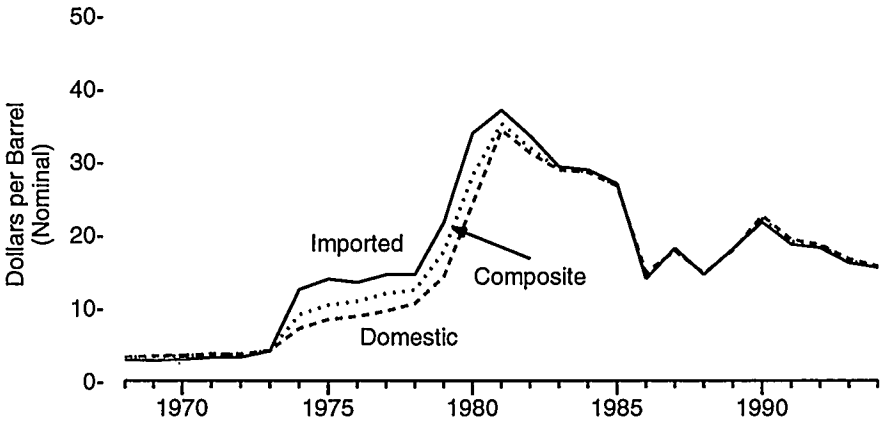
R=Revised data. P=Preliminary data. NA=Not available, included in "Other Non-OPEC." W=Value withheld to avoid disclosure of individual company data.

Note: Because the volumes associated with the landed costs are not the same as those used in the calculation of this table, the value of imports do not sum. The values were calculated independently.

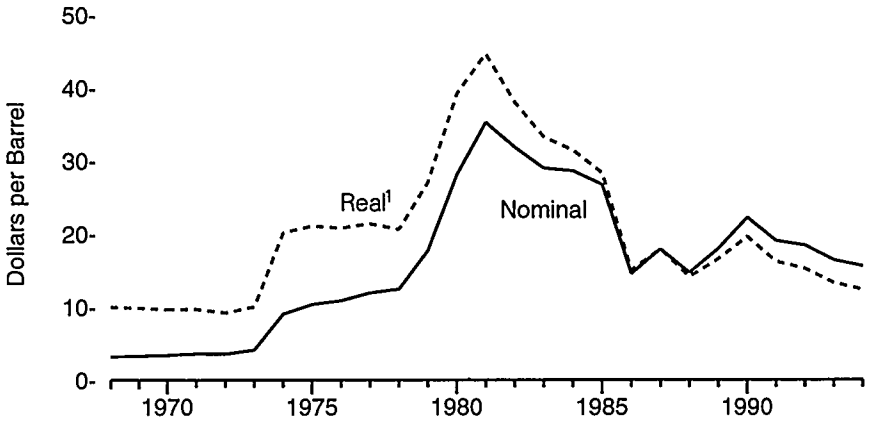
Sources: Calculated by using prices on Table 5.17 and volume data as follows: • 1973-1975—U.S. Department of the Interior, Bureau of Mines, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Petroleum Supply Monthly* (February 1995).

Figure 5.19 Crude Oil Refiner Acquisition Costs, 1968-1994

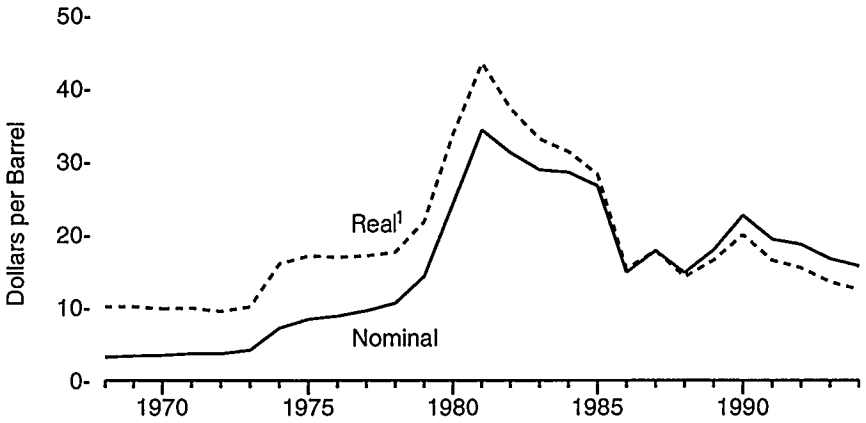
Summary



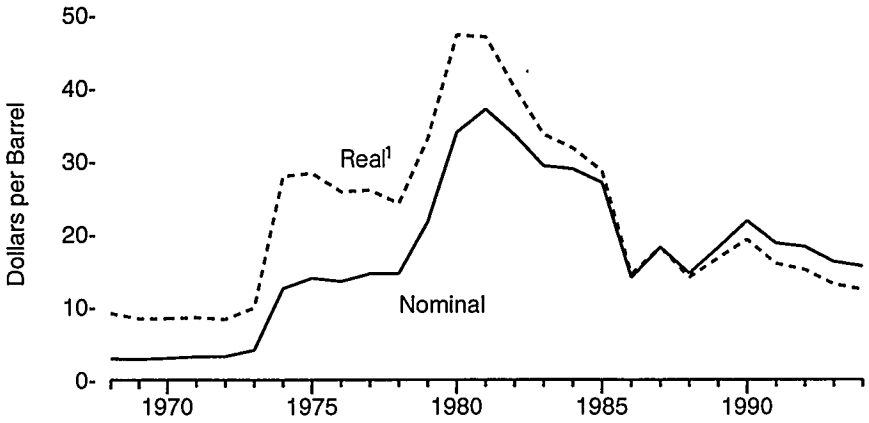
Composite Costs



Domestic Costs



Imported Costs



[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

Source: Table 5.19.

Table 5.19 Crude Oil Refiner Acquisition Costs, 1968-1994

(Dollars per Barrel)

Year	Domestic		Imported		Composite	
	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]
1968	3.21	10.09	2.90	9.12	3.17	9.97
1969	3.37	10.09	2.80	8.38	3.29	9.85
1970	3.46	9.83	2.96	8.41	3.40	9.66
1971	3.68	9.92	3.17	8.54	3.60	9.70
1972	3.67	9.46	3.22	8.30	3.58	9.23
1973	4.17	10.10	4.08	9.88	4.15	10.05
1974	7.18	15.99	12.52	27.88	9.07	20.20
1975	8.39	17.05	13.93	28.31	10.38	21.10
1976	8.84	16.90	13.48	25.77	10.89	20.82
1977	9.55	17.08	14.53	25.99	11.96	21.40
1978	10.61	17.60	14.57	24.16	12.46	20.66
1979	14.27	21.79	21.67	33.08	17.72	27.05
1980	24.23	33.79	33.89	47.27	28.07	39.15
1981	34.33	43.51	37.05	46.96	35.24	44.66
1982	31.22	37.26	33.55	40.04	31.87	38.03
1983	28.87	33.11	29.30	33.60	28.99	33.25
1984	28.53	31.35	28.88	31.74	28.63	31.46
1985	26.66	28.24	26.99	28.59	26.75	28.34
1986	14.82	15.29	14.00	14.45	14.55	15.02
1987	17.76	17.76	18.13	18.13	17.90	17.90
1988	14.74	14.19	14.56	14.01	14.67	14.12
1989	17.87	16.47	18.08	16.66	17.97	16.56
1990	22.59	19.94	21.76	19.21	22.22	19.61
1991	19.33	R16.44	18.70	R15.90	19.06	R16.21
1992	18.63	R15.41	18.20	R15.05	18.43	R15.24
1993	R16.67	R13.50	16.14	R13.07	16.41	R13.29
1994P	15.68	12.43	15.51	12.30	15.59	12.36

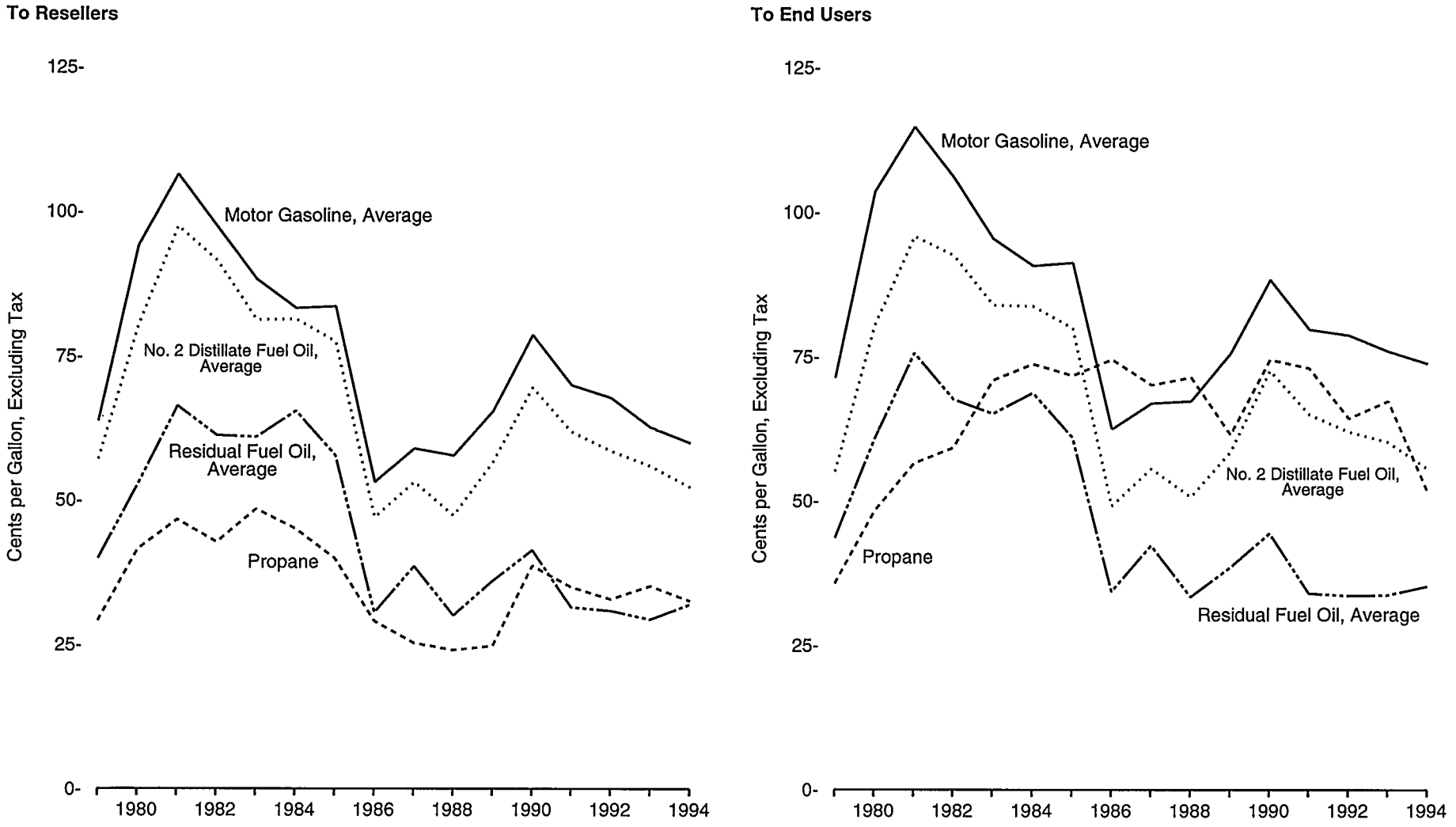
[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

R=Revised data. P=Preliminary data.

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.

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 September 1977—FEA, Form FEA-P110-M-1, "Refiners' Monthly Cost Allocation Report." • October 1977 through June 1978—Energy Information Administration (EIA), Form FEA-P110-M-1, "Refiners' Monthly Cost Allocation Report." • July 1978 through December 1980—EIA, Form ERA-49, "Domestic Crude Oil Entitlements Program Refiners Monthly Report." • 1981 forward—EIA, Form EIA-14, "Refiners' Monthly Cost Report."

Figure 5.20 Refiner Sales Prices of Selected Petroleum Products, 1979-1994



Source: Table 5.20.

Table 5.20 Refiner Sales Prices and Refiner Margins of Selected Petroleum Products, 1979-1994

(Cents per Gallon, Excluding Taxes)

Product	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 P
Sales Prices to Resellers: [1]																
Aviation Gasoline	72.1	112.8	125.0	122.8	117.8	116.5	113.0	91.2	85.9	85.0	95.0	106.3	100.1	99.1	R96.5	93.3
Motor Gasoline	63.7	94.1	106.4	97.3	88.2	83.2	83.5	53.1	58.9	57.7	65.4	78.6	69.9	67.7	R62.6	59.9
Leaded Regular	NA	NA	NA	NA	85.0	79.5	79.3	50.1	56.5	54.8	63.1	75.4	65.7	69.3	NA	NA
Unleaded Regular	NA	NA	NA	NA	89.5	84.2	84.3	52.2	56.9	54.8	61.8	75.8	67.2	R64.5	R59.3	56.6
Unleaded Midgrade	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	68.6	81.4	73.3	R70.8	66.0	63.8
Premium	NA	NA	NA	NA	96.4	91.6	92.2	61.0	67.1	67.2	74.9	87.4	79.2	R77.4	R72.2	69.5
Kerosene	62.4	86.4	106.6	101.8	89.2	91.6	87.4	60.6	59.2	54.9	66.9	83.9	72.2	63.2	R60.4	61.8
Jet Fuel, Kerosene-Type	66.0	86.8	101.2	95.3	85.4	83.0	79.4	49.5	53.8	49.5	58.3	77.3	65.0	R60.5	57.7	53.4
No. 1 Distillate Fuel Oil	58.3	88.0	107.1	103.8	89.6	89.2	86.3	57.9	59.9	54.9	66.8	83.8	73.0	R65.2	64.6	61.4
No. 2 Distillate Fuel Oil	57.1	80.2	97.4	91.4	81.2	81.3	77.4	47.0	53.1	47.3	56.6	69.5	61.8	58.5	55.9	52.2
No. 2 Fuel Oil	56.9	80.3	97.6	91.4	81.5	82.1	77.6	48.6	52.7	47.3	56.5	69.7	62.2	57.9	R54.4	50.6
No. 2 Diesel Oil	57.4	80.1	97.2	91.4	80.8	80.3	77.2	45.2	53.4	47.3	56.7	69.4	61.5	R59.1	R57.0	52.9
No. 4 Distillate Fuel Oil [2]	47.0	67.0	78.3	73.7	72.6	70.7	67.2	40.9	46.2	42.5	48.0	59.0	55.6	49.5	48.8	46.1
Residual Fuel Oil	39.9	52.8	66.3	61.2	60.9	65.4	57.7	30.5	38.5	30.0	36.0	41.3	31.4	R30.8	29.3	31.9
1% or Less Sulfur Content	45.0	60.8	74.8	69.5	64.3	68.5	61.0	32.8	41.2	33.3	40.7	47.2	36.4	R35.1	R33.7	34.5
Greater than 1% Sulfur Content	36.6	47.9	62.2	57.2	59.1	63.9	56.0	28.9	36.2	27.1	33.1	37.2	29.2	R28.6	R25.6	28.9
Propane (Consumer Grade)	29.1	41.5	46.6	42.7	48.4	45.0	39.8	29.0	25.2	24.0	24.7	38.6	34.9	32.8	35.1	32.5
Sale Prices to End Users: [1]																
Aviation Gasoline	68.9	108.4	130.3	131.2	125.5	123.4	120.1	101.1	90.7	89.1	99.5	112.0	104.7	102.7	99.0	95.6
Motor Gasoline	71.3	103.5	114.7	106.0	95.4	90.7	91.2	62.4	66.9	67.3	75.6	88.3	79.7	R78.7	R75.9	73.8
Leaded Regular	NA	NA	NA	NA	90.6	84.8	84.2	57.3	61.8	61.9	71.0	83.1	71.5	78.5	NA	NA
Unleaded Regular	NA	NA	NA	NA	97.0	91.5	91.7	61.6	65.0	64.1	71.4	84.9	76.1	R74.3	71.2	68.9
Unleaded Midgrade	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	79.2	92.1	84.3	R82.7	R80.5	78.5
Premium	NA	NA	NA	NA	105.7	101.5	102.3	73.7	78.4	78.8	86.7	98.5	90.7	R91.4	88.9	86.5
Kerosene	58.5	90.2	112.3	108.9	96.1	103.6	103.0	79.0	77.0	73.8	70.9	92.3	83.8	R78.8	75.4	66.0
Jet Fuel, Kerosene-Type	54.7	86.8	102.4	96.3	87.8	84.2	79.6	52.9	54.3	51.3	59.2	76.6	65.2	61.0	R58.0	53.4
No. 1 Distillate Fuel Oil	57.2	83.4	103.9	102.3	96.2	92.7	88.0	62.0	60.4	56.4	66.1	81.9	74.0	R66.6	R66.6	64.0
No. 2 Distillate Fuel Oil	55.1	80.4	95.8	92.5	83.9	83.7	79.9	49.1	55.6	50.7	58.5	72.6	65.0	R62.0	R60.2	55.6
No. 2 Fuel Oil	51.6	78.8	91.4	90.5	91.6	91.6	84.9	56.0	58.1	54.4	58.7	73.4	66.5	62.7	60.2	57.2
No. 2 Diesel Oil	58.5	81.8	99.5	94.2	82.6	82.3	78.9	47.8	55.1	50.0	58.5	72.5	64.8	R61.9	R60.2	55.4
No. 4 Distillate Fuel Oil [2]	47.9	68.2	79.7	75.0	76.6	79.6	77.3	48.9	51.3	46.1	51.2	62.2	58.0	52.6	R50.1	50.1
Residual Fuel Oil	43.6	60.7	75.6	67.6	65.1	68.7	61.0	34.3	42.3	33.4	38.5	44.4	34.0	R33.6	R33.7	35.2
1% or Less Sulfur Content	46.8	67.5	82.9	74.7	69.5	72.0	64.4	37.2	44.7	37.2	43.6	50.5	40.2	38.9	R39.7	40.1
Greater than 1% Sulfur Content	38.9	52.3	67.3	61.1	61.1	65.9	58.2	31.7	39.6	30.0	34.4	40.0	30.6	R31.2	R30.3	32.9
Propane (Consumer Grade)	35.7	48.2	56.5	59.2	70.9	73.7	71.7	74.5	70.1	71.4	61.5	74.5	73.0	R64.3	R67.3	51.7
Refiner Margins [3]																
Motor Gasoline	21.5	27.3	22.5	21.4	19.2	15.1	19.8	18.4	16.3	22.8	22.6	25.7	24.5	23.8	R23.5	22.8
Jet Fuel, Kerosene-Type	23.8	20.0	17.3	19.4	16.4	14.9	15.8	14.9	11.2	14.6	15.5	24.4	19.6	16.5	18.6	16.3
No. 2 Distillate Fuel Oil	14.9	13.4	13.5	15.5	12.2	13.1	13.8	12.4	10.4	12.4	13.8	16.6	16.4	14.6	16.8	15.1
Residual Fuel Oil	-2.3	-14.0	-17.6	-14.7	-8.1	-2.8	-6.0	-4.1	-4.1	-5.0	-6.8	-11.6	-14.0	-13.2	-9.8	-5.2
Composite [4]	19.4	22.4	19.4	19.4	16.0	13.7	17.0	15.8	13.8	18.7	18.8	22.1	20.7	19.8	R19.0	18.3

[1] Sales for resale, that is, 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.

[2] Includes No. 4 fuel oil and No. 4 diesel fuel.

[3] On this table, refiner margin is the difference between the composite refiner acquisition price of crude oil and the price to resellers.

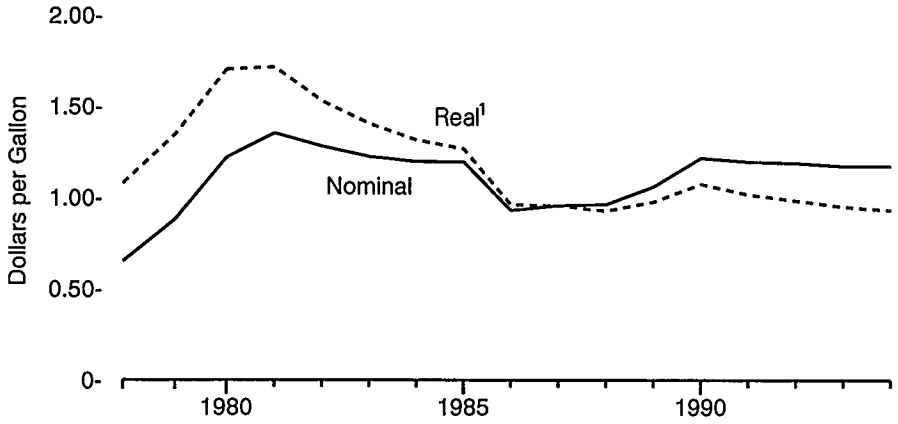
[4] Composite of aviation gasoline, kerosene-type jet fuel, kerosene, motor gasoline, distillate fuel nos. 1, 2, and 4, and residual fuel.

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

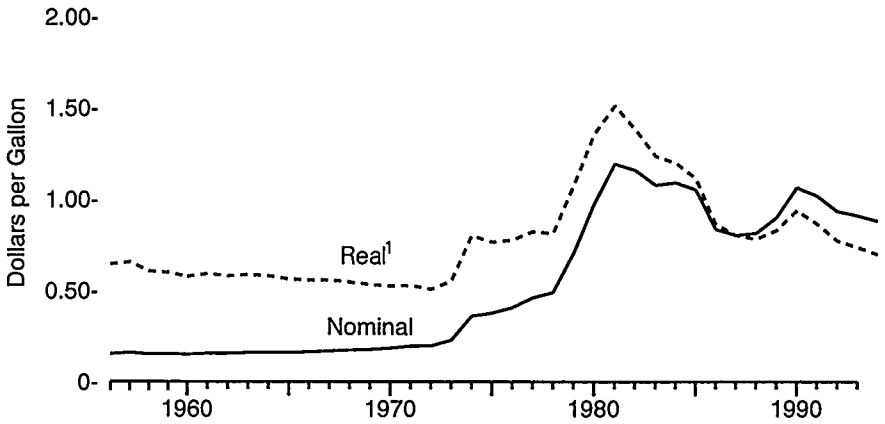
Sources: • 1978-1992—Energy Information Administration (EIA), Form EIA-460, "Petroleum Industry Monthly Report for Product Prices," the source for backcast estimates • 1983 forward—EIA, Form EIA-782A, "Monthly Petroleum Product Sales Report."

Figure 5.21 Motor Gasoline and Residential Heating Oil Retail Prices

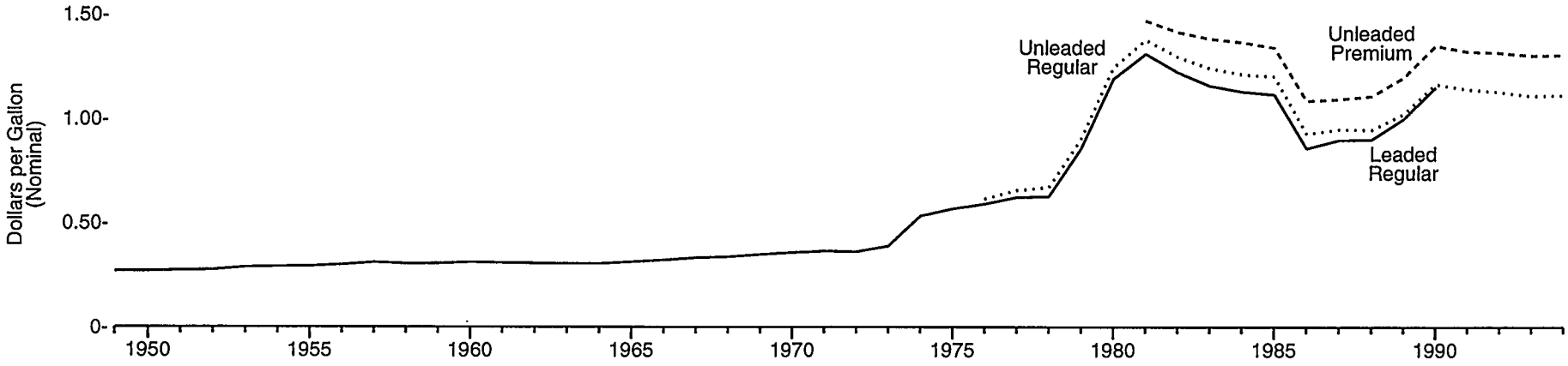
Motor Gasoline, All Types, 1978-1994



Residential Heating Oil, 1956-1994



Motor Gasoline by Type, 1949-1994



[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

Notes: • Residential heating oil prices from 1978 forward exclude all taxes.

• Because vertical scales differ, graphs should not be compared.

Source: Table 5.21.

Table 5.21 Motor Gasoline and Residential Heating Oil Retail Prices, 1949-1994

(Cents per Gallon)

Year	Motor Gasoline (Including Taxes)								Residential Heating Oil [2]	
	Leaded Regular [1]		Unleaded Regular		Unleaded Premium		All Types			
	Nominal	Real [3]	Nominal	Real [3]	Nominal	Real [3]	Nominal	Real [3]	Nominal	Real [3]
1949	26.8	134.7	NA	NA	NA	NA	NA	NA	NA	NA
1950	26.8	132.7	NA	NA	NA	NA	NA	NA	NA	NA
1951	27.2	127.7	NA	NA	NA	NA	NA	NA	NA	NA
1952	27.4	127.4	NA	NA	NA	NA	NA	NA	NA	NA
1953	28.7	130.5	NA	NA	NA	NA	NA	NA	NA	NA
1954	29.0	130.6	NA	NA	NA	NA	NA	NA	NA	NA
1955	29.1	127.1	NA	NA	NA	NA	NA	NA	NA	NA
1956	29.9	126.7	NA	NA	NA	NA	NA	NA	15.2	64.4
1957	31.0	127.0	NA	NA	NA	NA	NA	NA	16.0	65.6
1958	30.4	122.1	NA	NA	NA	NA	NA	NA	15.1	60.6
1959	30.5	119.1	NA	NA	NA	NA	NA	NA	15.3	59.8
1960	31.1	119.6	NA	NA	NA	NA	NA	NA	15.0	57.7
1961	30.8	117.1	NA	NA	NA	NA	NA	NA	15.6	59.3
1962	30.6	113.8	NA	NA	NA	NA	NA	NA	15.6	58.0
1963	30.4	111.8	NA	NA	NA	NA	NA	NA	16.0	58.8
1964	30.4	109.7	NA	NA	NA	NA	NA	NA	16.1	58.1
1965	31.2	109.9	NA	NA	NA	NA	NA	NA	16.0	56.3
1966	32.1	109.2	NA	NA	NA	NA	NA	NA	16.4	55.8
1967	33.2	109.6	NA	NA	NA	NA	NA	NA	16.9	55.8
1968	33.7	106.0	NA	NA	NA	NA	NA	NA	17.4	54.7
1969	34.8	104.2	NA	NA	NA	NA	NA	NA	17.8	53.3
1970	35.7	101.4	NA	NA	NA	NA	NA	NA	18.5	52.6
1971	36.4	98.1	NA	NA	NA	NA	NA	NA	19.6	52.8
1972	36.1	93.0	NA	NA	NA	NA	NA	NA	19.7	50.8
1973	38.8	93.9	NA	NA	NA	NA	NA	NA	22.8	55.2
1974	53.2	118.5	NA	NA	NA	NA	NA	NA	36.0	80.2
1975	56.7	115.2	NA	NA	NA	NA	NA	NA	37.7	76.6
1976	59.0	112.8	61.4	117.4	NA	NA	NA	NA	40.6	77.6
1977	62.2	111.3	65.6	117.4	NA	NA	NA	NA	46.0	82.3
1978	62.6	103.8	67.0	111.1	NA	NA	65.2	108.1	49.0	81.3
1979	85.7	130.8	90.3	137.9	NA	NA	88.2	134.7	70.4	107.5
1980	119.1	166.1	124.5	173.6	NA	NA	122.1	170.3	97.4	135.8
1981	131.1	166.2	137.8	174.7	[4]147.0	[4]186.3	135.3	171.5	119.4	151.3
1982	122.2	145.8	129.6	154.7	141.5	168.9	128.1	152.9	116.0	138.4
1983	115.7	132.7	124.1	142.3	138.3	158.6	122.5	140.5	107.8	123.6
1984	112.9	124.1	121.2	133.2	136.6	150.1	119.8	131.6	109.1	119.9
1985	111.5	118.1	120.2	127.3	134.0	141.9	119.6	126.7	105.3	111.5
1986	85.7	88.4	92.7	95.7	108.5	112.0	93.1	96.1	83.6	86.3
1987	89.7	89.7	94.8	94.8	109.3	109.3	95.7	95.7	80.3	80.3
1988	89.9	86.5	94.6	91.0	110.7	106.5	96.3	92.7	81.3	78.2
1989	99.8	92.0	102.1	94.1	119.7	110.3	106.0	97.7	90.0	82.9
1990	114.9	101.4	116.4	102.7	134.9	119.1	121.7	107.4	106.3	93.8
1991	NA	NA	114.0	96.9	132.1	[R]112.3	119.6	[R]101.7	101.9	86.6
1992	NA	NA	112.7	[R]93.2	131.6	[R]108.9	119.0	[R]98.4	93.4	[R]77.3
1993	NA	NA	110.8	[R]89.7	130.2	[R]105.4	117.3	[R]95.0	91.1	[R]73.8
1994	NA	NA	111.2	88.2	130.5	103.5	117.4	93.1	[P]88.2	[P]69.9

[1] Average motor gasoline prices are calculated from a sample of service stations providing all types of service (i.e., full-, mini-, and self-serve). Geographic coverage - 1949-1973, 55 representative cities; 1974-1977, 56 urban areas; 1978 forward, 85 urban areas.

[2] Average residential heating oil (No. 2 fuel oil) prices are derived by dividing the sum of the estimated national value of retail sales for residential heating by the estimated volume of retail sales for residential heating. Data for 1978 forward exclude all taxes.

[3] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

[4] Based on September through December data only.

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

Sources: **Motor Gasoline:** • 1949-1973—*Platt's Oil Price Handbook and Oilmanac, 1974*, 51st Edition. • 1974 forward—Energy Information Administration (EIA), simple annual averages of monthly data from Bureau of Labor Statistics, *Consumer Prices: Energy*. **Residential Heating Oil:** • 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—EIA, Form EIA-9, "No. 2 Heating Oil Supply/Price Monitoring Report." • 1978-1993—EIA, *Petroleum Marketing Annual 1993* (August 1994), Table 16. • 1994—EIA estimates.

Petroleum Notes

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.

2. The methods for 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. 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. 1974-1980, GIDU is published annual data. 1981 forward, GIDU is the sum of reported monthly data.

3. Total petroleum products supplied is the sum of the product 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.

4. 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. These 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 these 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.

5. The Crude Oil Domestic First Purchase Prices 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.

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 oils 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.

6. Natural Gas

Prices

Through the early 1970's, natural gas prices were relatively stable. Thereafter, the natural gas market underwent a period of price fluctuations brought on by deregulation and industry restructuring. The annual average wellhead price, in real terms,[1] trended downward from a 1983 peak of $2.97 per thousand cubic feet to a 15-year low of $1.39 per thousand cubic feet in 1991 (6.8).* Over the next 3 years, prices recovered somewhat; in 1994, the annual average wellhead price was $1.45 per thousand cubic feet. Prices to consumers vary by region; for example, prices are lower in main producing areas, where transmission costs are lower. Prices to consumers also vary by sector (6.9).

Sectoral Patterns of Demand

Throughout the 1950's and 1960's, the market for natural gas expanded as low prices encouraged demand (6.6). Of the many factors affecting natural gas markets during those decades, Federal and State regulatory commissions were the most influential. Below-market rates for certain categories of natural gas, coupled with strong demand, ultimately resulted in regional shortages during the second half of the 1970's.

In 1972, total consumption of natural gas reached an all-time high of 22 trillion cubic feet. Thereafter, uncertainties about supply and rising energy prices began to erode demand. By the 1980's, lower demand resulted in a short-term surplus of deliverable gas and gas well shutins in many producing areas. In 1986, natural gas consumption totaled 16 trillion cubic feet, the lowest annual total since 1965.

Weakened demand spanned all end-use sectors but was most severe in the industrial and electric utility sectors, where, particularly during the early and mid-1980's, the option of fuel switching proved to be most viable. Lower consumption by the industrial sector accounted for over half of the 5.9-trillion-cubic-foot reduction from 1972 through 1986, and lower use at electric utilities accounted for close to one-fourth.

[1]Real prices are expressed in 1987 dollars. Prices are nominal unless specifically noted as real.

Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.

In 1993, natural gas delivered for the account of others to industrial, electric utility, and commercial customers reached 7.8 trillion cubic feet.

After the 1986 low point, natural gas consumption trended upward, reaching 21 trillion cubic feet in 1994 (6.6). Electric utilities and the commercial sector consumed more natural gas in 1994 than they had in 1993. Electric utility consumption of natural gas rose to 3.0 trillion cubic feet, a 12-percent increase, and commercial sector consumption also totaled 3.0 trillion cubic feet, up 4.9 percent. Consumption in the industrial sector (the largest consuming sector) fell slightly (0.2 percent) to 9.2 trillion cubic feet in 1994. Residential consumption fell 2.6 percent to 4.8 trillion cubic feet and transportation consumption remained at the 1993 level of 0.6 trillion cubic feet.

Natural Gas Delivered for the Account of Others

During the 1980's, regulatory and legislative changes allowed consumers to purchase natural gas directly from producers and to arrange for pipeline and distribution companies to deliver it to them for a fee. Federal Energy Regulatory Commission (FERC) Order 636 (implemented November 1, 1993) extended that trend toward a more efficient market by requiring interstate pipeline companies to unbundle (separate) their sales and transportation services. In 1993, natural gas delivered for the account of others to industrial, electric utility, and commercial customers reached 7.8 trillion cubic feet (6.5). Such deliveries accounted for 71 percent of total deliveries to industrial customers, 68 percent of total deliveries to electric utilities, and 16 percent of total deliveries to commercial customers.

Natural Gas Production and Productivity

In 1994, gross withdrawals of natural gas from wells totaled 24 trillion cubic feet, up for the eighth consecutive year (6.2). Texas, Louisiana, and Oklahoma, the largest producers of natural gas, accounted for 61 percent of the U.S. total in 1994 (6.4). Most withdrawals came from onshore wells and State offshore wells, but 5.2 trillion cubic feet were Federal offshore withdrawals. The 24 trillion cubic feet of gross withdrawals in 1994 yielded 20 trillion cubic feet of marketed production (6.2).

The U.S. total of natural gas gross well withdrawals includes a small but rapidly growing amount of methane produced from coalbeds. In 1993, gross withdrawals of coalbed methane totaled about 732 billion cubic feet, an amount equal to over 4 percent of U.S. total dry production.[2]

[2]Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1993 Annual Report*, DOE/EIA-0216(93) (Washington, DC, October 1994), pp. 13 and 39.

Meeting Peak Demand

Seasonal, and even daily, fluctuations in natural gas demand are met by withdrawals from storage when demand is high and by injections into storage when demand is low compared with available gas flow in transmission lines. Net withdrawals from storage can provide more than half of some companies' peak winter deliveries. During the 1993-1994 heating season (October through March), net withdrawals from storage supplied 15 percent of total natural gas consumed.[3]

Natural gas in storage at the end of the year increased throughout the period of the 1970's, when local shortages resulted in curtailments to some consumers (6.7). Underground storage of working gas (that in excess of the base gas needed to maintain optimum reservoir pressure) equaled 7.1 percent of annual consumption in 1969 and 13 percent in 1994 (6.1 and 6.7). At the end of 1994, working gas in storage was 2.6 trillion cubic feet and base gas was 4.4 trillion cubic feet.

[3]Energy Information Administration, *Monthly Energy Review* March 1995, DOE/EIA-0035(95/03) (Washington, DC, March 1995), Tables 4.4 and 4.5.

However, the rate of increase in coalbed methane reserves slowed in 1993 as Federal tax incentives for new coalbed methane wells expired. In addition, Alabama lowered its estimates of proved coalbed methane reserves from the large increase posted in 1992. U.S. total reserves in coalbed methane fields accounted for 6 percent of U.S. natural gas total reserves in 1993, about the same share as in 1992.

About 288 thousand gas wells were in operation during 1994 (6.4). Withdrawals from those wells accounted for almost three-fourths of all gross withdrawals, while oil wells supplied the remainder (6.2). After peaking at 435 thousand cubic feet per day in 1971 (6.4), average gas well productivity trended downward; from 1985 through 1993, productivity remained below 167 thousand cubic feet per day. In 1994, however, productivity rose 4.2 percent from the 1993 level to 167 thousand cubic feet per day.

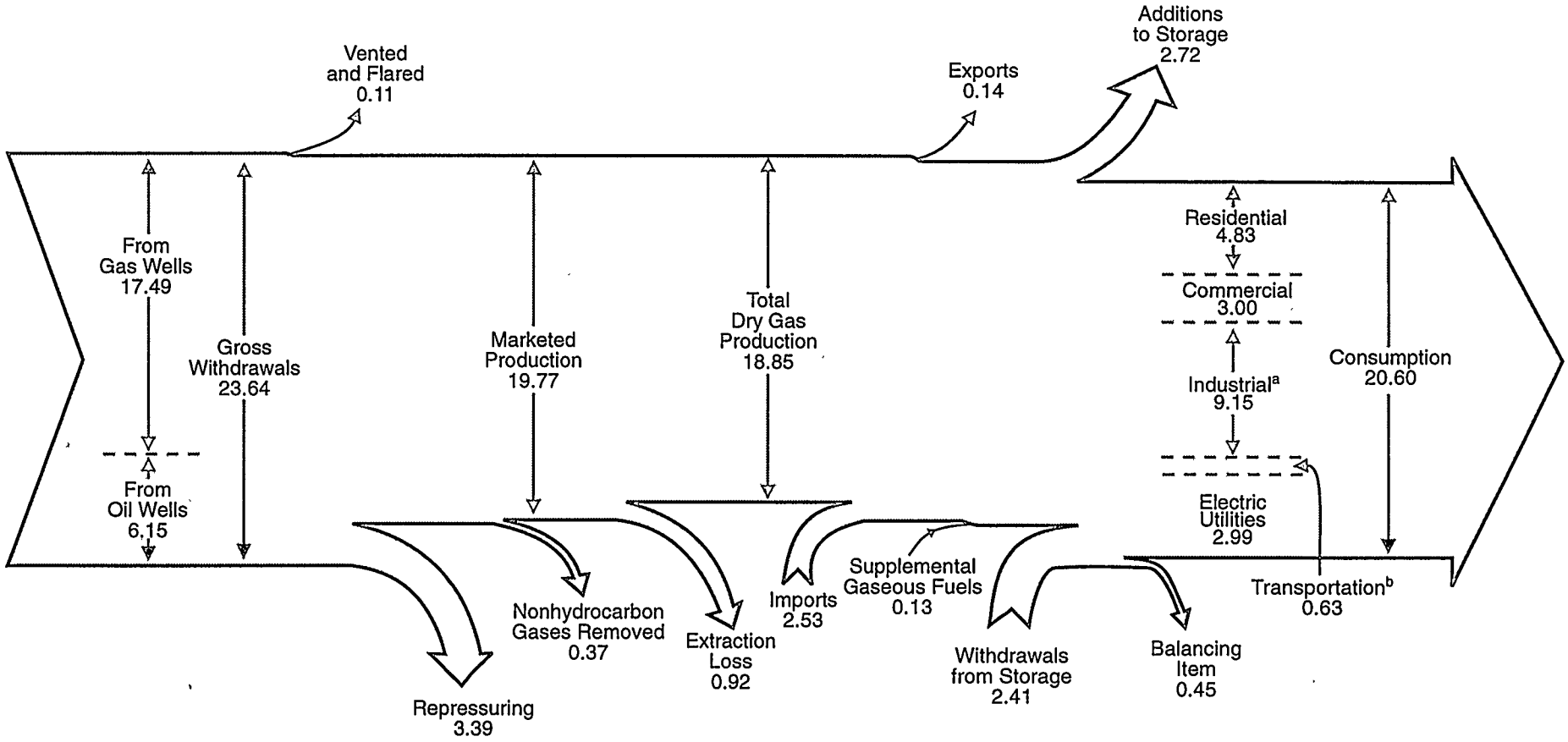
Imports and Exports

U.S. natural gas trade was limited to the border countries of Mexico and Canada until shipping natural gas in liquefied form emerged as an alternative to pipelines. In 1969, the first shipments of liquefied natural gas (LNG) were sent to Japan, and U.S. imports from Algeria began the following year (6.3). In 1994, U.S. net imports of natural gas by all routes totaled 2.4 trillion cubic feet, up 7.9 percent from 1993 net imports and the equivalent of 12 percent of domestic consumption, up from 11 percent in 1993.

Historically, Canada has been the major supplier of U.S. natural gas imports, with Algeria and Mexico supplying smaller amounts. The remarkable growth in U.S. net imports of natural gas from the 1986 level of 689 billion cubic feet (a 17-year low at the time) to 2.4 trillion cubic feet in 1994 was due almost entirely to higher levels of imports from Canada. In 1994, Canada supplied net imports of 2.4 trillion cubic feet. Importing Canadian natural gas was facilitated by the completion of the Iroquois transportation system in January 1992.

From 1970 through 1990 and again in 1993 and 1994, Japan was the primary purchaser of U.S. natural gas. In 1994, Japan purchased 63 billion cubic feet of U.S. natural gas.

Diagram 3. Natural Gas Flow, 1994
(Trillion Cubic Feet)

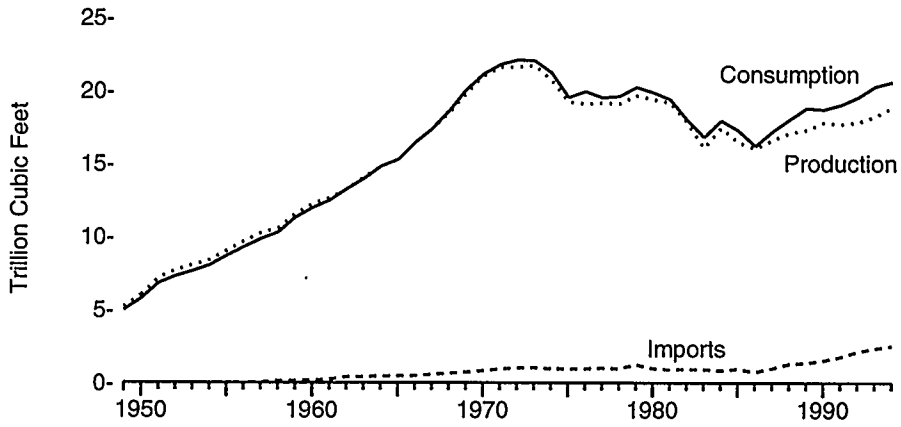


[a]Includes lease and plant fuel.
[b]Natural gas consumed in the operation of pipelines, primarily in compressors, and a small quantity used as vehicle fuel.

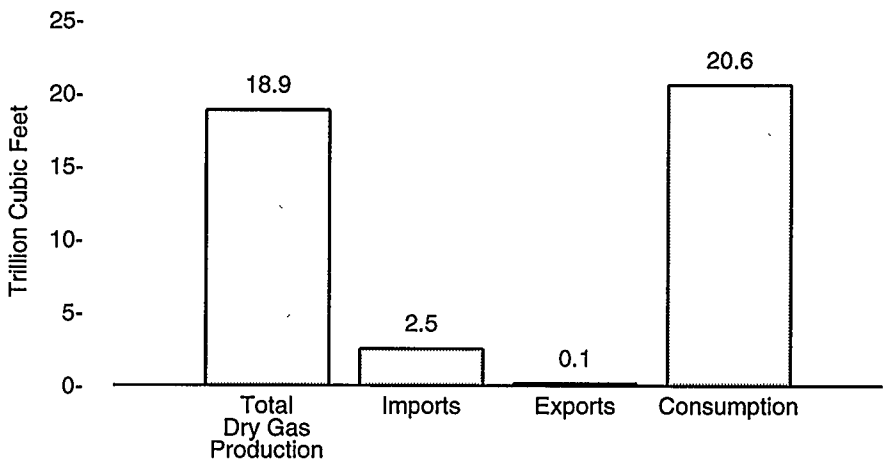
Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.
Sources: Tables 6.1, 6.2, and 6.6.

Figure 6.1 Natural Gas Overview

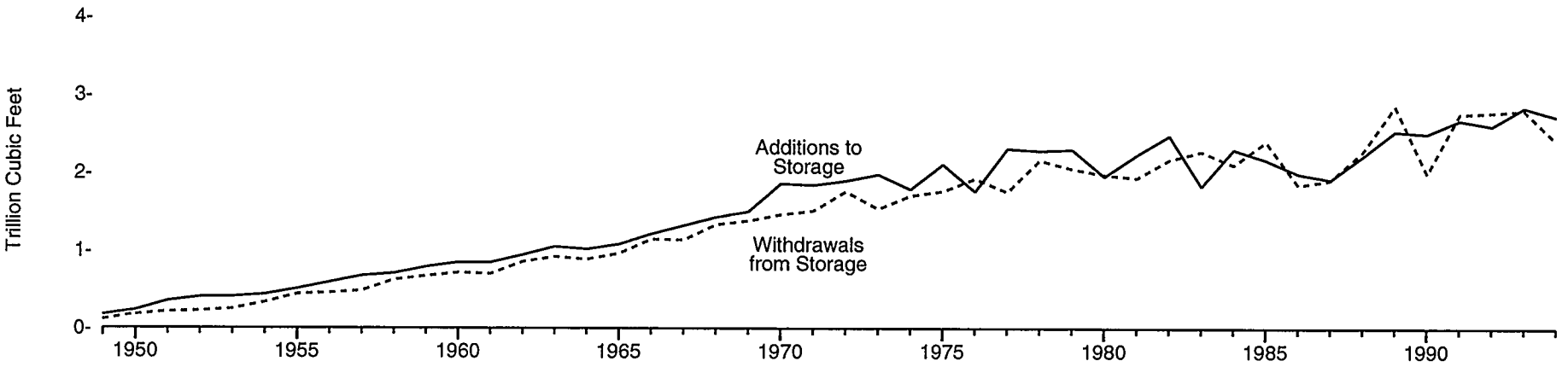
Overview, 1949-1994



Overview, 1994



Storage Additions and Withdrawals,[1] 1949-1994



[1]Beginning with 1980, includes liquefied natural gas storage in above ground tanks.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 6.1.

Table 6.1 Natural Gas Overview, 1949-1994

(Trillion Cubic Feet)

Year	Total Dry Gas Production	Supplemental Gaseous Fuels	Imports	Exports	Withdrawals from Storage [1]	Additions to Storage [1]	Balancing Item [2]	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	-0.22	18.80
1990	17.81	0.12	1.53	0.09	1.99	2.50	-0.15	18.72
1991	17.70	0.11	1.77	0.13	2.75	2.67	-0.50	19.04
1992	17.84	0.12	2.14	0.22	2.77	2.60	-0.51	19.54
1993	R18.24	R0.12	R2.35	0.14	R2.80	R2.83	R-0.24	R20.29
1994P	18.85	0.13	2.53	0.14	2.41	2.72	-0.45	20.60

[1] Beginning with 1980, includes liquefied natural gas storage in above ground tanks.

[2] Quantities lost and imbalances in data due to differences among data sources. Excludes intransit shipments 1980 forward.

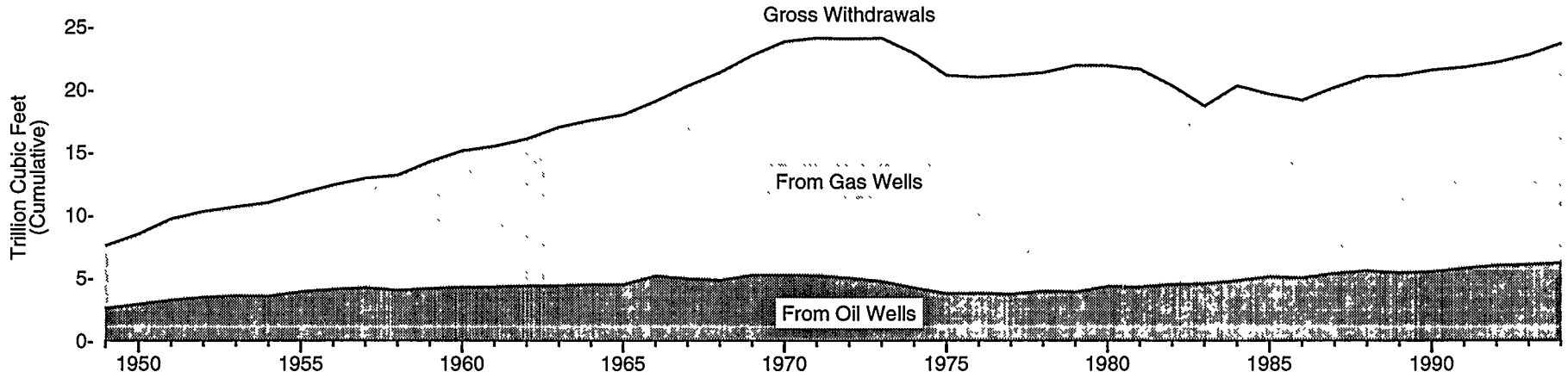
R=Revised data. P=Preliminary data. NA=Not available.

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.

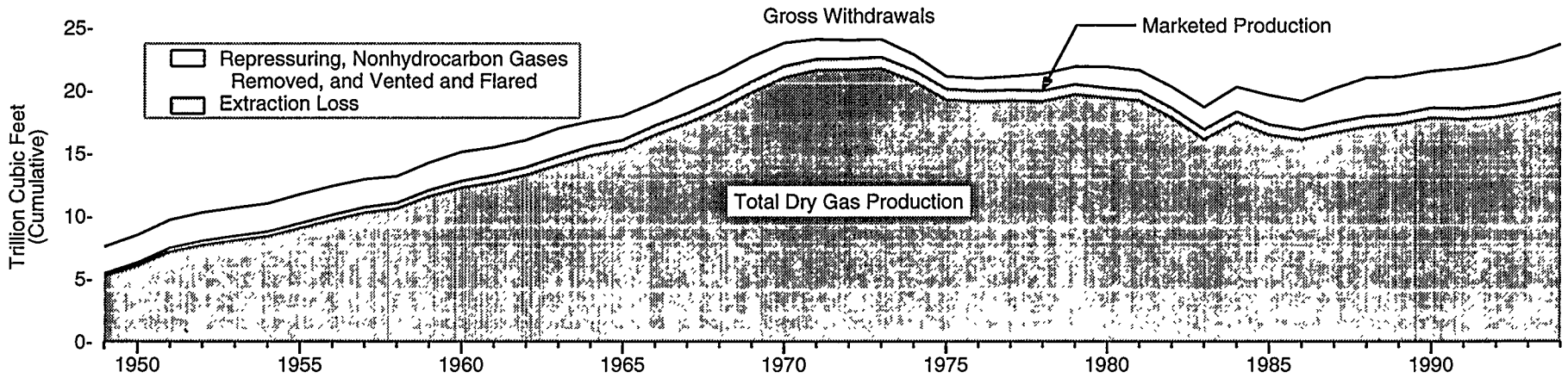
Sources: **1949-1988:** • Supplemental Gaseous Fuels—Energy Information Administration (EIA), *Natural Gas Annual 1992, Volume 2* (November 1993), Table 12. • All Other Data— EIA, *Natural Gas Annual 1993* (October 1994), Table 100. **1989 forward:** EIA, *Natural Gas Monthly* (March 1995), Table 2.

Figure 6.2 Natural Gas Production, 1949-1994

Gross Withdrawals by Well Type



Natural Gas Production by Phase



Source: Table 6.2.

Table 6.2 Natural Gas Production, 1949-1994

(Trillion Cubic Feet)

Year	Gross Withdrawals			Repressuring	Nonhydrocarbon Gases Removed	Vented and Flared	Marketed Production	Extraction Loss [1]	Total 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	R16.70	R6.03	R22.73	R3.07	R0.41	R0.12	R19.13	R0.89	R18.24
1994P	17.49	6.15	23.64	3.39	0.37	0.11	19.77	0.92	18.85

[1] Volume reduction resulting from the removal of natural gas plant liquids. Natural gas plant liquids are transferred to petroleum supply.

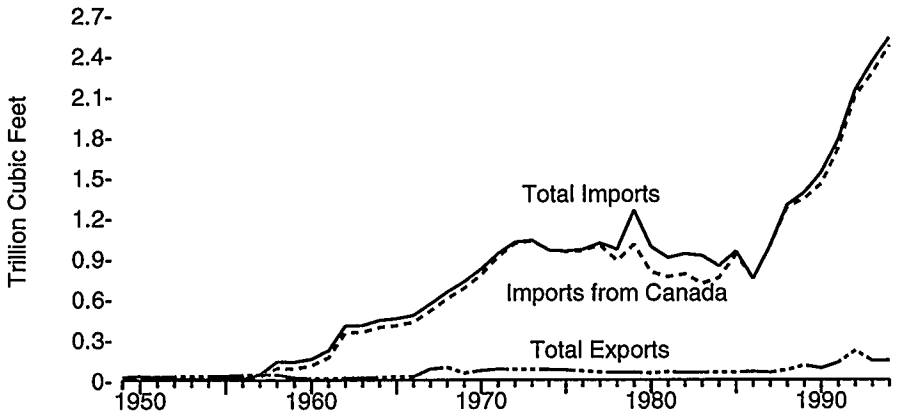
R=Revised data. P=Preliminary data. NA=Not available.

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.

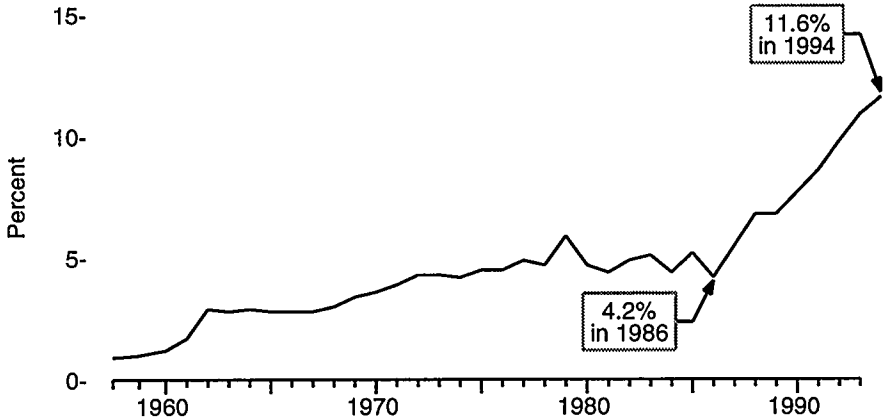
Sources: **From Gas Wells and From Oil Wells:** • 1949-1966—Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. • 1967-1988—Energy Information Administration (EIA), *Natural Gas Annual 1992, Volume 2* (November 1993), Table 5. • 1989-1993—EIA, *Natural Gas Annual 1993* (October 1994), Table 3. • 1994—EIA, estimated data. **All Other Data:** • 1949-1988—EIA, *Natural Gas Annual 1993* (October 1994), Table 99. • 1989 forward—EIA, *Natural Gas Monthly* (March 1995), Table 1.

Figure 6.3 Natural Gas Imports, Exports, and Net Imports

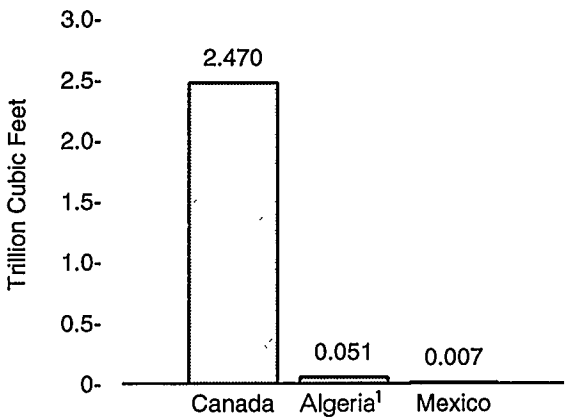
Trade Overview, 1949-1994



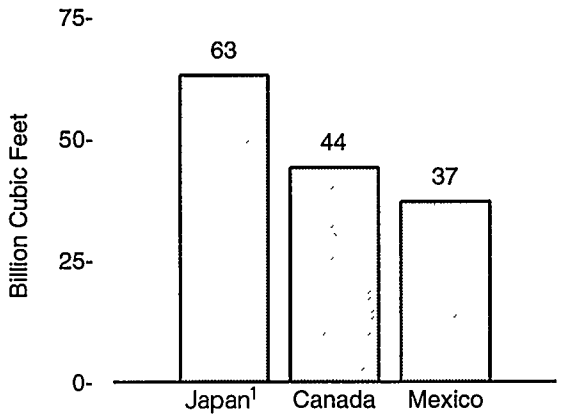
Net Imports as Share of Consumption, 1958-1994



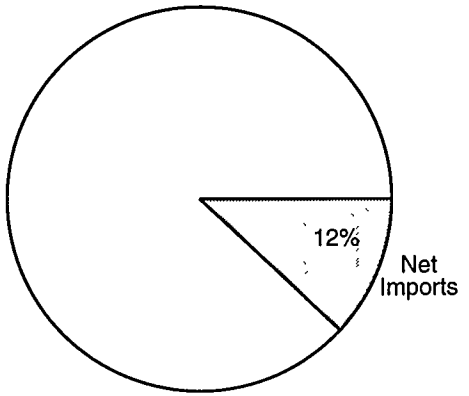
Imports by Country of Origin, 1994



Exports by Country of Destination, 1994



Net Imports' Share of Consumption, 1994



[1]Imports from Algeria and exports to Japan are liquefied petroleum gases.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 6.3.

Table 6.3 Natural Gas Imports, Exports, and Net Imports, 1949-1994

(Billion Cubic Feet, Except as Noted)

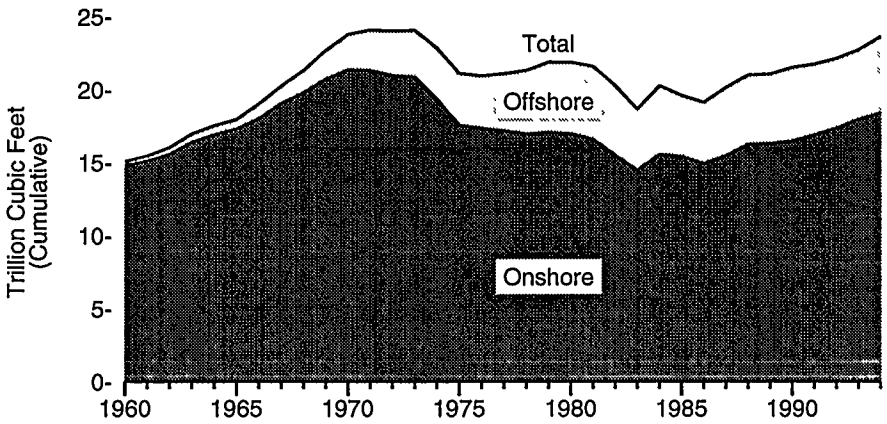
	Imports by Country of Origin					Exports by Country of Destination				Net Imports [1]	
Year	Canada	Mexico	Algeria [2]	Indonesia	Total	Canada	Mexico	Japan [2]	Total	Total	Percent of U.S. Consumption
1949	0	0	0	0	0	(s)	20	0	20	-20	([3])
1950	0	0	0	0	0	3	23	0	26	-26	([3])
1951	0	0	0	0	0	4	21	0	24	-24	([3])
1952	8	(s)	0	0	8	6	22	0	27	-20	([3])
1953	9	0	0	0	9	6	22	0	28	-19	([3])
1954	7	0	0	0	7	6	23	0	29	-22	([3])
1955	11	(s)	0	0	11	11	20	0	31	-20	([3])
1956	10	(s)	0	0	10	17	19	0	36	-26	([3])
1957	21	17	0	0	38	31	11	0	42	-4	([3])
1958	90	46	0	0	136	32	7	0	39	97	0.9
1959	83	51	0	0	134	12	7	0	18	116	1.0
1960	109	47	0	0	156	6	6	0	11	144	1.2
1961	167	52	0	0	219	6	5	0	11	208	1.7
1962	350	51	0	0	402	6	10	0	16	386	2.9
1963	356	50	0	0	406	7	10	0	17	389	2.8
1964	391	53	0	0	443	10	10	0	20	424	2.9
1965	405	52	0	0	456	18	8	0	26	430	2.8
1966	430	50	0	0	480	20	4	0	25	455	2.8
1967	513	51	0	0	564	70	11	0	82	483	2.8
1968	604	47	0	0	652	82	12	0	94	558	3.0
1969	680	47	0	0	727	35	13	3	51	676	3.4
1970	779	41	1	0	821	11	15	44	70	751	3.6
1971	912	21	1	0	935	14	16	50	80	854	3.9
1972	1,009	8	2	0	1,019	16	15	48	78	941	4.3
1973	1,028	2	3	0	1,033	15	14	48	77	956	4.3
1974	959	(s)	0	0	959	13	13	50	77	882	4.2
1975	948	0	5	0	953	10	9	53	73	880	4.5
1976	954	0	10	0	964	8	7	50	65	899	4.5
1977	997	2	11	0	1,011	(s)	4	52	56	955	4.9
1978	881	0	84	0	966	(s)	4	48	53	913	4.7
1979	1,001	0	253	0	1,253	(s)	4	51	56	1,198	5.9
1980	797	102	86	0	985	(s)	4	45	49	936	4.7
1981	762	105	37	0	904	(s)	3	56	59	845	4.4
1982	783	95	55	0	933	(s)	2	50	52	882	4.9
1983	712	75	131	0	918	(s)	2	53	55	864	5.1
1984	755	52	36	0	843	(s)	2	53	55	788	4.4
1985	926	0	24	0	950	(s)	2	53	55	894	5.2
1986	749	0	0	2	750	9	2	50	61	689	4.2
1987	993	0	0	0	993	3	2	49	54	939	5.5
1988	1,276	0	17	0	1,294	20	2	52	74	1,220	6.8
1989	1,339	0	42	0	1,382	38	17	51	107	1,275	6.8
1990	1,448	0	84	0	1,532	17	16	53	86	1,447	7.7
1991	1,710	0	64	0	1,773	15	60	54	129	1,644	8.6
1992	2,094	0	43	0	2,138	68	96	53	216	1,921	9.8
1993	R2,267	R2	82	0	R2,350	R45	R40	56	R140	R2,210	R10.9
1994P	2,470	7	51	0	2,528	44	37	63	144	2,384	11.6

[1] Net Imports = Imports minus exports.
[2] Imports from Algeria and exports to Japan are liquefied natural gas.
[3] Not meaningful because there were net exports during this year.
R=Revised data. P=Preliminary data. (s)=Less than 0.5 billion cubic feet.
Note: Totals may not equal sum of components due to independent rounding.

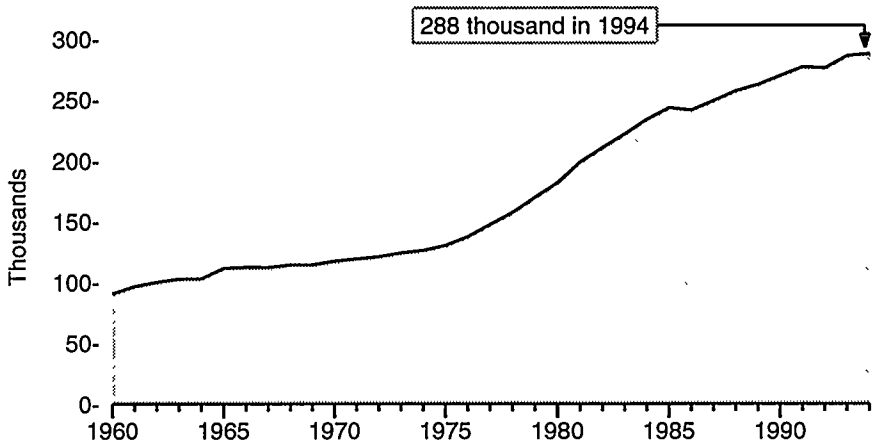
Sources: **Total Imports and Total Exports:** • 1949-1993—Energy Information Administration (EIA), *Natural Gas Annual 1993* (October 1994), Table 100. • 1994—EIA estimates. **All Other Data:** • 1949-1954—Energy Information Administration (EIA), Office of Oil and Gas, Reserves and Natural Gas Division, unpublished data. • 1955-1993—EIA, *Natural Gas Monthly* (March 1995), Tables 5, 6, and unpublished revisions. • 1994—EIA estimates.

Figure 6.4 Natural Gas Gross Withdrawals by State and Location and Gas Well Productivity, 1960-1994

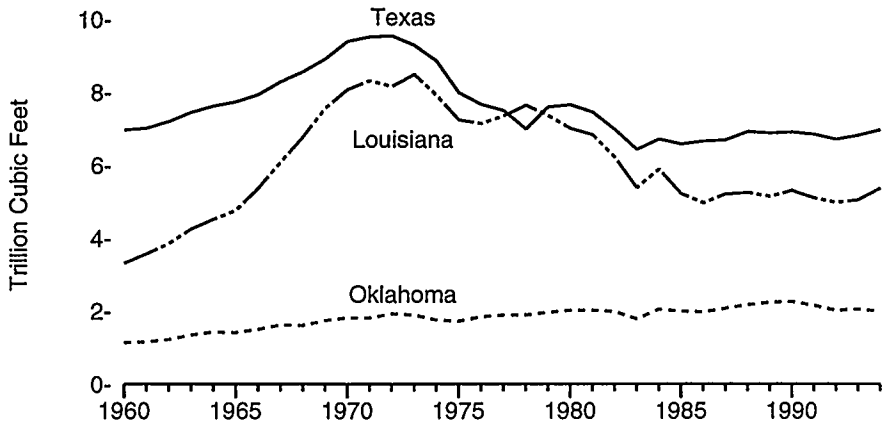
Gross Withdrawals by Location



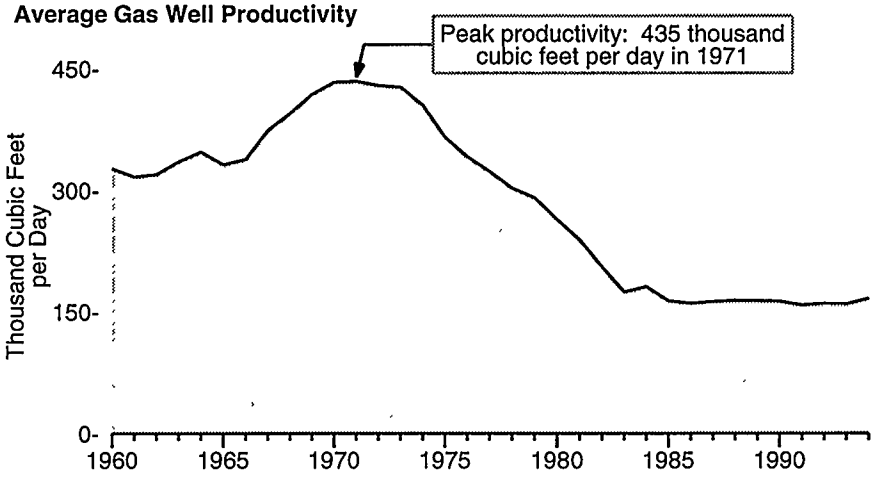
Number of Producing Wells



Gross Withdrawals by 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, 1960-1994

(Trillion Cubic Feet, Except as Noted)

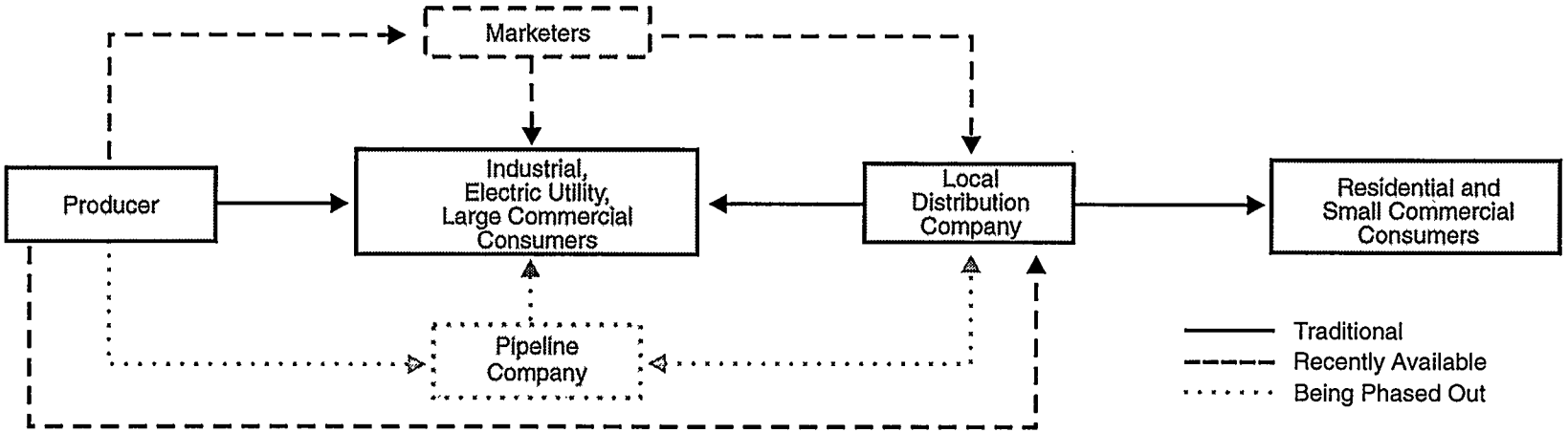
Year	State				Location		Gross Withdrawals from Oil and Gas Wells	Gas Well [1] Productivity		
	Texas	Louisiana	Oklahoma	Other	Onshore [2]	Offshore [3]		Gross Withdrawals from Gas Wells	Thousands of Producing Wells [4]	Average Productivity (thousand cubic feet per day)
1960	6.96	3.31	1.13	3.68	14.81	0.27	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	270	163.0
1991	6.85	5.10	2.15	7.65	16.90	4.85	21.75	16.02	277	158.4
1992	6.71	4.98	2.02	8.43	17.36	4.77	22.13	16.16	276	160.5
1993	R6.82	R5.05	2.05	R8.82	R17.96	R4.77	R22.73	R16.70	286	R159.8
1994P	6.97	5.36	1.99	9.32	18.40	5.24	23.64	17.49	288	166.5

[1] See Glossary.
[2] Includes State offshore gross withdrawals.
[3] Excludes State offshore gross withdrawals; includes Federal offshore (Outer Continental Shelf) gross withdrawals.
[4] As of December 31.
R=Revised data. P=Preliminary data.

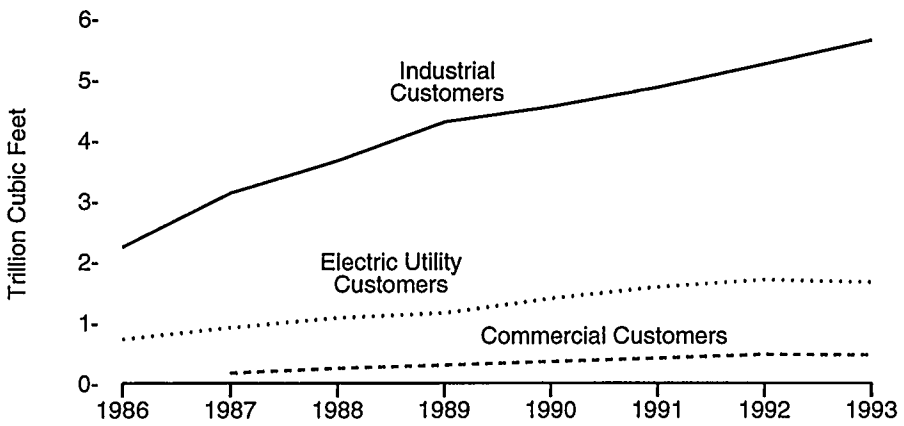
Sources: **Offshore** (Outer Continental Shelf): • 1960-1981—U.S. Geological Survey. • 1982-1985—The United States Minerals Management Service, *Mineral Revenues - The 1989 Report on Receipts from Federal and Indian Leases*, and predecessor annual reports. • 1986—Energy Information Administration (EIA), *Natural Gas Annual 1990, Volume 1* (December 1991), Table 4. • 1987—EIA, *Natural Gas Annual 1991* (October 1992), Table 4. • 1988—EIA, *Natural Gas Annual 1992, Volume 1* (November 1993), Table 4. • 1989-1993—EIA, *Natural Gas Annual 1993* (October 1994), Table 4. • 1994—The United States Minerals Management Service. **Gross Withdrawals:** • 1960-1966—Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. • 1967-1988—EIA, *Natural Gas Annual 1992, Volume 2* (November 1993), Table 5. • 1989-1993—EIA, *Natural Gas Annual 1993* (October 1994), Table 3. • 1994—EIA, estimated data. **All Other Data:** • 1960-1966—Bureau of Mines, *Natural Gas Production and Consumption.* • 1967-1992—EIA, *Natural Gas Annual 1992, Volume 2* (November 1993), Tables 5 and 6. • 1993—EIA, *Natural Gas Annual 1993* (October 1994), Tables 3 and 5. • 1994—EIA, *Natural Gas Monthly* (March 1994), Table 1, and Gulf Publishing Company, *World Oil*, February 1995.

Figure 6.5 Natural Gas Delivered for the Account of Others

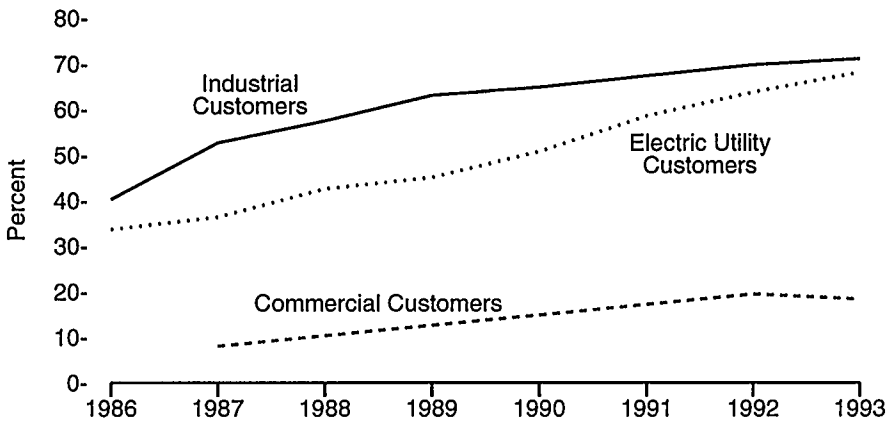
Transaction Paths for Natural Gas Purchases



Delivered for the Account of Others, 1986-1993



Share of Total Deliveries to Sector, 1986-1993



Source: Table 6.5.

Table 6.5 Natural Gas Delivered for the Account of Others, 1986-1993

Year	Commercial Customers			Industrial Customers			Electric Utilities [1]		
	Delivered for the Account of Others	Total Deliveries [2]	Account of Others Share of Total	Delivered for the Account of Others	Total Deliveries	Account of Others Share of Total	Delivered for the Account of Others	Total Deliveries	Account of Others Share of Total [1]
	Billion Cubic Feet		Percent	Billion Cubic Feet		Percent	Billion Cubic Feet		Percent
1986	NA	2,318	NA	2,240	5,579	40	721	2,602	34
1987	167	2,430	7	3,129	5,953	53	914	2,844	36
1988	247	2,670	9	3,663	6,383	57	1,076	2,636	43
1989	296	2,718	11	4,298	6,816	63	1,152	2,787	45
1990	353	2,623	13	4,545	7,018	65	1,390	2,787	51
1991	406	2,729	15	4,864	7,231	67	1,580	2,789	59
1992	471	2,803	17	5,249	7,527	70	1,697	2,766	64
1993	463	2,863	16	5,642	7,986	71	1,658	2,682	68

[1] For electric utilities, total deliveries data are from Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report"; deliveries for the account of others and their share of total deliveries are from EIA, Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition." Because of the different reporting universes for the two data collection forms, the account-of-others share of total deliveries for electric utilities cannot be derived from the data shown on this table.

[2] Small quantities of natural gas delivered for use as vehicle fuel are included for 1990-1993.

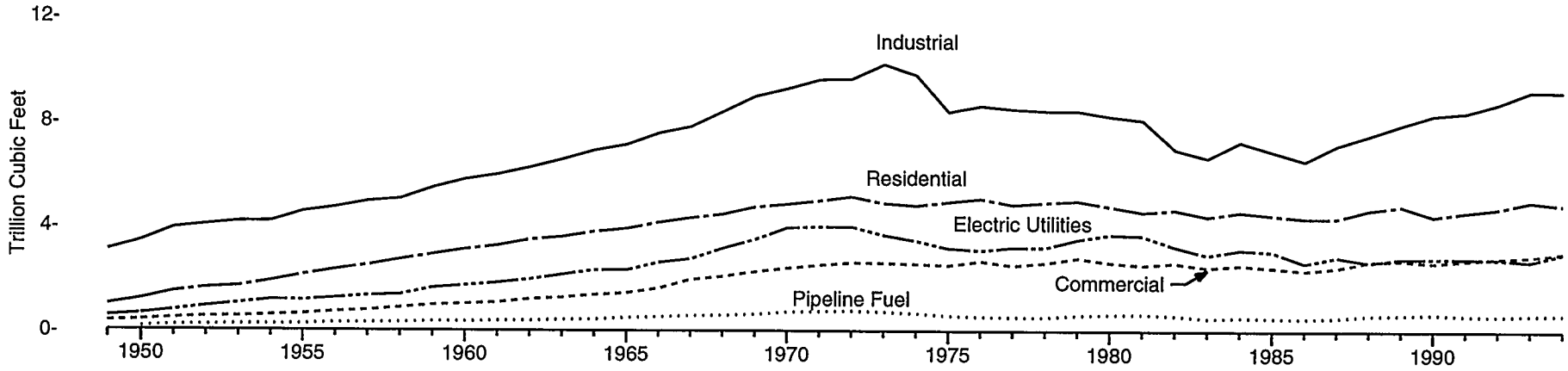
NA=Not available.

Notes: • Percentages are based on data prior to rounding. • 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.

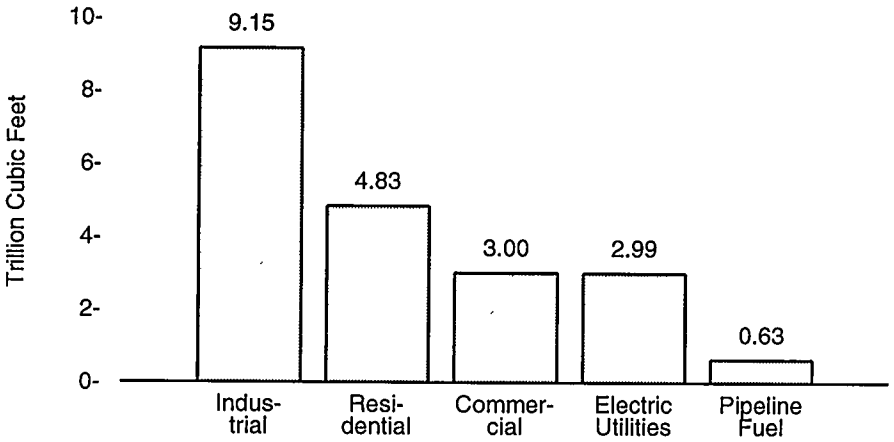
Sources: **Electric Utilities Total Deliveries:** EIA, Form EIA-759, "Monthly Power Plant Report." **All Other Data:** • 1986—EIA, *Natural Gas Annual 1990, Volume 1* (December 1991), Tables 17-20. • 1987—EIA, *Natural Gas Annual 1991* (October 1992), Tables 17-20. • 1988—EIA, *Natural Gas Annual 1992, Volume 1* (November 1993), Tables 17-20. • 1989 forward—EIA, *Natural Gas Annual 1993* (October 1994), Tables 15-18.

Figure 6.6 Natural Gas Consumption by Sector

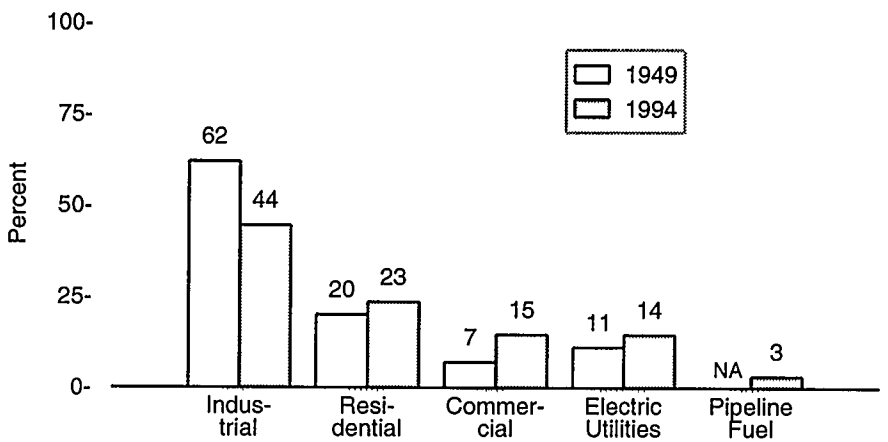
By Sector, 1949-1994



By Sector, 1994



Shares[1] by Sector, 1949 and 1994



[1] Shares are based on data prior to rounding for publication and may not sum exactly to 100 percent.
NA=Not available.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 6.6.

Table 6.6 Natural Gas Consumption by Sector, 1949-1994

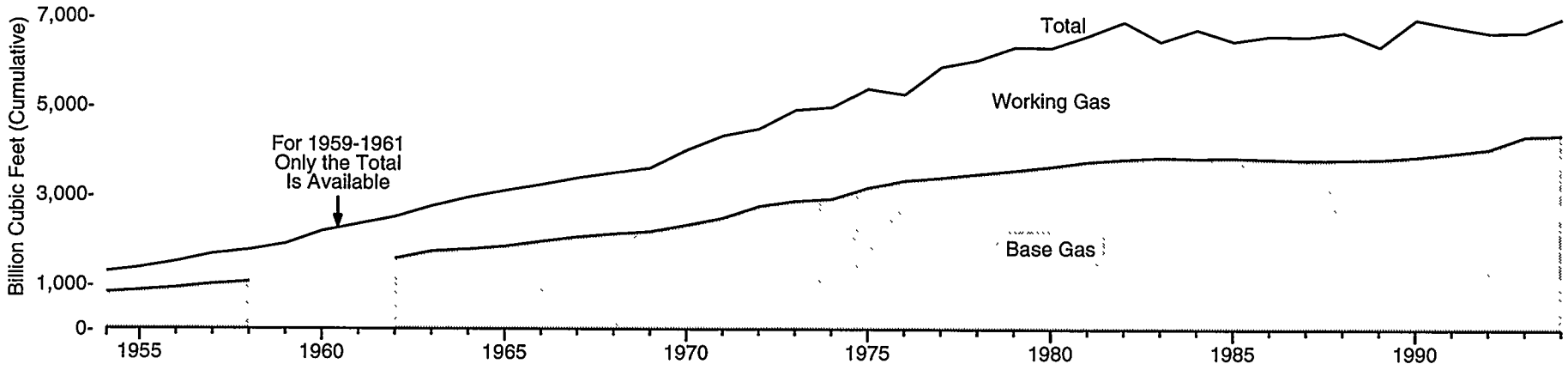
(Trillion Cubic Feet)

Year	Residential	Commercial [1]	Industrial			Transportation			Electric Utilities	Total
			Lease and Plant Fuel	Other	Total	Pipeline Fuel [2]	Vehicle Fuel	Total		
1949	0.99	0.35	0.84	2.25	3.08	NA	NA	NA	0.55	4.97
1950	1.20	0.39	0.93	2.50	3.43	0.13	NA	0.13	0.63	5.77
1951	1.47	0.46	1.15	2.77	3.91	0.19	NA	0.19	0.76	6.81
1952	1.62	0.52	1.16	2.87	4.04	0.21	NA	0.21	0.91	7.29
1953	1.69	0.53	1.13	3.03	4.16	0.23	NA	0.23	1.03	7.64
1954	1.89	0.58	1.10	3.07	4.17	0.23	NA	0.23	1.17	8.05
1955	2.12	0.63	1.13	3.41	4.54	0.25	NA	0.25	1.15	8.69
1956	2.33	0.72	1.00	3.71	4.71	0.30	NA	0.30	1.24	9.29
1957	2.50	0.78	1.05	3.89	4.93	0.30	NA	0.30	1.34	9.85
1958	2.71	0.87	1.15	3.89	5.03	0.31	NA	0.31	1.37	10.30
1959	2.91	0.98	1.24	4.22	5.46	0.35	NA	0.35	1.63	11.32
1960	3.10	1.02	1.24	4.53	5.77	0.35	NA	0.35	1.72	11.97
1961	3.25	1.08	1.29	4.67	5.96	0.38	NA	0.38	1.83	12.49
1962	3.48	1.21	1.37	4.86	6.23	0.38	NA	0.38	1.97	13.27
1963	3.59	1.27	1.41	5.13	6.55	0.42	NA	0.42	2.14	13.97
1964	3.79	1.37	1.37	5.52	6.89	0.44	NA	0.44	2.32	14.81
1965	3.90	1.44	1.16	5.96	7.11	0.50	NA	0.50	2.32	15.28
1966	4.14	1.62	1.03	6.51	7.55	0.54	NA	0.54	2.61	16.45
1967	4.31	1.96	1.14	6.65	7.79	0.58	NA	0.58	2.75	17.39
1968	4.45	2.08	1.24	7.13	8.37	0.59	NA	0.59	3.15	18.63
1969	4.73	2.25	1.35	7.61	8.96	0.63	NA	0.63	3.49	20.06
1970	4.84	2.40	1.40	7.85	9.25	0.72	NA	0.72	3.93	21.14
1971	4.97	2.51	1.41	8.18	9.59	0.74	NA	0.74	3.98	21.79
1972	5.13	2.61	1.46	8.17	9.62	0.77	NA	0.77	3.98	22.10
1973	4.88	2.60	1.50	8.69	10.18	0.73	NA	0.73	3.66	22.05
1974	4.79	2.56	1.48	8.29	9.77	0.67	NA	0.67	3.44	21.22
1975	4.92	2.51	1.40	6.97	8.36	0.58	NA	0.58	3.16	19.54
1976	5.05	2.67	1.63	6.96	8.60	0.55	NA	0.55	3.08	19.95
1977	4.82	2.50	1.66	6.82	8.47	0.53	NA	0.53	3.19	19.52
1978	4.90	2.60	1.65	6.76	8.40	0.53	NA	0.53	3.19	19.63
1979	4.97	2.79	1.50	6.90	8.40	0.60	NA	0.60	3.49	20.24
1980	4.75	2.61	1.03	7.17	8.20	0.63	NA	0.63	3.68	19.88
1981	4.55	2.52	0.93	7.13	8.06	0.64	NA	0.64	3.64	19.40
1982	4.63	2.61	1.11	5.83	6.94	0.60	NA	0.60	3.23	18.00
1983	4.38	2.43	0.98	5.64	6.62	0.49	NA	0.49	2.91	16.83
1984	4.56	2.52	1.08	6.15	7.23	0.53	NA	0.53	3.11	17.95
1985	4.43	2.43	0.97	5.90	6.87	0.50	NA	0.50	3.04	17.28
1986	4.31	2.32	0.92	5.58	6.50	0.49	NA	0.49	2.60	16.22
1987	4.31	2.43	1.15	5.95	7.10	0.52	NA	0.52	2.84	17.21
1988	4.63	2.67	1.10	6.38	7.48	0.61	NA	0.61	2.64	18.03
1989	4.78	2.72	1.07	6.82	7.89	0.63	NA	0.63	2.79	18.80
1990	4.39	2.62	1.24	7.02	8.25	0.66	(s)	0.66	2.79	18.72
1991	4.56	2.73	1.13	7.23	8.36	0.60	(s)	0.60	2.79	19.04
1992	4.69	2.80	1.17	7.53	8.70	0.59	(s)	0.59	2.77	19.54
1993	R4.96	R2.86	R1.18	R7.99	R9.17	R0.62	(s)	0.63	2.68	R20.29
1994P	4.83	3.00	1.24	7.92	9.15	0.63	NA	0.63	2.99	20.60

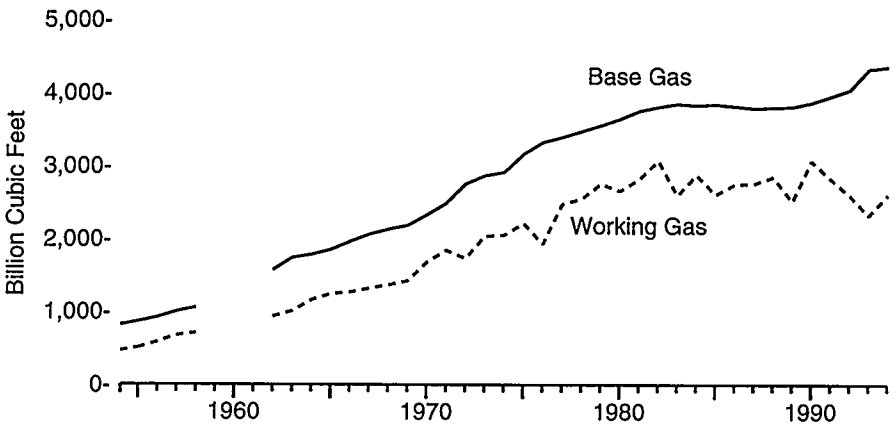
[1] Includes deliveries to municipalities and public authorities for institutional heating and other purposes.
[2] Natural gas consumed in the operation of pipelines, primarily in compressors.
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 5 billion cubic feet.
Notes: • For the definition of natural gas consumption, see Note 1 at end of section. • 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.
Sources: • 1949-1992—Energy Information Administration (EIA), *Natural Gas Annual 1993* (October 1994), Table 101. • 1993 and 1994—EIA, *Natural Gas Monthly* (March 1995), Table 3.

