Annual Energy Review 1999

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Preface

A generation ago the Ford Foundation convened a group of experts to explore and assess the Nation's energy future, and published their conclusions in *A Time To Choose: America's Energy Future* (Cambridge, MA: Ballinger, 1974). The Energy Policy Project developed scenarios of U.S. potential energy use in 1985 and 2000. Now, with 1985 well behind us and 2000 nearly on the record books, it may be of interest to take a look back to see what actually happened and consider what it means for our future.

The study group sketched three primary scenarios with differing assumptions about the growth of energy use. The Historical Growth scenario assumed that U.S. energy consumption would continue to expand by 3.4 percent per year, the average rate from 1950 to 1970. This scenario assumed no intentional efforts to change the pattern of consumption, only efforts to encourage development of our energy supply. The Technical Fix scenario anticipated a "conscious national effort to use energy more efficiently through engineering know-how." The Zero Energy Growth scenario, while not clamping down on the economy or calling for austerity, incorporated the Technical Fix efficiencies plus additional efficiencies. This third path anticipated that economic growth would depend less on energy-intensive industries and more on those that require less energy, i.e., the service sector.

In 2000, total energy consumption was projected to be 187 quadrillion British thermal units (Btu) in the Historical Growth case, 124 quadrillion Btu in the Technical Fix case, and 100 quadrillion Btu in the Zero Energy Growth case. The *Annual Energy Review 1999* reports a preliminary total consumption for 1999 of 97 quadrillion Btu (see Table 1.1), and the Energy Information Administration's *Short-Term Energy Outlook* (April 2000) forecasts total energy consumption of 98 quadrillion Btu in 2000.

What energy consumption path did the United States actually travel to get from 1974, when the scenarios were drawn, to the end of the century? What happened to the relationship between growth and energy consumption? How did the fuel mix change over this period? What are the effects of energy usage on our environment? What level of consumption will the United States—and the world—record in the *Annual Energy Review 2025*?

We present this edition of the *Annual Energy Review* to help investigate these important questions and to stimulate and inform our thinking about what the future holds.

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Energy in the United States: A Brief History and Current Trends

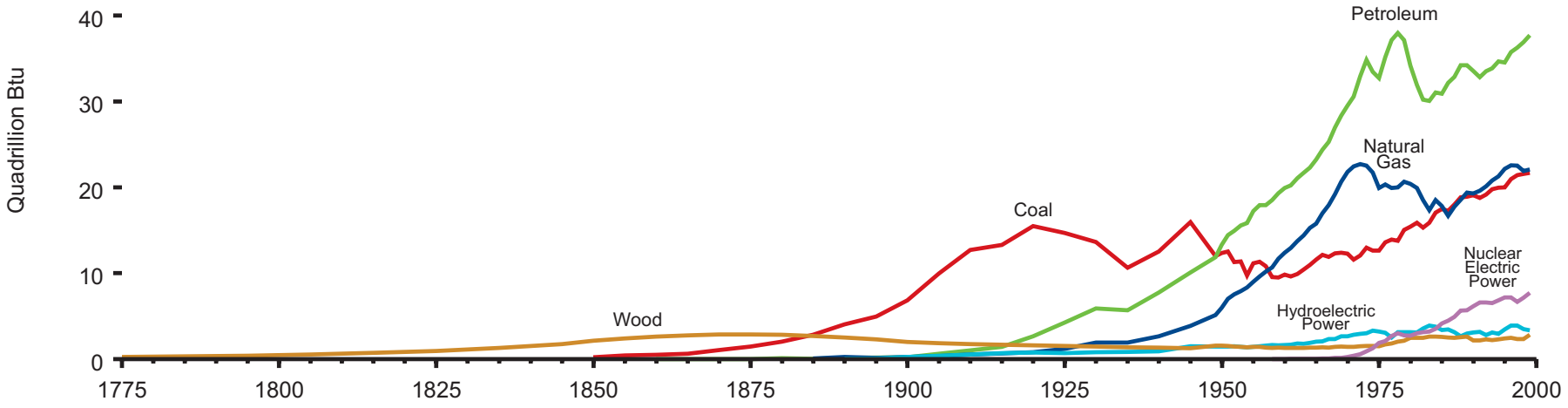
Energy is essential to life. Living creatures draw on energy flowing through the environment and convert it to forms they can use. The most fundamental energy flow for living creatures is the energy of sunlight, and the most important conversion is the act of biological primary production, in which plants and sea-dwelling phytoplankton convert sunlight into biomass by photosynthesis. The Earth's web of life, including human beings, rests on this foundation.

Over millennia, humans have found ways to extend and expand their energy harvest, first by harnessing draft animals and later by inventing machines to tap the power of wind and water. The watershed social and economic development of the modern world, industrialization, was accompanied by the widespread and intensive use of fossil fuels. This development freed human society from the limitations of natural energy flows by unlocking the Earth's vast stores of coal, oil, and natural gas. By tapping these ancient, concentrated deposits of solar energy, the rate at which energy could be poured into the human economy was enormously multiplied.

The result was one of the most profound social transformations in history. The new river of energy wrought astonishing changes and did so with unprecedented speed. The energy transformations experienced by traditional societies—from human labor alone to animal muscle power and later windmills and watermills—were very slow, and their consequences were equally slow to take effect. In contrast, industrialization and its associated socioeconomic changes took place in the space of a few generations.

The history of energy use in the United States reflects these general themes of transformation and its consequences. Consider the evolution of the U.S. energy mix. Wood energy has been a significant part of that mix for a very long time (Figure 1); in fact, fuelwood was overwhelmingly the dominant energy source from the founding of the earliest colonies until late in the last century. Thereafter, the modern era is notable for the accelerated appearance of new sources of energy, in contrast to the imperceptible pace of change in earlier times. Coal ended the long dominance of fuelwood in the United States about 1885, only itself to be surpassed in 1951 by petroleum and then

Figure 1. Energy Consumption in the United States, 1775-1999



by natural gas a few years later. Hydroelectric power and nuclear electric power appeared about 1890 and 1957, respectively. Solar photovoltaic, advanced solar thermal, and geothermal technologies also represent recent developments in energy sources. The most striking of these entrances, however, is that of petroleum and natural gas. The curves depicting their consumption remain shallow for several decades following the haphazard success of Colonel Drake's drilling rig in 1859, but begin to rise more steeply in the 1920s. Then, interrupted only by the Depression, the curves climb at increasingly alpine angles until 1973. Annual consumption of petroleum and natural gas exceeded that of coal in 1947 and then quadrupled in a single generation. Neither before nor since has any source of energy become so dominant so quickly.

As for the social, economic, and ecological consequences of evolving energy sources, they are too deep and numerous to do more than give suggestive examples. One of the most significant is the shift between muscle- and machine power. Horses, mules, and other draft animals were invaluable prime movers well into the first half of the 20th century, and despite increasing reliance on fossil fuels and the engines they powered, the number of draft animals in the United States continued to rise until about 1920. As late as 1870, draft animals accounted for more than half of the total horsepower of all prime movers. Their displacement by fossil-fuel driven engines meant, eventually, the disappearance from city and farm alike of millions of animals, along with the vast stables that housed the city-based animals, the mountains of dung they left on city streets, and the hordes of English sparrows that fed on the grain therein.

As fossil fuels and the machines that ran on them proliferated, the nature of work itself was transformed along with the fundamental social, political, and geopolitical circumstances of the Nation. In the middle of the 19th century, most Americans lived in the countryside and worked on farms. The country ran mainly on wood fuel and was relatively unimportant in global affairs. A hundred years later, after the Nation had become the world's largest producer and consumer of fossil fuels, most Americans were city-dwellers and only a relative handful were agricultural workers. The United States had roughly tripled its per-capita consumption of energy and become a global superpower.

Although coal, oil, and natural gas are the world's most important energy sources, their dominance does not extend to all corners of the globe. In most places and times diversity and evolution in energy supplies has been the rule. In many areas muscle power and biomass energy remain indispensable. The shifting emphasis over time is clear not only in the long sweep of history but also in the short term, especially in the industrialized world. Electricity, for example, was essentially unavailable until the 1880s; now it is ubiquitous. And as the data in this volume show, in the span of a few decades nuclear electric power in the United States was born, peaked, and began to decline in its contribution to total energy production.

No doubt we have not seen the end of evolution in energy sources. The pages that follow briefly discuss the major energy sources now in use in the United States, including a bit of history, trends, and snapshots of current consumption. The story they tell is one of diversity and transformation, driven by chance, the play of economic forces, and human ingenuity. Whatever energy future awaits us, that part of the story seems unlikely to change.

Total Energy

The United States has always been a resource-rich nation, but in 1776, the year the Nation declared its independence from Great Britain, nearly all energy was still supplied by muscle power and fuelwood. America's vast deposits of coal and petroleum lay untapped and mostly undiscovered, although small amounts of coal were used to make coke, vital for casting the cannon that helped win the war. Mills made use of waterpower, and of course the wind enabled transport by ship.

Fuelwood use continued to expand in parallel with the Nation's economic growth, but chronic shortages of energy in general encouraged the search for other sources. During the first 30 years or so of the 19th century, coal began to be used in blast furnaces and in making coal-gas for illumination. Natural gas also found limited application in lighting during the period. Even electricity sought a niche; for example, experiments were conducted with battery-powered electric trains in the 1840s and 1850s. Still, muscle power remained an important source of energy for decades. Although a number of mechanical innovations appeared, including the cotton gin and the mechanical reaper, they had the effect of multiplying the productivity of human and animal muscle power rather than spurring the development of machine power. It was not until well after mid-century that the total work output from all types of engines exceeded that of work animals.

The westward expansion helped change that. As railroads drove west to the plains and the mountains, they left behind the fuelwood so abundant along the eastern seaboard. Coal became more attractive, both because deposits were often found near the new railroad rights of way and because its

higher energy content increased the range and load of steam trains. Demand for coal also rose because the railroads were laying thousands of miles of new track, and the metals industry needed an economical source of coke to make iron and steel for the rails and spikes. The transportation and industrial sectors in general began to grow rapidly during the latter half of the century, and coal helped fuel their growth.

Petroleum got its start as an illuminant and nostrum ingredient and did not catch on as a fuel for some time. At the end of World War I, coal still accounted for about 75 percent of U.S. total energy use. About the same time, the horse and mule population reached 26 million and then went into permanent decline. The beginning of the transition from muscle power was over.

America's appetite for energy as it industrialized was prodigious, roughly quadrupling between 1880 and 1918. Coal fed much of this growth, while electricity expanded in applications and total use alike. Petroleum got major boosts with the discovery of Texas's vast Spindletop Oil Field in 1901 and with the advent of mass-produced automobiles, several million of which had been built by 1918.

In the years after World War II, "Old King Coal" relinquished its place as the premier fuel in the United States. The railroads lost business to trucks that ran on petroleum and also began switching to diesel locomotives themselves. Labor troubles and safety standards drove up coal production costs. The declining demand for natural gas as an illuminant forced that industry to look for other markets. Heating applications had obvious potential, and natural gas replaced coal in many household ranges and furnaces. The coal industry survived in part because nationwide electrification created new demand for coal among electric utilities despite regional competition from hydroelectric and petroleum-fired generation.

Most energy produced today in the United States, as in the rest of the industrialized world, comes from fossil fuels—coal, natural gas, crude oil, and natural gas plant liquids (Figure 2). Although U.S. energy production draws from many sources, fossil fuels together far exceed all other forms. In 1999 they accounted for 80 percent of total energy production and were valued at an estimated $94 billion (nominal dollars).

For much of its history, the United States was mostly self-sufficient in energy, although small amounts of coal were imported from Britain in colonial times. Through the late 1950s, production and consumption of energy were nearly in balance. Over the following decade, however, consumption slightly outpaced domestic production and by the early 1970s a more significant gap had developed (Figure 3).

Figure 2. Energy Production, 1999

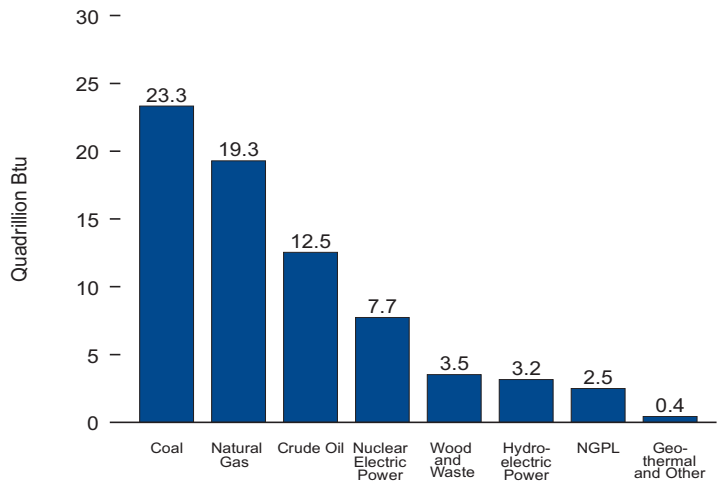
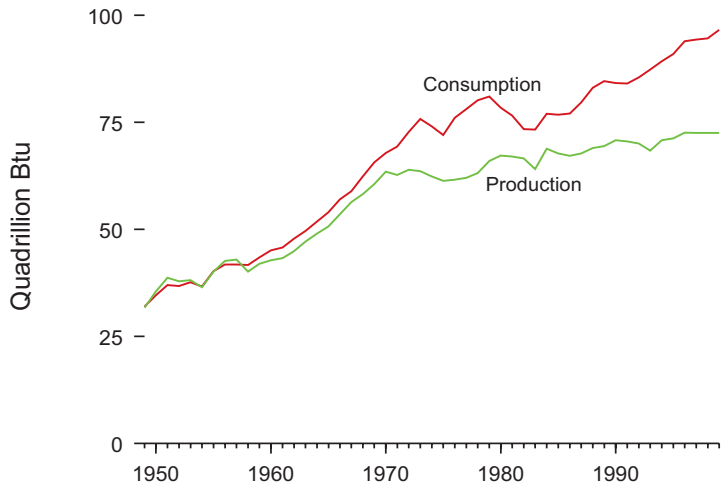


Figure 3. Production and Consumption



In 1999 the United States produced 73 quadrillion British thermal units (Btu) of energy and exported 4 quadrillion Btu, about 40 percent of it as coal. Consumption totaled 97 quadrillion Btu, requiring imports of 27 quadrillion Btu (Figure 4), 18 times the 1949 level.

This appetite for imported energy is driven by petroleum consumption. U.S. petroleum imports in 1973 totaled 6.3 million barrels per day (3.2 million barrels per day of crude oil and 3.0 million barrels per day of petroleum products). In October 1973, however, the Arab members of the Organization of Petroleum Exporting Countries (OPEC) embargoed the sale of oil to the United States, prices rose sharply, and petroleum imports fell for two years (Figure 5). They increased again until the price of crude oil rose dramatically (roughly 1979 through 1981) and suppressed imports. The rising-import trend resumed by 1986, and in 1998 U.S. petroleum net imports reached an annual record level of 9.8 million barrels per day. In 1999, net imports fell slightly to 9.6 million barrels per day.

The efficiency with which Americans use energy has improved over the years. One such measure is the amount of energy consumed to produce a (constant) dollar's worth of gross domestic product (GDP). By that measure, efficiency improved 47 percent between 1949 and 1999, as the amount of energy required to generate a dollar of output (chained 1996 dollars) fell from 20.6 thousand Btu to 10.9 thousand Btu. Nevertheless, a growing

Figure 4. Energy Flow, 1999

(Quadrillion Btu)

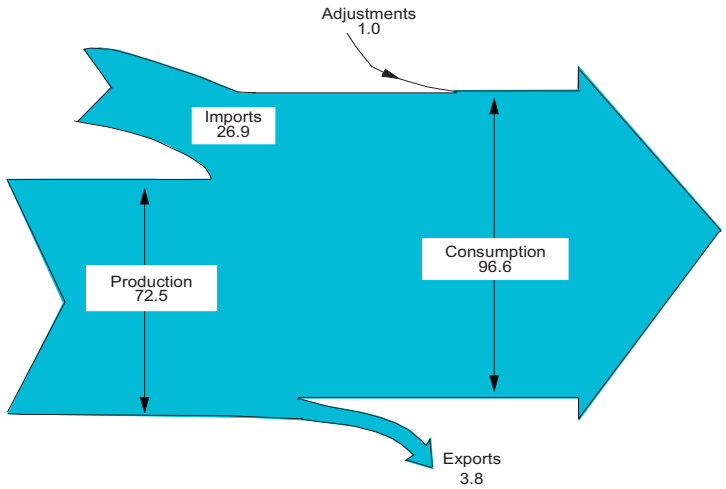
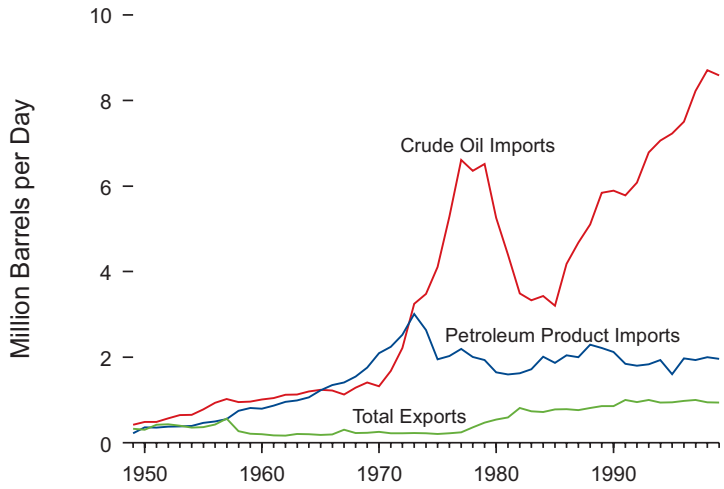


Figure 5. Petroleum Trade

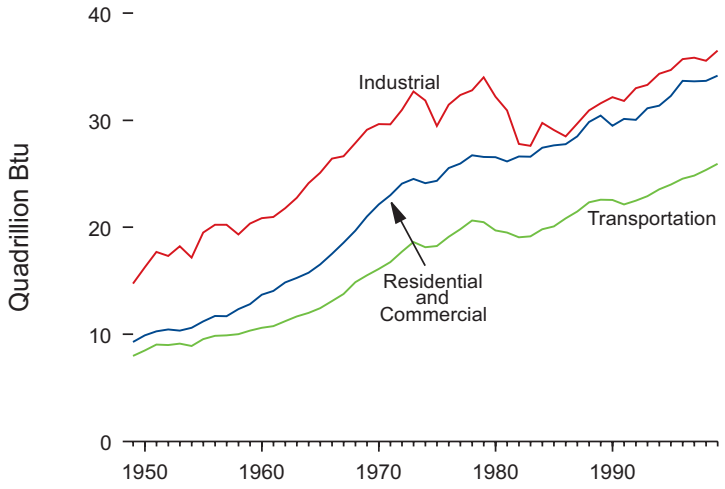


population and economy drove total energy use up. As the U.S. population expanded from 149 million people in 1949 to 273 million in 1999 (an increase of 83 percent), total energy consumption grew from 32 quadrillion Btu to 97 quadrillion Btu (up 202 percent). Per-capita energy consumption rose 65 percent, from 215 million Btu in 1949 to 354 million Btu in 1999.

Energy plays a central role in the operation of the industrialized U.S. economy, and energy spending is commensurately large. In recent years, American consumers have spent over half a trillion dollars a year on energy. That energy is consumed in three broad end-use sectors: the residential and commercial sector, the industrial sector, and the transportation sector. Industry, historically the largest consuming sector of the economy, ran just ahead of the residential and commercial sector in recent years, followed by the transportation sector (Figure 6).

The industrial sector reveals occasional sharp fluctuations in its use of energy. In contrast, trends in the residential and commercial sector are smoother. Within the sectors, energy sources have changed dramatically over time. For example, in the residential and commercial sector, coal was the leading source as late as 1951 but disappeared rapidly thereafter (Figure 7). Petroleum usage grew slowly to its peak in 1972 and then subsided. Natural gas became an important resource, growing strongly until 1972, when its growth stalled. Electricity, only an incidental source in 1949, expanded in almost every year since

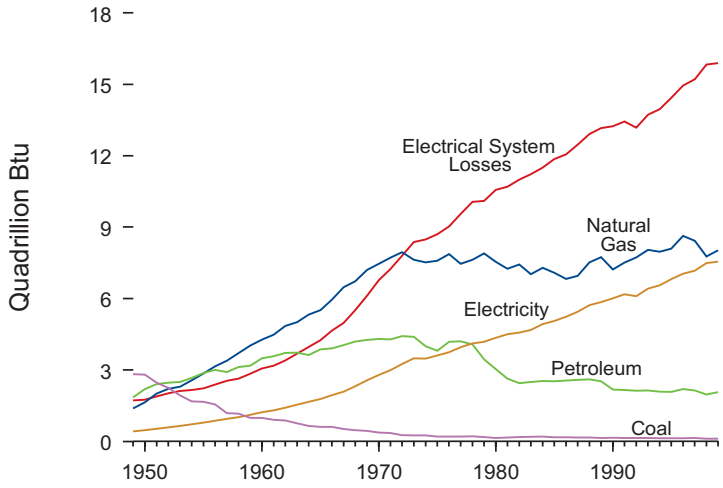
Figure 6. Energy Consumption by End-Use Sector



then, as did the energy losses associated with producing and distributing the electricity. (See page xxxi for an explanation of these losses.)

The expansion of electricity use reflects the increased electrification of U.S. households, which typically rely on a wide variety of electrical appliances and systems. In 1997, 99 percent of U.S. households had a color television and 47 percent had central air conditioning. Eighty-five percent of all households had one refrigerator; the remaining 15 percent had two or more. New products continued to penetrate the market; for example, in 1978 only 8 percent of U.S. households had a microwave oven, but by 1997 microwaves could be found in 83 percent. EIA first collected household survey data on personal computers in 1990, when 16 percent of households owned one or more. By 1997 that share had more than doubled to 35 percent.

Figure 7. Residential and Commercial Consumption



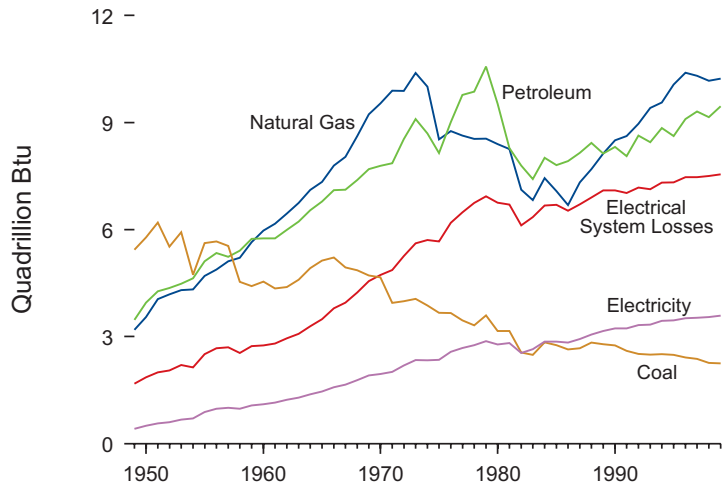
U.S. home heating also underwent a big change. Over a third of all U.S. housing units were warmed by coal in 1950, but by 1997 that share was only 0.2 percent. Distillate fuel oil lost just over half its share of the home-heating market during the same period, falling from 22 percent. Natural gas and electricity gained as home-heating sources: the share of natural gas rose from about a quarter of all homes to over half, while electricity's share shot up from only 0.6 percent in 1950 to 29 percent in 1997. In recent times, electricity and natural gas have been the most common sources of energy used by commercial buildings as well.

In the industrial sector, the consumption of both natural gas and petroleum rose steadily and in tandem until the oil embargo in 1973, after which their use fluctuated (Figure 8). Consumption of coal, once the leading source in the sector, shrank. Electricity and its associated losses grew steadily.

About three-fifths of the energy consumed in the industrial sector is used for manufacturing. The remainder goes to mining, construction, agriculture, fisheries, and forestry. Within manufacturing, large consumers of energy are the petroleum and coal products, chemicals and allied products, paper and allied products, and primary metal industries. Natural gas is the most commonly consumed energy source in manufacturing. The predominant end-use activity is process heating, followed by machine drive and then facility heating, ventilation, and air conditioning combined.

Just under 7 percent of all energy consumed in the United States is used for nonfuel purposes, such as asphalt and road oil for roofing products and road building and conditioning; liquefied petroleum gases for feedstocks at petrochemical plants; waxes for packaging, cosmetics, pharmaceuticals, inks, and adhesives; and still gas for chemical and rubber manufacture.

Figure 8. Industrial Consumption



While variety and change in energy sources are the hallmarks of the industrial sector and the residential and commercial sector, transportation's reliance on petroleum has been nearly total since 1949 (Figure 9).

Figure 9. Transportation Consumption

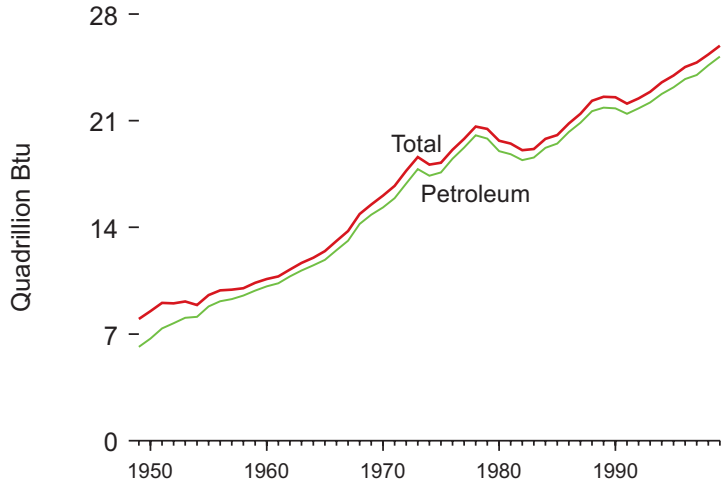
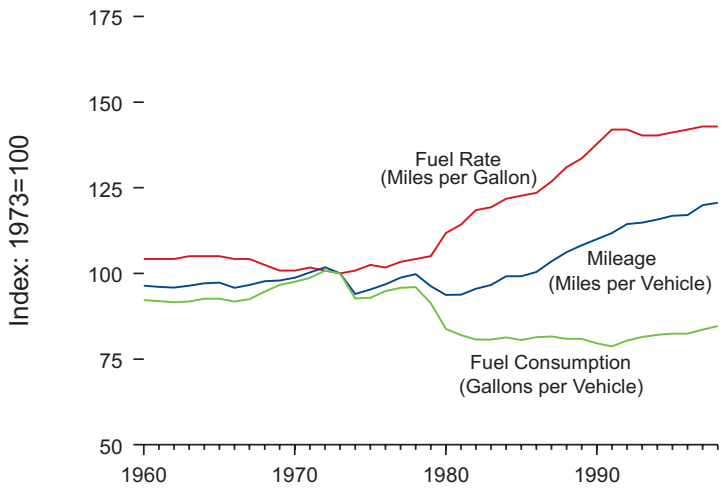


Figure 10. Motor Vehicle Efficiency



Compared with trends just prior to the oil embargo of 1973, fuel consumption per motor vehicle fell in the two decades that followed, miles traveled per vehicle generally fell until the early 1980s and then resumed a pattern of increase, and the fuel rate (i.e., miles per gallon) improved greatly (Figure 10).

Petroleum

It is hard to imagine a world without petroleum, partly because humans have been using it since at least 3000 B.C. Mesopotamians of that era used "rock oil" in architectural adhesives, ship caulks, medicines, and roads. The Chinese of two millennia ago refined crude oil for use in lamps and in heating homes. Seventh-century Arab and Persian chemists discovered that petroleum's lighter elements could be mixed with quicklime to make "Greek fire," the napalm of its day. From these scattered uses, petroleum has come to occupy a central place in modern civilization. Today petroleum still finds applications in buildings, shipping, medicine, roads, and warfare. It is crucial to many industries, including chemicals and agriculture. Needless to say, it dominates the world energy scene.

Petroleum was known to native peoples in the northeastern parts of what was to become the United States, and was put to various uses by some of

them. A French military officer noted in 1750 that Indians living near Fort Duquesne (now the site of Pittsburgh) set fire to an oil-slicked creek as part of a religious ceremony. As settlement by Europeans proceeded, oil was discovered in many places in northwestern Pennsylvania and western New York—to the frequent dismay of the well-owners, who were drilling for salt brine.

In the mid-1800s expanding uses for oil extracted from coal and shale began to hint at the value of rock oil and encouraged the search for readily accessible supplies. This impetus launched the modern petroleum age, which began on a Sunday afternoon in August 1859 at Oil Creek, near Titusville in northwestern Pennsylvania. The credit has traditionally gone to "Colonel" Edwin L. Drake, a railroad conductor on sick leave employed by the Pennsylvania Rock Oil Company. After months of effort and many setbacks, Drake's homemade drilling rig drove down to 70 feet, and the bit came up coated with oil. Ironically, Drake wasn't there that day to witness the historic event. And except for the slow and uncertain mails of the time, which delayed a letter from his financial backers ordering him to cease operations, it might not have happened in Oil Creek at all.

"Great excitement ensued" following Drake's discovery, according to the account in the 1883 edition of *Mineral Resources of the United States*. The succeeding oil boom was driven by strong demand for lighting fuel and lubricants. Over the next four decades the boom spread to Texas and California in the United States and to Romania, Baku (in Azerbaijan), Sumatra, Mexico, Trinidad, Iran, and Venezuela. Overproduction temporarily drove prices down, but the rapid adoption and spread of internal combustion engines in the late 19th century helped create vast new markets. With only temporary interruptions, world petroleum consumption has expanded ever since.

Until the 1950s the United States produced nearly all the petroleum it needed. But by the end of the decade the gap between production and consumption began to widen and imported petroleum became a major component of the U.S. petroleum supply (Figure 11). After 1992, imports exceeded production.

Production of petroleum (crude oil and natural gas plant liquids) in the U.S. lower 48 States reached its highest level in 1970 at 9.4 million barrels per day (Figure 12). A surge in Alaskan oil output at Prudhoe Bay beginning in the late 1970s helped postpone the decline in overall U.S. production, but Alaska's production peaked in 1988 at 2.0 million barrels per day and fell to 1.0 million barrels per day in 1999. By then U.S. total output had dropped to 7.8 million barrels per day, 31 percent below its peak.

Figure 11. Petroleum Production and Consumption

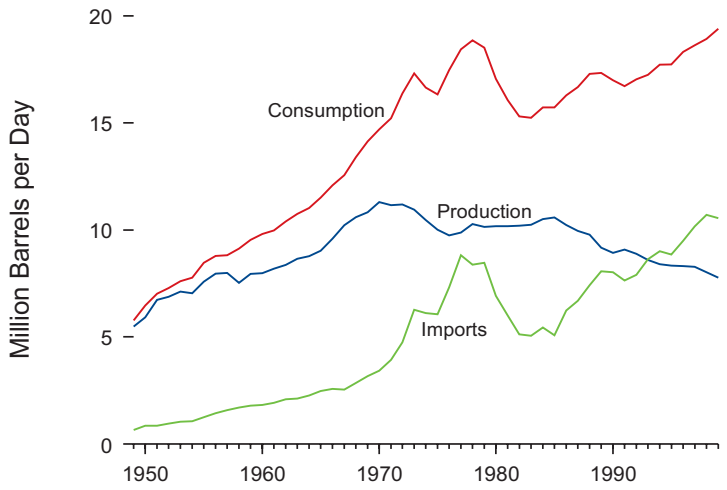
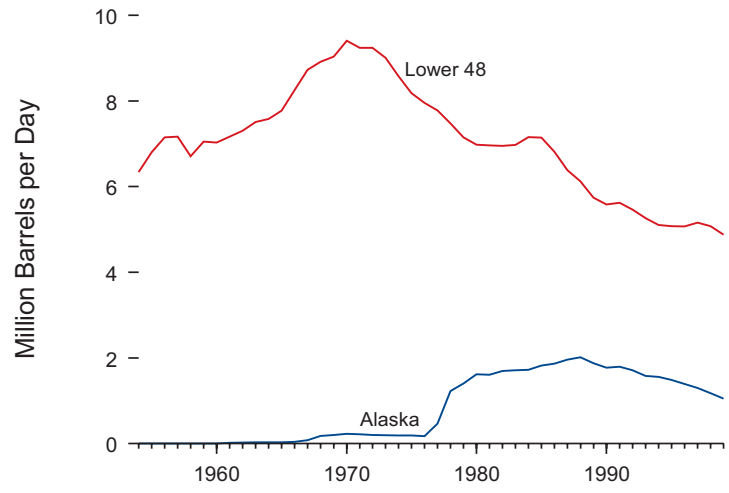


Figure 12. Lower 48 and Alaskan Crude Oil Production



Another index of the Nation's petroleum output is oil well productivity, which fell from a high of 18.4 barrels per day per well in 1972 to 10.7 barrels per day per well in 1999 (Figure 13).

U.S. petroleum consumption rose annually until 1973, when the Arab OPEC embargo stalled the annual increases for two years. The increases then resumed, raising consumption to 18.8 million barrels per day in 1978, before rising prices drove it down to a post-embargo low of 15.2 million barrels per day in 1983. Consumption began to rebound the following year and was boosted by plummeting crude oil prices in 1986. By 1999 it had reached 19.4 million barrels per day, an all-time high.

Of every 10 barrels of petroleum consumed in the United States in 1999, more than 4 barrels were consumed in the form of motor gasoline. The transportation sector alone accounted for two-thirds of all petroleum used in the United States in 1999 (Figure 14).