Figure 6.7 Natural Gas in Underground Storage, End of Year 1954-1994

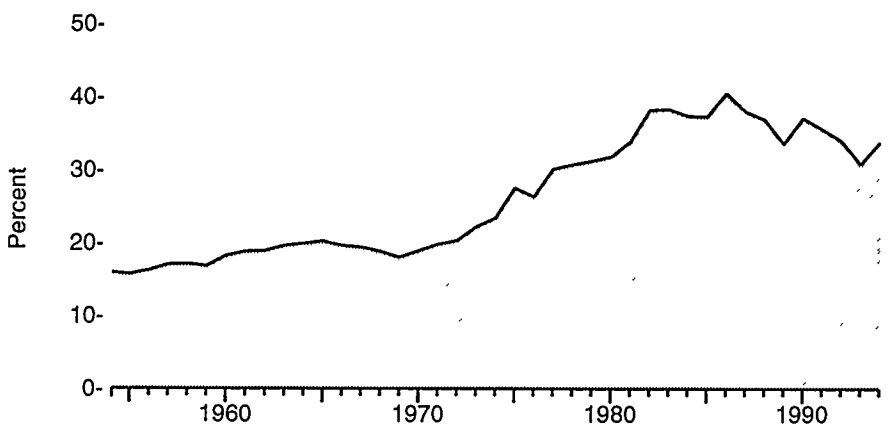
Total



Base Gas and Working Gas



End-of-Year Storage as a Share of Total Consumption



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

Sources: Tables 6.6 and 6.7.

Table 6.7 Natural Gas in Underground Storage, End of Year 1954-1994

(Billion Cubic Feet)

Year	Base Gas [1]	Working Gas	Total [1]
1954	817	465	1,281
1955	863	505	1,368
1956	919	583	1,502
1957	1,001	673	1,674
1958	1,056	708	1,764
1959	NA	NA	1,901
1960	NA	NA	2,184
1961	NA	NA	2,344
1962	1,571	933	2,504
1963	1,738	1,007	2,745
1964	1,781	1,159	2,940
1965	1,848	1,242	3,090
1966	1,958	1,267	3,225
1967	2,058	1,318	3,376
1968	2,128	1,366	3,495
1969	2,181	1,421	3,602
1970	2,326	1,678	4,004
1971	2,485	1,840	4,325
1972	2,751	1,729	4,480
1973	2,864	2,034	4,898
1974	2,912	2,050	4,962
1975	3,162	2,212	5,374
1976	3,323	1,926	5,250
1977	3,391	2,475	5,866
1978	3,473	2,547	6,020
1979	3,553	2,753	6,306
1980	3,642	2,655	6,297
1981	3,752	2,817	6,569
1982	3,808	3,071	6,879
1983	3,847	2,595	6,442
1984	3,830	2,876	6,706
1985	3,842	2,607	6,448
1986	3,819	2,749	6,567
1987	3,792	2,756	6,548
1988	3,800	2,850	6,650
1989	3,812	2,513	6,325
1990	3,868	3,068	6,936
1991	3,954	2,824	6,778
1992	4,044	2,597	6,641
1993	R4,327	R2,322	R6,649
1994	4,359	2,602	6,960

[1] Includes native gas.

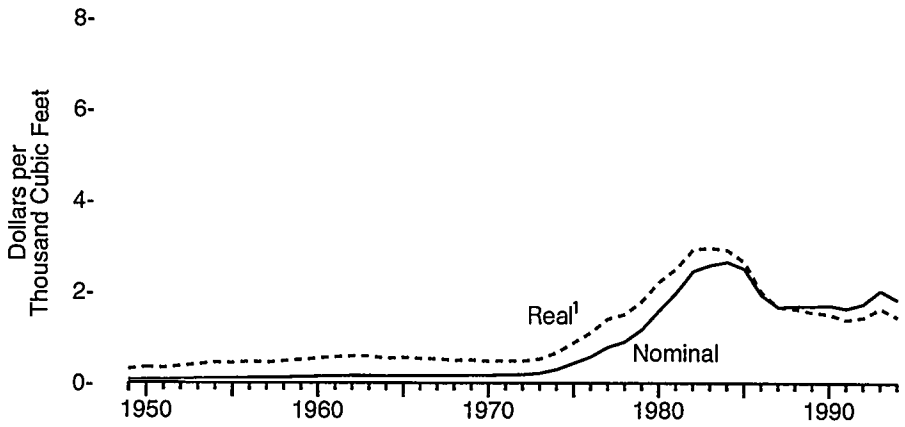
R=Revised data. NA=Not available.

Notes: • 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.

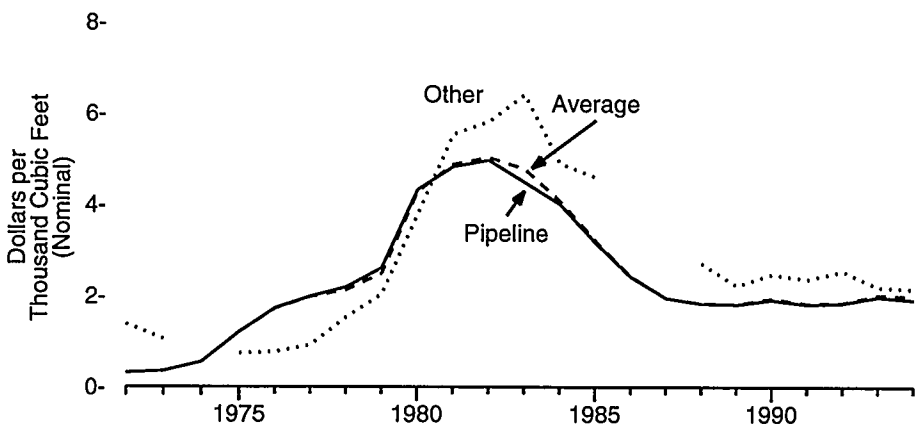
Sources: • 1954-1974—American Gas Association, *Gas Facts.* • 1975 and 1976—Federal Energy Administration, Form FEA-G318-M-O, and Federal Power Commission, Form FPC-8, "Underground Gas Storage Report." • 1977 and 1978—Energy Information Administration (EIA), and Federal Energy Administration, Form FEA-G318-M-O, and Federal Power Commission, Form FPC-8, "Underground Gas Storage Report." • 1979-1984—EIA, Form EIA-191 and Federal Energy Regulatory Commission, Form FERC-8, "Underground Gas Storage Report." • 1985—EIA, *Natural Gas Monthly* (March 1991), Table 17. • 1986—EIA, *Natural Gas Monthly* (March 1992), Table 17. • 1987—EIA, *Natural Gas Monthly* (March 1993), Table 13. • 1988—EIA, *Natural Gas Monthly* (March 1994), Table 13. • 1989 forward—EIA, *Natural Gas Monthly* (March 1995), Table 13.

Figure 6.8 Natural Gas Wellhead and Import Prices

Wellhead, 1949-1994

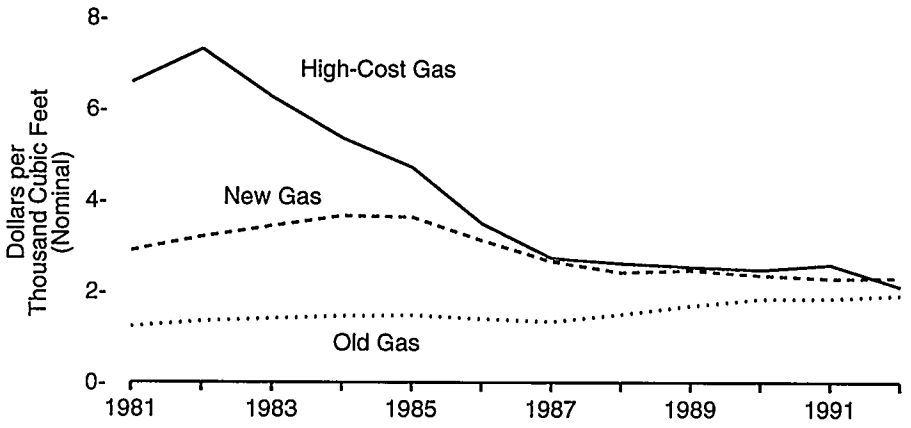


Imports, 1972-1994

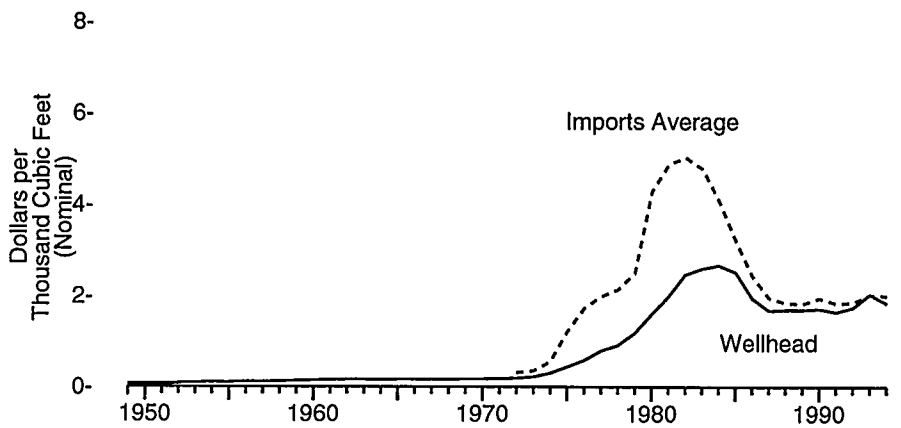


In 1974 and 1987 all imports were by pipeline.

Purchases by NGPA[2] Categories, 1981-1992



Domestic and Imported Average Prices, 1949-1994



[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

[2] NGPA=Natural Gas Policy Act.
Source: Table 6.8.

Table 6.8 Natural Gas Wellhead and Import Prices, 1949-1994

(Dollars per Thousand Cubic Feet)

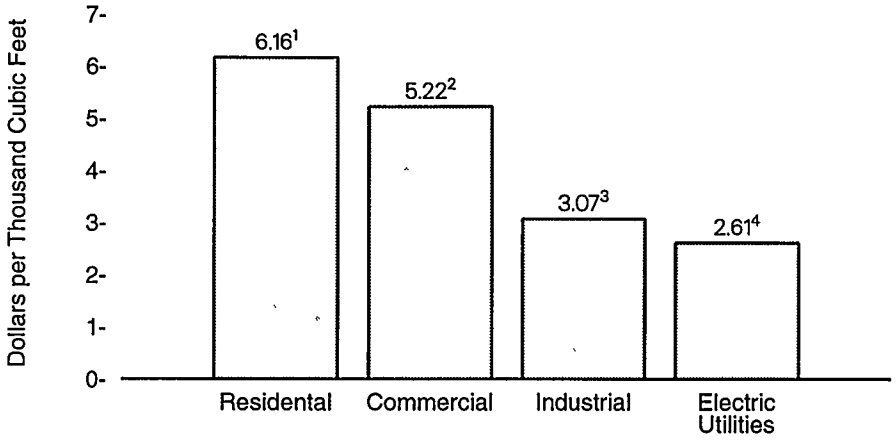
Year	Wellhead [2]		Purchases by NGPA Categories [1]			Imports		
			Old Gas	New Gas	High-Cost Gas	Pipeline	Other [3]	Average
	Nominal	Real [4]	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
1949	0.06	0.30	—	—	—	NA	NA	NA
1950	0.07	0.35	—	—	—	NA	NA	NA
1951	0.07	0.33	—	—	—	NA	NA	NA
1952	0.08	0.37	—	—	—	NA	NA	NA
1953	0.09	0.41	—	—	—	NA	NA	NA
1954	0.10	0.45	—	—	—	NA	NA	NA
1955	0.10	0.44	—	—	—	NA	NA	NA
1956	0.11	0.47	—	—	—	NA	NA	NA
1957	0.11	0.45	—	—	—	NA	NA	NA
1958	0.12	0.48	—	—	—	NA	NA	NA
1959	0.13	0.51	—	—	—	NA	NA	NA
1960	0.14	0.54	—	—	—	NA	NA	NA
1961	0.15	0.57	—	—	—	NA	NA	NA
1962	0.16	0.59	—	—	—	NA	NA	NA
1963	0.16	0.59	—	—	—	NA	NA	NA
1964	0.15	0.54	—	—	—	NA	NA	NA
1965	0.16	0.56	—	—	—	NA	NA	NA
1966	0.16	0.54	—	—	—	NA	NA	NA
1967	0.16	0.53	—	—	—	NA	NA	NA
1968	0.16	0.50	—	—	—	NA	NA	NA
1969	0.17	0.51	—	—	—	NA	NA	NA
1970	0.17	0.48	—	—	—	NA	NA	NA
1971	0.18	0.49	—	—	—	NA	NA	NA
1972	0.19	0.49	—	—	—	0.31	1.38	0.31
1973	0.22	0.53	—	—	—	0.35	1.05	0.35
1974	0.30	0.67	—	—	—	0.55	([5])	0.55
1975	0.44	0.89	—	—	—	1.21	0.74	1.21
1976	0.58	1.11	—	—	—	1.73	0.77	1.72
1977	0.79	1.41	—	—	—	1.99	R0.92	1.98
1978	0.91	1.51	—	—	—	2.19	1.53	2.13
1979	1.18	1.80	—	—	—	2.61	2.03	2.49
1980	1.59	2.22	—	—	—	R4.32	3.77	4.28
1981	1.98	2.51	1.22	2.89	6.58	R4.83	5.54	4.88
1982	2.46	2.94	1.34	3.19	7.31	R4.97	5.82	5.03
1983	2.59	2.97	1.40	3.43	6.25	R4.49	6.41	4.78
1984	2.66	2.92	1.45	3.65	5.35	R4.01	4.90	4.08
1985	2.51	2.66	1.47	3.62	4.71	3.17	4.60	3.21
1986	1.94	2.00	1.39	3.11	3.48	2.42	([5])	2.43
1987	1.67	1.67	1.33	2.65	2.72	1.95	([5])	1.95
1988	1.69	1.63	1.49	2.41	2.61	1.83	2.71	1.84
1989	1.69	1.56	1.68	2.46	2.53	1.81	2.22	1.82
1990	1.71	1.51	1.83	2.35	2.47	1.91	2.47	1.94
1991	1.64	1.39	1.84	2.28	2.58	1.81	2.36	1.83
1992	1.74	1.44	1.91	2.29	2.10	1.84	2.54	1.85
1993	R2.03	R1.64	—	—	—	R1.98	R2.19	2.02
1994E	1.83	1.45	—	—	—	1.91	2.15	1.99

[1] Projected natural gas wellhead purchase prices by major interstate pipeline companies by Natural Gas Policy Act of 1978 categories (see Note 2 at end of section).
[2] See Glossary for definition of Natural Gas Wellhead Price.
[3] Primarily liquefied natural gas from Algeria.
[4] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
[5] Not applicable. All imports were by pipeline.
R=Revised data. E=Estimate. NA=Not available. — = Not applicable.

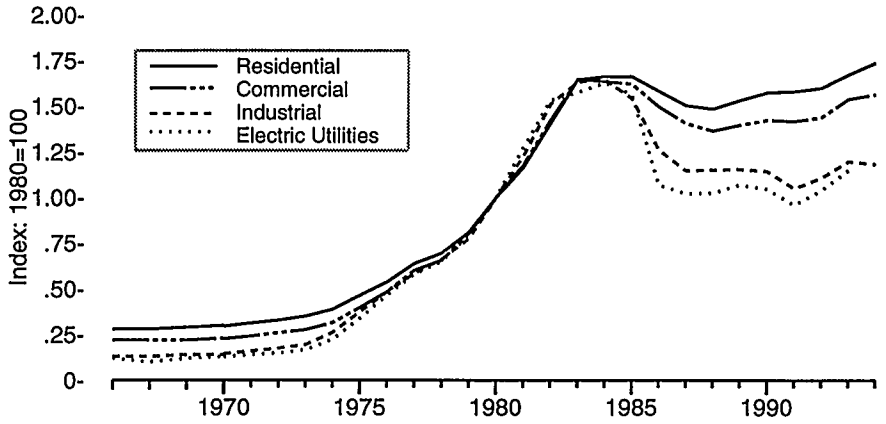
Sources: **Wellhead:** • 1949-1988—Energy Information Administration (EIA), *Natural Gas Annual 1993* (October 1994), Table 99. • 1989 forward—EIA, *Natural Gas Monthly* (March 1995), Table 4. **Old Gas, 1981-1986 and New Gas, 1981:** EIA, *Natural Gas Monthly*, November 1987 (January 1988), Table 5. **New Gas, 1982-1986:** EIA, *Natural Gas Monthly*, January 1988 (March 1988), Table 5. **High-Cost Gas:** • 1981-1983—EIA, *Natural Gas Monthly*, December 1984 (February 1985), Table 22. • 1984-1986—EIA, *Natural Gas Monthly*, December 1987 (February 1988), Table 5. **Old Gas, New Gas, and High-Cost Gas:** • 1987-1992—EIA, *Natural Gas Monthly* (February 1993), Table 5. **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. • 1977-1988—EIA, *Natural Gas Monthly* (August 1994), Table FE7. • 1989 forward—EIA, *Natural Gas Monthly* (March 1995), Table 5.

Figure 6.9 Natural Gas Prices by Sector

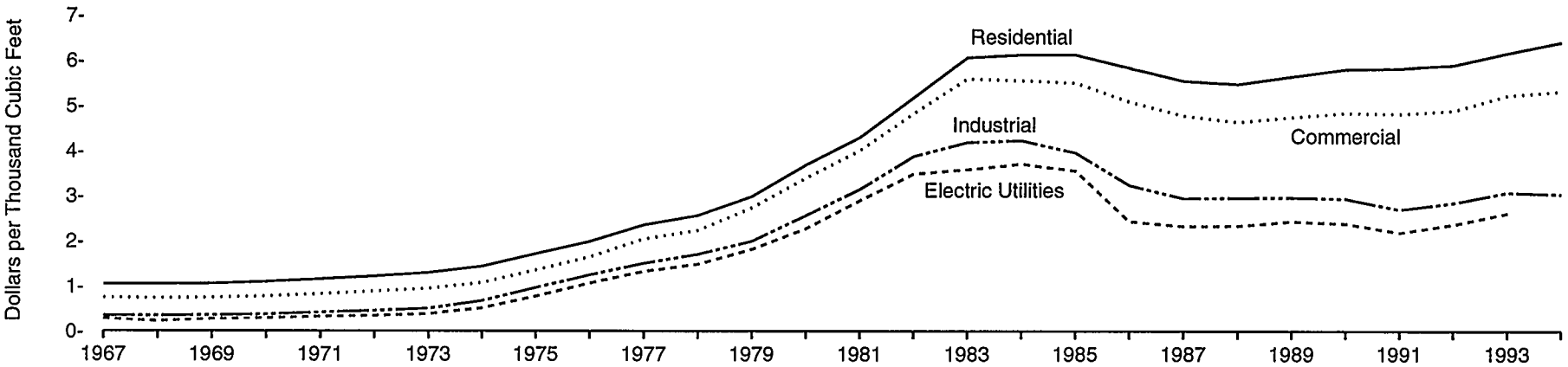
Prices, 1993



Prices Indexed, 1967-1994



Prices, 1967-1994



[1] Based on 100 percent of volume delivered.
[2] Based on 84.1 percent of volume delivered.
[3] Based on 29.0 percent of volume delivered.
[4] Based on all steam-electric utility plants with a combined capacity of 50 megawatts or greater.
Source: Table 6.9.

Table 6.9 Natural Gas Prices by Sector, 1967-1994

(Dollars per Thousand Cubic Feet)

Year	Residential	Commercial [1]		Industrial		Vehicle Fuel [2]		Electric Utilities
	Price [3]	Price	Percentage of Total Volume Delivered	Price	Percentage of Total Volume Delivered	Price	Percentage of Total Volume Delivered	Price [4]
1967	1.04	0.74	NA	0.34	NA	NA	NA	0.28
1968	1.04	0.73	NA	0.34	NA	NA	NA	0.22
1969	1.05	0.74	NA	0.35	NA	NA	NA	0.27
1970	1.09	0.77	NA	0.37	NA	NA	NA	0.29
1971	1.15	0.82	NA	0.41	NA	NA	NA	0.32
1972	1.21	0.88	NA	0.45	NA	NA	NA	0.34
1973	1.29	0.94	NA	0.50	NA	NA	NA	0.38
1974	1.43	1.07	NA	0.67	NA	NA	NA	0.51
1975	1.71	1.35	NA	0.96	NA	NA	NA	0.77
1976	1.98	1.64	NA	1.24	NA	NA	NA	1.06
1977	2.35	2.04	NA	1.50	NA	NA	NA	1.32
1978	2.56	2.23	NA	1.70	NA	NA	NA	1.48
1979	2.98	2.73	NA	1.99	NA	NA	NA	1.81
1980	3.68	3.39	NA	2.56	NA	NA	NA	2.27
1981	4.29	4.00	NA	3.14	NA	NA	NA	2.89
1982	5.17	4.82	NA	3.87	85.1	NA	NA	3.48
1983	6.06	5.59	NA	4.18	80.7	NA	NA	3.58
1984	6.12	5.55	NA	4.22	74.7	NA	NA	3.70
1985	6.12	5.50	NA	3.95	68.8	NA	NA	3.55
1986	5.83	5.08	NA	3.23	59.8	NA	NA	2.43
1987	5.54	4.77	93.1	2.94	47.4	NA	NA	2.32
1988	5.47	4.63	90.7	2.95	42.6	NA	NA	2.33
1989	5.64	4.74	89.1	2.96	37.0	NA	NA	2.43
1990	5.80	4.83	86.6	2.93	35.2	3.39	NA	2.38
1991	5.82	4.81	85.1	2.69	32.7	3.96	NA	2.18
1992	5.89	4.88	83.2	2.84	30.0	4.05	NA	2.36
1993	R6.16	R5.22	84.1	R3.07	29.0	4.27	87.8	R2.61
1994P	6.40	5.31	85.6	3.03	32.8	NA	NA	NA

[1] Includes deliveries to municipalities and public authorities for institutional heating and other purposes.

[2] 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.

[3] Based on 100 percent of volume delivered.

[4] Based on all steam-electric utility plants with a combined capacity of 50 megawatts or greater.

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

Notes: • Residential, commercial, and industrial price data represent prices of natural gas sold and delivered by local distribution companies to residential, commerical, and industrial consumers, respectively. The data do not reflect prices of natural gas transported for the account of others. • Dry natural gas, including supplemental gaseous fuels. • 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 1 at end of section.

Sources: **Vehicle Fuel:** • 1990-1993—EIA, *Natural Gas Annual 1993* (October 1994), Table 102. **All Other Data:** • 1967-1988—EIA, *Natural Gas Annual 1993* (October 1994), Table 102. • 1989 forward—EIA, *Natural Gas Monthly* (March 1995), Table 4.

Natural Gas Notes

1. Natural gas consumption statistics are compiled from surveys of natural gas production, transmission, and distribution companies and electric utility companies. 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: Commercial Sector–consumption by nonmanufacturing establishments, by municipalities for institutional heating and lighting, and those engaged in agriculture, forestry, and fishing; Electric Utility Sector–consumption by electric utilities for the generation of electric power; Industrial Sector–consumption by establishments engaged primarily in processing unfinished materials into another form of product (includes mining, petroleum refining, manufacturing, and natural gas industry use for lease and plant fuel); Residential Sector–consumption by private households for space heating, cooking, and other household uses; Transportation Sector–natural gas transmission (pipeline) fuel.

2. **Natural Gas Prices by Natural Gas Policy Act of 1978 (NGPA) Categories: Old Gas:** Includes natural gas dedicated to interstate commerce and natural gas purchased under existing interstate or rollover contracts (NGPA Sections 104, 105, and 106). **New Gas:** Includes new natural gas and certain natural gas produced from the Outer Continental Shelf, stripper well gas, and other new gas categories (NGPA Sections 102, 103, 108, and 109). **High-Cost Gas:** Includes natural gas from deep wells and low permeability (tight) reservoirs and unregulated gas (NGPA Section 107).

7. Coal

Changing Patterns of Coal Production

In 1994, estimated production of all types of coal totaled 1,031 million short tons, the highest total ever (7.1).* The 1994 total was 85 million short tons above the 1993 total, which was lower than the totals of some previous years due to a strike by the United Mine Workers of America against member companies of the Bituminous Coal Operators' Association.

Of all coal production, bituminous and subbituminous coal accounted for by far the largest share (91 percent) in 1994 (7.2). Lignite and anthracite accounted for the remainder of coal produced. Despite its superior burning qualities, anthracite, mined in northeastern Pennsylvania, accounts for a diminishing share of total coal production. In 1949, anthracite accounted for 8.9 percent of the total; by 1994, its share had shrunk to 0.4 percent.

More coal is mined east of the Mississippi than in the West, but the West's share of total production increased almost every year after 1965 (7.2). That year, production of western coal was 27 million short tons, 5.2 percent of the total. By 1994, western production had increased by a factor of 17, to 463 million short tons (45 percent of the total). The growth in western coal production was due in part to environmental concerns that led to increased demand for low-sulfur coal, which is concentrated in the West. In addition, surface mining, with its higher average productivity, is much more prevalent in the West.

Domestic Markets: Changes in Coal End Use

Electric utilities are the dominant consumers of coal (7.3). Their consumption grew from 84 million short tons, a 17-percent share, in 1949, to 817 million short tons, an 88-percent share, in 1994. By contrast, consumption by all other economic sectors in 1994 was lower than it had been in 1949. The most dramatic declines occurred in the transportation sector, where railroads switched to petroleum, and in the residential and commercial sector. In 1949, those two sectors accounted for 187 million short tons, 39 percent of total coal consumption. By 1994, their consumption totaled 7.0 million short tons, less than 1 percent of U.S. coal consumption.

Consumption by the industrial sector, including coke plants, trended downward after the mid-1960's. From 205 million short tons in 1966, industrial consumption fell to about 112 million short tons in 1986 and 1987. In 1988, growth in manufacturing activity was accompanied by a modest increase in industrial consumption, which rose to 118 million short tons. In 1989, industrial consumption fell to 117 million short tons, and, through 1994, slow growth in the economy restrained industrial demand for coal. In 1994, industrial consumption totaled 106 million short tons, down 0.5 percent from the 1993 level.

Coal Mining Productivity

The average productivity of all types of mines in the United States increased each year from 1949 to 1969, when it reached 2.4 short tons per miner hour (7.6). Productivity during the 1970's and early 1980's was lower, due primarily to the coal industry's compliance with the Federal Coal Mine Health and Safety Act of 1969, as well as to environmental and other factors.

The growing importance of surface coal mining, where productivity is generally higher than for underground mining, and the closing of nonproductive mines, led to increases in average productivity during the 1980's and 1990's. In 1993, average productivity in all types of mines (excluding anthracite) reached an all-time high of 4.7 short tons per miner hour. That year, productivity of underground mines (excluding anthracite) was 3.0 short tons per miner hour and productivity of surface mines (excluding anthracite) was 7.4 short tons per miner hour.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

Foreign Markets

Since World War II, coal has been the United States' major energy export (1.4). Throughout most of the 1960's and 1970's, U.S. exports of coal increased, peaking at 113 million short tons in 1981 (7.4). Increased shipments to Canada, Japan, and European markets contributed to the growth. The level of U.S. coal exports fluctuated throughout the 1980's, falling as low as 78 million short tons in 1983 but attaining 95 million short tons in 1988. That year, difficulties experienced by competing countries (particularly China, Australia, and Poland) allowed the United States to recapture some export markets, and thereafter coal exports rose each year through 1991, when coal exports totaled 109 million short tons. In 1992, coal exports fell to 103 million short tons. A large increase in exports to Canada was more than offset by lower levels of exports to Brazil and to European markets, particularly Italy. In 1993, the continuing weakness of the European economy and ongoing subsidies for domestic European coal caused exports to fall dramatically to 75 million short tons, and, in 1994, coal exports fell to 71 million short tons, the lowest level in 15 years. Japan purchased the most U.S. coal (10 million short tons), followed by Canada (9.2 million short tons) and Italy (7.5 million short tons). Together, those three countries accounted for 38 percent of total coal exports in 1994.

In 1994, the average real price of bituminous coal and lignite at the minemouth fell to $15.41 per short ton, down for the sixteenth year in a row.

Prices

In 1994, the average real price[1] of bituminous coal and lignite at the minemouth fell to $15.41 per short ton, down for the sixteenth year in a row (7.8). The 1994 price was less than half of the peak price of $39.09 per short ton recorded in 1975. The average real price of anthracite of $25.62 per short ton was also well below the 1975 peak of $65.57 per short ton. The decline in coal prices was the result of gains in productivity, the expanded use of longwall mining in underground mines, and the increased use of less-expensive western coal.

[1]Real prices are expressed in 1987 dollars.

From 1961 on, electric utilities were the primary consumers of coal (7.3). Throughout the 1960's, the average real price of coal delivered to electric utilities declined (7.8). However, when prices of other fossil fuels rose rapidly after 1973, coal prices at electric utilities also increased, from $21.82 per short ton in 1973 to $34.43 per short ton the following year. (Despite that increase, coal remained the least expensive fossil fuel, on a Btu basis.) The price of coal at electric utilities gradually rose after 1974, peaking at $41.66 per short ton in 1982 and then declined each year through 1994, by which time the price had fallen to $22.26 per short ton.

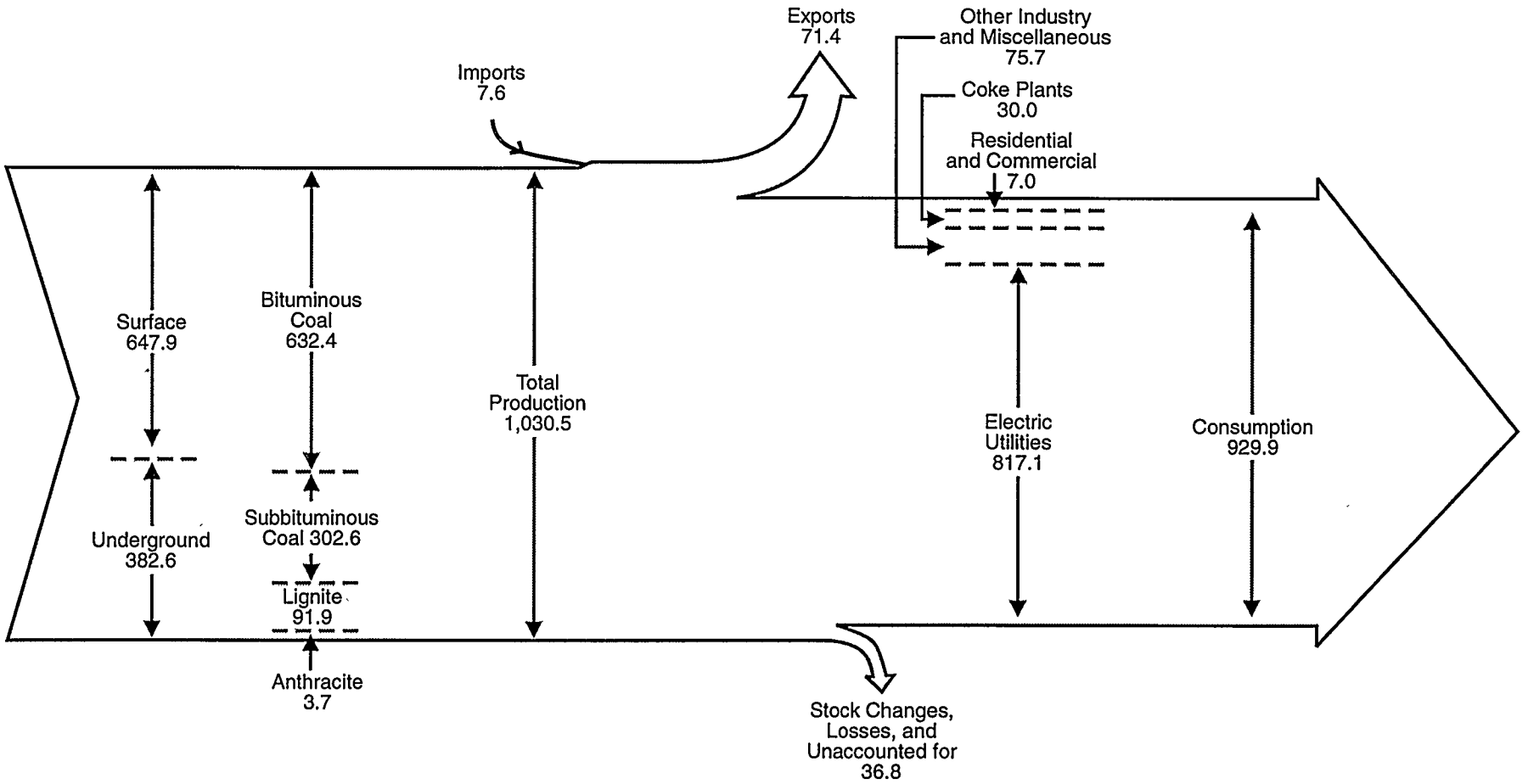
Stocks

Although there is little seasonal variation in demand, production of coal can vary considerably due to such factors as coal miners' strikes and bad weather. To compensate for possible supply interruptions, coal producers and distributors, as well as such major consumers as electric utilities and coke plants, generally maintain large stockpiles. For example, in 1980 coal stocks were built up to a year-end total of 228 million short tons (7.5) and then drawn down to augment supplies during the 1981 miners' strike. Despite stockpiling during the second half of 1981, after the strike had ended, year-end stocks totaled 209 million short tons, 19 million short tons below the level at the end of 1980.

Similarly, wildcat strikes in 1989 resulted in year-end stocks of 175 million short tons, the lowest level since 1978. In 1990, a major stock build-up by electric utilities brought year-end stocks to 202 million short tons. In 1991, year-end coal stocks declined slightly, to 201 million short tons. In 1992, year-end coal stocks declined again, to 198 million short tons, despite upcoming contract negotiations between the United Mine Workers of America (UMWA) and the Bituminous Coal Operators' Association. In 1993, the UMWA strike led to lower levels of coal production, as noted earlier, and stocks were drawn down to compensate. At year end, coal stocks totaled 146 million short tons. In 1994, year-end coal stocks rose to 167 million short tons.

In 1994, electric utilities held more than three-fourths of the coal, and coal producers and distributors held most of the remainder. Stocks at coke plants and other industrial sites were relatively small.

Diagram 4. Coal Flow, 1994
(Million Short Tons)

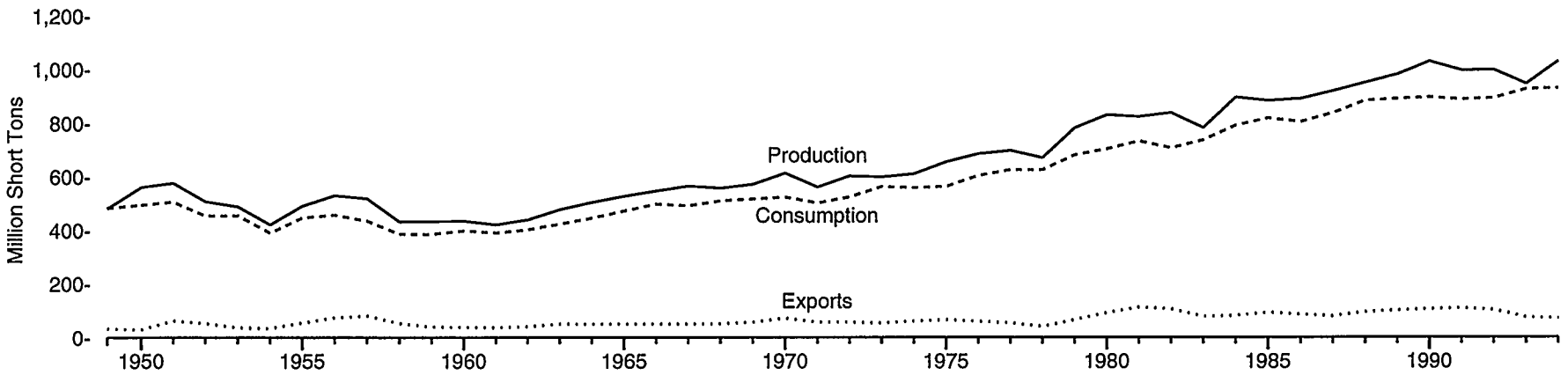


Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.

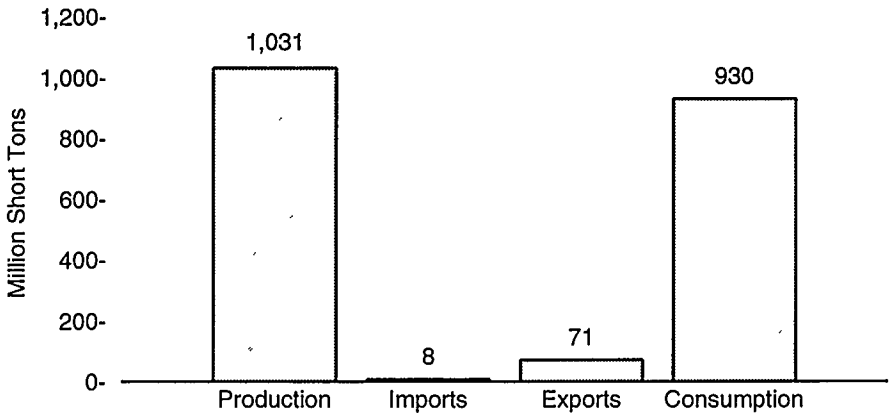
Sources: Tables 7.1, 7.2, and 7.3.

Figure 7.1 Coal Overview

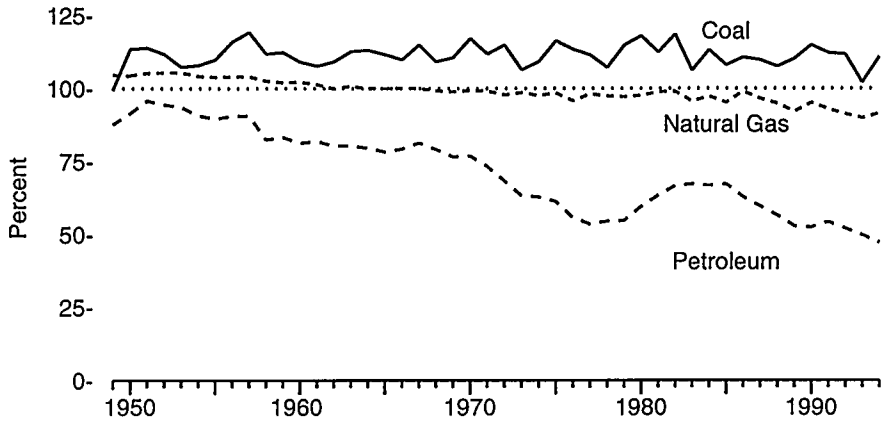
Overview, 1949-1994



Overview, 1994



Production as Share of Consumption by Type of Fossil Fuel, 1949-1994



Sources: Tables 5.1, 6.1, and 7.1.

Table 7.1 Coal Overview, 1949-1994

(Million Short Tons)

Year	Production	Imports	Exports	Stock Changes, Losses, and Unaccounted for [1]	Consumption
1949	480.6	0.3	32.8	35.1	483.2
1950	560.4	0.4	29.4	-37.3	494.1
1951	576.3	0.3	62.7	-8.1	505.9
1952	507.4	0.3	52.2	-1.4	454.1
1953	488.2	0.3	36.5	2.8	454.8
1954	420.8	0.2	33.9	2.8	389.9
1955	490.8	0.3	54.4	10.3	447.0
1956	529.8	0.4	73.8	0.5	456.9
1957	518.0	0.4	80.8	-3.2	434.5
1958	431.6	0.3	52.6	6.4	385.7
1959	432.7	0.4	39.0	-9.0	385.1
1960	434.3	0.3	38.0	1.5	398.1
1961	420.4	0.2	36.4	6.2	390.4
1962	439.0	0.2	40.2	3.2	402.3
1963	477.2	0.3	50.4	-3.6	423.5
1964	504.2	0.3	49.5	-9.3	445.7
1965	527.0	0.2	51.0	-4.1	472.0
1966	546.8	0.2	50.1	0.8	497.7
1967	564.9	0.2	50.1	-23.6	491.4
1968	556.7	0.2	51.2	4.1	509.8
1969	571.0	0.1	56.9	2.2	516.4
1970	612.7	(s)	71.7	-17.7	523.2
1971	560.9	0.1	57.3	-2.2	501.6
1972	602.5	(s)	56.7	-21.5	524.3
1973	598.6	0.1	53.6	17.5	562.6
1974	610.0	2.1	60.7	7.0	558.4
1975	654.6	0.9	66.3	-26.6	562.6
1976	684.9	1.2	60.0	-22.3	603.8
1977	697.2	1.6	54.3	-19.2	625.3
1978	670.2	3.0	40.7	-7.2	625.2
1979	781.1	2.1	66.0	-36.6	680.5
1980	829.7	1.2	91.7	-36.4	702.7
1981	823.8	1.0	112.5	20.3	732.6
1982	838.1	0.7	106.3	-25.7	706.9
1983	782.1	1.3	77.8	31.1	736.7
1984	895.9	1.3	81.5	-24.4	791.3
1985	883.6	2.0	92.7	25.1	818.0
1986	890.3	2.2	85.5	-2.8	804.2
1987	918.8	1.7	79.6	-4.0	836.9
1988	950.3	2.1	95.0	26.3	883.6
1989	980.7	2.9	100.8	6.9	889.7
1990	1,029.1	2.7	105.8	-30.5	895.5
1991	996.0	3.4	109.0	-2.8	887.6
1992	997.5	3.8	102.5	-6.4	892.4
1993	R945.4	7.3	74.5	R47.7	R925.9
1994	E1,030.5	7.6	71.4	E-36.8	E929.9

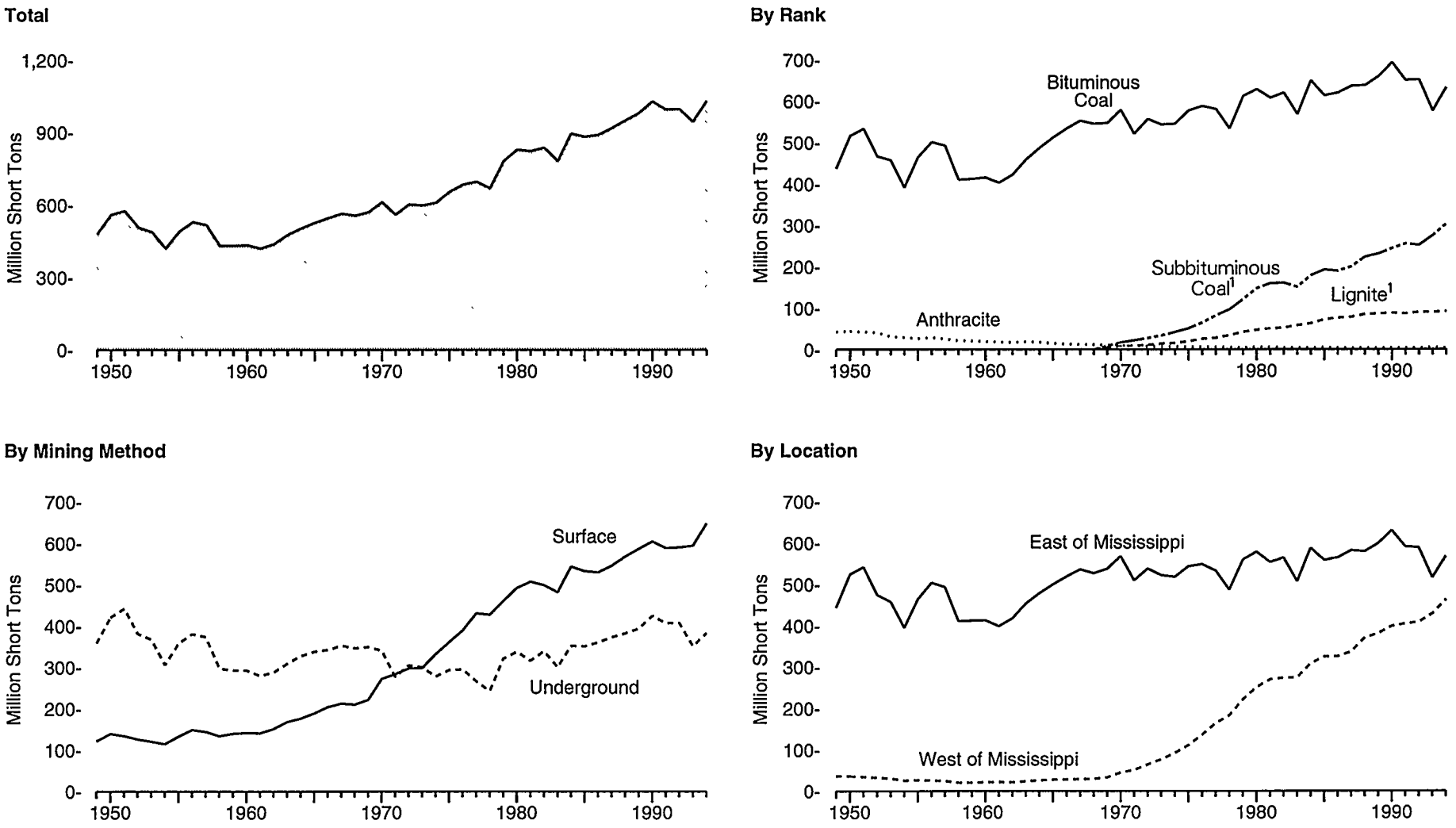
[1] Includes changes in stocks at electric utilities, coke plants, other industries, retail dealers, producers/distributors, and the balancing item of losses and unaccounted for.

R=Revised data. E=Estimate. (s)=Less than 0.05 million short tons.

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

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 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.* • 1981-1993—EIA, *Weekly Coal Production, Coal Production* (annual), and *Quarterly Coal Report October-December 1994* (May 1995), Table 1. • 1994—EIA, *Monthly Energy Review* (March 1995), Table 6.1.

Figure 7.2 Coal Production, 1949-1994



[1] 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, 1949-1994

(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	651.9	252.1	90.1	3.5	407.2	590.3	409.0	588.6	997.5
1993	R576.7	R274.9	R89.5	4.3	R351.1	R594.4	R429.2	R516.2	945.4
1994E	632.4	302.6	91.9	3.7	382.6	647.9	463.1	567.4	1,030.5

[1] Included in bituminous coal.

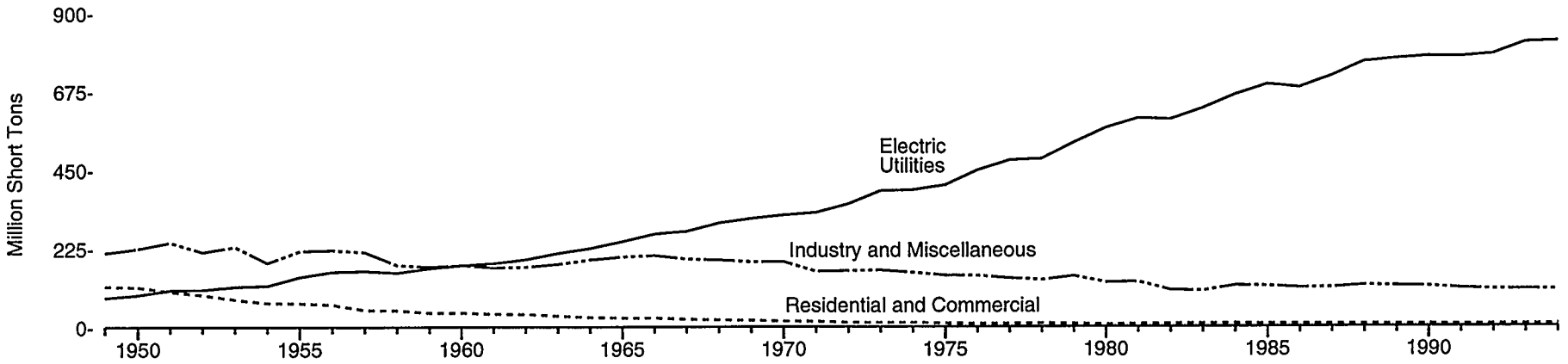
R=Revised data. E=Estimate.

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

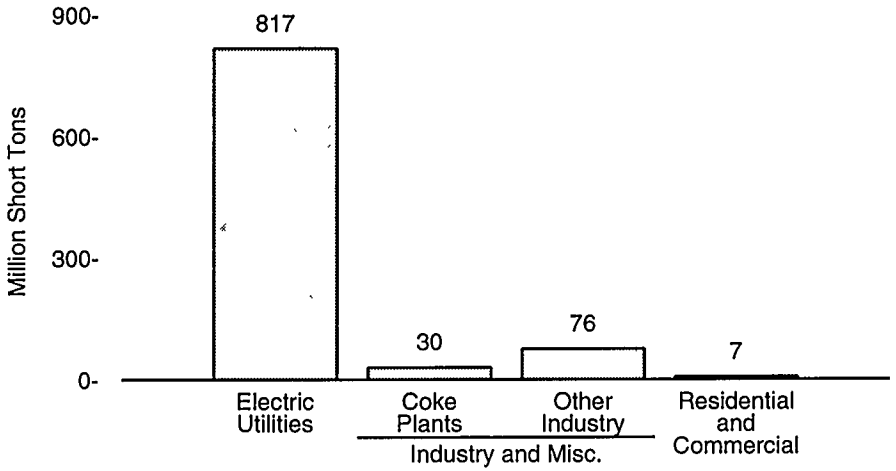
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976*. • 1977 and 1978—EIA, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977; 1978, Coal-Pennsylvania Anthracite 1977; 1978*, and *Coal Production* (annual). • 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report* and *Coal Production* (annual). • 1981-1992—EIA, *Weekly Coal Production* and *Coal Production* (annual). • 1993—EIA, *Coal Industry Annual 1993* (December 1994), Tables 1, 3, and 9. • 1994—EIA estimates.

Figure 7.3 Coal Consumption by Sector

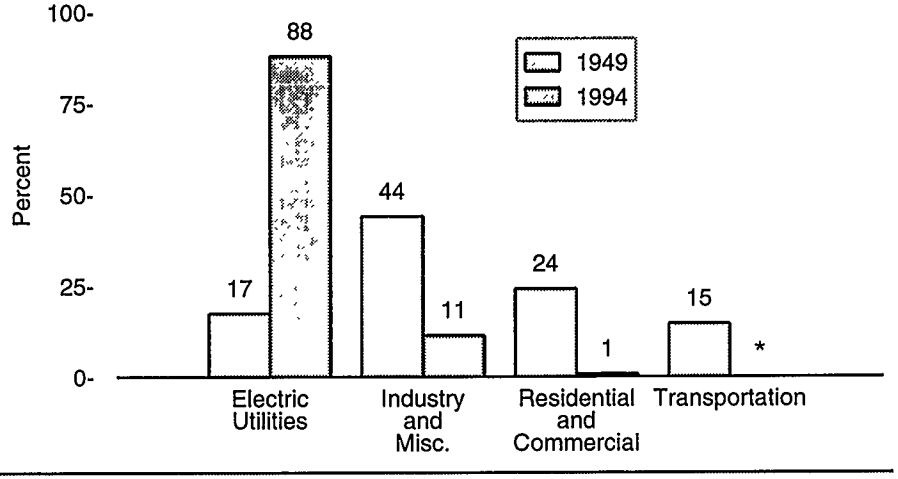
By Sector, 1949-1994



By Sector, 1994



Shares by Sector, 1949 and 1994



* Small amounts of coal for transportation use are included in Industry and Miscellaneous.

Source: Table 7.3.

Table 7.3 Coal Consumption by Sector, 1949-1994

(Million Short Tons)

Year	Residential and Commercial	Industry and Miscellaneous			Transportation	Electric Utilities	Total
		Coke Plants	Other Industry and Miscellaneous	Total			
1949	116.5	91.4	121.2	212.6	70.2	84.0	483.2
1950	114.6	104.0	120.6	224.6	63.0	91.9	494.1
1951	101.5	113.7	128.7	242.4	56.2	105.8	505.9
1952	92.3	97.8	117.1	214.9	39.8	107.1	454.1
1953	79.2	113.1	117.0	230.1	29.6	115.9	454.8
1954	69.1	85.6	98.2	183.9	18.6	118.4	389.9
1955	68.4	107.7	110.1	217.8	17.0	143.8	447.0
1956	64.2	106.3	114.3	220.6	13.8	158.3	456.9
1957	49.0	108.4	106.5	214.9	9.8	160.8	434.5
1958	47.9	76.8	100.5	177.4	4.7	155.7	385.7
1959	40.8	79.6	92.7	172.3	3.6	168.4	385.1
1960	40.9	81.4	96.0	177.4	3.0	176.7	398.1
1961	37.3	74.2	95.9	170.1	0.8	182.2	390.4
1962	36.5	74.7	97.1	171.7	0.7	193.3	402.3
1963	31.5	78.1	101.9	180.0	0.7	211.3	423.5
1964	27.2	89.2	103.1	192.4	0.7	225.4	445.7
1965	25.7	95.3	105.6	200.8	0.7	244.8	472.0
1966	25.6	96.4	108.7	205.1	0.6	266.5	497.7
1967	22.1	92.8	101.8	194.6	0.5	274.2	491.4
1968	20.0	91.3	100.4	191.6	0.4	297.8	509.8
1969	18.9	93.4	93.1	186.6	0.3	310.6	516.4
1970	16.1	96.5	90.2	186.6	0.3	320.2	523.2
1971	15.2	83.2	75.6	158.9	0.2	327.3	501.6
1972	11.7	87.7	72.9	160.6	0.2	351.8	524.3
1973	11.1	94.1	68.0	162.1	0.1	389.2	562.6
1974	11.4	90.2	64.9	155.1	0.1	391.8	558.4
1975	9.4	83.6	63.6	147.2	(s)	406.0	562.6
1976	8.9	84.7	61.8	146.5	(s)	448.4	603.8
1977	9.0	77.7	61.5	139.2	(s)	477.1	625.3
1978	9.5	71.4	63.1	134.5	(1)	481.2	625.2
1979	8.4	77.4	67.7	145.1	(1)	527.1	680.5
1980	6.5	66.7	60.3	127.0	(1)	569.3	702.7
1981	7.4	61.0	67.4	128.4	(1)	596.8	732.6
1982	8.2	40.9	64.1	105.0	(1)	593.7	706.9
1983	8.4	37.0	66.0	103.0	(1)	625.2	736.7
1984	9.1	44.0	73.7	117.8	(1)	664.4	791.3
1985	7.8	41.1	75.4	116.4	(1)	693.8	818.0
1986	7.7	35.9	75.6	111.5	(1)	685.1	804.2
1987	6.9	37.0	75.2	112.1	(1)	717.9	836.9
1988	7.1	41.9	76.3	118.1	(1)	758.4	883.6
1989	6.2	40.5	76.1	116.6	(1)	766.9	889.7
1990	6.7	38.9	76.3	115.2	(1)	773.5	895.5
1991	6.1	33.9	75.4	109.3	(1)	772.3	887.6
1992	6.2	32.4	74.0	106.4	(1)	779.9	892.4
1993	R6.2	R31.3	R74.9	R106.2	(1)	R813.5	R925.9
1994	E7.0	E30.0	E75.7	E105.7	(1)	817.1	E929.9

[1] After 1977, small amounts of coal consumed by Transportation Sector are included in "Other Industry and Miscellaneous."

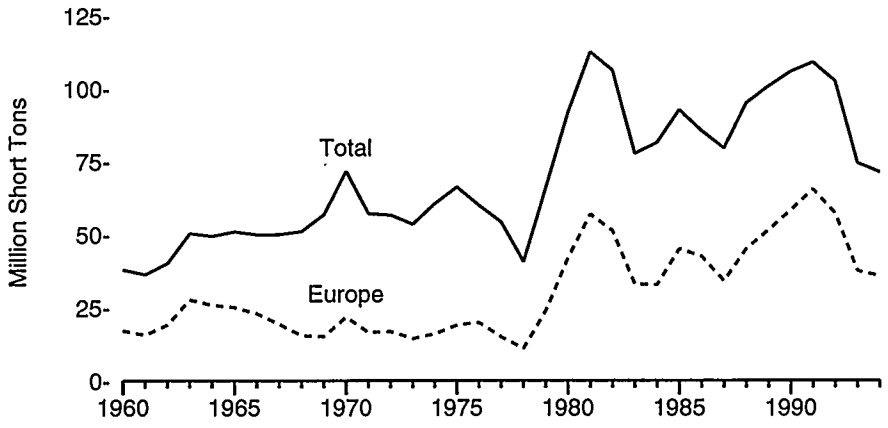
R=Revised data. E=Estimate. (s)=Less than 0.05 million short tons.

Notes: • See Note at end of section. • Totals may not equal sum of components due to independent rounding.

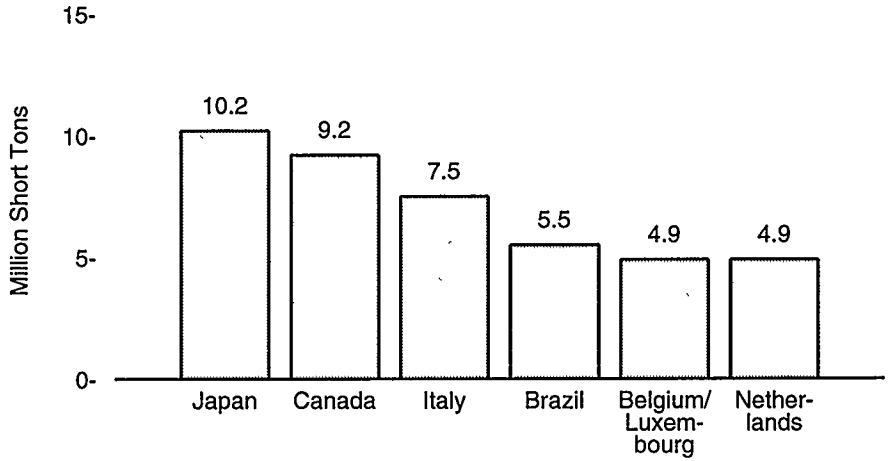
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976*. • 1977 and 1978—EIA, Energy Data Report, *Coal-Pennsylvania Anthracite 1977; 1978*, and *Weekly Coal Report*. • 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report*. • 1981—EIA, *Weekly Coal Production*. • 1982—EIA, *Quarterly Coal Report October-December 1990* (May 1991), Table 23. • 1983—EIA, *Quarterly Coal Report October-December 1991* (May 1992), Table 23. • 1984—EIA, *Quarterly Coal Report October-December 1992* (May 1993), Table 45. • 1985—EIA, *Quarterly Coal Report October-December 1993* (May 1994), Table 45. • 1986-1993—EIA, *Quarterly Coal Report October-December 1994* (May 1995), Table 45. • 1994—EIA, *Monthly Energy Review* (March 1995), Table 6.2.

Figure 7.4 Coal Exports by Country of Destination

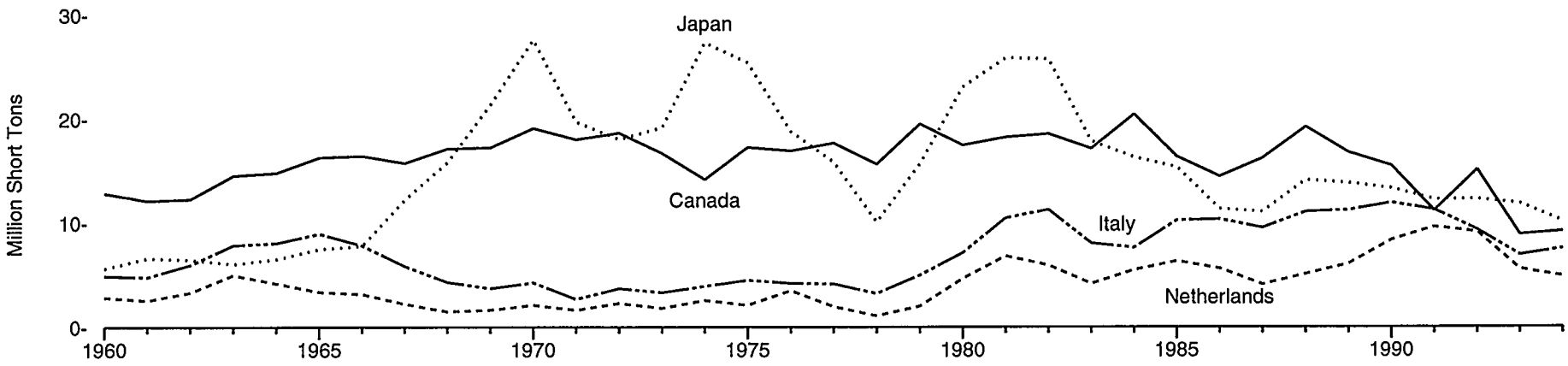
Total and Europe, 1960-1994



By Selected Country, 1994



By Selected Country, 1960-1994



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

Source: Table 7.4.

Table 7.4 Coal Exports by Country of Destination, 1960-1994

(Million Short Tons)

Year	Canada	Brazil	Europe										Japan	Other	Total
			Belgium/ Luxembourg	Denmark	France	Germany [1]	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

[1] 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.

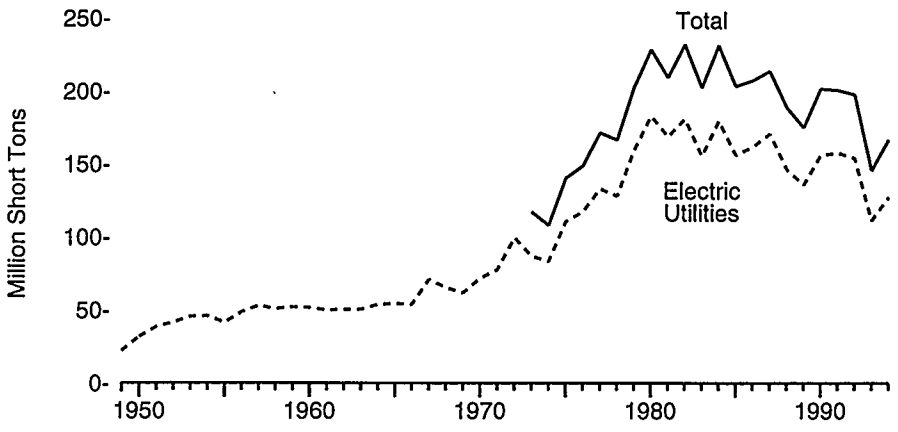
(s)=Less than 50,000 tons.

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

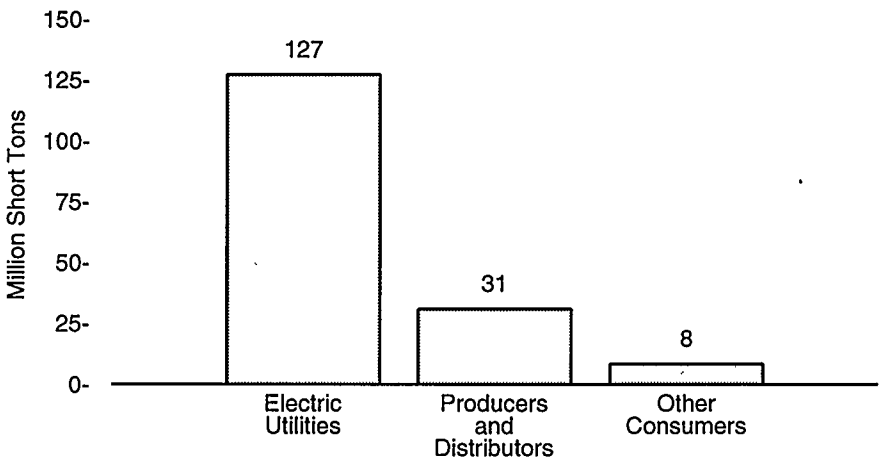
Sources: • 1960-1988—U.S. Department of Commerce, Bureau of the Census. *U.S. Exports by Schedule B Commodities, EM 522.* • 1989 forward—U.S. Department of Commerce, Bureau of the Census, "Monthly Report EM 545."

Figure 7.5 Coal Stocks, End of Year

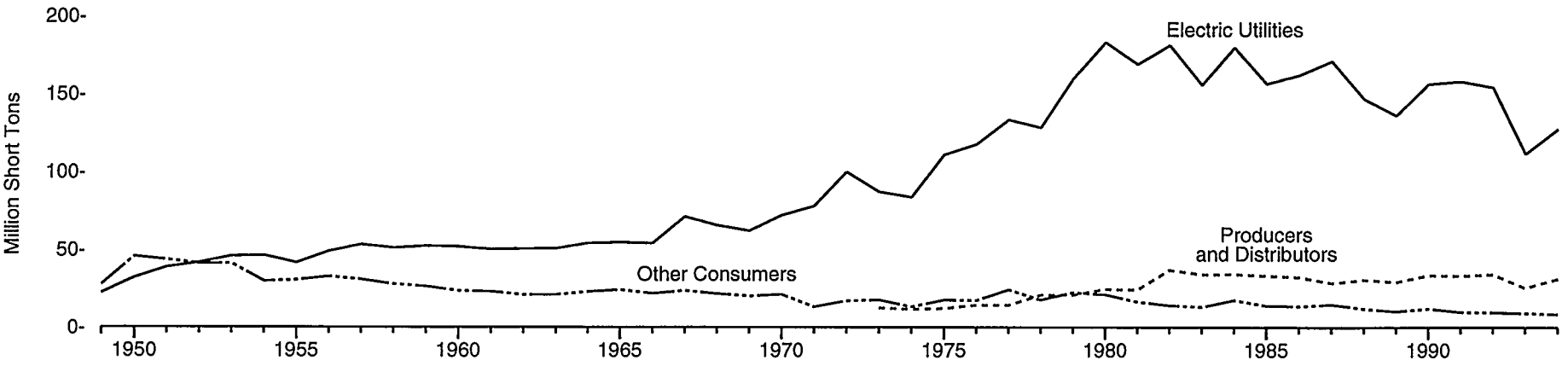
Total and Electric Utility Stocks, 1949-1994



By Holding Entity, 1994



By Holding Entity, 1949-1994



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

Source: Table 7.5.

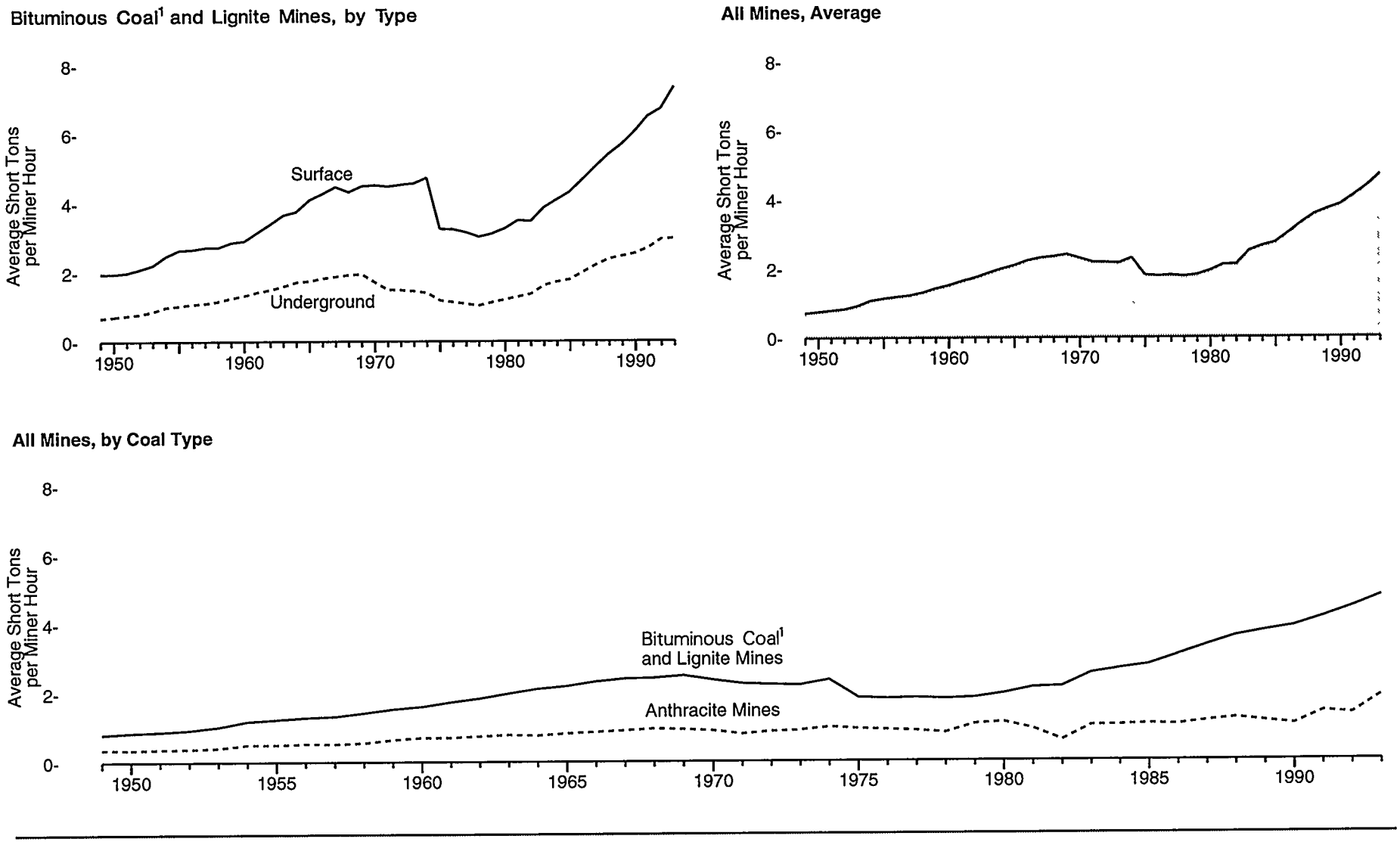
Table 7.5 Coal Stocks, End of Year 1949-1994

(Million Short Tons)

Year	Consumer					Producers and Distributors	Total
	Residential [1] and Commercial	Coke Plants	Other Industry [2]	Electric Utilities	Total		
1949	1.4	10.0	16.1	22.1	49.5	NA	NA
1950	2.5	16.8	26.2	31.8	77.3	NA	NA
1951	1.8	15.3	26.2	38.5	81.8	NA	NA
1952	1.7	14.5	24.7	41.5	82.4	NA	NA
1953	1.5	16.6	22.8	45.6	86.6	NA	NA
1954	0.8	12.4	16.4	46.1	75.7	NA	NA
1955	1.0	13.4	15.9	41.4	71.7	NA	NA
1956	1.1	14.0	17.4	48.8	81.3	NA	NA
1957	0.9	14.2	15.5	53.1	83.7	NA	NA
1958	0.9	13.1	13.7	51.0	78.7	NA	NA
1959	1.0	11.6	13.6	52.1	78.4	NA	NA
1960	0.7	11.1	11.6	51.7	75.2	NA	NA
1961	0.5	10.5	11.9	50.1	73.0	NA	NA
1962	0.5	8.4	12.0	50.4	71.3	NA	NA
1963	0.5	8.1	12.3	50.6	71.5	NA	NA
1964	0.4	10.2	12.2	53.9	76.7	NA	NA
1965	0.4	10.6	13.1	54.5	78.6	NA	NA
1966	0.2	9.3	12.2	53.9	75.6	NA	NA
1967	0.2	11.1	12.3	71.0	94.6	NA	NA
1968	0.2	9.7	11.7	65.5	87.0	NA	NA
1969	0.2	9.1	10.8	61.9	81.9	NA	NA
1970	0.3	9.0	11.8	71.9	93.0	NA	NA
1971	0.3	7.3	5.6	77.8	91.0	NA	NA
1972	0.3	9.1	7.6	99.7	116.8	NA	NA
1973	0.3	7.0	10.4	87.0	104.6	12.5	117.2
1974	0.3	6.2	6.6	83.5	96.6	11.6	108.2
1975	0.2	8.8	8.5	110.7	128.3	12.1	140.4
1976	0.2	9.9	7.1	117.4	134.7	14.2	148.9
1977	0.2	12.8	11.1	133.2	157.3	14.2	171.5
1978	0.4	8.3	9.0	128.2	145.9	20.7	166.6
1979	0.3	10.2	11.8	159.7	182.0	20.8	202.8
1980	NA	9.1	12.0	183.0	204.0	24.4	228.4
1981	NA	6.5	9.9	168.9	185.3	24.1	209.4
1982	NA	4.6	9.5	181.1	195.3	36.8	232.0
1983	NA	4.3	8.7	155.6	168.7	33.9	202.6
1984	NA	6.2	11.3	179.7	197.2	34.1	231.3
1985	NA	3.4	10.4	156.4	170.2	33.1	203.4
1986	NA	3.0	10.4	161.8	175.2	32.1	207.3
1987	NA	3.9	10.8	170.8	185.5	28.3	213.8
1988	NA	3.1	8.8	146.5	158.4	30.4	188.8
1989	NA	2.9	7.4	135.9	146.1	29.0	175.1
1990	NA	3.3	8.7	156.2	168.2	33.4	201.6
1991	NA	2.8	7.1	157.9	167.7	33.0	200.7
1992	NA	2.6	7.0	154.1	163.7	34.0	197.7
1993	NA	R2.4	R6.7	111.3	R120.5	R25.3	R145.7
1994	NA	E2.3	E6.1	127.3	E135.7	E31.0	E166.7

[1] Stocks at retail dealers, excluding anthracite.
[2] Includes transportation sector.
R=Revised data. E=Estimate. NA=Not available.
Note: Totals may not equal sum of components due to independent rounding.
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, *Coal-Pennsylvania Anthracite 1977; 1978*, and *Weekly Coal Report*. • 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report*. • 1981—EIA, *Weekly Coal Production*. • 1982—EIA, *Quarterly Coal Report October-December 1990* (May 1991), Table 31. • 1983—EIA, *Quarterly Coal Report October-December 1991* (May 1992), Table 31. • 1984—EIA, *Quarterly Coal Report October-December 1992* (May 1993), Table 52. • 1985—EIA, *Quarterly Coal Report October-December 1993* (May 1994), Table 52. • 1986-1993—EIA, *Quarterly Coal Report October-December 1994* (May 1995), Table 52. • 1994—EIA, *Monthly Energy Review* (March 1995), Table 6.3.

Figure 7.6 Coal Mining Productivity, 1949-1993



[1] Includes subbituminous coal.

Source: Table 7.6.

Table 7.6 Coal Mining Productivity, 1949-1993

(Short Tons per Miner Hour [1])

Year	Bituminous Coal [2] and Lignite Mines			Anthracite Mines	All Mines
	Underground	Surface	Average		
1949	0.68	1.92	0.80	0.36	0.72
1950	0.72	1.96	0.85	0.35	0.76
1951	0.76	2.00	0.88	0.37	0.80
1952	0.80	2.10	0.93	0.38	0.84
1953	0.88	2.22	1.02	0.41	0.93
1954	1.00	2.48	1.18	0.50	1.08
1955	1.04	2.65	1.23	0.50	1.14
1956	1.08	2.67	1.29	0.53	1.19
1957	1.11	2.73	1.32	0.52	1.23
1958	1.17	2.73	1.42	0.55	1.31
1959	1.26	2.87	1.53	0.64	1.43
1960	1.33	2.91	1.60	0.70	1.52
1961	1.43	3.16	1.73	0.70	1.64
1962	1.50	3.40	1.84	0.74	1.74
1963	1.60	3.66	1.98	0.78	1.87
1964	1.72	3.76	2.11	0.76	1.99
1965	1.75	4.10	2.19	0.82	2.09
1966	1.83	4.28	2.32	0.86	2.23
1967	1.88	4.48	2.40	0.90	2.31
1968	1.93	4.33	2.42	0.95	2.35
1969	1.95	4.50	2.49	0.93	2.41
1970	1.72	4.53	2.36	0.89	2.30
1971	1.50	4.49	2.25	0.79	2.19
1972	1.49	4.54	2.22	0.86	2.18
1973	1.46	4.58	2.20	0.89	2.16
1974	1.41	4.74	2.35	0.98	2.31
1975	1.19	3.26	1.83	0.93	1.81
1976	1.14	3.25	1.80	0.90	1.78
1977	1.09	3.16	1.82	0.87	1.80
1978	1.04	3.03	1.79	0.81	1.77
1979	1.13	3.12	1.82	1.06	1.81
1980	1.21	3.27	1.94	1.11	1.93
1981	1.29	3.50	2.11	0.92	2.10
1982	1.37	3.48	2.14	0.59	2.11
1983	1.62	3.87	2.52	1.01	2.50
1984	1.72	4.10	2.65	1.02	2.64
1985	1.79	4.32	2.76	1.05	2.74
1986	2.00	4.69	3.04	1.03	3.01
1987	2.21	5.06	3.32	1.13	3.30
1988	2.38	5.41	3.58	1.21	3.55
1989	2.46	5.70	3.73	1.12	3.70
1990	2.54	6.07	3.86	1.03	3.83
1991	2.70	6.51	4.12	1.39	4.09
1992	2.95	6.73	4.41	1.33	4.36
1993	2.97	7.36	4.74	1.86	4.70

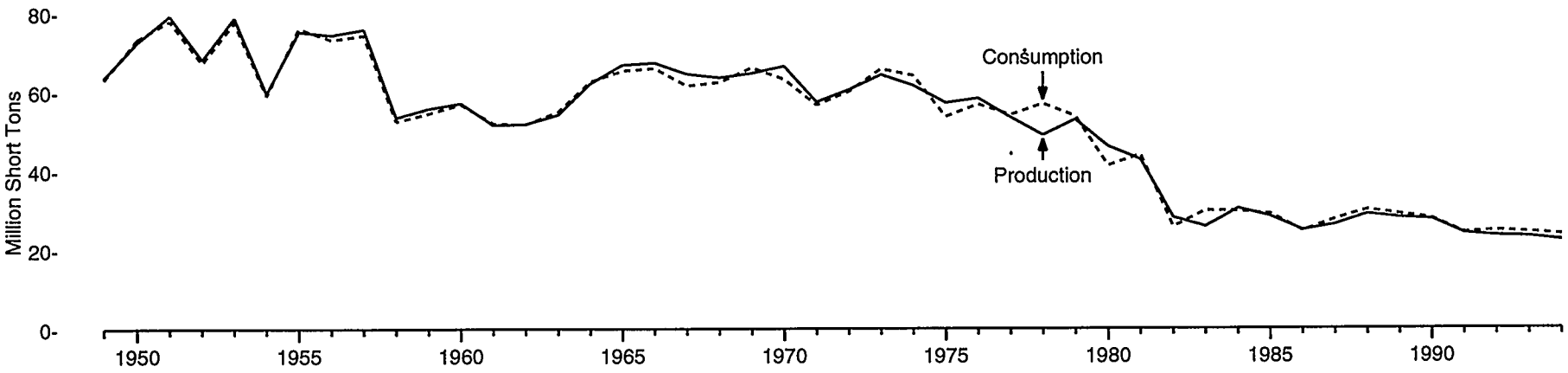
[1] Data for bituminous coal and lignite mines 1949-1973 and anthracite mines 1949-1978 were originally reported in short tons per miner-day. The data were converted to short-tons per miner-hour by assuming an eight-hour day. All remaining data were calculated by dividing total production by total labor hours worked by all mine employees except office workers.

[2] Includes subbituminous coal.

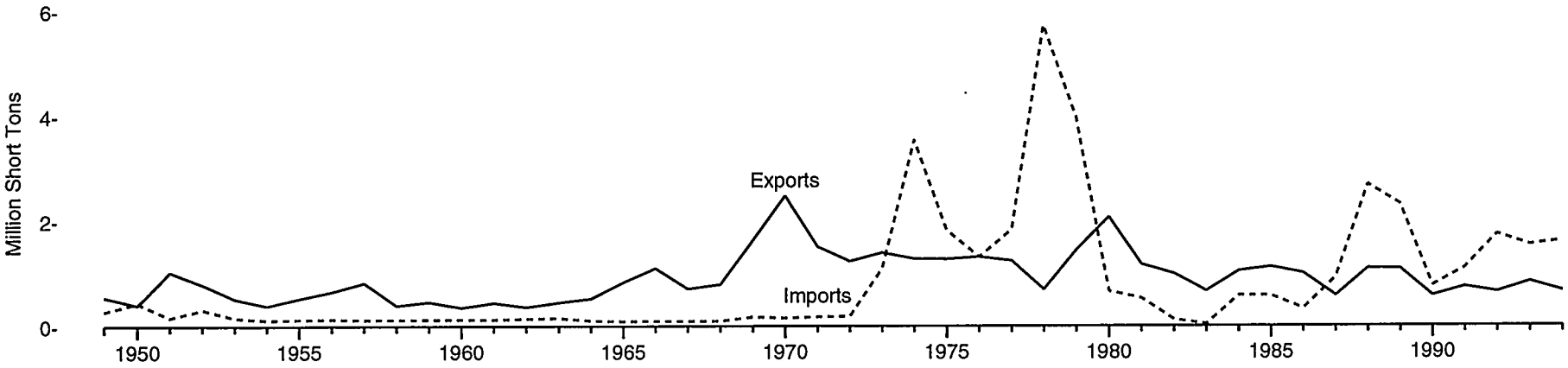
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976*. • 1977 and 1978—EIA, 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*. • 1980-1992—EIA, *Coal Production* (annual). • 1993—EIA, *Coal Industry Annual 1993* (December 1994).

Figure 7.7 Coke Overview, 1949-1994

Production and Consumption



Imports and Exports



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

Source: Table 7.7.

Table 7.7 Coke Overview, 1949-1994

(Million Short Tons)

Year	Production	Imports	Exports	Stock Change [1]	Consumption [2]
1949	63.64	0.28	0.55	-0.18	63.19
1950	72.72	0.44	0.40	0.66	73.42
1951	79.33	0.16	1.03	-0.37	78.09
1952	68.25	0.31	0.79	-0.42	67.36
1953	78.84	0.16	0.52	-0.78	77.70
1954	59.66	0.12	0.39	-0.27	59.12
1955	75.30	0.13	0.53	1.25	76.15
1956	74.48	0.13	0.66	-0.63	73.32
1957	75.95	0.12	0.82	-0.81	74.43
1958	53.60	0.12	0.39	-0.68	52.66
1959	55.86	0.12	0.46	-0.86	54.67
1960	57.23	0.13	0.35	-0.06	56.95
1961	51.71	0.13	0.45	0.70	52.09
1962	51.91	0.14	0.36	0.14	51.82
1963	54.28	0.15	0.45	1.02	55.00
1964	62.15	0.10	0.52	0.91	62.64
1965	66.85	0.09	0.83	-0.73	65.38
1966	67.40	0.10	1.10	-0.38	66.02
1967	64.58	0.09	0.71	-2.39	61.57
1968	63.65	0.09	0.79	-0.52	62.44
1969	64.76	0.17	1.63	2.87	66.17
1970	66.53	0.15	2.48	-0.99	63.21
1971	57.44	0.17	1.51	0.59	56.69
1972	60.51	0.19	1.23	0.59	60.05
1973	64.33	1.09	1.40	1.74	65.77
1974	61.58	3.54	1.28	0.25	64.09
1975	57.21	1.82	1.27	-4.06	53.69
1976	58.33	1.31	1.32	-1.50	56.83
1977	53.51	1.83	1.24	0.05	54.14
1978	49.01	5.72	0.69	2.91	56.95
1979	52.94	3.97	1.44	-1.65	53.83
1980	46.13	0.66	2.07	-3.44	41.28
1981	42.79	0.53	1.17	1.90	44.05
1982	28.12	0.12	0.99	-1.47	25.78
1983	25.81	0.04	0.67	4.67	29.85
1984	30.40	0.58	1.05	-0.20	29.74
1985	28.44	0.58	1.12	1.16	29.06
1986	24.92	0.33	1.00	0.49	24.73
1987	26.30	0.92	0.57	1.00	27.65
1988	28.95	2.69	1.09	-0.52	30.02
1989	28.05	2.31	1.09	-0.34	28.93
1990	27.62	0.77	0.57	(s)	27.81
1991	24.05	1.10	0.74	-0.19	24.22
1992	23.41	1.74	0.64	0.22	24.73
1993	23.18	1.53	0.84	0.42	24.30
1994	E22.27	1.61	0.66	E0.52	23.75

[1] Producer and distributor stocks at end of year. Negative numbers denote a net addition to stocks or a reduction in supply. Positive numbers denote a net withdrawal from stocks or an addition to supply.

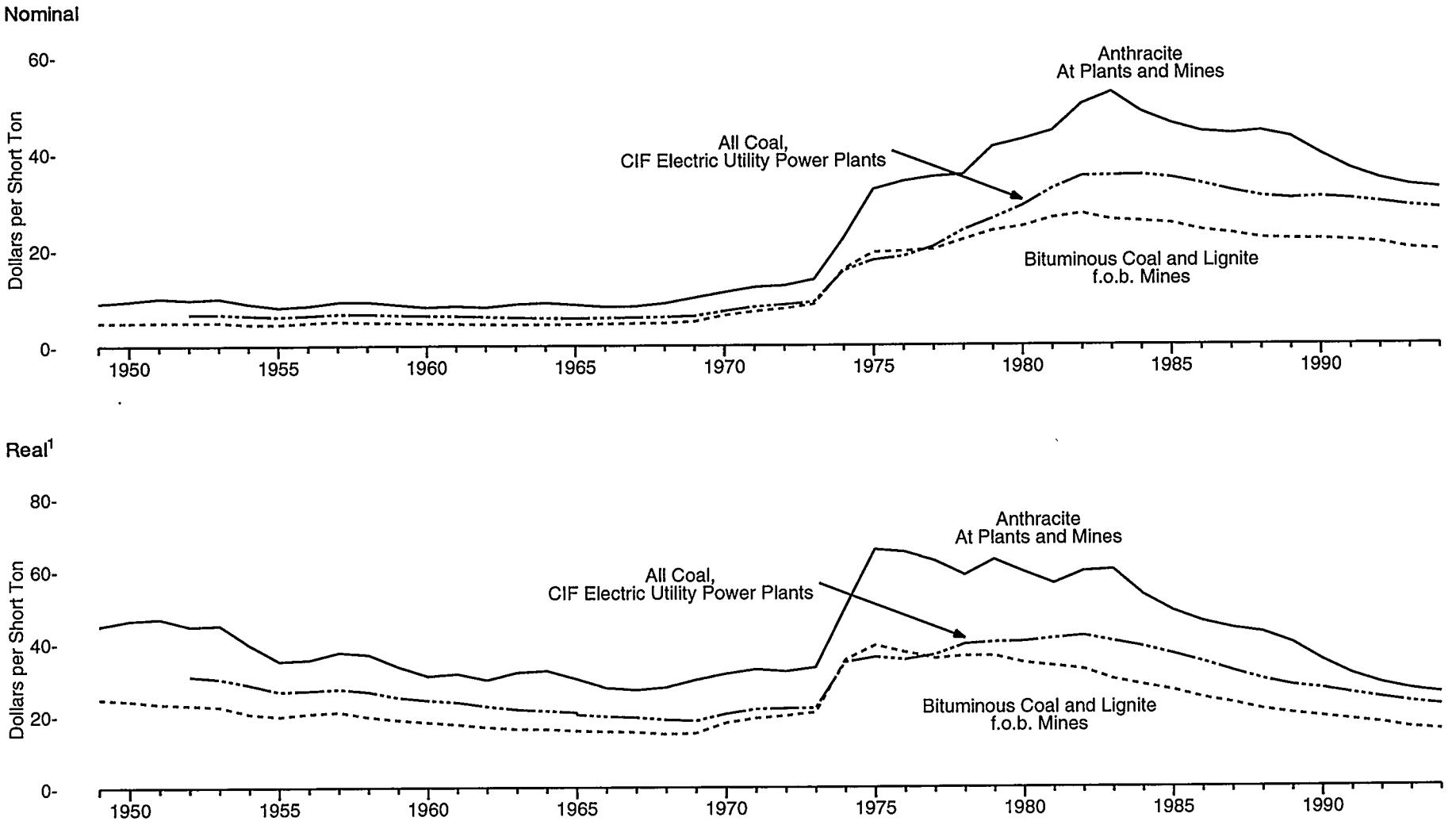
[2] Consumption is the sum of production, imports, and stock change minus exports.

E=Estimate. (s)=Less than 0.005 million short tons .

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

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. • 1981—EIA, Energy Data Report, *Coke Plant Report,* quarterly. • 1982—EIA, *Quarterly Coal Report October-December 1990* (May 1991), Table A1. • 1983—EIA, *Quarterly Coal Report October-December 1991* (May 1992), Table A1. • 1984—EIA, *Quarterly Coal Report October-December 1992* (May 1993), Table 2. • 1985—EIA, *Quarterly Coal Report October-December 1993* (May 1994), Table 2. • 1986 forward—EIA, *Quarterly Coal Report October-December 1994* (May 1995), Table 2.

Figure 7.8 Coal Prices, 1949-1994



[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

Notes: Bituminous coal includes subbituminous coal. CIF=Cost, Insurance, and Freight. f.o.b.=Free on board. See Glossary.

Source: Table 7.8.