To meet demand, crude oil and petroleum products were imported at the rate of 10.5 million barrels per day in 1999, while exports measured 0.9 million barrels per day. Between 1985 (when net imports fell to a post-embargo low) and 1999, net imports of crude oil and petroleum products more than doubled from 4.3 million barrels per day to 9.6 million barrels per day. The share of U.S. net imports that came from OPEC nations reached 72 percent in 1977, subsided to 42 percent in 1985, and climbed back to 50 percent in 1999. Total net imports as a share of petroleum consumption reached a record high of 52 percent in

Figure 13. Oil Well Productivity

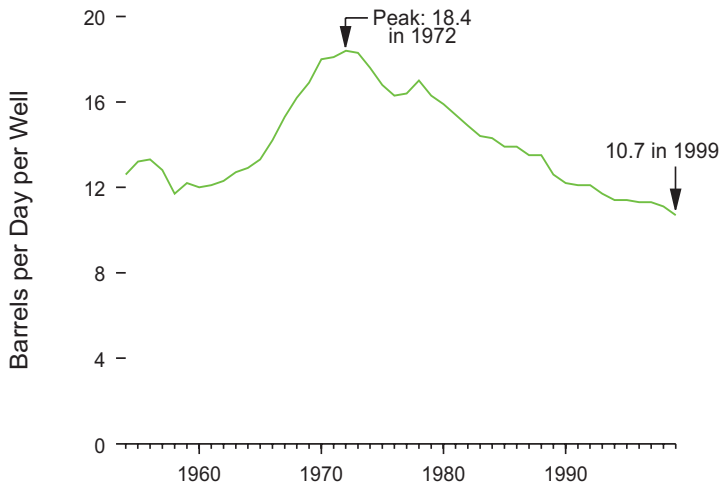


Figure 14. Petroleum Consumption by Sector

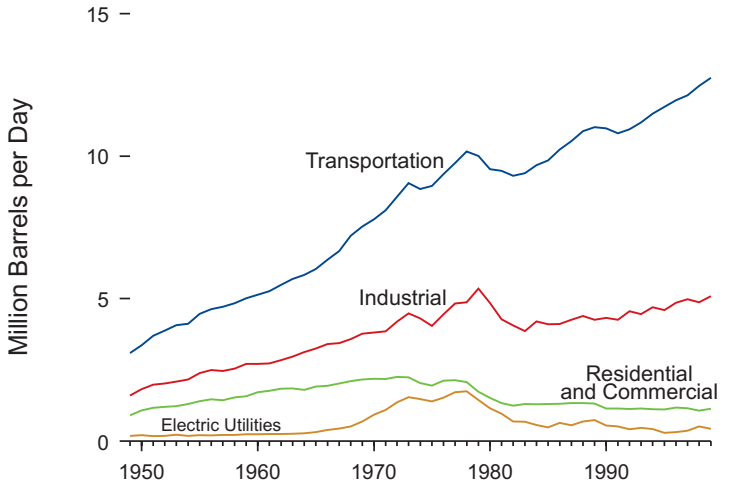


Figure 15. Strategic Petroleum Reserve Stocks

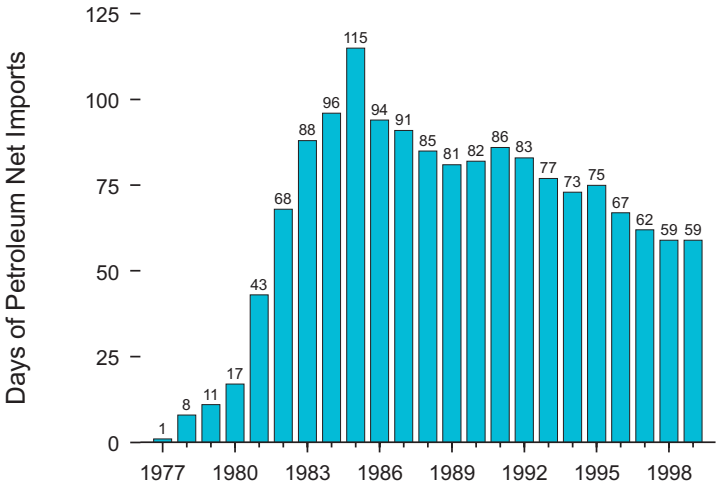
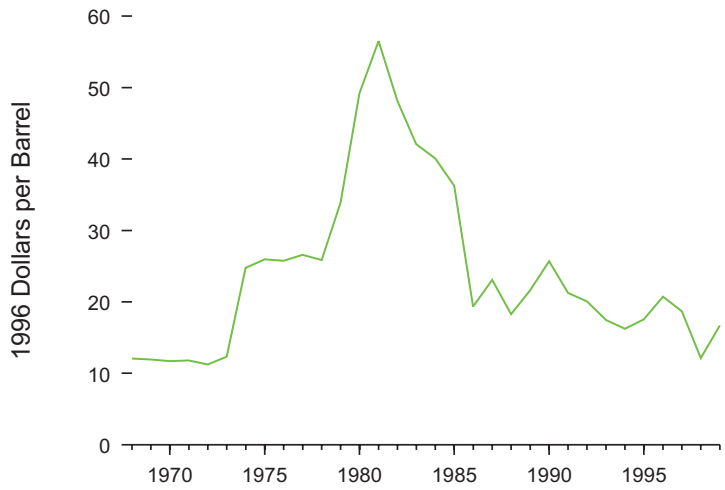


Figure 16. Inflation-Adjusted Cost of Crude Oil



1998 before declining to 50 percent the following year. The five leading suppliers of petroleum to the United States in 1999 were Saudi Arabia, Venezuela, Canada, Mexico, and Nigeria.

To protect against supply disruptions, the United States began to build a Strategic Petroleum Reserve in the late 1970s. By 1985 the reserve's holdings reached 493 million barrels, which would have provided enough crude oil to replace about 115 days' worth of net petroleum imports that year (Figure 15). In 1999, the reserve held 567 million barrels of crude oil. Due to the increased rate of imports, however, that amount would replace only 59 days' worth of net imported petroleum.

Despite recent price increases, petroleum remains relatively cheap in the United States. Refiners' acquisition costs for crude oil in 1999 averaged $17.46 per barrel. When adjusted for inflation, the cost was $16.69 (chained 1996 dollars), 37 percent above the previous year's cost but 70 percent below 1981's record inflation-adjusted cost of $56.50 per barrel (Figure 16).

Natural Gas

Natural gas is mostly a mixture of methane, ethane, and propane, with methane making up 73 to 95 percent of the total. Often encountered when drilling for oil, natural gas was once considered mainly a nuisance. When either uses or—more likely today—accessible markets were lacking, it was simply flared (burned off) at the wellhead. Major flaring sites were sometimes the brightest areas visible in nighttime satellite images. Today, however, the gas is mostly reinjected for later use and to encourage greater oil production.

The first practical use of natural gas dates to 200 B.C. and is attributed, like so many technical developments, to the Chinese. They used it to make salt from brine in gas-fired evaporators, boring shallow wells with crude percussion rigs and conveying the gas to the evaporators via bamboo pipes. Natural gas was used extensively in Europe and North America in the 19th century as a lighting fuel, until the rapid development of electricity beginning in the 1890s ended that era. The development of steel pipelines and related equipment, which allowed large volumes of gas to be easily and safely transported over many miles, launched the modern natural gas industry. The first all-welded pipeline over 200 miles in length was built in 1925, from Louisiana to Texas. U.S. demand for natural gas grew rapidly thereafter, especially following World War II. Residential demand grew fifty-fold between 1906 and 1970.

Figure 17. Natural Gas Overview

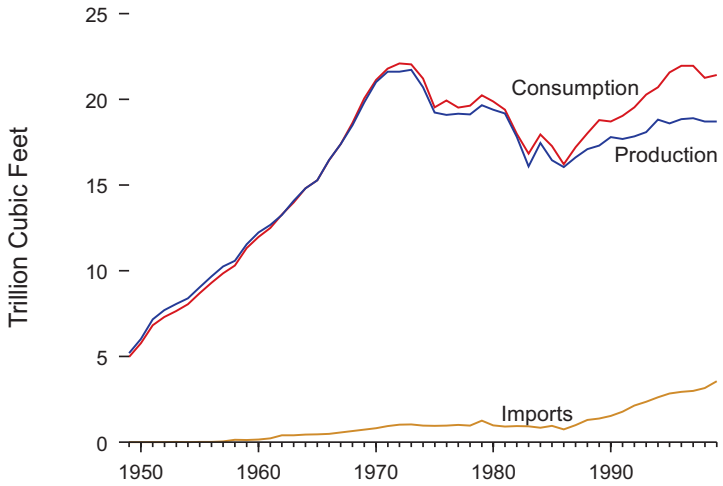


Figure 18. Natural Gas Net Imports as Share of Consumption

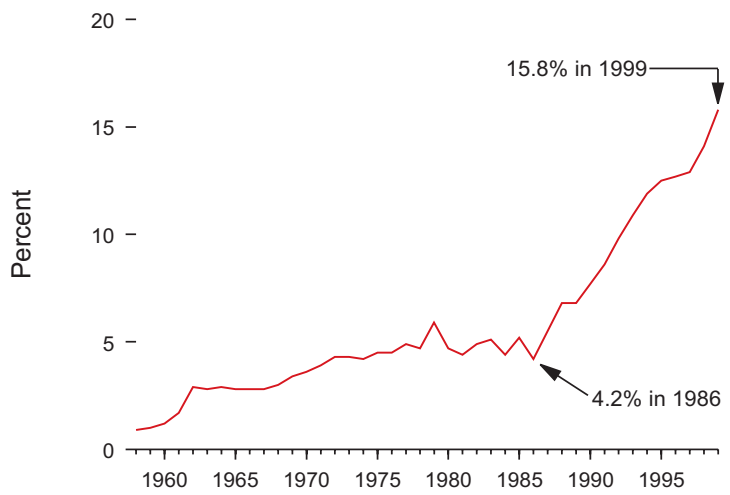
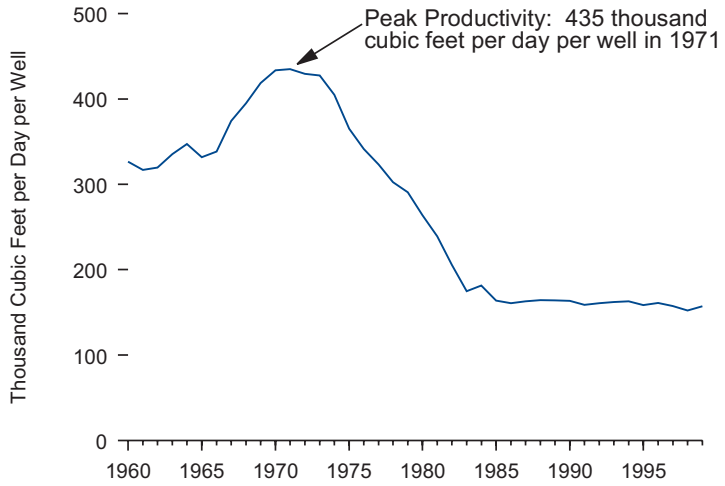


Figure 19. Natural Gas Well Productivity



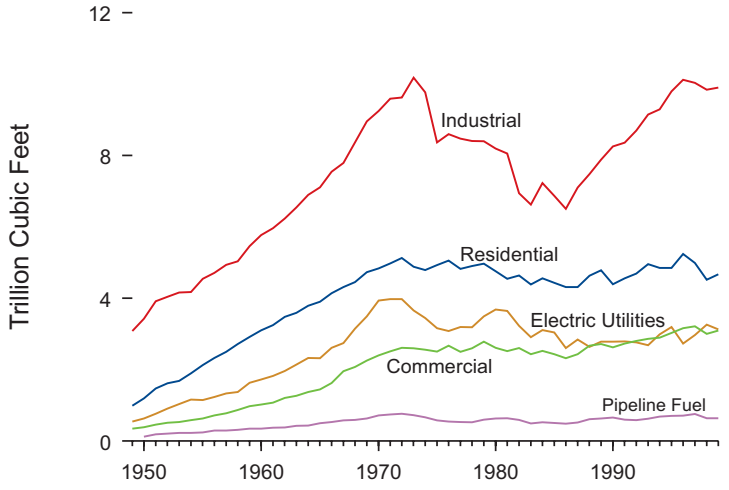
The United States had large natural-gas reserves and was essentially self-sufficient in natural gas until the late 1980s, when consumption began to significantly outpace production (Figure 17). Imports rose to make up the difference, nearly all coming by pipeline from Canada, although small volumes were brought by tanker in liquefied form from Algeria and, in recent years, from a few other countries as well. Net imports as a share of consumption more than tripled from 1986 to 1999 (Figure 18).

U.S. natural gas production in 1999 was 18.7 trillion cubic feet, well below the record-high 21.7 trillion cubic feet produced in 1973. Gas well productivity peaked at 435 thousand cubic feet per well per day in 1971, then fell steeply through the mid-1980s before stabilizing. Productivity in 1999 was 157 thousand cubic feet per well per day (Figure 19).

Three States (Texas, Louisiana, and Oklahoma) account for over half of all natural gas produced in the United States. Texas alone produced 6.9 trillion cubic feet in 1999. Advancing drilling technology has made offshore sites more important, and over the last two decades about one-fifth of all U.S. production has come from offshore sites.

For decades, the industrial sector of the economy has been the heaviest user of natural gas (Figure 20). In 1999 industrial entities (including most electric power producers other than utilities) accounted for nearly half of all natural gas consumption, followed by the residential sector, which used another fifth of the total. In recent years, very small amounts of natural gas (about 5 billion cubic feet in 1998) have been reported for use in vehicles.

Figure 20. Natural Gas Consumption by Sector



The price of natural gas at the wellhead (i.e., where the gas is produced) was $1.98 per thousand cubic feet in 1999, in real terms (chained 1996 dollars), well below the historical high of $3.76 per thousand cubic feet in 1983. In nominal dollars, the 1999 wellhead price was $2.07 per thousand cubic feet.

Coal

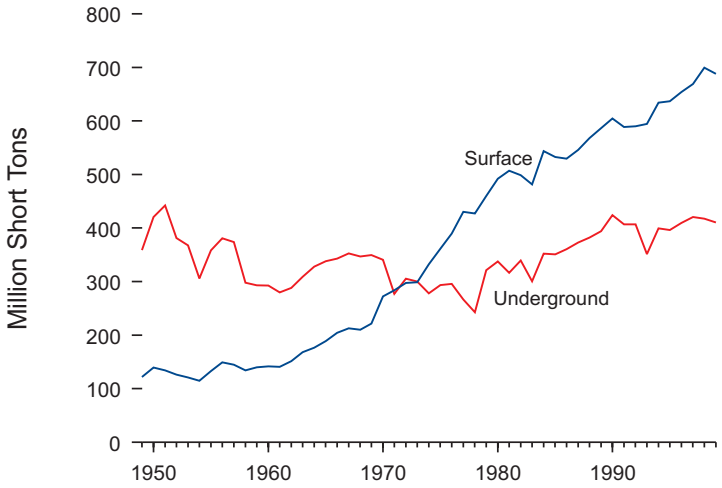
Scattered records of the use of coal as a fuel date from at least 1100 B.C. However, coal was not used extensively until the Middle Ages, when small mining operations in Europe began to supply it for forges, smithies, limeburners, and breweries. The invention of firebricks in the late 1400s, which made chimneys cheap to build, helped create a home heating market for coal. Despite its drawbacks (smoke and fumes), coal was firmly established as a domestic fuel by the 1570s. By that time, production in England was high enough that exports were thriving. Eventually, some of that coal went to the American colonies.

The total amount of coal consumed in the United States in all the years before 1800 was an estimated 108,000 tons, much of it imported. The U.S. market for coal expanded slowly and it was not until 1885 that the young and heavily forested nation burned more coal than wood. However, the arrival of the industrial revolution and the development of the railroads in the mid-nineteenth century inaugurated a period of generally growing production and consumption of coal that continues to the present time. Today, the United States extracts coal in enormous quantities. In 1998 U.S. production of coal reached a record 1.12 billion short tons and was second worldwide after China. U.S. 1999 production was 1.10 billion short tons.

From 1885 through 1951, coal was the leading source of energy produced in the United States. Crude oil and natural gas then vied for that role until 1982. Coal regained the position of the top resource that year and again in 1984, and has retained it since. At 23 quadrillion Btu in 1999, coal accounted for a third of all energy produced in the country.

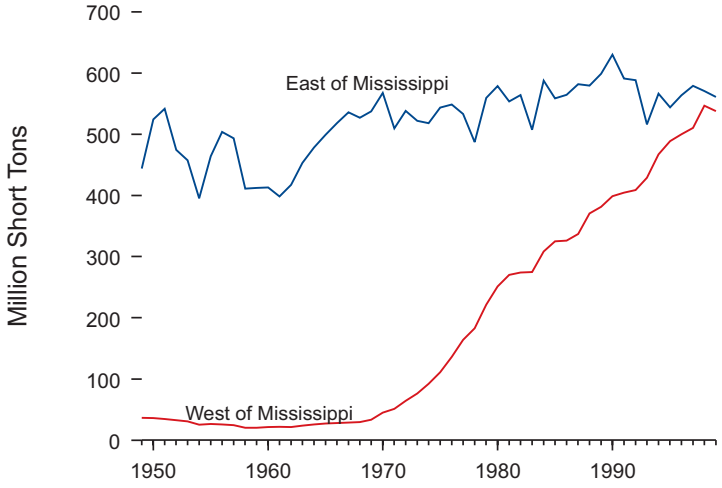
Over the past several decades, coal production shifted from primarily underground mines to surface mines (Figure 21). In addition, the coal resources of Wyoming and other areas west of the Mississippi River underwent tremendous development (Figure 22).