Table 7.8 Coal Prices, 1949-1994

(Dollars per Short Ton)

Year	Bituminous Coal [1] and Lignite		Anthracite		All Coal	
	F.O.B. [2] Mines		At Plants and Mines [3]		CIF [4] Electric Utility Power Plants	
	Nominal	Real [5]	Nominal	Real [5]	Nominal	Real [5]
1949	4.88	24.52	8.90	44.72	NA	NA
1950	4.84	23.96	9.34	46.24	NA	NA
1951	4.92	23.10	9.94	46.67	NA	NA
1952	4.90	22.79	9.58	44.56	6.61	30.74
1953	4.92	22.36	9.87	44.86	6.61	30.05
1954	4.52	20.36	8.76	39.46	6.31	28.42
1955	4.50	19.65	8.00	34.93	6.07	26.51
1956	4.82	20.42	8.33	35.30	6.32	26.78
1957	5.08	20.82	9.11	37.34	6.64	27.21
1958	4.86	19.52	9.14	36.71	6.58	26.43
1959	4.77	18.63	8.55	33.40	6.37	24.88
1960	4.69	18.04	8.01	30.81	6.26	24.08
1961	4.58	17.41	8.26	31.41	6.20	23.57
1962	4.48	16.65	7.99	29.70	6.02	22.38
1963	4.39	16.14	8.64	31.76	5.86	21.54
1964	4.45	16.06	8.93	32.24	5.74	20.72
1965	4.44	15.63	8.51	29.96	5.71	20.11
1966	4.54	15.44	8.08	27.48	5.76	19.59
1967	4.62	15.25	8.15	26.90	5.85	19.31
1968	4.67	14.69	8.78	27.61	5.93	18.65
1969	4.99	14.94	9.91	29.67	6.13	18.35
1970	6.26	17.78	11.03	31.34	7.13	20.26
1971	7.07	19.06	12.08	32.56	8.00	21.56
1972	7.66	19.74	12.40	31.96	8.44	21.75
1973	8.53	20.65	13.65	33.05	9.01	21.82
1974	15.75	35.08	22.19	49.42	15.46	34.43
1975	19.23	39.09	32.26	65.57	17.63	35.83
1976	19.43	37.15	33.92	64.86	18.38	35.14
1977	19.82	35.46	34.86	62.36	20.37	36.44
1978	21.78	36.12	35.25	58.46	23.75	39.39
1979	23.65	36.11	41.06	62.69	26.15	39.92
1980	24.52	34.20	42.51	59.29	28.76	40.11
1981	26.29	33.32	44.28	56.12	32.32	40.96
1982	27.14	32.39	49.85	59.49	34.91	41.66
1983	25.85	29.64	52.29	59.97	34.99	40.13
1984	25.51	28.03	48.22	52.99	35.12	38.59
1985	25.10	26.59	45.80	48.52	34.53	36.58
1986	23.70	24.46	44.12	45.53	33.30	34.37
1987	23.00	23.00	43.65	43.65	31.83	31.83
1988	22.00	21.17	44.16	42.50	30.64	29.49
1989	21.76	20.06	42.93	39.57	30.15	27.79
1990	21.71	19.16	39.40	34.77	30.45	26.88
1991	21.45	R18.24	36.34	R30.90	30.02	R25.53
1992	20.98	R17.35	34.24	R28.32	29.36	R24.28
1993	R19.79	R16.02	R32.90	R26.64	R28.58	R23.14
1994E	19.43	15.41	32.31	25.62	28.07	22.26

[1] Includes subbituminous coal.
[2] Free on board (see Glossary).
[3] For 1949-1978, prices are f.o.b. preparation plants. For 1979 forward, prices are f.o.b. mines.
[4] Cost, Insurance, and Freight (see Glossary).
[5] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
R=Revised data. E=Estimate. NA=Not available.

Sources: **Bituminous Coal and Lignite, F.O.B. Mines:** • 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). • 1993—EIA, *Coal Industry Annual 1993* (December 1994). • 1994—EIA estimates. **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). • 1993—EIA, *Coal Industry Annual 1993* (December 1994). • 1994—EIA estimates. **All Coal, CIF Electric Utility Power Plants:** • 1949-1972—National Coal Association, *Steam Electric Plant Factors.* • 1973-1982—Federal Power Commission, Form FPC-423, "Monthly Report of Cost and Quality of Fuels for Electric Plants." • 1983 forward—Federal Energy Regulatory Commission, Form FERC-423, "Monthly Report of Cost and Quality of Fuel for Electric Utilities."

Coal Note

Data in this report on the consumption of bituminous coal (including subbituminous coal), lignite, and anthracite are generated 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 Utility Sector–consumption by privately and publicly owned establishments engaged in the generation and/or distribution of electric power primarily for sale or resale; 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 vessel bunker fuel; Residential and Commercial Sector–retail dealer sales to households and small commercial establishments.

Net Summer Capability at Electric Utilities

Net summer capability, a common measure of generating capacity, is defined as the steady hourly output that generating equipment is expected to supply to the system load, exclusive of auxiliary power, as demonstrated by testing at the time of summer peak demand. Although data on net summer capability have been collected only since 1985, the Energy Information Administration has estimated values for prior years (8.8).* Estimates and collected data indicate that net summer capability during the 1949-to-1994 period increased at an average annual rate of 5.5 percent, reaching 704 million kilowatts.

Conventional steam plants, fueled by fossil fuels, wood, and waste, were responsible for most of the growth. In 1994, they accounted for close to two-thirds of total net summer capability. Nuclear-powered plants accounted for 14 percent of the total in 1994. Conventional and pumped storage hydroelectric facilities also accounted for 14 percent. Internal combustion and gas turbine plants, as well as plants powered by emerging sources of energy, such as geothermal, accounted for the remainder.

Electric Utility Net Generation

Net generation of electricity by electric utilities in 1994 totaled 2.9 trillion kilowatthours, up 0.9 percent from the 1993 level (8.3). Coal continued to fuel most of the generation and accounted for 1.6 trillion kilowatthours. Natural gas accounted for 291 billion kilowatthours. Despite lower petroleum prices, petroleum-fired generation in 1994 fell to 91 billion kilowatthours. In contrast, nuclear-based generation rose 4.8 percent to 639 billion kilowatthours, an all-time high. Conventional hydroelectric generation totaled 247 billion kilowatthours, down 8.2 percent from generation in 1993. Hydroelectric pumped storage generation, however, was a negative 3 billion kilowatthours, because the energy used for pumping exceeded energy generated. Geothermal and other renewable energy sources accounted for 9 billion kilowatthours.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

Fossil-fueled steam generators, consistently the major source of electricity, provided 68 percent of net generation in 1994 (8.4). Nuclear, conventional hydroelectric, geothermal, and other generators powered by renewables supplied 31 percent. Internal combustion, gas turbine, and hydroelectric pumped storage generators, usually reserved for meeting peak demand, supplied 1.2 percent of net generation.

Fossil Fuel Consumption at Electric Utilities

During the 1949-to-1994 period, consumption of coal at electric utilities grew at a faster rate than did consumption of natural gas and petroleum (8.5). On a Btu basis, coal accounted for 67 percent of total

Demand-Side Management at Electric Utilities

The planning, implementation, and monitoring of electric utility activities designed to encourage customers to modify their patterns of electricity usage, including the timing and level of electricity demand, is called demand-side management (DSM). Rebates to customers who install energy-efficient appliances and reduced rates for non-peakload use of electricity are examples of DSM programs.

DSM has both economic and environmental benefits. The economic benefit to customers lies in its ability to provide the same level of energy services at a lower cost. DSM is most advantageous when electric utilities can use it to eliminate the need for costly new capacity. The environmental benefit of DSM occurs when it lowers fossil fuel use. Because electricity generation relies heavily on the burning of fossil fuels, it is responsible for emissions of carbon dioxide, sulfur dioxide, and nitrogen oxides. To the extent that DSM reduces fossil fuel consumption, it contributes to improving the quality of the environment.

In 1993, electric utilities spent $2.8 billion on DSM programs, up from $2.2 billion the previous year (8.7). The actual peakload reduction in 1993 totaled 23,181 megawatts, up from 17,204 megawatts in 1992. The energy savings attributable to DSM programs are calculated at 44 billion kilowatthours in 1993, up from 36 billion kilowatthours in 1992.

fossil fuel consumption in 1949 and 81 percent of the total in 1994. Seventeen quadrillion Btu of coal were consumed by electric utilities in 1994.

Electric utility consumption of both petroleum and natural gas increased during much of the period, but growth in the use of both fuels began to slow during the 1970's. During the first half of the 1980's, consumption actually decreased.

Electricity remained by far the most expensive source of energy on a Btu basis.

Changes in the consumption of petroleum and natural gas at electric utilities in 1986 through 1988 were particularly illustrative of the utilities' fuel-switching capabilities and their use of them to respond to fluctuations in fuel prices. In 1986, when petroleum prices fell dramatically, petroleum consumption at electric utilities rose 0.36 quadrillion Btu, while natural gas consumption fell 0.47 quadrillion Btu. When petroleum prices recovered somewhat in 1987, electric utilities scaled back consumption of petroleum by 0.19 quadrillion Btu while increasing natural gas consumption by 0.25 quadrillion Btu. In response to the 1988 decline in petroleum prices, electric utilities increased petroleum consumption by 0.30 quadrillion Btu and consumed 0.23 quadrillion Btu less of natural gas. After 1988, however, electric utility consumption of natural gas remained in the 2.7-to-3.1 quadrillion Btu range, while consumption of petroleum fell from 1.7 quadrillion Btu in 1989 to 1.0 quadrillion Btu in 1994.

Sales of Electricity to Consumers

During the 1949-to-1994 period, electricity sales increased at an average annual rate of 5.6 percent (8.6). Annual sales declined only two times, in 1974 and 1982. In 1974, the decline in sales spanned all sectors, whereas in 1982, lower sales to the industrial sector alone accounted for the decline.

Historically (from 1949 through 1990), sales of electricity to the industrial sector exceeded sales to other sectors. In 1991, 1993, and 1994, however, sales to the residential sector accounted for the largest share. In 1994, sales to the residential sector rose 1.2 percent to the record level of 1,007 billion kilowatthours, while sales to the industrial sector rose 2.6 percent to 1,002 billion kilowatthours. Sales to the commercial sector of 823 billion kilowatthours were 3.5 percent above the 1993 level.

Retail Prices of Electricity

The weighted average real price[1] of electricity to all sectors in 1994 was 5.5 cents per kilowatthour, 20 percent below the price in 1960 (8.11). However, the apparent stability in electricity prices masked fluctuations that occurred throughout the period and variations in prices paid by consumers in different end-use sectors. And, because transmission and distribution losses account for roughly two-thirds of the energy input for electricity generation, electricity remained by far the most expensive source of energy on a Btu basis. The average real price of electricity sold to the residential sector, where prices have usually been the highest, was 6.7 cents per kilowatthour in 1994, the same as the price in 1993. The commercial sector price also remained at the 1993 level of 6.2 cents per kilowatthour in 1994. Industrial customers continued to pay prices that compared favorably with prices in other sectors. In 1994, the real price of electricity sold to industrial users was 3.7 cents per kilowatthour, down 5.1 percent from the price in 1993.

Nonutility Power Producers

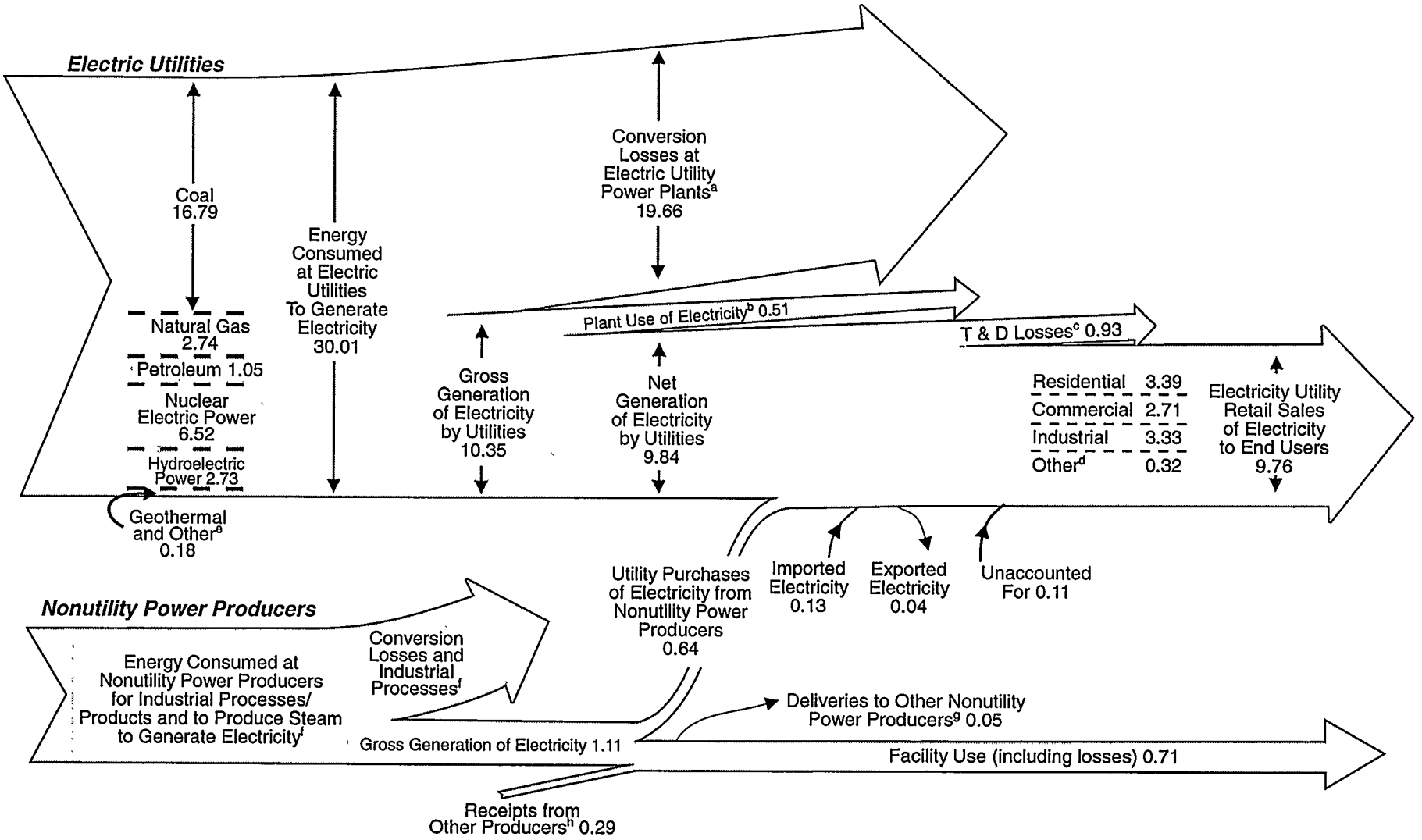
Nonutility power producers own electric generating capacity but, unlike electric utilities, lack a designated service area. Cogenerators, small power producers, and independent power producers are all classified as nonutility power producers. In 1993, net summer capability at nonutilities increased 6.8 percent from the 1992 level to 55 million kilowatts, 7.3 percent of the electric power industry total (8.2).

Nonutilities' gross generation totaled 325 billion kilowatthours, up 9.9 percent from the 1992 level (8.12). Over half of that total was sold to electric utilities (8.1 and 8.12). Whereas electric utilities rely heavily on coal as an energy input, 54 percent of the nonutilities' 1993 gross generation came from natural gas and 25 percent came from renewable energy sources.

In 1993, by far the largest share of nonutility power gross generation came from manufacturers (8.13). The transportation, public utilities, and mining industries also generated significant amounts of electric power. The West South Central and Pacific Census Divisions led the Nation in nonutility power gross generation.

[1]Real prices are expressed in 1987 dollars.

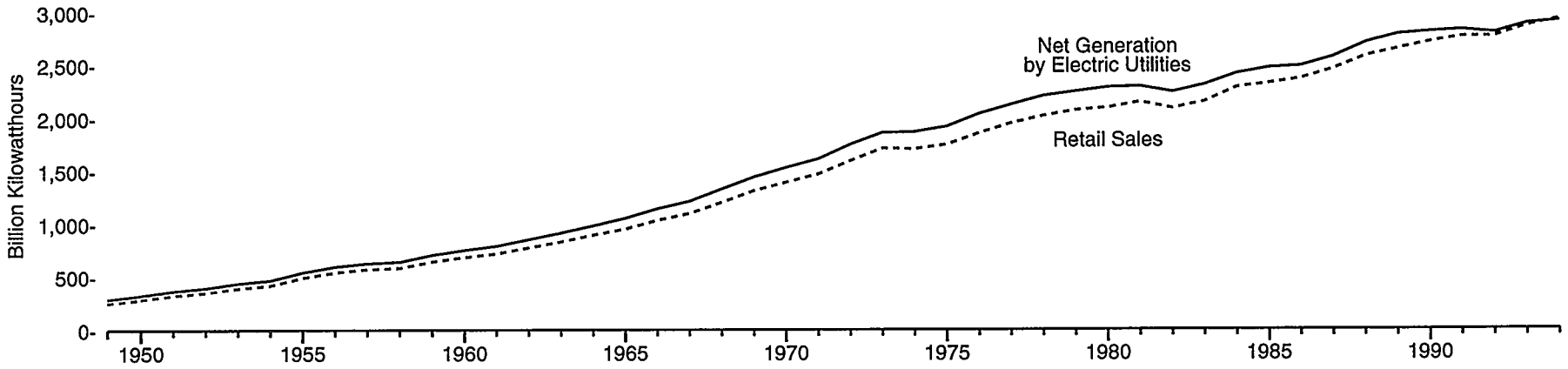
Diagram 5. Electricity Flow, 1993
(Quadrillion Btu)



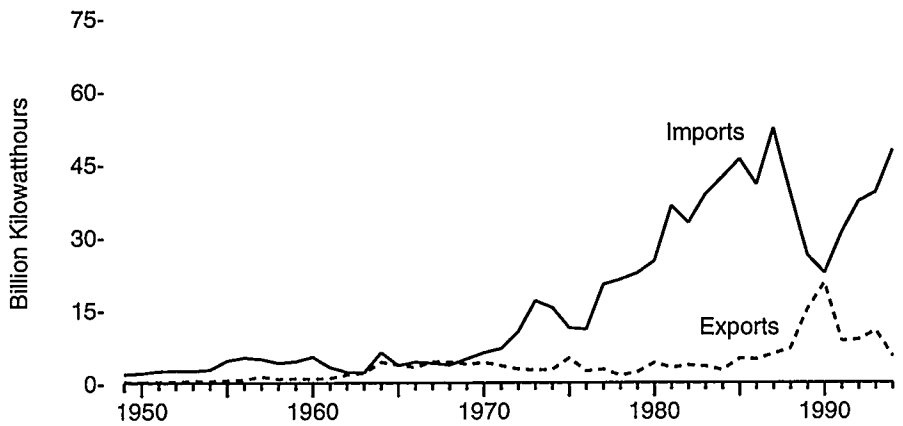
[a]Estimated as two-thirds of the energy consumed at electric utilities to generate electricity. See Note 1 at end of section.
[b]Estimated as 5 percent of gross generation of electricity by utilities. See Note 1 at end of section.
[c]Estimated as 9 percent of gross generation of electricity by utilities. See Note 1 at end of section.
[d]"Other" is public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.
[e]"Other" is wood, waste, wind, photovoltaic, and solar thermal energy used to generate electricity for distribution. See Table 10.8.
[f]Data not available.
[g]Includes sales interchanges and exchanges of electric energy with electric utilities and other nonutilities.
[h]Includes purchases, interchanges, and exchanges of electric energy with electric utilities and other nonutilities.
Note: Totals may not equal sum of components due to independent rounding.
Sources: Table 8.1, 8.3, 8.5, 8.6, 8.12, 10.8, and A7.

Figure 8.1 Electricity Overview

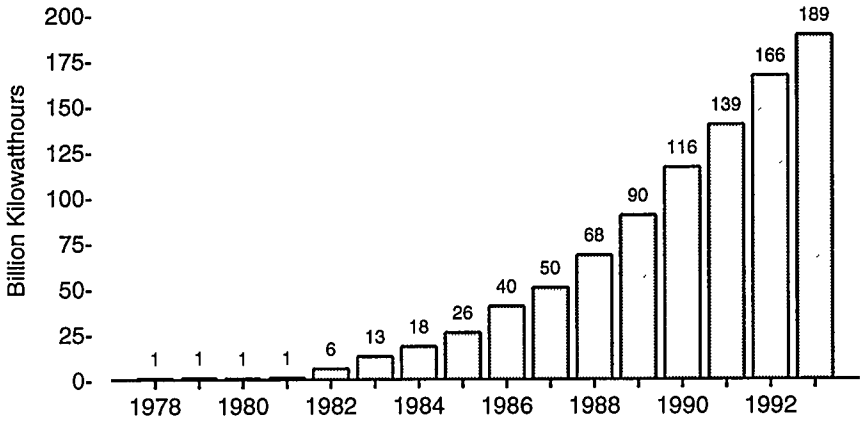
Net Generation by Electric Utilities and Retail Sales, 1949-1994



Electricity Trade, 1949-1994



Purchases by Electric Utilities from Nonutility Power Producers, 1978-1993



Notes: • The difference between net generation at electric utilities and retail sales is purchases by electric utilities from nonutility power producers and imports minus exports, transmission and distribution losses, data collection frame differences, and nonsampling error.

• Because vertical scales differ, graphs should not be compared.
Source: Table 8.1.

Table 8.1 Electricity Overview, 1949-1994

(Billion Kilowatthours)

Year	Net Generation by Electric Utilities [1]	Purchases by Electric Utilities from Nonutility Power Producers [2]	Imports [3]	Exports [3]	Losses and Unaccounted For [4]	Retail Sales
1949	291	NA	2	(s)	38	255
1950	329	NA	2	(s)	39	291
1951	371	NA	2	(s)	43	330
1952	399	NA	3	(s)	45	356
1953	443	NA	2	(s)	48	396
1954	472	NA	3	(s)	50	424
1955	547	NA	5	(s)	54	497
1956	601	NA	5	1	59	546
1957	632	NA	5	1	59	576
1958	645	NA	4	1	61	588
1959	710	NA	4	1	67	647
1960	756	NA	5	1	72	688
1961	794	NA	3	1	74	722
1962	855	NA	2	2	77	778
1963	917	NA	2	2	84	833
1964	984	NA	6	4	90	896
1965	1,055	NA	4	4	101	954
1966	1,144	NA	4	3	110	1,035
1967	1,214	NA	4	4	115	1,099
1968	1,329	NA	4	4	126	1,203
1969	1,442	NA	5	4	129	1,314
1970	1,532	NA	6	4	142	1,392
1971	1,613	NA	7	4	147	1,470
1972	1,750	NA	10	3	162	1,595
1973	1,861	NA	17	3	162	1,713
1974	1,867	NA	15	3	174	1,706
1975	1,918	NA	11	5	177	1,747
1976	2,038	NA	11	2	191	1,855
1977	2,124	NA	20	3	193	1,948
1978	2,206	1	21	1	209	2,018
1979	2,247	1	23	2	198	2,071
1980	2,286	1	25	4	214	2,094
1981	2,295	1	36	3	182	2,147
1982	2,241	6	33	4	190	2,086
1983	2,310	13	39	3	207	2,151
1984	2,416	18	42	3	188	2,286
1985	2,470	26	46	5	212	2,324
1986	2,487	40	41	5	194	2,369
1987	2,572	50	52	6	211	2,457
1988	2,704	68	39	7	226	2,578
1989	2,784	90	26	15	238	2,647
1990	2,808	116	23	21	214	2,713
1991	2,825	139	31	9	225	2,762
1992	2,797	166	37	9	229	2,763
1993	R2,883	189	R39	R11	238	R2,861
1994P	2,909	NA	48	5	NA	2,928

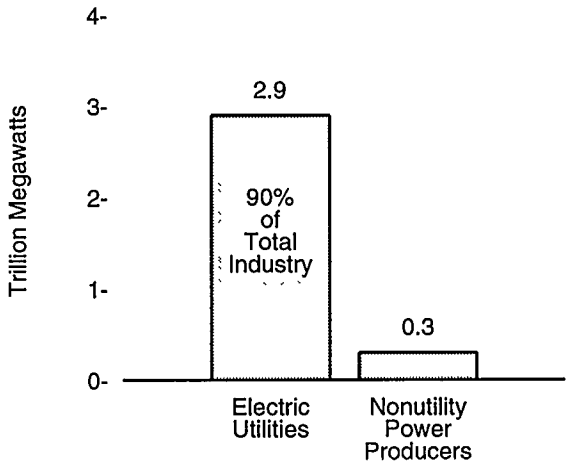
[1] See Note 2 at end of section.
[2] See Glossary.
[3] Electricity transmitted across U.S. borders with Canada and Mexico.
[4] Transmission and distribution losses, data collection frame differences, and nonsampling error.
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 0.5 billion kilowatthours.

Notes: • See Note 3 at end of section. • Totals may not equal sum of components due to independent rounding.

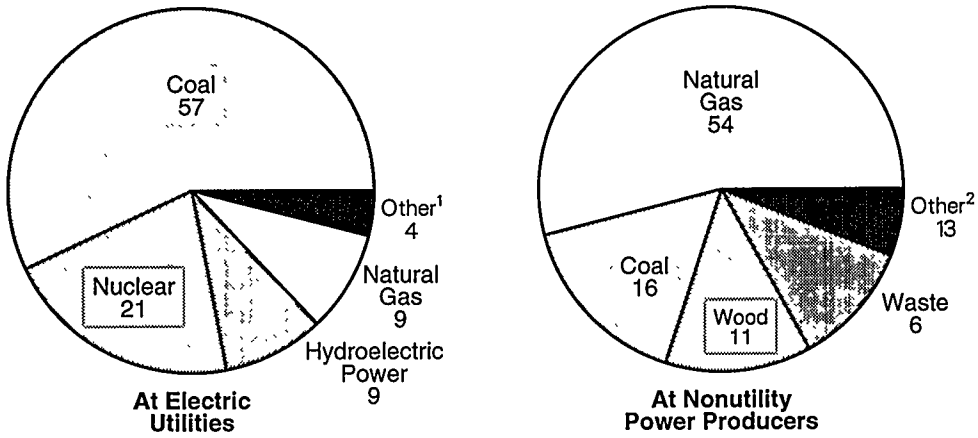
Sources: **Net Generation by Electric Utilities:** See Table 8.3. **Purchases by Electric Utilities from Nonutility Power Producers:** • 1978-1985—Federal Energy Regulatory Commission, Form FERC-1, "Annual Report of Major Electric Utilities, Licensees and Others." • 1986 forward—Energy Information Administration (EIA), Form EIA-861, "Annual Electric Utility Report." **Imports and Exports:** • 1949-September 1977—unpublished Federal Power Commission data. • October 1977-1980—unpublished Economic Regulatory Administration (ERA) data. • 1981—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—ERA, *Electricity Exchanges Across International Borders.* • 1984-1986—ERA, *Electricity Transactions Across International Borders.* • 1987 and 1988—ERA, Form ERA-781R, "Annual Report of International Electrical Export/Import Data." • 1989-1993—Fossil Energy, Form FE-781R, "Annual Report of International Electrical Export/Import Data." • 1994—EIA estimates based on preliminary data from the National Energy Board of Canada and Department of Energy, Fossil Energy. **Retail Sales:** See Table 8.6.

Figure 8.2 Electric Power Industry Net Generation and Net Summer Capability, 1993

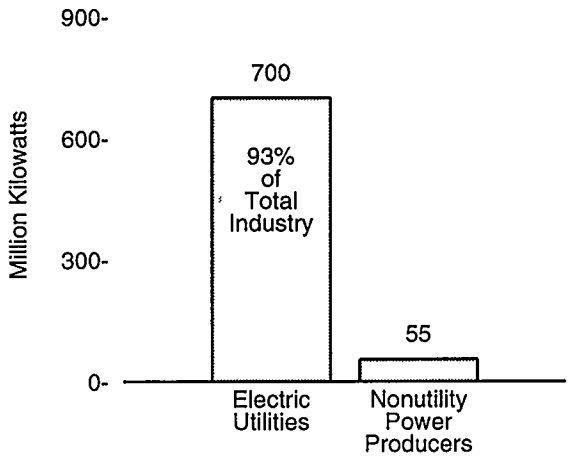
Net Generation



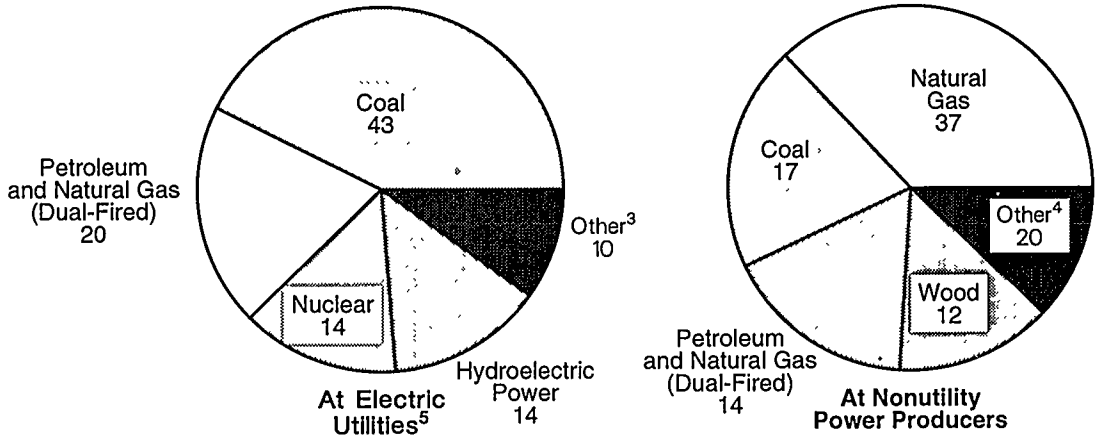
Net Generation Shares by Source of Power (Percent of Total)



Net Summer Capability



Net Summer Capability Shares by Type of Capacity (Percent of Total)



[1] "Other" is petroleum, geothermal energy, wood, waste, solar, and wind.
[2] "Other" is petroleum, hydroelectric power, geothermal energy, wind, solar, nuclear, hydrogen, sulfur, batteries, chemicals, fish oil, and spent sulfite liquor.
[3] "Other" is petroleum, natural gas, geothermal energy, wood, waste, solar, and wind.
[4] "Other" is waste, hydroelectric power, petroleum, wind, geothermal energy, solar, nuclear, hydrogen, sulfur, batteries, chemicals, fish oil, and spent sulfite liquor.
[5] Shares do add exactly to 100 percent due to rounding of components.
Source: Table 8.2.

Table 8.2 Electric Power Industry Net Generation and Net Summer Capability, 1992 and 1993

Item	Electric Utilities		Nonutility Power Producers		Total	
	1992	1993	1992	1993	1992	1993
Net Generation (billion megawatthours)	2,797.2	2,882.5	286.1	314.4	3,083.4	3,196.9
Coal [1]	1,575.9	1,639.2	45.2	50.9	1,621.1	1,690.0
Natural Gas [2]	263.9	258.9	154.4	169.5	418.3	428.4
Petroleum [3]	88.9	99.5	10.5	12.8	99.4	112.4
Hydroelectric Power [4]	239.6	265.1	9.4	11.4	248.9	276.5
Geothermal Energy	8.1	7.6	8.3	9.5	16.4	17.0
Wood [5]	0.8	0.9	34.8	35.9	35.6	36.8
Waste [6]	1.3	1.1	16.5	17.4	17.8	18.5
Solar	(s)	(s)	0.7	0.9	0.7	0.9
Wind	(s)	(s)	2.9	3.0	2.9	3.0
Nuclear [7]	618.8	610.3	0.1	0.1	618.8	610.4
Other [8]	0.0	0.0	3.4	3.1	3.4	3.1
Net Summer Capability (million kilowatts)	695.1	700.0	51.5	55.0	746.6	755.0
Coal [1]	300.5	300.8	7.9	9.1	308.5	309.9
Natural Gas [2]	15.7	16.6	18.7	20.3	34.4	36.9
Petroleum [3]	50.6	48.3	1.6	1.9	52.2	50.2
Petroleum and Natural Gas (duel-fired)	133.6	137.2	7.5	7.5	141.1	144.7
Hydroelectric Power [4]	93.4	95.9	2.6	2.6	96.0	98.6
Geothermal Energy	1.7	1.7	1.2	1.2	2.9	3.0
Wood [5]	0.2	0.2	6.4	6.7	6.7	6.9
Waste [6]	0.2	0.2	2.8	2.9	3.0	3.2
Solar	(s)	(s)	0.3	0.3	0.3	0.3
Wind	0.0	(s)	1.8	1.8	1.8	1.8
Nuclear [7]	99.0	99.0	(s)	(s)	99.0	99.1
Other [8]	0.0	0.0	0.6	0.5	0.6	0.5

[1] Includes coal, anthracite culm, and coal waste.
[2] Includes natural gas, butane, ethane, propane, waste heat, and waste gases.
[3] Includes petroleum, petroleum coke, diesel, kerosene, and petroleum sludge and tar.
[4] In the nonutility sector, conventional hydroelectric power only; there are no pumped-storage projects.
[5] Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, and wood sludge.
[6] Includes municipal solid waste, agricultural waste, straw, tires, landfill gases, and other waste.
[7] Nuclear reactor and generator at Argonne National Laboratory used primarily for research and development in testing reactor fuels as well as for training. The generation from the unit is used for internal consumption.
[8] Includes hydrogen, sulfur, batteries, chemicals, fish oil, and spent sulfite liquor.

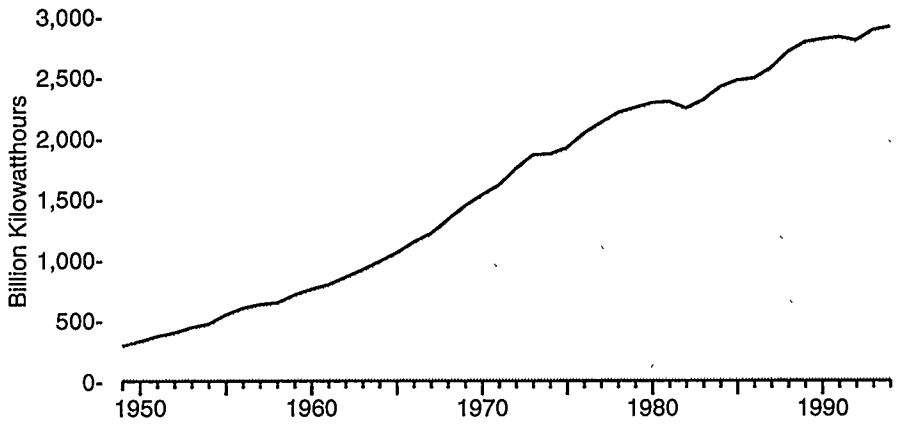
(s)=Less than 0.01 billion megawatthours or less than 0.01 million kilowatts.

Notes: • Nonutility electric generating facilities with a total generator capacity of 1 megawatt or greater. • For gross-to-net generation conversion methodology for nonutility power producers, refer to Energy Information Administration (EIA), *Electric Power Annual 1993* (December 1994), p. 151. • Totals may not equal sum of components due to independent rounding.

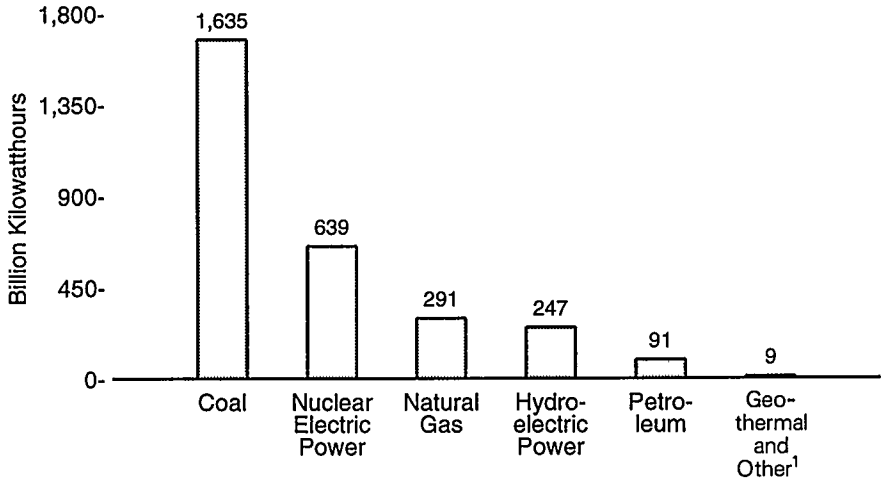
Sources: **Electric Utilities Net Generation:** EIA, Form EIA-759, "Monthly Power Plant Report." **Electric Utilities Net Summer Capability:** EIA, Form EIA-860, "Annual Electric Generator Report." **Nonutility Power Producers:** EIA, Form EIA-867, "Annual Nonutility Power Producer Report."

Figure 8.3 Electric Utility Net Generation of Electricity by Energy Source

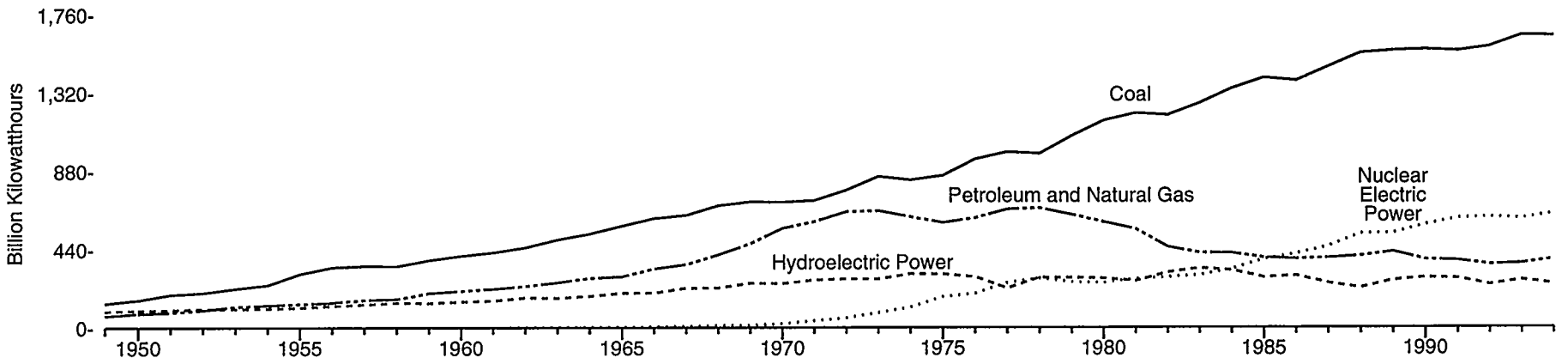
Total, 1949-1994



By Major Energy Source, 1994



Total, 1949-1994



[1] "Other" is wood, waste, wind, photovoltaic, and solar thermal energy used to generate electricity for distribution.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 8.3.

Table 8.3 Electric Utility Net Generation of Electricity by Energy Source, 1949-1994

(Billion Kilowatthours)

Year	Fossil Fuels				Nuclear Electric Power	Hydroelectric Pumped Storage [2]	Renewable Energy			Total
	Coal	Natural Gas	Petroleum [1]	Total			Conventional Hydroelectric Power	Geothermal Energy and Other [3]	Total	
1949	135	37	29	201	0	(4)	90	(s)	90	291
1950	155	45	34	233	0	(4)	96	(s)	96	329
1951	185	57	29	271	0	(4)	100	(s)	100	371
1952	195	68	30	294	0	(4)	105	(s)	106	399
1953	219	80	38	337	0	(4)	105	(s)	106	443
1954	239	94	32	364	0	(4)	107	(s)	107	472
1955	301	95	37	434	0	(4)	113	(s)	113	547
1956	339	104	36	478	0	(4)	122	(s)	122	601
1957	346	114	40	501	(s)	(4)	130	(s)	130	632
1958	344	120	40	504	(s)	(4)	140	(s)	140	645
1959	378	147	47	572	(s)	(4)	138	(s)	138	710
1960	403	158	48	609	1	(4)	146	(s)	146	756
1961	422	169	49	640	2	(4)	152	(s)	152	794
1962	450	184	49	683	2	(4)	169	(s)	169	855
1963	494	202	52	748	3	(4)	166	(s)	166	917
1964	526	220	57	803	3	(4)	177	(s)	177	984
1965	571	222	65	857	4	(4)	194	(s)	194	1,055
1966	613	251	79	944	6	(4)	195	1	195	1,144
1967	630	265	89	985	8	(4)	222	1	222	1,214
1968	685	304	104	1,094	13	(4)	222	1	223	1,329
1969	706	333	138	1,177	14	(4)	250	1	251	1,442
1970	704	373	184	1,261	22	(4)	248	1	249	1,532
1971	713	374	220	1,307	38	(4)	266	1	267	1,613
1972	771	376	274	1,421	54	(4)	273	2	274	1,750
1973	848	341	314	1,503	83	(4)	272	2	274	1,861
1974	828	320	301	1,449	114	(4)	301	3	304	1,867
1975	853	300	289	1,442	173	(4)	300	3	303	1,918
1976	944	295	320	1,559	191	(4)	284	4	288	2,038
1977	985	306	358	1,649	251	(4)	220	4	225	2,124
1978	976	305	365	1,646	276	(4)	280	3	284	2,206
1979	1,075	329	304	1,708	255	(4)	280	4	284	2,247
1980	1,162	346	246	1,754	251	(4)	276	6	282	2,286
1981	1,203	346	206	1,755	273	(4)	261	6	267	2,295
1982	1,192	305	147	1,644	283	(4)	309	5	314	2,241
1983	1,259	274	144	1,678	294	(4)	332	6	339	2,310
1984	1,342	297	120	1,759	328	(4)	321	9	330	2,416
1985	1,402	292	100	1,794	384	(4)	281	11	292	2,470
1986	1,386	249	137	1,771	414	(4)	291	12	302	2,487
1987	1,464	273	118	1,855	455	(4)	250	12	262	2,572
1988	1,541	253	149	1,942	527	(4)	223	12	235	2,704
1989	1,554	267	158	1,979	529	(4)	265	11	276	2,784
1990	1,560	264	117	1,941	577	-4	283	11	294	2,808
1991	1,551	264	111	1,927	613	-5	280	10	290	2,825
1992	1,576	264	89	1,929	619	-4	244	10	254	2,797
1993	1,639	259	100	R1,998	610	-4	269	10	279	R2,883
1994P	1,635	291	91	2,017	639	-3	247	9	256	2,909

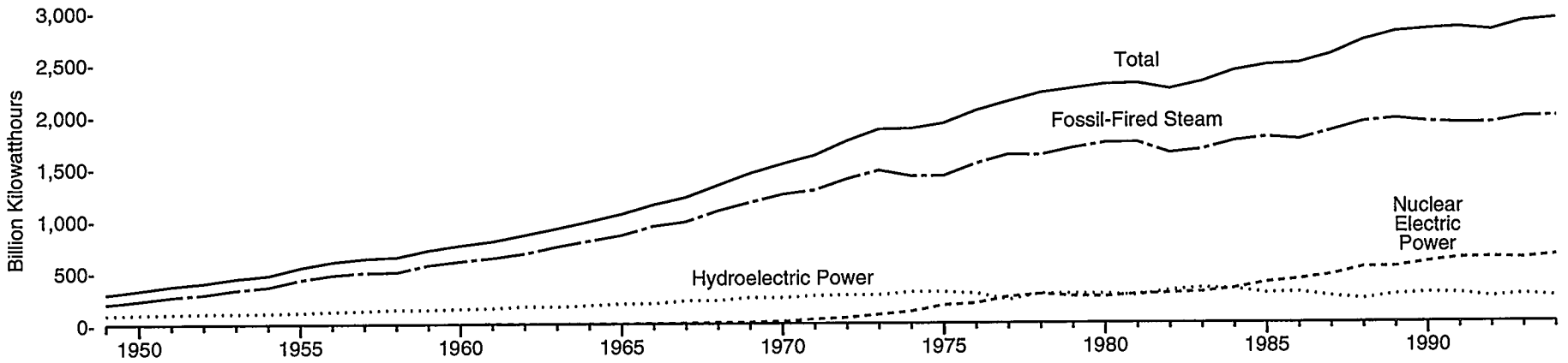
[1] Distillate fuel oil, residual fuel oil (including crude oil burned as fuel), jet fuel, and petroleum coke.
[2] Represents total pumped storage facility production minus energy used for pumping.
[3] "Other" is wood, waste, wind, photovoltaic, and solar thermal energy used to generate electricity for distribution. See Table 10.8 for components of this column.
[4] Included in conventional hydroelectric power.
R=Revised data. P=Preliminary data. (s)=Less than 0.5 billion kilowatthours.

Notes: • See Notes 2 and 3 at end of section. • Totals may not equal sum of components due to independent rounding.

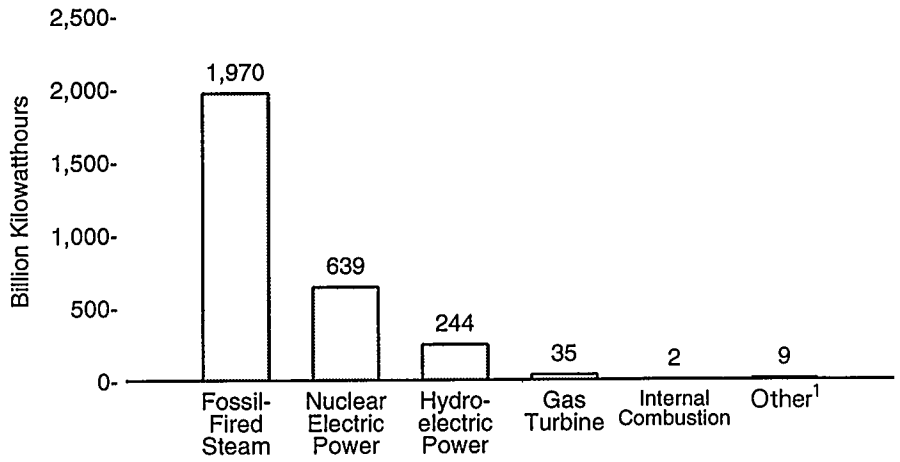
Sources: • 1949-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982 forward—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Figure 8.4 Electric Utility Net Generation of Electricity by Prime Mover

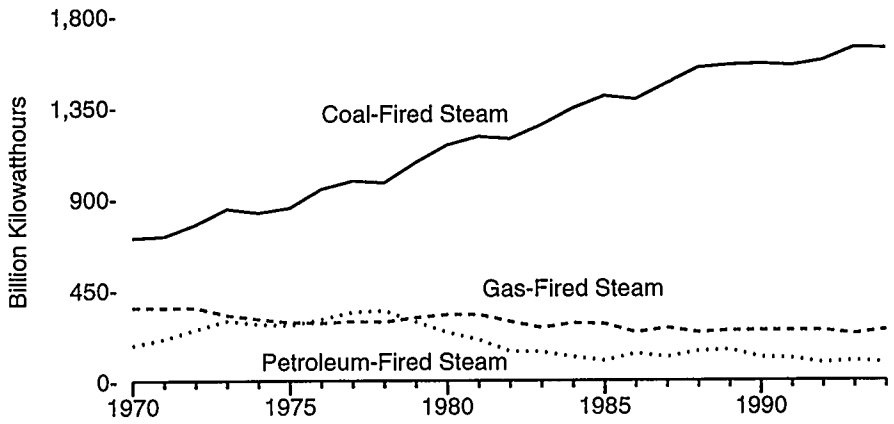
Total, 1949-1994



Total by Prime Mover, 1994



Fossil-Fired Steam by Fuel, 1970-1994



[1] "Other" is geothermal, wood, waste, wind, photovoltaic, and solar thermal energy used to generate electricity for distribution.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 8.4.

Table 8.4 Electric Utility Net Generation of Electricity by Prime Mover, 1949-1994

(Billion Kilowatthours)

Year	Fossil-Fired Steam				Internal Combustion	Gas Turbine	Nuclear Electric Power	Hydroelectric Power			Other [1]	Total
	Coal-Fired	Petroleum-Fired	Gas-Fired	Total				Conventional	Pumped Storage	Total		
1949	135	NA	NA	197	3	[2]	0	90	[3]	90	(s)	291
1950	155	NA	NA	229	4	[2]	0	96	[3]	96	(s)	329
1951	185	NA	NA	267	4	[2]	0	100	[3]	100	(s)	371
1952	195	NA	NA	290	4	[2]	0	105	[3]	105	(s)	399
1953	219	NA	NA	333	4	[2]	0	105	[3]	105	(s)	443
1954	239	NA	NA	361	4	[2]	0	107	[3]	107	(s)	472
1955	301	NA	NA	430	4	[2]	0	113	[3]	113	(s)	547
1956	339	NA	NA	474	4	[2]	0	122	[3]	122	(s)	601
1957	346	NA	NA	497	4	[2]	(s)	130	[3]	130	(s)	632
1958	344	NA	NA	500	4	[2]	(s)	140	[3]	140	(s)	645
1959	378	NA	NA	567	4	[2]	(s)	138	[3]	138	(s)	710
1960	403	NA	NA	603	4	[2]	1	146	[3]	146	(s)	756
1961	422	NA	NA	634	5	[2]	2	152	[3]	152	(s)	794
1962	450	NA	NA	677	5	[2]	2	169	[3]	169	(s)	855
1963	494	NA	NA	742	5	[2]	3	166	[3]	166	(s)	917
1964	526	NA	NA	798	6	[2]	3	177	[3]	177	(s)	984
1965	571	NA	NA	851	6	[2]	4	194	[3]	194	(s)	1,055
1966	613	NA	NA	938	5	[2]	6	195	[3]	195	1	1,144
1967	630	NA	NA	980	5	[2]	8	222	[3]	222	1	1,214
1968	685	NA	NA	1,084	9	[2]	13	222	[3]	222	1	1,329
1969	706	NA	NA	1,163	14	[2]	14	250	[3]	250	1	1,442
1970	704	174	361	1,240	6	16	22	248	[3]	248	1	1,532
1971	713	206	360	1,279	6	22	38	266	[3]	266	1	1,613
1972	771	253	361	1,385	7	29	54	273	[3]	273	2	1,750
1973	848	296	323	1,467	7	30	83	272	[3]	272	2	1,861
1974	828	279	304	1,411	6	32	114	301	[3]	301	3	1,867
1975	853	273	288	1,414	6	22	173	300	[3]	300	3	1,918
1976	944	302	284	1,530	5	24	191	284	[3]	284	4	2,038
1977	985	338	292	1,615	5	29	251	220	[3]	220	4	2,124
1978	976	345	290	1,610	5	31	276	280	[3]	280	3	2,206
1979	1,075	290	311	1,676	4	28	255	280	[3]	280	4	2,247
1980	1,162	238	326	1,726	4	24	251	276	[3]	276	6	2,286
1981	1,203	202	325	1,730	3	22	273	261	[3]	261	6	2,295
1982	1,192	144	291	1,628	2	14	283	309	[3]	309	5	2,241
1983	1,259	141	261	1,661	2	14	294	332	[3]	332	6	2,310
1984	1,342	117	284	1,742	2	15	328	321	[3]	321	9	2,416
1985	1,402	97	279	1,778	2	14	384	281	[3]	281	11	2,470
1986	1,386	133	236	1,756	2	14	414	291	[3]	291	12	2,487
1987	1,464	115	258	1,837	2	16	455	250	[3]	250	12	2,572
1988	1,541	144	236	1,921	2	20	527	223	[3]	223	12	2,704
1989	1,554	151	245	1,950	2	27	529	265	[3]	265	11	2,784
1990	1,560	113	246	1,919	2	12	577	283	-4	280	11	2,808
1991	1,551	108	246	1,905	2	20	613	280	-5	276	10	2,825
1992	1,576	86	246	1,908	2	19	619	244	-4	240	10	2,797
1993	1,639	96	R229	R1,964	2	23	610	269	-4	265	10	R2,883
1994P	1,635	86	248	1,970	2	35	639	247	-3	244	9	2,909

[1] "Other" is geothermal, wood, waste, wind, photovoltaic, and solar thermal energy used to generate electricity for distribution.

[2] Included in internal combustion.

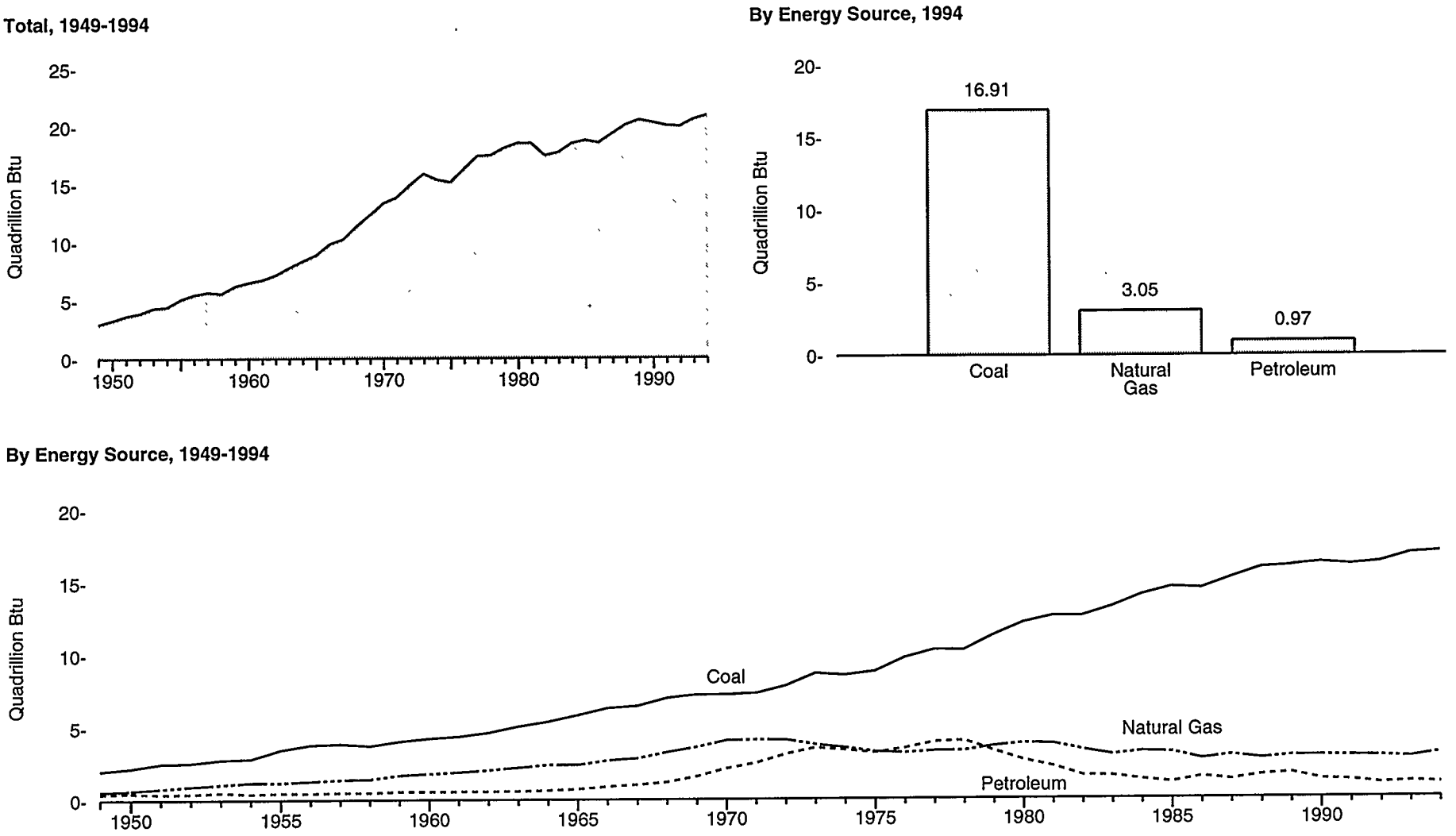
[3] Included in conventional hydroelectric power.

R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 0.5 billion kilowatthours.

Notes: • See Notes 2 and 3 at end of section. • Totals may not equal sum of components due to independent rounding.

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 forward—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Figure 8.5 Electric Utility Consumption of Fossil Fuels To Generate Electricity



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

Source: Table 8.5.

Table 8.5 Electric Utility Consumption of Fossil Fuels To Generate Electricity, 1949-1994

Year	Coal		Natural Gas		Petroleum [1]		Total
	Million Short Tons	Quadrillion Btu	Billion Cubic Feet	Quadrillion Btu	Million Barrels	Quadrillion Btu	Quadrillion Btu
1949	84.0	2.00	550.1	0.57	66.3	0.41	2.98
1950	91.9	2.20	628.9	0.65	75.4	0.47	3.32
1951	105.8	2.51	763.9	0.79	63.9	0.40	3.70
1952	107.1	2.56	910.1	0.94	67.2	0.42	3.92
1953	115.9	2.78	1,034.3	1.07	82.2	0.51	4.36
1954	118.4	2.84	1,165.5	1.21	66.7	0.42	4.46
1955	143.8	3.46	1,153.3	1.19	75.3	0.47	5.12
1956	158.3	3.79	1,239.3	1.28	72.7	0.45	5.53
1957	160.8	3.86	1,336.1	1.38	79.7	0.50	5.74
1958	155.7	3.72	1,372.9	1.42	77.7	0.49	5.63
1959	168.4	4.03	1,628.5	1.69	88.3	0.55	6.27
1960	176.7	4.23	1,724.8	1.79	88.2	0.55	6.57
1961	182.2	4.35	1,825.1	1.89	88.9	0.56	6.80
1962	193.3	4.62	1,966.0	2.03	89.3	0.56	7.22
1963	211.3	5.05	2,144.5	2.21	93.3	0.58	7.85
1964	225.4	5.38	2,322.9	2.40	101.1	0.63	8.41
1965	244.8	5.82	2,321.1	2.40	115.2	0.72	8.94
1966	266.5	6.30	2,609.9	2.70	140.9	0.88	9.88
1967	274.2	6.44	2,746.4	2.83	161.3	1.01	10.29
1968	297.8	6.99	3,147.9	3.25	188.6	1.18	11.42
1969	310.6	7.22	3,487.6	3.60	251.0	1.57	12.39
1970	320.2	7.23	3,931.9	4.05	338.7	2.12	13.40
1971	327.3	7.30	3,976.0	4.10	399.5	2.49	13.89
1972	351.8	7.81	3,976.9	4.08	496.9	3.10	14.99
1973	389.2	8.66	3,660.2	3.75	562.8	3.51	15.92
1974	391.8	8.53	3,443.4	3.52	539.4	3.36	15.42
1975	406.0	8.79	3,157.7	3.24	506.5	3.17	15.19
1976	448.4	9.72	3,080.9	3.15	556.3	3.48	16.35
1977	477.1	10.26	3,191.2	3.28	624.2	3.90	17.45
1978	481.2	10.24	3,188.4	3.30	637.8	3.99	17.52
1979	527.1	11.26	3,490.5	3.61	524.6	3.28	18.16
1980	569.3	12.12	3,681.6	3.81	421.1	2.63	18.57
1981	596.8	12.58	3,640.2	3.77	351.8	2.20	18.55
1982	593.7	12.58	3,225.5	3.34	250.5	1.57	17.49
1983	625.2	13.21	2,910.8	3.00	246.8	1.54	17.75
1984	664.4	14.02	3,111.3	3.22	205.7	1.29	18.53
1985	693.8	14.54	3,044.1	3.16	174.6	1.09	18.79
1986	685.1	14.44	2,602.4	2.69	232.0	1.45	18.59
1987	717.9	15.17	2,844.1	2.94	201.1	1.26	19.37
1988	758.4	15.85	2,635.6	2.71	250.1	1.56	20.12
1989	766.9	15.99	2,787.0	2.87	270.0	1.69	20.54
1990	773.5	16.19	2,787.3	2.88	200.2	1.25	20.32
1991	772.3	16.03	2,789.0	2.86	188.5	1.18	20.06
1992	779.9	16.21	2,765.6	2.83	152.3	0.95	19.99
1993	[R]813.5	[R]16.79	[R]2,682.4	2.74	[R]168.6	1.05	[R]20.58
1994[P]	817.1	16.91	2,986.4	3.05	155.5	0.97	20.93

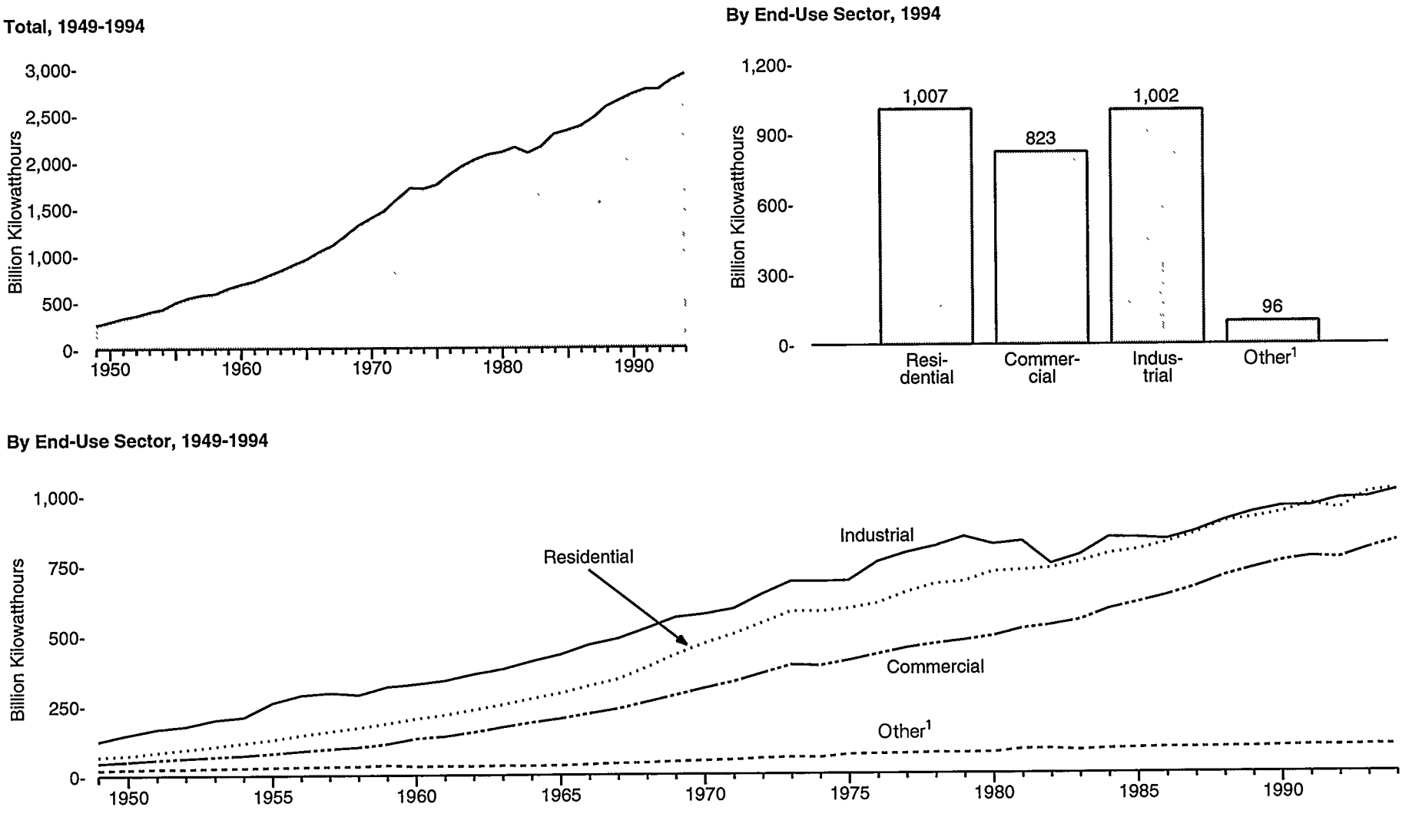
[1] These data show petroleum consumed by electric utilities and do not equate to petroleum supplied to (or delivered to) electric utilities. Included are residual fuel oil (including crude oil burned as fuel), distillate fuel oil, jet fuel, and petroleum coke. Petroleum coke is reported in short tons and has been converted to barrels at a rate of 5 barrels per short ton.

R=Revised data. P=Preliminary data.

Notes: • See Note 3 at end of section. • Totals may not equal sum of components due to independent rounding.

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 forward—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Figure 8.6 Electric Utility Retail Sales of Electricity



[1] "Other" is 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 8.6.

Table 8.6 Electric Utility Retail Sales of Electricity by End-Use Sector, 1949-1994

(Billion Kilowatthours)

Year	Residential	Commercial	Industrial	Other [1]	Total
1949	67	45	123	20	255
1950	72	51	146	22	291
1951	83	57	166	24	330
1952	94	62	176	24	356
1953	104	67	199	26	396
1954	116	72	208	27	424
1955	128	79	260	29	497
1956	143	87	286	30	546
1957	157	94	294	31	576
1958	169	100	287	32	588
1959	185	112	315	36	647
1960	201	131	324	32	688
1961	214	138	337	32	722
1962	233	153	360	32	778
1963	251	171	377	34	833
1964	272	187	405	32	896
1965	291	200	429	34	954
1966	317	218	464	37	1,035
1967	340	234	485	40	1,099
1968	382	258	521	42	1,203
1969	427	282	559	46	1,314
1970	466	307	571	48	1,392
1971	500	329	589	51	1,470
1972	539	359	641	56	1,595
1973	579	388	686	59	1,713
1974	578	385	685	58	1,706
1975	588	403	688	68	1,747
1976	606	425	754	70	1,855
1977	645	447	786	71	1,948
1978	674	461	809	73	2,018
1979	683	473	842	73	2,071
1980	717	488	815	74	2,094
1981	722	514	826	85	2,147
1982	730	526	745	86	2,086
1983	751	544	776	80	2,151
1984	780	583	838	85	2,286
1985	794	606	837	87	2,324
1986	819	631	831	89	2,369
1987	850	660	858	88	2,457
1988	893	699	896	90	2,578
1989	906	726	926	90	2,647
1990	924	751	946	92	2,713
1991	955	766	947	94	2,762
1992	936	761	973	93	2,763
1993	R995	R795	R977	R95	R2,861
1994P	1,007	823	1,002	96	2,928

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

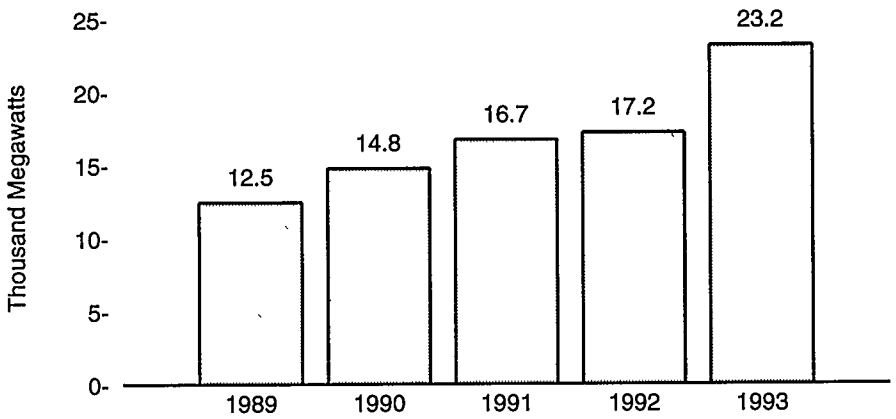
R=Revised data. P=Preliminary data.

Notes: • See Note 4 at end of section. • Totals may not equal sum of components due to independent rounding.

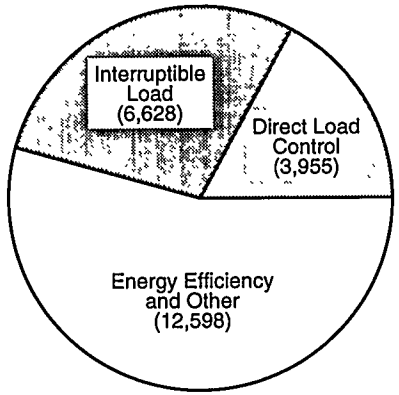
Sources: • 1949-September 1977—Federal Power Commission, Form FPC-5, "Monthly Statement of Electric Operating Revenue and Income." • October 1977-February 1980—Federal Energy Regulatory Commission (FERC), Form FPC-5, "Monthly Statement of Electric Operating Revenue and Income." • March 1980-1982—FERC, Form FPC-5, "Electric Utility Company Monthly Statement." • 1983—Energy Information Administration (EIA), Form EIA-826, "Electric Utility Company Monthly Statement." • 1984-1993—EIA, Form EIA-861, "Annual Electric Utility Report." • 1994—EIA, Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions."

Figure 8.7 Electric Utility Demand-Side Management Programs

Actual Peakload Reductions, Total of All Programs, 1989-1993

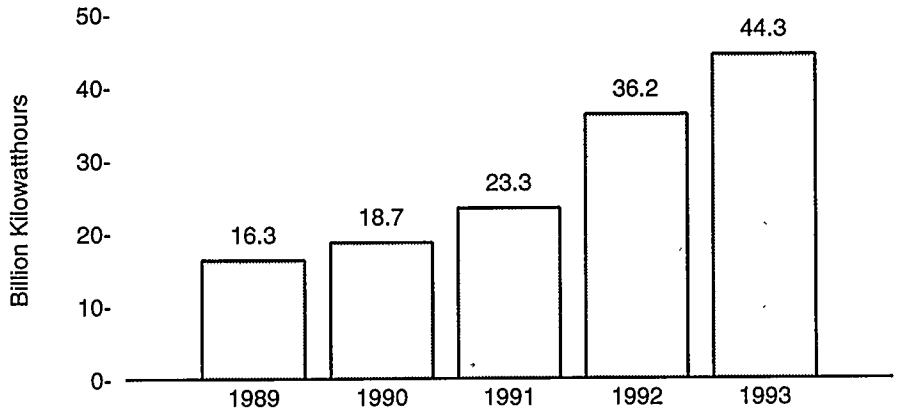


Actual Peakload Reductions by Program, 1993

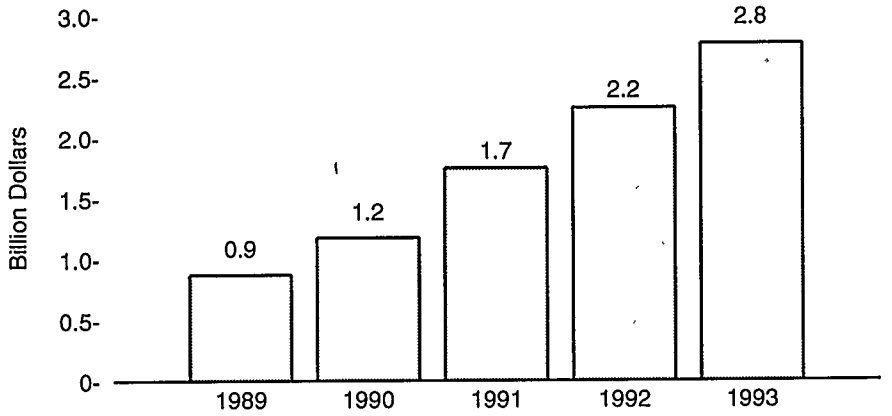


Total: 23,181 Megawatts

Energy Savings, 1989-1993



Costs, 1989-1993



Source: Table 8.7.

Table 8.7 Electric Utility Demand-Side Management Programs: Peakload Reductions, Energy Savings, and Costs, 1989-1993

Year	Actual Peakload Reductions (megawatts)				Energy Savings (million kilowatthours)	Costs (thousand dollars)
	Direct Load Control [1,2]	Interruptible Load [1,3]	Energy Efficiency [4] and Other [5]	Total		
1989	NA	NA	NA	12,463	16,268	872,935
1990	3,692	4,219	6,861	14,772	18,671	1,177,457
1991	5,093	3,674	7,972	16,739	23,343	1,747,933
1992	3,779	3,579	[R]9,847	[R]17,204	[R]36,164	2,243,270
1993[P]	3,955	6,628	12,598	23,181	44,349	2,768,662

[1] 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.

[2] 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.

[3] 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.

[4] 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.

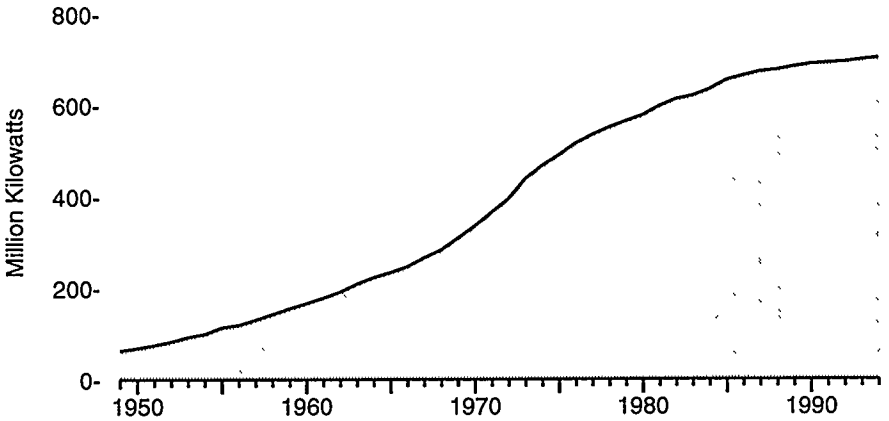
[5] For example, programs that promote consumer's substitution of electricity by other energy types and programs that limit or shift peak load from on-peak to off-peak time periods, such as space heating and water heating storage systems, cool storage systems, and load limiting devices in energy management systems.

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

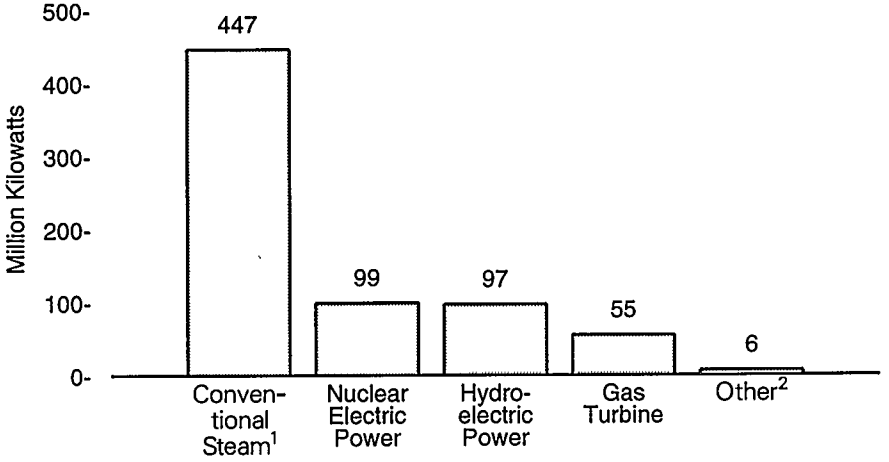
Sources: **Actual Peakload Reductions:** • 1989—Energy Information Administration (EIA), *Electric Power Annual 1993* (December 1994), Table 65. • 1990-1993—EIA, *Electric Power Annual 1993* (December 1994), Table 66. **Energy Savings** and **Costs:** EIA, *Electric Power Annual 1993* (December 1994), Table 65.

Figure 8.8 Electric Utility Net Summer Capability, End of Year

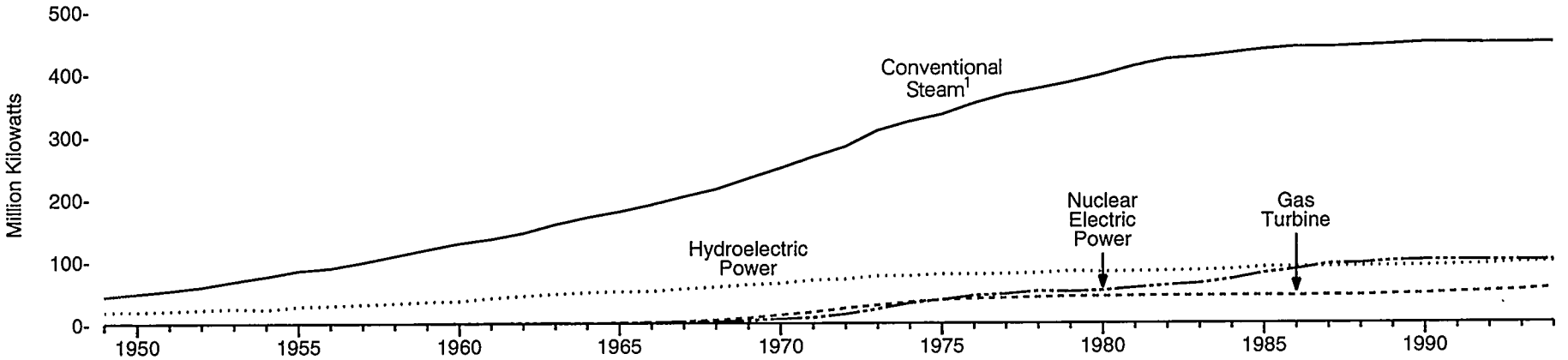
Total, 1949-1994



By Prime Mover, 1994



By Prime Mover, 1949-1994



[1] Includes fossil steam, wood, and waste.
[2] "Other" is internal combustion, geothermal, wind, photovoltaic, and solar thermal energy.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 8.8.

Table 8.8 Electric Utility Net Summer Capability, End of Year 1949-1994

(Million Kilowatts)

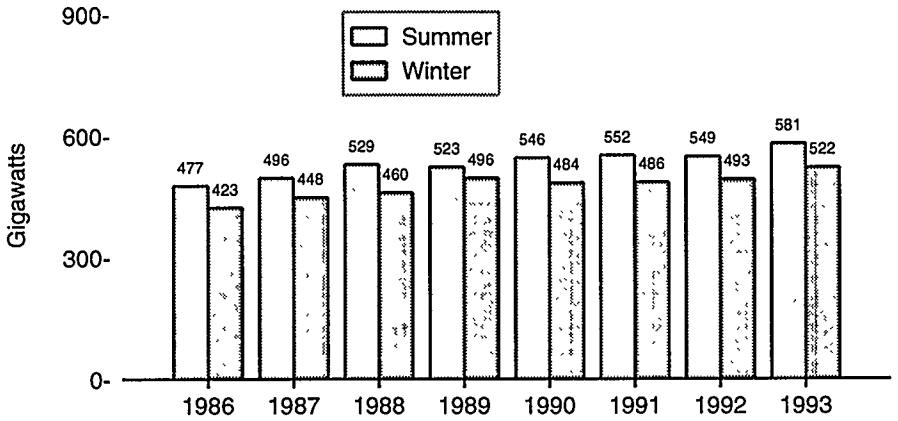
Year	Conventional Steam [1]	Internal Combustion	Gas Turbine	Nuclear Electric Power	Hydroelectric Power			Geothermal Energy and Other [2]	Total
					Conventional	Pumped Storage	Total		
1949	43.2	1.7	0.0	0.0	18.5	([3])	18.5	(s)	63.4
1950	48.2	1.8	0.0	0.0	19.2	([3])	19.2	(s)	69.2
1951	53.1	1.9	0.0	0.0	20.5	([3])	20.5	(s)	75.5
1952	58.8	2.0	0.0	0.0	22.4	([3])	22.4	(s)	83.2
1953	67.5	2.1	0.0	0.0	23.8	([3])	23.8	(s)	93.3
1954	75.4	2.2	0.0	0.0	22.5	([3])	22.5	(s)	100.0
1955	84.6	2.3	0.0	0.0	27.4	([3])	27.4	(s)	114.2
1956	88.8	2.4	0.0	0.0	28.5	([3])	28.5	(s)	119.7
1957	97.9	2.3	0.0	0.1	30.7	([3])	30.7	(s)	131.1
1958	108.2	2.4	0.0	0.1	32.5	([3])	32.5	(s)	143.3
1959	118.5	2.5	0.0	0.1	34.8	([3])	34.8	(s)	155.9
1960	128.3	2.6	0.0	0.4	35.8	([3])	35.8	(s)	167.1
1961	135.1	2.8	0.0	0.4	40.7	([3])	40.7	(s)	179.0
1962	144.6	2.8	0.0	0.7	44.0	([3])	44.0	(s)	192.1
1963	158.4	3.0	0.5	0.8	47.0	([3])	47.0	(s)	209.7
1964	169.6	3.1	0.8	0.8	49.4	([3])	49.4	(s)	223.7
1965	178.7	3.2	1.1	0.8	51.0	([3])	51.0	(s)	234.8
1966	189.6	3.3	1.6	1.7	51.2	([3])	51.2	(s)	247.5
1967	202.5	3.6	2.8	2.7	55.0	([3])	55.0	0.1	266.7
1968	214.3	3.8	5.3	2.7	57.9	([3])	57.9	0.1	284.0
1969	231.4	4.0	8.4	4.4	61.6	([3])	61.6	0.1	309.8
1970	248.0	4.1	13.3	7.0	63.8	([3])	63.8	0.1	336.4
1971	266.0	4.2	17.9	9.0	69.1	([3])	69.1	0.2	366.4
1972	282.3	4.5	23.9	14.5	70.5	([3])	70.5	0.3	396.0
1973	307.9	4.7	28.8	22.7	75.4	([3])	75.4	0.4	439.8
1974	322.4	4.7	33.7	31.9	75.5	([3])	75.5	0.4	468.5
1975	333.3	4.8	37.1	37.3	78.4	([3])	78.4	0.5	491.3
1976	350.9	5.0	39.1	43.8	78.0	([3])	78.0	0.5	517.2
1977	365.3	5.0	40.3	46.3	78.6	([3])	78.6	0.5	535.9
1978	374.5	5.2	41.2	50.8	79.9	([3])	79.9	0.5	552.1
1979	384.6	5.2	42.5	49.7	82.9	([3])	82.9	0.7	565.5
1980	396.6	5.2	42.5	51.8	81.7	([3])	81.7	0.9	578.6
1981	410.7	5.3	43.2	56.0	82.4	([3])	82.4	0.9	598.3
1982	421.4	4.8	43.5	60.0	83.0	([3])	83.0	1.1	613.7
1983	424.9	4.7	43.3	63.0	83.9	([3])	83.9	1.2	621.1
1984	430.8	4.5	43.5	69.7	85.3	([3])	85.3	1.3	635.1
1985	436.8	4.7	43.9	79.4	88.9	([3])	88.9	1.6	655.2
1986	440.6	4.6	43.4	85.2	89.3	([3])	89.3	1.6	664.8
1987	440.3	4.8	44.2	93.6	89.7	([3])	89.7	1.5	674.1
1988	442.4	4.7	43.9	94.7	90.3	([3])	90.3	1.7	677.7
1989	444.4	4.6	45.4	98.2	90.5	([3])	90.5	1.6	684.6
1990	447.5	4.6	46.3	99.6	73.6	17.3	90.9	1.6	690.5
1991	447.0	4.5	48.3	99.6	73.6	18.4	92.0	1.6	693.0
1992	446.7	4.5	49.8	99.0	74.3	19.0	93.4	1.7	695.1
1993	R446.8	R4.8	R51.7	R99.0	R74.8	R21.1	R95.9	1.7	R700.0
1994P	447.1	4.7	54.9	99.0	75.3	21.2	96.5	1.7	704.0

[1] Includes fossil steam, wood, and waste.
[2] "Other" is wind, photovoltaic, and solar thermal energy.
[3] Included in conventional hydroelectric power.
R=Revised data. P=Preliminary data. (s)=Less than 0.05 million kilowatts.

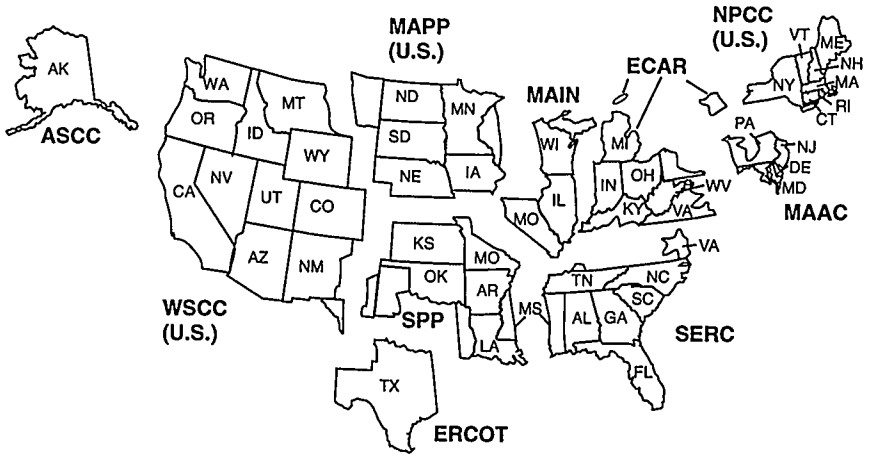
Notes: • See Glossary and Note 5 at end of section. • Totals may not equal sum of components due to independent rounding.
Sources: • 1949-1984—Energy Information Administration (EIA) estimates. • 1985 forward—EIA, Form EIA-860, "Annual Electric Generator Report."

Figure 8.9 Electric Utility Noncoincidental Peak Load

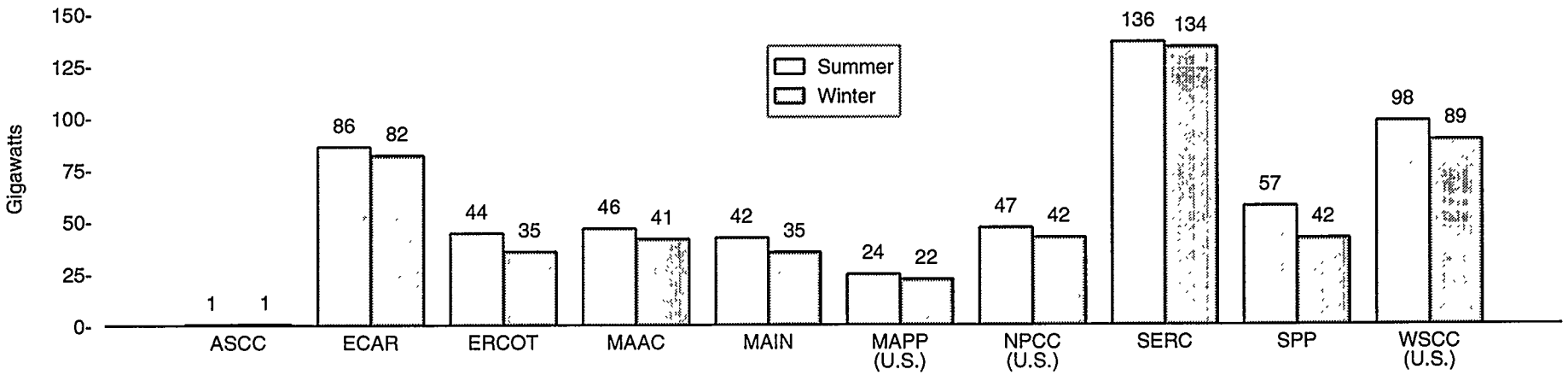
In the Contiguous United States, 1986-1993



North American Electric Reliability Council Map for the United States



By NERC Regions, 1993



Notes: • Noncoincidental 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 8.9.

Table 8.9 Electric Utility Noncoincidental Peak Load by Region, 1986-1993

(Megawatts)

Year	North American Electric Reliability Council Regions [1]									Contiguous United States	ASCC (Alaska)
	ECAR	ERCOT	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	[2]
1987	72,561	39,339	40,526	37,446	23,162	42,651	109,798	47,723	82,967	496,173	[2]
1988	79,149	40,843	43,110	41,139	24,899	45,245	115,168	49,356	90,551	529,460	[2]
1989	75,442	40,402	41,614	39,460	23,531	45,031	117,051	49,439	90,657	522,627	455
1990	79,258	42,737	42,613	40,740	24,994	44,116	121,149	52,541	97,389	545,537	463
1991	81,539	41,870	45,937	41,598	25,498	46,594	124,688	51,885	92,096	551,705	471
1992	78,550	42,619	43,658	38,819	22,638	43,658	128,236	51,324	99,205	548,707	504
1993	85,930	44,255	46,494	41,956	24,396	46,706	136,101	57,106	97,809	580,753	511
	Winter										
1986	64,561	28,730	32,807	28,036	18,850	37,976	101,849	33,877	76,171	422,857	[2]
1987	68,118	31,399	35,775	30,606	19,335	41,902	105,476	34,472	81,182	448,265	[2]
1988	67,771	34,621	36,363	30,631	20,162	42,951	108,649	35,649	82,937	459,734	[2]
1989	73,080	38,388	38,161	33,770	20,699	42,588	121,995	42,268	84,768	495,717	626
1990	67,097	35,815	36,551	32,461	21,113	40,545	117,231	38,949	94,252	484,014	613
1991	71,181	35,448	37,983	33,420	21,432	41,786	119,575	38,759	86,097	485,681	622
1992	72,885	35,055	37,915	31,289	21,866	41,125	121,250	39,912	91,686	492,983	635
1993	81,846	35,407	41,406	34,966	21,955	42,063	133,635	41,644	88,811	521,733	632

[1] See Glossary for information on the North American Electric Reliability Council (NERC). This table includes the U.S. portion of NERC only and does not cover Hawaii, Puerto Rico, and U.S. Trust Territories. See Figure 8.9 for an illustration of NERC regions.

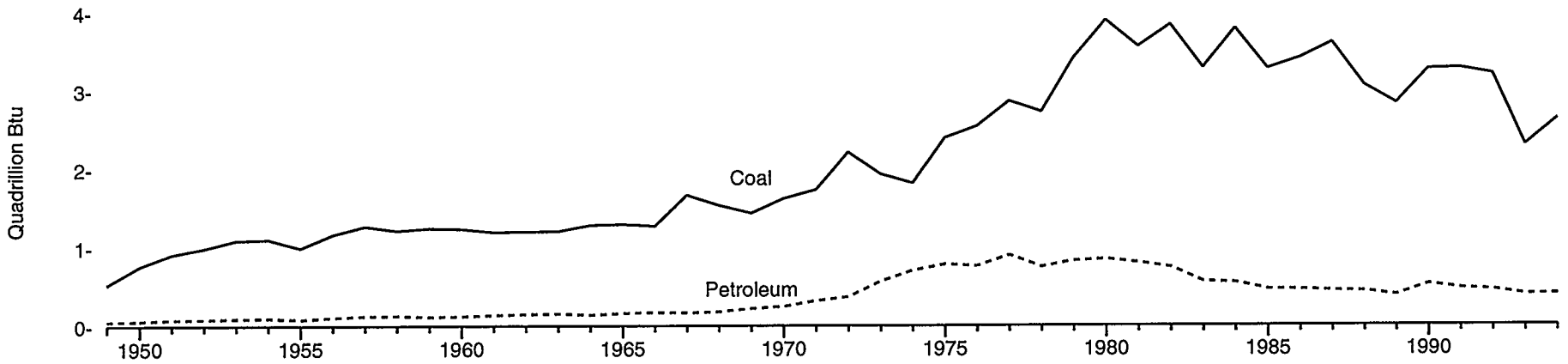
[2] Data submission for ASCC (Alaska) began in 1989.