Figure 21. Coal Production by Mining Method



Technological improvements in mining and the shift toward more surface-mined coal, especially west of the Mississippi, have led to great improvements in coal mining productivity. In 1949 U.S. miners produced 0.7 short tons of coal per miner hour; by 1998 that rate had increased to 6.2 short tons per miner hour.

Figure 22. Coal Production by Location



Since 1950, the United States has produced more coal than it has consumed. The excess production allowed the United States to become a significant exporter of coal to other nations. In 1999 U.S. coal exports totaled 58 million short tons, which, measured in Btu, accounted for 40 percent of all U.S. energy exports. About 38 percent of the year's coal exports went to Europe, while the individual nations buying the most American coal were Canada, Japan, Brazil, Italy, and the Netherlands. While the quantities of coal leaving the country are huge, in 1999 they represented only 7 percent of the Btu content of the petroleum coming *into* the United States.

The uses of coal in the United States have changed dramatically over the years. In the 1950s, most coal was consumed in the industrial sector, but many homes were still heated by coal and the transportation sector still consumed significant amounts in steam-driven trains and ships (Figure 23). In 1999 the industrial sector used less than half as much coal as in 1949. Today only 9 percent of all coal consumed in the United States goes to the industrial sector. Ninety percent is used in the electric power sector; coal-fired units accounted for 51 percent of U.S. electricity generation in 1999 (Figure 24).

Coal-fired electric generating units emit gases that are of environmental concern. In 1998 U.S. carbon dioxide emissions from the combustion of coal for electric utility generation were nearly half a billion metric tons of carbon, 32 percent of total carbon dioxide emitted from all U.S. fuel sources.

Figure 23. Coal Consumption by Sector

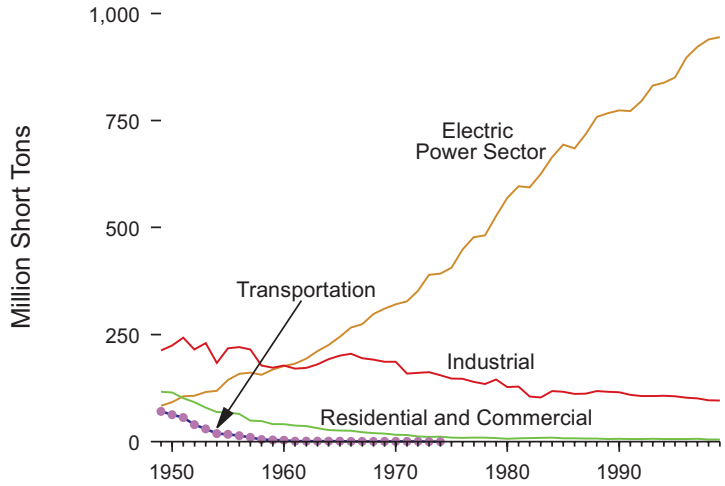
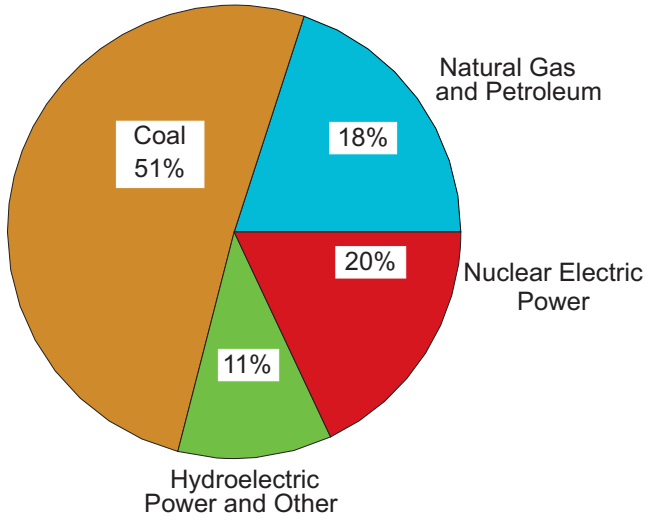


Figure 24. Electricity Net Generation by Source, 1999



Except for a post-oil-embargo price spike that peaked in 1975, real (inflation adjusted) coal prices have generally fallen over the last half-century. The average price in 1999 was 44 percent lower than it was in 1949. Coal is the least expensive of the major fossil fuels in this country: in nominal dollars, 1999 production prices for coal were 84 cents per million Btu compared with $1.86 per million Btu for natural gas and $2.68 per million Btu for crude oil.

Electricity

Electric power arrived barely a hundred years ago, but it has radically transformed and expanded our energy use. To a large extent, electricity defines modern technological civilization.

The reasons may not be easy to appreciate for those who have never known the filth, toil, danger, scarcity and/or inconvenience historically associated with obtaining and deploying such fuels as wood, coal, and whale oil. By contrast, at the point of use electricity is clean, flexible, controllable, safe, effortless, and instantly available. In homes, it runs everything from toothbrushes and televisions to heating and cooling systems. Outdoors, electricity guides traffic, aircraft, and ships, and lights up the night. In business and industry, electricity enables virtually instantaneous global communication and powers everything from trains, auto plant assembly lines, and

restaurant refrigerators to the computers that run the New York Stock Exchange and the automatic pin-setting machines at the local bowling alley.

Electric power developed slowly, however. Humphrey Davy built a battery-powered arc lamp in 1808 and Michael Faraday an induction dynamo in 1831, but it was another half-century before Thomas Edison's primitive cotton-thread filament burned long enough to prove that a workable electric light could be made. Once past that hurdle, progress accelerated. Edison opened the first electricity generating plant (in London) less than 3 years later, in January 1882, and followed with the first American plant (in New York) in September. Within a month, electric current from New York's Pearl Street station was feeding 1,300 lightbulbs, and within a year, 11,000—each a hundred times brighter than a candle. Edison's reported goal was to "make electric light so cheap that only the rich will be able to burn candles."

Though he fathered the electric utility industry, Edison failed in his attempts to dominate its business and technical sides. Other companies surpassed his efforts to build central power stations, and Edison's dogged faith in direct current (DC) betrayed him. DC could only be transmitted 2 miles, while a rival alternating-current (AC) system developed by George Westinghouse and Nikola Tesla (whom Edison had fired) enabled long-distance transmission of high-voltage current and stepdowns to lower voltages at the point of use—essentially the system in place today. Edison even subsidized construction of an AC-powered electric chair to convince the public that AC was dangerous, but to no avail.

The process of electrification proceeded in fits and starts. Industries like mining, textiles, steel, and printing electrified rapidly during the years between 1890 and 1910. Electricity's penetration of the residential sector was slowed by competition from gas companies, which had a large stake in the lighting market. Nevertheless, by 1900 there were 25 million electric incandescent lamps in use and homeowners had been introduced to electric stoves, sewing machines, curling irons, and vacuum cleaners. In parallel, generating equipment and distribution systems developed to meet the demand. By 1903 utility executive Samuel Insull had commissioned a 5 megawatt steam-driven turbine generator—the first of its type and the largest of any generator then built—and launched a revolution in generating hardware.

The cities received electric service first, because it has always been cheaper, easier, and more profitable to supply large numbers of customers when they are close together. High costs and the Great Depression, which dried up most investment capital, delayed electric service to rural Americans until President Franklin Roosevelt signed into law the Rural Electrification Administration (REA) in 1935. The REA loaned money at low interest and helped to set up electricity cooperatives. Though interrupted by World War II, rural electrification proceeded rapidly thereafter. By 1967 more than 98 percent of American farms were using electricity from central station power plants.

The depth of electricity's penetration into our economy and way of life is reflected in the fact that, over the last half century, annual increases in total electricity sales by electric utilities faltered only twice, in 1974 and 1982; in every other year, sales grew. From 1949 to 1999, while the population of the United States expanded 83 percent, the amount of electricity sold by utilities grew 1,180 percent. Per-capita average consumption of electricity in 1999 was seven times as high as in 1949. Electricity's broad usage in the economy can be seen in the sector totals, which were led in 1999 by the residential sector, followed closely by the industrial sector, and then the commercial sector (Figure 25).

Where does all this electricity come from? In the United States, coal has been and continues to be the source of most electricity, accounting for over half of all electricity generated by utilities in 1999 (Figure 26).

Figure 25. Electric Utility Retail Sales of Electricity, 1999

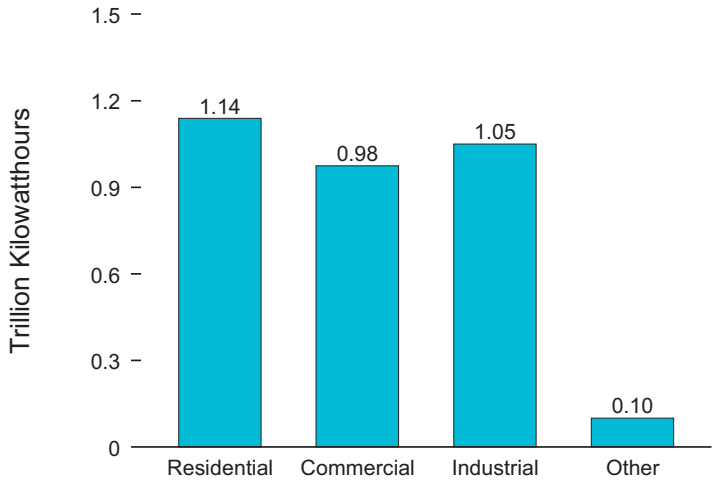


Figure 26. Electricity Net Generation at Utilities

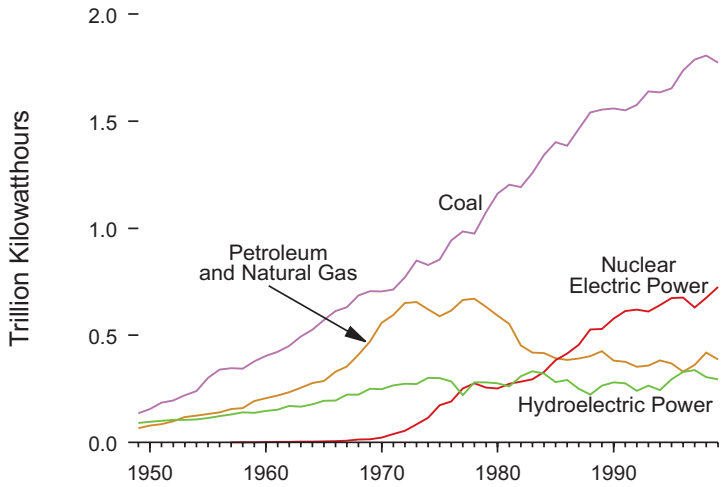
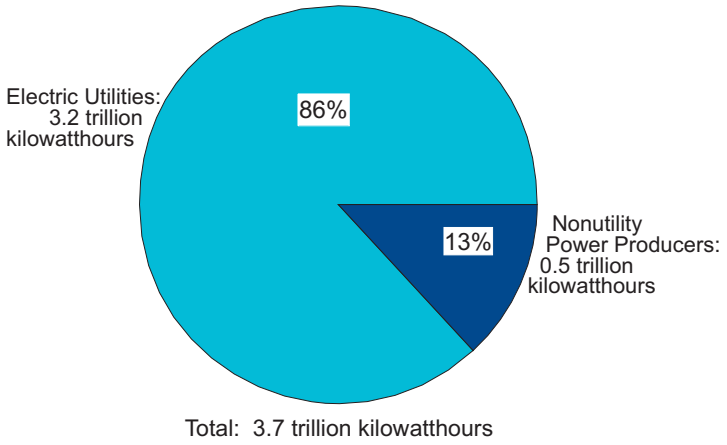


Figure 27. Electricity Net Generation, 1999

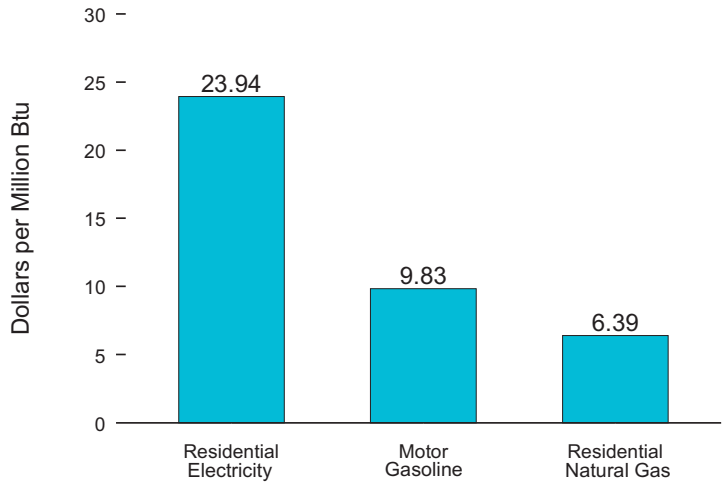


Hydroelectric power was an early source of U.S. electricity—accounting for almost a third of all utility generation in 1949—and remains a dependable contributor (over 9 percent of the total in 1999). Natural gas and petroleum grew steadily as sources of electricity in the late 1960s. Their combined usage peaked at 37 percent of the total in 1972 and stood at 18 percent in 1999. Meanwhile, a new source entered the picture: nuclear electric power. A trickle of nuclear electricity began flowing in 1957, and the stream widened steadily except for downturns in 1979 and 1980, following the accident at Three Mile Island, and again in 1993. Nuclear generation declined 7 percent in 1997 but rebounded 16 percent between 1997 and 1999.

Just as electricity's applications and sources change over time, so is the structure of the electric power sector itself evolving. The sector is now moving away from the traditional, highly regulated organizations known for many decades as electric utilities and toward an environment marked by lighter regulation and greater competition from and among nonutility power producers. In 1999, 13 percent of the total net generation of electricity came from nonutility power producers, such as independent power producers and nonutility cogenerators (Figure 27).

Electricity's great assets as a form of energy are reflected in its cost to the end user. The price paid by the consumer includes the cost of converting the energy from its original form, such as coal, into electricity and the cost of delivering it. In 1999 consumers paid an average of $23.94 per million Btu for the electricity delivered to their residences (Figure 28). In contrast, consumers paid an average of only $6.39 per million Btu for the natural gas

Figure 28. Consumer Prices, 1999



purchased for their homes and an average of $9.83 per million Btu for the motor gasoline to fuel their vehicles.

The unit cost of electricity is high because most of the energy that must be purchased to generate it does not actually reach the end user but is expended in creating the electricity and moving it to the point of use. In 1999, for example, approximately 35 quadrillion Btu of energy were consumed to generate electricity at utilities in the United States, but only 11 quadrillion Btu worth of electricity were actually used directly by consumers. Where did the other 24 quadrillion Btu go? Energy is never destroyed but it does change form. The chemical energy contained in fossil fuels, for example, is converted at the generator to the desired electrical energy. Because of theoretical and practical limits on the efficiency of conversion equipment, much of the energy in the fossil fuels is "lost," mostly as waste heat. The overall energy efficiency of a system can be increased through the tandem production of electricity and some form of useful thermal energy. This process, known as cogeneration, reduces waste energy by utilizing otherwise unwanted heat in the form of steam, hot water, or hot air for other purposes, such as operating pumps or for space heating or cooling.

In addition to the conversion losses, line losses occur during the transmission and distribution of electricity as it is transferred via connecting wires from the generating plant to substations (transmission), where its voltage is lowered, and from the substations to end users (distribution), such as homes, hospitals, stores, schools, and businesses. The generating plant itself uses some of the electricity. In the end, for every three units of energy that are converted to create electricity, only about one unit actually reaches the end user.

Nuclear Energy

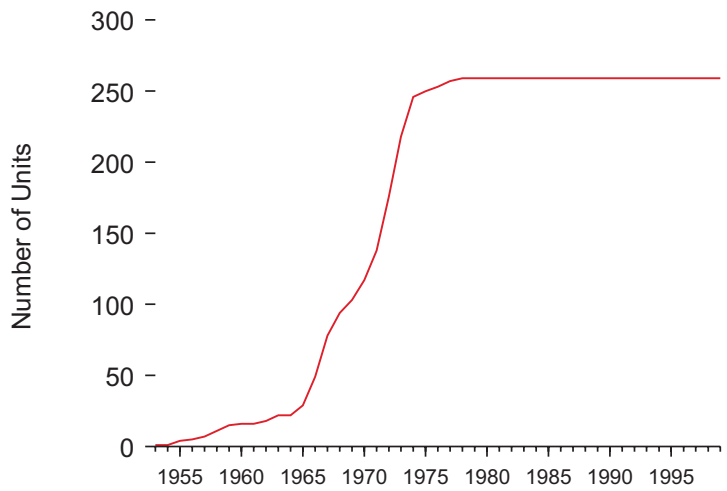
Among all the major forms of energy now in use, only nuclear power is native to the 20th century. The central insight—that the controlled fission of heavy elements could release enormous energies—came to British physicist Ernest Rutherford in 1904, and research during the 1930s convinced scientists that a controlled chain reaction was possible. Enrico Fermi's group achieved such a reaction for the first time in December 1942 at the University of Chicago in a primitive graphite-moderated reactor built on a vacant squash court.