Note: Noncoincidental peak load is the sum of two or more peak loads on individual systems that do not occur at the same time interval.

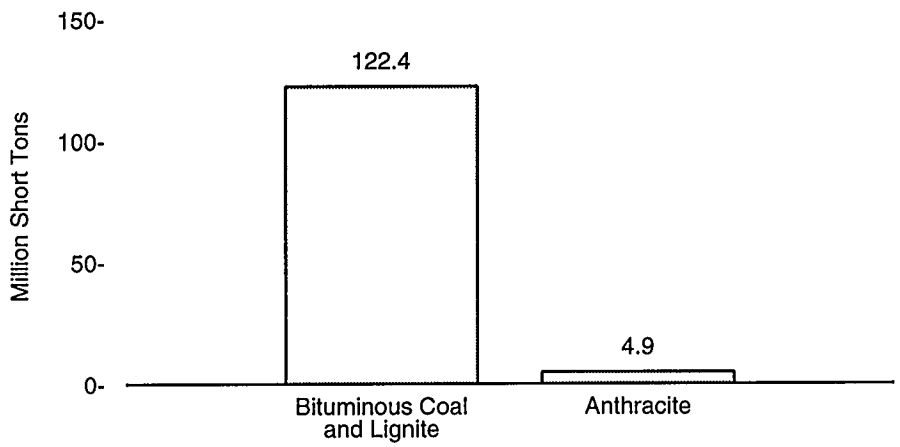
Sources: • 1986—Energy Information Administration (EIA), *Electric Power Annual 1990* (January 1992), Table 53. • 1987—EIA, *Electric Power Annual 1991* (February 1993), Table 52. • 1988—EIA, *Electric Power Annual 1992* (January 1994), Table 57. • 1989 forward—EIA, *Electric Power Annual 1993* (December 1994), Table 57, except for 1993 ECAR and Contiguous United States, which are from North American Electric Reliability Council, *1994-2003 Electricity Supply and Demand Database.*

Figure 8.10 Electric Utility Stocks of Coal and Petroleum, End of Year

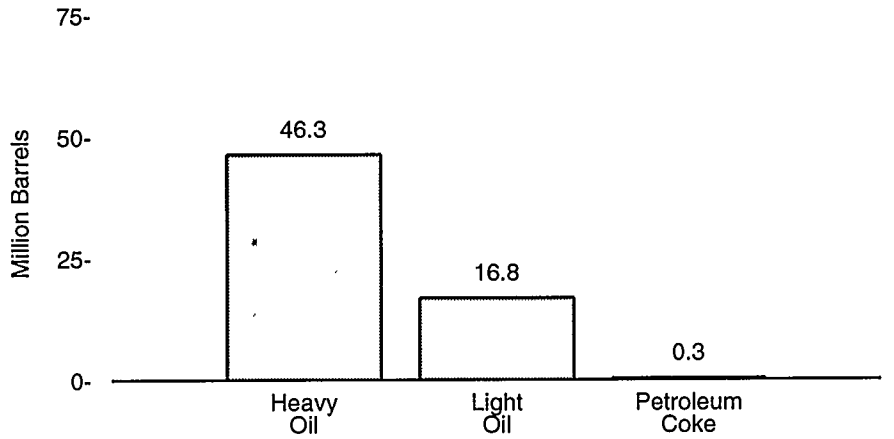
Coal and Petroleum, 1949-1994



Coal, 1994



Petroleum, 1994



Source: Table 8.10.

Table 8.10 Electric Utility Stocks of Coal and Petroleum, End of Year 1949-1994

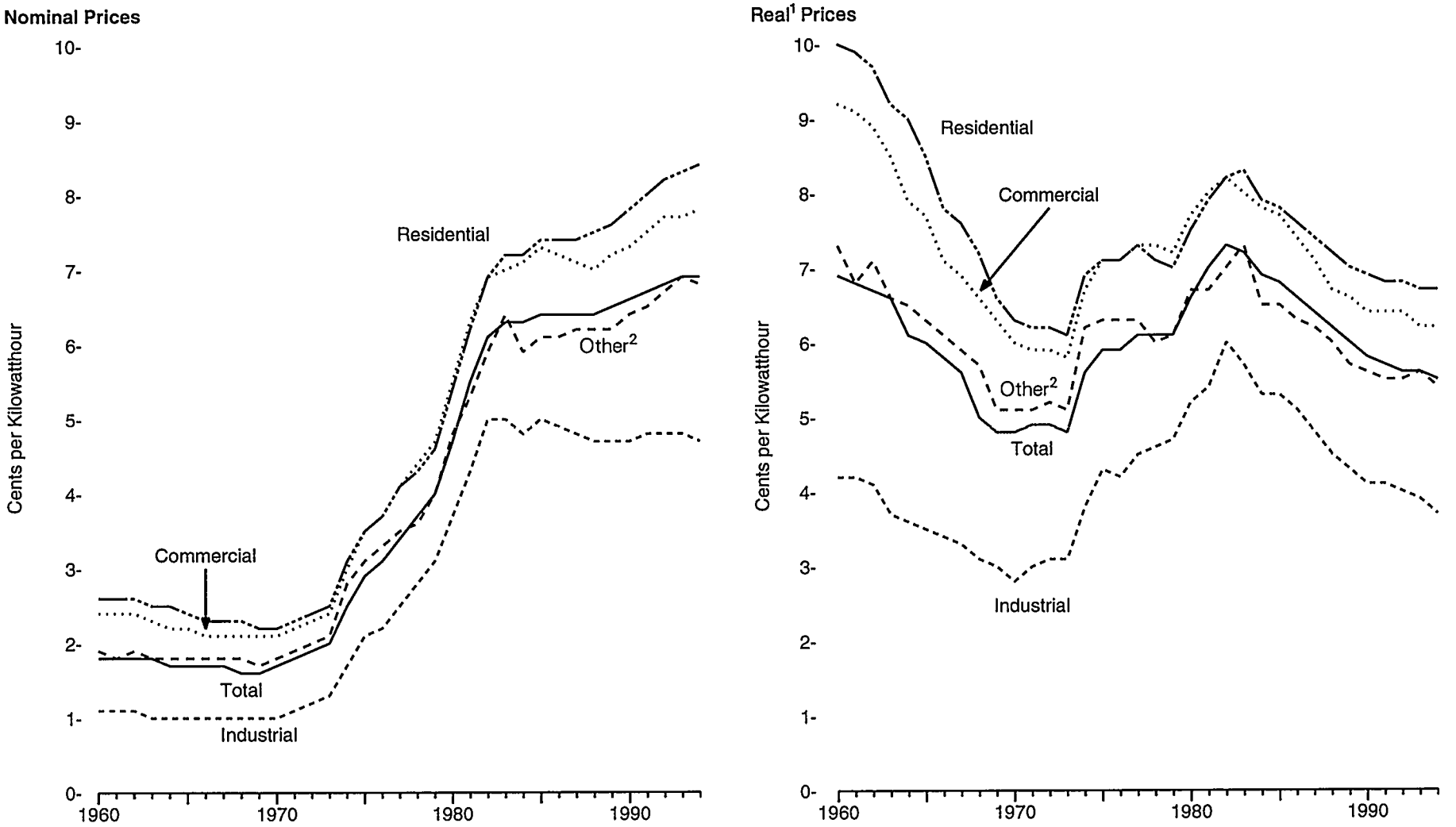
Year	Coal				Petroleum					
	Anthracite [1]	Bituminous Coal [2] and Lignite	Total		Heavy Oil [3]	Light Oil [4]	Total Liquids	Petroleum Coke [5]	Total	
	Million Short Tons		Million Short Tons	Trillion Btu	Million Barrels				Million Barrels	Trillion Btu
1949	4.3	17.8	22.1	524	NA	NA	8.6	NA	8.6	54
1950	4.7	27.1	31.8	762	NA	NA	10.2	NA	10.2	64
1951	5.1	33.4	38.5	913	NA	NA	12.8	NA	12.8	80
1952	5.6	35.9	41.5	991	NA	NA	13.7	NA	13.7	86
1953	5.9	39.8	45.6	1,094	NA	NA	15.0	NA	15.0	94
1954	6.4	39.7	46.1	1,106	NA	NA	15.9	NA	15.9	99
1955	3.2	38.2	41.4	996	NA	NA	13.7	NA	13.7	85
1956	2.8	46.0	48.8	1,168	NA	NA	17.3	NA	17.3	108
1957	2.8	50.3	53.1	1,273	NA	NA	20.1	NA	20.1	126
1958	2.2	48.8	51.0	1,218	NA	NA	20.8	NA	20.8	130
1959	2.0	50.1	52.1	1,247	NA	NA	18.5	NA	18.5	116
1960	1.8	49.9	51.7	1,238	NA	NA	19.6	NA	19.6	123
1961	1.5	48.6	50.1	1,197	NA	NA	22.0	NA	22.0	138
1962	1.4	49.0	50.4	1,205	NA	NA	23.8	NA	23.8	149
1963	1.3	49.3	50.6	1,209	NA	NA	24.9	NA	24.9	156
1964	1.2	52.7	53.9	1,286	NA	NA	22.4	NA	22.4	140
1965	1.1	53.4	54.5	1,297	NA	NA	25.6	NA	25.6	161
1966	1.0	52.9	53.9	1,274	NA	NA	27.4	NA	27.4	172
1967	1.3	69.7	71.0	1,669	NA	NA	26.7	NA	26.7	167
1968	1.3	64.2	65.5	1,538	NA	NA	28.7	NA	28.7	180
1969	1.3	60.6	61.9	1,438	NA	NA	35.3	NA	35.3	221
1970	1.1	70.8	71.9	1,623	NA	NA	38.0	1.2	39.2	245
1971	1.1	76.7	77.8	1,735	NA	NA	49.6	1.5	51.1	319
1972	0.9	98.8	99.7	2,214	NA	NA	57.7	1.4	59.1	368
1973	1.1	85.9	87.0	1,935	NA	NA	89.2	1.6	90.8	567
1974	0.9	82.6	83.5	1,819	NA	NA	112.9	0.2	113.1	705
1975	1.0	109.7	110.7	2,396	NA	NA	125.3	0.2	125.4	784
1976	1.0	116.4	117.4	2,546	NA	NA	121.7	0.2	121.9	762
1977	2.3	130.9	133.2	2,865	NA	NA	144.0	0.2	144.3	901
1978	2.2	126.0	128.2	2,728	NA	NA	118.8	1.0	119.8	749
1979	3.3	156.4	159.7	3,412	NA	NA	131.4	0.9	132.3	828
1980	4.7	178.3	183.0	3,897	105.4	30.0	135.4	0.3	135.6	848
1981	5.5	163.4	168.9	3,561	102.0	26.1	128.1	0.2	128.3	803
1982	6.1	175.1	181.1	3,839	95.5	23.4	118.9	0.2	119.1	745
1983	6.5	149.1	155.6	3,288	70.6	18.8	89.4	0.3	89.7	561
1984	6.7	173.0	179.7	3,792	68.5	19.1	87.6	0.3	87.9	549
1985	7.2	149.2	156.4	3,277	57.3	16.4	73.7	0.2	73.9	462
1986	7.1	154.7	161.8	3,412	56.8	16.3	73.1	0.2	73.3	459
1987	6.9	163.9	170.8	3,610	55.1	15.8	70.8	0.3	71.1	444
1988	6.6	139.9	146.5	3,062	54.2	15.1	69.3	0.4	69.7	436
1989	6.4	129.5	135.9	2,832	47.4	13.8	61.3	0.5	61.8	386
1990	6.5	149.7	156.2	3,268	67.0	16.5	83.5	0.5	84.0	525
1991	6.5	151.4	157.9	3,277	58.6	16.4	75.0	0.4	75.3	471
1992	6.2	147.9	154.1	3,204	56.1	15.7	71.8	0.3	72.2	451
1993	5.6	105.7	111.3	R2,298	46.8	15.7	62.4	0.4	62.9	392
1994P	4.9	122.4	127.3	2,633	46.3	16.8	63.2	0.3	63.5	396

[1] Includes anthracite silt stored off-site.
[2] Includes subbituminous coal.
[3] Includes Grade Nos. 4, 5, and 6, and residual fuel oils.
[4] Includes Grade No. 2 heating oil, kerosene, and jet fuel.
[5] Petroleum coke, which is reported in short tons, has been converted to barrels at a rate of 5 barrels per short ton.
R=Revised data. P=Preliminary data. NA=Not available.

Notes: • See Note 3 at end of section. • Totals may not equal sum of components due to independent rounding.

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 forward—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Figure 8.11 Retail Prices of Electricity Sold by Electric Utilities, 1960-1994



[1] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
[2] "Other" is public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.
Source: Table 8.11.

Table 8.11 Retail Prices of Electricity Sold by Electric Utilities, 1960-1994

(Cents per Kilowatthour)

Year	Residential		Commercial		Industrial		Other [1]		Total	
	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]
1960	2.6	10.0	2.4	9.2	1.1	4.2	1.9	7.3	1.8	6.9
1961	2.6	9.9	2.4	9.1	1.1	4.2	1.8	6.8	1.8	6.8
1962	2.6	9.7	2.4	8.9	1.1	4.1	1.9	7.1	1.8	6.7
1963	2.5	9.2	2.3	8.5	1.0	3.7	1.8	6.6	1.8	6.6
1964	2.5	9.0	2.2	7.9	1.0	3.6	1.8	6.5	1.7	6.1
1965	2.4	8.5	2.2	7.7	1.0	3.5	1.8	6.3	1.7	6.0
1966	2.3	7.8	2.1	7.1	1.0	3.4	1.8	6.1	1.7	5.8
1967	2.3	7.6	2.1	6.9	1.0	3.3	1.8	5.9	1.7	5.6
1968	2.3	7.2	2.1	6.6	1.0	3.1	1.8	5.7	1.6	5.0
1969	2.2	6.6	2.1	6.3	1.0	3.0	1.7	5.1	1.6	4.8
1970	2.2	6.3	2.1	6.0	1.0	2.8	1.8	5.1	1.7	4.8
1971	2.3	6.2	2.2	5.9	1.1	3.0	1.9	5.1	1.8	4.9
1972	2.4	6.2	2.3	5.9	1.2	3.1	2.0	5.2	1.9	4.9
1973	2.5	6.1	2.4	5.8	1.3	3.1	2.1	5.1	2.0	4.8
1974	3.1	6.9	3.0	6.7	1.7	3.8	2.8	6.2	2.5	5.6
1975	3.5	7.1	3.5	7.1	2.1	4.3	3.1	6.3	2.9	5.9
1976	3.7	7.1	3.7	7.1	2.2	4.2	3.3	6.3	3.1	5.9
1977	4.1	7.3	4.1	7.3	2.5	4.5	3.5	6.3	3.4	6.1
1978	4.3	7.1	4.4	7.3	2.8	4.6	3.6	6.0	3.7	6.1
1979	4.6	7.0	4.7	7.2	3.1	4.7	4.0	6.1	4.0	6.1
1980	5.4	7.5	5.5	7.7	3.7	5.2	4.8	6.7	4.7	6.6
1981	6.2	7.9	6.3	8.0	4.3	5.4	5.3	6.7	5.5	7.0
1982	6.9	8.2	6.9	8.2	5.0	6.0	5.9	7.0	6.1	7.3
1983	7.2	8.3	7.0	8.0	5.0	5.7	6.4	7.3	6.3	7.2
1984[3]	7.2	7.9	7.1	7.8	4.8	5.3	5.9	6.5	6.3	6.9
1985[3]	7.4	7.8	7.3	7.7	5.0	5.3	6.1	6.5	6.4	6.8
1986[3]	7.4	7.6	7.2	7.4	4.9	5.1	6.1	6.3	6.4	6.6
1987[3]	7.4	7.4	7.1	7.1	4.8	4.8	6.2	6.2	6.4	6.4
1988	7.5	7.2	7.0	6.7	4.7	4.5	6.2	6.0	6.4	6.2
1989	7.6	7.0	7.2	6.6	4.7	4.3	6.2	5.7	6.5	6.0
1990	7.8	6.9	7.3	6.4	4.7	4.1	6.4	5.6	6.6	5.8
1991	8.0	6.8	7.5	6.4	4.8	4.1	6.5	5.5	6.7	5.7
1992	8.2	6.8	7.7	6.4	4.8	4.0	6.7	5.5	6.8	5.6
1993	8.3	6.7	7.7	6.2	R4.8	3.9	R6.9	R5.6	6.9	5.6
1994P	8.4	6.7	7.8	6.2	4.7	3.7	6.8	5.4	6.9	5.5

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

[2] In 1987 dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

[3] These data were taken from Form EIA-861, "Annual Electric Utility Report," and differ from the Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions," data published in previous issues of this publication.

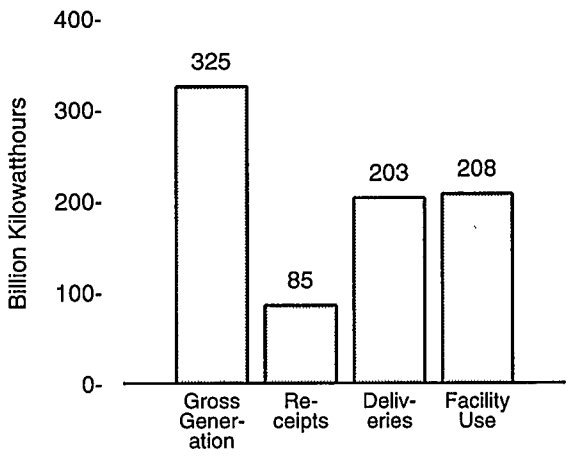
R=Revised data. P=Preliminary data.

Note: Data for 1979 and earlier data are for Classes A and B privately owned electric utilities only. Data for 1980 forward are for selected Class A utilities whose electric operating revenues were $100 million or more during the previous year.

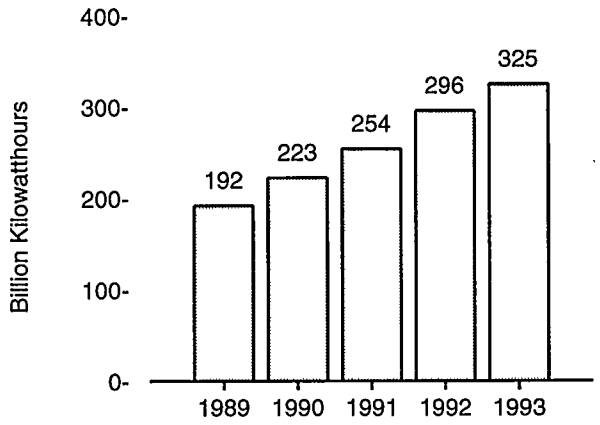
Sources: • 1960 through September 1977—Federal Power Commission, Form FPC-5, "Monthly Statement of Electric Operating Revenues and Income." • October 1977 through February 1980—Federal Energy Regulatory Commission (FERC), Form FPC-5, "Monthly Statement of Electric Operating Revenues and Income." • March 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." • 1984-1993—EIA, Form EIA-861, "Annual Electric Utility Report." • 1994—EIA, Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions."

Figure 8.12 Nonutility Power Overview, 1989-1993

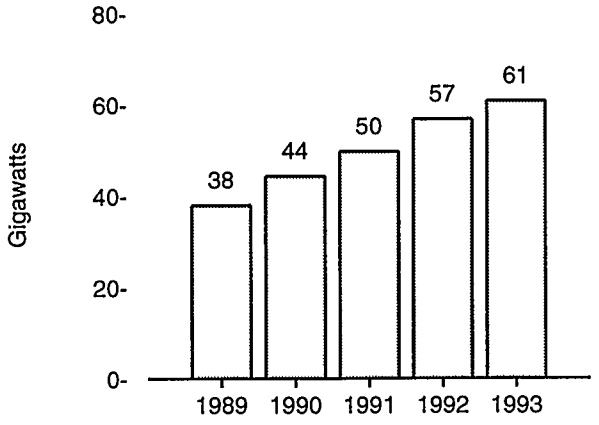
Supply and Disposition, 1993



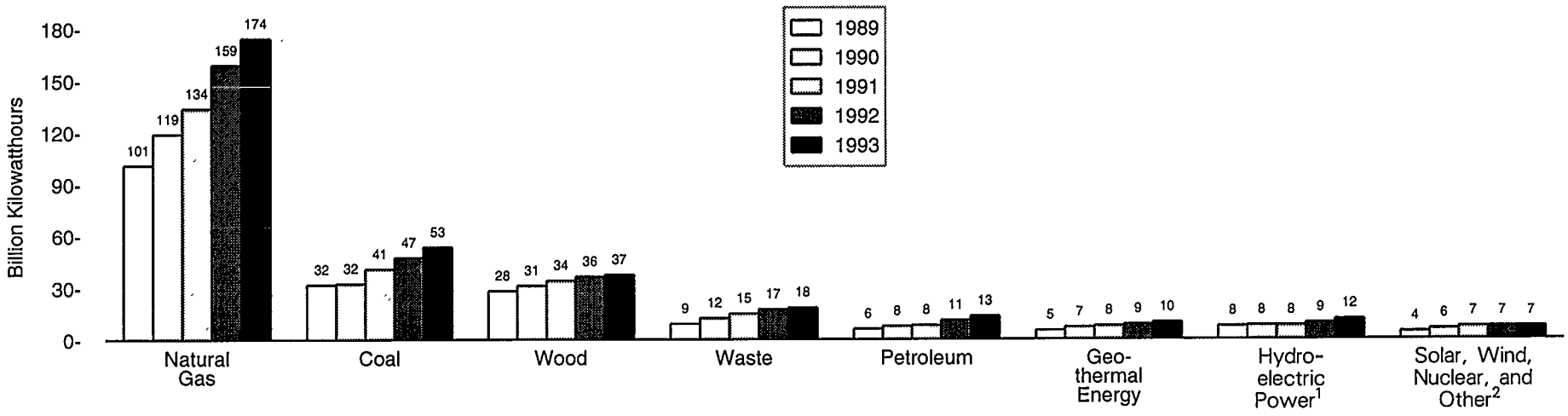
Gross Generation, 1989-1993



Installed Nameplate Capacity, 1989-1993



Gross Generation by Major Sources, 1989-1993



[1] Conventional hydroelectric power only; there are no pumped-storage projects in the nonutility sector.
[2] "Other" includes hydrogen, sulfur, batteries, chemicals, fish oil, and spent sulfite liquor.
Notes: • Nonutility electric generating facilities with a total generator capacity of 1 megawatt or greater. • See Table 8.12 for descriptions of fuels. • Because vertical scales differ, graphs should not be compared.
Source: Table 8.12.

Table 8.12 Nonutility Power Overview, 1989-1993

Item	1989	1990	1991	1992	1993 P
Supply and Disposition (million kilowatthours)					
Gross Generation	192,327	222,721	254,255	296,001	325,226
Receipts [1]	63,249	70,154	73,583	83,421	85,323
Deliveries [2]	99,276	129,023	143,207	175,160	203,035
Facility Use	152,354	163,946	183,698	204,261	207,514
Gross Generation (million kilowatthours)	192,327	222,721	254,255	296,001	325,226
Coal [3]	31,703	32,323	40,773	47,363	53,367
Natural Gas [4]	100,813	118,844	133,670	158,798	174,282
Petroleum [5]	5,972	7,584	8,083	10,963	13,364
Hydroelectric Power [6]	7,504	7,960	8,007	9,446	11,511
Geothermal Energy	5,091	6,916	7,695	8,578	9,749
Wood [7]	28,051	31,038	34,011	36,255	37,421
Waste [8]	9,015	12,259	14,886	17,352	18,325
Solar	489	663	779	746	897
Wind	1,877	2,295	2,650	2,916	3,052
Nuclear [9]	49	116	80	67	78
Other [10]	1,763	2,723	3,621	3,516	3,181
Installed Nameplate Capacity (megawatts)	37,984	44,352	49,736	56,814	60,778
Coal [3]	6,284	6,768	7,349	8,503	9,772
Natural Gas [4]	14,349	17,063	20,669	21,542	23,463
Petroleum [5]	1,030	946	1,351	1,730	2,043
Petroleum and Natural Gas (dual fired)	4,541	6,279	5,168	8,478	8,505
Hydroelectric Power [6]	1,848	1,991	2,118	2,684	2,741
Geothermal Energy	956	1,043	1,060	1,254	1,318
Wood [7]	5,321	5,854	6,648	6,805	7,046
Waste [8]	1,875	2,392	2,806	3,006	3,131
Solar	200	360	360	360	360
Wind	1,376	1,441	1,688	1,822	1,813
Nuclear [9]	20	20	20	20	20
Other [10]	184	195	499	611	566

[1] Includes purchases, interchanges, and exchanges of electric energy with utilities and other nonutilities.
[2] Includes sales, interchanges, and exchanges of electric energy with utilities and other nonutilities. The disparity in these data and data reported on other EIA surveys occurs due to differences in the respondent universe. The Form EIA-867 is filed by nonutilities reporting the energy delivered, while other data sources are filed by electric utilities reporting energy received. Differences in terminology and accounting procedures contribute to the disparity. In addition, because the frame for the Form EIA-867 is derived from utility surveys, the Form EIA-867 universe lags 1 year.
[3] Includes coal, anthracite culm, and coal waste.
[4] Includes natural gas, butane, ethane, propane, waste heat, and waste gases.
[5] Includes petroleum, petroleum coke, diesel, kerosene, and petroleum sludge and tar.
[6] Conventional hydroelectric power only; there are no pumped-storage projects in the nonutility sector.
[7] Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, and wood sludge.
[8] Includes municipal solid waste, agricultural waste, straw, tires, landfill gases, and other waste.
[9] Nuclear reactor and generator at Argonne National Laboratory used primarily for research and development in testing reactor fuels as well as for training. The generation from the unit is used for internal consumption.
[10] Includes hydrogen, sulfur, batteries, chemicals, fish oil, and spent sulfite liquor. Data previously published for other energy sources in 1989 and 1990 have been reclassified and are included in the category that best reflects their characteristics.

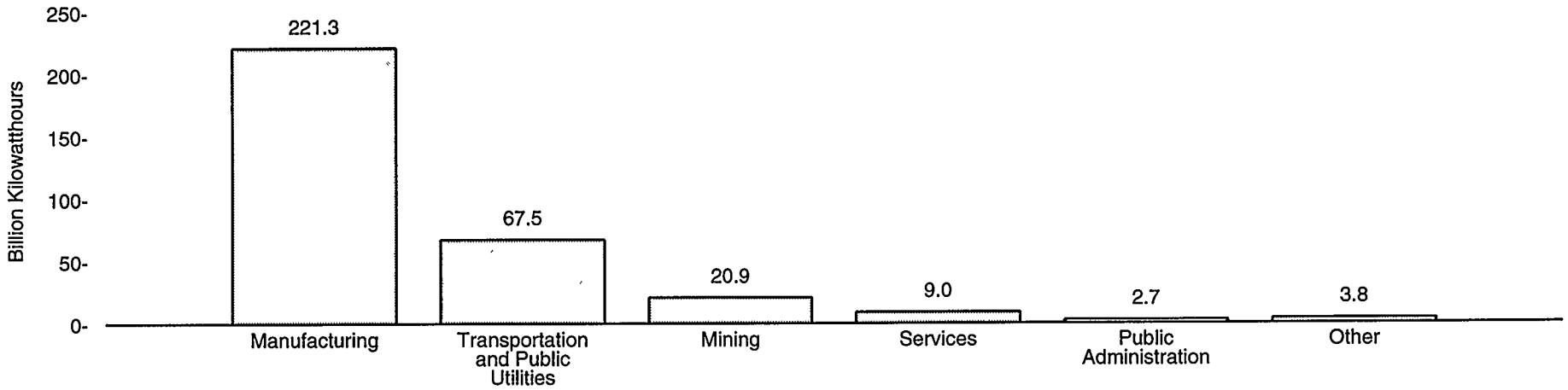
P=Preliminary data.

Notes: • Nonutility electric generating facilities with a total generator capacity of 1 megawatt or greater. • Totals may not equal sum of components due to independent rounding.

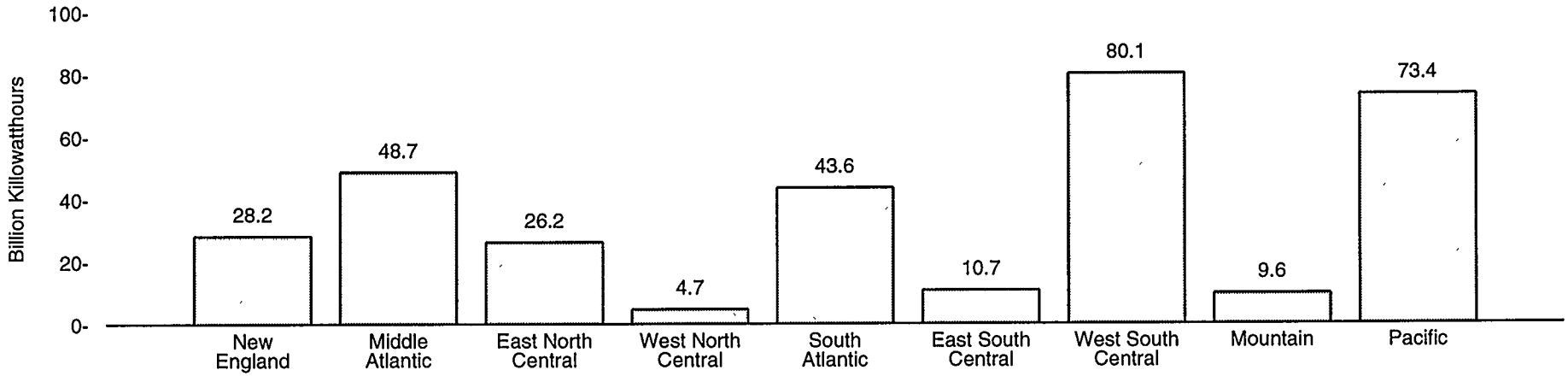
Sources: • 1989-1991—Estimated based on data collected from Form EIA-867, "Annual Nonutility Power Producer Report." See Note 6 at end of section for additional information. • 1992 forward—Energy Information Administration, *Electric Power Annual 1993* (December 1994), Table 74.

Figure 8.13 Nonutility Power Gross Generation, 1993

By Producing Industry Group



By Census Division



Notes: • Data are preliminary. • See Appendix F for Census divisions.
• Because vertical scales differ, graphs should not be compared.

Source: Table 8.13.

Table 8.13 Nonutility Power Gross Generation, 1993

(Million Kilowatthours)

Division/Region	Manufacturing	Transportation and Public Utilities	Services	Mining	Public Administration	Other Industry Groups	Total
Census Divisions							
New England	12,644	15,120	466	—	—	—	28,229
Middle Atlantic	31,368	11,669	2,809	W	—	1,273	48,705
East North Central	23,015	1,698	987	W	W	W	26,211
West North Central	2,983	341	W	W	W	W	4,675
South Atlantic	33,179	8,461	657	W	W	1,184	43,620
East South Central	10,531	72	W	W	W	—	10,741
West South Central	76,103	2,232	611	1,127	—	—	80,073
Mountain	4,622	2,899	975	W	—	W	9,572
Pacific	26,889	25,056	2,038	17,228	1,530	659	73,400
Total	**221,334**	**67,549**	**8,970**	**20,877**	**2,671**	**3,826**	**325,226**
North American Electric Reliability Council Regions [1]							
ECAR	23,237	2,680	1,215	0	13	48	27,193
ERCOT	45,193	554	479	901	0	0	47,127
MAAC	13,527	7,338	1,509	681	411	1,086	24,552
MAIN	6,396	425	395	334	7	110	7,666
MAPP (U.S.)	2,757	340	256	927	21	0	4,300
NPCC (U.S.)	29,465	19,644	1,783	0	504	231	51,626
SERC	37,398	6,926	165	58	184	1,184	45,915
SPP	31,803	1,687	137	179	0	0	33,806
WSCC (U.S.)	29,419	25,872	2,977	17,277	1,357	1,038	77,940
Contiguous United States	219,196	65,466	8,915	20,356	2,498	3,696	320,126
ASCC (Alaska)	412	0	55	321	173	13	1,174
Hawaii	1,726	2,083	0	0	0	117	3,926
Total	**221,334**	**67,549**	**8,970**	**20,877**	**2,671**	**3,826**	**325,226**

[1] See Glossary for information on the North American Electric Reliability Council (NERC). This table includes the U.S. portion of NERC only and does not cover Puerto Rico and U.S. Trust Territories. See Figure 8.9 for an illustration of NERC regions.

— = Not applicable. W=Withheld to avoid disclosure of individual company data.

Notes: • Nonutility electric generating facilities with a total generator capacity of 1 megawatt or greater. • Data are based on facilities' consumption. • Data are preliminary. • Totals may not equal sum of components due to independent rounding.

Sources: **Census Divisions:** Energy Information Administration (EIA), *Electric Power Annual 1993* (December 1994), Table C2. **NERC Regions:** EIA, Form EIA-867, "Annual Nonutility Power Producer Report."

Electricity Notes

1. Electrical system energy losses are estimated as the difference between total energy input at electric utilities and the total energy content of electricity sold to end-use consumers. 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 system losses may be less than actual losses, because primary consumption does not include the energy equivalent of utility purchases of electricity from non-electric utilities and from Canada and Mexico, although they are included in electricity sales.

2. 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 output of electricity.

3. Prior to 1985, electric utility supply and distribution statistics included data reported by institutions (such as universities) and military facilities that generated electricity primarily for their own use. Beginning in 1985, electricity statistics exclude data for these facilities and include data only for those organizations that generate electricity primarily for public use. In 1989, data for nonutility power producers (cogenerators, small power producers, and independent power producers) are provided.

4. Data on the sales of electric utility 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.

5. Net summer capabilities were first collected on Form EIA-860 for 1984. Units not assigned a net summer capability rating by the utility were given an estimated rating by use of a statistical relationship between installed nameplate capacity and net summer capability for each prime mover. To estimate net summer capability for 1949-1984, two methods were used. For each prime mover except nuclear and "other," net summer capability 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 capability 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 capability 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 capability. The net summer capability 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 capability based upon the operable definition. This was accomplished by assuming that nonnuclear 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 net summer capabilities are not currently collected for nonutilities.

6. Year-to-year changes in data from the Form EIA-867, "Annual Nonutility Power Plant Report," can result from correcting misreported data and modifying the frame to account for new or retired facilities, among other improvements. Data for 1989, 1990, and 1991 were collected for facilities of 5 megawatts or more. In 1992, the threshold was lowered to include facilities with capacities of 1 megawatt or more. Estimates of the 1-to-5-megawatt range for prior years were derived from historical data. The estimation did not include retirements that occurred prior to 1992 and included only the capacity of facilities that came on line before 1992.

9. Nuclear Energy

Status of Nuclear Generating Units

At the end of 1994, there were 109 operable nuclear generating units in the United States, the same number as in 1992 and 1993 (9.1).* Most of the operable units were located east of the Mississippi River. In addition to the operable units, seven units had received construction permits. However, on December 12, 1994, the Tennessee Valley Authority (TVA) announced that it was halting construction of three nuclear power units, Bellefonte 1 and 2 and Watts Bar 2. TVA may complete the units if partners to help with the financing can be found, but TVA doubts such partners will be found.

The number of units in all stages of planning, construction, and operation in 1993 was 116, the same as in 1992. The 1994 total of 116 units was well below the total of 226 in 1974. After 1974, many planned units were canceled; after 1977, no orders for new units were announced.

Environmental, safety, and economic concerns contributed to the decline in the number of planned nuclear units. Growth in electricity demand was slower than expected. Longer leadtimes for licensing and construction, coupled with higher financing expenses, increased the cost of nuclear power plants, and rising interest rates and an uncertain economic environment diminished electric utilities' willingness to commission new plants.

Contributions to Electricity Net Generation

Nuclear electric power's contribution to electricity net generation in the United States increased almost every year from the late 1950's through 1994 (9.2). Nuclear electric power production in 1994 totaled 639 billion kilowatthours, up 4.8 percent from the 1993 level. The nuclear portion of domestic electricity net generation rose from 21 percent in 1993 to 22 percent in 1994, and the capacity factor[1] rose from 71 percent in 1993 to 74 percent in 1994.

[1]The actual generation in a given time period divided by the maximum possible generation in that time period.

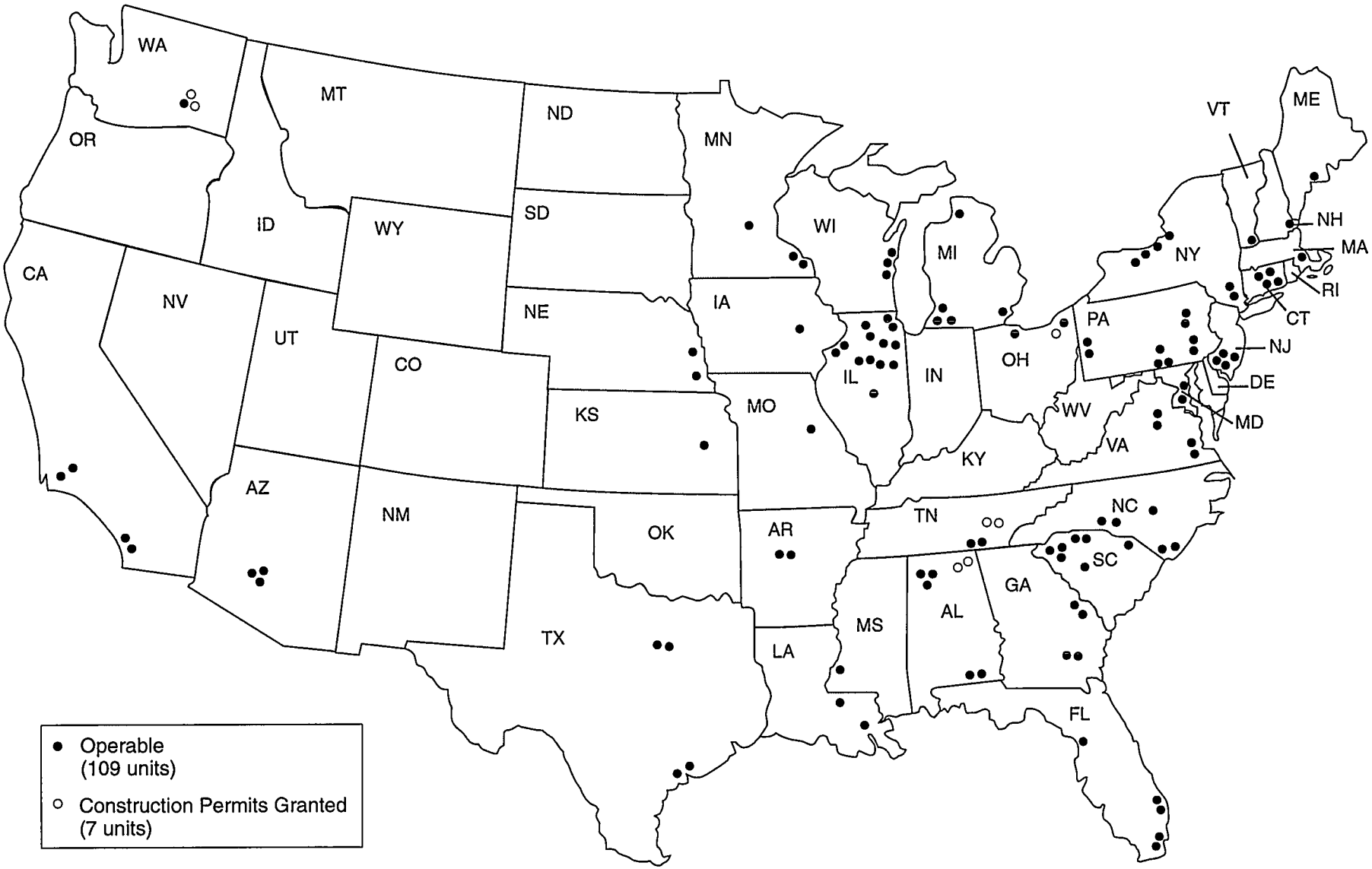
**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

The Uranium Industry

From 1949 through 1967, the Atomic Energy Commission (AEC) was the major purchaser of uranium. The AEC's demand for uranium for military purposes was strong during the 1950's and domestic production, spurred by AEC incentives, grew from 0.4 million pounds of uranium oxide (U_3O_8) in 1949 to 35 million pounds in 1960 (9.3). As the AEC began to accumulate stockpiles, its purchases declined and U.S. production fell to 21 million pounds in 1965. From 1966 through 1976, production fluctuated between 21 and 27 million pounds. Subsequently, orders for new nuclear plants led to strong growth, and production peaked at 44 million pounds in 1980. However, plant cancellations and postponements during the late 1970's led to a decline in projected demand and, coupled with buildups of inventories at electric utilities and foreign competition, caused the second major decline in production, which fell to 11 million pounds in 1985. In 1994, production totaled 3.4 million pounds.

Historically, domestic producers have faced competition from low-cost uranium imports. From 1949 through 1960, net imports actually exceeded domestic production (9.3). In 1966, the AEC effectively suspended imports by curtailing enrichment services for foreign uranium intended for use in domestic facilities, and no uranium was imported from 1967 through 1974. With the gradual removal of the AEC restrictions during the 1977-to-1983 period, foreign uranium deliveries to the United States began to increase. In 1990 through 1994, net imports of U_3O_8 once again exceeded domestic production. For example, in 1994, net imports totaled an estimated 19 million pounds, compared with domestic production of 3.4 million pounds.

Figure 9.1 Nuclear Generating Units, December 31, 1994



Note: Due to space limitations, symbols do not represent actual locations.

Source: Energy Information Administration, *World Nuclear Outlook 1994* (December 1994), Appendices C and D.

Table 9.1 Nuclear Generating Units, End of Year 1973-1994

Year	Licensed for Operation		Construction Permits		On Order	Announced	Total	Total Design Capacity[3]
	Operable[1]	In Startup[2]	Granted	Pending				
	Number of Units							Million Kilowatts
1973	39	2	57	52	49	9	208	198
1974	48	5	62	75	30	6	226	223
1975	54	2	69	69	14	5	213	212
1976	61	1	71	63	16	2	214	211
1977	65	2	78	49	13	2	209	203
1978	70	0	88	32	5	0	195	191
1979	68	0	90	24	3	0	185	180
1980	70	1	82	12	3	0	168	162
1981	74	0	76	11	2	0	163	157
1982	77	2	60	3	2	0	144	134
1983	80	3	53	0	2	0	138	129
1984	86	6	38	0	2	0	132	123
1985	95	3	30	0	2	0	130	121
1986	100	7	19	0	2	0	128	119
1987	107	4	14	0	2	0	127	119
1988	108	3	12	0	0	0	123	115
1989	110	1	10	0	0	0	121	113
1990	111	0	8	0	0	0	119	111
1991	111	0	8	0	0	0	119	111
1992	109	0	8	0	0	0	117	111
1993	109	0	7	0	0	0	116	110
1994	109	0	7	0	0	0	116	110

[1] Nuclear generating units that have been issued a full-power license by the Nuclear Regulatory Commission (NRC). See Note 1 at end of section for exceptions.

[2] The period of time between a nuclear generating unit's initial fuel loading date and the issuance of its full-power license. During that period, the unit is undergoing low-power testing and the maximum level of operation is 5 percent of the unit's design thermal rating.

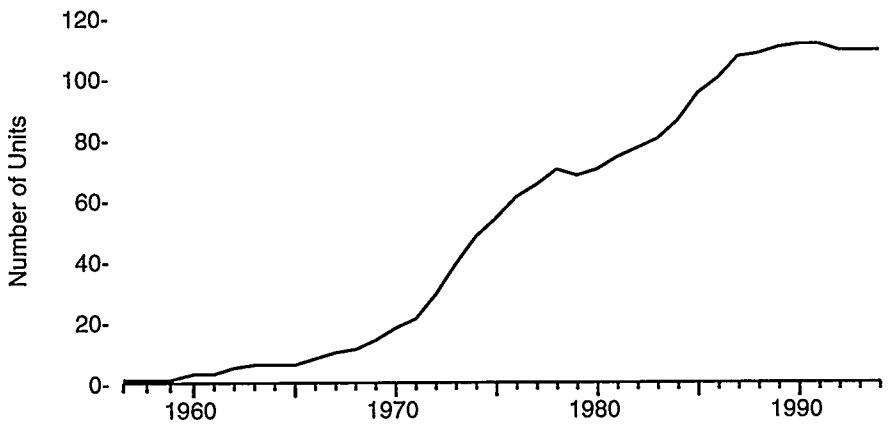
[3] Net design electrical rating (DER) is used because many of the units were canceled prior to being assigned a net summer capability. Nuclear generating units may have more than one type of net capacity rating, including the following: Net Summer Capability - The steady hourly output that generating equipment is expected to supply to system load, exclusive of auxiliary power, as demonstrated by test at the time of summer peak demand. Auxiliary power of a typical nuclear power plant is about 5 percent of gross generation. Net Design Capacity or DER - The nominal net electrical output of a unit, specified by the utility and used for plant design.

Note: Geographic coverage is the 50 States and the District of Columbia.

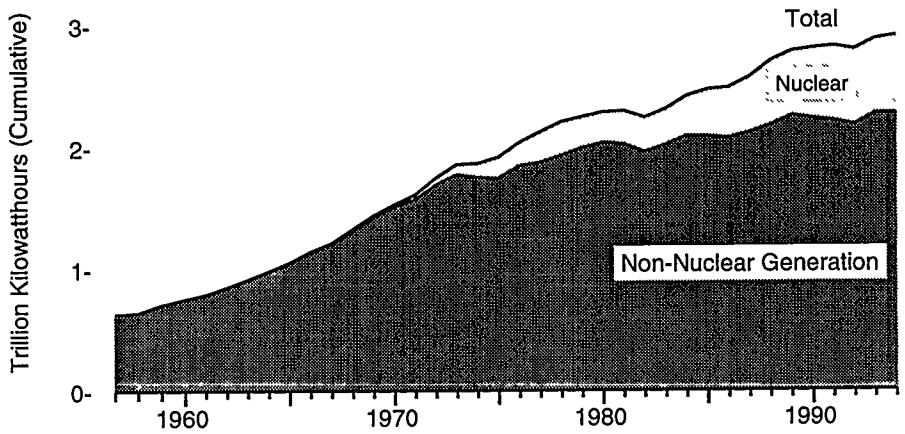
Sources: **Licensed for Operation:** • 1973-1982—U.S. Department of Energy (DOE), Office of Nuclear Programs, "U.S. Central Station Nuclear Electric Generating Units: Significant Milestones." • 1983 forward—NRC, "Licensed Operating Reactors" (NUREG-0020). **Construction Permits, On Order, and Announced:** • 1973-1982—Compiled from various sources, primarily DOE, Office of Nuclear Reactor Programs, "U.S. Central Station Nuclear Electric Generating Units: Significant Milestones"; Energy Information Administration (EIA), Office of Coal, Nuclear, Electric and Alternate Fuels (CNEAF), "Nuclear Steam-Electric Units That Have Been in Operation as of 1957-1989"; EIA, CNEAF, "Nuclear Plant Cancellations: Causes, Costs, and Consequences"; and Utility Data Institute, Inc., "U.S. Nuclear Plant Statistics, 1987." • 1983 forward—NRC, "Summary Information Report" (NUREG-0871); NRC, "Licensed Operating Reactors" (NUREG-0020); and various journals. **Total Design Capacity:** • 1973-1982—Compiled from various sources, primarily DOE, Office of Nuclear Reactor Programs, "U.S. Central Station Nuclear Electric Generating Units: Significant Milestones"; EIA, CNEAF, "Nuclear Steam-Electric Units That Have Been in Operation as of 1957-1987"; EIA, CNEAF, "Monthly Report for Electric Utilities-Power Generation"; EIA, CNEAF, "Nuclear Plant Cancellations: Causes, Costs, and Consequences"; and Utility Data Institute, Inc., "U.S. Nuclear Plant Statistics, 1987." • 1983 forward—NRC, "Summary Information Report" (NUREG-0871); NRC, "Licensed Operating Reactors" (NUREG-0020); and EIA, Form EIA-860, "Annual Electric Generator Report."

Figure 9.2 Nuclear Power Plant Operations

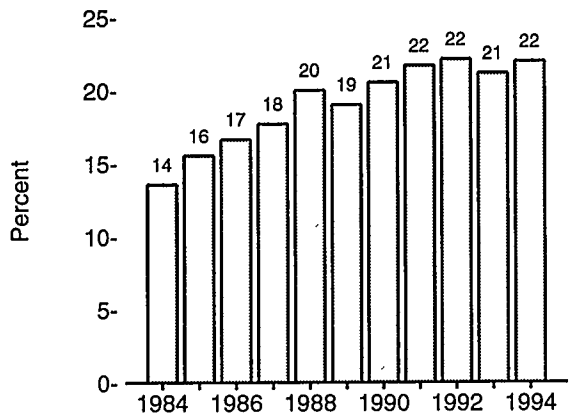
Operable Units, 1957-1994



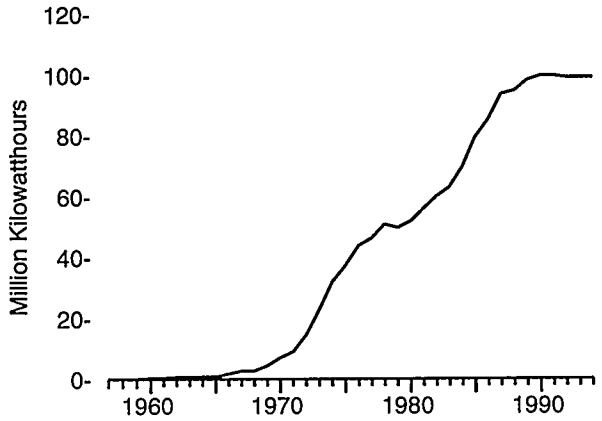
Nuclear and Total Net Generation of Electricity, 1957-1994



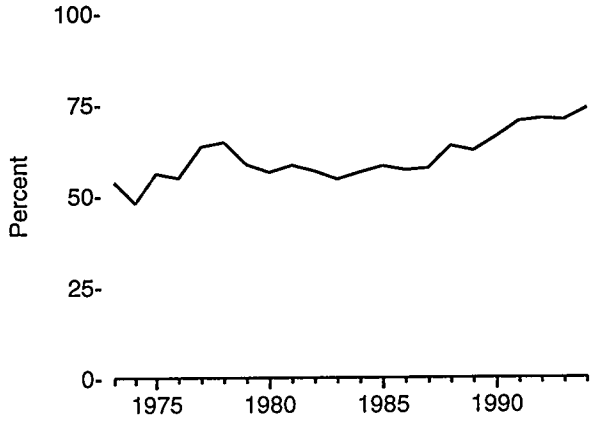
Nuclear Portion of Domestic Electricity Net Generation, 1984-1994



Net Summer Capability of Operable Units, 1957-1994



Capacity Factor, 1973-1994



Sources: Tables 8.2 and 9.2.

Table 9.2 Nuclear Power Plant Operations, 1957-1994

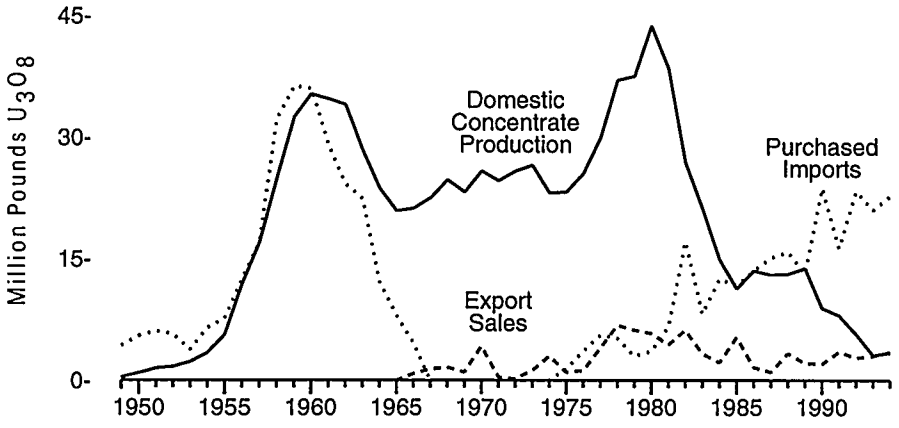
Year	Operable Units [1,2]	Nuclear Electricity Net Generation	Nuclear Portion of Domestic Electricity Net Generation	Net Summer Capability of Operable Units [1,3]	Capacity Factor [3]
	Number	Billion Kilowatthours	Percent	Million Kilowatts	Percent
1957	1	(s)	(s)	0.1	NA
1958	1	0.2	(s)	0.1	NA
1959	1	0.2	(s)	0.1	NA
1960	3	0.5	0.1	0.4	NA
1961	3	1.7	0.2	0.4	NA
1962	5	2.3	0.3	0.7	NA
1963	6	3.2	0.4	0.8	NA
1964	6	3.3	0.3	0.8	NA
1965	6	3.7	0.3	0.8	NA
1966	8	5.5	0.5	1.7	NA
1967	10	7.7	0.6	2.7	NA
1968	11	12.5	0.9	2.7	NA
1969	14	13.9	1.0	4.4	NA
1970	18	21.8	1.4	7.0	NA
1971	21	38.1	2.4	9.0	NA
1972	[2]29	54.1	3.1	[2]14.5	NA
1973	[2]39	83.5	4.5	[2]22.7	53.5
1974	48	114.0	6.1	31.9	47.8
1975	54	172.5	9.0	37.3	55.9
1976	61	191.1	9.4	43.8	54.7
1977	65	250.9	11.8	46.3	63.3
1978	70	276.4	12.5	50.8	64.5
1979	68	255.2	11.4	49.7	58.4
1980	70	251.1	11.0	51.8	56.3
1981	74	272.7	11.9	56.0	58.2
1982	77	282.8	12.6	60.0	56.6
1983	80	293.7	12.7	63.0	54.4
1984	86	327.6	13.6	69.7	56.3
1985	95	383.7	15.5	79.4	58.0
1986	100	414.0	16.6	85.2	56.9
1987	107	455.3	17.7	93.6	57.4
1988	108	527.0	19.5	94.7	63.5
1989	110	529.4	19.0	98.2	62.2
1990	111	576.9	20.5	99.6	66.0
1991	111	612.6	21.7	99.6	70.2
1992	109	618.8	22.1	99.0	70.9
1993	109	610.3	21.2	[R]99.0	70.5
1994[P]	109	639.4	22.0	99.0	73.7

[1] At end of year.
[2] See Note 2 at end of section.
[3] See Note 3 at end of section.
P=Preliminary data. NA=Not available. (s)=Less than 0.05 billion kilowatthours or less than 0.05 percent.

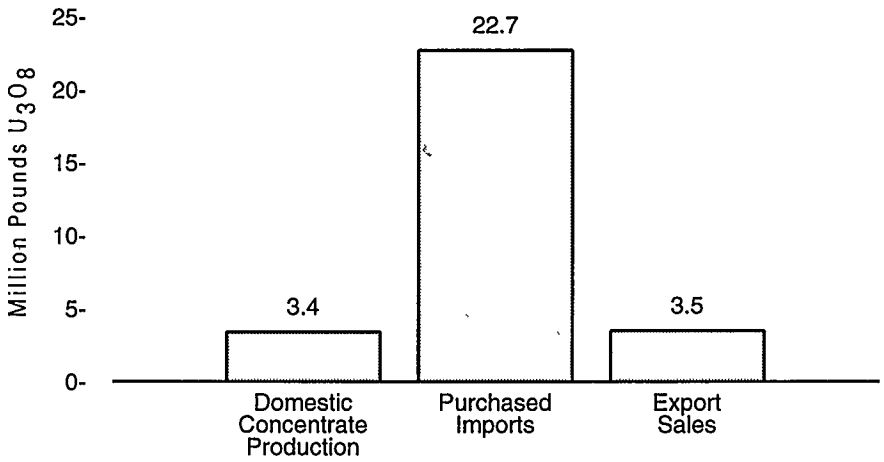
Sources: **Operable Units:** • 1957-1972—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • 1973 forward—Nuclear Regulatory Commission, *Licensed Operating Reactors,* (NUREG-0020), monthly. **Electricity Generation:** 1957-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982 forward—Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report." **Net Summer Capability of Operable Units:** • 1957-1983—See Note 2 at end of section. • 1984 forward—EIA, Form EIA-860, "Annual Electric Generator Report."

Figure 9.3 Uranium Overview

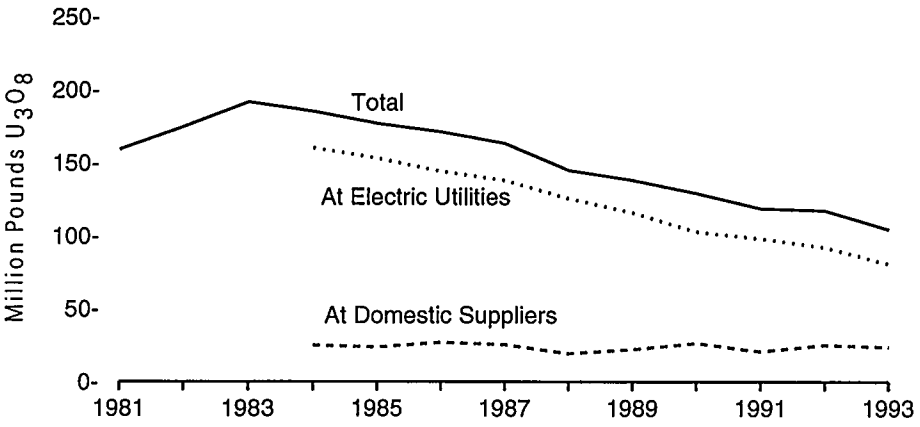
Production and Trade, 1949-1994



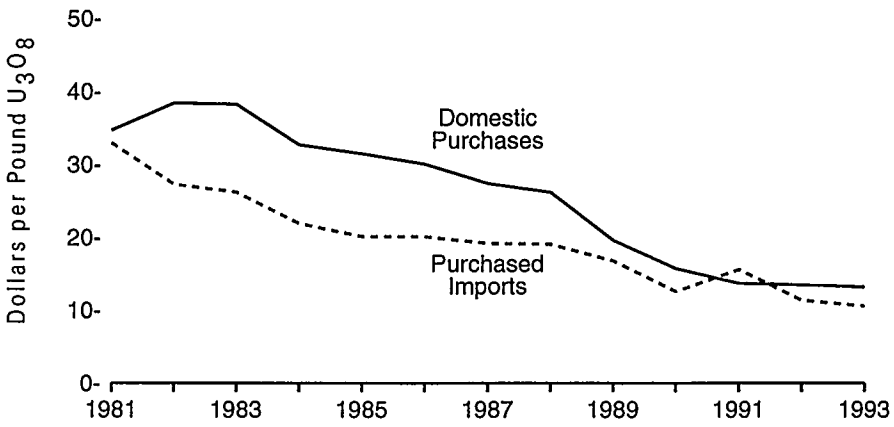
Production and Trade, 1994



Inventories, End of Year 1981-1993



Average Prices, 1981-1993



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

Source: Table 9.3.

Table 9.3 Uranium Overview, 1949-1994

Year	Domestic Concentrate Production	Purchased Imports [1]	Export [1] Sales	Utility Purchases from Domestic Suppliers	Loaded into U.S. Nuclear Reactors [2]	Inventories			Average Prices	
						At Domestic Suppliers	At Electric Utilities	Total	Of Purchased Imports	Of Domestic Purchases
	Million Pounds U_3O_8								U.S. Dollars per Pound U_3O_8	
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	153.1	176.9	20.08	31.43
1986	13.51	13.5	1.6	18.9	NA	27.0	144.0	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	R42.9	R25.2	R92.1	R117.3	11.34	13.45
1993	R3.06	R21.0	R3.0	R15.5	R45.1	R23.7	R80.7	R104.4	R10.53	R13.14
1994P	3.35	22.7	3.5	15.4	NA	NA	NA	NA	NA	NA

[1] Import quantities through 1970 are reported for fiscal years. Prior to 1968, the Atomic Energy Commission was the sole purchaser of all imported U_3O_8. Trade data prior to 1982 were for transactions conducted by uranium supplier only. For 1982 forward, transactions by uranium buyers (consumers) have been included. Buyer imports and exports prior to 1982 are believed to be small.

[2] Does not include any fuel rods removed from reactors and later reloaded into the reactor.

R=Revised data. P=Preliminary data. NA=Not available. — = Not applicable.

Sources: **1949-1966:** U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry*, Report No. GJO-100, annual. **1967-1993:** Energy Information Administration (EIA), *Uranium Industry Annual 1993* (September 1994), Table 17 (for Domestic Concentrate Production); Table 29 (for Purchased Imports and Export Sales); Table ES1 (for Utility Purchases from Domestic Suppliers, Total Inventories, and Average Prices); page 45 text (for Loaded into U.S. Nuclear Reactors); Table 40 (for 1990-1993 Inventories at Domestic Suppliers and at Electric Utilities). Inventories at Domestic Suppliers and at Electric Utilities, 1984-1989: EIA, Form EIA-858, "Uranium Industry Annual Survey." **1994:** EIA, Form EIA-858, "Uranium Industry Annual Survey."

Nuclear Energy Notes

1. Exceptions: The Shippingport (60 megawatts (MW)) and the Hanford-N (840 MW) nuclear units were included in the operable units until 1982 and 1988, respectively. The Shippingport unit was excluded from the operable category during March 1974-August 1977 due to a major core modification outage. Hanford-N, an unlicensed unit used for defense materiel production, was included in the operable category because power was produced as by-product and sold commercially. Three Mile Island 2 (880 MW) experienced a major accident in 1979 and, although that unit still retains its operating license and site cleanup continues, there is no plan to restart it. Therefore, it has not been included in the operable category since March 1979. Although Shoreham received a full-power license in April 1989, the unit is not currently scheduled to operate and, therefore, has not been included in the operable category. Rancho Seco (873 MW) was shut down by the Sacramento Municipal Utility District (SMUD) in June 1989 following a referendum on its continued operation. Because there are currently no plans to operate it as a nuclear unit, it is no longer included as an operable unit but is identified as a unit shut down for an extended period. As soon as SMUD and the Nuclear Regulatory Commission formalize the plant's official retirement, it will be noted as such in this report. The Department of Energy-operated Experimental Breeder Reactor 2 unit is not a commercial reactor and is therefore not included in the operable category.

In addition, nine units have been retired and therefore removed from the operable category. Those units are: Peach Bottom 1 (40 MW) and Indian Point 1 (265 MW), both retired in 1974; Humboldt Bay (65 MW), officially retired in 1976; Dresden 1 (200 MW), retired in August 1979; LaCrosse (51 MW), retired in May 1987; Fort Saint Vrain (217 MW), retired in August 1989; Yankee Rowe 1 (185 MW), retired in February 1992; San Onofre 1 (436 MW), retired in December 1992; and Trojan (1,104 MW), retired in January 1993.

2. Prior to 1973, the number of operable units included units that were in commercial operation by December 31 of the stated year. Units decommissioned or inoperative for extended periods were generally included. Also included were two U.S. Department of Energy (DOE)-operated plants that supply electricity to the commercial grid. A third DOE plant, which does not distribute electricity to the grid, was excluded. For 1973 forward, the number of units includes units issued full-power or operating licenses and generally does not include units in long-term shutdown status.

3. Net summer capabilities were first collected on Form EIA-860 for 1984. Units not assigned a net summer capability rating by the utility were given an estimated rating by use of a statistical relationship between installed nameplate capacity and net summer capability for each prime mover. To estimate net summer capability for 1949-1984, two methods were used. For each prime mover except nuclear and "other," net summer capability 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 capability 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 capability 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 capability. The net summer capability 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 capability based upon the operable definition. This was accomplished by assuming that nonnuclear 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.

10. Renewable Energy

Emerging Sources of Renewable Energy

After World War II, the United States relied on petroleum, natural gas, and coal, which, in addition to having high Btu contents, were inexpensive, readily accessible, and easy to transport. During the early 1970's, however, increases in the prices of petroleum and natural gas, concerns about the stability of supply, and environmental factors stimulated interest in alternative sources of energy. Technologies such as wood-burning stoves and solar thermal collectors for domestic water heating lend themselves to onsite applications, while technologies such as wind turbines can be used to generate electricity for transmission to distant markets. Although some sources with the potential for centralized applications, such as wind, solar, and ocean thermal energy, are not yet widely used, they may eventually contribute significantly to the domestic energy supply.

Renewable Energy Consumption

In 1994, the United States consumed an estimated 6.3 quadrillion Btu of renewable energy (10.1a).* Conventional hydroelectric power and biofuels accounted for the largest shares (49 percent and 45 percent, respectively). Geothermal, solar, and wind energy accounted for the remainder. Over the 5-year period of 1990 through 1994 (the only years for which data are available) renewable energy consumption rose 4.6 percent. Among the five major renewable energy sources, biofuels showed the greatest nominal increase in consumption (171 trillion Btu), while wind energy showed the greatest percentage increase (52 percent). The types and amounts of renewable energy consumed varied by sector (10.1b). Electric utilities and the industrial sector (the primary source of nonutility electric power) were the biggest consumers throughout the 1990-through-1994 period.

Conventional Hydroelectric Power. Almost all of the 3.1 quadrillion Btu of conventional hydroelectric power generation in 1994 occurred at electric utilities (10.1a and 10.1b). The industrial sector accounted for only 132 trillion Btu.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

Biofuels. Biofuels are fuelwood, wood byproducts, waste wood, municipal solid waste, manufacturing process waste, and alcohol fuels. In 1994, biofuel consumption totaled an estimated 2.8 quadrillion Btu, most of which (2.2 quadrillion Btu) was wood energy (10.2). Some industries, such as the paper and lumber industries, have ready access to wood and wood byproducts, and those rely heavily on wood as an energy source. Consumption of municipal solid waste and other wastes totaled 486 trillion Btu in 1994, and consumption of alcohol fuels (ethanol) totaled 96 trillion Btu.

Geothermal Energy. The third biggest source of renewable energy in 1994 was geothermal energy, which can be used directly, for purposes such as space heating, or converted to electricity. In 1960, The Geysers in California became the first U.S. power plant to generate electricity from geothermal steam. In 1994, geothermal energy consumption reached 265 trillion Btu (10.1a), 145 trillion Btu at electric utilities and 120 trillion Btu by the industrial sector (10.1b).

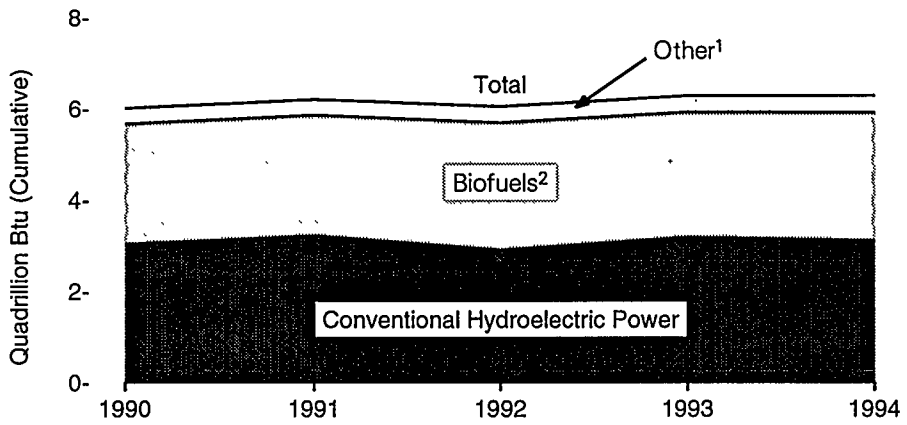
Solar Energy. Of the 71 trillion Btu of potential solar energy supplied in 1994, most (60 trillion Btu) was used in the residential and commercial sector (10.1b). The industrial sector accounted for 11 trillion Btu and electric utilities accounted for less than 0.5 trillion Btu.

Because it is difficult to measure solar energy use directly, producer shipments of equipment are used as an indicator. Shipments of low-temperature collectors, used primarily for heating swimming pools, totaled 6.0 million square feet in 1993 (10.4). Shipments of medium-temperature collectors, used for pool heating and domestic hot water, peaked at 12 million square feet in 1983 and 1984 but, following the expiration of the Federal energy tax credit in 1985, totaled only 0.9 million square feet in 1993. Shipments of high-temperature collectors, used for electricity generation, reached 5.2 million square feet in 1990 but fell to near zero in 1991 through 1993, when Luz International Ltd. ceased operating. Shipments of photovoltaic cells and modules, which have a wide variety of applications, rose to 21 thousand peak kilowatts in 1993 (10.6).

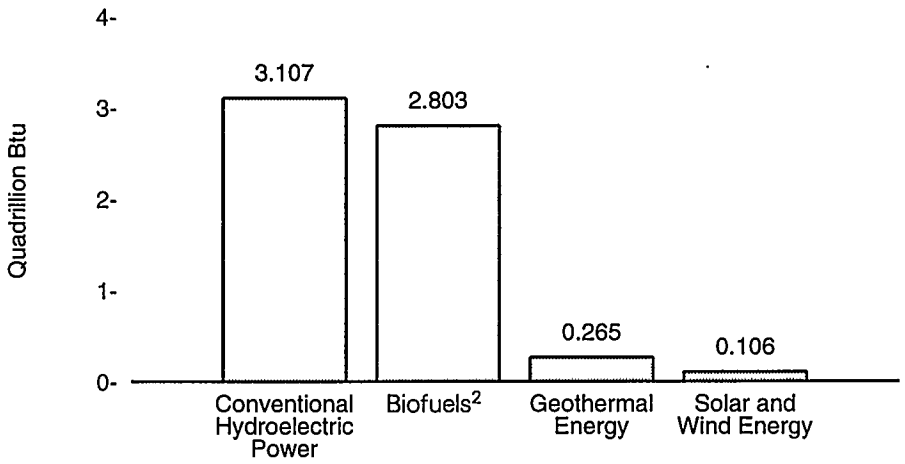
Wind Energy. An estimated 35 trillion Btu of wind energy was consumed in 1993, almost all in the industrial sector (10.1b). Very small amounts (less than 0.5 trillion Btu) were consumed at electric utilities.

Figure 10.1 Renewable Energy Consumption Estimates

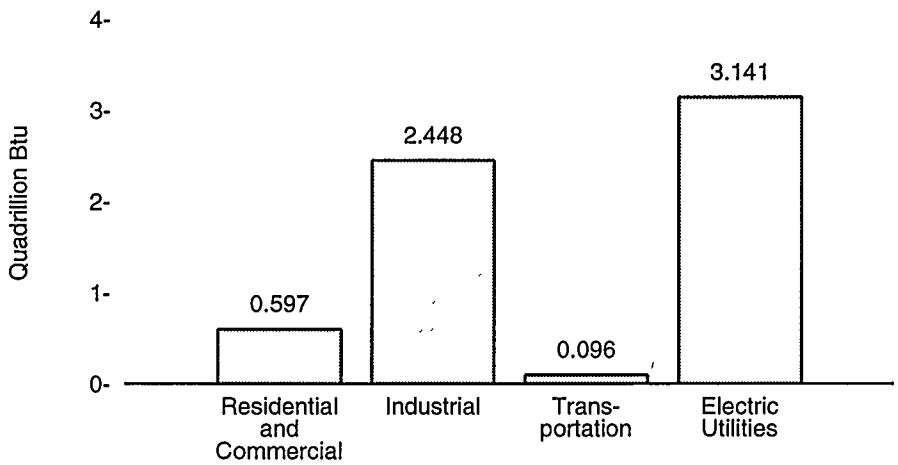
Total, 1990-1994



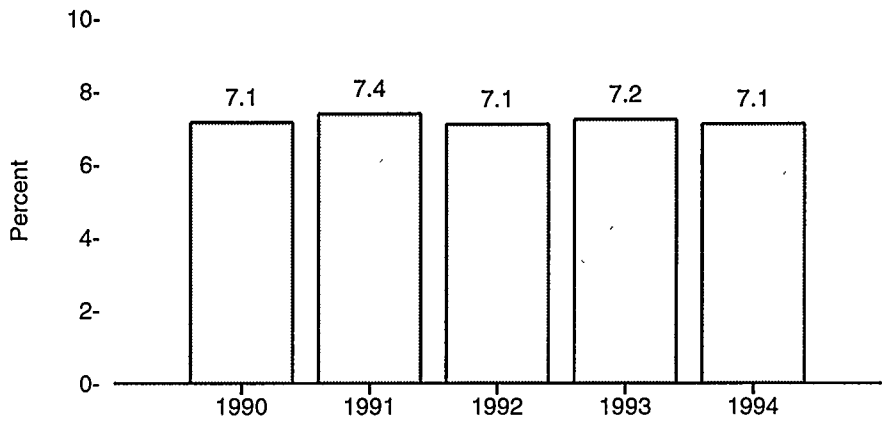
By Sources, 1994



By Sector, 1994



Share of Total Energy Consumption, 1990-1994



[1] Geothermal, solar, and wind energy.
[2] Fuelwood, wood byproducts, waste wood, municipal solid waste, manufacturing process waste, and alcohol fuels.

Note: Because vertical scales differ, graphs should not be compared.
Sources: Tables 1.1, 10.1a, and 10.1b.

Table 10.1a Renewable Energy Consumption by Source, 1990-1994

(Quadrillion Btu)

Year	Biofuels [1]	Geothermal Energy	Conventional Hydroelectric Power [2,3]	Solar Energy [4]	Wind Energy	Total
1990	2.632	0.252	3.033	0.067	0.023	6.007
1991	2.640	0.249	3.214	0.068	0.027	6.198
1992	2.785	0.257	2.900	0.068	0.030	6.040
1993	2.738	0.260	3.177	0.069	0.031	6.275
1994E	2.803	0.265	3.107	0.071	0.035	6.282

[1] Biofuels are fuelwood, wood byproducts, waste wood, municipal solid waste, manufacturing process waste, and alcohol fuels.
[2] Hydroelectricity generated by pumped storage is not included in renewable energy.
[3] Includes total net imports of electricity, which stem principally from hydroelectric power generators in Canada. It should be noted, however, that in 1993 only about 77 percent of gross imports of electricity from Canada were attributable to renewable energy sources, based on statistics from Natural Resources Canada, *Electric Power in Canada, 1993* (Ottawa: 1994), p. 89.
[4] Includes photovoltaic energy.
E=Estimate.
Source: Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

Table 10.1b Renewable Energy Consumption by Sector, 1990-1994

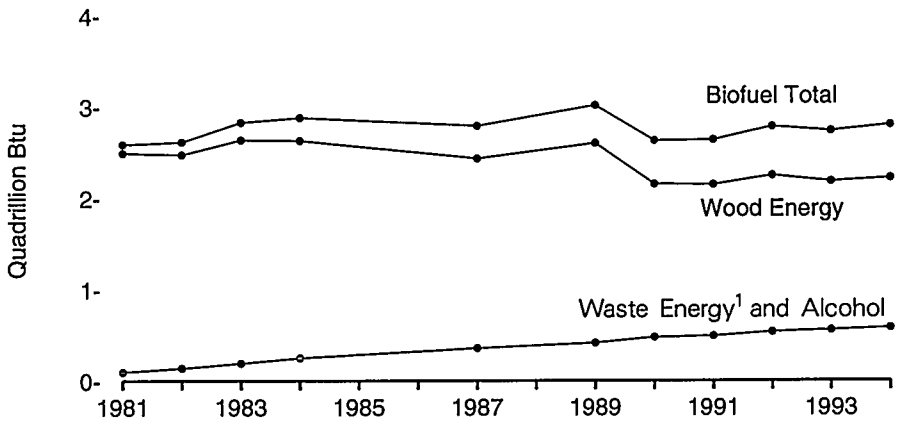
(Quadrillion Btu)

	Residential and Commercial			Industrial [1]						Transportation	Electric Utility					
Year	Biofuels	Solar [2]	Total	Biofuels	Geothermal	Conventional Hydroelectric [3]	Solar	Wind	Total	Biofuels [4]	Biofuels	Geothermal	Conventional Hydroelectric [3,5]	Solar and Wind	Total	Total
1990	0.581	0.060	0.641	1.948	0.071	0.083	0.007	0.023	2.132	0.082	0.021	0.181	2.950	(s)	3.152	6.007
1991	0.613	0.060	0.673	1.941	0.079	0.084	0.008	0.027	2.139	0.065	0.021	0.170	3.130	(s)	3.321	6.198
1992	0.645	0.060	0.705	2.039	0.088	0.097	0.008	0.030	2.262	0.079	0.022	0.169	2.803	(s)	2.994	6.040
1993	0.548	0.060	0.608	2.082	0.102	0.118	0.009	0.031	2.342	0.088	0.020	0.158	3.059	(s)	3.237	6.275
1994E	0.537	0.060	0.597	2.150	0.120	0.132	0.011	0.035	2.448	0.096	0.020	0.145	2.975	(s)	3.141	6.282

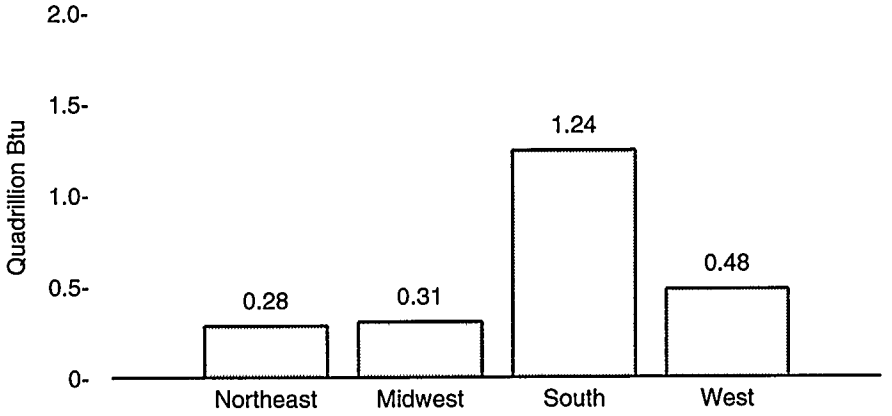
[1] Includes generation of electricity by cogenerators, independent power producers, and small power producers.
[2] The solar energy number of 0.06 quadrillion Btu for residential and commercial use is calculated by presuming an overall efficiency of 50 percent for all three categories of solar thermal collectors (low temperature, medium temperature, and high temperature), a 1,500-Btu per square foot average daily insolation, and the potential thermal energy production from the 219 million square feet of solar thermal collectors produced since 1974. This is a simplified approach since low-temperature and high-temperature collectors have been rated at more than 50 percent efficient and medium-temperature collectors are generally less than 50 percent efficient.
[3] Hydroelectricity generated by pumped storage is not included in renewable energy.
[4] Ethanol blended into gasoline.
[5] Includes total net imports of electricity, which stem principally from hydroelectric power generators in Canada. It should be noted, however, that in 1993 only about 77 percent of gross imports of electricity from Canada were attributable to renewable energy sources, based on statistics from Natural Resources Canada, *Electric Power in Canada, 1993* (Ottawa: 1994), p. 89.
E=Estimate. (s)=Less than 0.5 trillion Btu.
Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

Figure 10.2 Wood and Waste Energy and Alcohol Fuels Consumption

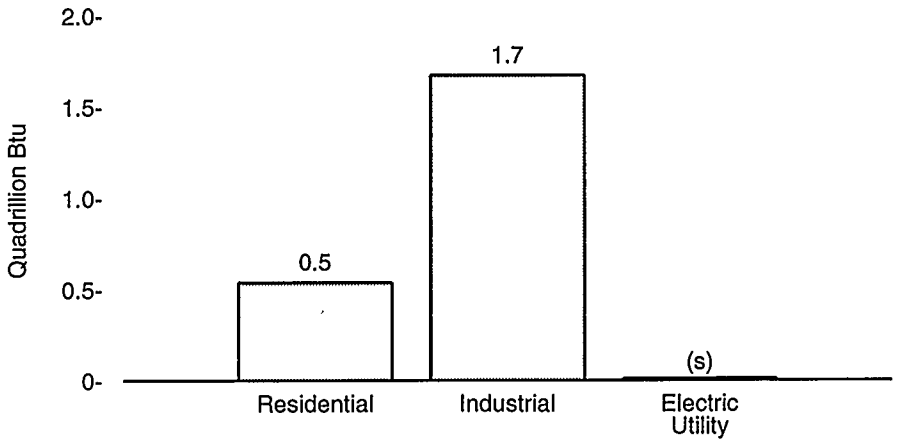
Biofuel Total, 1981-1984, 1987, and 1989-1994



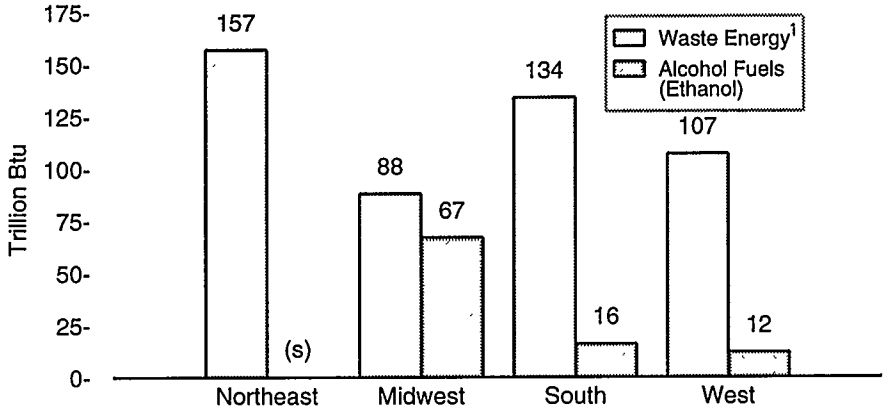
Wood Energy by Census Region, 1994



Wood Energy by Sector, 1994



Waste Energy and Alcohol Fuels by Census Region, 1994



(s)=Less than 0.5 trillion Btu.
[1] Municipal solid waste, manufacturing waste, refuse-derived fuel, and methane recovered from landfills.

Notes: • No data are available for 1985, 1986, and 1988. • See Appendix F for Census regions. • Because vertical scales differ, graphs should not be compared.
Source: Table 10.2.

Table 10.2 Wood and Waste Energy and Alcohol Fuels Consumption by Sector and Census Region, Selected Years, 1981-1994

(Trillion Btu)

Energy Source	1981	1982	1983	1984	1987	1989	1990	1991	1992	1993	1994
Wood Energy	2,495	2,478	2,640	2,633	2,437	2,604	2,155	2,150	2,249	2,184	2,221
Sector											
Residential	869	937	925	923	852	918	581	613	645	548	537
Commercial	21	22	22	22	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Industrial	1,602	1,516	1,690	1,679	1,576	1,673	1,562	1,528	1,593	1,625	1,673
Electric Utility	3	2	3	9	9	13	12	10	11	11	11
Census Region											
Northeast	395	358	380	349	350	432	256	224	264	267	283
Midwest	335	343	323	341	474	552	330	290	286	289	305
South	1,349	1,392	1,526	1,482	1,147	1,161	1,064	1,167	1,234	1,209	1,241
West	416	385	411	461	467	459	505	224	466	464	482
Waste Energy [2]	88	120	157	208	289	344	R395	426	457	468	486
Census Region											
Northeast	16	20	36	39	60	84	119	134	148	151	157
Midwest	5	13	17	21	47	64	89	99	84	85	88
South	37	50	56	57	108	145	114	109	128	130	134
West	30	36	48	91	74	51	73	87	100	102	107
Alcohol Fuels (Ethanol)	7	19	35	43	69	71	82	65	79	88	96
Census Region											
Northeast	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)
Midwest	4	11	22	25	38	38	R23	0	55	61	67
South	1	4	8	13	26	26	R34	0	13	15	16
West	2	4	5	5	4	7	R6	0	10	11	12
Biofuel Total	2,590	2,617	2,832	2,884	2,794	3,019	2,632	2,640	2,785	2,738	2,803

[1] Commercial wood energy use is not included because there are no accurate data sources to provide reliable estimates. However, from the "1986 Nonresidential Buildings Energy Consumption Survey," conducted by the Energy Information Administration (EIA), it is estimated that commercial sector use is about 20 trillion Btu to 40 trillion Btu.

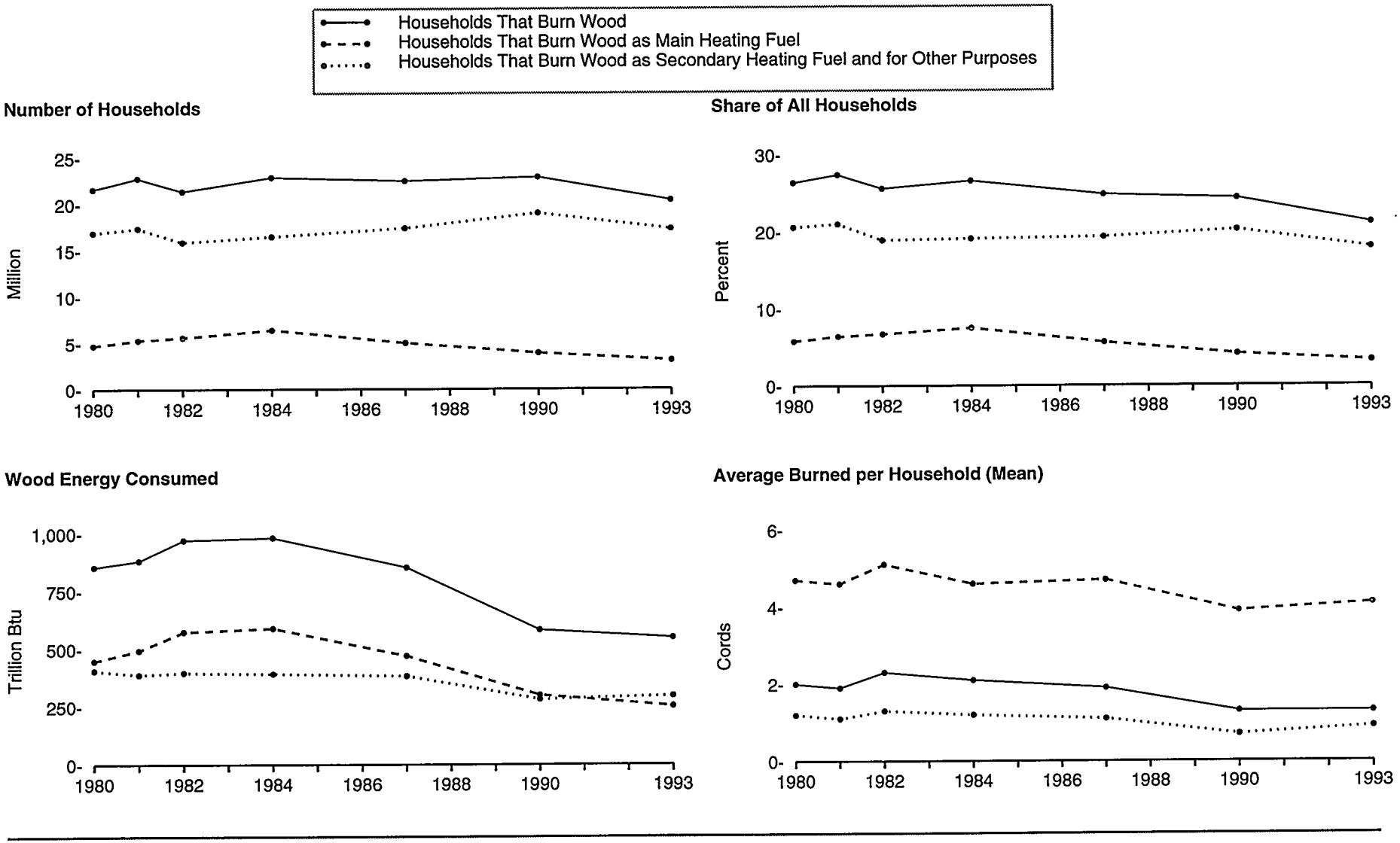
[2] Municipal solid waste, manufacturing waste, refuse-derived fuel, and methane recovered from landfills.

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

Notes: • No data are available for years not shown. • See Appendix F for Census regions. • Totals may not equal sum of components due to independent rounding.

Sources: • **1981-1983, Wood Energy**—EIA, *Estimates of U.S. Wood Energy Consumption, 1980-1983* (November 1984), Tables ES1 and ES2. • **1981-1983 Waste Energy and Alcohol Fuels, and 1984 Data**—EIA, Office of Coal, Nuclear, Electric and Alternate Fuels, unpublished data. • **1987**—EIA, *Estimates of Biofuels Consumption in the United States During 1987*, Tables ES1 and ES2. • **1989—Wood Energy, Industrial Sector:** American Paper Institute, *Fact Sheet on 1990 Energy Use in the U.S. Pulp and Paper Industry* (July 31, 1991). **All Other Data:** EIA, *Estimates of U.S. Biofuels Consumption 1989* (April 1991), Table ES1. • **1990—Wood Energy, Industrial Sector:** American Paper Institute, *Fact Sheet on 1990 Energy Use in the U.S. Pulp and Paper Industry* (July 1991). **Wood Energy, Residential Sector:** EIA, 1990 Residential Energy Consumption Survey. **Waste Energy:** EIA, *Estimates of U.S. Biofuels Consumption 1990* (October 1991), Table ES1. **Alcohol Fuels:** U.S. Department of Transportation, *Monthly Motor Fuel Reported by States*, FHWA-PL-92-011 (September 1991), and U.S. Department of Treasury, Bureau of Alcohol, Tobacco, and Firearms, *Monthly Distilled Spirits Report*, Report Symbol 76 (June 1991) and *Alcohol Fuels Report*, internal quarterly report (September 1991). • **1991 and 1992:** EIA, *Estimates of U.S. Biomass Energy Consumption 1992* (May 1994). **1993 and 1994—Wood Energy, Residential Sector:** EIA, Form EIA-457, "1993 Residential Energy Consumption Survey," and extrapolations from "1993 Residential Energy Consumption Survey" for 1994 estimates. **Wood Energy, Commercial and Industrial Sectors:** EIA, Office of Coal, Nuclear, Electric and Alternate Fuels (CNEAF), estimates derived from information from other government agencies, trade journals, industry association reports, and Form EIA-846, "1991 Manufacturing Energy Consumption Survey." **Wood Energy, Electric Utility:** EIA, Form EIA-867, "Annual Nonutility Power Producer Report," and Form EIA-861, "Annual Electric Utility Report. **Waste Energy:** Government Advisory Associates, *Resource Recovery Yearbook*, and *Methane Recovery Yearbook*, and CNEAF estimates. **Alcohol:** EIA, Form EIA-819M, "Monthly Oxygenate Telephone Report.

Figure 10.3 Households That Burn Wood, Selected Years, 1980-1993



Note: No data are available for 1983, 1985, 1986, 1988, 1989, 1991, and 1992.

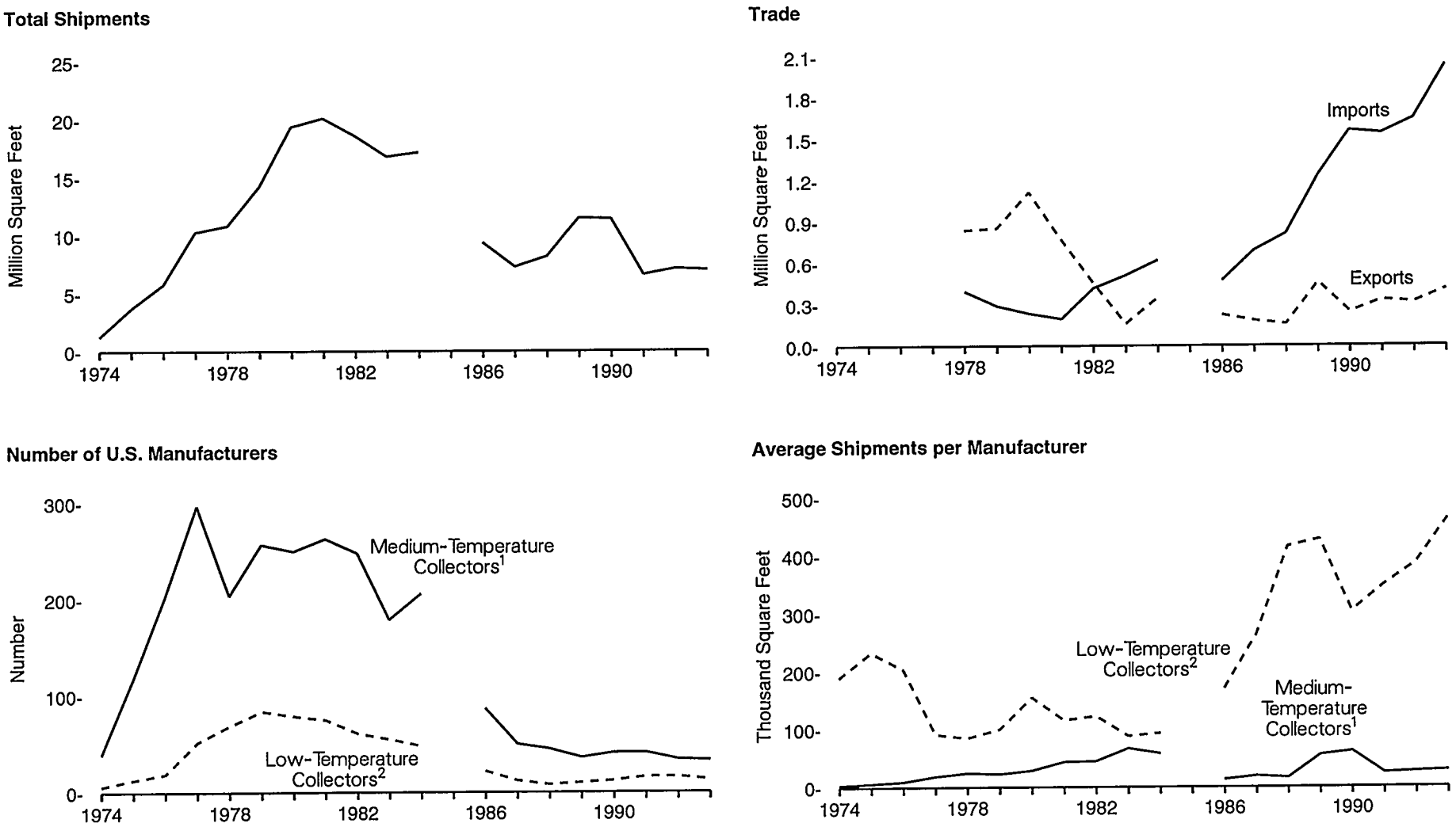
Source: Table 10.3.

Table 10.3 Households That Burn Wood, Selected Years, 1980-1993

Household Characteristic	1980	1981	1982	1984	1987	1990	1993
Households That Burn Wood							
Number of Households (millions)	21.6	22.8	21.4	22.9	22.5	22.9	20.4
Share of All U.S. Households (percent)	26.4	27.4	25.6	26.6	24.8	24.3	21.1
Number of Cords Burned (millions)	42.7	44.0	48.6	49.0	42.6	29.1	27.4
Average Number of Cords Burned per Household							
Mean	2.0	1.9	2.3	2.1	1.9	1.3	1.3
Median	0.7	1.0	1.0	1.0	0.7	0.5	0.5
Wood Energy Consumed (trillion Btu)	854	881	971	981	853	582	548
Households That Burn Wood as Main Heating Fuel							
Number of Households (millions)	4.7	5.3	5.6	6.4	5.0	3.9	3.1
Share of All U.S. Households (percent)	5.8	6.4	6.7	7.5	5.6	4.1	3.2
Number of Cords Burned (millions)	22.4	24.7	28.7	29.4	23.5	15.0	12.6
Average Number of Cords Burned per Household							
Mean	4.7	4.6	5.1	4.6	4.7	3.9	4.1
Median	3.3	3.0	4.0	4.0	4.0	3.3	3.0
Wood Energy Consumed (trillion Btu)	448	493	574	589	470	300	252
Households That Burn Wood as Secondary Heating Fuel and for Other Purposes							
Number of Households (millions)	16.9	17.4	15.9	16.5	17.4	19.0	17.3
Share of All U.S. Households (percent)	20.6	21.0	18.9	19.1	19.3	20.2	17.9
Number of Cords Burned (millions)	20.3	19.4	19.9	19.6	19.2	14.1	14.8
Average Number of Cords Burned per Household							
Mean	1.2	1.1	1.3	1.2	1.1	0.7	0.9
Median	0.3	0.5	0.5	0.5	0.5	0.3	0.3
Wood Energy Consumed (trillion Btu)	406	388	397	392	383	282	296

Notes: • Data are for the heating season beginning with the latter part of the previous year shown.
• Consumption estimates are based on respondent reports and may be subject to reporting biases.
• No data are available for years not shown.
Source: Energy Information Administration, Form EIA-457, "Residential Energy Consumption Survey."

Figure 10.4 Solar Thermal Collector Shipments and Trade, 1974-1984 and 1986-1993



[1] 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.
[2] 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 10.4.

Table 10.4 Solar Thermal Collector Shipments by Type and Trade, 1974-1984 and 1986-1993

Year	Low-Temperature Collectors [1]			Medium-Temperature Collectors [2]			High-Temperature Collector [3] Shipments (million square feet)	Total Shipments [4]	Imports	Exports
	Number of U.S. Manufacturers	Quantity Shipped (million square feet)	Average Annual Shipments per Manufacturer (thousand square feet)	Number of U.S. Manufacturers	Quantity Shipped (million square feet)	Average Annual Shipments per Manufacturer (thousand square feet)		Thousand Square Feet		
1974	6	1.14	189.5	39	0.14	3.5	NA	1,274	NA	NA
1975	13	3.03	232.8	118	0.72	6.1	NA	3,743	NA	NA
1976	19	3.88	204.0	203	1.93	9.5	NA	5,801	NA	NA
1977	52	4.74	91.2	297	5.57	18.8	NA	10,312	NA	NA
1978	69	5.87	85.1	204	4.99	24.5	NA	10,860	396	840
1979	84	8.39	100.0	257	5.86	22.8	NA	14,251	290	855
1980	79	12.23	154.8	250	7.17	28.7	NA	19,398	235	1,115
1981	75	8.68	115.7	263	11.46	43.6	NA	20,133	196	771
1982	61	7.48	122.6	248	11.15	44.9	NA	18,621	418	455
1983	55	4.85	88.2	179	11.98	66.9	NA	16,828	511	159
1984	48	4.48	93.3	206	11.94	58.0	0.77	17,191	621	348
1986	22	3.75	170.5	87	1.11	12.8	4.50	9,360	473	224
1987	12	3,16	263.1	50	0.96	19.1	3.16	7,269	691	182
1988	8	3.33	415.8	45	0.73	16.2	4.12	8,174	814	158
1989	10	4.28	428.3	36	1.99	55.3	5.21	11,482	1,233	461
1990	12	3.65	303.8	41	2.53	61.6	5.24	11,409	1,562	245
1991	16	5.59	349.0	41	0.99	24.1	(s)	6,574	1,543	332
1992	16	6.19	386.7	34	0.90	26.4	(s)	7,086	1,650	316
1993	13	6.03	463.5	33	0.93	28.2	(s)	6,968	2,039	411

[1] Low-temperature collectors are solar thermal collectors that generally operate at temperatures below 110 degrees Fahrenheit.

[2] 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).

[3] High-temperature collectors are solar thermal collectors that generally operate at temperatures above 180 degrees Fahrenheit.

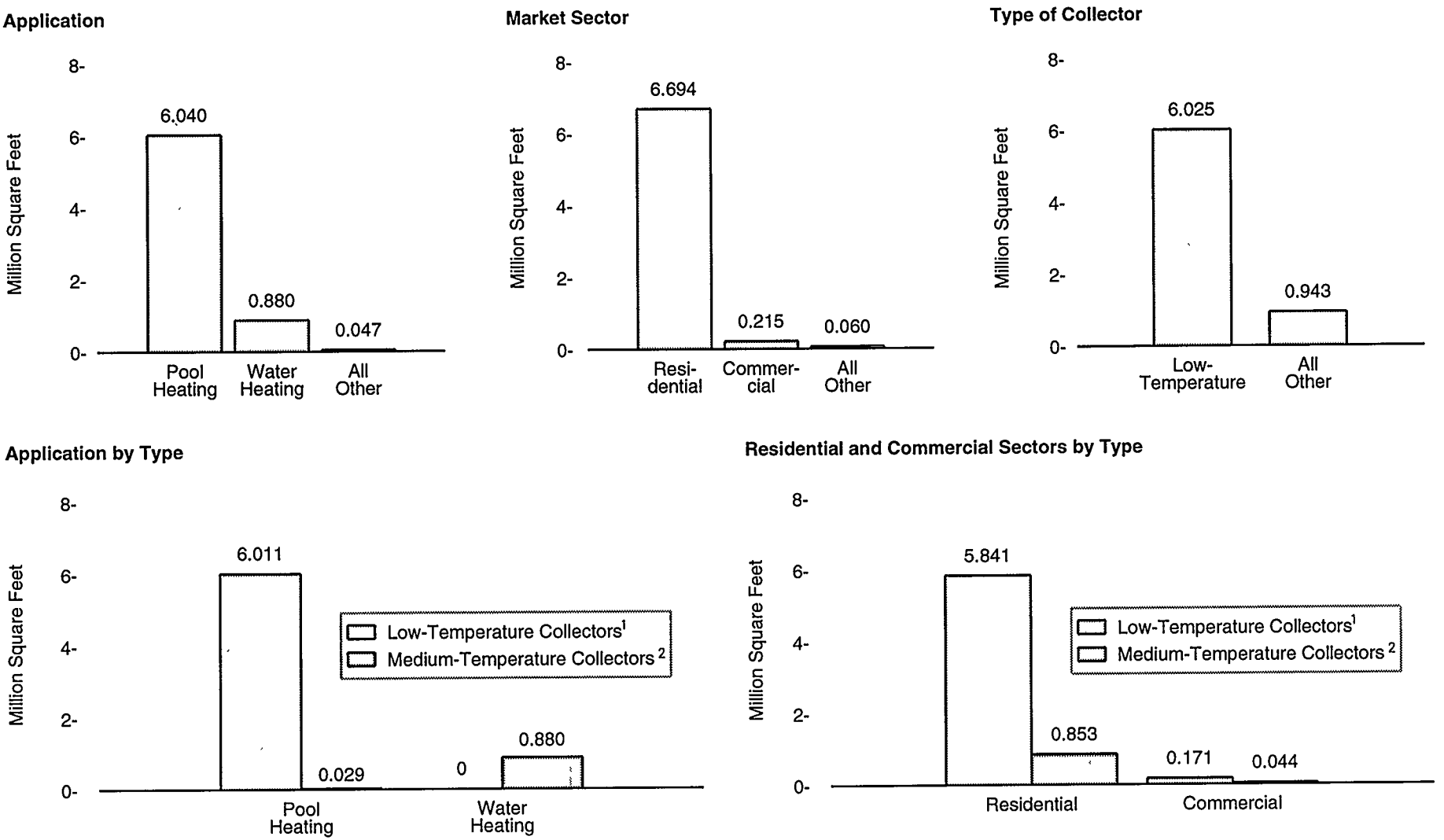
[4] Total shipments include all types of solar thermal collectors (low-temperature, medium-temperature, high-temperature, and other) and include import and export shipments.

NA=Not available. (s)=Less than 0.005 million square feet.

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.

Sources: **Number of U.S. Manufacturers:** Energy Information Administration (EIA), Form CE-63A, "Annual Solar Thermal Collector Manufacturers Survey," and prior form, Form EIA-63, "Annual Solar Thermal Collector and Photovoltaic Module Manufacturing Survey." **Shipments Data by Type:** • 1974-1976—Federal Energy Administration, *Solar Collector Manufacturing Activity*, semi-annual. • 1977—EIA, *Solar Collector Manufacturing Activity, July through December, 1981* (March 1982). • 1978 and 1979—EIA, *Solar Collector Manufacturing Activity*, annual. • 1980 forward—EIA, *Solar Collector Manufacturing Activity 1993* (August 1994), Table 6. **Total Shipments, Imports, and Exports:** EIA, *Solar Collector Manufacturing Activity 1993* (August 1994), Table 1.

Figure 10.5 Solar Thermal Collector Shipments by Type and End Use, 1993



[1] Collectors that generally operate at temperatures below 110 degrees Fahrenheit.
[2] 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.
Note: Because vertical scales differ, graphs should not be compared.
Source: Table 10.5.

Table 10.5 Solar Thermal Collector Shipments by Type and End Use, 1993

(Thousand Square Feet)

End Use	Low-Temperature Collectors [1]	Medium-Temperature Collectors [2]	High-Temperature Collectors [3]	Total
Application Total	6,025	931	12	6,968
Pool Heating	6,011	29	0	6,040
Water Heating	0	880	1	880
Space Heating	14	1	0	15
Space Cooling	0	0	0	0
Combined Space and Water Heating	0	4	0	4
Process Heating	0	17	0	17
Electricity Generation	0	0	11	11
Other [4]	0	(s)	0	(s)
Market Sector Total	6,025	931	12	6,968
Residential	5,841	853	1	6,694
Commercial	171	44	0	215
Industrial	14	17	0	31
Electric Utility	0	17	11	28
Other [5]	0	(s)	(s)	1

[1] Low-temperature collectors are solar thermal collectors that generally operate at temperatures below 110 degrees Fahrenheit.

[2] 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).

[3] Parabolic dish/trough collectors used primarily by independent power producers to generate electricity for the electric grid. High-temperature collectors are solar thermal collectors that generally operate at temperatures above 180 degrees Fahrenheit.

[4] "Other" includes shipments of solar thermal collectors for other uses, such as cooking foods, water pumping, water purification, desalinization, distilling, etc.

[5] "Other" includes shipments of solar thermal collectors to other sectors, such as government, including the military but excluding space applications.

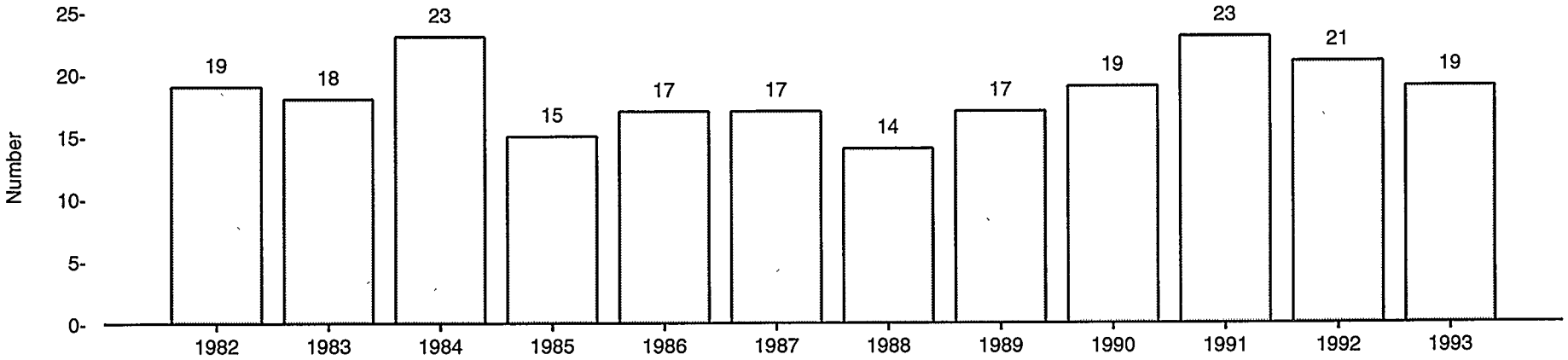
(s)=Less than 500 square feet.

Notes: • Data represent shipments from U.S. manufacturers only. • Totals may not equal sum of components due to independent rounding.

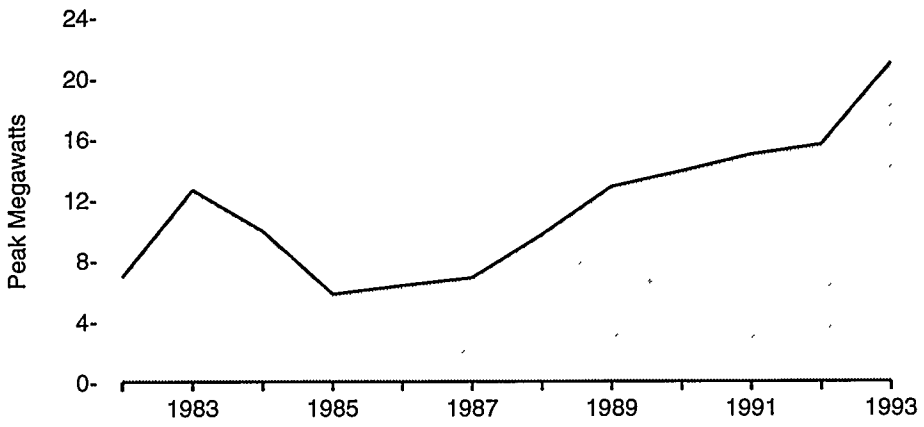
Source: Energy Information Administration, *Solar Collector Manufacturing Activity 1993* (August 1994), Tables 10 and 11.

Figure 10.6 Photovoltaic Cell and Module Shipments and Trade

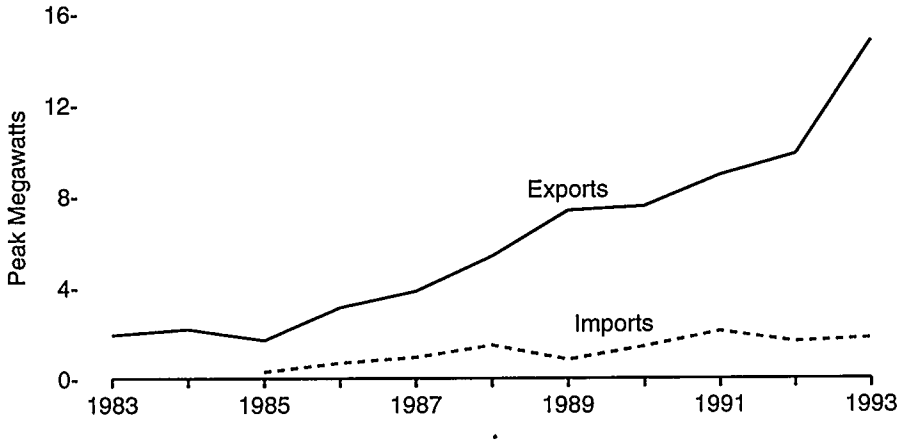
Number of U.S. Companies Reporting Shipments, 1982-1993



Total Shipments, 1982-1993



Trade, 1983-1993



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

Source: Table 10.6.

Table 10.6 Photovoltaic Cell and Module Shipments and Trade, 1982-1993

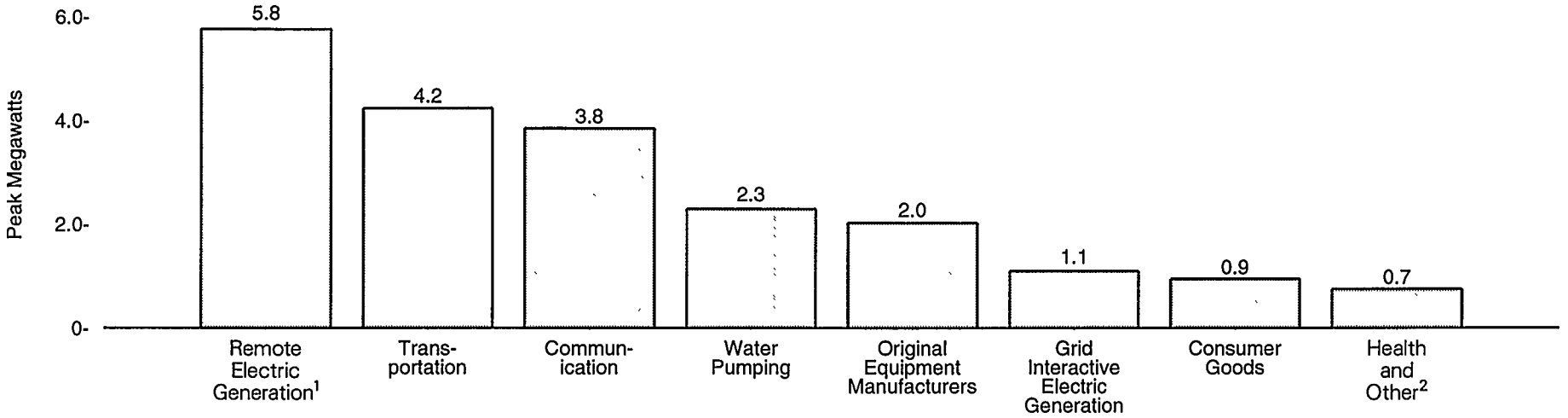
Year	Number of U.S. Companies Reporting Shipments	Total Shipments [1]	Imports	Exports
		Peak Kilowatts		
1982	19	6,897	NA	NA
1983	18	12,620	NA	1,903
1984	23	9,912	NA	2,153
1985[2]	15	5,769	285	1,670
1986[2]	17	6,333	678	3,109
1987[2]	17	6,850	921	3,821
1988[2]	14	9,676	1,453	5,358
1989[2]	17	12,825	826	7,363
1990[2]	[3]19	[3]13,837	1,398	7,544
1991[2]	23	14,939	2,059	8,905
1992[2]	21	15,583	1,602	9,823
1993[2]	19	20,951	1,767	14,814

[1] 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.
[2] Shipments of cells and modules for space and satellite applications are not included.
[3] Data were imputed for one nonrespondent who exited the industry during 1990.

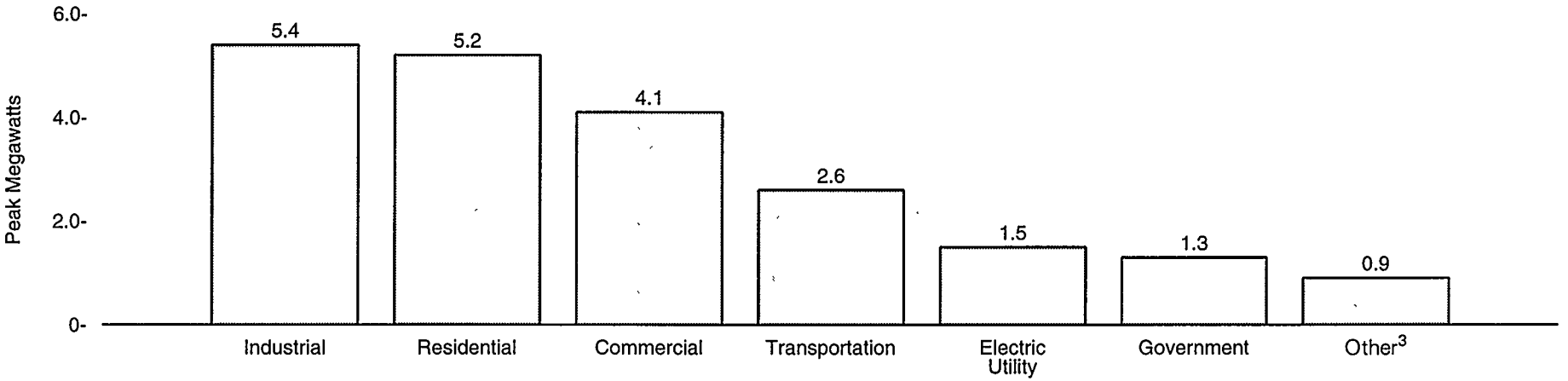
NA=Not available.
Source: Energy Information Administration, *Solar Collector Manufacturing Activity 1993* (August 1994), Table 16.

Figure 10.7 Photovoltaic Cell and Module Shipments by End Use, 1993

By Application



By Market Sector



[1] Units designed for installations that are not grid-interactive.
[2] Represents such applications as cooking food, desalinization, and distilling.
[3] Shipments to foreign governments and for specialty purposes.
Source: Table 10.7.

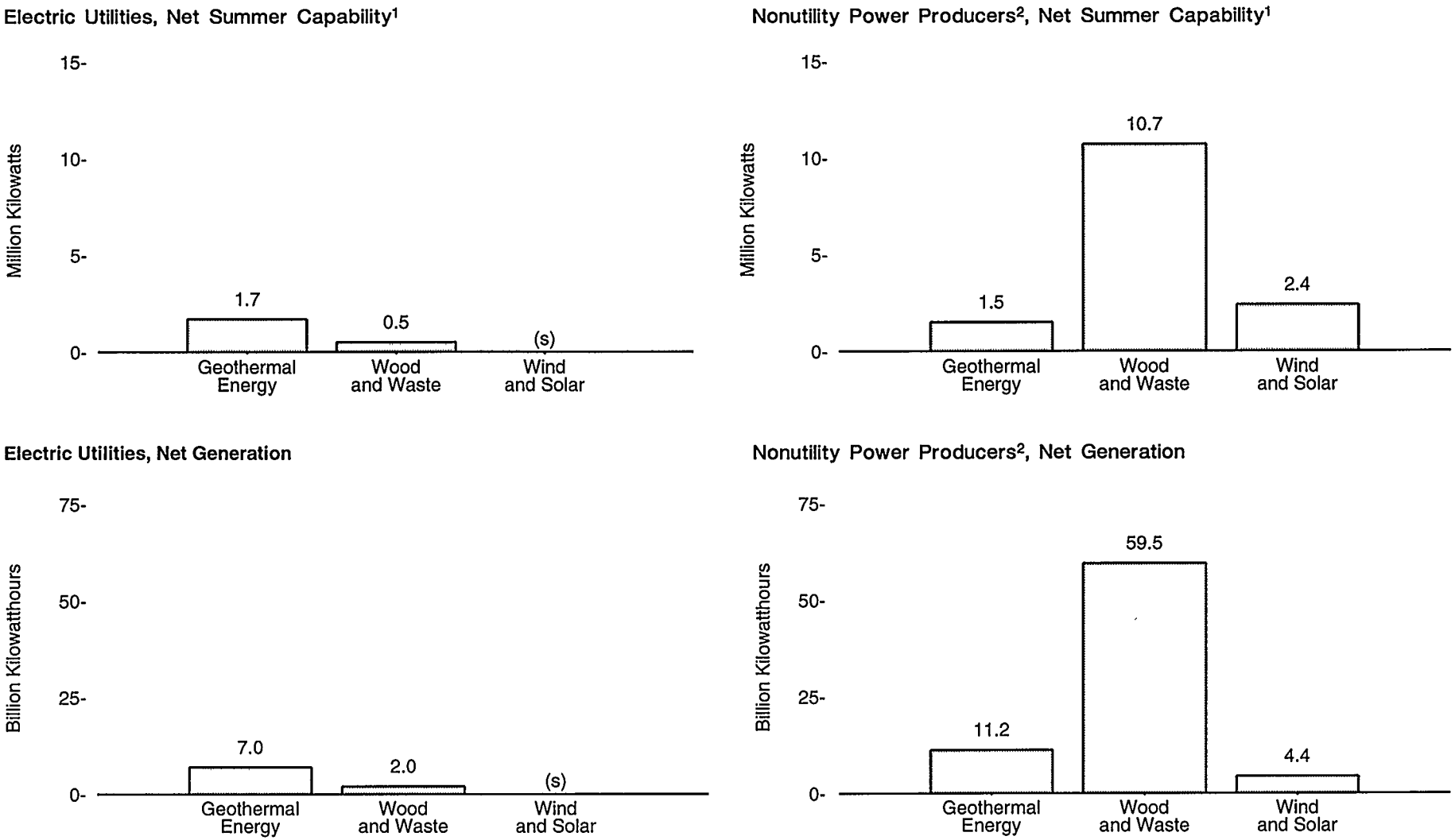
Table 10.7 Photovoltaic Cell and Module Shipments by End Use, 1989-1993

End Use	Amount Shipped (peak kilowatts)					Percent of Total				
	1989	1990	1991	1992	1993	1989	1990	1991	1992	1993
Application Total	12,825	13,837	14,939	15,583	20,951	100.0	100.0	100.0	100.0	100.0
Health	5	5	61	67	674	(s)	(s)	0.4	0.4	3.2
Water Pumping	711	1,014	729	809	2,294	5.5	7.3	4.9	5.2	10.9
Transportation	1,196	1,069	1,523	1,602	4,238	9.3	7.7	10.2	10.3	20.2
Communication	2,590	4,340	3,538	3,717	3,846	20.2	31.4	23.7	23.9	18.4
Consumer Goods	2,788	2,484	3,312	2,566	946	21.7	18.0	22.2	16.5	4.5
Electric Generation										
Grid Interactive	1,251	469	856	1,227	1,096	9.8	3.4	5.7	7.9	5.2
Remote [1]	2,620	3,097	3,594	4,238	5,761	20.4	22.4	24.1	27.2	27.5
Original Equipment Manufacturers [2]	[3] 1,595	[4] 1,119	[4] 1,315	828	2,023	12.4	8.1	8.8	5.3	9.7
Other [5]	[6] 69	240	13	530	74	0.5	1.7	0.1	3.4	0.4
Market Sector Total	12,825	13,837	14,939	15,583	20,951	100.0	100.0	100.0	100.0	100.0
Residential	1,439	1,701	3,624	4,154	5,237	11.2	12.3	24.3	26.7	25.0
Commercial	3,850	6,086	3,345	2,386	4,115	30.0	44.0	22.4	15.3	19.6
Government	1,077	1,002	815	1,063	1,325	8.4	7.2	5.5	6.8	6.3
Industrial	3,993	2,817	3,947	4,279	5,352	31.1	20.4	26.4	27.5	25.5
Transportation	1,130	974	1,555	1,673	2,564	8.8	7.0	10.4	10.7	12.2
Electric Utility	785	826	1,275	1,553	1,503	6.1	6.0	8.5	10.0	7.2
Other [7]	551	432	377	477	856	4.3	3.1	2.5	3.0	4.1

[1] Electric power generation photovoltaic units designed for installations that are not grid-interactive.
[2] Original equipment manufacturers are non-photovoltaic manufacturers that combine photovoltaic technology into existing or newly developed product lines.
[3] Photovoltaic cells to original equipment manufacturers.
[4] Photovoltaic cells and modules to original equipment manufacturers.
[5] Represents such applications as cooking food, desalinization, and distilling.
[6] Includes modules to original equipment manufacturers.
[7] 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.
Sources: **1989:** Energy Information Administration (EIA), *Solar Collector Manufacturing Activity 1989* (March 1991), Tables 17 and 18. **1990:** EIA, *Solar Collector Manufacturing Activity 1991* (December 1992), Tables 22 and 23. **1991:** EIA, *Solar Collector Manufacturing Activity 1992* (November 1993), Tables 25 and 26. **1992 and 1993:** EIA, *Solar Collector Manufacturing Activity 1993* (August 1994), Tables 23 and 24.

Figure 10.8 Electric Power Industry Net Summer Capability and Net Generation of Electricity by Selected Renewable Energy Resources, 1994



[1] At end of year.
[2] Cogenerators, independent power producers, and small producers of 1 megawatt or greater capacity.

(s)=Less than 0.05.
Source: Table 10.8.

Table 10.8 Electric Power Industry Net Summer Capability and Net Generation of Electricity by Selected Renewable Energy Resources, 1949-1994

Year	Geothermal Energy				Wood and Waste				Wind and Solar			
	Net Summer Capability [1] (thousand kilowatts)		Net Generation (million kilowatthours)		Net Summer Capability [1] (thousand kilowatts)		Net Generation (million kilowatthours)		Net Summer Capability [1] (thousand kilowatts)		Net Generation (million kilowatthours)	
	Electric Utilities	Nonutility Power Producers [2]	Electric Utilities	Nonutility Power Producers [2]	Electric Utilities	Nonutility Power Producers [2]	Electric Utilities	Nonutility Power Producers [2]	Electric Utilities	Nonutility Power Producers [2]	Electric Utilities	Nonutility Power Producers [2]
1949	([3])	NA	([3])	NA	13	NA	386	NA	0	NA	0	NA
1950	([3])	NA	([3])	NA	13	NA	390	NA	0	NA	0	NA
1951	([3])	NA	([3])	NA	13	NA	391	NA	0	NA	0	NA
1952	([3])	NA	([3])	NA	37	NA	482	NA	0	NA	0	NA
1953	([3])	NA	([3])	NA	37	NA	389	NA	0	NA	0	NA
1954	([3])	NA	([3])	NA	37	NA	263	NA	0	NA	0	NA
1955	([3])	NA	([3])	NA	37	NA	276	NA	0	NA	0	NA
1956	([3])	NA	([3])	NA	37	NA	152	NA	0	NA	0	NA
1957	([3])	NA	([3])	NA	64	NA	177	NA	0	NA	0	NA
1958	([3])	NA	([3])	NA	64	NA	175	NA	0	NA	0	NA
1959	([3])	NA	([3])	NA	64	NA	153	NA	0	NA	0	NA
1960	11	NA	33	NA	64	NA	140	NA	NA	NA	NA	NA
1961	11	NA	94	NA	64	NA	126	NA	NA	NA	NA	NA
1962	11	NA	100	NA	64	NA	128	NA	NA	NA	NA	NA
1963	24	NA	168	NA	64	NA	128	NA	NA	NA	NA	NA
1964	24	NA	204	NA	64	NA	148	NA	NA	NA	NA	NA
1965	24	NA	189	NA	64	NA	269	NA	NA	NA	NA	NA
1966	24	NA	188	NA	72	NA	334	NA	NA	NA	NA	NA
1967	51	NA	316	NA	72	NA	316	NA	NA	NA	NA	NA
1968	78	NA	436	NA	72	NA	375	NA	NA	NA	NA	NA
1969	78	NA	615	NA	72	NA	320	NA	NA	NA	NA	NA
1970	78	NA	525	NA	72	NA	356	NA	NA	NA	NA	NA
1971	184	NA	548	NA	72	NA	311	NA	NA	NA	NA	NA
1972	290	NA	1,453	NA	77	NA	331	NA	NA	NA	NA	NA
1973	396	NA	1,966	NA	77	NA	328	NA	NA	NA	NA	NA
1974	396	NA	2,453	NA	77	NA	251	NA	NA	NA	NA	NA
1975	502	NA	3,246	NA	77	NA	191	NA	NA	NA	NA	NA
1976	502	NA	3,616	NA	77	NA	266	NA	NA	NA	NA	NA
1977	502	NA	3,582	NA	77	NA	481	NA	NA	NA	NA	NA
1978	502	NA	2,978	NA	77	NA	338	NA	NA	NA	NA	NA
1979	667	NA	3,889	NA	78	NA	498	NA	NA	NA	NA	NA
1980	909	NA	5,073	NA	78	NA	433	NA	NA	NA	NA	NA
1981	909	NA	5,686	NA	78	NA	368	NA	(s)	NA	NA	NA
1982	1,022	NA	4,843	NA	79	NA	321	NA	6	NA	NA	NA
1983	1,207	NA	6,075	NA	212	NA	379	NA	6	NA	3	NA
1984	1,231	NA	7,741	NA	321	NA	886	NA	17	NA	12	NA
1985	1,580	NA	9,325	NA	350	NA	1,383	NA	18	NA	16	NA
1986	1,558	NA	10,308	NA	343	NA	1,177	NA	19	NA	18	NA
1987	1,549	NA	10,775	NA	401	NA	1,477	NA	25	NA	14	NA
1988	1,667	NA	10,300	NA	421	NA	1,674	NA	7	NA	10	NA
1989	1,606	E885	9,342	E4,895	465	E6,604	1,965	E34,394	4	E1,526	3	E2,288
1990	1,614	E969	8,581	E6,666	464	E7,558	2,067	E40,494	4	E1,740	3	E2,872
1991	1,563	E987	8,087	E7,420	464	E8,667	2,046	E45,724	4	E1,972	4	E3,335
1992	1,739	E1,171	8,104	E8,318	464	E9,237	2,093	E51,264	4	E2,158	3	E3,611
1993	R1,747	E1,231	7,571	E9,454	R459	E9,586	1,990	E53,318	R5	E2,148	4	E3,892
1994	E1,747	E1,453	P6,956	E11,161	E516	E10,670	P1,988	E59,489	E12	E2,444	P4	E4,439

[1] At end of year.
[2] Cogenerators, independent power producers, and small power producers of 1 megawatt or greater capacity.
[3] No geothermal energy capability prior to 1960.
R=Revised data. P=Preliminary data. E=Estimate. NA=Not available. (s)=Less than 500 kilowatts.
Note: For the definition of net summer capability, see Glossary.
Sources: **Electric Utility Net Summer Capability at End of Year:** • 1960-1984—Energy Information Administration (EIA) estimates. • 1985 forward—EIA, Form EIA-860, "Annual Electric Generator Report." **Electric Utility Net Generation:** • 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 forward—EIA, Form EIA-759, "Monthly Power Plant Report .• **Nonutility Power Producers:** Estimated by EIA, based on Form EIA-867, "Annual Nonutility Power Producer Report."

11. International Energy

World Leaders in Energy Production

Worldwide energy production of 349 quadrillion Btu in 1993 was 52 quadrillion Btu greater than in 1984 (11.1).* The relative contributions of the four leading energy producers changed markedly over the 10-year period.

In 1984, the United States was the leading producer of energy and U.S. production of 66 quadrillion Btu accounted for 22 percent of the world total. The former U.S.S.R., the second leading producer, accounted for 61 quadrillion Btu, a 21-percent share. In 1986, the former U.S.S.R.'s production surpassed U.S. production for the first time and remained higher than U.S. production through 1989. In 1990, however, former U.S.S.R. production of 69 quadrillion Btu was lower than U.S. production of 71 quadrillion Btu.

As of December 31, 1991, the U.S.S.R. ceased to exist as a political entity. Three of the U.S.S.R.'s constituent republics (Russia, Ukraine, and Kazakhstan) together produced 50 quadrillion Btu of energy in 1993. That year the United States produced 68 quadrillion Btu.

Energy production in China, the third largest producer of energy in 1984, exhibited the greatest growth in absolute terms over the 10-year period. In 1984, China produced 22 quadrillion Btu of energy, much of which was coal. By 1993, Chinese production had reached 32 quadrillion Btu.

At 11 quadrillion Btu, Saudi Arabia was the fourth largest producer of energy in 1984. During the 1984-to-1993 period, Saudi Arabian production levels varied widely. The low point came in 1985, when Saudi Arabia cut back production of energy (primarily petroleum) to 8.6 quadrillion Btu in an effort to regain control of world oil markets. By 1993, Saudi Arabian production had risen to 20 quadrillion Btu.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

Crude Oil Production in 1994

World production of crude oil totaled 61 million barrels per day in 1994, up 1.0 percent from the 1993 level (11.5). The most noticeable production increase occurred in the United Kingdom. The most noticeable production declines occurred in Russia, where production fell from 6.4 million barrels per day in 1993 to 5.8 million barrels per day in 1994, and in the United States, where production declined from 6.9 million barrels per day to 6.6 million barrels per day. In Saudi Arabia, the largest producer of crude oil in 1994, production declined slightly to 8.2 million barrels per day in 1994. Crude oil production by all members of the Organization of Petroleum Exporting Countries combined accounted for 43 percent of the world total in 1994.

Natural Gas Production in 1993

World production of dry natural gas totaled 76 trillion cubic feet (11.12) and, on a Btu basis, equaled 22 percent of world energy production in 1993 (11.2). Natural gas production in 1993 was 2.0 percent above the 1992 level (11.12). Russia was the major producer of natural gas in 1993 and accounted for 22 trillion cubic feet, a 29-percent share of the world total. The United States was the second largest producer and accounted for 18 trillion cubic feet, a 24-percent share.

Coal Production in 1993

World production of coal totaled 4.9 billion short tons (11.17) and, on a Btu basis, equaled 25 percent of world energy production in 1993 (11.2). That level of coal production was 2.2 percent below the 1992 level (11.17). China, the leading producer, accounted for 1.3 billion short tons in 1993. Coal production in the United States, the second leading producer, totaled 945 million short tons, below the record level of 1,029 million short tons recorded in 1990. Russia, the world's third largest producer of coal in 1993, accounted for 336 million short tons, and Germany, the fourth largest, accounted for 315 million short tons.

Installed Capacity and Electricity Generation

As of January 1, 1993, world electricity installed capacity at all sites (including nonutility power producers) totaled 2.8 billion kilowatts (11.21).

Most of the capacity (64 percent) was fossil fuel-fired. Hydroelectric generating capacity accounted for 24 percent and nuclear electric generating capacity accounted for 12 percent. Renewable sources, such as biofuels and geothermal, solar, and wind energy, accounted for less than 1 percent of the world total.

World fossil fuel-fired net generation totaled 7.2 trillion kilowatthours in 1992 (11.20). The United States, with 2.1 trillion kilowatthours, was by far the largest producer of fossil fuel-fired net generation. The former U.S.S.R. net generation totaled 1.1 trillion kilowatthours. World hydroelectric power net generation in 1993 totaled 2.3 trillion kilowatthours, up 3.8 percent from the 1992 level (11.22). Canada, the United States, Brazil, and Russia were the world leaders in hydroelectric power net generation and together accounted for 44 percent of the world total. In 1994, nuclear-based electricity gross generation totaled 2.2 trillion kilowatthours (11.23). The U.S. share of the world total was 30 percent. France accounted for 16 percent and Japan for 11 percent of the world total.

In real terms, the 1993 average price of crude oil was the lowest in 20 years.

Fluctuations in Petroleum Prices and Demand

In 1973, the expanding post-World War II petroleum market reached 57 million barrels per day (11.10). At that point, oil-producing nations became able, for the first time, to exploit the relative inelasticity of petroleum demand in the short term by raising prices substantially. In response, petroleum consumption dipped for 2 years before resuming its climb to 65 million barrels per day in 1979.

A steep price hike in 1979 and 1980, combined with the longer-term effects of fuel switching and increased efficiency, began to curb consumption, even as the higher prices stimulated new sources of production. World petroleum consumption had fallen to 59 million barrels per day in 1983 when lowered demand and excess production began to erode the price of oil (11.10). In 1986, the price of crude oil plunged 46 percent to $14.55 per barrel (5.19). Prices stayed low in the second half of the 1980's and petroleum consumption reached 66 million barrels per day, a record level at the time, in 1989.

Following Iraq's invasion of Kuwait in August 1990, the average price of crude oil rose to $22.22 per barrel, the highest in 5 years (5.19), and year-to-year growth in world petroleum consumption of only 0.2 percent was the lowest in 5 years (11.10). In 1991, following the resolution of the war in the Persian Gulf, the average price of crude oil fell to $19.06 per barrel. World consumption of petroleum rose 0.8 percent to 67 million barrels per day. In 1992 and 1993, the average price of crude oil fell further, reaching $16.41 per barrel. In real terms, the 1993 price was the lowest in 20 years. World consumption of petroleum, however, did not reflect the 11-percent price decline; in both years, it remained near the 1991 level of 67 million barrels per day.

From 1960 through 1993, the United States consumed more petroleum by far than any other country (11.10). In 1993, U.S. consumption accounted for 44 percent of the 39 million barrels per day consumed by the Organization for Economic Cooperation and Development (OECD) countries. Japan consumed 5.4 million barrels per day. Of the non-OECD countries, Russia was the biggest consumer, accounting for 3.8 million barrels per day.

Dry Natural Gas Consumption in 1993

Although natural gas can be transported across borders in pipelines and some natural gas is shipped as liquefied natural gas, in general, natural gas tends to be consumed closer to its site of production than does petroleum. Not surprisingly, the two top producers of dry natural gas in 1993 were also the top consumers (11.12 and 11.15). U.S. consumption of dry natural gas totaled 20 trillion cubic feet, equal to 111 percent of its production. Russia consumed 16 trillion cubic feet, an amount equal to 73 percent of its production of dry natural gas. Ukraine, the third largest consumer of natural gas, consumed 3.4 trillion cubic feet and Germany consumed 2.9 trillion cubic feet.

Coal Consumption in 1993

World coal consumption in 1993 totaled 4.9 billion short tons, down 1.1 percent from the level of consumption in 1992 (11.19). China, the United States, Russia, and Germany, the world's leading producers of coal (11.17), were also the leading consumers. China consumed 1.3 billion short tons, the United States consumed 926 million short tons, Russia consumed 337 million short tons, and Germany consumed 333 million short tons of coal in 1993.

Petroleum Stocks in OECD Countries

Following the oil supply disruptions in the mid-1970's, petroleum stocks held by members of the Organization for Economic Cooperation and Development (OECD) trended upward (11.11). In 1973, OECD petroleum stocks totaled 2.6 billion barrels. At the end of 1993, stocks were 3.7 billion barrels. Throughout the 21-year period, the United States held the largest share of total OECD stocks. U.S. petroleum stocks in 1973 totaled 1.0 billion barrels, a 39-percent share. In 1993, U.S. petroleum stocks of 1.6 billion barrels equaled a 45-percent share. Japan more than doubled its petroleum stocks over the same period, from 303 million barrels in 1973 to 619 million barrels in 1993.

Energy Reserves

As of January 1, 1994, world crude oil reserves were estimated to equal about 998 billion barrels (11.3).[1] Almost two-thirds of the reserves were located in the Middle East, especially in Saudi Arabia, where about 39 percent of the region's reserves were estimated to be. Iraq, the United Arab Emirates, Kuwait, and Iran each were estimated to have more crude oil reserves than entire regions in the rest of the world. Outside of the Middle East, three countries were estimated to have very large reserves: the former U.S.S.R., 57 billion barrels; Venezuela, 63 billion barrels; and Mexico, 51 billion barrels. The United States, at 23 billion barrels, ranked tenth in the world in amount of crude oil reserves.

The distribution of the world's 5.0 quadrillion cubic feet of natural gas reserves was different from the distribution of crude oil reserves (11.3). Former U.S.S.R. reserves of 2.0 quadrillion cubic feet made the Eastern Europe and U.S.S.R. region first in the world in amount of natural gas reserves. The Middle East was estimated to have reserves of 1.6 quadrillion cubic feet, primarily in Iran, as well as in Qatar, the United Arab Emirates, Saudi Arabia, and Iraq. The United States, at 162 trillion cubic feet, ranked sixth in the world in amount of natural gas reserves.

As of the end of 1990, recoverable reserves of coal were estimated to be 1.1 trillion short tons (11.16).[2] The three countries with the most plentiful coal reserves were the U.S.S.R., with 266 billion short tons; the United States, with 265 billion short tons,[3] and China, with 126 billion short tons.

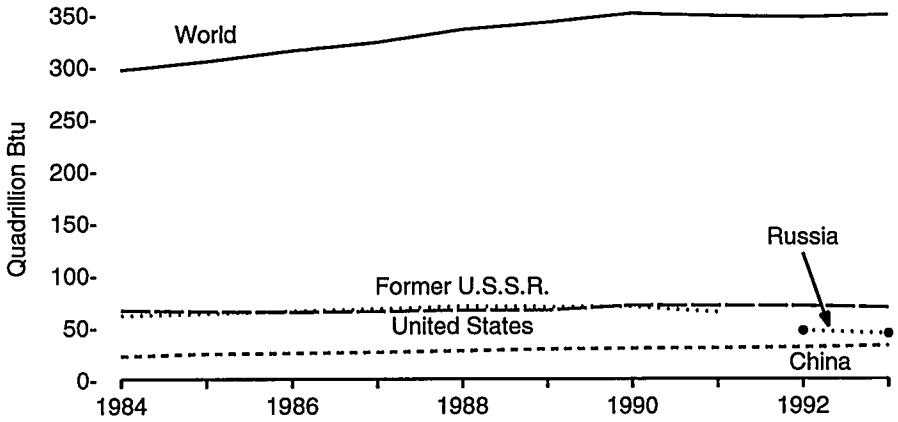
[1] *Oil and Gas Journal* data.

[2] World Energy Council data, with the exception of U.S. data, which are estimated by the Energy Information Administration. Data for the U.S.S.R. and China are as of December 31, 1990, the most recent period for which they are available.

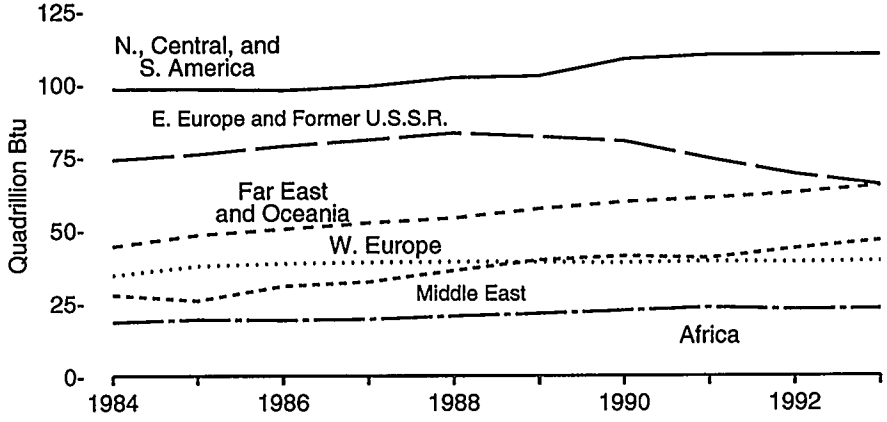
[3] U.S. data are more current; they represent recoverable reserves as of December 31, 1991.

Figure 11.1 World Primary Energy Production

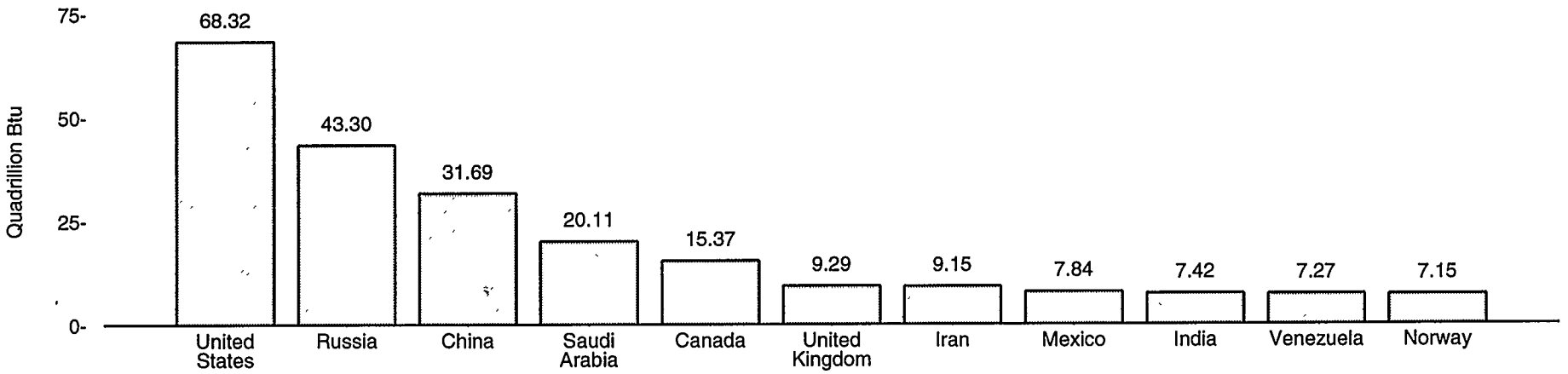
World and Leading Producers, 1984-1993



World Areas, 1984-1993



Top Producing Countries, 1993



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

Source: Table 11.1.

Table 11.1 World Primary Energy Production, 1984-1993

(Quadrillion Btu)

Region and Country	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 P
North, Central, and South America	R98.15	R98.14	R97.78	R99.17	R102.12	R102.71	R108.44	R109.80	R109.87	109.85
Canada	R11.11	R11.97	R11.91	R12.54	R13.41	R13.36	R13.41	13.96	R14.42	15.37
Mexico	R7.83	R7.70	R7.05	R7.24	R7.31	R7.37	R7.54	R7.87	R7.85	7.84
United States [1]	R65.96	R64.87	R64.35	R64.95	R66.10	R66.13	R,[1]70.68	R70.33	R69.87	68.32
Venezuela	5.02	4.78	R5.18	R5.14	R5.55	R5.73	R6.38	R6.97	R6.92	7.27
Other	R8.24	R8.80	R9.30	R9.29	R9.74	R10.13	R10.42	R10.68	R10.81	11.05
Western Europe	R34.40	R37.62	R38.49	R38.90	R39.10	R39.02	R38.74	R39.23	R38.91	39.28
France	R3.36	R3.55	R3.80	R3.94	R4.07	R4.10	4.20	R4.48	R4.63	4.86
Germany [2]	R7.66	R8.13	R7.92	R7.94	R7.98	R7.77	R7.23	R6.34	R6.11	5.68
Netherlands	R2.56	R2.92	R2.74	R2.73	R2.42	R2.60	2.63	2.94	R2.92	2.96
Norway	R3.59	R3.77	R3.95	R4.40	R4.77	R5.71	R5.94	R6.23	R7.08	7.15
United Kingdom	R8.86	R10.20	R10.64	R10.32	R10.00	R9.02	R8.96	R9.26	R8.96	9.29
Other	R8.39	R9.03	R9.44	R9.56	R9.85	R9.82	R9.78	R9.99	R9.22	9.32
Eastern Europe and Former U.S.S.R.	R73.97	R75.85	R78.68	R80.80	R83.17	R81.89	R80.36	R74.38	R69.01	65.32
Kazakhstan	—	—	—	—	—	—	—	—	R3.76	3.30
Poland	R5.64	R5.82	R6.02	R6.17	R6.18	R5.79	R4.97	R4.85	R4.68	4.61
Romania	R2.58	R2.48	R2.56	R2.56	R2.55	R2.35	R1.93	R1.71	1.59	1.58
Russia	—	—	—	—	—	—	—	—	R46.18	43.30
Ukraine	—	—	—	—	—	—	—	—	R4.20	3.84
Former U.S.S.R.	R61.20	R62.94	R65.41	R67.33	R69.73	R69.25	R69.44	R64.08	—	—
Other	R4.53	R4.61	R4.69	R4.74	R4.71	R4.51	R4.03	R3.74	R8.61	8.70
Middle East	R27.67	R25.77	R30.75	R32.21	R36.12	R39.72	41.03	R40.35	R43.56	46.34
Iran	R5.30	R5.59	5.06	R5.67	R5.71	7.01	7.67	R8.27	R8.51	9.15
Iraq	2.61	3.09	3.66	4.58	5.97	6.47	4.54	0.69	R1.02	1.32
Kuwait	2.76	2.44	3.36	3.77	R3.63	4.32	2.83	0.43	R2.44	4.31
Saudi Arabia	11.29	R8.64	R12.04	R10.84	R12.86	R12.81	15.92	19.75	R20.39	20.11
United Arab Emirates	3.00	3.29	3.68	4.21	R4.22	4.99	5.51	6.27	R6.11	5.98
Other	R2.69	2.72	2.95	3.14	R3.74	R4.11	R4.54	R4.93	R5.08	5.47
Africa	R18.35	R19.29	R19.07	R19.45	R20.54	R21.39	R22.43	R23.43	R22.74	22.91
Algeria	3.71	3.77	3.55	4.01	R4.07	4.28	4.52	4.81	R4.82	4.78
Libya	2.53	2.46	2.43	2.29	2.73	R2.70	3.18	3.44	R3.34	3.20
Nigeria	3.12	R3.36	R3.31	R3.05	3.29	R3.89	R4.06	R4.27	R4.40	4.63
South Africa	R4.69	R5.01	R5.13	R5.10	R5.28	R5.14	R5.08	5.18	R4.28	4.37
Other	R4.31	R4.71	R4.65	R4.99	R5.15	R5.38	R5.59	R5.72	R5.88	5.93
Far East and Oceania	R44.31	R48.22	R50.27	R52.41	R54.08	R57.23	R59.57	R60.84	R62.59	65.07
Australia	R4.28	R4.88	R5.16	R5.60	R5.34	R5.59	R6.15	6.30	R6.55	6.54
China	R22.09	R24.26	R25.00	R25.90	R27.10	R28.72	R29.34	R29.63	R30.32	31.69
India	R4.66	R4.96	R5.32	R5.59	R5.85	R6.40	R6.82	R6.77	R7.32	7.42
Indonesia	R4.29	R4.25	R4.34	R4.38	R4.47	R4.87	R5.16	R5.72	R5.86	6.09
Japan	2.66	R2.99	R2.98	R3.22	R3.21	R3.19	R3.23	R3.42	R3.31	3.67
Other	R6.32	R6.89	R7.47	R7.71	R8.11	R8.47	R8.86	R9.03	R9.21	9.66
World	R296.85	R304.89	R315.05	R322.94	R335.12	R341.96	R350.57	R348.04	R346.66	348.77

[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

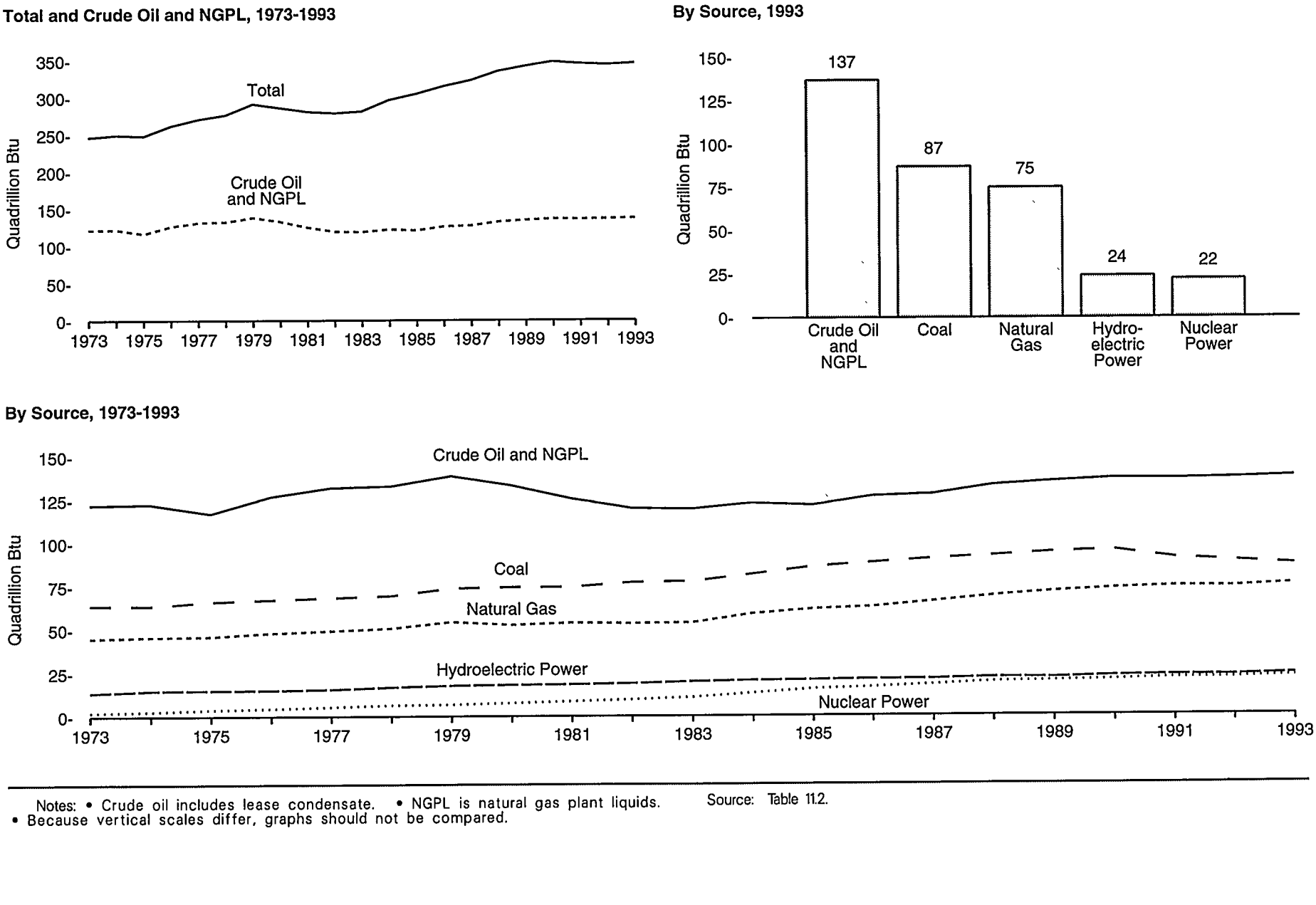
[2] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

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

Notes: • See Note 1 at end of section. • World primary energy production includes crude oil and lease condensate, natural gas plant liquids, dry natural gas, coal, and net hydroelectric power, nuclear electric power, geothermal, solar, and wind electric power. Data for the United States also include electricity generated from biomass. • Totals may not equal sum of components due to independent rounding.

Sources: **United States:** Table 1.2. **All Other Data:** Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.2 World Primary Energy Production by Source



Notes: • Crude oil includes lease condensate. • NGPL is natural gas plant liquids. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.2.

Table 11.2 World Primary Energy Production by Source, 1973-1993

(Quadrillion Btu)

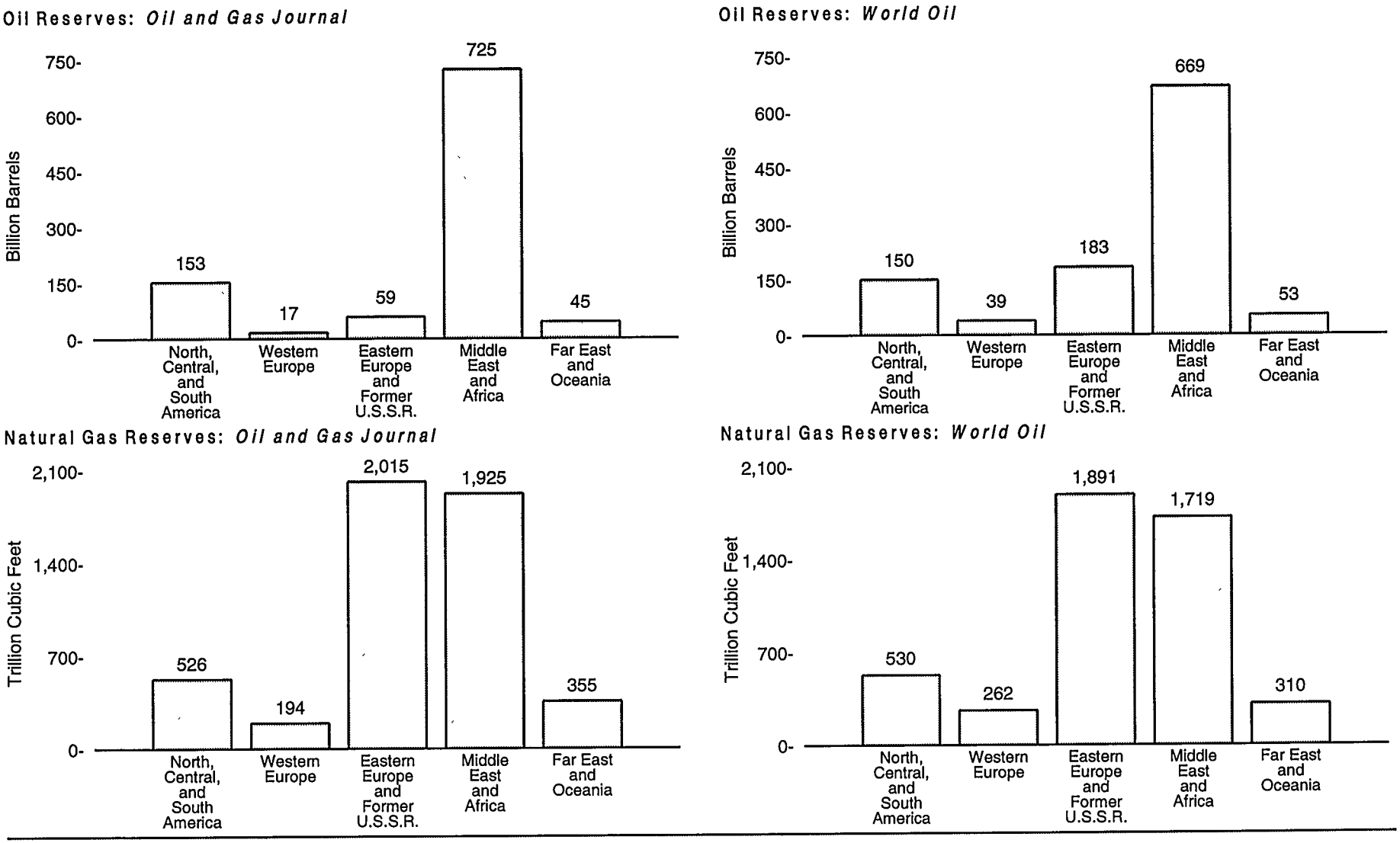
Year	Coal	Natural Gas [1]	Crude Oil [2]	Natural Gas Plant Liquids	Nuclear Power [3]	Hydroelectric Power [3]	Geothermal Energy [3] and Other [4]	Total
1973	63.87	R45.00	117.83	4.23	2.15	13.52	0.21	R246.81
1974	63.79	R45.82	118.22	4.22	2.87	14.84	0.22	R249.98
1975	66.20	R46.17	112.98	4.12	3.85	15.04	0.24	R248.60
1976	67.33	R48.14	122.72	4.24	4.52	15.08	0.26	R262.29
1977	68.47	R49.35	127.63	4.40	5.41	15.56	0.27	R271.09
1978	69.55	R50.79	128.38	4.55	6.43	16.80	0.28	R276.78
1979	73.80	R54.44	133.79	4.87	6.69	17.69	0.34	R291.62
1980	R74.48	R52.65	128.12	5.10	R7.58	R18.05	0.40	R286.38
1981	R74.51	R53.87	120.16	5.36	R8.53	R18.34	0.43	R281.21
1982	R77.15	R53.48	114.51	5.34	R9.51	R18.82	0.44	R279.27
1983	R77.56	R53.76	113.97	5.34	R10.72	R19.74	0.49	R281.58
1984	R81.58	R58.79	116.86	5.71	R13.00	R20.35	0.56	R296.85
1985	R85.77	R61.38	115.40	R5.82	R15.37	R20.56	0.60	R304.89
1986	R88.06	R62.60	120.24	R6.12	R16.34	R20.96	0.73	R315.05
1987	R90.27	R65.61	R121.16	R6.32	R17.80	R21.03	0.75	R322.94
1988	R91.92	R68.78	R125.93	R6.63	R19.30	R21.81	0.75	R335.12
1989	R93.92	R71.20	R127.98	R6.68	R19.82	R21.62	0.75	R341.96
1990	R94.97	R72.91	R129.50	R6.85	20.30	R22.46	0.75	R347.74
1991	R90.43	R73.99	R128.77	R7.16	21.27	R22.80	0.77	R345.19
1992	R88.62	R73.80	R129.12	R7.34	R21.30	R22.67	0.79	R343.64
1993P	86.67	75.34	129.72	7.63	22.10	23.51	0.79	345.76

[1] Dry production.
[2] Includes lease condensate.
[3] Net generation, i.e., gross generation less plant use.
[4] "Other" includes biomass, wind, wood, photovoltaic, and solar thermal energy.
R=Revised data. P=Preliminary data.

Notes: • See Note 1 at end of section. • Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.3 World Crude Oil and Natural Gas Reserves, January 1, 1994



Source: Table 11.3.

Table 11.3 World Crude Oil and Natural Gas Reserves, January 1, 1994

Region and Country	Crude Oil (billion barrels)		Natural Gas (trillion cubic feet)	
	Oil and Gas Journal	*World Oil*	*Oil and Gas Journal*	*World Oil*
North America	**79.0**	**72.1**	**328.2**	**325.7**
Canada	5.1	4.7	94.8	93.2
Mexico	50.9	44.4	71.0	70.0
United States	23.0	23.0	162.4	162.4
Central and South America	**74.1**	**77.7**	**197.5**	**204.1**
Argentina	1.6	1.9	26.5	26.5
Bolivia	0.1	0.1	3.9	4.5
Brazil	3.6	3.8	4.8	4.9
Colombia	1.9	3.0	10.0	7.2
Ecuador	2.0	2.3	3.8	3.9
Trinidad and Tobago	0.5	0.5	8.5	8.5
Venezuela	63.3	64.4	128.9	138.0
Other	1.0	1.5	11.1	10.8
Western Europe	**16.9**	**38.5**	**194.0**	**261.6**
Denmark	0.8	0.7	4.3	4.6
Germany	0.4	0.2	12.1	7.9
Italy	0.6	0.6	10.7	10.3
Netherlands	0.1	0.1	68.2	66.2
Norway	9.3	18.9	70.5	113.2
United Kingdom	4.6	16.9	21.5	54.7
Other	1.1	1.1	6.7	4.7
Eastern Europe and Former U.S.S.R.	**58.9**	**183.0**	**2,014.9**	**1,891.4**
Former U.S.S.R.	57.0	181.7	1,997.0	1,877.0
Other [1]	1.9	1.3	17.9	14.4
Middle East	**662.9**	**595.4**	**1,581.0**	**1,370.8**
Bahrain	0.1	0.1	5.9	5.6
Iran	92.9	60.0	730.0	612.0
Iraq	100.0	99.6	109.5	109.2
Kuwait	96.5	94.2	52.9	51.4
Oman	4.7	5.0	20.0	20.0
Qatar	3.7	4.2	250.0	165.0
Saudi Arabia	261.2	262.4	185.9	186.1
United Arab Emirates	98.1	64.5	204.6	198.4
Other	5.7	5.4	22.2	23.2
Africa	**62.0**	**73.9**	**343.5**	**347.8**
Algeria	9.2	10.1	128.0	130.7
Cameroon	0.4	0.3	3.9	3.9
Egypt	6.3	3.4	15.4	20.5
Libya	22.8	37.9	45.8	45.5
Nigeria	17.9	17.5	120.0	121.9
Tunisia	1.7	0.4	3.2	0.9
Other	3.7	4.3	27.2	24.5
Far East and Oceania	**44.6**	**53.3**	**354.5**	**309.7**
Australia	1.6	3.1	19.6	18.2
Brunei	1.4	1.3	14.0	13.3
China	24.0	29.5	59.0	45.0
India	5.9	5.9	25.4	22.8
Indonesia	5.8	6.2	64.4	67.5
Malaysia	4.3	5.1	76.7	80.8
New Zealand	0.2	0.1	3.2	3.0
Pakistan	0.2	0.2	22.9	23.0
Thailand	0.2	0.2	5.7	6.2
Other	1.1	1.6	63.6	29.8
World	**998.3**	**1,093.8**	**5,013.6**	**4,711.2**

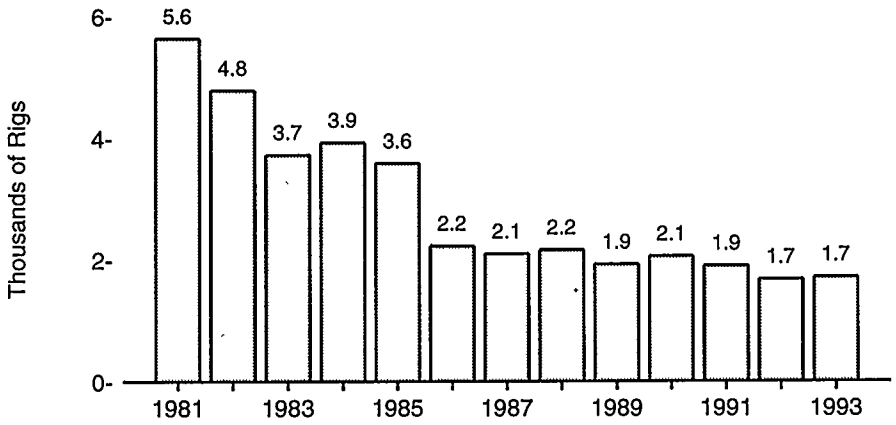
[1] Albania, Bulgaria, former Czechoslovakia, Hungary, Poland, and Romania.

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. Former U.S.S.R. figures are "explored reserves," which include proved, probable, and some partially possible. The Canadian natural gas figure includes proved and some probable. The latest Energy Information Administration data for the United States are for December 31, 1993. See Table 4.8. • Totals may not equal sum of components due to independent rounding.

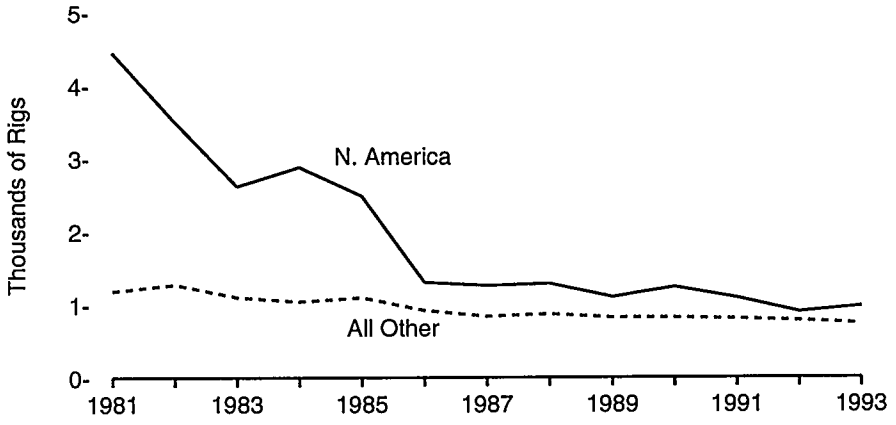
Sources: **United States:** Energy Information Administration (EIA), *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 1993 Annual Report* (October 1994). **All Other Data:** PennWell Publishing Company, *Oil and Gas Journal*, December 27, 1993. Gulf Publishing Company, *World Oil*, August 1994.

Figure 11.4 World Rotary Rigs in Operation

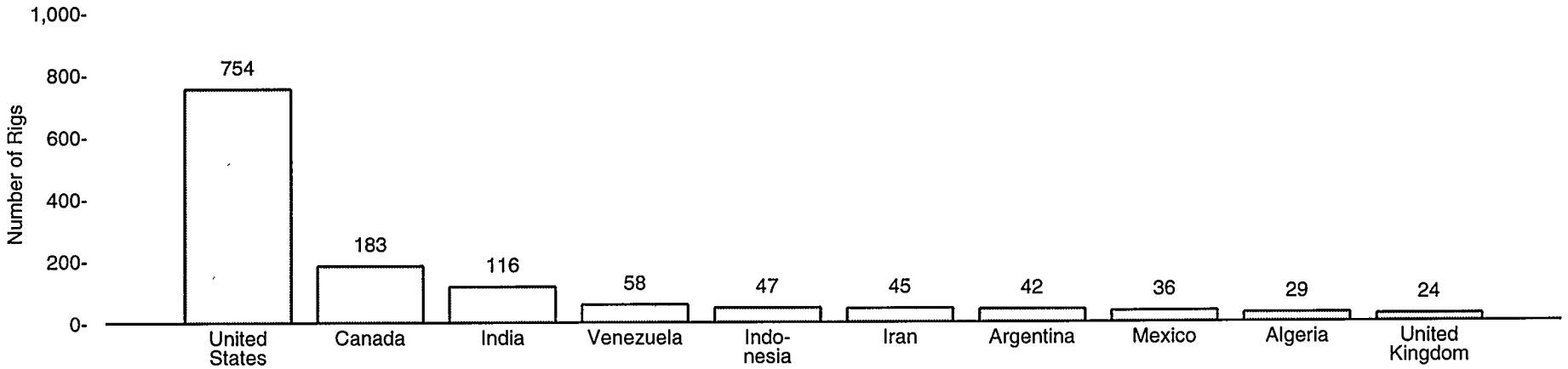
World Total, 1981-1993



World Areas, 1981-1993



Selected Countries, 1993



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

Source: Table 11.4.

Table 11.4 World Rotary Rigs in Operation, 1981-1993

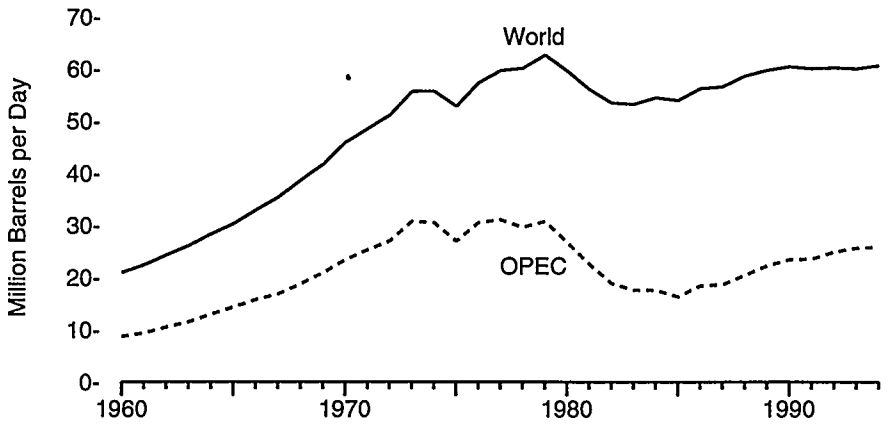
Region and Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
North America	4,452	3,506	2,620	2,883	2,487	1,305	1,260	1,287	1,102	1,238	1,090	897	974
Canada	264	199	201	259	311	178	181	196	130	138	121	96	183
Mexico	218	202	187	196	196	163	143	155	103	90	109	80	36
United States	3,970	3,105	2,232	2,428	1,980	964	936	936	869	1,010	860	721	754
Central and South America	303	320	264	243	247	208	195	180	158	158	167	170	167
Argentina	70	67	73	82	81	47	61	63	55	64	60	49	42
Brazil	81	94	83	70	76	77	60	39	28	23	21	26	25
Venezuela	63	69	41	30	33	29	18	25	28	32	45	50	58
Other	89	90	67	61	57	55	56	53	47	39	41	45	42
Western Europe	244	271	211	227	258	211	181	190	167	162	142	112	88
France	21	22	17	20	22	15	8	8	7	6	4	3	3
Italy	32	38	26	26	40	33	26	24	22	21	25	23	14
Netherlands	17	21	17	18	24	15	10	14	12	14	11	10	7
Norway	12	13	10	10	13	12	12	15	12	12	16	15	13
Turkey	26	34	26	24	25	27	26	21	20	17	19	15	16
United Kingdom	58	58	42	60	63	43	44	57	46	48	39	33	24
Former Yugoslavia	22	24	21	25	27	30	31	31	32	31	15	1	0
Other	56	61	52	44	44	36	24	20	16	13	13	12	11
Eastern Europe and Former U.S.S.R.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	26	21	24
Hungary	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	2	2
Poland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22	18	18
Former U.S.S.R.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	4
Middle East	117	130	142	136	139	118	90	102	110	108	92	128	134
Iran	0	3	13	20	20	18	18	18	20	19	21	39	45
Iraq	14	11	23	19	28	21	10	23	26	[1]23	NA	NA	NA
Saudi Arabia	29	29	26	16	11	6	5	4	5	10	16	22	21
Syria	16	15	15	23	26	27	22	24	24	17	14	17	15
United Arab Emirates	37	50	45	36	26	18	11	10	9	12	16	18	18
Other	21	22	20	22	28	28	24	23	26	27	25	32	35
Africa	240	242	181	140	155	130	113	112	101	107	106	94	83
Algeria	91	81	54	27	35	41	40	32	24	35	31	30	29
Egypt	27	36	35	36	37	33	23	21	18	15	17	16	13
Libya	33	31	24	26	30	20	12	16	17	15	15	15	15
Nigeria	23	27	17	11	10	10	11	13	14	18	21	16	10
Other	66	67	51	40	43	26	27	30	28	24	22	17	16
Far East and Oceania	281	311	303	295	298	254	259	287	286	284	273	254	241
Australia	23	33	25	34	31	15	16	19	14	14	12	10	11
Burma	30	32	36	33	33	33	29	26	23	19	22	18	17
India	44	50	56	57	62	70	116	131	135	137	136	124	116
Indonesia	86	92	88	82	80	62	37	44	46	52	53	50	47
Other	98	104	98	89	92	74	61	67	68	62	50	52	50
World	5,637	4,780	3,721	3,924	3,584	2,226	2,098	2,158	1,924	2,057	1,896	1,676	1,711

[1] Average rigs January through August.
R=Revised data. NA=Not available.

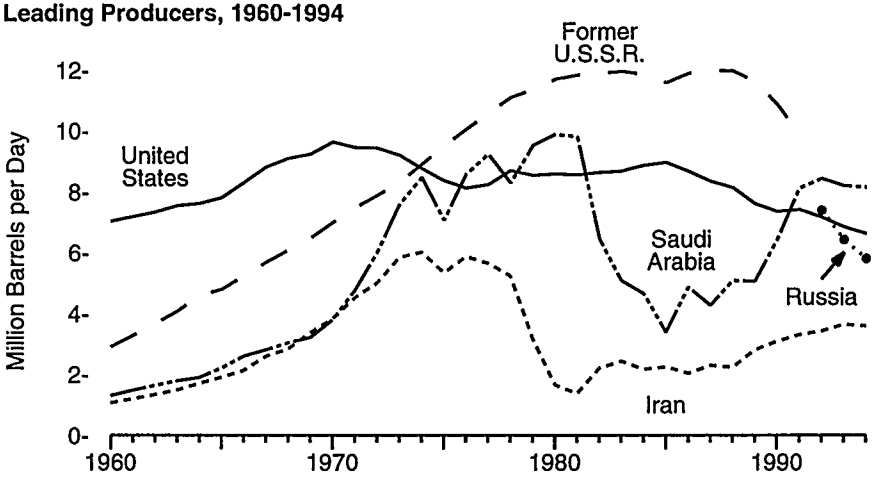
Source: Baker Hughes, Inc., Houston, Texas.

Figure 11.5 World Crude Oil Production

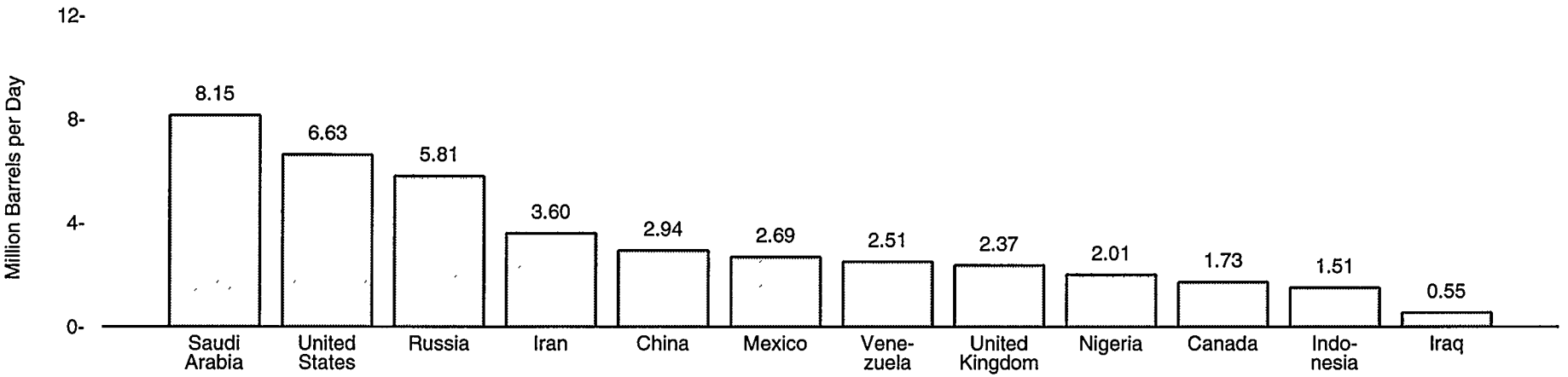
World and OPEC, 1960-1994



Leading Producers, 1960-1994



Top Producing Countries, 1994



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

Source: Table 11.5.

Table 11.5 World Crude Oil Production, 1960-1994

(Million Barrels per Day)

	OPEC [1]								Non-OPEC								
Year	Indonesia	Iran	Iraq	Nigeria	Saudi Arabia [2]	Venezuela	Other	Total	Canada	China	Mexico	Russia	United Kingdom	United States	Former U.S.S.R.	Other	World
1960	0.41	1.07	0.97	0.02	1.31	2.85	2.06	8.69	0.52	0.10	0.27	—	(s)	7.04	2.91	1.43	20.96
1961	0.42	1.20	1.01	0.05	1.48	2.92	2.28	9.36	0.61	0.11	0.29	—	(s)	7.18	3.28	1.60	22.43
1962	0.45	1.34	1.01	0.07	1.64	3.20	2.79	10.50	0.67	0.12	0.31	—	(s)	7.33	3.67	1.72	24.32
1963	0.44	1.49	1.16	0.08	1.79	3.25	3.30	11.51	0.71	0.13	0.32	—	(s)	7.54	4.07	1.85	26.13
1964	0.46	1.71	1.26	0.12	1.90	3.39	4.14	12.98	0.75	0.18	0.32	—	(s)	7.61	4.60	1.92	28.36
1965	0.48	1.91	1.31	0.27	2.21	3.47	4.68	14.33	0.81	0.23	0.32	—	(s)	7.80	4.79	2.02	30.30
1966	0.47	2.13	1.39	0.42	2.60	3.37	5.38	15.76	0.88	0.29	0.33	—	(s)	8.30	5.23	2.14	32.93
1967	0.51	2.60	1.23	0.32	2.81	3.54	5.84	16.84	0.96	0.28	0.37	—	(s)	8.81	5.68	2.43	35.37
1968	0.60	2.84	1.50	0.14	3.04	3.61	7.05	18.78	1.19	0.30	0.39	—	(s)	9.10	6.08	2.80	38.64
1969	0.74	3.38	1.52	0.54	3.22	3.59	7.91	20.90	1.13	0.48	0.46	—	(s)	9.24	6.48	3.00	41.69
1970	0.85	3.83	1.55	1.08	3.80	3.71	8.59	23.41	1.26	0.60	0.49	—	(s)	9.64	6.99	3.50	45.89
1971	0.89	4.54	1.69	1.53	4.77	3.55	8.35	25.32	1.35	0.78	0.49	—	(s)	9.46	7.48	3.64	48.52
1972	1.08	5.02	1.47	1.82	6.02	3.22	8.39	27.02	1.53	0.90	0.51	—	(s)	9.44	7.89	3.85	51.14
1973	1.34	5.86	2.02	2.05	7.60	3.37	8.55	30.78	1.80	1.09	0.47	—	(s)	9.21	8.32	4.01	55.68
1974	1.38	6.02	1.97	2.26	8.48	2.98	7.47	30.55	1.55	1.32	0.57	—	(s)	8.77	8.91	4.04	55.72
1975	1.31	5.35	2.26	1.78	7.08	2.35	6.87	26.99	1.43	1.49	0.71	—	0.01	8.37	9.52	4.30	52.83
1976	1.50	5.88	2.42	2.07	8.58	2.29	7.81	30.55	1.31	1.67	0.83	—	0.25	8.13	10.06	4.54	57.34
1977	1.69	5.66	2.35	2.09	9.25	2.24	7.85	31.12	1.32	1.87	0.98	—	0.77	8.24	10.60	4.80	59.71
1978	1.64	5.24	2.56	1.90	8.30	2.17	7.87	29.67	1.32	2.08	1.21	—	1.08	8.71	11.11	4.98	60.16
1979	1.59	3.17	3.48	2.30	9.53	2.36	8.36	30.78	1.50	2.12	1.46	—	1.57	8.55	11.38	5.30	62.67
1980	1.58	1.66	2.51	2.06	9.90	2.17	6.91	26.78	1.44	2.11	1.94	—	1.62	8.60	11.71	5.41	59.60
1981	1.61	1.38	1.00	1.43	9.82	2.10	5.30	22.63	1.29	2.01	2.31	—	1.81	8.57	11.85	5.60	56.08
1982	1.34	2.21	1.01	1.30	6.48	1.90	4.70	18.93	1.27	2.05	2.75	—	2.07	8.65	11.91	5.86	53.48
1983	1.34	2.44	1.01	1.24	5.09	1.80	4.74	17.65	1.36	2.12	2.69	—	2.29	8.69	11.97	6.49	53.26
1984	1.41	2.17	1.21	1.39	4.66	1.80	4.96	17.60	1.44	2.30	2.78	—	2.48	8.88	11.86	7.16	54.49
1985	1.33	2.25	1.43	1.50	3.39	1.68	4.79	16.35	1.47	2.51	2.75	—	2.53	8.97	11.59	7.82	53.98
1986	1.39	2.04	1.69	1.47	4.87	1.79	5.20	18.44	1.47	2.62	2.44	—	2.54	8.68	11.90	8.14	56.23
1987	1.34	2.30	2.08	1.34	4.27	1.75	5.59	18.67	1.54	2.69	2.55	—	2.41	8.35	11.99	8.42	56.60
1988	1.34	2.24	2.69	1.45	5.09	1.90	5.78	20.48	1.62	2.73	2.51	—	2.23	8.14	11.98	8.97	58.66
1989	1.41	2.81	2.90	1.72	5.06	1.91	6.48	22.28	1.56	2.76	2.52	—	1.80	7.61	11.63	9.62	59.77
1990	1.46	3.09	2.04	1.81	6.41	2.14	6.52	23.47	1.55	2.77	2.55	—	1.82	7.36	10.88	10.07	60.47
1991	1.59	3.31	0.31	1.89	8.12	2.38	5.98	23.57	1.55	2.84	2.68	—	1.80	7.42	9.89	10.37	60.11
1992	1.57	3.43	0.45	1.98	8.44	2.33	6.75	24.95	1.60	2.84	2.67	7.39	1.83	7.17	—	11.82	60.26
1993	1.51	3.65	0.51	2.05	8.20	2.38	7.39	25.68	R1.68	R2.91	R2.67	R6.43	1.91	R6.85	—	R11.95	R60.07
1994P	1.51	3.60	0.55	2.01	8.15	2.51	7.55	25.88	1.73	2.94	2.69	5.81	2.37	6.63	—	12.62	60.67

[1] Organization of Petroleum Exporting Countries. See Glossary for membership.