World War II postponed further progress toward commercial nuclear electric power, but the theoretical foundation had been established and several factors encouraged nuclear power's development when peace returned. It was believed that fuel costs would be negligible and therefore that nuclear power would be relatively inexpensive. In addition, both the United States and Western Europe became net importers of crude oil in the early 1950s and nuclear power was seen as critical to avoiding energy dependence. Geopolitics appear to have played a role as well; President Dwight Eisenhower's Atoms for Peace program was intended in part to divert fissionable materials from bombs to peaceful uses such as civilian nuclear power.

In 1951 an experimental reactor sponsored by the U.S. Atomic Energy Commission generated the first electricity from nuclear power. The British completed the first operable commercial reactor, at Calder Hall, in 1956. The U.S. Shippingport unit, a design based on power plants used in nuclear submarines, followed a year later. In cooperation with the U.S. electric utility industry, reactor manufacturers then built several demonstration plants and made commitments to build additional plants at fixed prices. This commitment helped launch commercial nuclear power in the United States.

The success of the demonstration plants and the growing awareness of U.S. dependency on imported crude oil led to a wave of enthusiasm for

Figure 29. Cumulative Orders for Nuclear Generating Units



nuclear electric power that sent orders for reactor units soaring between 1966 and 1974 (Figure 29). The number of operable units increased in turn, as ordered units were constructed, tested, licensed for full power operation, and connected to the electricity grid (Figure 30). However, the curve of operable units lagged behind the curve of ordered units somewhat because of the long construction times required for the large, complex plants. The total number of U.S. operable reactor units peaked in 1990 at 112.

Orders for new units fell off sharply after 1974. Of the total of 259 units ordered to date, none was ordered after 1978. Although safety concerns, especially after the accident at Three Mile Island in 1979, reinforced a growing wariness of nuclear power, the chief reason for its declining momentum in the United States was economic. The promise of nuclear electric power had been that it would, in the now-famous phrase, make energy "too cheap to meter." In reality, nuclear power plants have always been costly to build and, for several reasons, became radically more costly between the mid-1960s and the mid-1970s. Utilities began building large plants before much experience had been gained with small ones. Expected economies of scale did not materialize. Many units were forced to undertake costly design changes and equipment retrofits, partially as a result of the Three Mile Island accident. Meanwhile, nuclear power plants have also had to compete with conventional coal- or natural gas-fired plants with declining operating costs.

Figure 30. Operable Nuclear Generating Units

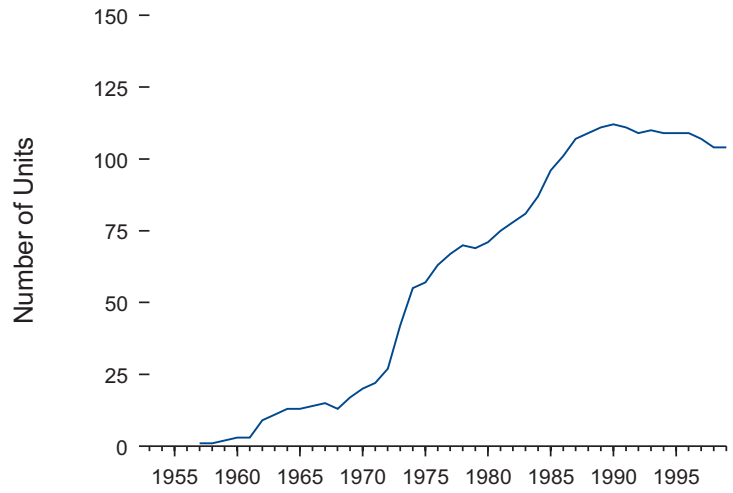
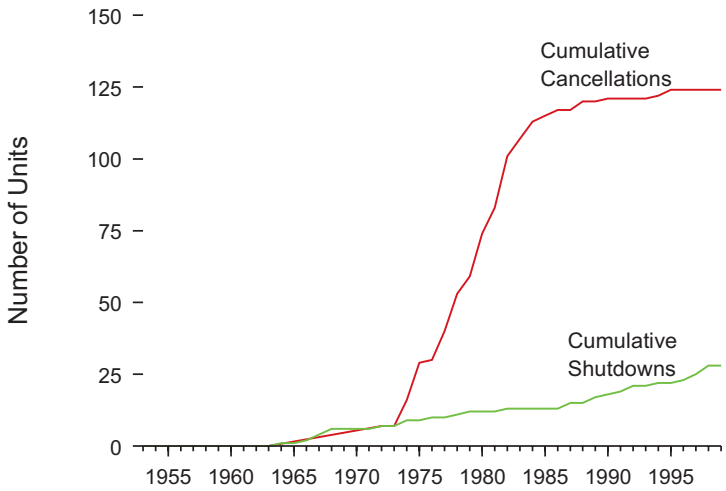


Figure 31. Nuclear Generating Units Cancelled or Shut Down



These trends disillusioned many utilities and investors. Interest in further orders subsided and many ordered units were cancelled before they were built. By the end of 1999, 124 units had been cancelled, 48 percent of all ordered units (Figure 31).

The average capacity factor of U.S. nuclear units—the ratio of the electricity they actually produced in a given year to the electricity they could have produced if run at continuous full power—has improved steadily over the years, and reached 86 percent in 1999. However, as operable nuclear power plants have aged, some have become uneconomic to operate or have otherwise reached the end of their useful lives. By the end of 1999, 28 once-operable units had been shut down permanently. The joint effect of shutdowns and lack of new units coming on line is that the number of U.S. operable units has fallen off since 1990 to 104. In its *Annual Energy Outlook 2000*, EIA projects that 41 percent of the nuclear generating capacity that existed at the end of 1998 will be retired by 2020. No new plants are expected to be built during the period.

Renewable Energy

For all but the most recent fraction of humanity's time on Earth, virtually all energy was renewable energy. Prior to the widespread use of fossil fuels

and nuclear power, which arrived only an eyeblink ago in relative terms, there was essentially nothing else. Our ancestors warmed themselves directly in the sun, burned brush and fuelwood fashioned by photosynthesis from sunlight and nutrients, harnessed the power of wind and water created mainly by sun-driven atmospheric and hydrologic cycles, and of course used their own musclepower and that of animals.

We still depend heavily on renewable energy in these primeval forms. But various cultures have also found more inventive means of harnessing renewable resources, from mounting sails on wheelbarrows, as did ancient Chinese laborers, to gathering and burning buffalo dung, as did American settlers making their way west. The story of renewable energy is one of the invention and refinement of technologies for extracting both more energy and more useful forms of it from a wider variety of renewable sources. Many energy experts believe that the age of fossil fuels is only an interlude between pre- and post-industrial eras dominated by the use of renewable energy.

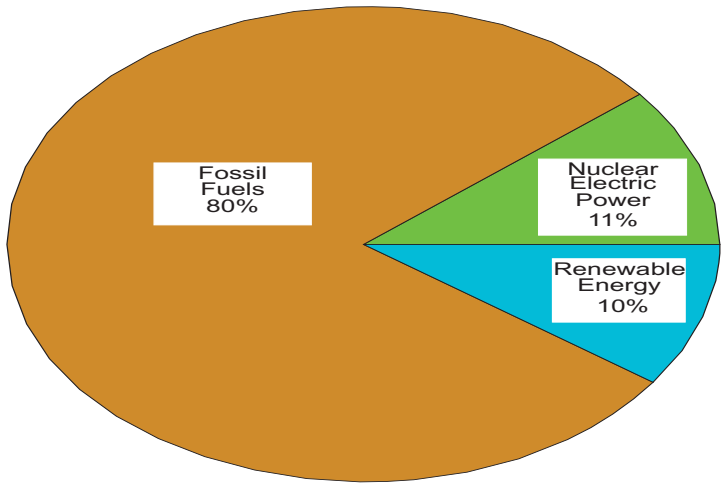
Some renewable energy technologies, such as water- and wind-driven mills, have been in use for centuries. Grain mills powered by waterwheels have existed since at least the first century B.C. and became commonplace long ago. In England, for example, the Domesday Book survey of 1086 counted 5,624 mills in the south and east alone. They were to be found throughout Europe and elsewhere and were used for a wide variety of mechanical tasks in addition to milling, from pressing oil to making wire. Some installations were surprisingly large. The Romans built a mill with 16 wheels and an output of over 40 horsepower near Arles in France. A giant 72-foot waterwheel with an output of 572 horsepower, dubbed Lady Isabella, was erected at a mine site on the Isle of Man in 1854. Further development of waterwheels ended with the invention of water turbines. Both types of machines were supplanted by large steam engines, which could be sited nearly anywhere. Turbines, however, found an important niche with the development of hydroelectric power.

Windmills are a younger but still ancient technology, dating at least to the 10th century in the Middle East, a bit later in Europe. In one form or another, windmills have remained in use ever since, for milling grain, pumping water, working metal, sawing, and crushing chalk or sugar cane. As mentioned in the introduction, American farms of the 19th century erected millions of small windmills to pump water for livestock or household use. In the modern era, technologically advanced windmills have been developed for generating electricity.

Modern renewable sources in the United States contribute about as much (roughly one-tenth) to total energy production as does nuclear power (Figure 32). Just as water power was relatively more important than wind energy in pre-industrial times, renewable energy today is dominated by hydroelectric power. About 45 percent of the U.S. renewable total in 1999 came from hydroelectric power generation, which uses dam-impounded water to drive turbine generators that make electricity. The American hydropower infrastructure is extensive and includes the great dams of the intermountain West, the Columbia basin, and the Tennessee River valley, as well as hundreds of other smaller installations nationwide.

Most of the rest of the U.S. renewable energy total came from wood and waste, a diverse category that includes not only the obvious candidates (such as wood, methanol, and ethanol) but also peat, wood liquors, wood sludge, railroad ties, pitch, municipal solid waste, agricultural waste, straw, tires, landfill gas, fish oil, and other things. Wood and wood byproducts are the most heavily used form of biomass and figure prominently in the energy consumption of such industries as paper manufacturing and lumber, which have ready access to them. Geothermal was third in 1999, accounting for about 5 percent of U.S. renewable energy production.

Figure 32. Renewable Energy in Total Energy Production, 1999



Despite their cachet, solar energy (photovoltaic and thermal) and wind energy contribute relatively little to the renewable total (about 1 percent and one-half percent respectively). The peak year for U.S. manufacturers' shipments of solar thermal collectors was 1981, when 21 million square feet were shipped. From 1991 through 1998, an average of 7.4 million square feet were shipped each year. Over 90 percent of the solar thermal collectors went to the residential sector in 1998. Ninety-three percent of the newly shipped collectors were used to heat swimming pools, while 6 percent were used for water heating and less than 1 percent for space heating. Prices for photovoltaic cells have fluctuated in recent years, while the volume of shipments in 1998 was nearly nine times the 1985 volume. U.S. wind energy production rose 58 percent between 1989 and 1999 but remains a very small factor in renewable energy here.

Environmental Indicators

The use of energy brings undisputed benefits, but it also incurs costs. Some of these costs show up on consumers' utility bills. The charges levied on consumers by an energy producer (an electric utility with a coal-fired generating plant, for instance) are designed to cover the producer's costs of building the power plant, extracting coal from the ground, transporting it to the power plant, crushing it to the proper size for combustion, maintaining the generating turbines, paying workers and managers, and so on.

One important category of costs that often is not reflected in consumers' bills is energy-related environmental effects. These unwanted effects can be thought of as the tail end of the energy cycle, which begins with extraction and processing of fuels (or gathering of wind or solar energy), proceeds with conversion to useful forms by means of petroleum refining, electricity generation, and other processes, and then moves on to distribution to, and consumption by, end-users. Once the energy has rendered the services for which it is consumed, all that is left are the byproducts of energy use, i.e., waste heat, mine tailings, sulfur dioxide and carbon dioxide gases, spent nuclear fuel, and many others.

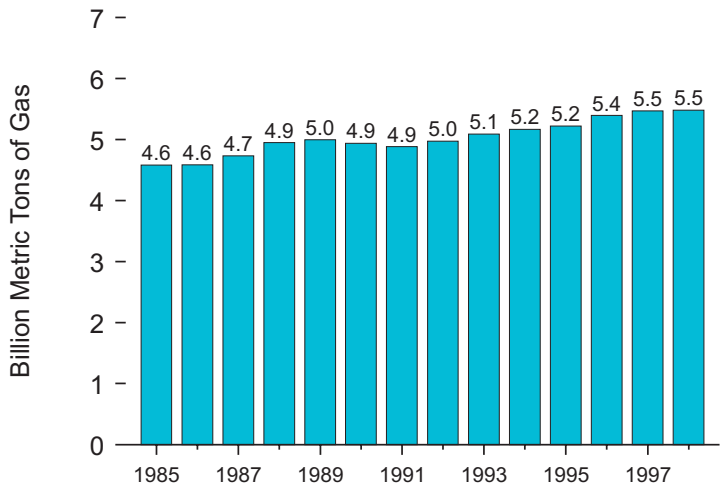
All energy use has unwanted effects of one kind or another; even a simple campfire produces eye-stinging smoke as well as warmth. The effects can be local or widespread, and neither type is only a concern of modern times. King Edward I of England, for instance, so objected to the noxious smoke and fumes from London's many coal-burning fires that in 1306 he tried (unsuccessfully) to ban its use by anyone except blacksmiths. But the enormous scale of modern energy use has sharply increased concerns about unwanted environmental effects. No form of energy production is entirely free of them, including renewable energy. Damming rivers and streams for hydropower facilities radically alters natural stream flows in ways that can threaten or endanger aquatic species. Wind-turbine generators can make noise and kill birds. Biomass generating plants that rely on plantation forestry for fuel can displace natural forest habitat and reduce biological diversity.

Among the most significant environmental effects of energy production and consumption is the emission of greenhouse gases. Such gases—carbon dioxide, methane, nitrous oxide, and others—block infrared radiation from the Earth to space and retain the captured heat in the atmosphere. This greenhouse effect keeps the Earth's climate hospitable to life. But the possibility of carbon-dioxide-forced warming of the climate has been postulated since 1861, and in recent years many scientists have come to believe that anthropogenic (human-caused) additions to greenhouse gases are raising global average temperatures and may produce harmful changes in the global climate. Energy-related greenhouse gas emissions make up a significant fraction of all such emissions, and the United States, as one of the world's largest producers and consumers of fossil fuels, is responsible for a major portion of global energy-related emissions.

Carbon dioxide (CO_2) accounts for the largest share of combined anthropogenic greenhouse gas emissions. In 1998 U.S. anthropogenic CO_2 emissions totaled about 5.5 billion metric tons (of gas; 1 ton of carbon equals 3.667 tons of carbon dioxide gas), 0.2 percent higher than the year before and 20 percent higher than in 1985 (Figure 33). Nearly 99 percent of this total was energy-related emissions, especially from petroleum consumed by the transportation sector, coal burned by electric utilities, and natural gas used by industry, homes, and businesses.

Energy-related emissions of methane, another important greenhouse gas, remained at 10 million metric tons in 1998. While about 35 percent of U.S. methane emissions stemmed from energy use, most came from landfills and such agricultural sources as ruminant animals (cattle and sheep) and their wastes. Emissions of a third potent greenhouse gas, nitrous oxide, remained about the same in 1998, at 1.2 million metric tons.

Figure 33. Carbon Dioxide Emissions



All sectors of the U.S. economy contribute to energy-related greenhouse gas emissions, especially CO_2. Of 1998 energy-related CO_2 emissions of 1.5 billion metric tons of carbon (5.4 billion tons of gas), the industrial and transportation sectors each accounted for about one-third, the residential sector for about one-fifth, and the commercial sector for the remainder. Industry's emissions derive from a broad mix of fossil-origin energy, including electricity, petroleum, natural gas, and coal. Not surprisingly, the transportation sector emits carbon dioxide mostly via the consumption of petroleum (especially motor gasoline, distillate fuels such as diesel, and jet fuel). Residential- and commercial-sector emissions are owed mostly to the use of electricity and natural gas.