[2] Includes about one-half of the production in the Neutral Zone between Kuwait and Saudi Arabia.

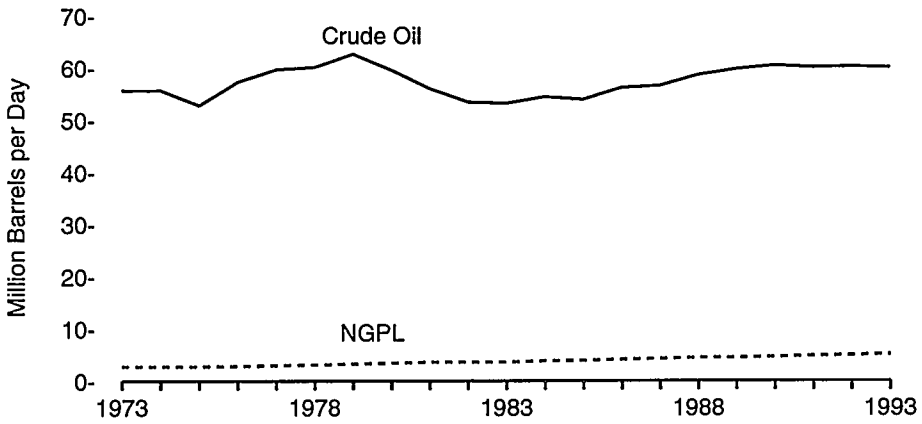
R=Revised data. P=Preliminary data. — = Not applicable. (s)=Less than 5,000 barrels per day.

Notes: • Includes lease condensate, excludes natural gas plant liquids. • Totals may not equal sum of components due to independent rounding.

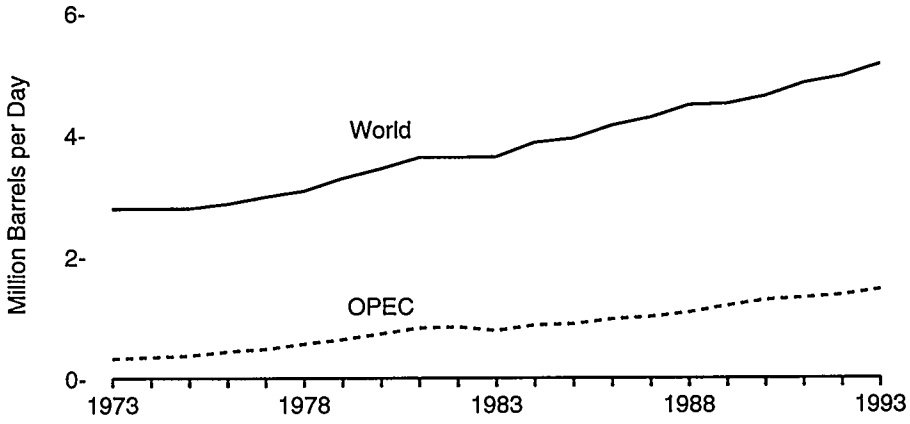
Sources: **China:** • 1960-1972—Central Intelligence Agency, unpublished data. • 1973-1979—Energy Information Administration (EIA), *International Energy Annual 1983*, Table 8. • 1980-1993—EIA, Office of Energy Markets and End Use, International Database, April 1995. • 1994—EIA, *Monthly Energy Review* (March 1995), Table 10.1. **United States:** • 1960-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1993—EIA, *Petroleum Supply Annual.* • 1994—EIA, *Monthly Energy Review* (March 1995), Table 10.1. **Former U.S.S.R.:** • 1960-1969—U.S.S.R. Central Statistical Office, *Narodnoye Khozyaystvo SSSR* (National Economy USSR). • 1970-1979—EIA, *International Petroleum Statistics Report*, February 1995, Table 4.1c. • 1980-1991—EIA, Office of Energy Markets and End Use, International Database, April 1995. **Russia:** • 1992-1994—EIA, Office of Energy Markets and End Use, International Database, April 1995. **OPEC Nations:** • 1960-1972—Organization of Petroleum Exporting Countries, *Annual Statistical Bulletin 1979.* • 1973-1979—EIA, *International Energy Annual 1983*, Table 8. • 1980-1993—EIA, Office of Energy Markets and End Use, International Database, April 1995. • 1994—EIA, *Monthly Energy Review* (March 1995), Table 10.1. **All Other Countries:** • 1960-1969—Bureau of Mines, *International Petroleum Annual, 1969.* • 1970-1972—EIA, *International Petroleum Annual, 1978.* • 1973-1979—EIA, *International Energy Annual 1983*, Table 8. • 1980-1993—EIA, Office of Energy Markets and End Use, International Database, March 1995. • 1994—EIA, *Monthly Energy Review* (March 1995), Table 10.1.

Figure 11.6 World Natural Gas Plant Liquids Production

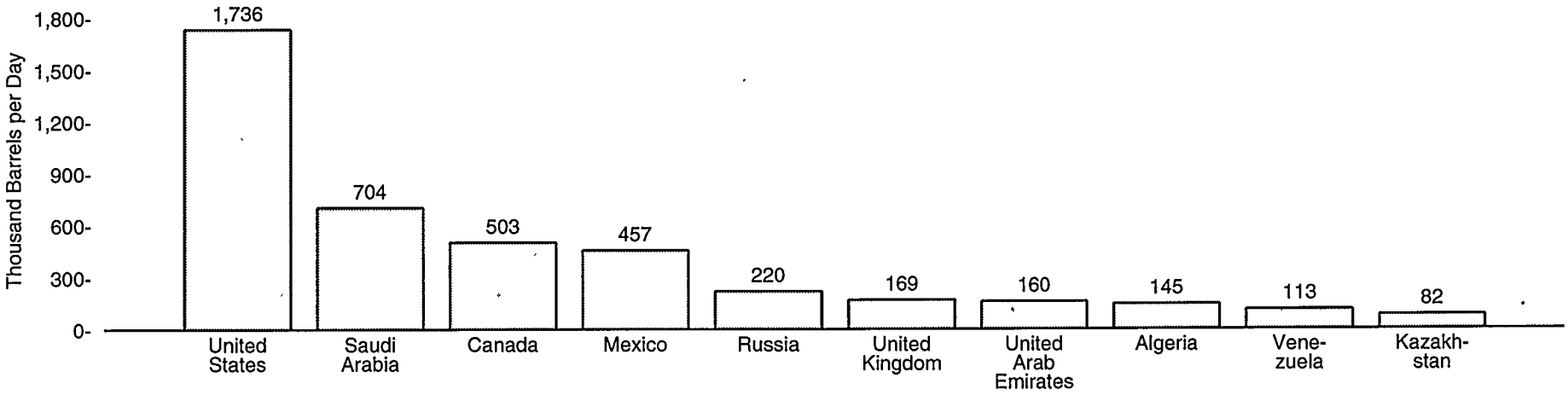
Crude Oil and NGPL Production, 1973-1993



World and OPEC NGPL Production, 1973-1993



Top NGPL Producing Countries, 1993



Note: 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, 1973-1993

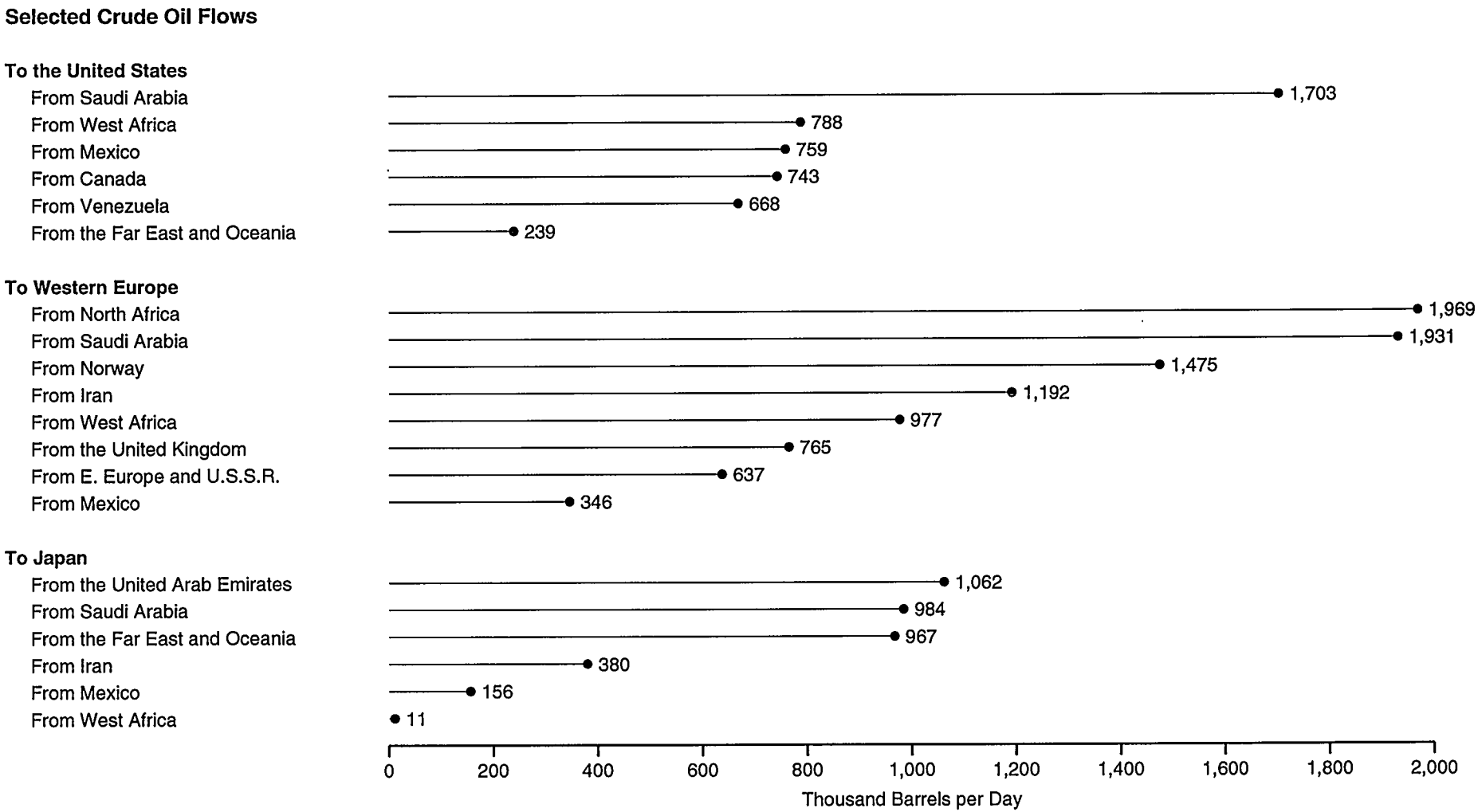
(Thousand Barrels per Day)

Year	OPEC [1]							Non-OPEC								World
	Algeria	Kuwait [2]	Saudi Arabia [2]	United Arab Emirates	Venezuela	Other	Total	Canada	Kazakhstan	Mexico	Russia	United Kingdom	United States	Former U.S.S.R.	Other	
1973	9	60	90	(s)	89	76	324	314	—	75	—	5	1,738	170	160	2,786
1974	12	50	130	(s)	84	71	347	314	—	80	—	5	1,688	190	166	2,790
1975	20	50	140	(s)	76	86	372	309	—	80	—	15	1,633	205	177	2,791
1976	24	50	185	(s)	77	105	442	289	—	95	—	15	1,604	220	203	2,867
1977	19	55	215	15	78	100	482	290	—	105	—	30	1,618	235	224	2,984
1978	25	75	250	30	61	125	566	281	—	115	—	40	1,567	255	256	3,080
1979	30	95	303	30	69	110	637	331	—	150	—	45	1,584	270	270	3,287
1980	36	95	369	35	60	137	732	331	—	193	—	45	1,573	285	285	3,444
1981	49	60	433	60	55	168	825	330	—	241	—	50	1,609	300	270	3,625
1982	58	40	430	90	60	164	842	318	—	255	—	78	1,550	315	268	3,626
1983	56	55	330	120	57	162	780	309	—	265	—	111	1,559	330	281	3,635
1984	105	67	355	130	57	155	869	336	—	257	—	136	1,630	340	301	3,869
1985	120	54	375	160	63	120	892	337	—	271	—	145	1,609	350	334	3,938
1986	120	75	385	185	97	107	969	328	—	352	—	152	1,551	440	358	4,150
1987	140	95	418	145	94	114	1,006	367	—	338	—	162	1,595	R430	381	R4,279
1988	120	100	499	130	98	130	1,077	381	—	370	—	159	1,625	R450	419	R4,481
1989	130	105	503	130	108	212	1,188	410	—	384	—	140	1,546	R425	410	R4,503
1990	130	65	620	135	114	217	1,281	426	—	428	—	108	1,559	R425	R402	R4,629
1991	140	0	680	165	117	R216	R1,318	431	—	457	—	141	1,659	R420	R416	R4,843
1992	R140	R34	R713	R144	113	R220	R1,364	R460	R86	R454	R230	160	1,697	—	R502	R4,953
1993P	145	53	704	160	113	280	1,455	503	82	457	220	169	1,736	—	535	5,157

[1] Organization of Petroleum Exporting Countries. See Glossary for membership.
[2] Includes about one-half of the production in the Neutral Zone between Kuwait and Saudi Arabia.
R=Revised data. P=Preliminary data. — = Not applicable. (s)=Less than 500 barrels per day.

Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.7 International Crude Oil Flow, 1991



Source: Table 11.7.

Table 11.7 International Crude Oil Flow, 1991

(Thousand Barrels per Day)

Exporter	Importer										
	North America		Central and South America						Far East and Oceania		
	United States	Canada	Caribbean Islands	Other	Western Europe	Eastern Europe and U.S.S.R.	Middle East	Africa	Japan	Other	Total [1]
North America											
Canada	743	—	0	0	0	0	0	0	1	8	752
Mexico	759	15	44	14	346	0	32	0	156	3	1,369
United States	—	5	[2] 111	0	(s)	0	0	0	0	0	116
Central and South America											
Ecuador	53	0	24	54	0	0	0	0	0	48	179
Peru	2	0	0	0	0	0	0	0	0	0	2
Trinidad and Tobago	72	0	0	0	0	0	0	0	0	0	72
Venezuela	668	35	374	96	199	0	0	0	9	0	1,381
Other	132	0	42	25	9	0	0	0	0	0	208
Western Europe											
Norway	74	157	0	0	1,475	0	23	0	0	0	1,729
United Kingdom	106	191	11	0	765	0	0	0	0	0	1,073
Other	3	0	0	0	134	0	0	0	0	0	137
Eastern Europe and U.S.S.R.	1	0	5	0	637	493	10	6	2	51	1,205
Middle East											
Iran	32	2	7	141	1,192	114	10	31	380	511	2,420
Iraq	0	0	0	0	0	0	42	0	0	0	42
Saudi Arabia	1,703	72	12	190	1,931	0	216	34	984	1,310	6,452
United Arab Emirates	2	3	63	1	193	0	5	238	1,062	628	2,195
Other	33	12	88	180	251	132	51	104	608	379	1,838
Africa											
North [3]	61	5	1	7	1,969	90	105	116	0	54	2,408
West [4]	788	54	31	64	977	0	(s)	85	11	8	2,018
Other	311	0	44	0	155	5	15	2	0	11	543
Far East and Oceania [5]	239	0	0	12	12	0	13	5	967	1,019	2,267
World	5,782	551	857	784	10,245	834	522	621	4,180	4,030	28,406

[1] The data in this column are for total exports plus adjustments; they do not equal total reported exports because of changes in stocks at sea, exchanges, transshipments, and other statistical discrepancies.

[2] Includes shipments to Puerto Rico and the U.S. Virgin Islands.

[3] Algeria, Egypt, Libya, Morocco, and Tunisia.

[4] Benin, Cameroon, Equatorial Guinea, Gabon, Ivory Coast, Nigeria, and Togo.

[5] Primarily Indonesia, China, Malaysia, and Brunei.

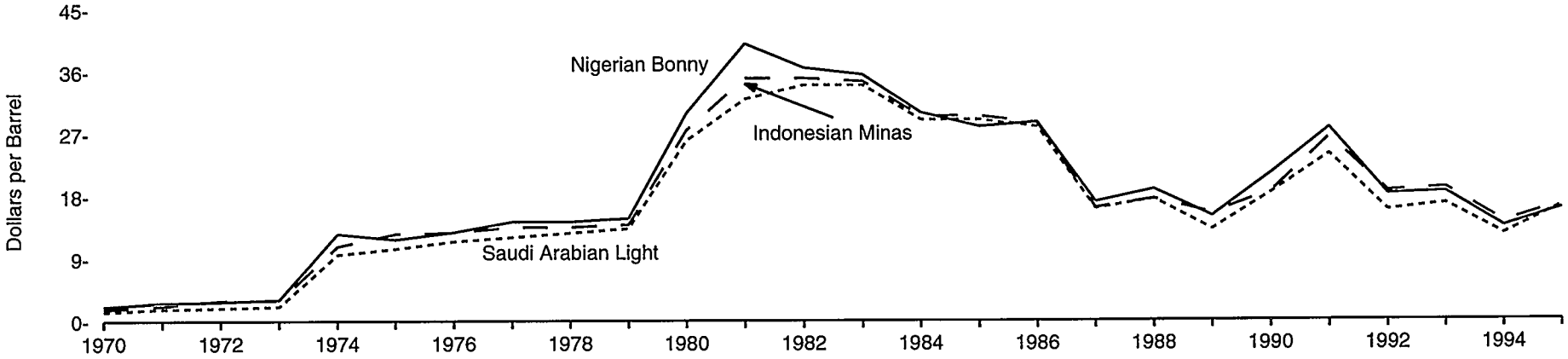
— = Not applicable. (s)=Less than 500 barrels per day.

Notes: • Transshipments are assigned to the country of original lading, if known. • Totals may not equal sum of components due to independent rounding.

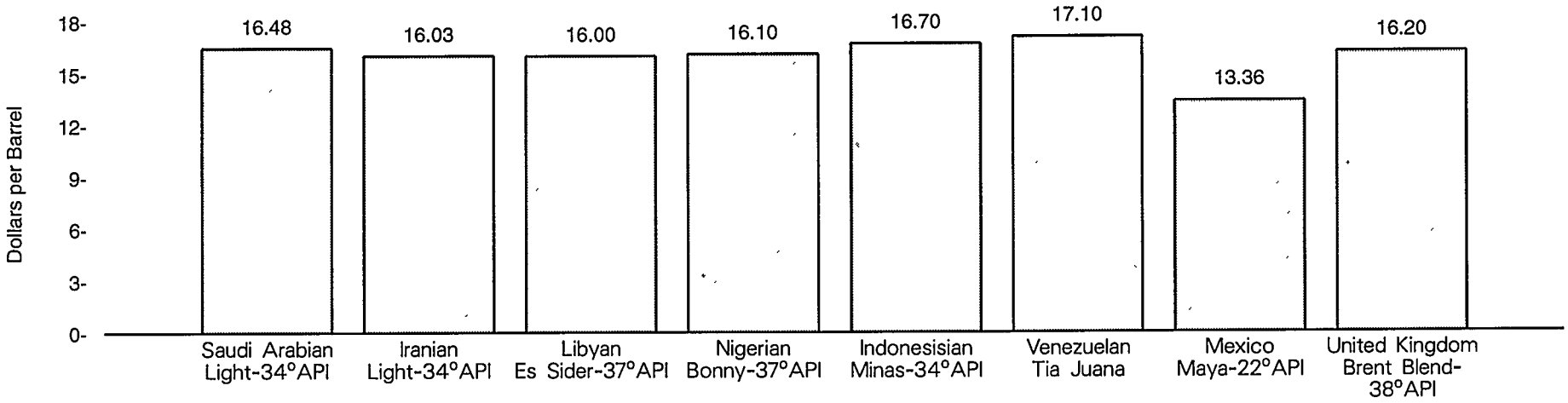
Source: Energy Information Administration, *International Energy Annual 1992* (January 1994), Table 20.

Figure 11.8 Official Prices of Selected Foreign Crude Oils

Selected Foreign Crude Oil Prices, 1970-1995



Selected Foreign Crude Oil Prices, 1995



Notes: • Prices are as of January 1, except in 1987, when prices are as of February 1. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.8.

Table 11.8 Official Prices of Selected Foreign Crude Oils, 1970-1995

(Dollars per Barrel)

Year	Saudi Arabian Light-34° API	Iranian Light-34° API	Libyan [1] Es Sider-37° API	Nigerian [2] Bonny-37° API	Indonesian Minas-34° API	Venezuelan Tia Juana [3]	Mexico [4] Maya-22° API	United Kingdom [5] 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	[6]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	27.10	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	16.48	16.03	16.00	16.10	16.70	17.10	13.36	16.20

[1] Prices for 1974 and 1975 are for crude oil with 40 degrees API gravity. Prices for 1980 include $4.72 in retroactive charges and market premiums.

[2] Prices from 1977 forward include 2 cents per barrel harbor dues.

[3] 1970-1985—26° API; 1986 forward—31° API.

[4] Mexico does not post official crude oil prices. Prices are formula-determined for each contract. For example, the prices given here are for free on board (f.o.b.) deliveries to Houston, Texas. They are based on a variety of U.S. domestic crude oil postings and on quotations for fuel oil imports into U.S. Gulf of Mexico ports.

[5] The United Kingdom does not post official crude oil prices. Prices for 1979-1984 are estimated long-term contract prices; prices for 1985 forward are contractural arrangements based on spot market quotations.

[6] Price for 1980 includes $1.87 market premiums and credit charges.

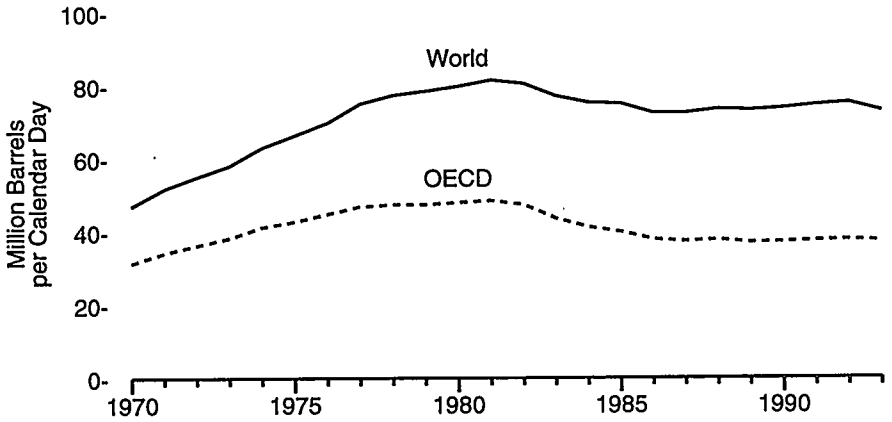
NA=Not available.

Notes: • The Organization of Petroleum Exporting Countries (OPEC) adopted major changes in their crude oil pricing system at the beginning of 1986. The primary result of these changes was a switch from official prices to netback arrangements and spot crude oil sales for the January 1986 through January 1987 time period. On February 1, 1987, official contract prices were again being used by OPEC as their primary pricing mechanism. However, subsequently in 1987 all OPEC producers moved to spot crude oil sales as a basis for their crude oil pricing systems. Spot market-related pricing continued through 1990 and into 1992. • Prices are usually f.o.b. at the foreign port of lading. Prices for the period mid-1974 forward are official selling prices. • Prices are as of January 1, except in 1987, when prices are as of February 1.

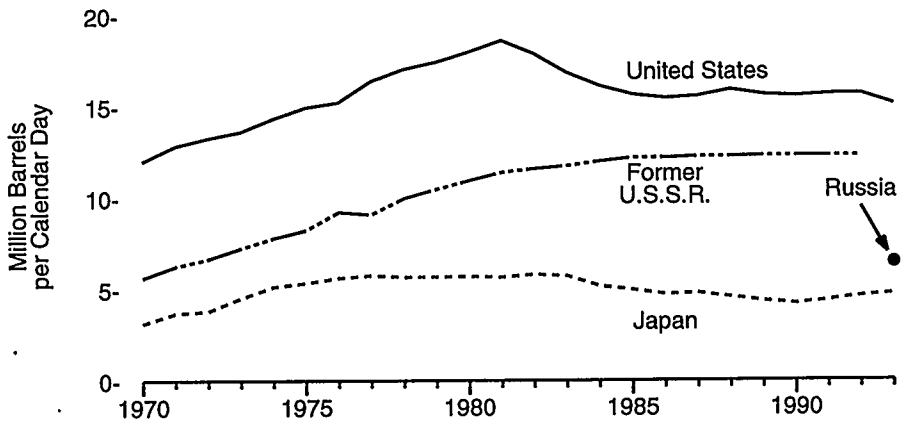
Sources: • 1970-1978—Petroleum and Energy Intelligence Weekly, Inc., *Petroleum Intelligence Weekly*. • 1979 forward—Energy Information Administration, *Weekly Petroleum Status Report*.

Figure 11.9 World Crude Oil Refining Capacity

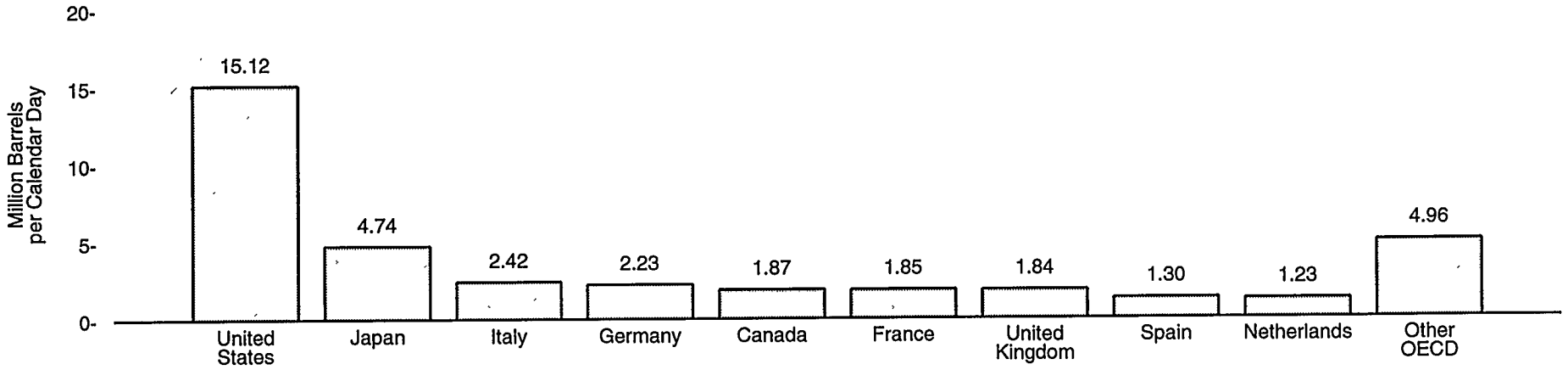
World and OECD, 1970-1993



Capacity in Leading Countries, 1970-1993



OECD Crude Oil Refining Capacity by Country, 1993



Notes: • Capacity is as of January 1. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.9.

Table 11.9 World Crude Oil Refining Capacity, 1970-1993

(Million Barrels per Calendar Day)

	OECD[1]											Non-OECD						
Year	Canada	France	Germany[2]	Italy	Japan	Nether-lands	Spain	United Kingdom	United States	Other	Total	Brazil	China	Mexico	Russia	Former U.S.S.R.	Other	World
1970	1.40	2.32	2.36	2.96	3.14	1.36	0.69	2.30	12.02	2.96	31.51	0.50	0.30	0.50	—	5.64	8.65	47.10
1971	1.45	2.53	2.54	3.24	3.70	1.39	0.85	2.39	12.86	3.40	34.35	0.51	0.42	0.57	—	6.27	9.79	51.91
1972	1.45	2.69	2.56	3.68	3.82	1.64	0.87	2.59	13.29	3.82	36.41	0.56	0.48	0.59	—	6.68	10.41	55.13
1973	1.73	2.95	2.70	3.59	4.53	1.83	1.03	2.47	13.64	3.97	38.42	0.72	0.50	0.63	—	7.26	10.67	58.20
1974	1.79	3.14	2.83	3.88	5.15	1.83	1.16	2.76	14.36	4.47	41.37	0.79	0.60	0.63	—	7.81	11.96	63.15
1975	1.88	3.34	2.99	3.95	5.35	1.84	1.17	2.78	14.96	4.63	42.89	0.96	0.85	0.76	—	8.24	12.83	66.52
1976	2.02	3.31	3.10	4.08	5.63	1.99	1.32	2.89	15.24	5.38	44.97	0.99	1.01	0.76	—	9.23	12.97	69.93
1977	2.10	3.52	3.08	4.26	5.76	2.03	1.28	3.01	16.40	5.55	46.98	1.12	1.40	0.94	—	9.10	15.58	75.12
1978	2.17	3.46	3.08	4.23	5.67	1.87	1.27	2.91	17.05	5.81	47.51	1.16	1.46	1.38	—	9.98	15.97	77.46
1979	2.23	3.47	3.10	4.20	5.68	1.86	1.43	2.53	17.44	5.61	47.52	1.21	1.58	1.24	—	10.48	16.55	78.58
1980	2.22	3.40	2.99	4.13	5.71	1.83	1.46	2.53	17.99	5.83	48.08	1.21	1.60	1.39	—	10.95	16.62	79.85
1981	2.17	3.34	3.02	4.09	5.66	1.83	1.46	2.63	18.62	5.75	48.57	1.40	1.81	1.39	—	11.40	16.99	81.56
1982	2.20	3.29	2.94	4.00	5.81	1.71	1.52	2.48	17.89	5.64	47.48	1.41	1.81	1.47	—	11.60	16.87	80.63
1983	2.02	2.87	2.47	3.28	5.73	1.55	1.52	2.26	16.86	5.18	43.75	1.22	2.00	1.29	—	11.75	17.21	77.21
1984	1.81	2.67	2.39	3.05	5.17	1.55	1.49	2.09	16.14	5.01	41.37	1.30	2.05	1.27	—	12.00	17.43	75.42
1985	1.87	2.39	2.17	3.10	4.97	1.50	1.49	2.01	15.66	4.91	40.05	1.31	2.15	1.27	—	12.20	18.14	75.12
1986	1.86	1.95	1.93	2.74	4.72	1.47	1.37	1.79	15.46	4.67	37.95	1.31	2.15	1.27	—	12.20	17.68	72.56
1987	1.76	1.83	1.72	2.68	4.79	1.40	1.31	1.78	15.57	4.60	37.43	1.32	2.20	1.35	—	12.26	18.01	72.57
1988	1.87	1.94	1.65	2.56	4.57	1.38	1.31	1.80	15.92	4.86	37.85	1.41	2.20	1.35	—	12.26	18.50	73.57
1989	1.86	1.88	1.52	2.45	4.36	1.38	1.29	1.80	15.65	4.93	37.12	1.41	2.20	1.35	—	12.30	18.96	73.34
1990	1.85	1.82	1.51	2.80	4.20	1.38	1.29	1.83	15.57	5.02	37.28	1.40	2.20	1.51	—	12.30	19.18	73.86
1991	1.88	1.82	2.07	2.39	4.38	1.20	1.32	1.87	15.68	5.03	37.62	1.41	2.20	1.68	—	12.30	19.56	74.76
1992	1.91	1.82	2.06	2.39	4.61	1.22	1.32	1.86	15.70	5.01	37.88	1.41	2.20	1.57	—	12.30	19.98	75.34
1993	1.87	1.85	2.23	2.42	4.74	1.23	1.30	1.84	15.12	4.96	37.57	1.40	2.20	1.52	6.46	—	23.94	73.10

[1] Organization for Economic Cooperation and Development. See Glossary for membership. "Other OECD" includes the United States territories of Puerto Rico, U.S. Virgin Islands, Guam, and Hawaiian Free Trade Zone. As of January 1, 1987, Hawaiian Free Trade Zone data are included in U.S. 50 States data.

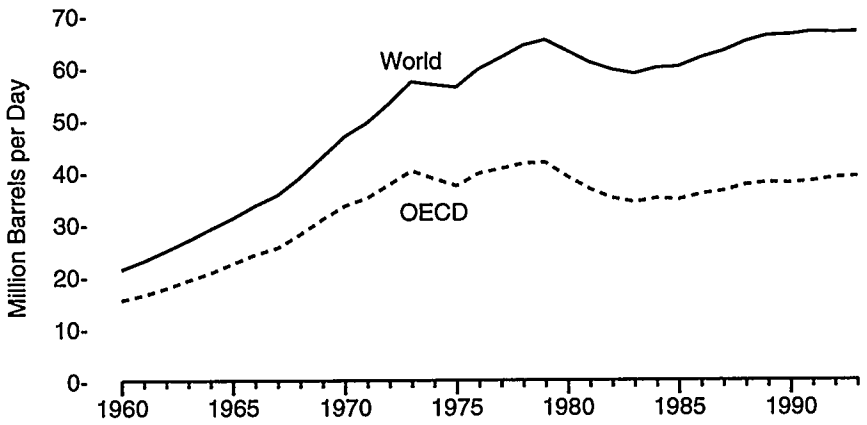
[2] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

Notes: • Capacity is as of January 1. • Totals may not equal sum of components due to independent rounding.

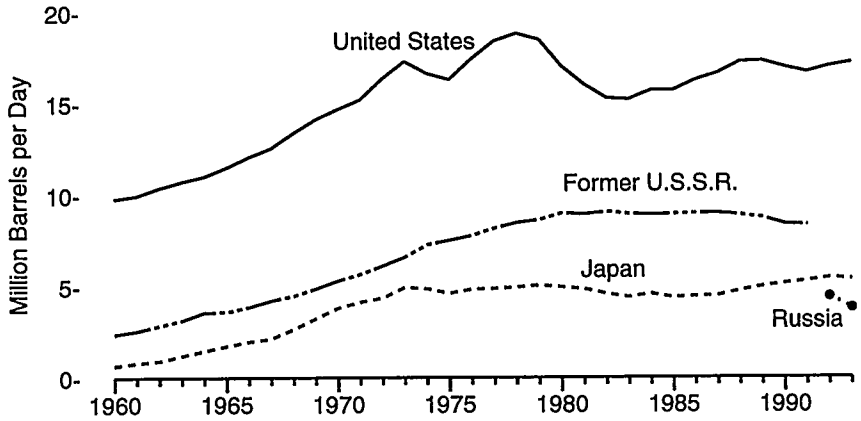
Sources: **United States:** • 1970-1977—Bureau of Mines, Mineral Industry Surveys, *Petroleum Refineries, Annual.* • 1978-1981—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Refineries in the United States and U.S. Territories.* • 1982 forward—EIA, *Petroleum Supply Annual.* **China and 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 and Gas Journal.* **All Other Countries:** PennWell Publishing Company, *Oil and Gas Journal.*

Figure 11.10 World Petroleum Consumption

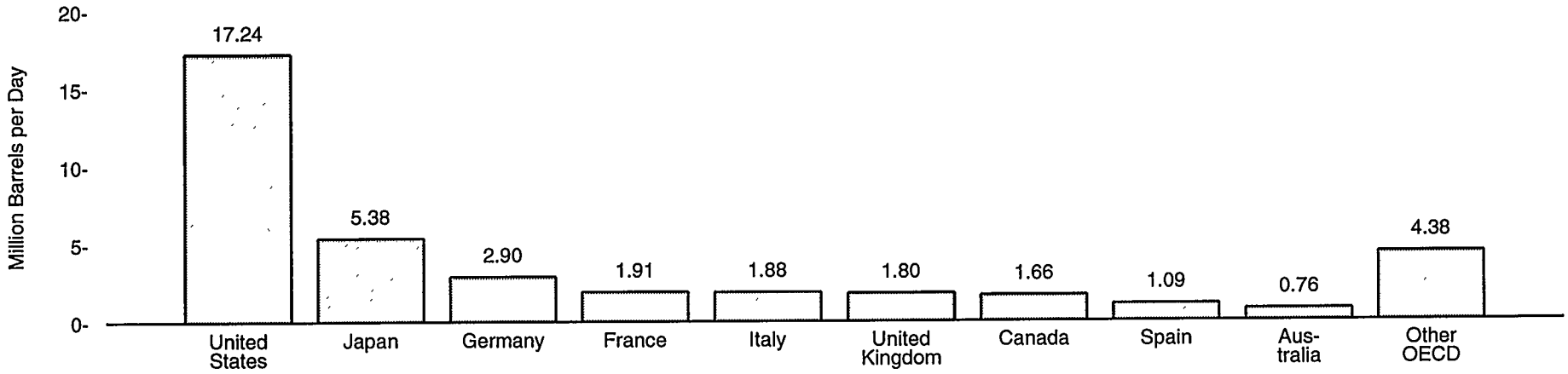
World and OECD, 1960-1993



Leading Consumers, 1960-1993



OECD Consumers, 1993



Notes: • OECD=Organization for Economic Cooperation and Development. See Glossary for membership. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.10.

Table 11.10 World Petroleum Consumption, 1960-1993

(Million Barrels per Day)

	OECD [1]											Non-OECD					
Year	Australia	Canada	France	Germany[2]	Italy	Japan	Spain	United Kingdom	United States	Other	Total	Brazil	China	Mexico	Russia	Former U.S.S.R.	World
1960	0.22	0.84	0.56	0.63	0.44	0.66	0.10	0.94	9.80	1.28	15.47	0.27	0.17	0.30	—	2.38	21.34
1961	0.23	0.87	0.63	0.79	0.54	0.82	0.12	1.04	9.98	1.45	16.46	0.28	0.17	0.29	—	2.57	23.00
1962	0.25	0.92	0.73	1.00	0.67	0.93	0.12	1.12	10.40	1.62	17.74	0.31	0.14	0.30	—	2.87	24.89
1963	0.29	0.99	0.86	1.17	0.77	1.21	0.12	1.27	10.74	1.85	19.26	0.34	0.17	0.31	—	3.15	26.92
1964	0.32	1.05	0.98	1.36	0.90	1.48	0.20	1.36	11.02	2.03	20.70	0.35	0.20	0.33	—	3.58	29.08
1965	0.35	1.14	1.09	1.61	0.98	1.74	0.23	1.49	11.51	2.30	22.44	0.33	0.23	0.34	—	3.61	31.14
1966	0.37	1.21	1.19	1.80	1.08	1.98	0.31	1.58	12.08	2.61	24.20	0.38	0.30	0.36	—	3.87	33.56
1967	0.41	1.25	1.34	1.86	1.19	2.14	0.36	1.64	12.56	2.72	25.48	0.38	0.28	0.39	—	4.22	35.59
1968	0.45	1.34	1.46	1.99	1.40	2.66	0.46	1.82	13.39	3.08	28.05	0.46	0.31	0.41	—	4.48	38.96
1969	0.49	1.42	1.66	2.33	1.69	3.25	0.49	1.98	14.14	3.49	30.94	0.48	0.44	0.45	—	4.87	42.89
1970	0.52	1.52	1.94	R2.83	1.71	3.82	0.58	2.10	14.70	3.79	R33.49	0.53	0.62	0.50	—	5.31	46.81
1971	0.48	1.56	2.12	R2.94	1.84	4.14	0.64	2.14	15.21	3.92	R34.99	0.58	0.79	0.52	—	5.66	49.42
1972	0.50	1.66	2.32	R3.13	1.95	4.36	0.68	2.28	16.37	4.29	R37.55	0.66	0.91	0.59	—	6.12	53.09
1973	0.57	1.73	2.60	R3.34	2.07	4.95	0.78	2.34	17.31	4.50	R40.18	0.78	1.12	0.67	—	6.60	57.24
1974	0.66	1.78	2.45	R3.06	2.00	4.86	0.86	2.21	16.65	4.16	R38.69	0.86	1.19	0.71	—	7.28	56.68
1975	0.64	1.78	2.25	R2.96	1.86	4.62	0.87	1.91	16.32	4.08	R37.29	0.92	1.36	0.75	—	7.52	56.20
1976	0.67	1.82	2.42	R3.21	1.97	4.84	0.97	1.89	17.46	4.44	R39.69	1.00	1.53	0.83	—	7.78	59.67
1977	0.68	1.85	2.29	R3.21	1.90	4.88	0.94	1.91	18.43	4.49	R40.58	1.02	1.64	0.88	—	8.18	61.83
1978	0.70	1.90	2.41	R3.29	1.95	4.95	0.98	1.94	18.85	4.59	R41.55	1.11	1.79	0.99	—	8.48	64.16
1979	0.69	1.97	2.46	R3.37	2.04	5.05	1.02	1.97	18.51	4.65	R41.75	1.18	1.84	1.10	—	8.64	R65.22
1980	0.59	1.87	2.26	R3.08	1.93	4.96	0.99	1.73	17.06	4.50	R38.97	1.15	1.77	1.27	—	9.00	63.07
1981	0.58	1.77	2.02	R2.80	1.87	4.85	0.94	1.59	16.06	4.13	R36.62	1.09	1.71	1.40	—	8.94	R60.90
1982	0.62	1.58	1.88	R2.74	1.78	4.58	1.00	1.59	15.30	3.82	R34.89	1.06	1.66	1.48	—	9.08	59.50
1983	0.59	1.45	1.84	R2.66	1.75	4.40	1.01	1.53	15.23	3.67	R34.13	0.98	1.73	1.35	—	8.95	58.74
1984	0.61	1.47	1.75	R2.66	1.65	4.58	0.91	1.85	15.73	3.63	R34.84	1.03	1.74	1.45	—	8.91	59.84
1985	0.63	1.50	1.78	R2.70	1.72	4.38	0.85	1.63	15.73	3.72	R34.63	1.08	1.89	1.47	—	8.95	60.10
1986	0.63	1.51	1.77	R2.86	1.74	4.44	0.88	1.65	16.28	3.90	R35.64	1.24	2.00	1.49	—	8.98	61.76
1987	0.64	1.55	1.79	R2.77	1.86	4.48	0.90	1.60	16.67	4.00	R36.25	1.26	2.12	1.52	—	9.00	63.01
1988	0.65	1.69	1.80	R2.74	1.84	4.75	0.98	1.70	17.28	3.98	R37.42	1.30	2.28	1.55	—	8.89	64.83
1989	0.69	1.73	1.86	R2.58	1.93	4.98	1.03	1.74	17.33	4.01	R37.87	1.32	2.38	1.66	—	8.74	66.03
1990	0.71	1.69	1.82	R2.66	1.87	5.14	1.01	1.75	16.99	4.12	R37.76	1.34	2.30	1.73	—	8.39	66.16
1991	0.71	1.62	1.94	2.83	1.86	5.28	1.07	1.80	16.71	4.25	38.07	1.35	2.50	1.80	—	8.35	66.71
1992	0.71	1.64	1.93	2.84	1.94	5.45	1.11	1.80	17.03	4.32	38.77	R1.37	R2.66	R1.83	R4.42	—	R66.57
1993P	0.76	1.66	1.91	2.90	1.88	5.38	1.09	1.80	17.24	4.38	39.00	1.41	3.11	1.84	3.79	—	66.71

[1] Organization for Economic Cooperation and Development. See Glossary for membership. "Other OECD" includes the United States territories of Puerto Rico, U.S. Virgin Islands, Guam, and Hawaiian Free Trade Zone. As of January 1, 1987, Hawaiian Free Trade Zone data are included in U.S. 50 States data.

[2] Through 1969, the data for Germany and Total OECD are for the former West Germany only. For 1970 through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

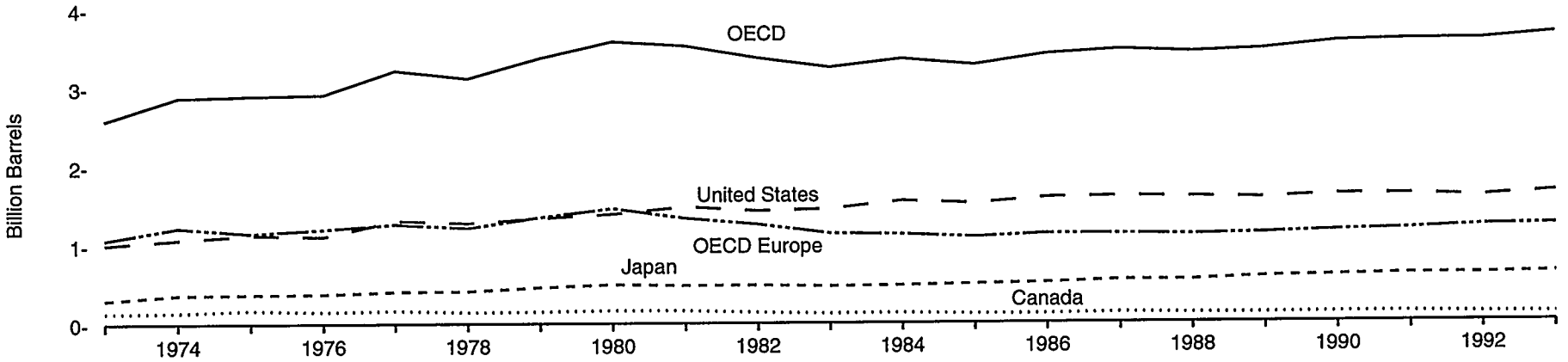
R=Revised data. P=Preliminary data. — = Not applicable.

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

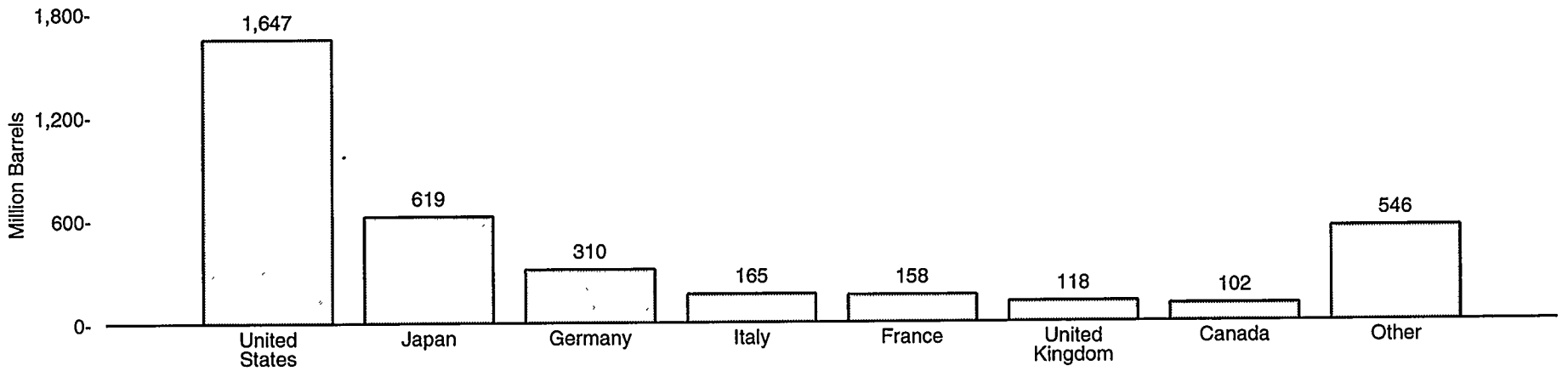
Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.11 Petroleum Stocks in OECD Countries, End of Year

Total, 1973-1993



By Country, 1993



Note: OECD=Organization for Economic Cooperation and Development. See Glossary for membership.

Source: Table 11.11.

Table 11.11 Petroleum Stocks in OECD Countries, End of Year 1973-1993

(Million Barrels)

Year	France	Germany [1]	Italy	United Kingdom	Other OECD Europe	OECD Europe	Canada	Japan	United States	Other OECD [2]	OECD
1973	201	181	152	156	380	1,070	140	303	1,008	67	2,588
1974	249	213	167	191	437	1,227	145	370	1,074	64	2,880
1975	225	187	143	165	434	1,154	174	375	1,133	67	2,903
1976	234	208	143	165	455	1,205	153	380	1,112	68	2,918
1977	239	225	161	148	495	1,268	167	409	1,312	68	3,224
1978	201	238	154	157	469	1,219	144	413	1,278	68	3,122
1979	226	272	163	169	523	1,353	150	460	1,341	75	3,379
1980	243	319	170	168	564	1,464	164	495	1,392	72	3,587
1981	214	297	167	143	516	1,337	161	482	1,484	67	3,531
1982	193	272	179	125	489	1,258	136	484	1,430	68	3,376
1983	153	249	149	118	473	1,142	121	470	1,454	68	3,255
1984	152	239	159	112	468	1,130	128	479	1,556	69	3,362
1985	139	233	157	123	440	1,092	113	494	1,519	66	3,284
1986	127	252	155	124	475	1,133	111	509	1,593	72	3,418
1987	127	259	169	121	454	1,130	126	540	1,607	R71	3,474
1988	140	266	155	112	R445	1,118	116	538	1,597	71	3,440
1989	138	271	164	118	442	1,133	114	577	1,581	71	3,476
1990	140	265	172	112	R474	1,163	121	590	1,621	73	3,568
1991	153	288	160	119	R461	R1,181	119	R606	1,617	65	R3,588
1992	146	310	174	113	R476	1,219	107	603	1,592	67	R3,588
1993	158	310	165	118	478	1,229	102	619	1,647	68	3,665

[1] 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.

[2] Australia, New Zealand, and United States Territories.

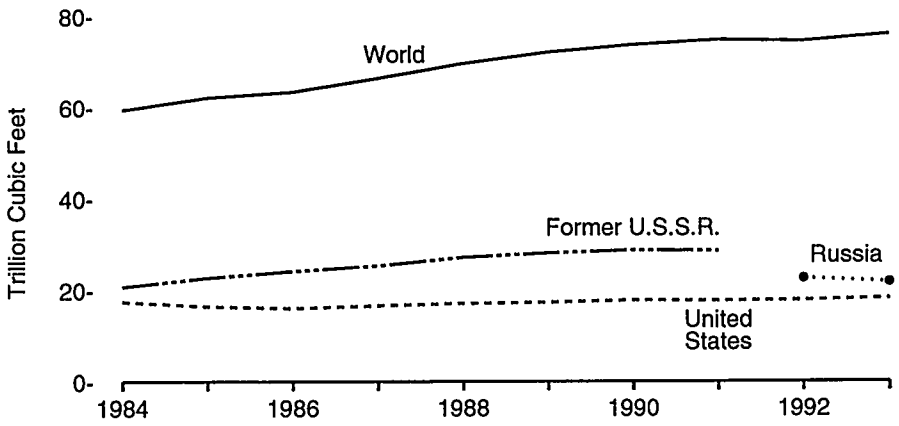
R=Revised data.

Notes: • Includes crude oil, lease condensate, natural gas plant liquids, unfinished oils, and finished petroleum products. See Note 2 at end of section. • Organization for Economic Cooperation and Development. See Glossary for membership. • Totals may not equal sum of components due to independent rounding.

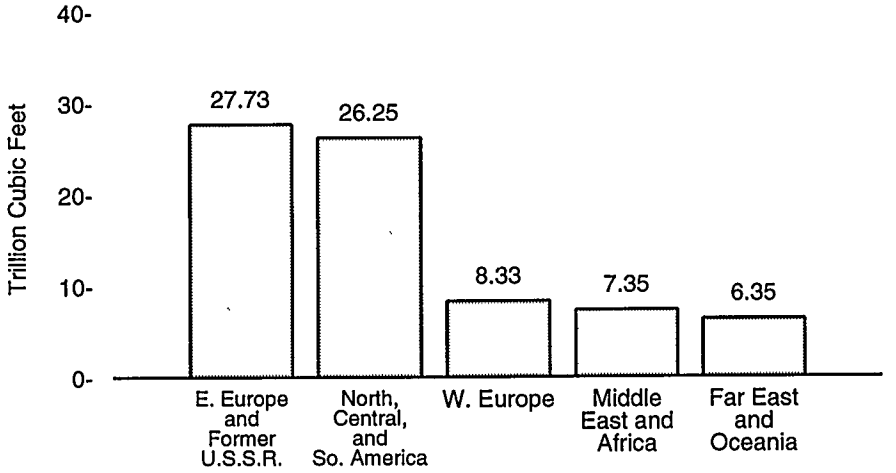
Sources: **United States:** Table 5.14. **All Other Data:** Organization for Economic Cooperation and Development, International Energy Agency, Monthly Oil Statistics Database.

Figure 11.12 World Dry Natural Gas Production

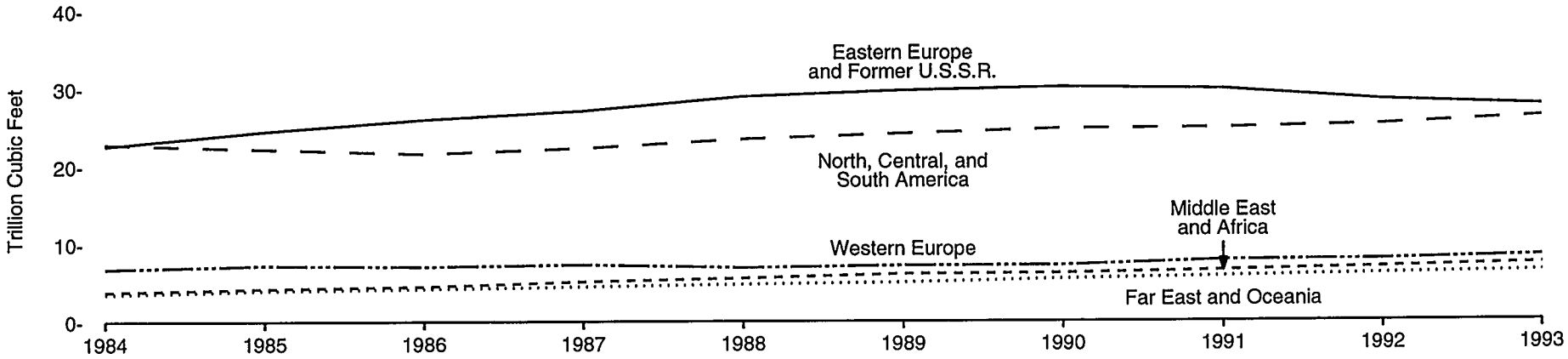
World and Leading Producers, 1984-1993



World Areas, 1993



World Areas, 1984-1993



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

Source: Table 11.12.

Table 11.12 World Dry Natural Gas Production, 1984-1993

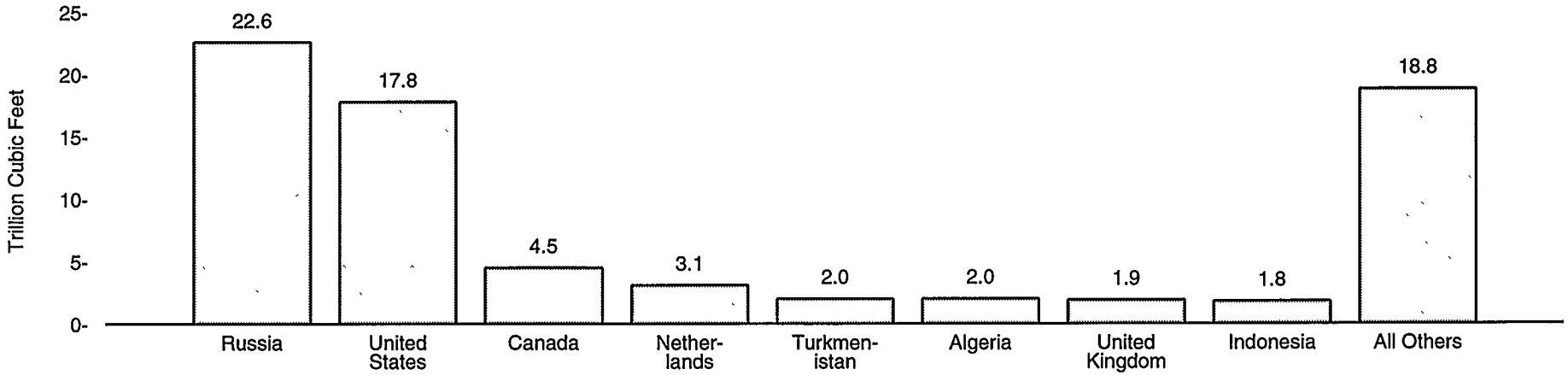
(Trillion Cubic Feet)

Region and Country	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 P
North, Central, and South America	22.82	R22.21	R21.62	R22.33	23.47	24.16	R24.78	R24.87	R25.26	26.25
Argentina	0.49	0.50	0.55	0.53	0.63	0.72	0.63	0.64	R0.54	0.55
Canada	2.61	R3.04	R2.86	R3.10	R3.57	3.80	R3.90	4.12	R4.53	4.96
Mexico	1.04	0.95	0.92	0.86	0.92	0.93	0.94	0.94	R0.92	0.92
United States	17.47	16.45	16.06	16.62	17.10	17.31	17.81	17.70	17.84	18.24
Venezuela	0.61	0.62	0.67	0.66	0.66	0.77	0.86	0.83	R0.76	0.86
Other	0.60	R0.65	0.56	0.55	R0.59	0.64	R0.63	0.65	R0.67	0.72
Western Europe	R6.76	R7.22	R7.07	R7.32	R6.91	R7.16	R7.19	R7.83	R7.89	8.33
Germany [1]	R0.82	R0.77	R0.71	R0.79	R0.74	R0.71	R0.67	0.67	R0.68	0.64
Italy	0.49	0.50	0.56	0.58	0.59	0.60	0.61	0.61	0.64	0.68
Netherlands	2.65	R3.01	2.76	2.77	2.45	2.67	2.69	3.04	3.06	3.11
Norway	0.93	0.94	0.99	1.06	1.05	1.09	0.98	R0.97	R1.04	1.02
United Kingdom	1.42	1.52	1.60	1.68	1.62	1.58	R1.75	2.01	R1.93	2.31
Other	R0.44	R0.45	R0.45	0.44	0.46	0.51	R0.49	R0.54	R0.52	0.55
Eastern Europe and Former U.S.S.R.	R22.58	R24.50	R26.03	R27.14	R28.95	R29.70	R30.13	29.85	R28.42	27.73
Romania	1.34	1.27	1.34	1.32	1.28	1.13	R1.00	0.88	0.78	0.75
Russia	—	—	—	—	—	—	—	—	22.62	21.80
Turkmenistan	—	—	—	—	—	—	—	—	R1.97	2.13
Ukraine	—	—	—	—	—	—	—	—	R0.64	0.59
Former U.S.S.R.	20.74	22.71	24.19	25.36	27.19	28.11	28.78	28.62	—	—
Uzbekistan	—	—	—	—	—	—	—	—	R1.50	1.58
Other	R0.50	R0.53	R0.51	R0.46	R0.47	R0.46	R0.35	0.35	R0.90	0.87
Middle East and Africa	3.81	4.24	4.51	5.13	5.55	6.08	6.17	R6.52	R6.90	7.35
Algeria	1.36	1.36	1.33	1.52	1.63	1.71	1.79	1.93	1.97	1.98
Iran	0.48	0.60	0.54	R0.56	0.71	0.78	0.84	0.92	0.88	1.04
Qatar	0.21	0.19	0.19	0.20	0.21	0.22	0.28	0.33	0.40	0.41
Saudi Arabia	0.62	0.72	0.89	0.95	1.03	1.05	1.08	1.13	1.20	1.27
United Arab Emirates	0.34	0.48	0.54	0.68	0.66	0.81	0.78	0.92	R1.02	1.04
Other	R0.79	R0.89	R1.03	R1.22	R1.29	R1.52	R1.41	R1.29	R1.43	1.61
Far East and Oceania	3.50	R4.00	4.21	4.50	4.78	4.98	R5.44	R5.76	R6.06	6.35
Australia	0.40	R0.46	0.52	0.53	0.56	0.57	0.72	R0.75	R0.82	0.86
China	0.44	0.46	0.48	0.49	0.49	0.51	0.51	0.53	R0.53	0.56
India	0.11	0.14	0.18	0.23	0.31	0.32	0.40	0.45	R0.48	0.47
Indonesia	1.06	1.23	1.18	1.29	1.34	1.42	1.53	1.72	R1.79	1.85
Malaysia	0.33	0.44	0.53	0.55	0.58	0.61	0.65	0.75	R0.80	0.88
Pakistan	0.35	0.37	0.39	0.42	0.44	0.47	R0.48	0.53	R0.55	0.58
Other	R0.81	R0.93	R0.93	R0.98	R1.05	R1.08	R1.15	R1.04	R1.11	1.17
World	59.46	R62.17	R63.45	R66.41	69.65	72.09	R73.71	R74.83	R74.53	76.01

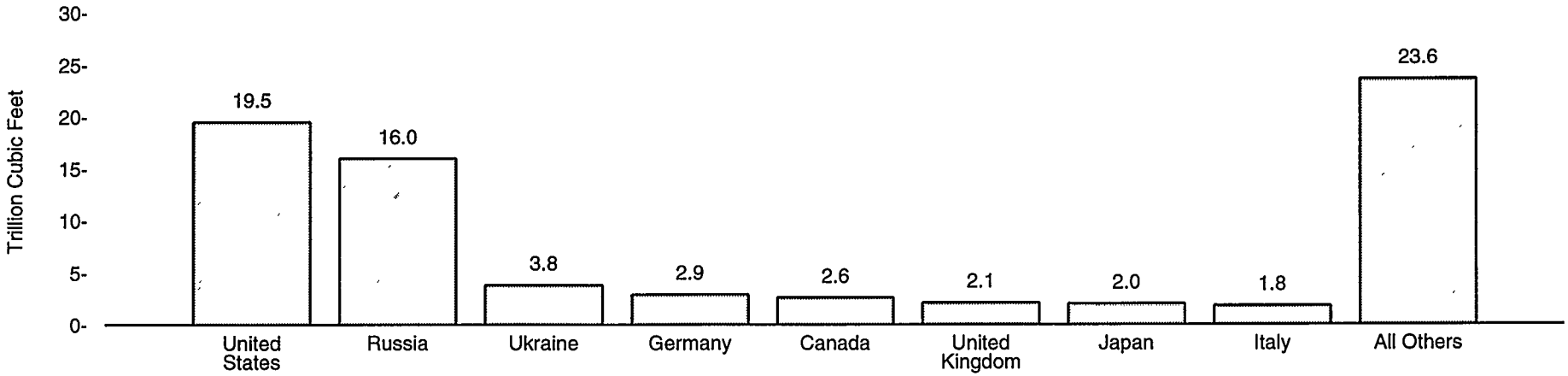
[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.
R=Revised data. P=Preliminary data. — = Not applicable.
Note: Totals may not equal sum of components due to independent rounding and the inclusion of more recent U.S. data from an alternative source.
Sources: **United States:** Table 6.1. **All Other Data:** Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.13 World Dry Natural Gas Production and Consumption, 1992

Production by Selected Country



Consumption by Selected Country



Source: Table 11.13.

Table 11.13 World Dry Natural Gas Supply and Disposition, 1992

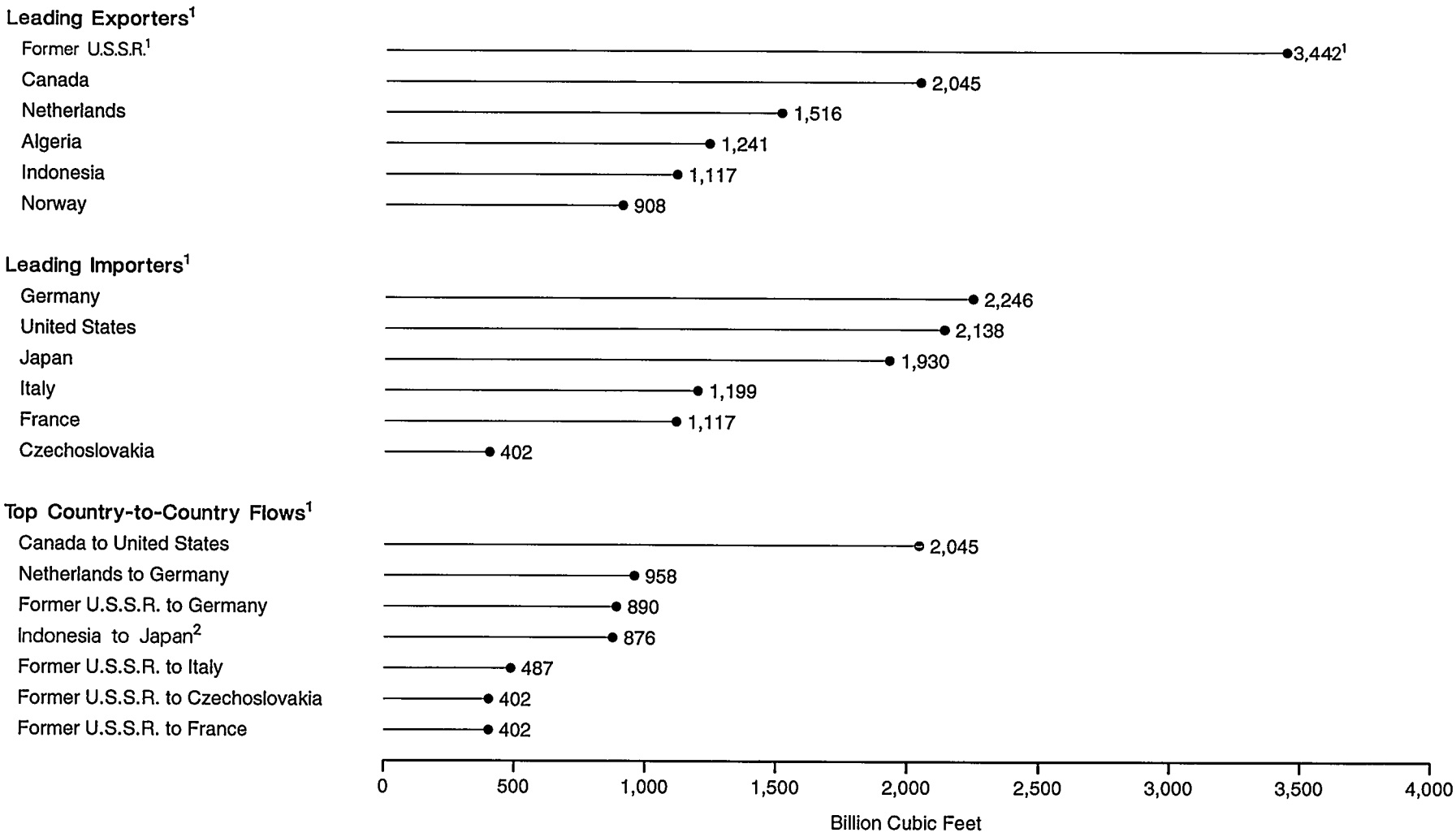
(Billion Cubic Feet)

Region and Country	Supply		Disposition	
	Dry Natural Gas Production	Imports [1]	Exports [1]	Apparent Consumption [2]
North, Central, and South America	**25,262**	**2,347**	**2,339**	**25,100**
Argentina	542	78	0	620
Canada	4,530	40	2,045	2,574
Mexico	924	92	0	1,015
United States	17,840	2,138	216	19,544
Venezuela	763	0	0	763
Other	663	0	78	584
Western Europe	**7,889**	**6,101**	**2,576**	**11,262**
Belgium and Luxembourg	0	397	0	393
France	111	1,117	37	1,139
Germany	677	2,246	55	2,858
Italy	641	1,199	1	1,757
Netherlands	3,058	104	1,516	1,669
Norway	1,039	0	908	131
United Kingdom	1,935	199	2	2,127
Other	428	837	57	1,188
Eastern Europe and Former U.S.S.R.	**28,420**	**6,622**	**8,927**	**26,174**
Czechoslovakia	10	402	0	411
Hungary	174	169	0	342
Poland	142	221	0	362
Romania	782	136	0	917
Russia	22,616	248	6,897	15,967
Turkmenistan	1,967	0	1,658	309
Ukraine	643	3,132	12	3,826
Uzbekistan	1,504	63	222	1,345
Other	582	2,251	138	2,695
Middle East and Africa	**6,904**	**17**	**1,427**	**5,494**
Algeria	1,971	0	1,241	730
Egypt	349	0	0	349
Iran	883	0	0	883
Saudi Arabia	1,201	0	0	1,201
United Arab Emirates	1,023	0	121	902
Other	1,477	17	65	1,429
Far East and Oceania	**6,059**	**2,171**	**1,989**	**6,254**
Australia	817	0	213	603
China	533	0	0	533
India	477	0	0	477
Indonesia	1,792	0	1,117	673
Japan	76	1,930	0	2,023
Malaysia	796	0	408	388
Pakistan	551	0	0	551
Other	1,017	241	251	1,006
World	**74,533**	**17,258**	**17,256**	**74,285**

[1] Includes liquefied natural gas.
[2] Includes stock changes.
Note: Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.14 International Natural Gas Flow, 1992



[1] Precise trade data for the countries of the former U.S.S.R. are not available. In 1992, it is estimated that those countries exported 5,485 billion cubic feet of natural gas to each other and exported 3,442 billion cubic feet to countries outside the area of the former U.S.S.R. The column total (8,927 billion cubic feet) is the sum of the exports among members of the former U.S.S.R. and to countries outside of the former U.S.S.R.

[2] Liquefied natural gas.

Source: Table 11.14.

Table 11.14 International Natural Gas Flow, 1992

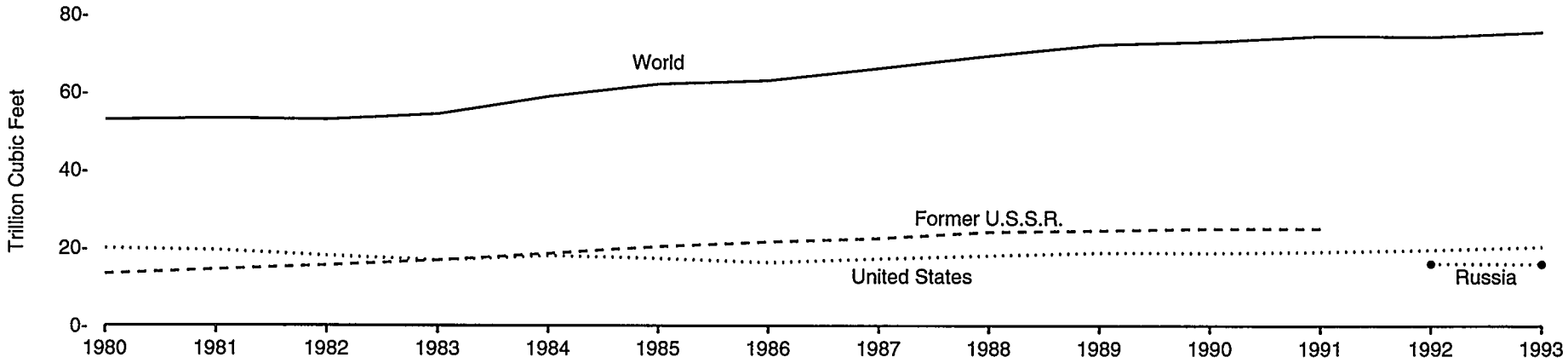
(Billion Cubic Feet)

Importer	Exporter													
	North and South America			Western Europe			Eastern Europe		Middle East [4]	Africa		Far East and Oceania		Total
	Canada	United States	Other [1]	Nether-lands	Norway	Other [2]	Former U.S.S.R. [3]	Other		Algeria	Other [5]	Indonesia	Other [6]	
North America														
Canada	—	40	0	0	0	0	0	0	0	0	0	0	0	40
Mexico	0	92	0	0	0	0	0	0	0	0	0	0	0	92
United States	2,045	—	0	0	0	0	0	0	0	[7] 93	0	0	0	[7] 2,138
Central and South America														
Argentina	0	0	78	0	0	0	0	0	0	0	0	0	0	78
Western Europe														
Austria	0	0	0	0	0	8	173	0	0	0	0	0	0	181
Belgium and Luxembourg	0	0	0	159	67	2	0	0	0	[7] 169	0	0	0	[7] 397
Finland	0	0	0	0	0	0	104	0	0	0	0	0	0	104
France	0	0	0	197	201	1	402	0	0	[7] 316	0	0	0	[7] 1,117
Germany	0	0	0	958	340	58	890	0	0	0	0	0	0	2,246
Italy	0	0	0	192	0	0	487	0	0	520	0	0	0	1,199
Netherlands	0	0	0	—	102	2	0	0	0	0	0	0	0	104
Spain	0	0	0	0	0	0	0	0	0	[7] 122	[7] 65	0	0	[7] 187
Sweden	0	0	0	0	0	27	0	0	0	0	0	0	0	27
Switzerland	0	0	0	10	0	52	12	0	0	4	0	0	0	78
Turkey	0	0	0	0	0	0	157	0	0	0	0	0	0	157
United Kingdom	0	0	0	0	199	0	0	0	0	0	0	0	0	199
Former Yugoslavia	0	0	0	0	0	0	104	0	0	0	0	0	0	104
Eastern Europe and Former U.S.S.R. [3]														
Bulgaria	0	0	0	0	0	0	186	0	0	0	0	0	0	186
Czechoslovakia	0	0	0	0	0	0	402	0	0	0	0	0	0	402
Hungary	0	0	0	0	0	0	169	0	0	0	0	0	0	169
Poland	0	0	0	0	0	0	221	0	0	0	0	0	0	221
Romania	0	0	0	0	0	0	136	0	0	0	0	0	0	136
Former U.S.S.R. [3]	0	0	0	0	0	0	[3] 5,485	0	0	0	0	0	23	5,508
Middle East														
Kuwait	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United Arab Emirates	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Africa														
Tunisia	0	0	0	0	0	0	0	0	0	17	0	0	0	17
Far East and Oceania														
Japan	0	[7] 84	0	0	0	0	0	0	[7] 121	0	0	[7] 876	[7] 849	[7] 1,930
South Korea	0	0	0	0	0	0	0	0	0	0	0	[7] 162	0	[7] 162
Taiwan	0	0	0	0	0	0	0	0	0	0	0	[7] 79	0	[7] 79
World	2,045	[7] 216	78	1,516	908	150	8,927	0	[7] 121	[7] 1,241	[7] 65	[7] 1,117	[7] 872	[7] 17,257

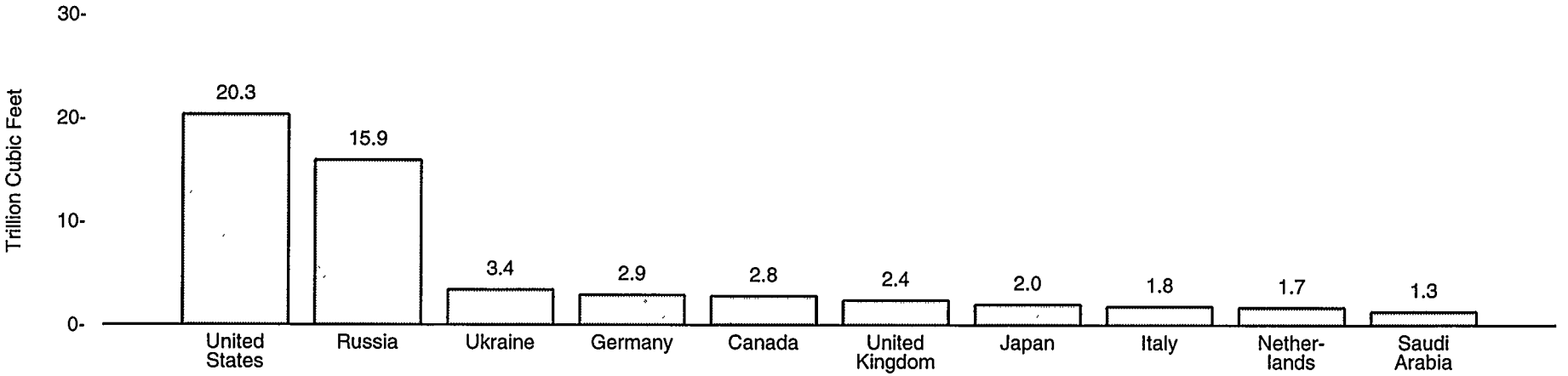
[1] Bolivia.
[2] Denmark, France, Germany, Italy, and United Kingdom.
[3] Precise trade data for the countries of the former U.S.S.R. are not available. In 1992, it is estimated that those countries exported 5,485 billion cubic feet of natural gas to each other and exported 3,442 billion cubic feet to countries outside the area of the former U.S.S.R. The column total (8,927 billion cubic feet) is the sum of the exports among members of the former U.S.S.R. and to countries outside of the former U.S.S.R.
[4] United Arab Emirates.
[5] Libya.
[6] Australia, Brunei, and Malaysia.
[7] Includes liquefied natural gas.
— = Not applicable.
Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.15 World Dry Natural Gas Consumption

World and Leading Consumers, 1980-1993



Top Consuming Countries, 1993



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

Source: Table 11.15.

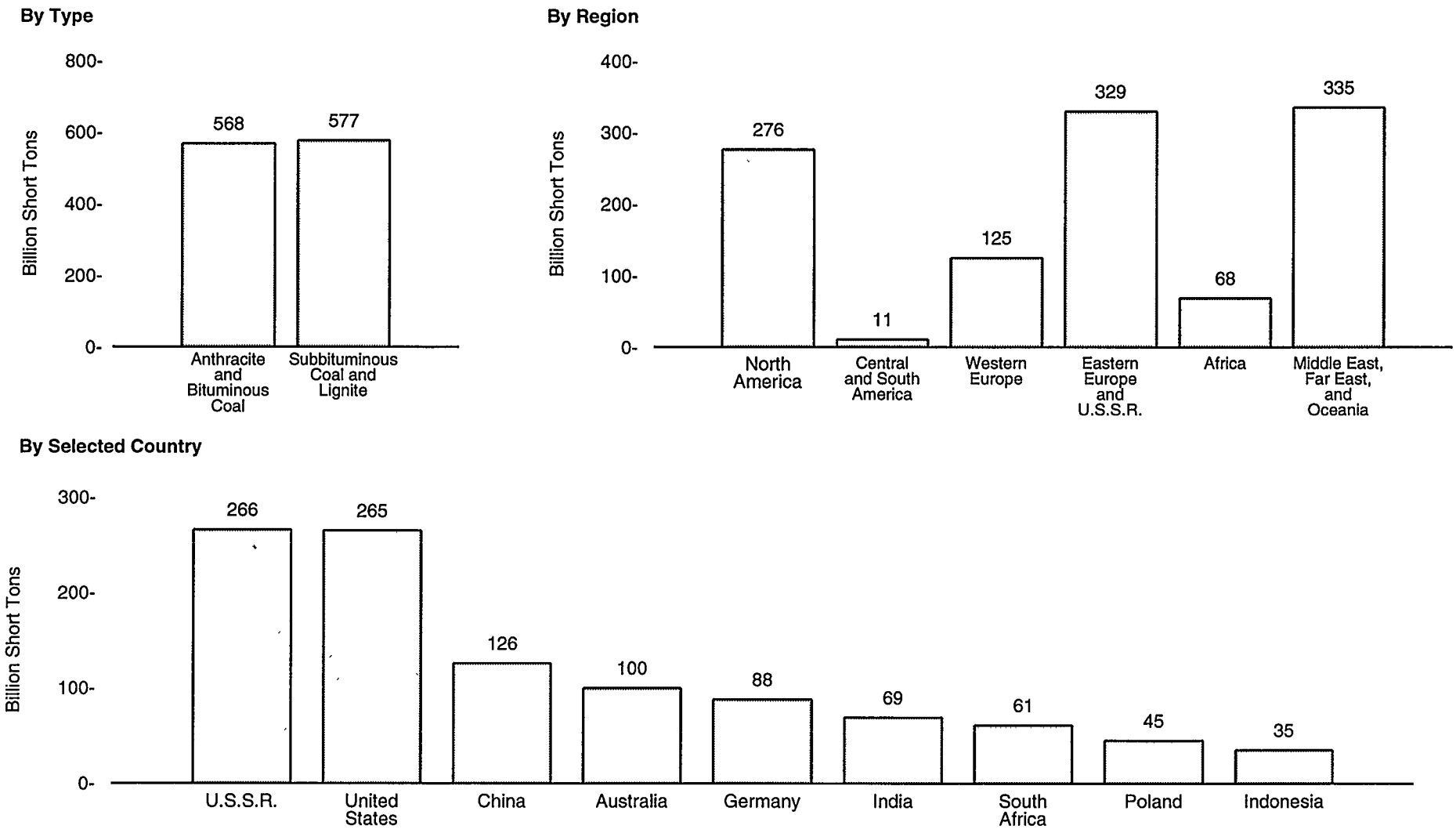
Table 11.15 World Dry Natural Gas Consumption, 1980-1993

(Billion Cubic Feet)

Year	Canada	France	Germany[1]	Italy	Japan	Mexico	Nether-lands	Romania	Russia	Saudi Arabia	Ukraine	United Kingdom	United States	Former U.S.S.R.	Uzbek-istan	Other	World
1980	R1,883	1,006	R2,465	973	903	908	1,493	1,251	—	517	—	1,702	19,877	13,328	—	R6,624	R52,930
1981	1,708	996	R2,359	983	886	930	1,421	1,267	—	460	—	1,671	19,404	14,440	—	R6,753	R53,278
1982	1,664	913	R2,189	989	919	1,016	1,511	1,411	—	201	—	1,570	18,001	15,522	—	R7,049	R52,955
1983	1,807	1,049	R2,274	1,009	1,008	1,078	1,371	1,446	—	200	—	1,774	16,835	16,822	—	R7,708	R54,381
1984	1,855	1,029	R2,372	1,171	1,367	990	1,395	1,395	—	253	—	1,900	17,951	18,512	—	R8,664	R58,854
1985	R2,165	R1,120	R2,369	R1,156	R1,468	955	R1,613	1,336	—	716	—	R1,991	17,281	20,302	—	R9,589	R62,061
1986	R2,131	1,127	R2,408	1,238	1,494	923	1,620	1,410	—	890	—	2,020	16,221	21,522	—	R10,002	R63,006
1987	R2,112	1,057	R2,592	1,371	1,543	865	1,672	1,405	—	946	—	2,079	17,211	22,462	—	R10,825	R66,140
1988	2,331	961	R2,519	1,460	1,618	926	1,513	1,306	—	1,028	—	1,972	18,030	24,092	—	R11,643	R69,399
1989	2,498	991	R2,635	1,578	1,731	943	1,550	1,384	—	1,052	—	1,951	18,801	24,529	—	R12,670	R72,313
1990	2,420	1,022	R2,624	1,672	1,851	946	R1,538	R1,261	—	1,077	—	2,059	18,716	24,961	—	R12,905	R73,052
1991	2,454	R1,143	R2,883	R1,773	R1,976	994	R1,715	1,040	—	1,130	—	R2,218	19,035	25,014	—	R13,170	R74,545
1992	R2,574	R1,139	R2,858	R1,757	R2,023	1,015	R1,669	R917	R15,967	1,201	R3,826	R2,127	19,544	—	R1,345	R16,323	R74,285
1993P	2,789	1,168	2,893	1,801	2,034	968	1,714	911	15,892	1,268	3,428	2,383	20,293	—	1,243	16,726	75,511

[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.
R=Revised data. P=Preliminary data. — = Not applicable.
Note: Totals may not equal sum of components due to independent rounding and the inclusion of more recent U.S. data from an alternative source.
Sources: **United States:** Table 6.1. **All Other Data:** Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.16 World Recoverable Reserves of Coal



Notes: • Recoverable reserves are as of December 31, 1990, except for the United States, which is as of December 31, 1991.

• Because vertical scales differ, graphs should not be compared.
Source: Table 11.16.

Table 11.16 World Recoverable Reserves of Coal

(Million Short Tons)

Region and Country	Anthracite and Bituminous Coal	Subbituminous Coal and Lignite	Total
North America	**123,741**	**152,544**	**276,285**
Canada	4,970	4,535	9,505
Mexico	1,380	516	1,896
United States [1]	117,391	147,291	264,682
Other	—	202	202
Central and South America	**6,226**	**4,478**	**10,703**
Brazil	—	2,600	2,600
Chile	34	1,268	1,302
Colombia	4,674	330	5,003
Peru	1,058	110	1,168
Other	460	169	629
Western Europe	**32,411**	**92,493**	**124,904**
Germany	26,366	61,895	88,261
Greece	—	3,307	3,307
Spain	937	661	1,598
Turkey	179	7,701	7,879
United Kingdom	3,638	551	4,189
Yugoslavia	77	18,188	18,265
Other	1,215	190	1,404
Eastern Europe and U.S.S.R.	**150,021**	**179,436**	**329,457**
Bulgaria	33	4,079	4,112
Czechoslovakia	2,061	3,858	5,919
Hungary	657	4,260	4,917
Poland	32,628	12,787	45,415
Romania	1	3,436	3,437
U.S.S.R.	114,640	151,017	265,657
Africa	**67,033**	**1,397**	**68,429**
Botswana	3,858	—	3,858
South Africa	60,994	—	60,994
Swaziland	—	1,101	1,101
Zimbabwe	809	—	809
Other	1,371	295	1,667
Middle East, Far East, and Oceania	**188,523**	**146,710**	**335,233**
Australia	49,979	50,265	100,244
China	68,564	57,651	126,215
India	66,853	2,094	68,947
Indonesia	1,060	34,283	35,343
Japan	912	19	930
Other	1,155	2,398	3,552
World	**567,954**	**577,057**	**1,145,011**

[1] U.S. data are more current than other data on this table. They represent recoverable reserves as of December 31, 1991; data for the other countries are as of December 31, 1990, the most recent period for which they are available. U.S. reserves represent both measured and indicated tonnage. The U.S. term "measured" approximates the term "proved," which is used by the World Energy Council. The U.S. "measured and indicated" data have been combined prior to depletion adjustments and cannot be recaptured as "measured alone."

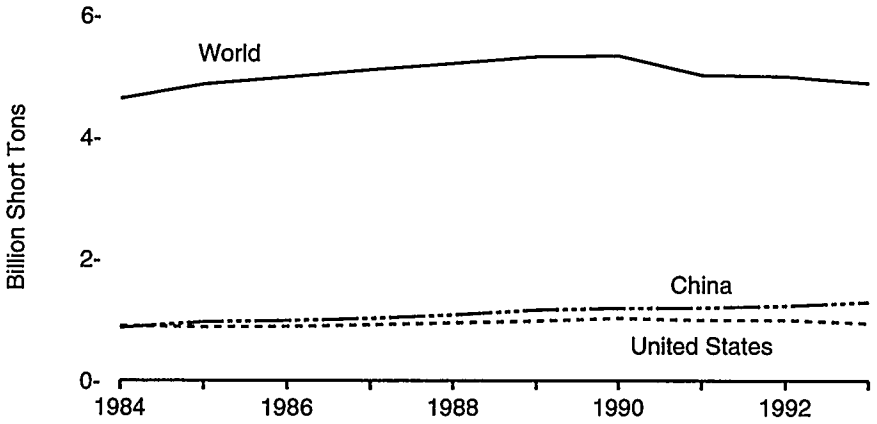
— = Not applicable.

Notes: • World Energy Council definition of "Proved Recoverable Reserves" is the tonnage of Proved Amount in Place that can be recovered (extracted from the earth in raw form) under present and expected local economic conditions with existing technology. • The EIA does not certify the international reserves data but reproduces the information as a matter of convenience for the reader. • Totals may not equal sum of components due to independent rounding.

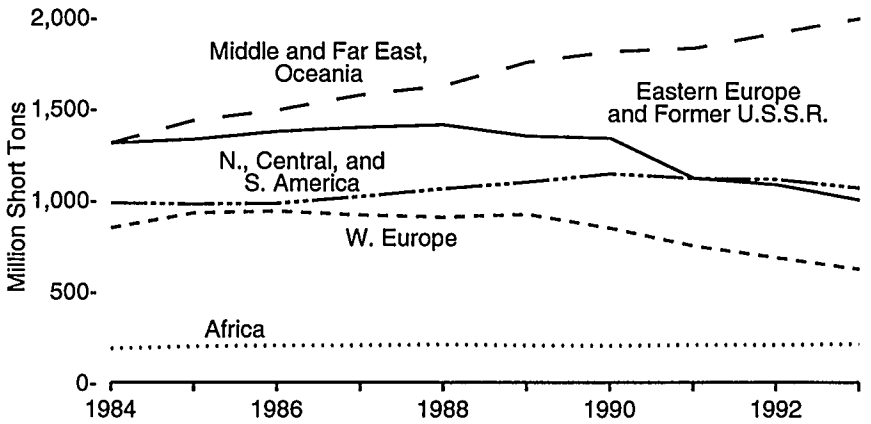
Sources: **United States:** Energy Information Administration, *U.S. Coal Reserves: An Update by Heat and Sulfur Content*, (February 1993). **All Other Data:** World Energy Council, *1992 Survey of Energy Resources*. World Energy Conference (1992).