The U.S. Energy Outlook

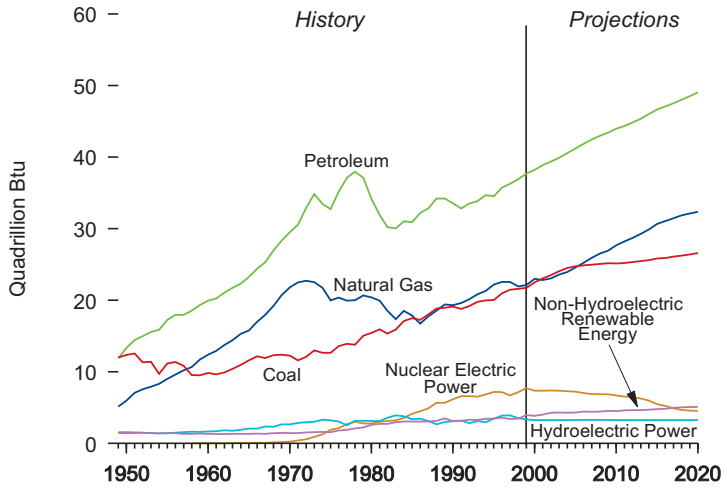
Future patterns of energy production, use, and consequences in the United States are, of course, purely speculative. But educated guesses can be made by means of sophisticated computer models, such as the Energy Information Administration's National Energy Modeling System (NEMS). EIA's current projections are published in its *Annual Energy Outlook 2000* (*AEO 2000*) and extend through 2020. Although emphatically not to be taken as predictions—no existing or imaginable model pretends to be able to foresee critical but unexpected events, such as the 1973 oil embargo—the projections can sketch a plausible general picture of future developments given known trends in technology and demographics and current laws and regulations.

The projections in *AEO 2000* suggest our near-term energy future will be one of more: consumption, production, imports, and emissions. Real energy prices are expected either to increase slowly (petroleum and natural gas) or to decline (coal and electricity). These circumstances will encourage greater consumption (Figure 34), and *AEO 2000* projects U.S. total consumption to reach 121 quadrillion Btu in 2020, 27 percent higher than in 1998. Consumption rises in all sectors, but growth is especially strong in transportation because of more travel and greater freight requirements.

Despite the general increase in energy consumption, efficiency gains and rising population keep per-capita use of energy roughly stable through 2020, according to the projections. Energy intensity, expressed as energy use per dollar of gross domestic product, has declined since 1970 and is expected to continue falling.

More energy consumption, of course, means more energy production—somewhere. Because the output of aging U.S. oil fields will continue to drop, rising demand for petroleum will have to be met by imports. The share of U.S. petroleum consumption met by net imports is projected to

Figure 34. Energy Consumption by Fuel, 1949-2020



rise from 52 percent in 1998 to 64 percent in 2020. Domestic natural gas production, on the other hand, increases 1.5 percent per year on average, an increase sufficient to meet most of the higher demand. Output from the Nation's vast coalfields likewise increases to meet rising domestic demand. Growth in production of energy from renewable sources is less than 1 percent per year, while output from nuclear power facilities declines significantly.

Unless policies to reduce emissions of carbon dioxide (such as those proposed under the 1997 Kyoto Protocol) are adopted, greater use of fossil fuels, slow market penetration by renewable energy sources, and less use of nuclear power will inevitably lead to higher emissions. *AEO 2000* projects U.S. energy-related carbon dioxide emissions to reach nearly 2 billion metric tons of carbon (7.3 billion tons of gas) in 2020, 33 percent more than in 1998.

What of our long-term energy future? That is even more speculative. Many would argue that the world is destined to move beyond fossil fuels eventually; if the threat of global climate change does not compel it, then exhausted supplies and rising prices may. The far future seems likely to belong to renewable sources of energy. Although the form they take may be radically different than in the past—solar hydrogen and advanced photovoltaics, perhaps, rather than fuelwood and dung—humankind's sources of energy thus will have come full circle.

Figure Source Notes

1. *Annual Energy Review 1999*, Appendix F, Tables F1a and F1b.
2. Ibid., Table 1.2.
3. Ibid., Tables 1.2 and 1.3.
4. Ibid., Table 1.1.
5. Ibid., Table 5.1.
6. Ibid., Table 2.1.
7. Ibid.
8. Ibid.
9. Ibid., Table 1.15.
10. Ibid., Table 2.9.
11. Ibid., Table 5.1.
12. Ibid., Table 5.2.
13. Ibid.
14. Ibid., Tables 5.12a and 5.12b.
15. Ibid., Table. 5.15.
16. Ibid., Table 5.19.
17. Ibid., Table 6.1.
18. Ibid., Table 6.3.
19. Ibid., Table 6.4.
20. Ibid., Table 6.5.
21. Ibid., Table 7.2.
22. Ibid.
23. Ibid., Table 7.3.
24. Ibid., Table 8.2.
25. Ibid., Table 8.9.
26. Ibid., Table 8.3.
27. Ibid., Table 8.1.
28. Calculated from data in *Annual Energy Review 1999*, Tables 8.13 (residential electricity) and A6, 5.22 (all types of motor gasoline) and A3, and 6.9 (residential natural gas) and A4.
29. *Annual Energy Review 1999,* Table 9.1.
30. Ibid.
31. Ibid.
32. Ibid., Table 1.2.
33. Ibid., Table 12.1.
34. **History:** Energy Information Administration, *Annual Energy Review 1999*, Table 1.3. **Projections:** Energy Information Administration, *Annual Energy Outlook 2000*, Tables A1 and A18.

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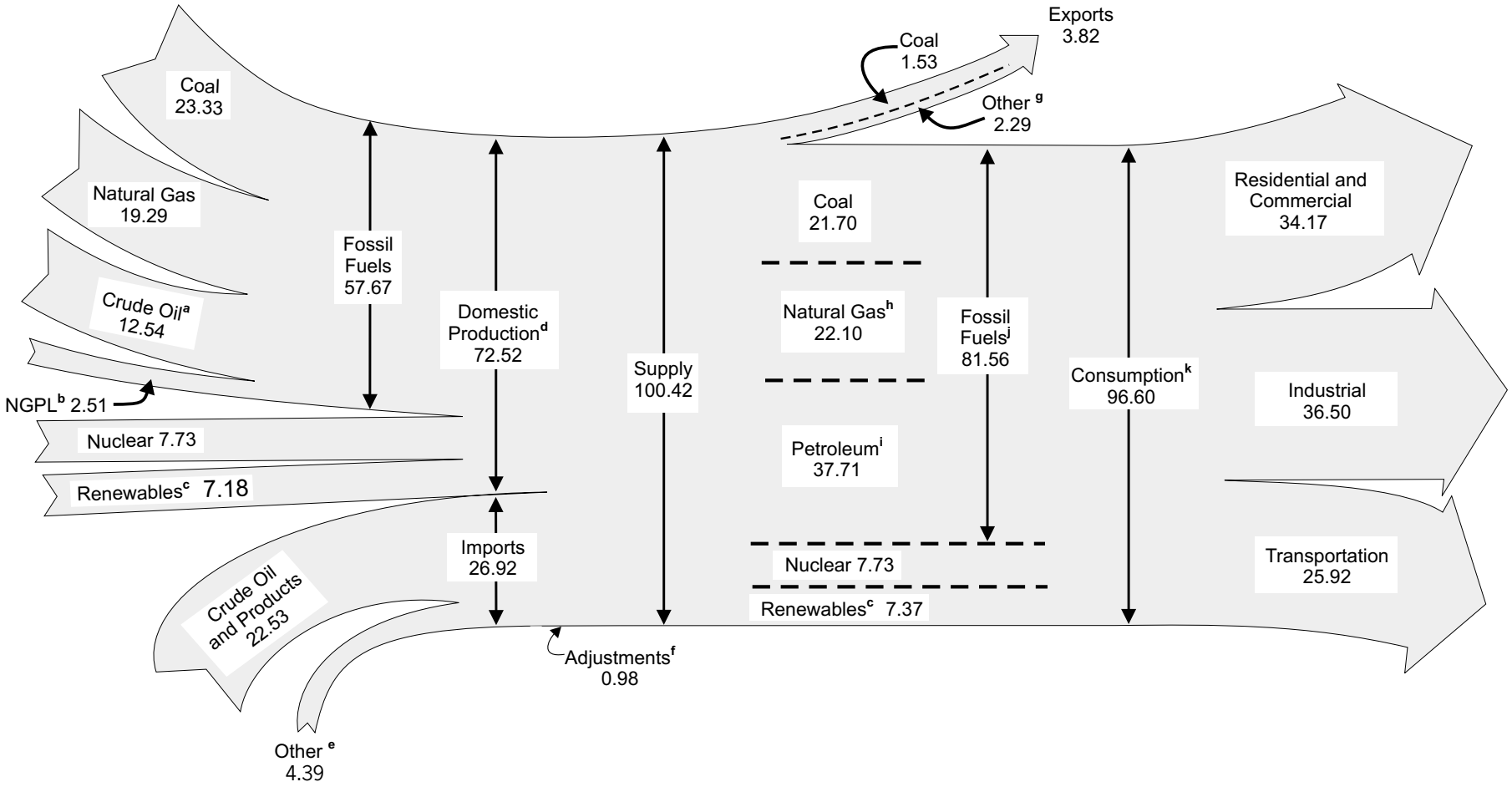
1 Energy Overview

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

Diagram 1. Energy Flow, 1999
(Quadrillion Btu)

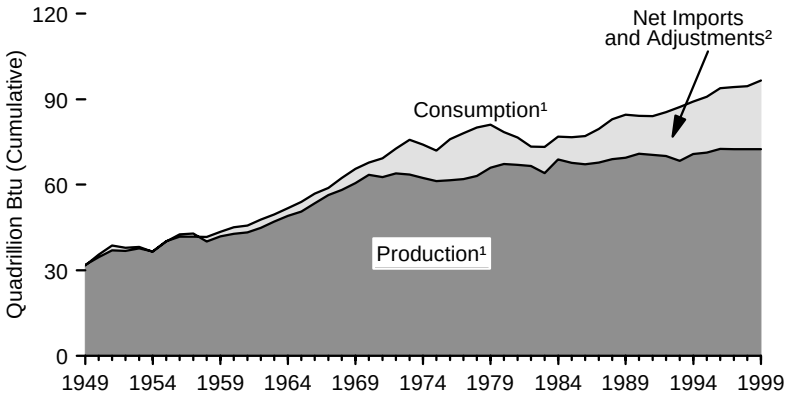


[a] Includes lease condensate.
[b] Natural gas plant liquids.
[c] Conventional hydroelectric power, wood, waste, ethanol blended into motor gasoline, geothermal, solar, and wind.
[d] Includes -0.06 quadrillion Btu hydroelectric pumped storage.
[e] Natural gas, coal, coal coke, and electricity.
[f] Stock changes, losses, gains, miscellaneous blending components, and unaccounted-for supply.
[g] Crude oil, petroleum products, natural gas, electricity, and coal coke.
[h] Includes supplemental gaseous fuels.
[i] Petroleum products, including natural gas plant liquids.
[j] Includes 0.06 quadrillion Btu coal coke net imports.
[k] Includes, in quadrillion Btu, 0.11 net imported electricity from nonrenewable sources; -0.06 hydroelectric pumped storage; and -0.11 ethanol blended into motor gasoline, which is accounted for in both fossil fuels and renewables and removed once from this total to avoid doublecounting.

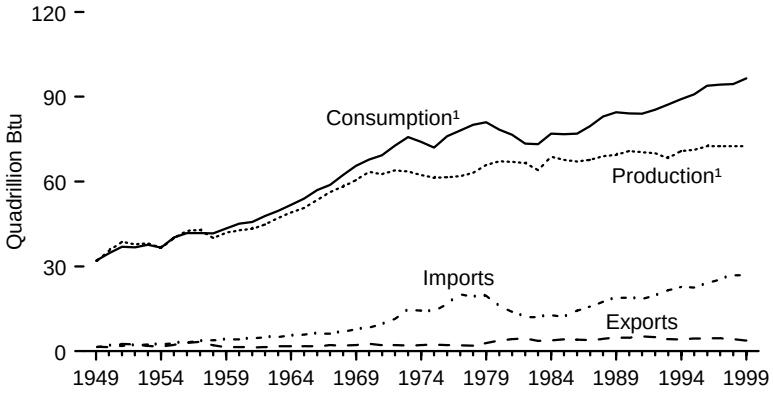
Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.
Sources: Tables 1.1, 1.2, 1.3, 1.4, 2.1, and 10.2.

Figure 1.1 Energy Overview

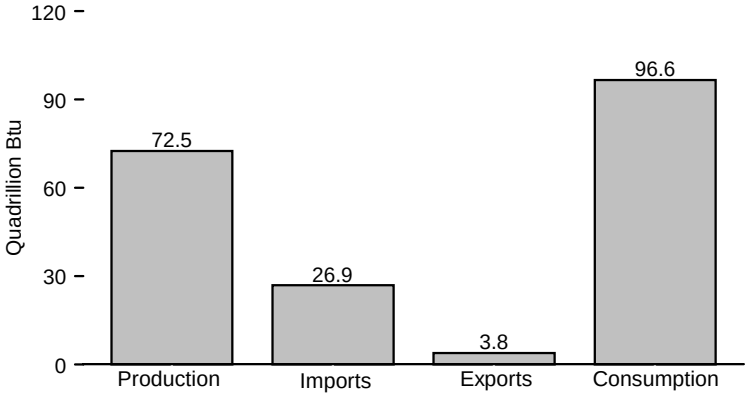
Overview, 1949-1999



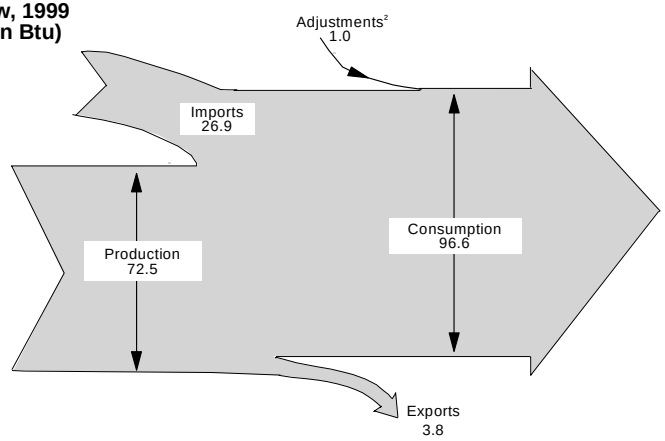
Overview, 1949-1999



Overview, 1999



Energy Flow, 1999 (Quadrillion Btu)



¹ There is a discontinuity in this time series between 1988 and 1989 due to the expanded coverage of renewable energy beginning in 1989.

² Stock changes, losses, gains, miscellaneous blending components, and unaccounted-for supply.

Note: Data for 1999 are preliminary.
Source: Table 1.1.

Table 1.1 Energy Overview, 1949-1999

(Quadrillion Btu)

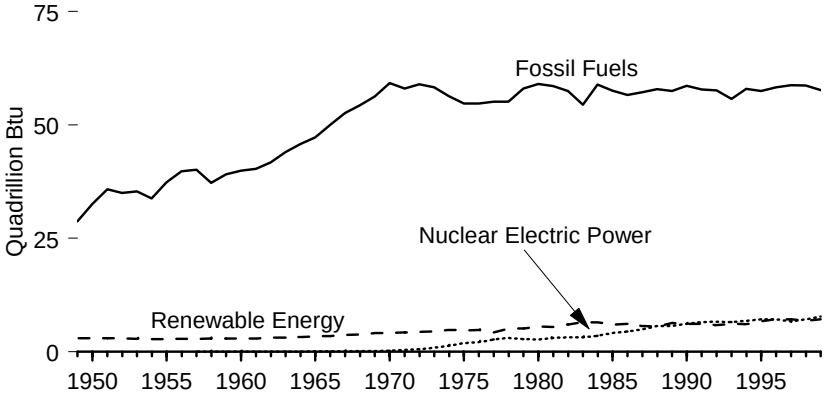
Year	Production				Imports		Exports		Adjustments [8]	Consumption			
	Fossil Fuels [1]	Nuclear Electric Power [2]	Renewable Energy [3]	Total [4]	Petroleum [5]	Total [6]	Coal	Total [7]		Fossil Fuels [9]	Nuclear Electric Power [2]	Renewable Energy [3]	Total [10]
1949	28.75	0	2.97	31.72	1.43	1.47	0.88	1.59	0.40	29.00	0	3.00	32.00
1950	32.56	0	2.98	35.54	1.89	1.93	0.79	1.47	-1.37	31.63	0	3.00	34.63
1951	35.79	0	2.96	38.75	1.87	1.92	1.68	2.62	-1.05	34.01	0	2.99	37.00
1952	34.98	0	2.94	37.92	2.11	2.17	1.40	2.37	-0.95	33.80	0	2.97	36.77
1953	35.35	0	2.83	38.18	2.28	2.34	0.98	1.87	-0.96	34.83	0	2.86	37.68
1954	33.76	0	2.75	36.52	2.32	2.37	0.91	1.70	-0.53	33.88	0	2.78	36.66
1955	37.36	0	2.78	40.15	2.75	2.83	1.46	2.29	-0.44	37.41	0	2.83	40.24
1956	39.77	0	2.85	42.62	3.17	3.25	1.98	2.95	-1.13	38.89	0	2.90	41.79
1957	40.13	(s)	2.85	42.98	3.46	3.57	2.17	3.45	-1.29	38.93	(s)	2.89	41.82
1958	37.22	(s)	2.92	40.13	3.72	3.92	1.42	2.06	-0.32	38.72	(s)	2.95	41.67
1959	39.05	(s)	2.90	41.95	3.91	4.11	1.05	1.54	-1.03	40.55	(s)	2.94	43.49
1960	39.87	0.01	2.93	42.80	4.00	4.23	1.02	1.48	-0.43	42.14	0.01	2.98	45.12
1961	40.31	0.02	2.95	43.28	4.19	4.46	0.98	1.38	-0.60	42.76	0.02	2.98	45.76
1962	41.73	0.03	3.12	44.88	4.56	5.01	1.08	1.48	-0.57	44.68	0.03	3.12	47.83
1963	44.04	0.04	3.10	47.17	4.65	5.10	1.36	1.85	-0.78	46.51	0.04	3.10	49.65
1964	45.79	0.04	3.23	49.06	4.96	5.49	1.34	1.84	-0.87	48.54	0.04	3.25	51.83
1965	47.23	0.04	3.40	50.68	5.40	5.92	1.38	1.85	-0.72	50.58	0.04	3.40	54.02
1966	50.04	0.06	3.43	53.53	5.63	6.18	1.35	1.85	-0.83	53.51	0.06	3.45	57.02
1967	52.60	0.09	3.69	56.38	5.56	6.19	1.35	2.15	-1.52	55.13	0.09	3.69	58.91
1968	54.31	0.14	3.78	58.23	6.21	6.93	1.38	2.03	-0.71	58.50	0.14	3.77	62.41
1969	56.29	0.15	4.10	60.54	6.90	7.71	1.53	2.15	-0.47	61.36	0.15	4.11	65.63
1970	59.19	0.24	R4.07	63.50	7.47	8.39	1.94	2.66	-1.37	63.52	0.24	R4.09	67.86
1971	58.04	0.41	4.27	62.72	8.54	9.58	1.55	2.18	-0.82	64.60	0.41	R4.30	69.31
1972	58.94	0.58	4.40	63.92	10.30	11.46	1.53	2.14	-0.48	67.70	0.58	4.48	72.76
1973	58.24	0.91	4.43	63.58	13.47	14.73	1.43	2.05	-0.46	70.32	0.91	4.58	75.81
1974	56.33	1.27	4.77	62.37	13.13	14.41	1.62	2.22	-0.48	67.91	1.27	4.90	74.08
1975	54.73	1.90	4.72	R61.35	12.95	14.11	1.76	2.36	-1.07	65.35	1.90	4.79	72.04
1976	54.72	2.11	4.77	61.60	15.67	16.84	1.60	2.19	-0.18	69.10	2.11	4.86	76.07
1977	55.10	2.70	4.25	62.05	18.76	20.09	1.44	2.07	-1.95	70.99	2.70	4.43	78.12
1978	55.07	3.02	5.04	63.14	17.82	19.25	1.08	1.93	-0.34	71.86	3.02	5.24	80.12
1979	58.01	2.78	R5.16	65.95	17.93	19.62	1.75	2.87	-1.65	72.89	2.78	R5.37	81.04
1980	59.01	2.74	5.49	67.24	14.66	15.97	2.42	3.72	-1.05	69.98	2.74	5.71	R78.43
1981	58.53	3.01	5.47	67.01	12.64	13.97	2.94	4.33	-0.08	67.75	3.01	5.82	76.57
1982	57.46	3.13	5.99	R66.57	10.78	12.09	2.79	4.63	-0.59	64.04	3.13	6.29	73.44
1983	54.42	3.20	6.49	64.11	10.65	12.03	2.04	3.72	0.90	63.29	3.20	6.86	73.32
1984	58.85	3.55	6.43	68.83	11.43	12.77	2.15	3.80	-0.82	66.62	3.55	6.84	76.97
1985	57.54	4.15	R6.03	R67.72	10.61	12.10	2.44	4.23	1.19	66.22	4.15	R6.46	R76.78
1986	56.58	4.47	R6.13	R67.18	13.20	14.44	2.25	4.06	-0.50	66.15	4.47	R6.51	R77.06
1987	57.17	4.91	R5.69	R67.76	14.16	15.76	2.09	3.85	-0.04	68.63	4.91	R6.17	R79.63
1988	57.87	5.66	R5.49	R69.03	15.75	17.56	2.50	4.42	0.89	71.66	5.66	R5.82	R83.07
1989	57.47	5.68	R,116.32	R,1169.46	17.16	18.96	2.64	4.77	0.94	72.55	5.68	R,116.47	R,1184.59
1990	58.56	6.16	R6.16	R70.85	17.12	R18.95	2.77	R4.87	-0.75	71.96	6.16	R6.26	R84.19
1991	57.83	6.58	R6.15	R70.51	16.35	R18.50	2.85	R5.16	0.21	71.23	6.58	R6.37	R84.06
1992	57.59	6.61	R5.90	R70.06	16.97	R19.58	2.68	R4.96	0.83	R72.85	6.61	R6.17	R85.51
1993	55.74	6.52	6.15	68.37	18.51	R21.50	1.96	R4.28	R1.73	R74.47	6.52	R6.42	87.31
1994	57.95	6.84	6.08	R70.83	R19.24	R22.73	1.88	R4.08	R-0.25	R75.98	6.84	6.39	R89.23
1995	57.46	7.18	6.68	71.29	18.86	R22.54	2.32	R4.54	R1.65	R76.80	7.18	R6.96	R90.94
1996	R58.30	7.17	7.15	R72.58	20.27	R23.99	2.37	R4.66	R1.99	R79.28	7.17	7.48	R93.91
1997	58.76	6.68	R7.14	R72.53	R21.74	R25.52	2.19	R4.57	R0.84	R80.29	6.68	R7.36	R94.32
1998	R58.66	7.16	R6.78	R72.55	R22.91	R26.86	R2.05	R4.34	R-0.49	R80.51	7.16	R6.98	R94.57
1999P	57.67	7.73	7.18	72.52	22.53	26.92	1.53	3.82	0.98	81.56	7.73	7.37	96.60

[1] Coal, natural gas (dry), crude oil, and natural gas plant liquids.
[2] See Note 1 at end of section.
[3] Conventional hydroelectric power, geothermal, wood, waste, ethanol blended into motor gasoline, solar, and wind.
[4] Also includes hydroelectric pumped storage.
[5] Crude oil and petroleum products.
[6] Also includes natural gas, coal, coal coke, and electricity.
[7] Also includes natural gas, petroleum, electricity, and coal coke.
[8] A balancing item. Includes stock changes, losses, gains, miscellaneous blending components, and unaccounted-for supply.
[9] Coal, coal coke net imports, natural gas, and petroleum.
[10] From 1989, includes net imported electricity from nonrenewable sources and hydroelectric pumped storage, and removes ethanol blended into motor gasoline, which would otherwise be double counted in both fossil fuels and renewable energy.
[11] There is a discontinuity in this time series between 1988 and 1989 due to the expanded coverage of renewable energy beginning in 1989. See Tables 10.1 and 10.2.

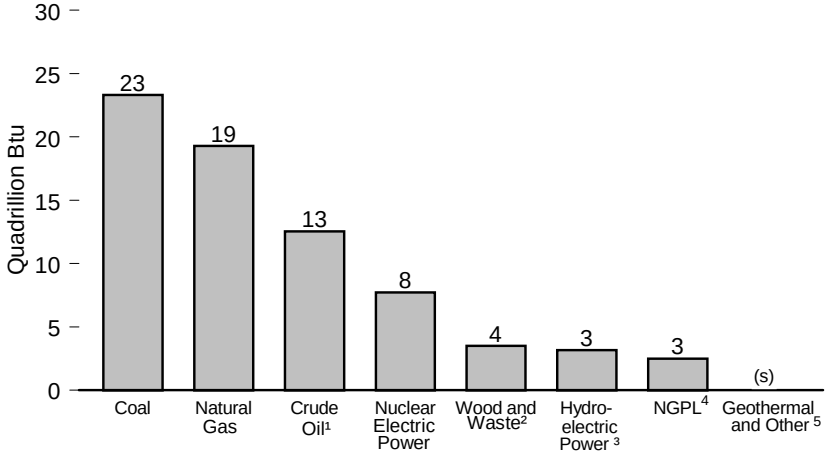
R=Revised. P=Preliminary. (s)=Less than 0.005 quadrillion Btu.
Note: Totals may not equal sum of components due to independent rounding.
Sources: See end of section.

Figure 1.2 Energy Production by Source

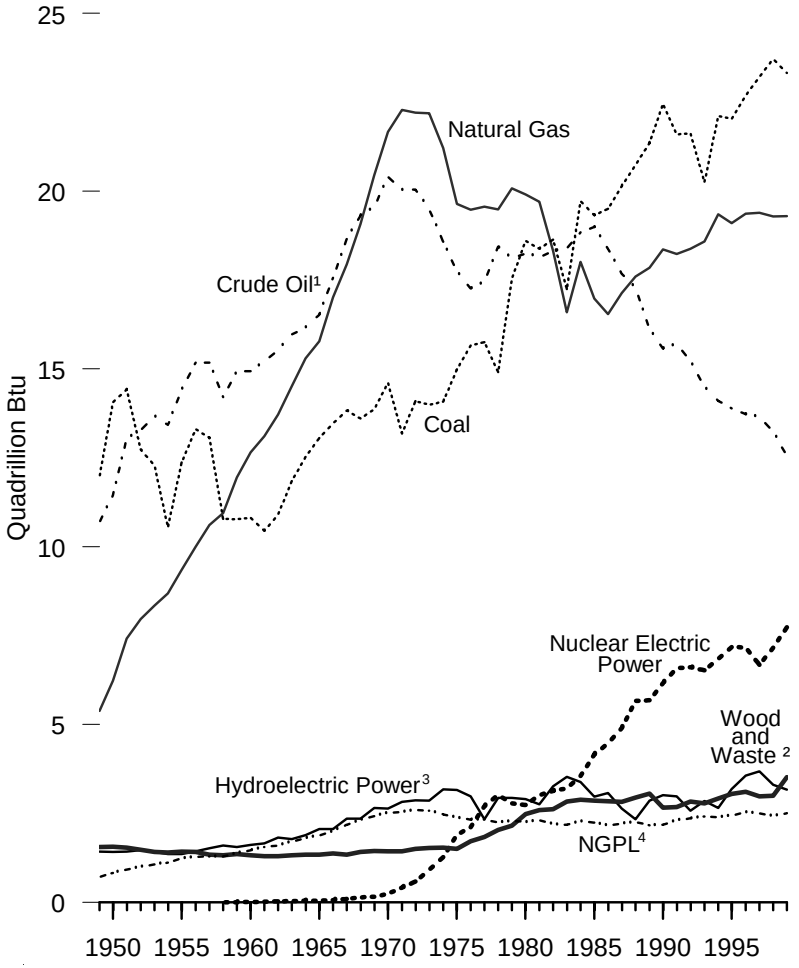
By Fossil Fuels, Nuclear Electric Power, and Renewable Energy, 1949-1999



By Source, 1999



By Major Source, 1949-1999



[1] Includes lease condensate.
[2] Includes ethanol blended into motor gasoline.
[3] Conventional and pumped-storage hydroelectric power.
[4] Natural gas plant liquids.
[5] Solar and wind.
(s)=Less than 0.5 quadrillion Btu.
Note: Because vertical scales differ, graphs should not be compared.
Source: Table 1.2.

Table 1.2 Energy Production by Source, 1949-1999

(Quadrillion Btu)

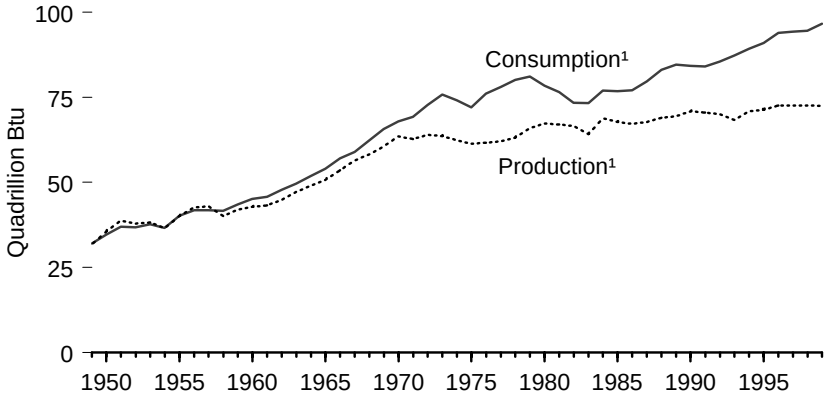
Year	Fossil Fuels					Nuclear Electric Power [2]	Hydroelectric Pumped Storage [3]	Renewable Energy						Total
	Coal	Natural Gas (Dry)	Crude Oil [1]	Natural Gas Plant Liquids	Total Fossil Fuels			Conventional Hydroelectric Power	Geothermal	Wood and Waste [4]	Solar	Wind	Total Renewable Energy	
1949	11.974	5.377	10.683	0.714	28.748	0	([5])	1.425	0	1.549	0	0	2.974	31.722
1950	14.060	6.233	11.447	0.823	32.563	0	([5])	1.415	0	1.562	0	0	2.978	35.540
1951	14.419	7.416	13.037	0.920	35.792	0	([5])	1.424	0	1.535	0	0	2.958	38.751
1952	12.734	7.964	13.281	0.998	34.977	0	([5])	1.466	0	1.474	0	0	2.940	37.917
1953	12.278	8.339	13.671	1.062	35.349	0	([5])	1.413	0	1.419	0	0	2.831	38.181
1954	10.542	8.682	13.427	1.113	33.764	0	([5])	1.360	0	1.394	0	0	2.754	36.518
1955	12.370	9.345	14.410	1.240	37.364	0	([5])	1.360	0	1.424	0	0	2.784	40.148
1956	13.306	10.002	15.180	1.283	39.771	0	([5])	1.435	0	1.416	0	0	2.851	42.622
1957	13.061	10.605	15.178	1.289	40.133	(s)	([5])	1.516	0	1.334	0	0	2.849	42.983
1958	10.783	10.942	14.204	1.287	37.216	0.002	([5])	1.592	0	1.323	0	0	2.915	40.133
1959	10.778	11.952	14.933	1.383	39.045	0.002	([5])	1.548	0	1.353	0	0	2.901	41.949
1960	10.817	12.656	14.935	1.461	39.869	0.006	([5])	1.608	0.001	1.320	0	NA	2.929	42.804
1961	10.447	13.105	15.206	1.549	40.307	0.020	([5])	1.656	0.002	1.295	0	NA	2.953	43.280
1962	10.901	13.717	15.522	1.593	41.732	0.026	([5])	1.816	0.002	1.300	0	NA	3.119	44.877
1963	11.849	14.513	15.966	1.709	44.037	0.038	([5])	1.771	0.004	1.323	0	NA	3.098	47.174
1964	12.524	15.298	16.164	1.803	45.789	0.040	([5])	1.886	0.005	1.337	0	NA	3.228	49.056
1965	13.055	15.775	16.521	1.883	47.235	0.043	([5])	2.059	0.004	1.335	0	NA	3.398	50.676
1966	13.468	17.011	17.561	1.996	50.035	0.064	([5])	2.062	0.004	1.369	0	NA	3.435	53.534
1967	13.825	17.943	18.651	2.177	52.597	0.088	([5])	2.347	0.007	1.340	0	NA	3.694	56.379
1968	13.609	19.068	19.308	2.321	54.306	0.142	([5])	2.349	0.009	1.419	0	NA	3.778	58.225
1969	13.863	20.446	19.556	2.420	56.286	0.154	([5])	2.648	0.013	1.440	0	NA	4.102	60.541
1970	14.607	21.666	20.401	2.512	59.186	0.239	([5])	2.634	0.011	R1.429	0	NA	R4.074	R63.499
1971	13.186	22.280	20.033	2.544	58.042	0.413	([5])	2.824	0.012	R1.430	0	NA	R4.266	R62.721
1972	14.092	22.208	20.041	2.598	58.938	0.584	([5])	2.864	0.031	R1.501	0	NA	R4.396	R63.918
1973	13.992	22.187	19.493	2.569	58.241	0.910	([5])	2.861	0.043	R1.527	0	NA	R4.431	R63.583
1974	14.074	21.210	18.575	2.471	56.331	1.272	([5])	3.177	0.053	R1.538	0	NA	R4.767	R62.370
1975	14.989	19.640	17.729	2.374	54.733	1.900	([5])	3.155	0.070	R1.497	0	NA	R4.722	R61.355
1976	15.654	19.480	17.262	2.327	54.723	2.111	([5])	2.976	0.078	R1.711	0	NA	R4.766	R61.600
1977	15.755	19.565	17.454	2.327	55.101	2.702	([5])	2.333	0.077	R1.837	0	NA	R4.247	R62.050
1978	14.910	19.485	18.434	2.245	55.074	3.024	([5])	2.937	0.064	R2.036	0	NA	R5.037	R63.136
1979	17.540	20.076	18.104	2.286	58.006	2.776	([5])	2.931	0.084	R2.150	0	NA	R5.164	R65.946
1980	18.598	19.908	18.249	2.254	59.008	2.739	([5])	2.900	0.110	R2.483	0	NA	R5.493	R67.240
1981	18.377	19.699	18.146	2.307	58.529	3.008	([5])	2.758	0.123	2.590	0	NA	5.471	67.007
1982	18.639	18.319	18.309	2.191	57.458	3.131	([5])	3.266	0.105	R2.615	0	NA	R5.985	R66.574
1983	17.247	16.593	18.392	2.184	54.416	3.203	([5])	3.527	0.129	2.831	0	(s)	6.488	64.106
1984	19.719	18.008	18.848	2.274	58.849	3.553	([5])	3.386	0.165	2.880	0	(s)	6.431	68.832
1985	19.325	16.980	18.992	2.241	57.539	4.149	([5])	2.970	0.198	R,62.862	0	(s)	R,66.030	R,667.718
1986	19.509	16.541	18.376	2.149	56.575	4.471	([5])	3.071	0.219	R,62.840	0	(s)	R,66.131	R,667.177
1987	20.141	17.136	17.675	2.215	57.167	4.906	([5])	2.635	0.229	R2.822	0	(s)	R5.686	R67.759
1988	20.738	17.599	17.279	2.260	57.875	5.661	([5])	2.334	0.217	R,62.940	0	(s)	R,65.491	R,669.028
1989	21.346	17.847	16.117	2.158	57.468	5.677	([5])	R,72.856	R,70.327	R,73.050	R,70.059	R,70.024	R,76.316	R,769.461
1990	22.456	18.362	15.571	2.175	58.564	R6.162	-0.036	R,83.049	R0.348	R2.665	0.063	R0.032	R6.157	R70.847
1991	21.594	18.229	15.701	2.306	57.829	R6.580	-0.047	R3.022	R0.353	R2.679	0.066	R0.032	R6.152	R70.513
1992	21.629	18.375	15.223	2.363	57.590	R6.608	-0.043	2.618	0.361	R2.826	0.068	0.030	R5.903	R70.058
1993	20.249	18.584	14.494	2.408	55.736	R6.520	-0.042	2.893	0.375	R2.782	0.071	0.031	R6.152	R68.366
1994	22.111	19.348	14.103	2.391	57.952	R6.838	-0.035	2.685	0.370	R2.914	0.072	0.036	R6.077	R70.833
1995	22.029	19.101	13.887	2.442	57.458	7.177	-0.028	3.209	0.321	R3.044	0.073	0.033	R6.679	R71.287
1996	22.684	R19.363	13.723	2.530	R58.299	7.168	-0.032	R3.594	0.339	R3.104	0.075	0.035	R7.147	R72.582
1997	23.211	19.394	13.658	2.495	58.758	6.678	-0.042	R3.720	R0.327	R2.982	0.074	R0.034	R7.138	R72.532
1998	R23.719	R19.288	R13.235	R2.420	R58.662	7.157	-0.046	R3.347	R0.334	R2.991	0.074	R0.031	R6.778	R72.550
1999P	23.328	19.295	12.544	2.506	57.673	7.733	-0.063	3.226	0.327	3.514	0.076	0.038	7.181	72.523