Figure 11.17 World Coal Production

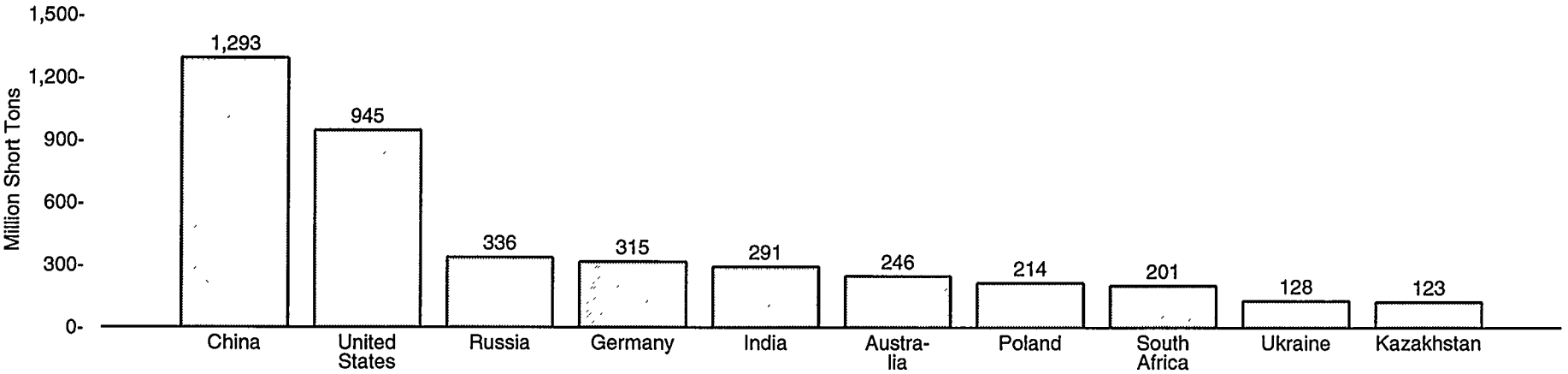
World and Leading Producers, 1984-1993



World Areas, 1984-1993



Top Producing Countries, 1993



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

Source: Table 11.17.

Table 11.17 World Coal Production, 1984-1993

(Million Short Tons)

Region and Country	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 P
North, Central, and South America	982	R977	981	R1,018	1,061	R1,097	1,142	1,118	R1,111	1,065
Canada	63	67	64	67	78	78	75	78	72	76
Colombia	8	R11	12	R16	17	21	23	26	26	26
United States	896	884	890	919	950	981	1,029	996	998	945
Other	15	16	15	16	16	17	15	17	R16	17
Western Europe	R846	R928	R938	R917	R905	R921	R845	R748	R683	620
France	21	19	18	17	17	R18	R16	R16	R14	13
Germany[1]	R563	R578	R568	R554	R552	R540	R479	R391	346	315
Greece	35	40	42	49	51	57	57	58	R61	57
Spain	R49	R48	R46	R38	R38	R45	46	R36	37	35
Turkey	R33	R45	R52	52	R44	R58	53	59	R57	57
United Kingdom	R56	104	119	115	R115	111	R104	R105	94	75
Former Yugoslavia	72	R77	77	R79	R80	82	84	R79	R71	64
Other	R17	R19	R16	R13	9	8	6	R5	R4	4
Eastern Europe and Former U.S.S.R.	R1,310	R1,331	R1,374	R1,397	R1,411	R1,349	R1,337	R1,119	R1,083	999
Bulgaria	36	34	R39	R41	38	38	35	R32	R33	32
Former Czechoslovakia	R145	R142	R141	R141	R138	R132	R117	R109	R99	—
Czech Republic	—	—	—	—	—	—	—	—	—	88
Hungary	R25	27	R26	R25	23	R18	R17	19	17	16
Kazakhstan	—	—	—	—	—	—	—	—	R140	123
Poland	267	275	286	R293	294	275	237	231	R219	214
Romania	49	51	52	R57	R65	68	42	R33	R42	44
Russia	—	—	—	—	—	—	—	—	R375	336
Slovakia	—	—	—	—	—	—	—	—	—	10
Ukraine	—	—	—	—	—	—	—	—	R147	128
Former U.S.S.R.	R787	R801	R828	R838	R851	R816	R886	R694	—	—
Other	R2	R2	R2	R2	R2	R2	R2	1	R10	9
Africa	R185	R197	R202	R203	208	R203	R201	R206	R205	211
South Africa	R180	R191	195	195	200	194	R193	197	R196	201
Other	5	6	R7	8	8	8	R9	9	9	10
Middle East, Far East, and Oceania	R1,310	R1,435	1,491	R1,574	R1,625	R1,753	R1,811	R1,830	R1,913	1,992
Australia	R152	R172	187	209	R196	216	R226	236	R248	246
China	870	R962	R986	1,023	1,080	1,162	R1,190	R1,199	R1,230	1,293
India	168	173	188	207	208	230	250	249	R281	291
Indonesia	R2	2	3	R4	5	R9	12	R16	25	30
North Korea	51	53	R55	R56	R60	R67	R65	R65	R65	68
South Korea	R24	R25	R27	R27	R27	23	19	17	13	10
Thailand	3	6	6	R8	R8	R10	14	16	17	18
Other	R41	R43	40	R41	R41	R36	R35	R33	R33	34
World	R4,633	R4,869	R4,986	R5,108	R5,210	R5,322	R5,336	R5,020	R4,996	4,885

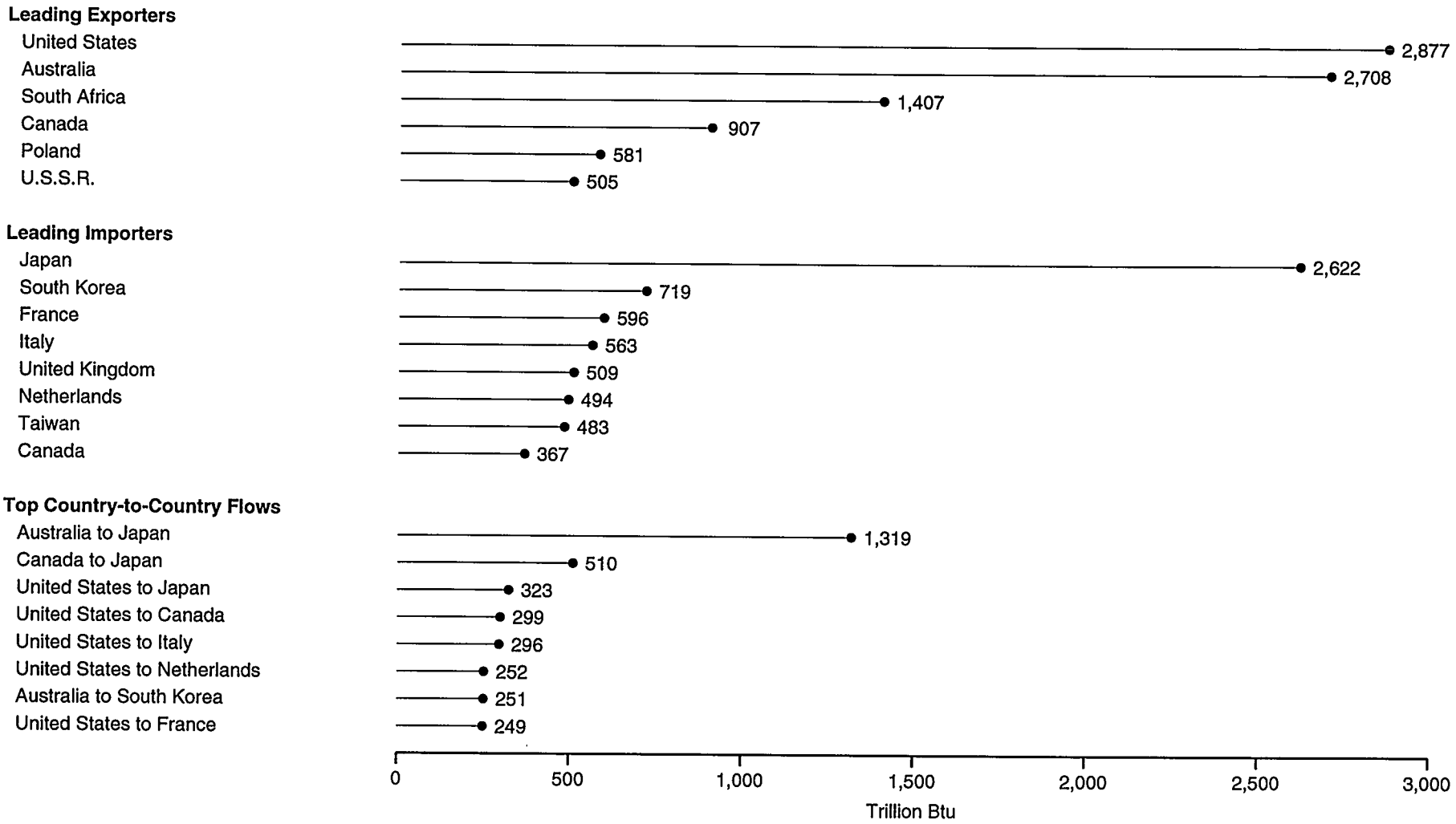
[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

R=Revised data. P=Preliminary data. — = 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.

Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.18 International Coal Flow, 1991



Source: Table 11.18.

Table 11.18 International Coal Flow, 1991

(Trillion Btu)

Importer	Exporter															
	North, Central, and South America			Western Europe				Eastern Europe			Africa	Far East			Other	Total
	Canada	United States	Colombia	Belgium	Germany	Nether-lands	United Kingdom	Czecho-slovakia	Poland	U.S.S.R.	South Africa	Aus-tralia	China	Japan		
North America																
Canada	—	299	0	0	0	0	0	0	0	0	0	0	0	0	67	367
United States	22	—	44	0	0	0	1	0	0	0	0	5	(s)	21	23	116
Other	2	5	0	0	0	0	0	0	0	0	0	0	0	0	(s)	7
Central and South America																
Brazil	36	188	1	0	(s)	0	(s)	0	21	0	20	45	4	0	13	330
Other	10	22	16	(s)	10	0	0	0	9	0	18	14	0	0	(s)	99
Western Europe																
Belgium and Luxembourg	3	197	4	—	24	18	4	0	15	10	105	38	5	0	39	464
Denmark	24	122	68	(s)	(s)	0	5	(s)	24	29	0	45	2	0	4	327
Finland	0	14	16	(s)	1	5	2	2	63	19	0	(s)	7	0	0	130
France	14	249	49	4	33	6	10	0	10	18	25	96	39	0	38	596
Germany	12	46	18	11	—	5	6	32	120	5	158	31	5	0	10	461
Italy	9	296	11	1	17	0	(s)	(s)	20	20	141	33	8	0	3	563
Netherlands	11	252	26	6	11	—	(s)	(s)	24	(s)	33	127	1	0	(s)	494
Spain	5	124	16	3	8	3	8	(s)	6	8	141	26	0	0	8	359
United Kingdom	25	162	62	5	7	45	—	0	19	19	19	107	6	0	31	509
Other	16	203	33	6	19	13	14	42	106	52	114	57	(s)	2	38	727
Eastern Europe and U.S.S.R.																
Bulgaria	0	25	0	0	0	0	0	(s)	0	71	0	0	0	0	1	97
Czechoslovakia	0	0	0	0	0	0	0	—	78	46	0	0	0	0	5	130
Romania	0	30	0	0	0	0	0	(s)	5	82	0	17	4	0	1	140
U.S.S.R.	0	1	0	0	0	0	0	(s)	0	—	0	0	0	0	29	31
Other	0	3	0	0	0	0	0	5	31	(s)	0	0	0	0	25	65
Middle East																
Israel	0	17	15	(s)	(s)	0	(s)	0	0	0	71	12	0	0	0	115
Other	3	(s)	0	(s)	(s)	0	0	0	(s)	0	0	9	0	0	(s)	13
Africa																
Algeria	0	14	0	0	0	0	(s)	0	0	0	0	10	0	0	12	36
Egypt	0	20	0	0	0	0	(s)	0	0	0	0	10	0	0	3	33
Other	0	33	0	(s)	0	0	3	2	(s)	3	21	1	0	3	1	69
Far East and Oceania																
Hong Kong	0	16	0	0	0	0	0	0	0	0	62	80	55	0	34	248
Japan	510	323	8	0	0	0	0	0	(s)	98	236	1,319	99	—	27	2,622
South Korea	170	97	0	0	0	0	0	0	0	11	77	251	100	0	10	719
Taiwan	20	119	0	0	0	0	0	0	0	0	152	159	32	(s)	(s)	483
Other	9	(s)	10	0	1	0	(s)	25	22	8	7	207	89	48	4	432
World	907	2,877	399	37	135	95	56	114	581	505	1,407	2,708	460	75	427	10,783

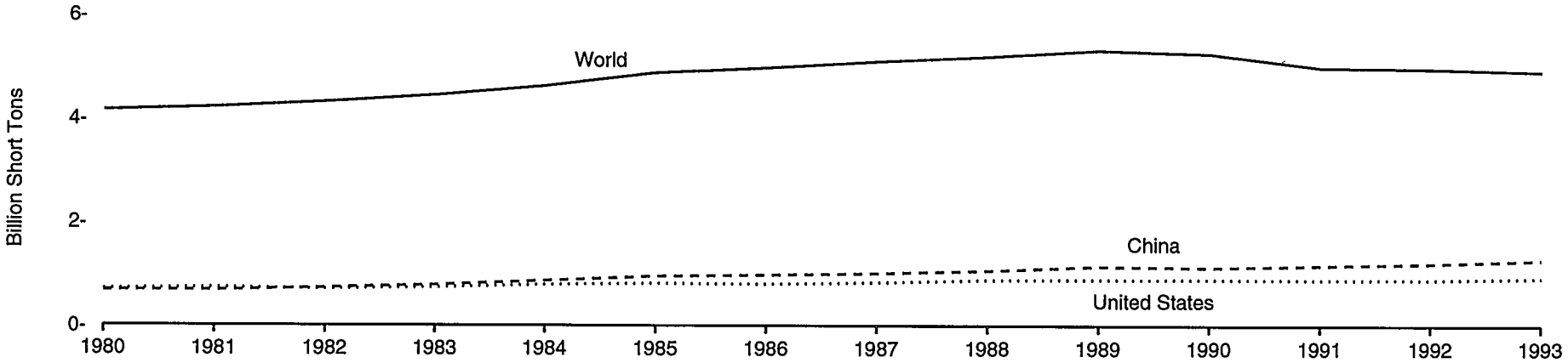
– = Not applicable. (s)=Less than 500 million Btu.

Notes: • Includes coal coke. • Totals may not equal sum of components due to statistical discrepancies, losses, unaccounted for coal and coal trade not in national accounts, such as the United States shipment of coal to United States Armed Forces in Europe.

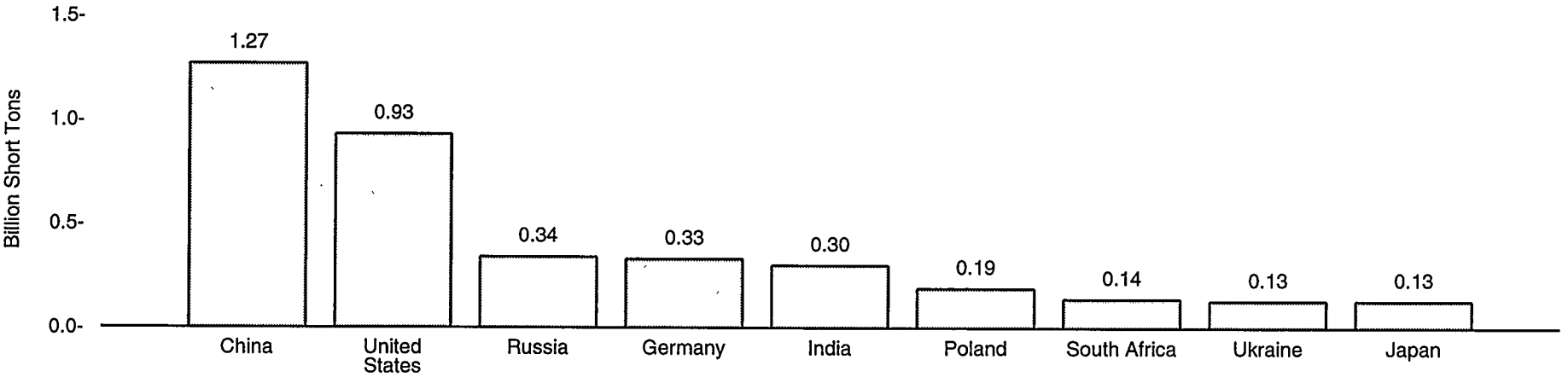
Source: Energy Information Administration, *International Energy Annual 1992* (January 1994), Table 27.

Figure 11.19 World Coal Consumption

World and Leading Consumers, 1980-1993



Top Consuming Countries, 1993



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

Source: Table 11.19.

Table 11.19 World Coal Consumption, 1980-1993

(Million Short Tons)

Year	Australia	China	Former Czecho-slovakia	Germany [1]	India	Japan	Kazakh-stan	Poland	Russia	South Africa	Ukraine	United Kingdom	United States	Former U.S.S.R.	Former Yugo-slavia	Other	World
1980	63	679	134	536	130	94	—	221	—	105	—	133	703	762	49	546	4,152
1981	80	680	134	545	138	104	—	200	—	117	—	130	733	755	59	539	4,213
1982	96	729	135	549	146	105	—	207	—	123	—	122	707	773	62	561	4,315
1983	93	782	138	549	162	100	—	214	—	127	—	123	737	773	68	577	4,443
1984	79	865	143	573	163	113	—	211	—	137	—	88	791	769	77	617	4,625
1985	73	955	140	585	177	120	—	239	—	142	—	116	818	777	82	660	4,883
1986	90	980	141	577	188	115	—	247	—	145	—	123	804	801	82	686	4,978
1987	113	1,013	138	566	206	112	—	258	—	148	—	129	837	806	83	693	5,102
1988	69	1,064	137	563	209	122	—	253	—	153	—	123	884	815	84	716	5,193
1989	107	1,146	130	553	235	121	—	242	—	143	—	126	890	777	85	763	5,318
1990	102	1,125	119	485	259	130	—	203	—	144	—	119	895	854	83	735	5,253
1991	102	1,165	109	408	249	125	—	202	—	143	—	118	888	665	81	735	4,988
1992	113	1,206	92	359	285	126	97	192	374	141	150	111	892	—	72	756	4,967
1993[P]	104	1,273	—	333	298	128	87	188	337	144	129	94	926	—	64	807	4,912

[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

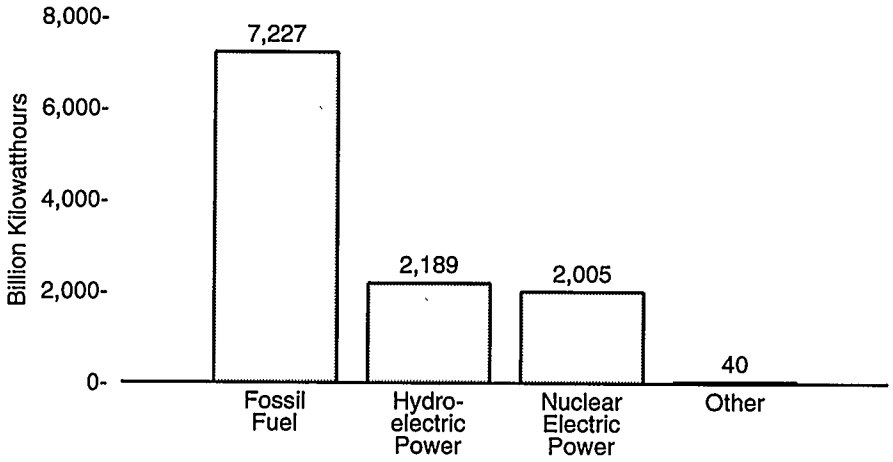
P=Preliminary data. — = Not applicable.

Notes: • Most data in this table are revised, because the methodology to calculate apparent consumption of coal was modified. • Totals may not equal sum of components due to independent rounding and the inclusion of more recent U.S. data from an alternative source.

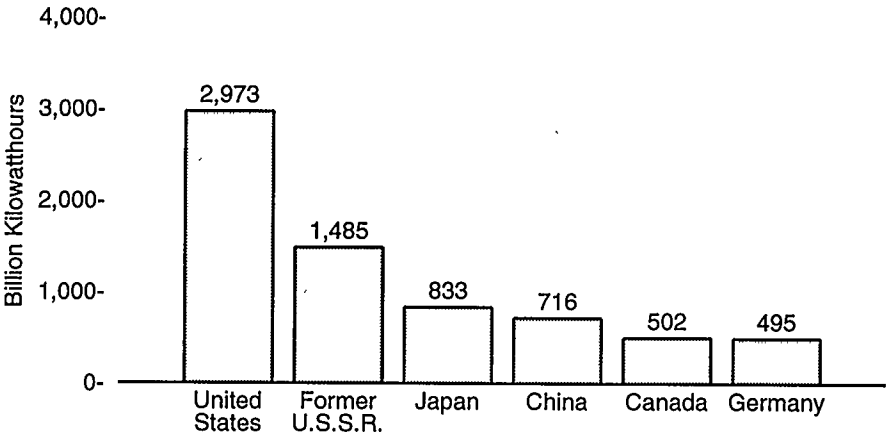
Sources: **United States:** Table 7.1. **All Other Data:** Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.20 World Net Generation of Electricity, 1992

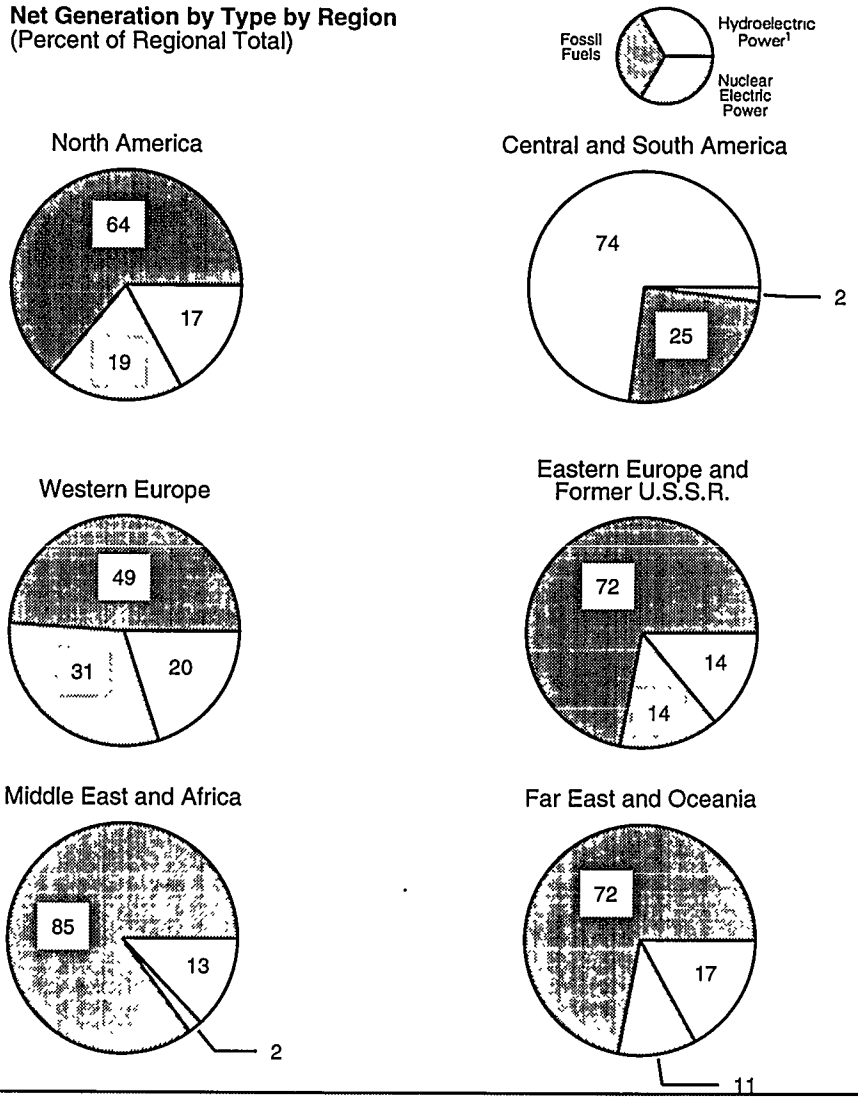
Net Generation by Type



Net Generation in Leading Countries



Net Generation by Type by Region
(Percent of Regional Total)



[1] Includes small quantities of other sources (i.e., geothermal, solar, biomass, wind, and other renewable energy sources).

Notes: • Data include both electric utility and non-electric utility sources.
• "Other" is geothermal, solar, biomass, wind, and other renewable sources.
• Because vertical scales differ, graphs should not be compared.

Source: Table 11.20.

Table 11.20 World Net Generation of Electricity by Type, 1992

(Billion Kilowatthours)

Region and Country	Fossil Fuel	Nuclear Electric Power	Hydro-electric Power	Other [1]	Total
North America	**2,300.3**	**698.5**	**582.1**	**15.4**	**3,596.3**
Canada	113.4	76.0	312.1	(s)	501.6
Mexico	91.5	3.7	21.0	5.2	121.4
United States	2,094.7	618.8	249.0	10.2	2,972.6
Other	0.7	0.0	0.0	0.0	0.7
Central and South America	**131.6**	**8.4**	**388.7**	**7.8**	**536.5**
Argentina	27.8	6.7	19.4	0.0	54.0
Brazil	8.1	1.7	221.1	7.0	237.8
Colombia	12.8	0.0	22.2	0.0	35.0
Venezuela	21.0	0.0	46.6	0.0	67.6
Other	61.9	0.0	79.4	0.8	142.1
Western Europe	**1,166.2**	**744.2**	**477.7**	**6.2**	**2,394.4**
Belgium	26.1	41.3	(s)	(s)	67.7
France	48.1	321.5	67.0	0.6	437.2
Germany	327.3	150.9	17.2	(s)	495.4
Italy	166.0	0.0	41.7	3.3	210.9
Netherlands	70.7	3.6	(s)	(s)	74.5
Norway	(s)	0.0	115.8	0.0	116.2
Spain	76.7	53.0	18.7	0.0	148.4
Sweden	7.5	60.8	73.5	(s)	141.8
Switzerland	1.5	22.1	32.4	(s)	56.0
Turkey	36.9	0.0	26.2	(s)	63.1
United Kingdom	227.6	69.1	5.5	1.0	303.2
Former Yugoslavia	42.5	3.8	18.0	0.0	64.3
Other	135.0	18.2	61.3	1.1	215.7
Eastern Europe and Former U.S.S.R.	**1,306.8**	**245.6**	**253.8**	**(s)**	**1,806.2**
Czechoslovakia	51.2	23.3	3.6	0.0	78.1
Poland	121.4	0.0	3.5	0.0	125.0
Former U.S.S.R.	1,057.0	198.1	229.6	(s)	1,484.7
Other	77.2	24.2	17.0	0.0	118.4
Middle East	**192.1**	**0.0**	**14.8**	**(s)**	**206.9**
Iran	43.9	0.0	6.4	0.0	50.3
Saudi Arabia	45.7	0.0	0.0	0.0	45.7
Other	102.5	0.0	8.4	(s)	110.8
Africa	**255.8**	**9.4**	**52.9**	**(s)**	**318.4**
Egypt	33.2	0.0	9.6	0.0	42.8
South Africa	153.2	9.4	0.6	0.0	163.2
Other	69.4	0.0	42.7	(s)	112.4
Far East and Oceania	**1,874.0**	**298.8**	**418.7**	**10.4**	**2,602.0**
Australia	134.8	0.0	14.7	0.9	150.5
China	584.2	0.5	131.1	0.0	715.8
India	236.2	6.0	69.2	(s)	311.4
Japan	542.7	207.2	81.7	1.7	833.3
South Korea	65.4	53.7	4.8	0.0	123.9
Taiwan	59.7	30.8	8.3	0.0	98.9
Other	251.0	0.5	108.8	7.8	368.1
World	**7,226.8**	**2,004.9**	**2,188.7**	**40.2**	**11,460.6**

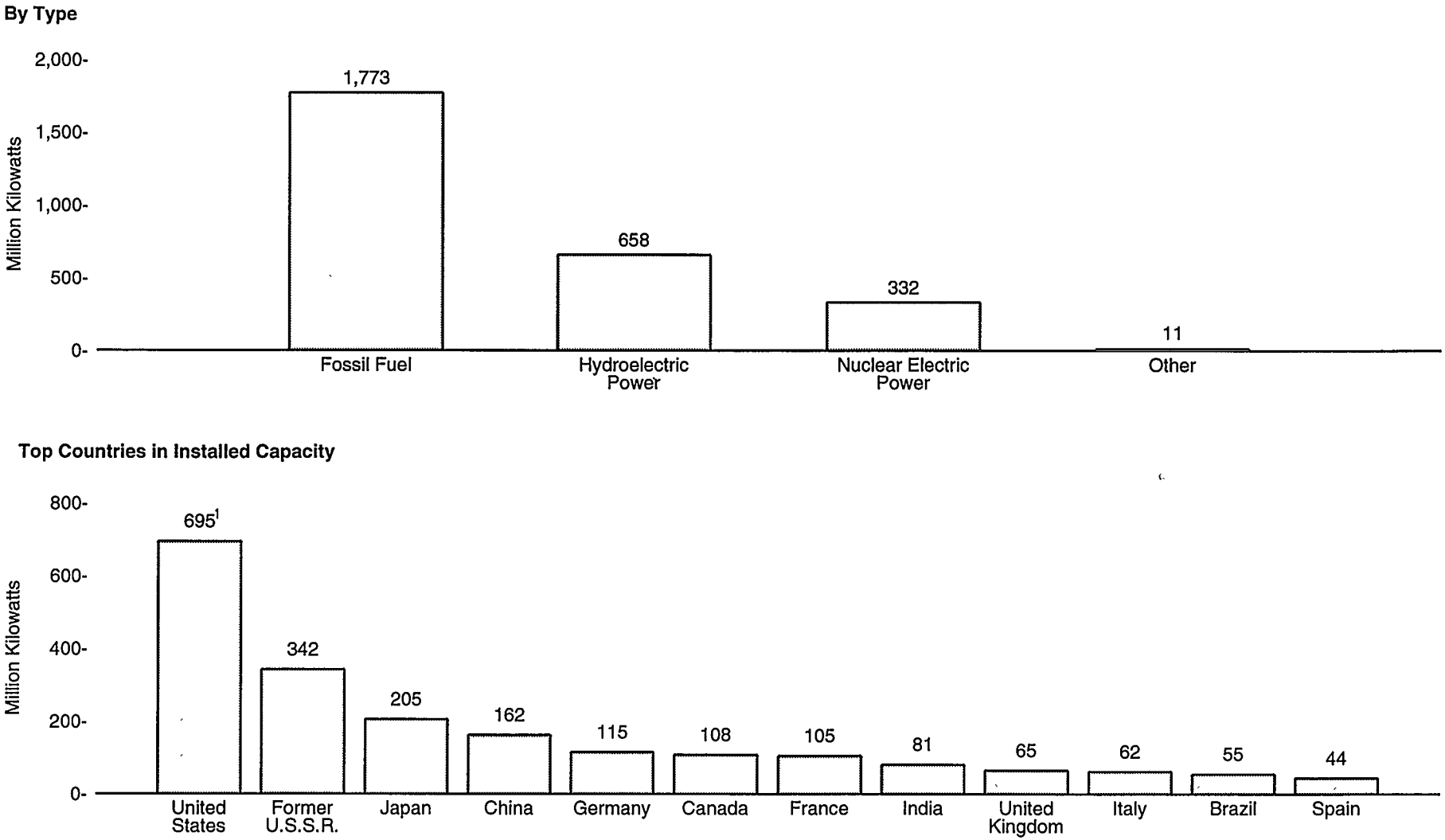
[1] Geothermal, biomass, wind, photovoltaic, and solar thermal generation.

(s)=Less than 0.5 billion kilowatthours.

Notes: • Data include both electric utility and non-electric utility sources. • Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.21 World Electrical Installed Capacity by Type, January 1, 1993



[1]Net summer capability.
Notes: • Data include both electric utility and non-electric utility sources. • "Other" is geothermal, solar, biomass, wind, and other renewable energy sources.
• Because vertical scales differ, graphs should not be compared.
Source: Table 11.21.

Table 11.21 World Electricity Installed Capacity by Type, January 1, 1993

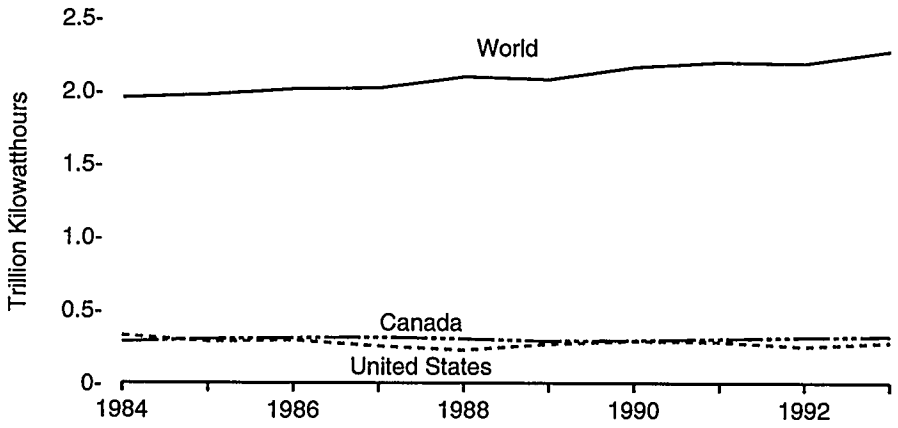
(Million Kilowatts)

Region and Country	Fossil Fuel	Nuclear Electric Power	Hydro-electric Power	Other [1]	Total
North America	**553.1**	**113.7**	**163.0**	**2.5**	**832.3**
Canada	32.4	14.0	61.7	(s)	108.1
Mexico	19.4	0.7	8.0	0.7	28.8
United States	[2] 501.0	[2] 99.0	[2] 93.4	[2] 1.7	[2] 695.1
Other	0.3	0.0	0.0	0.0	0.3
Central and South America	**42.9**	**1.7**	**90.9**	**4.8**	**140.4**
Argentina	9.9	1.0	6.5	0.0	17.3
Brazil	2.1	0.7	47.7	4.7	55.1
Colombia	2.4	0.0	7.8	0.0	10.2
Venezuela	8.1	0.0	10.7	0.0	18.7
Other	20.4	0.0	18.3	(s)	38.9
Western Europe	**309.4**	**120.6**	**165.8**	**1.5**	**597.3**
Austria	6.1	0.0	11.1	0.0	17.2
France	22.5	57.7	24.9	0.2	105.2
Germany	84.1	22.6	8.6	(s)	115.4
Italy	41.8	0.0	19.4	0.5	61.6
Netherlands	16.8	0.5	(s)	(s)	17.5
Norway	(s)	0.0	27.0	0.0	27.3
Spain	20.4	7.0	16.4	0.0	43.8
Sweden	8.2	10.0	16.4	(s)	34.6
Switzerland	0.8	3.0	11.7	(s)	15.4
Turkey	10.3	0.0	8.4	(s)	18.7
United Kingdom	49.7	11.4	4.2	(s)	65.4
Former Yugoslavia	8.4	0.6	4.9	0.0	13.9
Other	40.0	7.8	12.9	0.5	61.2
Eastern Europe and Former U.S.S.R.	**312.9**	**44.6**	**77.3**	**(s)**	**434.8**
Former Czechoslovakia	14.2	3.5	3.0	0.0	20.8
Poland	29.1	0.0	2.0	0.0	31.1
Romania	16.4	0.0	5.7	0.0	22.2
Former U.S.S.R.	241.7	36.7	63.7	(s)	342.1
Other	11.5	4.4	2.7	0.0	18.7
Middle East	**67.8**	**0.0**	**3.9**	**(s)**	**71.6**
Iran	17.3	0.0	1.8	0.0	19.1
Saudi Arabia	17.6	0.0	0.0	0.0	17.6
Other	33.0	0.0	2.0	(s)	35.0
Africa	**54.9**	**1.9**	**19.1**	**(s)**	**75.9**
Egypt	9.0	0.0	2.8	0.0	11.8
South Africa	24.0	1.9	0.6	0.0	26.5
Other	21.8	0.0	15.7	(s)	37.6
Far East and Oceania	**431.7**	**49.5**	**138.5**	**1.5**	**621.2**
Australia	27.1	0.0	7.4	(s)	34.5
China	120.0	0.0	42.0	0.0	162.0
India	59.6	2.0	19.6	(s)	81.2
Japan	130.7	34.6	39.5	(s)	205.1
South Korea	16.8	7.6	2.5	0.0	26.9
Taiwan	13.7	5.1	2.6	0.0	21.5
Other	63.6	(s)	24.9	1.2	89.9
World	**1,772.6**	**331.9**	**658.4**	**10.5**	**2,773.5**

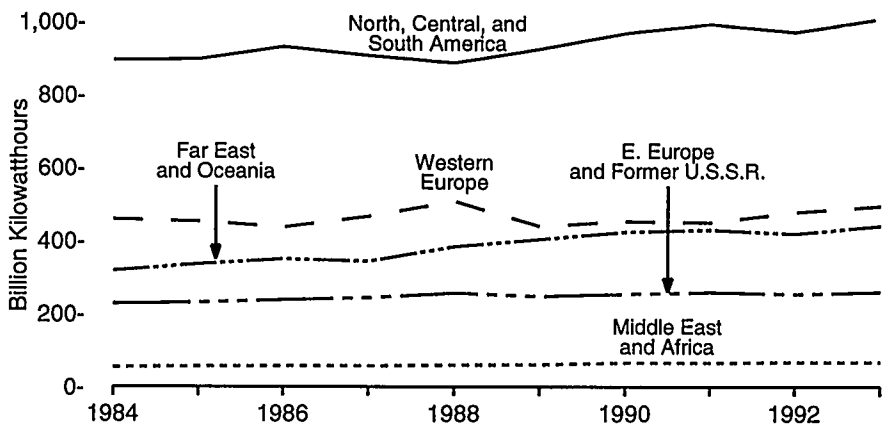
[1] Geothermal, biomass, wind, photovoltaic, and solar thermal capacity.
[2] Net summer capability.
(s)=Less than 0.5 million kilowatts.
Notes: • Data include both electric utility and non-electric utility sources. • Totals may not equal sum of components due to independent rounding.
Sources: Energy Information Administration (EIA), Office of Energy Markets and End Use, International Database, April 1995, except U.S. capacity, which is net summer capability from EIA, *Electric Power Annual 1993* (December 1994), Table 2.

Figure 11.22 World Hydroelectric Power Net Generation

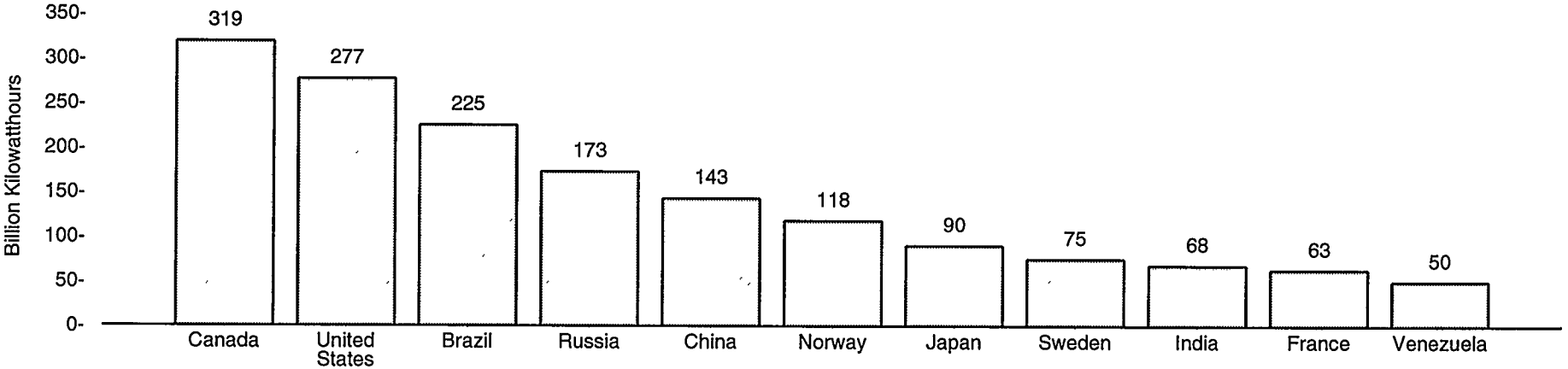
World and Leading Producers, 1984-1993



World Areas, 1984-1993



Top Generating Countries, 1993



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

Source: Table 11.22.

Table 11.22 World Hydroelectric Power Net Generation, 1984-1993

(Billion Kilowatthours)

Region and Country	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 P
North, Central, and South America	895	897	R931	R907	R887	R925	R968	R993	R971	1,008
Argentina	20	20	21	22	16	13	18	16	R19	20
Brazil	165	177	181	184	197	203	205	216	R221	225
Canada	283	301	308	313	R303	288	293	304	312	319
Chile	9	10	11	12	11	10	R12	R13	R15	15
Colombia	20	22	25	21	24	26	27	R27	R22	20
Mexico	23	26	20	18	21	24	24	R22	R21	20
Peru	9	9	10	11	10	10	10	11	R10	8
United States	324	284	294	253	226	268	R288	R284	R249	277
Venezuela	R19	22	R25	31	34	R34	R37	R44	R47	50
Other	R21	26	R36	43	R44	R48	R55	R56	R55	55
Western Europe	R459	R453	R437	R467	R508	R440	R453	R450	R478	495
Austria	R28	R30	R30	R25	R35	R35	R31	R31	R34	37
Finland	13	12	12	14	13	13	11	13	15	13
France	R64	R60	R61	R69	R74	R46	R53	R56	R67	63
Germany [1]	18	R17	R18	R20	R20	R18	R17	R15	R17	18
Italy	R42	R41	R41	R39	R40	R34	R31	R42	R42	41
Norway	R105	R101	R95	R102	R108	R117	120	R109	116	118
Portugal	10	11	R8	9	12	6	9	9	5	8
Spain	R31	R31	R26	R27	R35	R19	R25	R27	R19	24
Sweden	67	70	60	71	R69	71	72	R62	74	75
Switzerland	R30	32	33	R34	R35	R29	R30	R32	R32	35
Turkey	13	12	12	18	R28	18	23	22	26	34
Former Yugoslavia	26	24	R27	26	26	23	20	19	18	17
Other	R12	12	R13	R12	R13	R12	R12	R13	R13	12
Eastern Europe and Former U.S.S.R.	R228	R231	R238	R244	R257	R248	R254	R259	R254	260
Romania	11	12	11	11	R13	R12	11	14	R12	13
Russia	—	—	—	—	—	—	—	—	170	173
Former U.S.S.R.	203	205	R213	R217	229	221	231	233	—	—
Other	R13	R14	R14	R16	R15	R15	R12	R13	R72	74
Middle East and Africa	54	R56	R57	R57	R60	R61	R66	66	R68	68
Egypt	10	8	8	8	8	8	10	10	10	10
Zambia	10	10	10	8	8	7	8	8	R8	8
Other	R35	R38	R39	R40	R44	R46	R48	R48	R50	51
Far East and Oceania	R318	R336	R350	R344	R384	R404	R424	R430	R419	441
Australia	12	14	R14	R13	R13	R14	R14	16	R15	16
China	87	92	R94	100	108	117	125	124	R131	143
India	53	51	53	47	57	62	R71	R72	R69	68
Japan	R73	R82	R80	R74	R90	R91	R88	R97	R82	90
Korea, North	27	28	29	29	31	31	31	31	R30	30
New Zealand	20	20	22	22	23	22	23	23	R20	21
Pakistan	13	12	14	15	17	17	17	18	R20	22
Other	34	R39	R43	R44	44	50	R54	R49	R51	51
World	R1,953	R1,973	R2,012	R2,019	R2,096	R2,079	R2,164	R2,198	R2,189	2,273

[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

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

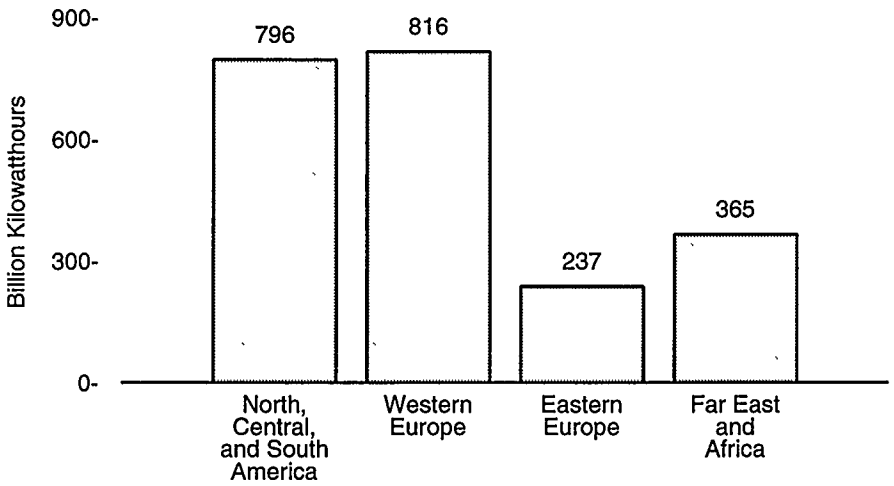
Notes: • See Note 3 at end of section. • Generation data consist of both utility and non-utility sources.

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

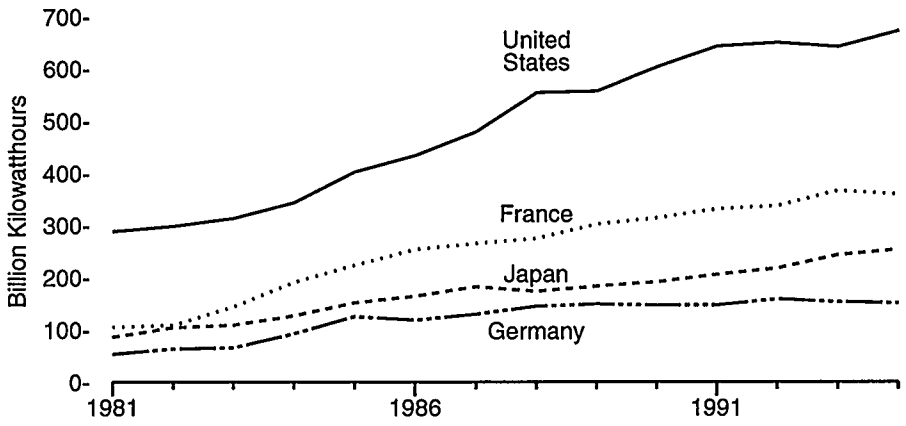
Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, April 1995.

Figure 11.23 Nuclear Electricity Gross Generation

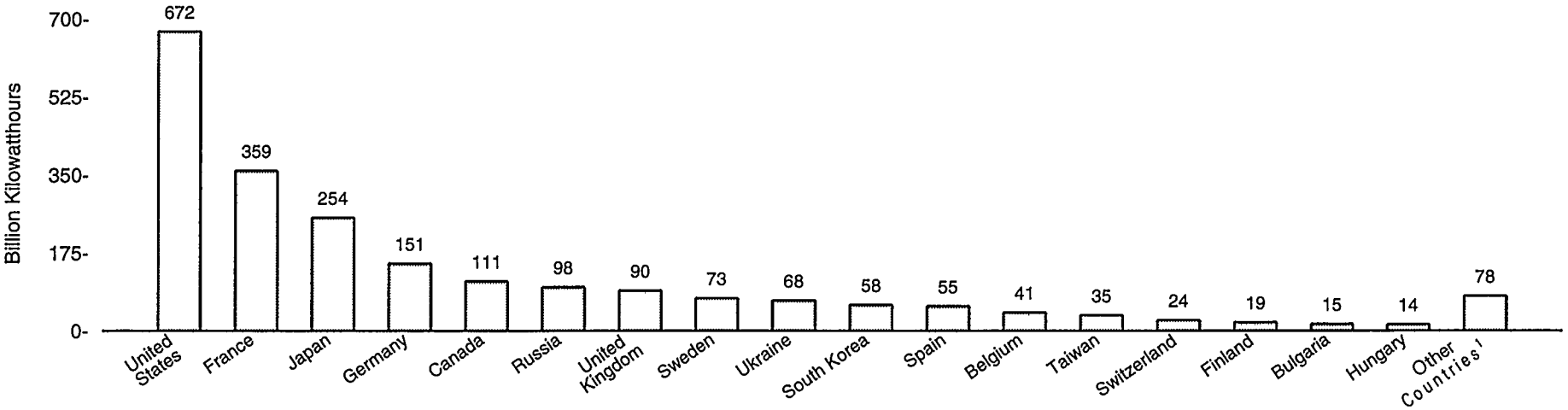
By Region, 1994



By Major Producers, 1981-1994



By Country, 1994



[1] "Other countries" are Argentina, Brazil, Mexico, Netherlands, Czech Republic, Kazakhstan, Lithuania, Romania, Slovakia, Slovenia, China, India, Pakistan, and South Africa.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 11.23.

Table 11.23 Nuclear Electricity Gross Generation, 1981-1994

(Billion Kilowatthours)

Region and Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
North, Central, and South America	334.6	343.1	370.2	404.1	474.8	514.6	566.3	645.2	646.9	690.7	742.6	744.0	R752.7	795.5
Argentina	2.8	1.9	3.4	4.5	5.8	5.7	5.2	5.1	5.0	7.4	7.7	7.1	R7.7	8.2
Brazil	0.0	0.1	0.2	2.1	3.4	0.1	1.0	0.3	1.6	2.0	1.4	1.8	0.4	0.0
Canada	43.3	42.6	53.0	53.8	62.9	74.6	80.6	85.6	83.2	75.8	86.1	81.3	97.6	110.7
Mexico	—	—	—	—	—	—	—	—	—	2.1	4.2	3.9	4.9	4.2
United States [1]	288.5	298.6	313.6	343.8	402.7	434.1	479.5	554.1	557.0	603.4	643.0	650.0	642.0	672.4
Western Europe	293.4	321.8	377.2	485.4	582.8	631.5	648.3	688.1	732.0	738.6	769.7	783.9	R817.0	815.5
Belgium	12.8	15.6	24.1	27.7	34.5	38.6	41.9	43.1	41.2	42.7	42.9	43.5	41.9	40.6
Finland	14.5	16.5	17.4	18.5	18.8	18.8	19.4	19.3	18.8	18.9	19.2	19.0	19.6	19.1
France	105.2	108.9	144.2	191.2	224.0	254.3	265.5	274.9	302.5	314.1	331.4	337.6	366.7	359.1
Germany [2]	53.4	63.4	65.8	92.6	125.8	118.9	130.2	145.2	149.5	147.2	147.3	158.8	153.5	151.1
Italy	2.7	6.8	5.8	6.9	7.0	8.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	3.7	3.9	3.6	3.8	3.9	4.2	3.6	3.7	4.0	3.4	3.3	3.8	3.9	4.0
Spain	9.4	8.8	10.7	23.1	28.0	37.5	41.3	50.4	56.1	54.3	55.6	55.8	56.1	55.1
Sweden	37.7	38.8	40.4	51.3	58.6	69.9	67.2	69.4	65.6	68.2	76.8	63.5	61.4	72.8
Switzerland	15.2	15.0	15.5	16.3	22.4	22.5	23.0	22.7	22.8	23.6	22.9	23.4	23.3	24.2
United Kingdom	38.9	44.1	49.6	54.1	59.7	58.2	56.2	59.4	71.6	66.1	70.4	78.5	R90.4	89.5
Eastern Europe [3]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	E271.5	R,E263.0	E237.3
Bulgaria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	E12.2	14.0	E14.5
Czech Republic	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	E12.9	R,E13.2	E13.2
Hungary	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	E13.8	13.8	14.0
Kazakhstan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	E0.5	E0.4	E0.4
Lithuania	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	E16.4	E12.9	E12.9
Romania [4]	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Russia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	E125.6	120.4	97.7
Slovakia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	E11.7	E11.6	E11.6
Slovenia	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	E4.0	4.0	4.6
Ukraine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	E74.6	E72.7	68.4
Far East and Africa	102.9	123.6	140.1	171.9	207.9	232.9	266.1	259.6	275.2	293.2	313.0	325.1	R,E353.0	E365.4
China	—	—	—	—	—	—	—	—	—	—	—	—	E2.6	E2.6
India	3.1	2.2	2.9	4.1	4.5	5.1	5.5	6.1	4.0	6.3	5.4	6.3	6.2	5.0
Japan	86.0	104.5	109.1	127.2	152.0	164.8	182.8	173.6	183.7	191.9	205.8	218.0	243.5	253.8
Pakistan	0.2	0.1	0.2	0.3	0.3	0.5	0.3	0.2	0.1	0.4	0.4	0.6	0.4	0.6
South Africa	—	—	—	4.2	5.9	9.3	6.6	11.1	11.7	8.9	9.7	9.9	7.7	10.3
South Korea	2.9	3.8	9.0	11.8	16.5	26.1	37.8	38.7	47.4	52.8	56.3	56.4	58.1	58.3
Taiwan	10.7	13.1	18.9	24.3	28.7	26.9	33.1	29.9	28.3	32.9	35.3	33.8	34.3	34.8
World [5]	730.9	788.5	887.5	1,061.5	1,265.4	1,378.9	1,480.8	1,592.8	1,654.2	1,722.5	1,825.2	E2,124.5	R,E2,185.6	E2,213.7

[1] See Note 3 at end of section.

[2] 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.

[3] The gross generation estimates for 1992 through 1994 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.*

[4] Romania has one nuclear generating unit under construction. Its earliest initial commercial operation is projected to be in 1995.

[5] Eastern European countries are included in the total figure beginning in 1992.

R=Revised data. E=Estimate. NA=Not available. — = Not applicable.

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

Source: McGraw-Hill Publishing Co., Inc., *Nucleonics Week.*

International Energy Notes

1. World primary energy production comprises crude oil (including lease condensate), natural gas plant liquids, dry natural gas, coal, net electricity from hydroelectric power and nuclear electric power, and net electricity generated for distribution from geothermal, wind, and solar thermal 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 (anthracitic, subanthracitic, bituminous, subbituminous, lignitic, and brown coal) 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 workings and normally exclude wastes removed at mines or associated preparation plants. The data on production of electricity from hydroelectric power, nuclear electric power, and electricity generated for distribution from geothermal, wind, and solar thermal energy include data on both electric utility and industrial production 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.

2. Petroleum stocks reported by the Organization for Economic Cooperation and Development (OECD) include those held at (or in) the following locations or facilities: leases, refineries, natural gas processing plants, bulk terminals, tanks associated with pipelines, barges, intercoastal tankers, ocean tankers in port, inland ship bunkers, major final consumers, and the strategic storage reserve. For an individual country, stocks include those held for the account of that country but located in another country. U.S. stocks include those held in the 50 States and the District of Columbia. "Other OECD" includes stocks held in Puerto Rico and the Virgin Islands. The OECD definition of petroleum stocks excludes petroleum in pipelines, rail tank cars, tank trucks, oceangoing ship bunkers, service stations, retail stores, and tankers at sea. An exception is U.S. stocks, which include petroleum in pipelines.

3. 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 Table 11.23 are gross output of electricity.

12. Environmental Indicators

Emissions of Greenhouse Gases

Greenhouse gases—carbon dioxide, methane, nitrous oxide, carbon monoxide, and other gases—are those which block infrared radiation from Earth to space and reradiate the captured heat to the atmosphere. This warming effect, known as the greenhouse effect, keeps Earth's climate hospitable to plant, animal, and human life. But some scientists believe that manmade additions to greenhouse gases will raise global average temperatures and produce deleterious changes in the global climate.

Manmade emissions of carbon dioxide totaled 5.1 billion metric tons of gas in 1992 (the most recent year for which most emissions data are available), up from 4.7 billion metric tons in 1985 (12.1).* Methane emissions rose from 26 million metric tons to 27 million metric tons. By contrast, carbon monoxide emissions fell from 98 million metric tons in 1985 to 79 million metric tons in 1992, a decline of 19 percent. Nonmethane volatile organic compounds (VOC's) fell from 23 million metric tons to 21 million metric tons, and nitrous oxide emissions were unchanged at 0.4 million metric tons.

Carbon dioxide accounts for the largest share by far of total manmade emissions of greenhouse gases, and a major source of carbon dioxide emissions is the burning of fossil fuels (12.1 and 12.2). Energy-related carbon dioxide emissions totaled 1.4 billion metric tons of carbon in 1993 (12.2). In terms of the amount of carbon emitted, in 1993 the industrial and transportation sectors were the sources of the most emissions: 456 million metric tons of carbon and 437 million metric tons of carbon, respectively. The residential and commercial sectors emitted 270 million metric tons of carbon and 212 million metric tons of carbon, respectively.

Consumption of petroleum (in particular, motor gasoline) by the transportation sector and coal burning at electric utilities were the biggest sources of carbon dioxide emissions in 1992 (12.3). Natural gas consumed by all sectors accounted for a total of 287 million metric tons of carbon. Energy-related activities also accounted for a big share of methane emissions (8.3 million metric tons) in 1992 (12.4). But agricultural sources (such as digestive processes in ruminant animals and the anaerobic decomposition of organic materials in animal wastes and rice paddies) emitted 8.7 million metric tons of methane.

Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.

Emissions and Environmental Equipment at Electric Utilities

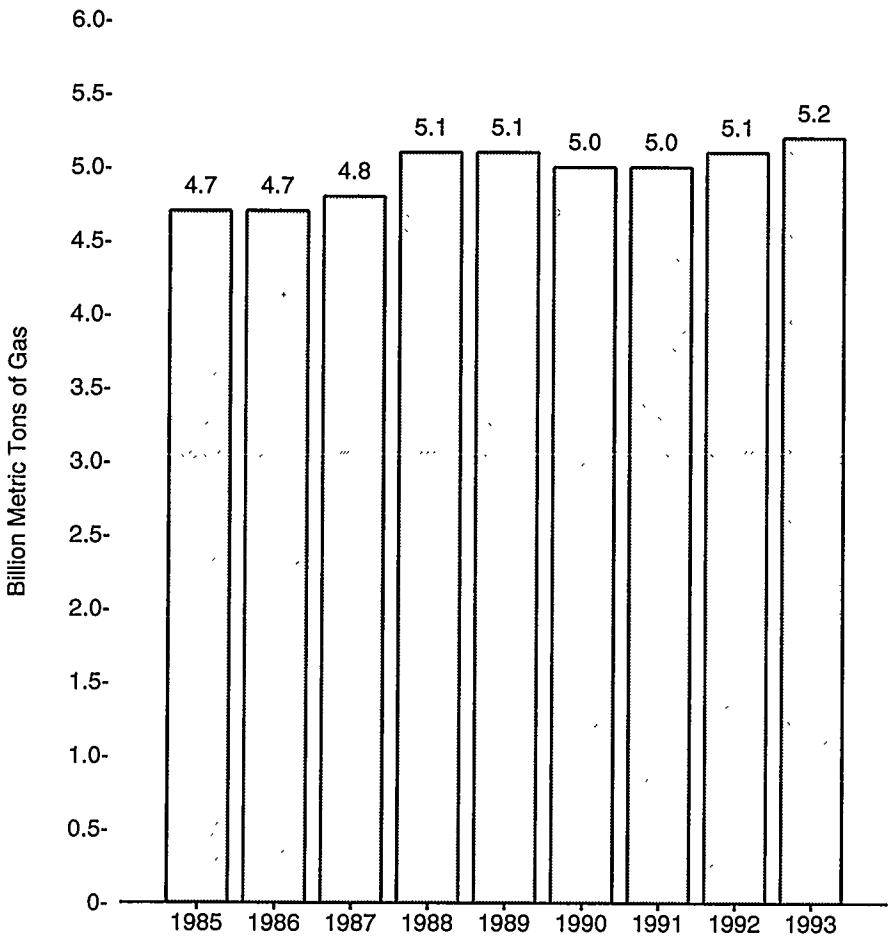
In general, changes in electric utility consumption of fossil fuels are accompanied by concomitant changes in the emission of carbon dioxide. In 1985 (the first year of the Energy Information Administration's electric utility emissions data series), consumption of fossil fuels to generate electricity totaled 19 quadrillion Btu (8.5). Emissions of carbon dioxide from fossil-fueled steam-electric generating units totaled 1.7 billion short tons (12.5). In 1993, consumption of fossil fuels to generate electricity rose to 21 quadrillion Btu, 10 percent higher than in 1985 (8.5), and carbon dioxide emissions from fossil-fueled steam-electric generating units were 15 percent higher than in 1985 (12.5).

Carbon dioxide accounts for the largest share by far of total manmade emissions of greenhouse gases.

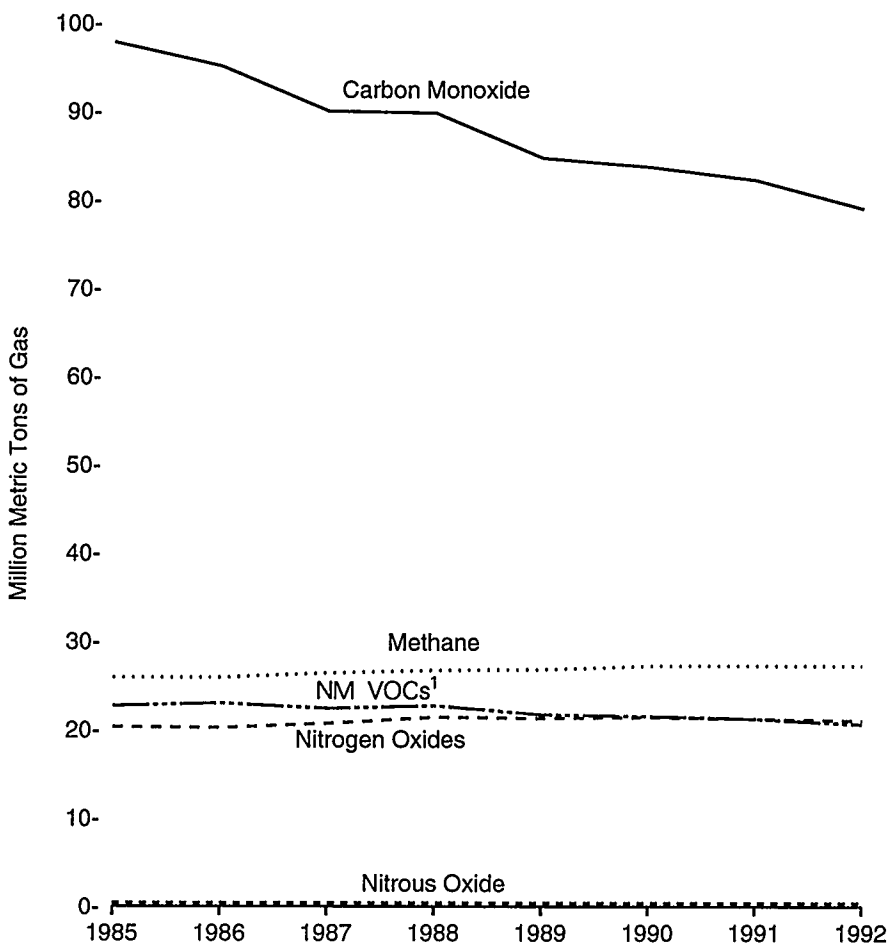
By contrast, emissions of sulfur dioxide were actually lower in 1993 than they were in 1985. As is true of carbon dioxide emissions, most emissions of sulfur dioxide were attributable to coal combustion. However, such sulfur dioxide emissions can be controlled through the use of coal with a lower sulfur content and the use of scrubbers. From 1985 through 1993, the amount of coal-fired capacity equipped with scrubbers increased 24 percent to 71 million kilowatts (12.6). Although the amount of electricity generated by burning coal at electric utilities rose 17 percent during the 1985-to-1993 period (8.3), coal-related sulfur dioxide emissions declined 6.9 percent (12.5).

Figure 12.1 Estimated Emissions of Greenhouse Gases

Carbon Dioxide, 1985-1993



Other Greenhouse Gases, 1985-1992



[1] Nonmethane volatile organic compounds.
Note: Because vertical scales differ, graphs should not be compared.

Source: Table 12.1.

Table 12.1 Estimated Emissions of Greenhouse Gases by Gas, 1985-1993

(Million Metric Tons of Gas)

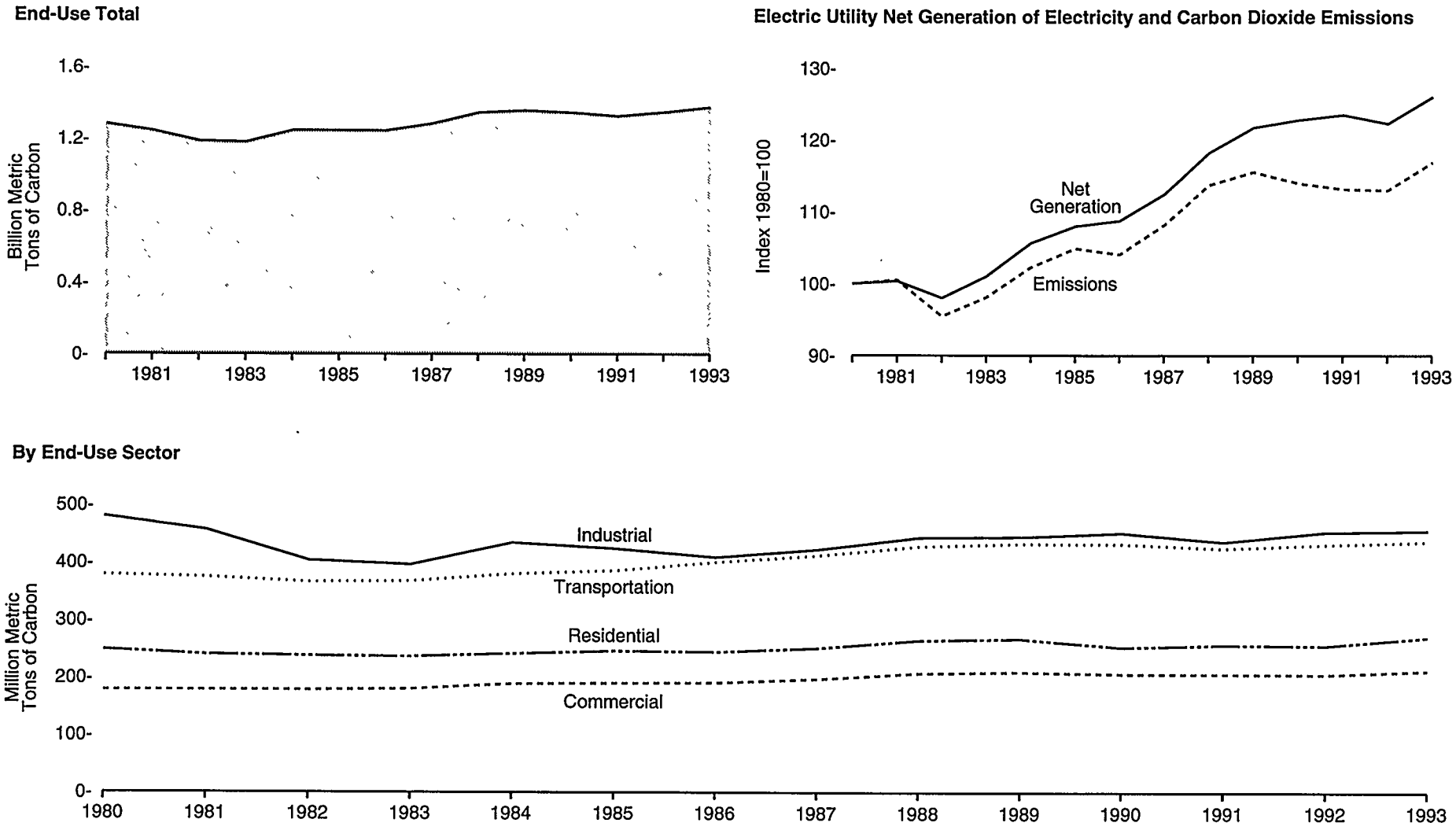
Gas	1985	1986	1987	1988	1989	1990	1991	1992	1993
Carbon Dioxide	R4,684.3	R4,680.4	4,827.4	5,052.3	5,085.5	5,040.8	4,993.1	5,069.3	5,167.1
Methane	R25.9	R25.9	26.4	26.7	26.8	27.2	27.2	27.2	NA
Nitrous Oxide	R0.4	R0.4	0.4	0.4	0.4	0.4	0.4	0.4	NA
Halocarbons and Minor Gases									
CFC[1]-11, CFC-12, CFC-113	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	NA
HCFC[2]-22	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	NA
HFC[3]-23 and PFCs[4]	0.0	0.0	([5])	([5])	([5])	([5])	([5])	([5])	NA
Methyl Chloroform	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	NA
Criteria Pollutants									
Carbon Monoxide	R97.8	R95.1	90.0	89.8	84.7	83.7	82.2	79.0	NA
Nitrogen Oxides	R20.3	R20.2	20.7	21.4	21.3	21.4	21.2	21.0	NA
Nonmethane VOCs[6]	R22.7	R23.0	22.4	22.7	21.7	21.5	21.2	20.6	NA

[1] Chlorofluorocarbons.
[2] Chlorodifluoromethane.
[3] Hydrofluorocarbons.
[4] Perfluorocarbons.
[5] Estimated HFC-23 and perfluorocarbon emissions combined totaled 0.006 million metric tons in 1987, rising to 0.007 million metric tons in 1992.
[6] Volatile organic compounds.

R=Revised data. NA=Not available.

Sources: • 1985 and 1986—Energy Information Administration (EIA), Office of Integrated Analysis and Forecasting estimates. • 1987 forward—EIA, *Emissions of Greenhouse Gases in the United States 1987-1992*, October 1994, Table ES1.

Figure 12.2 Carbon Dioxide Emissions from Fossil Energy Consumption by Sector, 1980-1993



Sources: Tables 8.1 and 12.2.

Table 12.2 Carbon Dioxide Emissions from Fossil Energy Consumption by Sector, 1980-1993

(Million Metric Tons of Carbon)

Year	Residential	Commercial	Industrial	Transportation	End-Use Total	Electric Utilities [1]
1980	R248.4	R178.3	R480.7	378.7	1,281.6	R418.3
1981	R239.9	R178.3	R457.0	374.7	1,244.3	R420.5
1982	237.6	R178.2	R403.8	R366.2	R1,185.8	R399.3
1983	236.2	R180.0	R396.4	367.5	R1,180.2	R410.4
1984	241.2	188.8	R434.6	R380.2	R1,244.8	427.9
1985	R245.8	R189.6	R424.3	R385.6	R1,245.3	R438.9
1986	R244.0	R190.4	R409.1	R400.4	R1,244.0	R435.4
1987	R251.0	197.2	R422.8	R412.4	R1,283.4	R452.6
1988	R264.9	R207.6	R444.2	R428.7	R1,345.4	R475.9
1989	R267.5	R210.0	R445.7	R433.7	R1,356.9	R483.5
1990	253.1	206.7	R452.5	R433.2	R1,345.5	R476.9
1991	257.2	206.4	R436.8	R425.5	R1,325.9	R473.5
1992	255.9	205.5	454.1	432.3	1,347.8	472.9
1993P	270.1	212.1	456.2	437.1	1,375.5	489.1

[1] Electric utility emissions are distributed across end-use sectors.

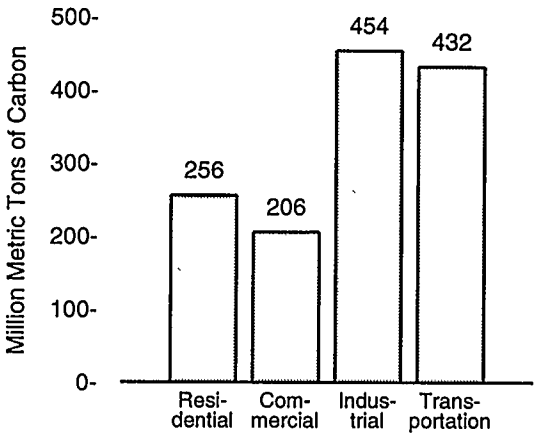
R=Revised data. P=Preliminary data.

Notes: • Includes energy from petroleum, natural gas, and coal. • Totals may not equal sum of components due to independent rounding.

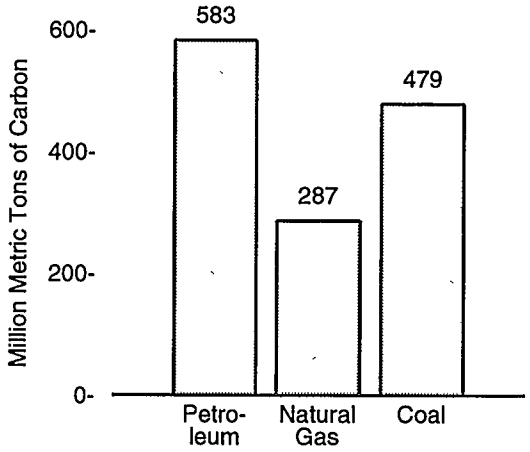
Sources: • 1980 and 1981—Energy Information Administration (EIA), Office of Integated Analysis and Forecasting (OIAF) estimates. • 1982 forward—EIA, *Emissions of Greenhouse Gases in the United States 1987-1992,* October 1994, Tables 5 and C1-C5, except Industrial 1983 and 1986, which are OIAF estimates.

Figure 12.3 Carbon Dioxide Emissions from Energy Use by Sector, 1992

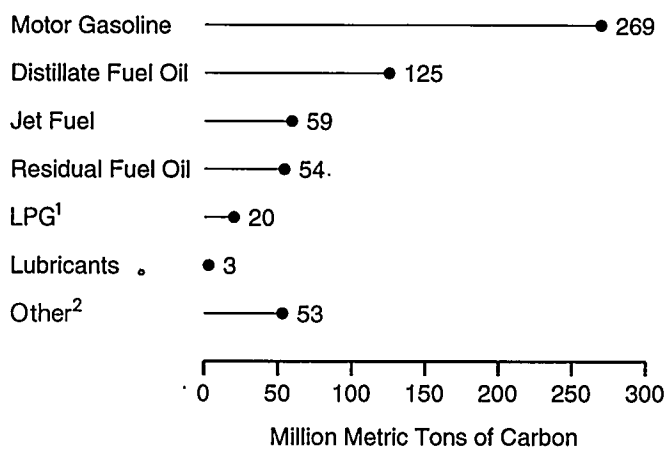
By End-Use Sector



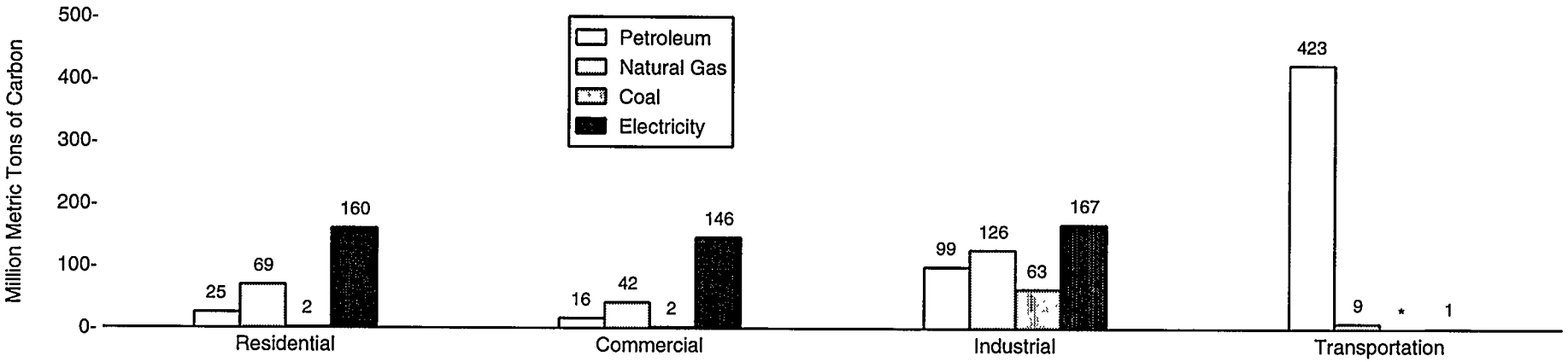
By Fuel



By Petroleum Product



By End-Use Sector and Source



[1] Liquefied petroleum gases.
[2] "Other" includes aviation gasoline, kerosene, and other products.
*Included in the industrial sector.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 12.3.

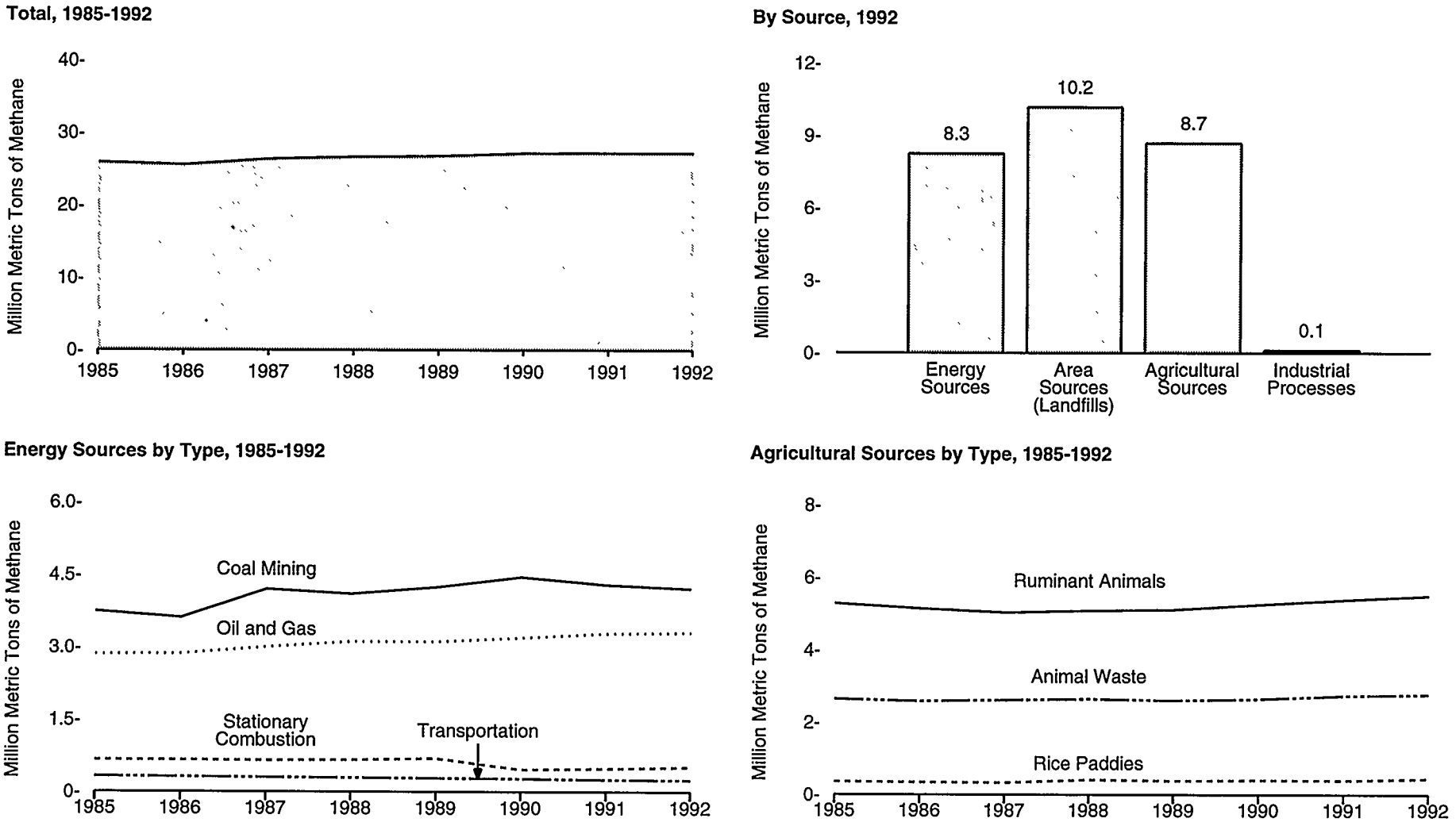
Table 12.3 Carbon Dioxide Emissions from Energy Use by Sector, 1992

(Million Metric Tons of Carbon)

Energy Source	Residential	Commercial	Industrial	Transportation	End-Use Total	Electric Utilities [1]	Total
Petroleum	24.9	16.1	98.6	422.8	562.4	20.3	582.8
Aviation Gasoline	—	—	—	0.8	0.8	—	0.8
Distillate Fuel	17.1	9.2	22.6	75.3	124.1	[2] 1.3	125.4
Jet Fuel	—	—	—	58.7	58.7	—	58.7
Kerosene	1.3	0.2	0.2	—	1.7	—	1.7
Liquefied Petroleum Gases	6.5	1.2	11.9	0.3	19.9	—	19.9
Lubricants	—	—	1.7	1.6	3.3	—	3.3
Motor Gasoline	—	1.5	3.7	263.2	268.5	—	268.5
Residual Fuel	—	4.1	8.3	23.0	35.4	[3] 18.2	53.6
Other	—	—	50.0	—	50.0	[4] 0.8	50.9
Natural Gas	69.4	41.5	126.1	8.8	245.8	40.7	286.5
Coal	1.5	2.2	63.0	([5])	66.6	411.9	478.5
Electricity	160.2	145.6	166.5	0.7	472.9	—	—
Total	255.9	205.5	454.1	432.3	1,347.8	472.9	1,347.8

[1] Electric utility emissions are distributed across end-use sectors. Electric utilities include independent power producers but exclude cogeneration facilities.
[2] Light fuel oil.
[3] Heavy fuel oil.
[4] Petroleum coke.
[5] Included in the industrial sector.
— = Not applicable.
Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, *Emissions of Greenhouse Gases in the United States 1987-1992*, October 1994, Tables C1-C5 and unpublished estimates.

Figure 12.4 Methane Emissions from Anthropogenic Sources



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

Source: Table 12.4.

Table 12.4 Methane Emissions from Anthropogenic Sources, 1985-1992

(Million Metric Tons of Methane)

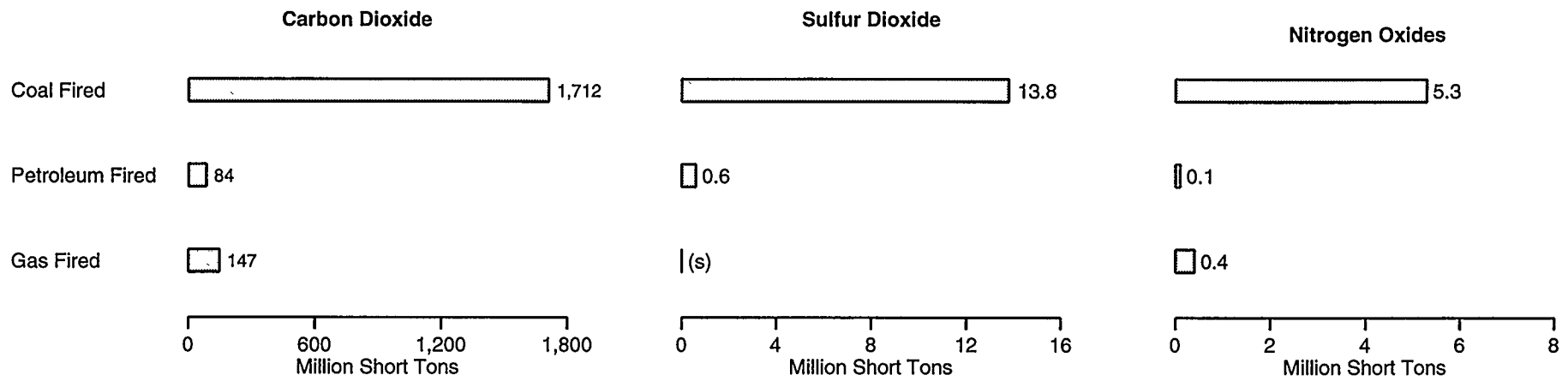
Year	Energy Sources					Area Sources	Agricultural Sources				Industrial Processes	Total
	Oil and Gas	Coal Mining	Transportation	Stationary Combustion	Total	Landfills	Ruminant Animals	Animal Waste	Rice Paddies	Total		
1985	2.85	3.74	0.32	0.66	7.58	9.96	5.28	2.64	0.36	8.28	0.11	25.92
1986	2.86	3.61	0.31	0.66	7.44	9.98	5.14	2.58	0.34	8.06	0.10	25.57
1987	3.00	4.20	0.30	0.65	8.15	10.16	5.03	2.61	0.33	7.97	0.11	26.39
1988	3.11	4.10	0.29	0.66	8.16	10.26	5.08	2.64	0.41	8.13	0.12	26.67
1989	3.11	4.24	0.28	0.69	8.33	10.27	5.11	2.60	0.38	8.09	0.12	26.81
1990	3.19	4.45	0.27	0.46	8.37	10.42	5.25	2.64	0.40	8.29	0.12	27.19
1991	3.28	4.29	0.25	0.48	8.30	10.33	5.38	2.73	0.39	8.50	0.11	27.24
1992	3.30	4.21	0.24	0.51	8.25	10.18	5.49	2.76	0.44	8.69	0.12	27.23

Notes: • Most data on this table are revised, and the units are million metric tons versus thousand metric tons last year. • 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 "Uncertainties Associated with Methane Emissions" in the source report, page 100. • Anthropogenic, in the context of emissions, means "produced as the result of human activities." • Ruminant animals, such as cattle, buffalo, sheep, goats, and camels, emit methane as a product of the digestive process. • Under certain conditions, methane may be produced naturally via anaerobic decomposition of organic materials in landfills, animal wastes, and rice paddies. • Totals may not equal sum of components due to independent rounding.

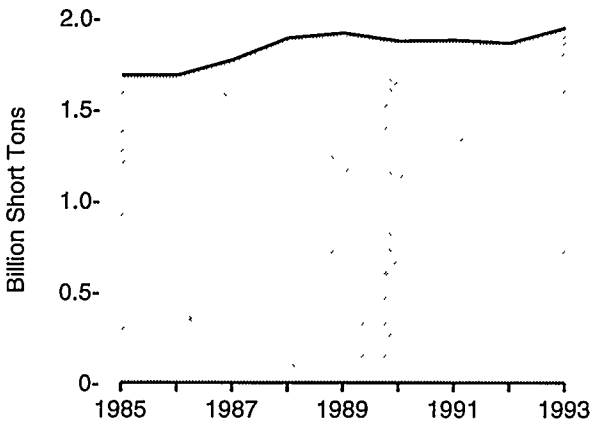
Sources: • 1985 and 1986—Energy Information Administration (EIA), Office of Integrated Analysis and Forecasting estimates. • 1987 forward—EIA, *Emissions of Greenhouse Gases in the United States 1987-1992*, October 1994, Table 15.

Figure 12.5 Emissions from Fossil-Fueled Steam-Electric Generating Units at Electric Utilities

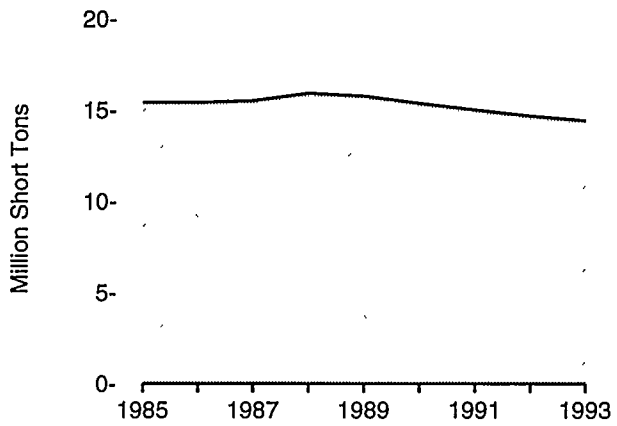
Emissions by Generating Unit Type, 1993



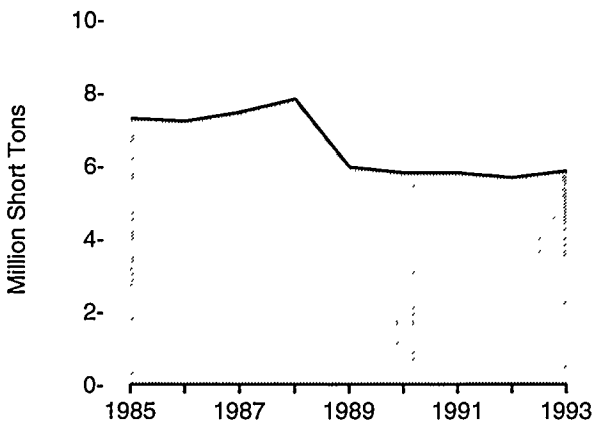
Total Carbon Dioxide Emissions, 1985-1993



Total Sulfur Dioxide Emissions, 1985-1993



Total Nitrogen Oxides Emissions, 1985-1993



(s)=Less than 0.05 million short tons.
Note: Because horizontal and vertical scales differ, graphs should not be compared.

Source: Table 12.5.

Table 12.5 Emissions from Fossil-Fueled Steam-Electric Generating Units at Electric Utilities, 1985-1993

(Thousand Short Tons)

Year	Coal Fired			Petroleum Fired			Gas Fired			Total [1]		
	Carbon Dioxide	Sulfur Dioxide	Nitrogen Oxides	Carbon Dioxide	Sulfur Dioxide	Nitrogen Oxides	Carbon Dioxide	Sulfur Dioxide	Nitrogen Oxides	Carbon Dioxide	Sulfur Dioxide	Nitrogen Oxides
1985	1,430,704	14,871	6,439	81,401	552	185	173,710	1	666	1,686,382	15,426	7,293
1986	1,422,436	14,654	6,380	110,655	762	260	150,581	1	572	1,685,809	15,418	7,217
1987	1,509,662	14,883	6,613	94,278	630	219	165,227	1	629	1,771,414	15,515	7,464
1988	1,623,317	15,202	6,963	114,303	716	272	149,834	1	580	1,891,049	15,923	7,822
1989	1,623,130	15,297	7,045	120,688	760	284	158,666	1	605	R1,917,606	R15,760	R5,956
1990	1,613,100	15,038	7,076	91,978	623	219	157,091	1	588	R1,874,153	R15,369	R5,801
1991	1,621,926	14,695	7,078	87,697	637	209	159,562	1	602	R1,878,839	R15,012	R5,801
1992	1,625,788	14,445	7,113	69,803	531	167	159,221	1	601	R1,863,361	R14,680	R5,674
1993	1,711,673	13,844	5,288	84,129	583	136	146,584	1	424	1,946,266	14,432	5,852

[1] In addition to coal, petroleum, and gas, also includes light oil, methane, coal-oil mixture, propane gas, blast furnace gas, wood, and refuse.

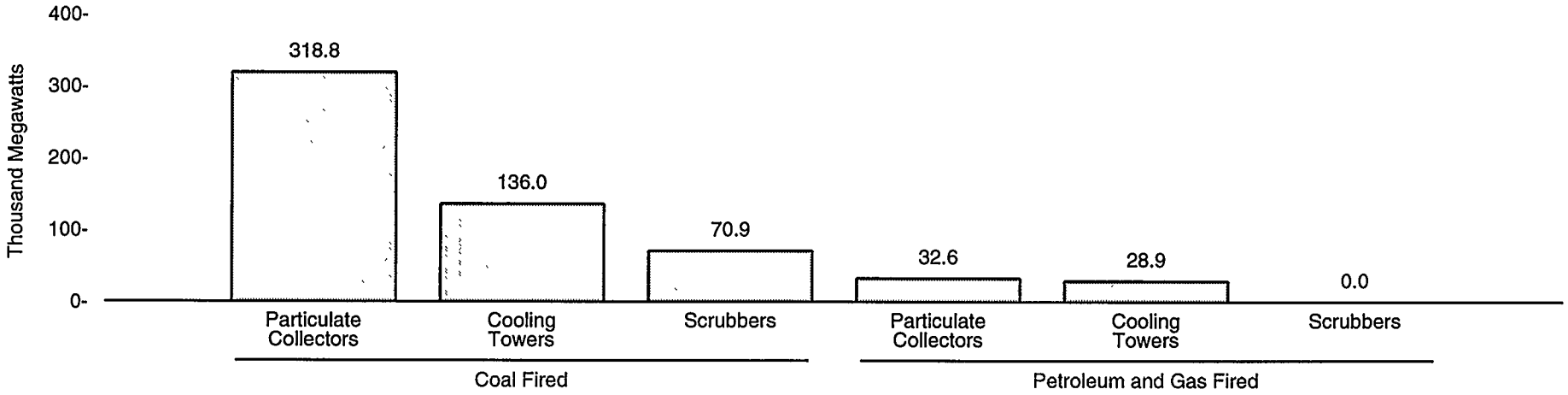
R=Revised data.

Notes: • Historical data are revised to reflect changed emission factors for the calculation of carbon dioxide and sulfur dioxide and reductions from nitrogen oxides control technologies. See Technical Notes in the *Electric Power Annual 1992* for additional information. • Emissions are based on fuel consumption data reported on Form EIA-767, "Steam-Electric Plant Operation and Design Report," for steam-electric generating units of 10 megawatts or larger. Total carbon dioxide emissions based on fuel consumption data reported on Form EIA-759, "Monthly Power Plant Report," are published in *Emissions of Greenhouse Gases in the United States 1985-1990.* • All data are preliminary and may be revised in future publications. • Totals may not equal sum of components due to independent rounding.

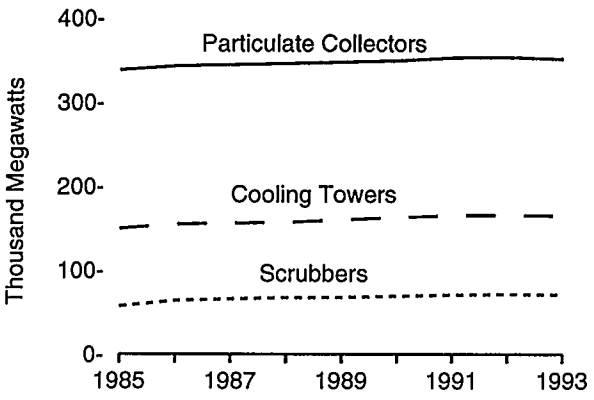
Sources: **Coal Fired, Petroleum Fired, and Gas Fired:** • 1985-1992—Energy Information Administration (EIA), Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 1993—EIA, *Electric Power Annual 1993* (December 1994), Table 47. **Total:** • 1985-1988—EIA, Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 1989 forward—EIA, *Electric Power Annual 1993* (December 1994), Table 44.

Figure 12.6 Installed Nameplate Capacity of Fossil-Fueled Steam-Electric Generators for Electric Utility Plants With Environmental Equipment

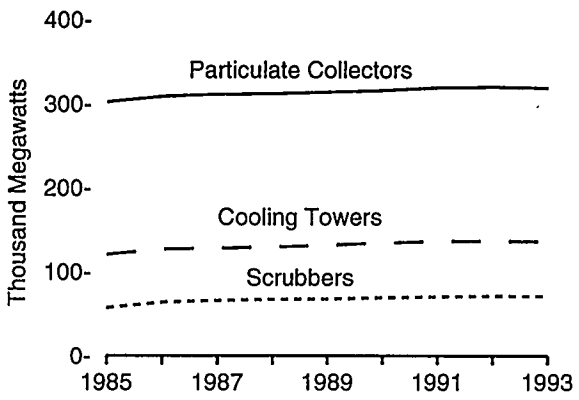
By Fuel and Equipment Type, 1993



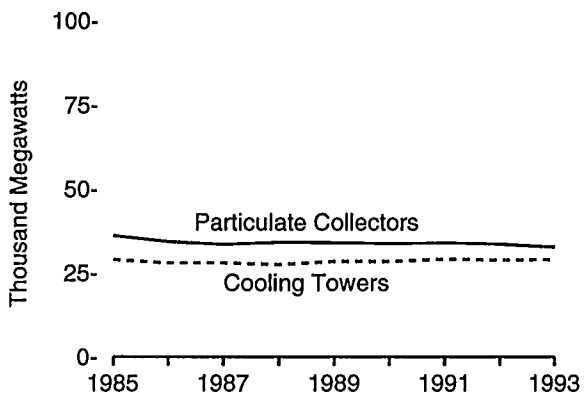
Total by Equipment Type, 1985-1993



Coal-Fired Units by Equipment Type, 1985-1993



Petroleum- and Gas-Fired Units by Equipment Type, 1985-1993



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

Source: Table 12.6.

Table 12.6 Installed Nameplate Capacity of Fossil-Fueled Steam-Electric Generators for Electric Utility Plants With Environmental Equipment, 1985-1993

(Megawatts)

Year	Coal Fired				Petroleum and Gas Fired				Total			
	Particulate Collectors	Cooling Towers	Scrubbers	Total [1]	Particulate Collectors	Cooling Towers	Scrubbers	Total [1]	Particulate Collectors	Cooling Towers	Scrubbers	Total [1]
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	R347,655	R160,087	R67,534	R375,257
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

[1] Components are not additive because some generators are included in more than one category.

R=Revised data.

Notes: • Historical data are revised to include emissions from other fuels (including light oil, methane, coal-oil mixture, propane gas, blast furnace gas, wood, and refuse); to incorporate reevaluation and resubmission of data by respondents to The Clean Air Act Amendments of 1990; and to reflect revisions to the methodology used to estimate emissions. • All data are preliminary and may be revised in future publications. • Coverage is plants with fossil-fueled steam-electric capacity of 100 megawatts or greater.

Sources: **Coal Fired and Petroleum and Gas Fired:** • 1985-1992—Energy Information Administration (EIA), Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 1993—EIA, *Electric Power Annual 1993* (December 1994), Tables 48 and 49. **Total:** • 1985 and 1988—EIA, Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 1989 forward—EIA, *Electric Power Annual 1993* (December 1994), Table 45.

Appendix A

Thermal Conversion Factors

Using Thermal Conversion Factors

The thermal conversion factors presented in the following seven 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/barrel = 66.36 million Btu).

In general, the annual thermal conversion factors presented in Tables A2 through A7 are computed from final annual data. However, if the current year's final data are not available in time for publication, thermal conversion factors for the current year are computed from the best available data and are labeled "preliminary." The source of each factor is described in a section entitled "Thermal Conversion Factor Source Documentation," which follows Table A7 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 more heavily than the thermal conversion factor for propane.

More information about British thermal units (the standardized unit of measure for energy) can be found in Appendix D, "Energy Units in Perspective," and in the Glossary.

Table A1. Approximate Heat Content of Petroleum Products and Wood

Energy Source	Heat Content
	Million Btu per Barrel
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	5.253
Natural Gasoline and Isopentane	4.620
Pentane 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
	Million Btu per Short Ton
Hardwood, dry (average)	17.2

Table A2. Approximate Heat Content of Crude Oil, Crude Oil and Products, and Natural Gas Plant Liquids, 1949-1994

(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	R5.883	R5.779	R3.801
1994P	5.800	5.951	5.800	5.863	5.781	3.794

R=Revised data. P=Preliminary data.
Note: Includes lease condensate.

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A7.

Table A3. Approximate Heat Content of Petroleum Product Weighted Averages, 1949-1994

(Million Btu per Barrel)

Year	Consumption					Imports	Exports
	Residential and Commercial	Industrial	Transportation	Electric Utilities	Total		
1949	5.631	5.947	5.465	6.254	5.649	6.261	5.651
1950	5.626	5.940	5.461	6.254	5.649	6.263	5.751
1951	5.626	5.913	5.458	6.254	5.634	6.265	5.753
1952	5.621	5.905	5.442	6.254	5.621	6.261	5.768
1953	5.606	5.897	5.426	6.254	5.608	6.268	5.732
1954	5.603	5.883	5.412	6.254	5.595	6.252	5.738
1955	5.607	5.866	5.408	6.254	5.591	6.234	5.765
1956	5.601	5.856	5.406	6.254	5.585	6.225	5.744
1957	5.587	5.842	5.405	6.254	5.577	6.219	5.774
1958	5.582	5.832	5.393	6.254	5.567	6.091	5.778
1959	5.549	5.811	5.389	6.254	5.557	6.142	5.830
1960	5.570	5.800	5.388	6.267	5.555	6.161	5.835
1961	5.570	5.795	5.386	6.268	5.552	6.102	5.833
1962	5.555	5.784	5.386	6.267	5.545	6.138	5.842
1963	5.532	5.759	5.384	6.266	5.534	6.126	5.841
1964	5.517	5.728	5.388	6.267	5.528	6.129	5.845
1965	5.535	5.728	5.387	6.267	5.532	6.123	5.742
1966	5.523	5.722	5.388	6.266	5.532	6.112	5.728
1967	5.473	5.682	5.391	6.266	5.515	6.128	5.758
1968	5.450	5.646	5.394	6.263	5.504	6.095	5.762
1969	5.399	5.603	5.394	6.259	5.492	6.093	5.713
1970	5.404	5.604	5.393	6.252	5.503	6.088	5.811
1971	5.392	5.600	5.389	6.245	5.504	6.062	5.775
1972	5.368	5.564	5.388	6.233	5.500	6.045	5.741
1973	5.387	5.568	5.395	6.245	5.515	5.983	5.752
1974	5.377	5.538	5.394	6.238	5.504	5.959	5.773
1975	5.358	5.528	5.392	6.250	5.494	5.935	5.747
1976	5.383	5.538	5.395	6.251	5.504	5.980	5.743
1977	5.389	5.555	5.400	6.249	5.518	5.908	5.796
1978	5.382	5.553	5.404	6.251	5.519	5.955	5.814
1979	5.471	5.418	5.428	6.258	5.494	5.811	5.864
1980	5.468	5.376	5.440	6.254	5.479	5.748	5.841
1981	5.409	5.313	5.432	6.258	5.448	5.659	5.837
1982	5.392	5.263	5.422	6.258	5.415	5.664	5.829
1983	5.286	5.273	5.415	6.255	5.406	5.677	5.800
1984	5.384	5.223	5.422	6.251	5.395	5.613	5.867
1985	5.326	5.221	5.423	6.247	5.387	5.572	5.819
1986	5.357	5.286	5.427	6.257	5.418	5.624	5.839
1987	5.316	5.253	5.430	6.249	5.403	5.599	5.860
1988	5.320	5.248	5.434	6.250	5.410	5.618	5.842
1989	5.257	5.233	5.440	6.241	5.410	5.641	5.869
1990	5.208	5.272	5.445	6.247	5.411	5.614	5.838
1991	5.163	5.192	5.442	6.248	5.384	5.636	5.827
1992	5.169	5.188	5.445	6.243	5.378	5.623	5.774
1993	R5.148	R5.200	R5.438	6.241	R5.379	R5.620	R5.777
1994P	5.122	5.181	5.441	6.231	5.370	5.538	5.779

R=Revised data. P=Preliminary data.

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 A7.

Table A4. Approximate Heat Content of Natural Gas, 1949-1994

(Btu per Cubic Foot)

Year	Production		Consumption			Imports	Exports
	Dry	Marketed (Wet)	Sectors Other Than Electric Utilities	Electric Utilities	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	1,030	1,031	1,004	1,019
1990	1,031	1,106	1,030	1,034	1,031	1,012	1,018
1991	1,030	1,108	1,031	1,024	1,030	1,014	1,022
1992	1,030	1,110	1,031	1,022	1,030	1,011	1,018
1993	R1,027	R1,106	R1,028	1,022	R1,027	R1,020	R1,016
1994P	1,027	1,106	1,028	1,022	1,027	1,020	1,016

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

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A7.

Table A5. Approximate Heat Content of Coal and Coal Coke, 1949-1994

(Million Btu per Short Ton)

Year	Coal								Coal Coke
		Consumption							
	Production	Residential and Commercial	Coke Plants	Other Industries [1]	Electric Utilities	Total	Imports	Exports	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	20.848	21.272	25.000	26.160	24.800
1990	21.822	23.137	26.799	22.457	20.929	21.331	25.000	26.202	24.800
1991	21.681	23.114	26.799	22.460	20.755	21.146	25.000	26.188	24.800
1992	21.646	23.105	26.799	22.250	20.787	21.143	25.000	26.161	24.800
1993	R21.388	R22.994	R26.800	R22.123	R20.639	R20.983	25.000	R26.335	24.800
1994P	21.352	23.600	26.800	22.067	20.691	21.015	25.000	26.329	24.800

[1] Includes transportation.
R=Revised data. P=Preliminary data.

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A7.

Table A6. Approximate Heat Content of Coal by Type, 1949-1994

(Million Btu per Short Ton)

Year	Bituminous Coal [1] and Lignite								Anthracite				
	Production	Consumption					Imports	Exports	Production	Consumption			Imports and Exports
		Residential and Commercial	Coke Plants	Other Industry [2]	Electric Utilities	Total				Sectors Other Than Electric Utilities	Electric Utilities	Total	
1949	24.965	24.044	26.800	24.601	24.022	24.836	25.000	27.000	24.421	24.954	17.500	24.291	25.400
1950	25.126	24.162	26.800	24.804	24.200	25.024	25.000	27.000	24.667	25.297	17.500	24.592	25.400
1951	25.065	23.988	26.800	24.503	23.936	24.854	25.000	27.000	24.439	25.082	17.500	24.289	25.400
1952	25.157	24.108	26.800	24.711	24.118	24.955	25.000	27.000	24.400	25.063	17.500	24.257	25.400
1953	25.207	24.143	26.800	24.773	24.172	25.062	25.000	27.000	24.264	25.132	17.500	24.147	25.400
1954	25.115	24.144	26.800	24.775	24.174	24.971	25.000	27.000	24.234	25.015	17.500	24.130	25.400
1955	25.258	24.166	26.800	24.811	24.206	25.034	25.000	27.000	24.194	25.084	17.500	24.053	25.400
1956	25.187	24.082	26.800	24.668	24.080	24.913	25.000	27.000	23.899	24.548	17.500	23.580	25.400
1957	25.286	24.108	26.800	24.711	24.118	24.979	25.000	27.000	23.785	24.587	17.500	23.441	25.400
1958	25.031	24.039	26.800	24.592	24.014	24.758	25.000	27.000	24.059	25.003	17.500	23.903	25.400
1959	24.965	24.047	26.800	24.606	24.026	24.773	25.000	27.000	23.817	24.666	17.500	23.664	25.400
1960	24.960	24.054	26.800	24.604	24.029	24.765	25.000	27.000	23.717	24.721	17.500	23.592	25.400
1961	24.892	24.034	26.800	24.569	23.993	24.693	25.000	27.000	23.854	24.870	17.500	23.707	25.400
1962	24.869	24.027	26.800	24.558	23.988	24.668	25.000	27.000	23.811	24.666	17.500	23.515	25.400
1963	24.879	24.007	26.800	24.524	23.962	24.639	25.000	27.000	23.633	24.110	17.500	23.107	25.400
1964	24.887	23.988	26.800	24.490	23.928	24.652	25.000	27.000	23.507	24.164	17.500	23.128	25.400
1965	24.813	23.928	26.800	24.387	23.836	24.575	25.000	27.000	23.471	24.316	17.500	23.175	25.400
1966	24.664	23.836	26.800	24.227	23.699	24.431	25.000	27.000	23.202	24.193	17.500	22.906	25.400
1967	24.516	23.737	26.800	24.056	23.554	24.287	25.000	27.000	22.655	23.506	17.500	22.291	25.400
1968	24.487	23.724	26.800	24.034	23.531	24.229	25.000	27.000	22.426	23.293	17.500	22.037	25.400
1969	24.313	23.553	26.800	23.737	23.274	24.011	25.000	27.000	22.543	23.200	17.500	22.003	25.400
1970	23.862	23.111	26.800	22.973	22.603	23.461	25.000	27.000	22.603	23.476	17.500	22.102	25.400
1971	23.519	22.927	26.800	22.653	22.325	23.138	25.000	27.000	22.718	23.572	17.500	22.210	25.400
1972	23.400	22.861	26.800	22.539	22.225	23.050	25.000	27.000	22.422	23.403	17.500	21.822	25.400
1973	23.391	22.887	26.800	22.585	22.262	23.073	25.000	26.612	22.132	22.674	17.920	21.464	25.400
1974	23.087	22.523	26.800	22.420	21.799	22.694	25.000	26.716	21.711	22.330	17.200	20.919	25.400
1975	22.910	22.258	26.800	22.439	21.659	22.522	25.000	26.573	21.582	22.272	17.064	20.762	25.400
1976	22.863	22.819	26.800	22.528	21.692	22.509	25.000	26.613	22.045	22.618	17.526	21.254	25.400
1977	22.597	22.594	26.800	22.290	21.521	22.266	25.000	26.561	22.661	24.101	17.244	22.066	25.400
1978	22.242	22.078	26.800	22.175	21.284	22.014	25.000	26.501	23.079	24.388	17.104	22.398	25.400
1979	22.449	21.884	26.800	22.436	21.372	22.100	25.000	26.570	23.170	24.272	17.454	22.069	25.400
1980	22.411	22.488	26.800	22.690	21.301	21.950	25.000	26.404	22.869	22.719	17.652	21.405	25.400
1981	22.301	22.010	26.800	22.572	21.091	21.710	25.000	26.176	23.291	23.749	18.168	22.080	25.400
1982	22.233	22.226	26.800	22.695	21.200	21.670	25.000	26.231	23.289	24.578	18.160	22.518	25.400
1983	22.048	22.438	26.800	22.680	21.141	21.576	25.000	26.300	22.734	24.536	16.516	21.583	25.400
1984	22.005	22.406	26.800	22.525	21.108	21.570	25.000	26.410	23.107	25.128	17.018	22.322	25.400
1985	21.867	22.568	26.800	22.013	20.965	21.368	25.000	26.320	22.428	23.031	16.784	20.817	25.400
1986	21.908	22.669	26.800	22.185	21.091	21.462	25.000	26.308	23.084	24.399	15.578	21.512	25.400
1987	21.918	22.800	26.800	22.360	21.143	21.514	25.000	26.304	23.108	26.293	15.962	22.435	25.400
1988	21.817	23.135	26.800	22.341	20.905	21.324	25.000	26.308	23.266	26.021	17.312	22.423	25.400
1989	21.759	22.917	26.800	22.324	20.854	21.268	25.000	26.166	23.385	27.196	16.310	22.623	25.400
1990	21.819	22.678	26.800	22.444	20.935	21.330	25.000	26.207	22.574	25.199	16.140	21.668	25.400
1991	21.678	22.635	26.800	22.448	20.761	21.146	25.000	26.192	22.573	25.268	15.858	21.410	25.400
1992	21.643	22.768	26.800	22.242	20.792	21.142	25.000	26.165	22.572	24.617	16.944	21.423	25.400
1993	R21.383	R22.749	26.800	R22.111	R20.644	R20.983	25.000	R26.341	R22.573	R24.096	R16.534	R21.262	25.400
1994P	21.348	23.004	26.800	22.036	20.699	21.012	25.000	26.335	22.574	26.280	14.878	21.711	25.400

[1] Includes subbituminous coal.
[2] Includes transportation.

R=Revised data. P=Preliminary data.
Source: See "Thermal Conversion Factor Source Documentation," which follows Table A7.

Table A7. Approximate Heat Rates for Electricity, 1949-1994

(Btu per Kilowatthour)

Year	Electricity Generation			Electricity Consumption
	Fossil-Fueled Steam-Electric Plants [1]	Nuclear Steam-Electric Plants	Geothermal Energy Plants	
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	10,813	21,263	3,412
1986	10,446	10,799	21,263	3,412
1987	10,419	10,776	21,263	3,412
1988	10,324	10,743	21,096	3,412
1989	10,317	10,724	21,096	3,412
1990	10,335	10,680	21,096	3,412
1991	10,352	10,740	20,997	3,412
1992	10,302	10,678	R20,914	3,412
1993P	R10,280	R10,682	R20,914	3,412
1994P	10,280	10,682	20,914	3,412

[1] Used as the thermal conversion factor for hydroelectric power generation and for wood and waste, wind, photovoltaic, and solar thermal energy consumed at electric utilities.

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 **Petroleum Products, Exports** and **Crude Oil, Exports.**

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."

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.

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 naphtha. 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 30,120,000 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 factor 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 Naphtha. 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 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 and was first published in the *Petroleum Statement, Annual, 1970.*

Unfinished Oil. EIA assumed the thermal conversion factor to be 5.825 million Btu per barrel or equal to that for distillate fuel oil (see **Distillate Fuel Oil**) and first published 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 in EIA's *Annual Report to Congress, Volume 2, 1981.*

Wax. 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. • 1980-1992: Calculated annually by EIA by dividing the total heat content of natural gas consumed by the total quantity of natural gas consumed. The heat content and quantity consumed are from Form EIA-176. Published sources are: • 1980-1989: EIA, *Natural Gas Annual 1992, Volume 2*, Table 15. • 1990-1992: EIA, *Natural Gas Annual 1992, Volume 2*, Table 16. • 1993: 1992 value used as an estimate.

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 (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

Anthracite, Total Consumption. Calculated annually by EIA by dividing the sum of the heat content of anthracite consumed by electric utilities and all other sectors combined by the total quantity of anthracite consumed.

Anthracite, Consumption by Electric Utilities. • 1949-1972: Assumed by EIA that all anthracite consumed at electric utilities was recovered from culm banks and river dredging and estimated to have an average heat content of 17.500 million Btu per short ton. • 1973 forward: Calculated annually by EIA by dividing the heat content of anthracite receipts at electric utilities by the quantity of anthracite received at electric utilities, as reported on Form FERC-423 and predecessor forms.

Anthracite, Consumption by Sectors Other Than Electric Utilities. Calculated annually by EIA by dividing the heat content of anthracite production less the heat content of the anthracite consumed at electric utilities, net exports, and shipments to U.S. Armed Forces overseas by the quantity of anthracite consumed by sectors other than electric utilities, less the quantity of anthracite stock changes, losses, and "unaccounted for."

Anthracite, Imports and Exports. EIA assumed the anthracite imports and exports to be freshly mined anthracite having an estimated heat content of 25.400 million Btu per short ton.

Anthracite, Production. Calculated annually by EIA by dividing the sum of the heat content of freshly mined anthracite (estimated to have an average heat content of 25.400 million Btu per short ton) and the heat content of anthracite recovered from culm banks and river dredging (estimated to have an average heat content of 17.500 million Btu per short ton) by the total quantity of anthracite produced.

Bituminous Coal and Lignite, Total Consumption. Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite consumed by electric utilities, coal coke plants, other industrial plants, and by the residential and commercial sector and the transportation sector by the sum of their respective tonnages.

Bituminous Coal and Lignite, Consumption by Coke Plants: Estimated by EIA to be 26.800 million Btu per short ton based on input-output analysis of coal carbonization.

Bituminous Coal and Lignite, Consumption by Electric Utilities. •1949-1972: EIA adopted the average thermal conversion factor of the Bureau of Mines, which used the National Coal Association average thermal conversion factor for electric utilities calculated from Form FPC-1 and published in *Steam Electric Plant Factors*, a National Coal Association annual report. • 1973 forward: Calculated annually by EIA by dividing the total heat content of bituminous coal and lignite received at electric utilities by the total quantity received at electric utilities. Heat contents and receipts are from Form FERC-423 and predecessor forms.

Bituminous Coal and Lignite, Consumption by Other Industrial Users. • 1949-1973: Calculated annually by EIA through regression analysis measuring the difference between the average Btu value of coal consumed by other industrial users and that of coal consumed at electric utilities in the 1974-1983 period. • 1974 forward: Calculated annually by EIA by assuming that the bituminous coal and lignite delivered to other industrial users from each coal-producing area (reported on Form EIA-6 and predecessor Bureau of Mines Form 6-1419-Q) contained a heat value equal to that of bituminous coal and lignite received at electric utilities from each of the same coal-producing areas (reported on Form FERC-423). The average Btu value of coal by coal-producing area was applied to the volume of deliveries to other industrial users from each coal-producing area, and the sum total of the heat content was divided by the total volume of deliveries. Coal-producing areas are the Bureau of Mines coal-producing districts for 1974 through 1989 and coal-producing States for 1990.

Bituminous Coal and Lignite, Consumption by Residential and Commercial Users. • 1949-1973: Calculated annually by EIA through regression analysis measuring the difference between the average Btu value of coal consumed by residential and commercial users and that of coal consumed by electric utilities in the 1974-1983 period. • 1974 forward: Calculated annually by EIA by assuming that the bituminous coal and lignite delivered to residential and commercial users from each coal-producing area (reported on Form EIA-6 and predecessor Bureau of Mines Form 6-1419-Q) contained a heat value equal to that of bituminous coal and lignite received at electric utilities from each of the same coal-producing areas (reported on Form FERC-423). The average

Btu value of coal by coal-producing area was applied to the volume of deliveries to residential and commercial users from each coal-producing area, and the sum total of the heat value was divided by the total volume of deliveries. Coal-producing areas are the Bureau of Mines coal-producing districts for 1974 through 1989 and coal-producing States for 1990.

Bituminous Coal and Lignite, Consumption by Transportation Users: Assumed by EIA to be equal to the Btu conversion factor for **Bituminous Coal and Lignite, Consumption by Other Industrial Users.**

Bituminous Coal and Lignite, Exports. • 1949-1972: Assumed by EIA to be all metallurgical coal and to have an average thermal content of 27.000 million Btu per short ton. • 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of exported metallurgical coal (estimated to average 27.000 million Btu per short ton) and the heat content of exported steam coal (estimated to have an average thermal content of 25.000 million Btu per short ton) by the total quantity of bituminous coal and lignite exported.

Bituminous Coal and Lignite, Imports. EIA estimated the average thermal conversion factor to be 25.000 million Btu per short ton.

Bituminous Coal and Lignite, Production. Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite consumption, net exports, stock changes, and unaccounted for by the sum of their respective tonnages. Consumers' stock changes by sectors were assumed to have the same conversion factor as that for the consumption sector. Producers' stock changes and unaccounted for were assumed to have the same conversion factor as that for consumption by all users.

Coal, Total Consumption. Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite consumption by the sum of their respective tonnages.

Coal, Consumption by Electric Utilities. Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite received at electric utilities by the sum of their respective tonnages received.

Coal, Consumption by Sectors Other Than Electric Utilities. Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite consumed by sectors other than electric utilities by the sum of their respective tonnages.

Coal, Exports. Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite exported by the sum of their respective tonnages.

Coal, Imports. Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite imported by the sum of their respective tonnages.

Coal, Production. Calculated annually by EIA by dividing the sum of the total heat content of bituminous coal and lignite and anthracite produced by the sum of their respective tonnages.

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 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 kilowatthour of electricity produced, regardless of the generation process, is 3,412 Btu per kilowatthour. • 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 through 1991: 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. • 1992 forward: Unpublished factors calculated on the basis of data from Form EIA-676.

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. • 1982 forward: Estimated annually by EIA on the basis of an informal survey of relevant plants.

Nuclear Steam-Electric Plant Generation. • 1957-1991: Calculated annually by EIA 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 are reported on Form FERC-1, Form EIA-412, and predecessor forms. The factors, beginning with 1982 data, are published in the following EIA reports–1982: *Historical Plant Cost and Annual Production Expenses for Selected Electric Plants 1982*, page 215. 1983-1991: *Electric Plant Cost and Power Production Expenses 1991*, Table 13. • 1992 forward: Calculated annually by EIA by dividing the total heat content of the steam leaving the nuclear generating units to generate electricity by the total (net) electricity generated by nuclear generating units. The heat content and electricity generation data are reported in Nuclear Regulatory Commission, *Licensed Operating Reactors—Status Summary Report.*

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 are the equivalent of 453.6 metric tons (500 short tons x 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 are the equivalent of 420 U.S. gallons (10 barrels x 42 gallons/barrel = 420 gallons).

Table B1. Metric Conversion Factors

U.S. Unit	*multiplied by*	Conversion Factor	*equals*	Metric Unit
Mass				
short tons (2,000 lb)	x	0.907 184 7	=	metric tons (t)
long tons	x	1.016 047	=	metric tons (t)
pounds (lb)	x	0.453 592 37[a]	=	kilograms (kg)
pounds uranium oxide (lb U_3O_8)	x	0.384 647[b]	=	kilograms uranium (kgU)
ounces, avoirdupois (avdp oz)	x	28.349 52	=	grams (g)
Length				
miles (mi)	x	1.609 344[a]	=	kilometers (km)
yards (yd)	x	0.914 4[a]	=	meters (m)
feet (ft)	x	0.304 8[a]	=	meters (m)
inches (in)	x	2.54[a]	=	centimeters (cm)
Energy				
British thermal units (Btu)	x	1,055.056[c]	=	joules (J)
calories (cal)	x	4.186 8[a]	=	joules (J)
kilowatthours (kWh)	x	3.6[a]	=	megajoules (MJ)
Volume				
barrels of oil (bbl)	x	0.158 987 3	=	cubic meters (m^3)
cubic yards (yd^3)	x	0.764 555	=	cubic meters (m^3)
cubic feet (ft^3)	x	0.028 316 85	=	cubic meters (m^3)
U.S. gallons (gal)	x	3.785 412	=	liters (L)
ounces, fluid (fl oz)	x	29.573 53	=	milliliters (mL)
cubic inches (in^3)	x	16.387 06	=	milliliters (mL)
Area				
acres	x	0.404 69	=	hectares (ha)
square miles (mi^2)	x	2.589 988	=	square kilometers (km^2)
square yards (yd^2)	x	0.836 127 4	=	square meters (m^2)
square feet (ft^2)	x	0.092 903 04[a]	=	square meters (m^2)
square inches (in^2)	x	6.451 6[a]	=	square centimeters (cm^2)
Temperature				
degrees Fahrenheit (°F)	x	5/9 (after subtracting 32)[a,d]	=	degrees Celsius (°C)

[a]Exact conversion.
[b]Calculated by the Energy Information Administration.
[c]The Btu used in this table is the International Table Btu adopted by the Fifth International Conference on Properties of Steam, London, 1956.
[d]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 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^{1}	deka	da	10^{-1}	deci	d
10^{2}	hecto	h	10^{-2}	centi	c
10^{3}	kilo	k	10^{-3}	milli	m
10^{6}	mega	M	10^{-6}	micro	μ
10^{9}	giga	G	10^{-9}	nano	n
10^{12}	tera	T	10^{-12}	pico	p
10^{15}	peta	P	10^{-15}	femto	f
10^{18}	exa	E	10^{-18}	atto	a
10^{21}	zetta	Z	10^{-21}	zepto	z
10^{24}	yotta	Y	10^{-24}	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
Petroleum	barrels (bbl)	x	42[a]	=	U.S. gallons (gal)
Coal	short tons	x	2,000[a]	=	pounds (lb)
	long tons	x	2,240[a]	=	pounds (lb)
	metric tons (t)	x	1,000[a]	=	kilograms (kg)
Wood	cords (cd)	x	1.25[b]	=	short tons
	cords (cd)	x	128[a]	=	cubic feet (ft^3)

[a]Exact conversion.
[b]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

The need for accurate estimates of carbon dioxide emissions produced during the combustion of coal has led the Energy Information Administration (EIA) to develop basic emission factors. Basic emission factors reflect the carbon-to-heat-content ratio of coal, a ratio which measures carbon dioxide emissions per unit of energy (pounds per million Btu), assuming complete combustion. These basic factors are derived from 5,426 sample analyses maintained in EIA's Coal Analysis File. Variations in the carbon-to-heat-content of different coals were observed to follow coal rank and geographic origin, leading EIA to develop basic emission factors specific to the rank and the State of origin of the coal.

On the basis of these rank- and State-specific basic emission factors for coal, EIA has also developed emission factors by sector. These sectoral emission factors weight the coal consumed in a given sector by its rank and State of origin. Table C1 presents the U.S. average carbon dioxide emission factors for coal by sector. Emission factors differ among sectors and within a given sector over time for a number of reasons:

- A higher average emission factor in the residential and commercial sector can be attributed to the steady consumption of bituminous coal and anthracite (presumably for home heating).
- Virtually all of the coal consumed by coke plants comes from only a few States in the Appalachian Coal Basin (West Virginia, Virginia, and eastern Kentucky). Hence, the emission factors for this sector have remained fairly constant.
- Other industrial users of coal (not coke plants) increased consumption of low-rank, high-emission western coals, which has contributed to a rise in their average emission factor.
- Electric utilities, which account for most U.S. coal consumption, have shifted over time away from high-rank, low-emission bituminous coal to low-rank, high-emission subbituminous coal and lignite as reflected in a gradually rising weighted-average carbon dioxide emission factor.

Table C1. Average Carbon Dioxide Emission Factors for Coal by Coal-Consuming Sector
(Pounds of Carbon Dioxide per Million Btu)

Year	Residential and Commercial	Industrial		Electric Utilities	U.S. Average[b]
		Coke Plants[a]	Other Coal		
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	209.5	206.2	206.8	207.6	207.4
1991	210.2	206.2	206.9	207.7	207.5
1992	211.2	206.2	207.1	207.7	207.6
1993	209.9	206.2	207.0	207.8	207.7

[a]No allowances have been made for carbon retained in non-energy coal chemical byproducts from the coal carbonization process.
[b]Weighted average. The weights used are consumption values by sector.
Source: Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

Appendix D

Energy Units in Perspective

Using Appendix D

The two tables in this appendix are intended to help the nontechnical reader understand the value of the various energy units used in the *Annual Energy Review*. The values shown here (especially the equivalents in Table D2) are approximations intended to convey a general idea of the magnitude of energy units. The tables can be used to relate a familiar measure of energy, such as gallons, to energy measures used in this report. For example, using information from Table D1, the reader can calculate that 8 gallons of motor gasoline was, on average, about a six-and-a-half-day supply per capita in 1994. Table D2 indicates that 8 gallons of motor gasoline equals about 10 therms of natural gas or approximately 1 million British thermal units (see Glossary).

Table D1. U.S. Daily Per Capita Consumption of Energy by Type, 1974, 1984, and 1994

Type of Energy	Type of Unit	1974	1984	1994	Percent Change 1974-1984	Percent Change 1984-1994
Petroleum Products	gallons	3.3	2.8	2.9	-14.8	2.1
Motor Gasoline	gallons	1.3	1.2	1.2	-7.8	3.1
Natural Gas (dry)	cubic feet	273	207	217	-23.9	4.6
Coal	pounds	14.3	18.3	19.6	27.5	7.1
Hydroelectricity	kilowatthours	3.9	3.7	2.6	-4.1	-29.9
Nuclear Electricity	kilowatthours	1.5	3.8	6.7	158.8	77.5
Total Electricity	kilowatthours	21.9	26.4	30.8	20.5	16.7
Total Energy	thousand Btu	932	858	932	-7.9	8.6

Note: Percent change is calculated from data prior to rounding.
Sources: Tables 1.5, 2.1, 5.1, 5.11, 6.1, 7.1, 8.1, and 8.3.

Table D2. Energy Equivalents

Unit of Energy	Energy Equivalent[a]	
1 Btu of energy	1	match tip
	250	calories (International Steam Table)
	0.25	kilocalories (food calories)
1 million Btu of energy	90	pounds of coal
	8	gallons of motor gasoline
	10	therms of dry natural gas
	11	gallons of propane
	1.1	days of U.S. energy consumption per capita
1 quadrillion[b] Btu of energy	45	million short tons of coal
	60	million short tons of oven-dried hardwood
	1	trillion cubic feet of dry natural gas
	170	million barrels of crude oil
	470	thousand barrels of crude oil per day for 1 year
	19	days of U.S. petroleum imports
	25	days of U.S. motor gasoline use
	25	hours of world energy use (1993)
1 barrel of crude oil	16	days of U.S. petroleum consumption per capita
	5.6	thousand cubic feet of dry natural gas
	0.26	short tons (520 pounds) of coal
	1.7	thousand kilowatthours of electricity[c]
1 short ton of coal	102	days of U.S. coal consumption per capita
	3.8	barrels of crude oil
	21	thousand cubic feet of dry natural gas
	6.5	thousand kilowatthours of electricity
1,000 cubic feet of natural gas	4.6	days of U.S. natural gas consumption per capita
	300	kilowatthours of electricity[c]
1,000 kilowatthours of electricity	32	days of U.S. electricity use per capita

[a]Equivalents are approximate.
[b]One quadrillion equals 1,000,000,000,000,000.
[c]However, because of net energy losses associated with the generation of electricity, about three times as much fossil fuel is required to generate 1,000 kilowatthours: 1.8 barrels of crude oil, 0.47 short tons of coal, or 10,000 cubic feet of natural gas.

Notes: • One million Btu of fossil fuels burned at electric utilities can generate about 100 kilowatthours of electricity, while it takes about 300 kilowatthours of electricity generated at electric utilities to produce 1 million Btu of heat. • Calculations are based on 1994 data where applicable, unless otherwise noted.

Appendix E

Gross Domestic Product and Implicit Price Deflators

Table E1. Gross Domestic Product and Implicit Price Deflators, 1949–1994

Years 1949–1971	Gross Domestic Product (billion 1987 dollars)	Implicit Price Deflator (1987=100)	Years 1972–1994	Gross Domestic Product (billion 1987 dollars)	Implicit Price Deflator (1987=100)
1949	1,305.5	19.9	1972	3,107.1	38.8
1950	1,418.5	20.2	1973	3,268.6	41.3
1951	1,558.4	21.3	1974	3,248.1	44.9
1952	1,624.9	21.5	1975	3,221.7	49.2
1953	1,685.5	22.0	1976	3,380.8	52.3
1954	1,673.8	22.2	1977	3,533.3	55.9
1955	1,768.3	22.9	1978	3,703.5	60.3
1956	1,803.6	23.6	1979	3,796.8	65.5
1957	1,838.2	24.4	1980	3,776.3	71.7
1958	1,829.1	24.9	1981	3,843.1	78.9
1959	1,928.8	25.6	1982	3,760.3	83.8
1960	1,970.8	26.0	1983	3,906.6	87.2
1961	2,023.8	26.3	1984	4,148.5	91.0
1962	2,128.1	26.9	1985	4,279.8	94.4
1963	2,215.6	27.2	1986	4,404.5	96.9
1964	2,340.6	27.7	1987	4,539.9	100.0
1965	2,470.5	28.4	1988	4,718.6	103.9
1966	2,616.2	29.4	1989	4,838.0	108.5
1967	2,685.2	30.3	1990	4,897.3	113.3
1968	2,796.9	31.8	1991	R4,867.6	R117.6
1969	2,873.0	33.4	1992	R4,979.3	R120.9
1970	2,873.9	35.2	1993	R5,134.5	R123.5
1971	2,955.9	37.1	1994	5,342.4	126.1

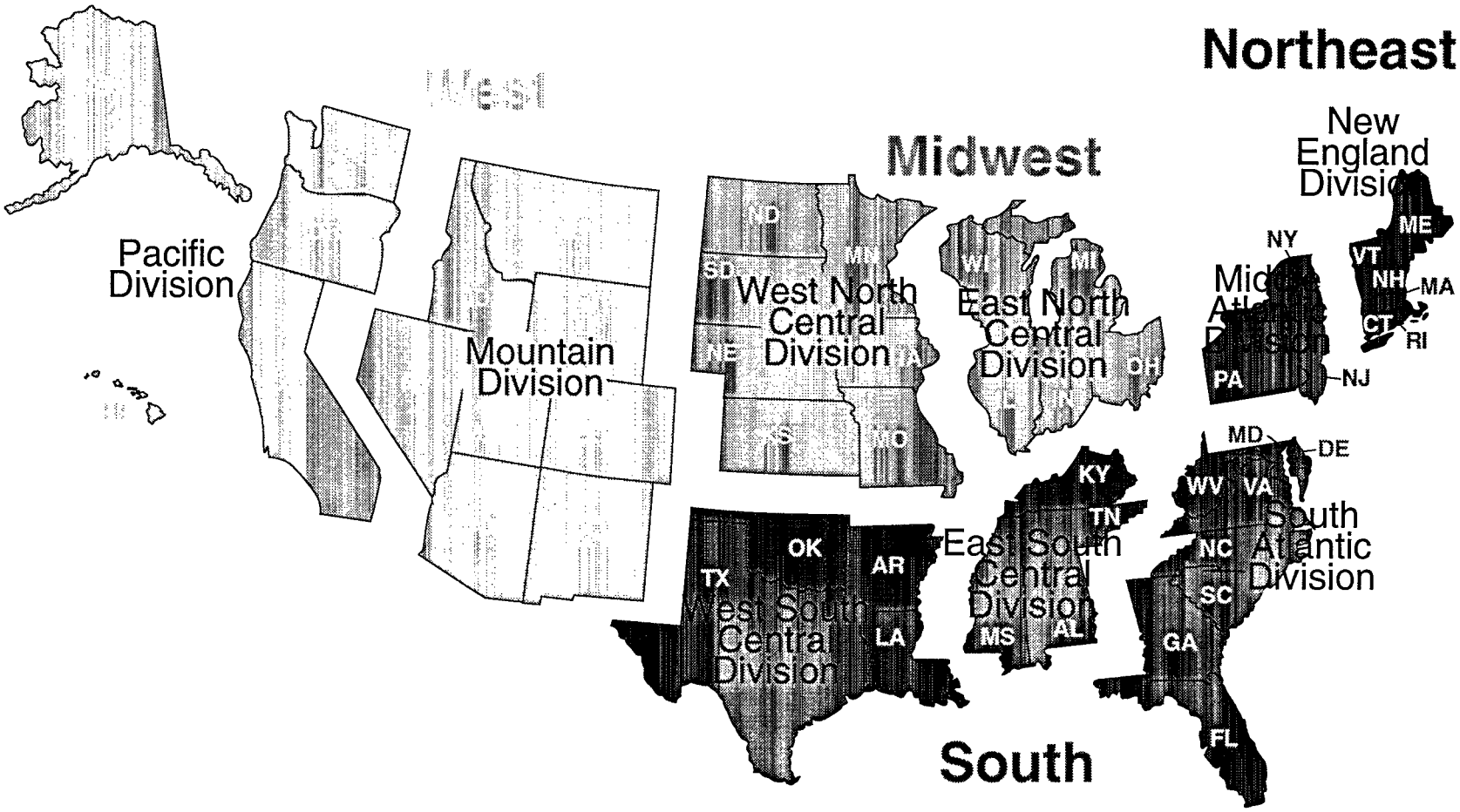
R=Revised data.

Sources: **Gross Domestic Product:** • 1949–1992—Bureau of Economic Analysis (BEA), U.S. Department of Commerce (DOC), *Survey of Current Business,* "Summary National Income and Product Series, 1929–93" (Washington, DC, September 1994), Table 2. • 1994—BEA, DOC, *United States Department of Commerce News* (Washington, DC, March 1, 1995), Table 2.

Implicit Price Deflators: • 1949–1958—United States Department of Commerce, *Economic Bulletin Board.* • 1959–1993—BEA, DOC, *Survey of Current Business,* "Summary National Income and Product Series, 1929–93" (Washington, DC, September 1994), Table 3. • 1994—BEA, DOC, *United States Department of Commerce News* (Washington, DC, March 1, 1995), Table 3.

U.S. Census Regions and Divisions

Figure 1. U.S. Census Regions and Divisions



Source: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States 1994* (Washington, DC, September 1994), Figure 1.

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.

Additions to Property: The current year's expenditures on property, plant, and equipment. The amount is predicated upon each reporting company's accounting practices. That is, accounting practices with regard to capitalization of certain items may differ across companies, and, therefore, this figure is a function of each reporting company's policy.

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; CH_3-$(CH_2)_n$-OH (e.g., methanol, ethanol, and tertiary butyl alcohol).

Anthracite: A hard, black, lustrous coal containing a high percentage of fixed carbon and a low percentage of volatile matter. Often referred to as hard coal. It conforms to ASTM Specification D388-84 for anthracite, meta-anthracite, and semianthracite.

API: The American Petroleum Institute, a trade association.

API Gravity: An arbitrary scale expressing the gravity or density of liquid petroleum products. The measuring scale is calibrated in terms of degrees API. A lighter, less dense product has a higher API gravity.

Apparent Consumption, Natural Gas (international): The total of an individual nation's marketed natural gas production plus imports less exports.

Apparent Consumption, Petroleum (international): Consumption which includes internal consumption, refinery fuel and loss, and bunkering. For countries in the Organization for Economic Cooperation and Development (OECD), apparent consumption is derived from refined product output plus refined product imports minus refined product exports plus refined product stock changes plus other oil consumption (such as direct use of crude oil). For countries outside the OECD, apparent consumption is either a reported figure or is derived from refined product output plus refined product imports minus refined product exports, with stock levels assumed to remain the same. Apparent consumption also includes, where available, liquefied petroleum gases sold directly from natural gas processing plants, for fuel or chemical uses.

Asphalt: A dark-brown-to-black cement-like material containing bitumens as the predominant constituents. It is obtained by petroleum processing. The definition 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.

ASTM: The American Society for Testing and Materials.

Aviation Gasoline Blending Components: Naphthas that are used for blending or compounding into finished aviation gasoline (e.g., straight-run gasoline, alkylate, and reformate). Excluded are oxygenates (alcohols, ethers), butane, and pentanes plus.

Aviation Gasoline, Finished: All special grades of gasoline for use in aviation reciprocating engines, as given in ASTM Specification D910 and Military Specification MIL-G-5572. Excludes blending components that will be used in blending or compounding into finished aviation gasoline.

Barrel (petroleum): A unit of volume equal to 42 U.S. gallons.

Barrels per Calendar Day (operable refinery capacity): The maximum number of barrels of input that can be processed during a 24-hour period after making allowances for the following limitations: the capability of downstream facilities to absorb the output of crude oil processing facilities of a given refinery (no reduction is made when a planned distribution of intermediate streams through other than downstream facilities is part of a refinery's normal operation); the types and grades of inputs to be processed; the types and grades of products to be manufactured; the environmental constraints associated with refinery operations; the reduction of capacity for scheduled

downtime, such as routine inspection, mechanical problems, maintenance, repairs, and turnaround; and the reduction of capacity for unscheduled downtime, such as mechanical problems, repairs, and slowdowns.

Base (Cushion) 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.

Biofuels: Wood, waste, and alcohol fuels.

Bituminous Coal: A dense black coal, often with well-defined bands of bright and dull material, with a moisture content usually less than 20 percent. Often referred to as soft coal. It is the most common coal and is used primarily for generating electricity, making coke, and space heating. It conforms to ASTM Specification D388-84 for bituminous coal. In this report, bituminous coal includes subbituminous coal.

British Thermal Unit (Btu): The quantity of heat needed to raise the temperature of 1 pound of water by 1° F at or near 39.2° F. (See **Heat Content of a Quantity of Fuel, Gross,** and **Heat Content of a Quantity of Fuel, Net.**)

Butane: A normally gaseous straight-chain or branched-chain hydrocarbon (C_4H_{10}). It is 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° F. 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° F. It is extracted from natural gas or refinery gas streams.

Butylene: An olefinic hydrocarbon (C_4H_8) recovered from refinery processes.

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.

CIF: See **Cost, Insurance, Freight.**

City Gate: A point or measuring station at which a distribution gas utility receives gas from a natural gas pipeline company or transmission system.

Class A Electric Utility: An electric utility having annual electric operating revenues of $2.5 million or more. (Use of this term ceased on December 31, 1983.)

Class B Electric Utility: An electric utility having annual electric operating revenues of $1.0 million or more but less than $2.5 million. (Use of this term ceased on December 31, 1983.)

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

Coalbed Methane: Methane that is produced from coalbeds in the same manner as natural gas produced from other strata. Methane is the principal component of natural gas.

Coal Coke: A hard, porous product made from baking bituminous coal in ovens at temperatures as high as 2,000° F. It is used both as a fuel and as a reducing agent in smelting iron ore in a blast furnace.

Cogenerator: A generating facility that produces electricity and another form of useful thermal energy (such as heat or steam) used for

industrial, commercial, heating, and cooling purposes. See **Nonutility Power Producer.**

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: The commercial sector, as defined economically, consists of business establishments that are not engaged in transportation or in manufacturing or other types of industrial activity (agriculture, mining, or construction). Commercial establishments include hotels, motels, restaurants, wholesale businesses, retail stores, laundries, and other service enterprises; religious and nonprofit organizations; health, social, and educational institutions; and Federal, State, and local governments. Street lights, pumps, bridges, and public services are also included if the establishment operating them is considered commercial. Standard Industrial Classification (SIC) codes used to classify an establishment as commercial are 50 through 87, 89, and 91 through 97.

Completion: 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.

Constant Dollars: Amounts expressed in constant dollars have been adjusted to remove the effect of changes in the purchasing power of the dollar. Prices expressed in constant dollars usually reflect buying power relative to a base year.

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.

Cost, Insurance, Freight (CIF): A type of sale in which the buyer of the product agrees to pay a unit price that includes the f.o.b. value of the product at the point of origin, plus all costs of insurance and transportation. This type of transaction differs from a "delivered" purchase in that the buyer accepts the quantity as determined at the loading port (as certified by the Bill of Loading and Quality Report) rather than pay on the basis of the quantity and quality ascertained at the unloading port. It is similar to the terms of an f.o.b. sale, except that the seller, as a service for which he is compensated, arranges for transportation and insurance.

Crude Oil f.o.b. Price: The crude oil price actually charged at the oil-producing country's port of loading. Includes deductions for any rebates and discounts or additions of premiums, where applicable. It is the actual price paid with no adjustment for credit terms.

Crude Oil (Including Lease Condensate): A mixture of hydrocarbons that exists in liquid phase in underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Included are lease condensate and liquid hydrocarbons produced from tar sands, gilsonite, and oil shale. Drip gases are also included, but topped crude oil (residual oil) and other unfinished oils are excluded. Where identifiable, liquids produced at natural gas processing plants and mixed with crude oil are likewise excluded.

Crude Oil Landed Cost: The price of crude oil at the port of discharge, including charges associated with the purchase, transporting, and insuring of 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.

Glossary

Cubic Foot (natural gas): A unit of volume equal to 1 cubic foot at a pressure base of 14.73 pounds standard per square inch absolute and a temperature base of 60° F.

Current Dollars: Amounts expressed in current dollars have not been adjusted to remove the effect of changes in the purchasing power of the dollar.

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 up to 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 presently 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, 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.

Distillate Fuel Oil: A general classification for one of the petroleum fractions produced in conventional distillation operations. Included are products known as No. 1, No. 2, and No. 4 fuel oils and No. 1, No. 2, and No. 4 diesel fuels. It is used primarily for space heating, on- and off-highway diesel engine fuel (including railroad engine fuel and fuel for agricultural machinery), 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 piped into the building. The 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.

Dry Natural Gas Production (as a decrement from gas reserves): The volume of natural gas withdrawn from reservoirs during the report year less (1) the volume returned to such reservoirs in cycling, repressuring of oil reservoirs, and conservation operations; (2) shrinkage resulting from the removal of lease condensate and plant liquids; and (3) nonhydrocarbon gases, where they occur in sufficient quantity to render the gas unmarketable. Volumes of gas withdrawn from gas storage reservoirs and native gas that has been transferred to the storage category are not considered in production. This is not the same as marketed production, since the latter also excludes vented and flared gas but contains liquids.

Dry Natural Gas Production (as an increment to gas supply): Gross withdrawals from production reservoirs less gas used in reservoir repressuring, amounts vented and flared, nonhydrocarbons removed, and various natural gas constituents, such as ethane, propane, and butane, removed at natural gas processing plants. The parameters for measurement are 60° F and 14.73 pounds standard per square inch absolute.

Electrical System Energy Losses: The amount of energy lost during generation, transmission, and distribution of electricity, including plant and unaccounted-for uses.

Electricity Generation: The process of producing electric energy or transforming other forms of energy into electric energy. Also the amount of electric energy produced or expressed in watthours (Wh).

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

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

Electricity Production: Net electricity (gross electricity output measured at generator terminals minus power plant use) generated by publicly and privately owned electric utilities. Excludes industrial electricity generation (except autogeneration of hydroelectric power).

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 Power Plant: A station containing prime movers, electric generators, and auxiliary equipment for converting mechanical, chemical, and/or fission energy into electric energy.

Electric Utilities: All privately owned companies and all publicly owned agencies engaged in the generation, transmission, or distribution of electric power for public use. Publicly owned agencies include municipal electric utilities; Federal power projects, such as the Tennessee Valley Authority (TVA); rural electrification cooperatives; power districts; and State power projects.

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

Electric Utility Sector: The electric utility sector consists of privately and publicly owned establishments that generate, transmit, distribute, or sell electricity primarily for use by the public and that meet the definition of an electric utility. Nonutility power producers are not included in the electric utility sector.

Eliminations: Revenues and expenses resulting from transactions between segments. Consolidated company accounts do not include intersegment revenues and expenses. Therefore, such intersegment transactions must be eliminated.

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 Consumption, End-Use: The sum of fossil fuel consumption by the four end-use sectors (residential, commercial, industrial, and transportation) plus electric utility sales to those sectors and generation of hydroelectric power by nonelectric utilities. Net end-use energy consumption excludes electrical system energy losses. Total end-use energy consumption includes electrical system energy losses.

Energy Consumption, Total: The sum of fossil fuel consumed by the five sectors (residential, commercial, industrial, transportation, and

electric utility) plus hydroelectric power, nuclear electric power, net imports of coal coke, and electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

Energy Expenditures: The money directly spent 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 Source: A substance, such as petroleum, natural gas, or coal, that supplies heat or power. In Energy Information Administration (EIA) reports, electricity and renewable forms of energy, such as biomass, geothermal, wind, and solar, are considered to be energy sources.

Energy-Weighted Industrial Output: The weighted sum of real output for all two-digit Standard Industrial Classification (SIC) manufacturing industries plus agriculture, construction, and mining. The weight for each industry is the ratio of the quantity of end-use energy consumption to the value of real output. The base year for those weights is either 1981 or 1982, depending on data availability.

Ethane: A normally gaseous straight-chain hydrocarbon (C_2H_6). It is a colorless, paraffinic gas that boils at a temperature of -127.48° F. It is extracted from natural gas and refinery gas streams.

Ethylene: An olefinic hydrocarbon (C_2H_4) recovered from refinery processes or petrochemical processes.

Exploratory Well: A well drilled to find and produce oil or gas in an unproved area, to find a new reservoir in a field previously found to be productive of oil or gas in another reservoir, or to extend the limit of a known oil or gas reservoir.

Exports: Shipments of goods from the 50 States and the District of Columbia to foreign countries and to Puerto Rico, the Virgin Islands, and other U.S. possessions and territories.

Extraction Loss: The reduction in volume of natural gas due to the removal of natural gas constituents, such as ethane, propane, and butane, at natural gas processing plants.

f.a.s.: See **Free Alongside Ship.**

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.

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 1992 begins on October 1, 1991, and ends on September 30, 1992.

Flared Natural Gas: Natural gas burned in flares on the base site or at gas processing plants.

Floorspace: All the area enclosed by the exterior walls of a building, including indoor parking facilities, basements, hallways, lobbies, stairways, and elevator shafts. For aggregate floorspace statistics, square

footage was summed or aggregated over all buildings in a category (such as all office buildings in the United States).

f.o.b.: See **Free on Board.**

Former U.S.S.R.: See **U.S.S.R.**

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.

Forward Costs: The operating and capital costs still to be incurred in the production of uranium from estimated reserves; such costs are used in assigning the uranium reserves to cost categories. Those costs include labor, materials, power and fuel, royalties, payroll and production taxes, insurance, and applicable general and administrative costs. They exclude expenditures prior to reserve estimates—e.g., for property acquisition, exploration, mine development, and mill construction from the forward cost determinations, as well as income taxes, profit, and the cost of money. Forward costs are neither the full costs of production nor the market price at which the uranium will be sold.

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

Fossil Fuel 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.

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 transaction whereby the seller makes the product available within an agreed-on period at a given port at a given price. It is the responsibility of the buyer to arrange for the transportation and insurance.

Fuel Ethanol: An anhydrous, denatured aliphatic alcohol (C_2H_5OH) intended for motor gasoline blending. See **Oxygenates.**

Fuel-Switching Capability: The short-term capability of a manufacturing establishment to have used substitute energy sources in place of those actually consumed. Capability to use substitute energy sources means that the establishment's combustors (for example, boilers, furnaces, ovens, and blast furnaces) had the machinery or equipment either in place or available for installation so that substitutions could actually have been introduced within 30 days without extensive modifications. Fuel-switching capability does not depend on the relative prices of energy sources; it depends only on the characteristics of the equipment and certain legal constraints.

Full-Power Operation: Operation of a nuclear generating unit at 100 percent of its design capacity. Full-power operation precedes commercial operation.

Gasohol: A blend of finished motor gasoline (leaded or unleaded) and alcohol (generally ethanol but sometimes methanol) limited to 10 percent by volume of alcohol. Gasohol is included in finished leaded and unleaded motor gasoline.

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

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.

Geothermal Energy: Energy from the internal heat of the Earth, which may be residual heat, friction heat, or a result of radioactive decay. The heat is found in rocks and fluids at various depths and can be extracted by drilling and/or pumping.

Geothermal Energy (as used at electric utilities): Hot water or steam, extracted from geothermal reservoirs in the Earth's crust, and supplied to steam turbines at electric utilities that drive generators to produce electricity.

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: The implicit price deflator, published by the U.S. Department of Commerce, Bureau of Economic Analysis, is used to convert nominal figures to real figures.

Gross Electricity Generation: See **Electricity Generation, Gross.**

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. Also referred to as the higher heating value. Btu conversion factors typically used by EIA 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. Also referred to as the lower heating value. Btu conversion factors typically used by EIA 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-electric power plants is heavy oil.

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. The household includes babies, lodgers, boarders, employed persons who live in the housing unit, and persons who usually live in the household but are away traveling or in a hospital. The household does not include persons who are normally members of the household but who are away from home as college students or members of the armed forces. The household does not include persons temporarily visiting with the household if they have a place of residence elsewhere, persons who take their meals with the household but usually lodge or sleep elsewhere, domestic employees or other persons employed by the household who do not sleep in the same housing unit, or persons who are former members of the household, but have since become inmates of correctional or penal institutions, mental institutions, homes for the aged or needy, homes or hospitals for the chronically ill or handicapped, nursing homes, convents or monasteries, or other places in which residents may remain for long periods of time. By definition, the number of households is the same as the number of occupied housing units.

Housing Unit: A structure or part of a structure where a household lives. It has access from the outside of the building either directly or through a common hall. Housing units do not include group quarters, such as prisons or nursing homes where 10 or more unrelated persons

live. 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 production of electricity from the kinetic energy of falling water.

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

Imports: Receipts of goods into the 50 States and the District of Columbia from foreign countries and from Puerto Rico, the Virgin Islands, and other U.S. possessions and territories.

Independent Power Producer: Wholesale electricity producers (other than qualifying facilities under the Public Utilities Regulatory Policies Act of 1978) that are unaffiliated with franchised utilities in the area in which the independent power producers are selling power and that lack significant marketing power. Unlike traditional electric utilities, independent power producers do not possess transmission facilities that are essential to their customers and do not sell power in any retail service territory where they have a franchise. See **Nonutility Power Producer.**

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 1/2 to 1-1/2 miles apart. Indicated coal is projected to extend as a 1/2-mile-wide belt that lies more than 1/4 mile from the outcrop or points of observation or measurement.

Industrial Sector: The industrial sector comprises manufacturing industries which make up the largest part of the sector along with mining, construction, agriculture, fisheries, and forestry. Establishments in this sector range from steel mills, to small farms, to companies assembling electronic components. The SIC codes used to classify establishments as industrial are 1 through 39.

Internal Combustion Electric Power Plant: A power plant in which the prime mover is an internal combustion engine. Diesel or gas-fired engines are the principal types used in electric power plants. The plant is usually operated during periods of high demand for electricity.

International Bunkers: Storage compartments, found on vessels and aircraft engaged in international commerce, where fuel to be used by the vessel or aircraft is stored.

Jet Fuel: The term includes kerosene-type jet fuel and naphtha-type jet fuel. Kerosene-type jet fuel is a kerosene-quality product used primarily for commercial turbojet and turboprop aircraft engines. Naphtha-type jet fuel is a fuel in the heavy naphthas range used primarily for military turbojet and turboprop aircraft engines.

Kerosene: A petroleum distillate that has a maximum distillation temperature of 401° F at the 10-percent recovery point, a final boiling point of 572° F, and a minimum flash point of 100° F. Included are the two grades designated in ASTM D3699 (No. 1-K and No. 2-K) and all grades of kerosene called range or stove oil. Kerosene is used in space heaters, cook stoves, and water heaters; it is suitable for use as an illuminant when burned in wick lamps.

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 as fuel in natural gas processing plants.

Lease Condensate: A natural gas liquid recovered from gas well gas (associated and non-associated) in lease separators or natural gas field facilities. Lease condensate consists primarily of pentanes and heavier hydrocarbons.

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

Lignite: A brownish-black coal of low rank with a high content of moisture and volatile matter. Often referred to as brown coal. It is used almost exclusively for electric power generation. It conforms to ASTM Specification D388-84 for lignite.

Line-Miles of Seismic Exploration: The distance along the Earth's surface that is covered by seismic surveying.

Liquefied Natural Gas (LNG): Natural gas (primarily methane) that has been liquefied by reducing its temperature to -260° F at atmospheric pressure.

Liquefied Petroleum Gases (LPG): Ethane, ethylene, propane, propylene, normal butane, butylene, and isobutane produced at refineries or natural gas processing plants, including plants that fractionate new natural gas plant liquids.

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.

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 as process materials either incorporated into other materials used as processing aids in the manufacturing of other products or as carriers of other materials. Petroleum lubricants may be produced either from distillates or residues. Other substances may be added to impart or improve certain required properties. Excluded are by-products of lubricating oil refining, such as aromatic extracts derived from solvent extraction or tars derived from deasphalting. Lubricants include all grades of lubricating oils from spindle oil to cylinder oil and those used in greases. Lubricant categories include paraffinic and naphthenic.

Main Cooking Fuel: Fuel most often used for cooking.

Main Heating Equipment: Equipment used primarily for heating ambient air in the housing unit.

Main Heating Fuel: Fuel that powers the main heating equipment.

Major Electric Utility: A utility that, in the last 3 consecutive calendar years, had sales or transmission services exceeding one of the following: (1) 1 million megawatthours of total annual sales; (2) 100 megawatthours of annual sales for resale; (3) 500 megawatthours of annual gross interchange out; or (4) 500 megawatthours of wheeling (deliveries plus losses) for others.

Major Fuels: The energy sources or fuels for which consumption and expenditure data were collected on the 1986 Nonresidential Building Energy Consumption Survey. Those fuels or energy sources are as follows: electricity, fuel oil, liquefied petroleum gases, natural gas, district steam, district hot water, and district chilled water.

Manufacturing Establishment: An economic unit at a single physical location where the mechanical or chemical transformation of materials or substances into new products is performed. Those operations are generally conducted in facilities described as plants, factories, or mills and characteristically use power-driven machines and material handling equipment. In addition, the assembly of components of manufactured products is considered manufacturing, as is the blending of materials, such as lubricating oil, plastics, resins, or liquors. Manufacturing establishments are covered by SIC codes 20 through 39.

Manufacturing Sector: The universe of manufacturing establishments within the 50 States and the District of Columbia.

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 1/2 mile apart. Measured coal is projected to extend as a belt 1/4 mile wide from the outcrop or points of observation or measurement.

Metallurgical Coal: Coal that meets the requirements for making coke. It must be low in ash and sulfur and form a coke that is capable of supporting the charge of iron ore and limestone in a blast furnace. A blend of two or more bituminous coals is usually required to make coke.

Methanol: A light, volatile alcohol (CH_3OH) eligible for motor gasoline blending. See **Oxygenates.**

Metropolitan: Refers to buildings located within Metropolitan Statistical Areas (MSA's) as defined in the 1980 Census. Except in New England, an MSA is a county or a group of contiguous counties that contains at least one city of 50,000 inhabitants or more, or twin cities with a combined population of 50,000 or more. The contiguous counties are included in an MSA if they are essentially metropolitan in character and are socially and economically integrated with the central city. In New England, MSA's consist of towns and cities rather than counties.

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: A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, obtained by blending appropriate refinery streams to form a fuel suitable for use in spark-ignition engines. Motor gasoline includes both leaded and unleaded grades of finished motor gasoline, blending components, and gasohol.

Motor Gasoline Blending Components: Naphthas that will be used for blending or compounding into finished motor gasoline (e.g., straight-run gasoline, alkylate, reformate, benzene, toluene, and xylene). Excluded are oxygenates (alcohols and ethers), butane, and pentanes plus.

Motor Gasoline, Finished: A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, that has been blended to form a fuel suitable for use in spark-ignition engines. Motor gasoline, as given in ASTM Specification D439 or Federal Specification VV-G-1690B, includes a range in distillation temperatures from 122 to 158° F at the 10-percent recovery point and from 365 to 374° F at the 90-percent recovery point. Motor gasoline includes reformulated motor gasoline, oxygenated motor gasoline (Environmental Protection Agency [EPA] approved), and other finished motor gasoline. Blendstock is excluded until blending has been completed.

- *Reformulated Motor Gasoline:* Motor gasoline, formulated for use in motor vehicles, the composition and properties of which are certified as "reformulated motor gasoline" by the EPA.
- *Oxygenated Motor Gasoline (EPA Approved):* Motor gasoline, formulated for use in motor vehicles, that is intended for use in the EPA carbon monoxide nonattainment program. Reformulated motor gasoline is excluded.
- *Other Finished:* Motor gasoline that is not included in the reformulated or oxygenated categories.

Motor Gasoline, Finished Gasohol: A blend of finished motor gasoline (leaded or unleaded) and alcohol (generally ethanol, but sometimes methanol) in which 10 percent or more of the product is alcohol.

Motor Gasoline, Finished Leaded: Motor gasoline that contains more than 0.05 gram of lead per gallon or more than 0.005 gram of phosphorus per gallon. Premium and regular grades are included, depending on the octane rating. Includes leaded gasohol. Blendstock is excluded until blending has been completed. Alcohol that is to be used in the blending of gasohol is also excluded.

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Motor Gasoline, Finished Leaded Premium: Motor gasoline having an antiknock index, calculated as (R+M)/2, greater than 90 and containing more than 0.05 gram of lead per gallon or more than 0.005 gram of phosphorus per gallon.

Motor Gasoline, Finished Leaded Regular: Motor gasoline having an antiknock index, calculated as (R+M)/2 greater than or equal to 87 and less than or equal to 90 and containing more than 0.05 gram of lead or 0.005 gram of phosphorus per gallon.

Motor Gasoline, Finished Unleaded: Motor gasoline containing not more than 0.05 gram of lead per gallon and not more than 0.005 gram of phosphorus per gallon. Premium and regular grades are included, depending on the octane rating. Includes unleaded gasohol. Blendstock is excluded until blending has been completed. Alcohol that is to be used in the blending of gasohol is also excluded.

Motor Gasoline, Finished Unleaded Midgrade: Motor gasoline having an antiknock index calculated as (R+M)/2, greater than or equal to 88 and less than or equal to 90 and containing not more than 0.05 gram of phosphorus per gallon.

Motor Gasoline, Finished Unleaded Premium: Motor gasoline having an antiknock index calculated as (R+M)/2, greater than 90 and containing not more than 0.05 gram of lead or 0.005 gram of phosphorus per gallon.

Motor Gasoline, Finished Unleaded Regular: Motor gasoline having an antiknock index, calculated as (R+M)/2, of 87 and containing not more than 0.05 gram of lead per gallon and not more than 0.005 gram of phosphorus per gallon.

Motor Gasoline, Leaded: Motor gasoline that contains more than 0.05 gram of lead per gallon or more than 0.005 gram of phosphorus per gallon. Premium and regular grades are included.

Motor Gasoline Retail Prices: Motor gasoline prices calculated each month by the Bureau of Labor Statistics (BLS) in conjunction with the construction of the Consumer Price Index (CPI). Those prices are collected in 85 urban areas selected to represent all urban consumers–about 80 percent of the total U.S. population. The service stations are selected initially, and on a replacement basis, in such a way that they represent the purchasing habits of the CPI population. Service stations in the current sample include those providing all types of service (i.e., full-, mini-, and self-service).

Motor Gasoline, Total: Includes finished leaded motor gasoline (premium and regular), finished unleaded motor gasoline (premium, midgrade, and regular), motor gasoline blending components, and gasohol.

Motor Gasoline, Unleaded: Gasoline that contains not more than 0.05 gram of lead per gallon and not more than 0.005 gram of phosphorus per gallon. Premium and regular grades are included, depending on the octane rating.

MTBE (Methyl Tertiary Butyl Ether): An ether, $(CH_3)_3COCH_3$, intended for motor gasoline blending. See **Oxygenates.**

Naphtha: A generic term applied to a petroleum fraction with an approximate boiling range between 122 and 400° F.

Native Gas: The total volume of natural gas indigenous to the storage reservoir at the time the storage started.

Natural Gas: A mixture of hydrocarbons (principally methane) and small quantities of various nonhydrocarbons existing in the gaseous phase or in solution with crude oil in underground reservoirs.

Natural Gas, Dry: The marketable portion of natural gas production, which is obtained by subtracting extraction losses, including natural gas liquids removed at natural gas processing plants, from total production.

Natural Gas Gross Withdrawals: Full well stream volume of produced natural gas, excluding condensate separated at the lease.

Natural Gas Liquids (NGL): Those hydrocarbons in natural gas that are separated as liquids from the gas. Natural gas liquids include natural gas plant liquids (primarily ethane, propane, butane, and

isobutane), and lease condensate (primarily pentanes produced from natural gas at lease separators and field facilities.)

Natural Gas Marketed Production: Gross withdrawals of natural gas from production reservoirs, less gas used for reservoir repressuring; nonhydrocarbon gases removed in treating and processing operations; and quantities vented and flared.

Natural Gas Plant Liquids (NGPL): Natural gas liquids recovered from natural gas in processing plants and, in some situations, from natural gas field facilities, as well as those extracted by fractionators. Natural gas plant liquids are defined according to the published specifications of the Gas Processors Association and the American Society for Testing and Materials as follows: ethane, propane, normal butane, isobutane, pentanes plus, and other products from natural gas processing plants (i.e., products meeting the standards for finished petroleum products produced at natural gas processing plants, such as finished motor gasoline, finished aviation gasoline, special naphthas, kerosene, distillate fuel oil, and miscellaneous products).

Natural Gas Wellhead Price: The wellhead price of natural gas is 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. Minerals 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.

Natural Gas, Wet: Natural gas prior to the extraction of liquids and other miscellaneous products.

NERC: See **North American Electric Reliability Council.**

Net Electricity Generation: See **Electricity Generation, Net.**

Net Income: Operating income plus earnings from unconsolidated affiliates; gains from disposition of property, plant, and equipment; minority interest income; and foreign currency translation effects less income taxes, extraordinary items, and the cumulative effect of accounting changes.

Net Ownership Interest: The sum of net working interest and royalty interest. Net ownership interest applies to both production and reserves.

Net Property Investment: The original cost of property, plant, and equipment (PP&E), less accumulated depreciation.

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

Net Working Interest: A company's working interest, not including any basic royalty or overriding royalty interests.

Nominal Price: The price paid for a product or service at the time of the transaction. The nominal price, which is expressed in current dollars, is not adjusted to remove the effect of changes in the purchasing power of the dollar.

Nonhydrocarbon Gases: Typical nonhydrocarbon gases that may be present in reservoir natural gas are carbon dioxide, helium, hydrogen sulfide, and nitrogen.

Nonmetropolitan: Refers to buildings not located within Metropolitan Statistical Areas as defined in the 1980 Census.

Nontraceables: Those 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 electric generating capacity and is not an electric utility. Nonutility power producers include qualifying cogenerators, qualifying small power producers, and other nonutility generators (including independent power producers) without a designated, franchised service area that do not file forms listed in the *Code of Federal Regulations*, Title 18, Part 141. See **Cogenerator; Independent Power Producer;** and **Small Power Producer.**

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. The NERC consists of nine regional reliability councils and encompasses essentially all the power systems of the contiguous United States and Canada. The NERC regions are as follows: (1) East Central Area Reliability Coordination Agreement (ECAR); (2) Electric Reliability Council of Texas (ERCOT); (3) Mid-America Interpol Network (MAIN); (4) Mid-Atlantic Area Council (MAAC); (5) Mid-Continent Area Power Pool (MAPP); (6) Northeast Power Coordinating Council (NPCC); (7) Southeastern Electric Reliability Council (SERC); (8) Southwest Power Pool (SPP); and (9) Western Systems Coordinating Council (WSCC).

Nuclear Electric Power: Electricity generated by an electric power plant whose turbines are driven by steam generated in a reactor by heat from the fissioning of nuclear fuel.

Nuclear Electric Power Plant: A single-unit or multi-unit facility in which heat produced in one or more reactors by the fissioning of nuclear fuel is used to drive one or more steam turbines.

Nuclear Reactor: An apparatus in which the nuclear fission chain can be initiated, maintained, and controlled so that energy is released at a specific rate. The reactor includes fissionable material (fuel), such as uranium or plutonium; fertile material; moderating material (unless it is a fast reactor); a heavy-walled pressure vessel; shielding to protect personnel; provision for heat removal; and control elements and instrumentation.

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.

Oil: See **Crude Oil (Including Lease Condensate).**

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): A U.S. nuclear generating unit is considered operable after it completes low-power testing and is issued a full-power operating license by the Nuclear Regulatory Commission. A foreign nuclear generating unit is considered operable once it has generated electricity to the grid.

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): Current members are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States and its territories (Guam, Puerto Rico, and the Virgin Islands), and Germany.

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 are Algeria, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.

Other Hydrocarbons (petroleum): Other materials processed at refineries. Includes coal tar derivatives, hydrogen, gilsonite, and natural gas received by the refinery for reforming into hydrogen.

Oxygenated Motor Gasoline: See **Motor Gasoline, Finished.**

Oxygenates: Any substance which, when added to motor gasoline, increases the amount of oxygen in that motor gasoline blend. Through a series of waivers and interpretive rules, the Environmental Protection

Agency (EPA) has determined the allowable limits for oxygenates in unleaded gasoline. The "Substantially Similar" Interpretive Rules (56 FR [February 11, 1991]) allows blends of aliphatic alcohols other than methanol and aliphatic ethers, provided the oxygen content does not exceed 2.7 percent by weight. The "Substantially Similar" Interpretive Rules also provide for blends of methanol up to 0.3 percent by volume exclusive of other oxygenates, and butanol or alcohols of a higher molecular weight up to 2.75 percent by weight. Individual waivers pertaining to the use of oxygenates in unleaded motor gasoline have been issued by the EPA. They include the following:

- *Fuel Ethanol:* Blends of up to 10 percent by volume anhydrous ethanol (200 proof).
- *Methanol:* Blends of methanol and gasoline-grade tertiary butyl alcohol (GTBA) such that the total oxygen content does not exceed 3.5 percent by weight and the ratio of methanol to GTBA is less than or equal to 1. It is also specified that this blended fuel must meet ASTM volatility specifications.
  Blends of up to 5.0 percent by volume methanol with a minimum of 2.5 percent by volume cosolvent alcohols having carbon number of 4 or less (i.e., ethanol, propanol, butanol, and/or GTBA). The total oxygen must not exceed 3.7 percent by weight, and the blend must meet ASTM volatility specfications as well as phase separation and alcohol purity specifications.
- *MTBE (Methyl tertiary butyl ether):* Blends up to 15.0 percent by volume MTBE that must meet the ASTM D4814 specifications. Blenders must take precautions that the blends are not used as base gasolines for other oxygenated blends.

Pentanes Plus: A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas. Includes isopentane, natural gasoline, and plant condensate.

Petrochemical Feedstocks: Chemical feedstocks derived from petroleum principally for the manufacture of chemicals, synthetic rubber, and a variety of plastics. The categories reported are naphthas less than 401°F endpoint and other oils equal to or greater than 401°F endpoint.

Petroleum: A generic term applied to oil and oil products in all forms, such as crude oil, lease condensate, unfinished oils, petroleum products, natural gas plant liquids, and nonhydrocarbon compounds blended into finished petroleum products.

Petroleum Coke: A residue that is the final product of the condensation process in cracking. The product is either marketable petroleum coke or catalyst petroleum coke.

Petroleum Coke, Catalyst: The carbonaceous residue that is deposited on and deactivates the catalyst used in many catalytic operations (e.g., catalytic cracking). Carbon is deposited on the catalyst, thus deactivating the catalyst. The catalyst is reactivated by burning off the carbon, which is used as a fuel in the refining process. That carbon or coke is not recoverable in a concentrated form.

Petroleum Coke, Marketable: Those grades of coke produced in delayed or fluid cokers that may be recovered as relatively pure carbon. Marketable petroleum coke may be sold as is or further purified by calcining.

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: Products 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: See **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 and Solar Thermal Energy (as used at electric utilities): Energy radiated by the sun as electromagnetic waves (electromagnetic radiation) that is converted at electric utilities into electricity by means of solar (photovoltaic) cells or concentrating (focusing) collectors.

Photovoltaic Module: A group of photovoltaic cells. (Cells are solid-state devices that produce electricity when exposed to sunlight.) The electricity is used primarily in applications requiring remote power, such as radio communication, cathodic protection, and navigational aids.

Pipeline: 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.

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.

Primary Energy Consumption Expenditures: Expenditures for energy consumed in each of the four major end-use sectors, excluding energy in the form of electricity, plus expenditures by the electric utilities sector for energy used to generate electricity. There are no fuel-associated expenditures for hydroelectric power, geothermal energy, photovoltaic and solar energy, or wind energy. Also excluded are the quantifiable consumption expenditures that are an integral part of process fuel consumption.

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 amount by which total volume of refinery ouput is greater than the volume of input for a given period of time. The processing gain arises when crude oil and other hydrocarbons are processed into products that are, on average, less dense than the input.

Processing Loss: The amount by which total volume of refinery output is less than input for a given period of time. The processing loss arises when crude oil and other hydrocarbons are processed into products that are, on average, more dense than the input.

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° F. 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 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 demonstrate 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.

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.

Refiner Acquisition Cost of Crude Oil: The cost of crude oil to the refiner, including transportation and fees. The composite cost is the weighted average of domestic and imported crude oil costs.

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, the fossil fuels, of which there is a finite supply). Renewable sources of energy include wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

Reservoir Repressuring: The injection of a pressurized fluid (such as air, gas, or water) into oil and gas reservoir formations to effect greater ultimate recovery.

Residential Building: A structure used primarily as a dwelling for one or more households.

Residential Sector: The residential sector is considered to consist of all private residences, whether occupied or vacant, owned or rented, including single-family homes, multifamily housing units, and mobile homes. Secondary homes, such as summer homes, are also included. Institutional housing, such as school dormitories, hospitals, and military barracks, generally are not included in the residential sector; they are included in the commercial sector. The Standard Industrial Classification (SIC) code used to classify an establishment as residential is 88 (Household).

Residential Vehicles: Motorized vehicles used by U.S. households for personal transportation. Excluded are motorcycles, mopeds, large trucks, and buses. Included are automobiles, station wagons, passenger vans, cargo vans, motor homes, pickup trucks, and jeeps or similar vehicles. In order to be included, vehicles must be: (1) owned by members of the household, or (2) company cars not owned by household members but regularly available to household members for their personal use and ordinarily kept at home, or (3) rented or leased for 1 month or more.

Residual Fuel Oil: The heavier oils that remain after the distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations and that conform to ASTM Specifications D396 and D975. Included are No. 5, a residual fuel oil of medium viscosity; Navy Special, for use in steam-powered vessels in government service and in shore power plants; and No. 6, which includes Bunker C fuel oil and is used for commercial and industrial heating, electricity generation, and to power ships. Imports of residual fuel oil include imported crude oil burned as fuel.

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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.

Rural Area: A place that had a population of less than 2,500 as of the 1980 U.S. Census.

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

SIC: See **Standard Industrial Classification.**

Small Power Producer: Under the Public Utility Regulatory Policies Act, a small power production facility (small power producer) generates electricity using waste or renewable energy (biomass, conventional hydroelectric, wind, solar, and geothermal) as a primary energy source. Fossil fuels can be used, but renewable resources must provide at least 75 percent of the total energy input. See **Nonutility Power Producer.**

Solar Collector: Equipment that actively concentrates thermal energy from the sun. The energy is usually used for space heating, for water heating, or for heating swimming pools. Either air or liquid is the working fluid.

Solar Energy: The radiant energy of the sun that 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 into 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 Thermal Collector, High-Temperature: A collector that generally operates at temperatures above 180° F.

Solar Thermal Collector, Low-Temperature: A collector that generally operates at temperatures below 110° F. Typically, it has no glazing or insulation and is made of plastic or rubber, although some are made of metal.

Solar Thermal Collector, Medium-Temperature: A collector that generally operates at temperatures of 140 to 180° F but can also operate at temperatures as low as 110° F. Typically, it has one or two glazings, a metal frame, a metal absorption panel with integral flow channels or attached tubing (liquid collector) or with integral ducting (air collector) and insulation on the sides and back of the panel.

Solar Thermal Collector, Special: An evacuated tube collector or a concentrating (focusing) collector. Special collectors 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).

Space Heating: The use of mechanical equipment (including wood stoves and active solar heating devices) to heat all, or part, of a building to at least 50° F.

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.

Spot Market Price: A transaction price concluded "on the spot," that is, on a one-time, prompt basis; usually the transaction involves only one specific quantity of product. This contrasts with a term contract sale price, which obligates the seller to deliver a product at an agreed frequency and price over an extended period.

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

Startup Test Phase of Nuclear Power Plant: A nuclear power plant that has been licensed by the Nuclear Regulatory Commission to operate but is still in the initial testing phase, during which the production of electricity may not be continuous. In general, when the electric utility is satisfied with the plant's performance, it formally accepts the plant from the manufacturer and places it in commercial operation status. A request is then submitted to the appropriate utility rate commission to include the power plant in the rate base calculation.

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 gas produced in refineries by distillation, cracking, reforming, and other processes. The principal constituents are methane, ethane, ethylene, normal butane, butylene, propane, and propylene. It is used primarily as refinery fuel and petrochemical feedstock.

Strategic Petroleum Reserve (SPR): Petroleum stocks maintained by the Federal Government for use during periods of major supply interruption.

Stripper Well (natural gas): A well that produces 60 thousand cubic feet per day or less of gas-well gas, for a period of 3 consecutive months while producing at its maximum rate flow. In determining abandonments, a stripper well is one that produced less than 22.5 million cubic feet in its last 12 months of production.

Stripper Well Property (petroleum): A property whose average daily production of crude oil per well (excluding condensate recovered in nonassociated natural gas production) did not exceed an average of 10 barrels per day during any preceding consecutive 12-month period beginning after December 31, 1972.

Subbituminous Coal: A dull, black coal of rank intermediate between lignite and bituminous coal. It conforms to ASTM Specification D388-84 for subbituminous coal. In this report, subbituminous coal is included in bituminous coal.

Supplemental Gaseous Fuels: Any gaseous substance that, introduced into or commingled with natural gas, increases 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 inert gases added for Btu stabilization.

Synthetic Natural Gas (SNG): A manufactured product chemically similar in most respects to natural gas, resulting from the conversion or reforming of petroleum hydrocarbons. It may easily be substituted for, or interchanged with, pipeline quality natural gas. Also referred to as substitute natural gas.

Transportation Sector: The transportation sector consists of private and public vehicles that move people and commodities. Included are automobiles, trucks, buses, motorcycles, railroads, and railways (including streetcars), aircraft, ships, barges, and natural gas pipelines. The SIC codes used to classify establishments as belonging to the transportation sector are 40 through 49.

Unaccounted-for Crude Oil: Arithmetic difference between the calculated supply and the calculated disposition of crude oil. The calculated supply is the sum of crude oil production and imports, less 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: Quantities lost, the net result of flow data metered at varying temperature and pressure conditions and converted to a standard temperature and pressure base; metering inaccuracies; differences between the billing cycle and calendar period timeframes; the effect of variations in company accounting and billing practices; and imbalances from the merger of data reporting systems which vary in scope, format, definitions, and type of respondents.

Underground Storage: The storage of natural gas in underground reservoirs at different locations from which it was produced.

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 refinery processing, except those requiring only mechanical blending. Includes 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: Unless otherwise noted, United States in this publication means the 50 States and the District of Columbia. U.S. exports include shipments to U.S. territories, and imports include receipts from U.S. territories.

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 plutonium-239, an isotope that also is fissionable by thermal neutrons.

Uranium Ore: Rock containing uranium mineralization (typically 1 to 4 pounds of U_3O_8 per ton or 0.05 percent to 0.2 percent U_3O_8) that can be mined economically.

Uranium Oxide: Uranium concentrate or yellowcake.

Uranium Resources: Uranium resource estimates are divided into three separate categories reflecting different levels of confidence in the quantities estimated: reasonable assured resources, estimated additional resources, and speculative resources. Reasonably assured resources refers to uranium in known mineral deposits of such size, grade, and configuration that it could be recovered within the given cost ranges, with currently proven mining and processing technology. Estimated additional resources refers to uranium in addition to reasonably assured resources that is expected, mostly on the basis of direct geological evidence, to occur in extensions of well-explored deposits and in deposits in which geological continuity has been well established, as well as in deposits believed to exist in well-defined geologic trends or areas of mineralization with known deposits. Deposits in this category can be discovered and delineated and the uranium subsequently recovered, all within the given cost range. Speculative resources refers to uranium in addition to estimated additional resources that are thought to exist, mostly on the basis of indirect evidence and geological extrapolations.

Urban Area: A place that had a population of 2,500 or more as of the 1970 U.S. Census.

U.S.S.R.: The Union of Soviet Socialist Republics consisted of 15 constituent republics: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyz Republic, 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 base site or at processing plants.

Vessel: Tankers used to transport crude oil and petroleum products. Vessel categories are as follows: Ultra Large Crude Carrier (ULCC), Very Large Crude Carrier (VLCC), Other Tanker, and Specialty Ships (LPG/LNG).

Waxes: Solid or semisolid materials derived from petroleum distillates or residues. Waxes are light-colored, more or less translucent crystalline masses, slightly greasy to the touch, consisting of a mixture of solid hydrocarbons in which the paraffin series predominates. Included are all marketable waxes, whether crude scale or fully refined. Waxes are used primarily as industrial coating for surface protection.

Well: A hole drilled in the Earth for the purpose of finding or producing crude oil or natural gas; or providing services related to the

production of crude oil or natural gas. Wells are classified as oil wells, gas wells, dry holes, stratigraphic test wells, or service wells. The latter two types of wells are counted for Federal Reporting System data reporting. Oil wells, gas wells, and dry holes are classified as exploratory wells or development wells. Exploratory wells are subclassified as new-pool wildcats, deeper-pool tests, shallow-pool tests, and outpost (extension) tests. Well classifications reflect the status of wells after drilling has been completed.

Wellhead Price: The value of crude oil or natural gas at the mouth of the well.

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.

Wind Energy (as used at electric utilities): The kinetic energy of wind converted at electric utilities into mechanical energy by wind turbines (i.e., blades rotating from a hub) that drive generators to produce electricity for distribution.

Wood and Waste (as used at electric utilities): Wood energy, garbage, bagasse, sewerage gas, and other industrial, agricultural, and urban refuse used to generate electricity for distribution.

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 gas in a reservoir that is in addition to the base (cushion) 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 given season.

Working Interest: An interest in a mineral property that entitles the owner to explore, develop, and operate a property. The working interest owner bears the costs of exploration, development, and operation of the property and, in return, is entitled to a share of the mineral production from the property or to a share of the proceeds.

Yellowcake: A uranium oxide concentrate that results from milling (concentrated) uranium ore. It is the final precipitate formed in the milling process. U_3O_8, a common form of triuranium oxide, is the powder obtained by evaporating an ammonia solution of the oxide. Yellowcake typically contains 80 percent to 90 percent U_3O_8.

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