[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] Values are estimated. For all years, includes wood consumption in all sectors (see Table 10.4). Beginning in 1970, includes electric utility waste consumption (see Table 8.3). Beginning in 1981, includes industrial sector waste consumption, and transportation sector use of ethanol blended into motor gasoline (see Table 10.3). Beginning in 1989, includes expanded coverage of nonutility wood and waste consumption (see Table 8.4).
[5] Through 1989, pumped storage is included in conventional hydroelectric power.
[6] Not all data were available; therefore, values were interpolated.
[7] There is a discontinuity in this time series between 1988 and 1989 due to the expanded coverage of renewable energy beginning in 1989. See Tables 10.1 and 10.2.
[8] There is a discontinuity in this time series between 1989 and 1990; beginning in 1990, pumped storage is removed.

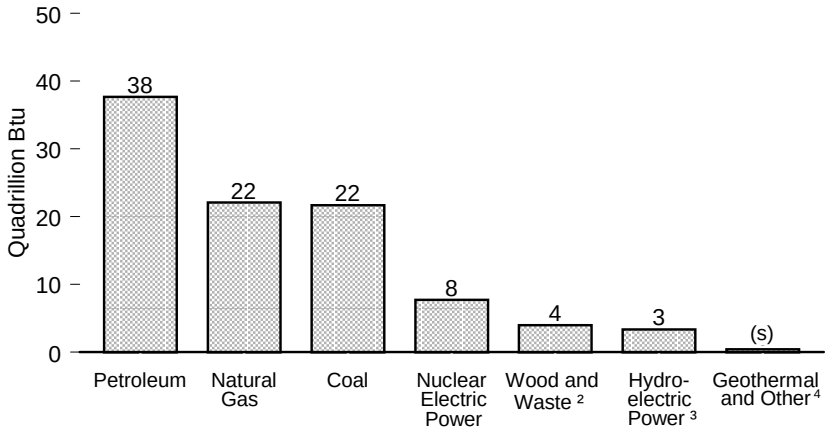
R=Revised. P=Preliminary. (s)=Less than 0.0005 quadrillion Btu. NA=Not available.
Note: Totals may not equal sum of components due to independent rounding.
Web Page: http//www.eia.doe.gov/fueloverview.html.
Sources: See end of section.

Figure 1.3 Energy Consumption by Source

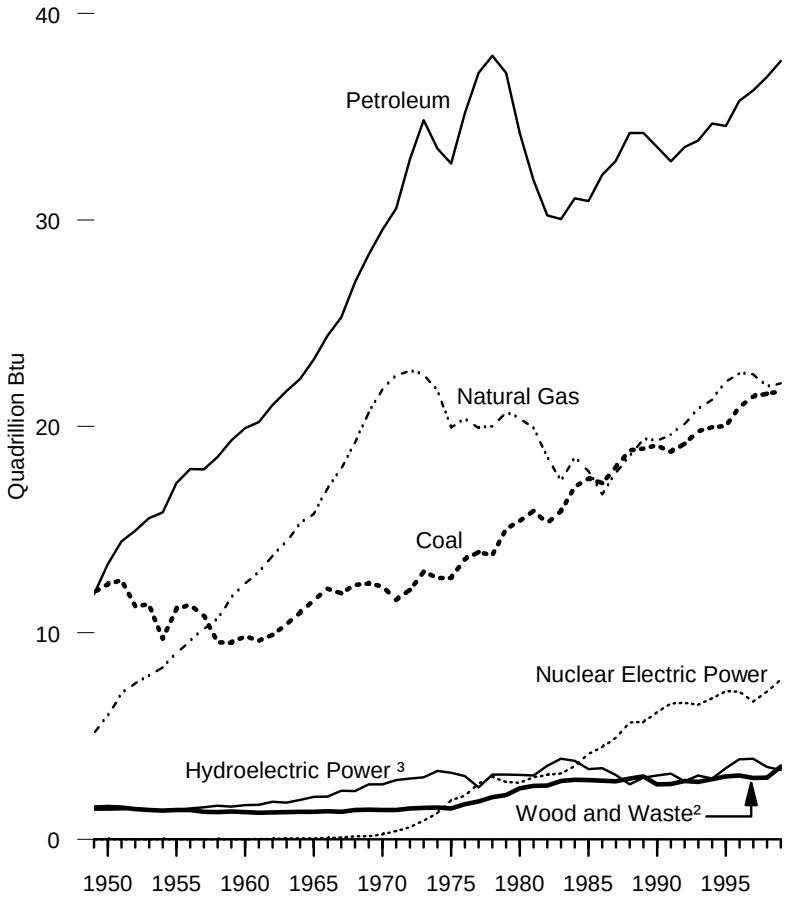
Production and Consumption, 1949-1999



By Source, 1999



By Major Source, 1949-1999



[1] There is a discontinuity in this time series between 1988 and 1989 due to the expanded coverage of renewable energy beginning in 1989.

[2] Includes ethanol blended into motor gasoline.

[3] Conventional and pumped-storage hydroelectric power.

[4] Solar and wind.

(s)=Less than 0.5 quadrillion Btu.

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

Sources: Tables 1.2 and 1.3.

Table 1.3 Energy Consumption by Source, 1949-1999

(Quadrillion Btu)

Year	Fossil Fuels					Nuclear Electric Power	Hydroelectric Pumped Storage [3]	Renewable Energy						Total [7]
	Coal	Coal Coke Net Imports	Natural Gas [1]	Petroleum [2]	Total Fossil Fuels			Conventional Hydroelectric Power [4]	Geothermal [5]	Wood and Waste [6]	Solar	Wind	Total Renewable Energy	
1949	11.981	-0.007	5.145	11.883	29.002	0	([8])	1.449	0	1.549	0	0	2.998	32.000
1950	12.347	0.001	5.968	13.315	31.632	0	([8])	1.440	0	1.562	0	0	3.003	34.635
1951	12.553	-0.021	7.049	14.428	34.008	0	([8])	1.454	0	1.535	0	0	2.988	36.996
1952	11.306	-0.012	7.550	14.956	33.800	0	([8])	1.496	0	1.474	0	0	2.970	36.770
1953	11.373	-0.009	7.907	15.556	34.826	0	([8])	1.439	0	1.419	0	0	2.857	37.684
1954	9.715	-0.007	8.330	15.839	33.877	0	([8])	1.388	0	1.394	0	0	2.783	36.660
1955	11.167	-0.010	8.998	17.255	37.410	0	([8])	1.407	0	1.424	0	0	2.832	40.242
1956	11.350	-0.013	9.614	17.937	38.888	0	([8])	1.487	0	1.416	0	0	2.903	41.791
1957	10.821	-0.017	10.191	17.932	38.926	(s)	([8])	1.557	0	1.334	0	0	2.890	41.816
1958	9.533	-0.007	10.663	18.527	38.717	0.002	([8])	1.629	0	1.323	0	0	2.952	41.670
1959	9.518	-0.008	11.717	19.323	40.550	0.002	([8])	1.587	0	1.353	0	0	2.940	43.493
1960	9.838	-0.006	12.385	19.919	42.137	0.006	([8])	1.657	0.001	1.320	0	NA	2.977	45.120
1961	9.623	-0.008	12.926	20.216	42.758	0.020	([8])	1.680	0.002	1.295	0	NA	2.977	45.755
1962	9.906	-0.006	13.731	21.049	44.681	0.026	([8])	1.822	0.002	1.300	0	NA	3.124	47.832
1963	10.413	-0.007	14.403	21.701	46.509	0.038	([8])	1.772	0.004	1.323	0	NA	3.099	49.647
1964	10.964	-0.010	15.288	22.301	48.543	0.040	([8])	1.907	0.005	1.337	0	NA	3.248	51.831
1965	11.581	-0.018	15.769	23.246	50.577	0.043	([8])	2.058	0.004	1.335	0	NA	3.397	54.016
1966	12.143	-0.025	16.995	24.401	53.514	0.064	([8])	2.073	0.004	1.369	0	NA	3.446	57.024
1967	11.914	-0.015	17.945	25.284	55.127	0.088	([8])	2.344	0.007	1.340	0	NA	3.691	58.906
1968	12.331	-0.017	19.210	26.979	58.502	0.142	([8])	2.342	0.009	1.419	0	NA	3.771	62.415
1969	12.382	-0.036	20.678	28.338	61.362	0.154	([8])	2.659	0.013	1.440	0	NA	4.113	65.628
1970	12.265	-0.058	21.795	29.521	63.522	0.239	([8])	2.654	0.011	R1.429	0	NA	R4.094	R67.856
1971	11.598	-0.033	22.469	30.561	64.596	0.413	([8])	2.861	0.012	R1.430	0	NA	R4.303	R69.312
1972	12.077	-0.026	22.698	32.947	67.696	0.584	([8])	2.944	0.031	R1.501	0	NA	R4.476	R72.756
1973	12.971	-0.007	22.512	34.840	70.316	0.910	([8])	3.010	0.043	R1.527	0	NA	R4.579	R75.806
1974	12.663	0.056	21.732	33.455	67.906	1.272	([8])	3.309	0.053	R1.538	0	NA	R4.900	R74.078
1975	12.663	0.014	19.948	32.731	65.355	1.900	([8])	3.219	0.070	R1.497	0	NA	R4.786	R72.041
1976	13.584	(s)	20.345	35.175	69.104	2.111	([8])	3.066	0.078	R1.711	0	NA	R4.855	R76.070
1977	13.922	0.015	19.931	37.122	70.989	2.702	([8])	2.515	0.077	R1.837	0	NA	R4.429	R78.120
1978	13.766	0.125	20.000	37.965	71.856	3.024	([8])	3.141	0.064	R2.036	0	NA	R5.242	R80.122
1979	15.040	0.063	20.666	37.123	72.892	2.776	([8])	3.141	0.084	R2.150	0	NA	R5.375	R81.042
1980	15.423	-0.035	20.394	34.202	69.984	2.739	([8])	3.118	0.110	R2.483	0	NA	R5.710	R78.434
1981	15.908	-0.016	19.928	31.931	67.750	3.008	([8])	3.105	0.123	2.590	0	NA	5.818	76.569
1982	15.322	-0.022	18.505	30.232	64.037	3.131	([8])	3.572	0.105	R2.615	0	NA	R6.292	R73.441
1983	15.894	-0.016	17.357	30.054	63.290	3.203	([8])	3.899	0.129	2.831	0	(s)	6.860	73.317
1984	17.071	-0.011	18.507	31.051	66.617	3.553	([8])	3.800	0.165	2.880	0	(s)	6.845	76.972
1985	17.478	-0.013	17.834	30.922	66.221	4.149	([8])	3.398	0.198	R,92.862	0	(s)	R,96.458	R,976.777
1986	17.260	-0.017	16.708	32.196	66.148	4.471	([8])	3.446	0.219	R,92.840	0	(s)	R,96.506	R,977.065
1987	18.008	0.009	17.744	32.865	68.626	4.906	([8])	3.117	0.229	R2.822	0	(s)	R6.169	R79.633
1988	18.846	0.040	18.552	34.222	71.660	5.661	([8])	2.662	0.217	R,92.940	0	(s)	R,95.819	R,983.071
1989	18.926	0.030	19.384	34.211	72.551	5.677	([8])	R,102.999	R,100.338	R,103.050	R,100.059	R,100.024	R,106.470	R,1084.593
1990	19.101	0.005	19.296	33.553	71.955	R6.162	-0.036	R,113.140	R0.359	R2.665	0.063	R0.032	R6.260	R84.186
1991	18.770	R0.010	19.606	32.845	R71.231	R6.580	-0.047	R3.222	R0.368	R2.679	0.066	R0.032	R6.367	R84.063
1992	1219.158	R0.035	20.131	33.527	R,1272.850	R6.608	-0.043	2.863	0.379	R2.826	0.068	0.030	R6.167	R,1285.512
1993	19.776	R0.027	20.827	33.841	R74.471	R6.520	-0.042	3.147	0.393	R2.782	0.071	0.031	R6.424	87.309
1994	19.960	R0.058	21.288	R34.670	R75.976	R6.838	-0.035	2.971	0.395	R2.914	0.072	0.036	R6.387	R89.234
1995	20.024	R0.061	22.163	R34.553	R76.802	7.177	-0.028	3.474	0.339	R3.044	0.073	0.033	R6.963	R90.940
1996	20.940	R0.023	R22.559	R35.757	R79.279	7.168	-0.032	R3.915	0.352	R3.104	0.075	0.035	R7.482	R93.911
1997	21.444	R0.046	R22.530	R36.266	R80.286	6.678	-0.042	R3.940	R0.328	R2.982	0.074	R0.034	R7.358	R94.316
1998	R21.593	R0.067	R21.921	R36.934	R80.515	7.157	-0.046	R3.552	R0.335	R2.991	0.074	R0.031	R6.984	R94.570
1999P	21.698	0.058	22.096	37.706	81.557	7.733	-0.063	3.417	0.327	3.514	0.076	0.038	7.373	96.596

[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] Through 1988, includes all net imports of electricity. From 1989, includes only the portion of net imports of electricity that is derived from hydroelectric power.
[5] Includes electricity imports from Mexico that are derived from geothermal energy.
[6] Values are estimated. For all years, includes wood consumption in all sectors (see Table 10.4). Beginning in 1970, includes electric utility waste consumption (see Table 8.3). Beginning in 1981, includes industrial sector waste consumption, and transportation sector use of ethanol blended into motor gasoline (see Table 10.3). Beginning in 1989, includes expanded coverage of nonutility wood and waste consumption (see Table 8.4).
[7] From 1989, includes net imported electricity from nonrenewable sources and removes ethanol blended into motor gasoline, which would otherwise be double counted in both petroleum and renewable energy.
[8] Through 1989, pumped storage is included in conventional hydroelectric power.
[9] Not all data were available; therefore, values were interpolated.
[10] There is a discontinuity in this time series between 1988 and 1989 due to the expanded coverage of renewable energy beginning in 1989. See Tables 10.1 and 10.2.
[11] There is a discontinuity in this time series between 1989 and 1990; beginning in 1990, pumped storage is removed and expanded coverage of use of hydroelectric power is included.
[12] Independent power producers' use of coal is included beginning in 1992. See Table 7.3.

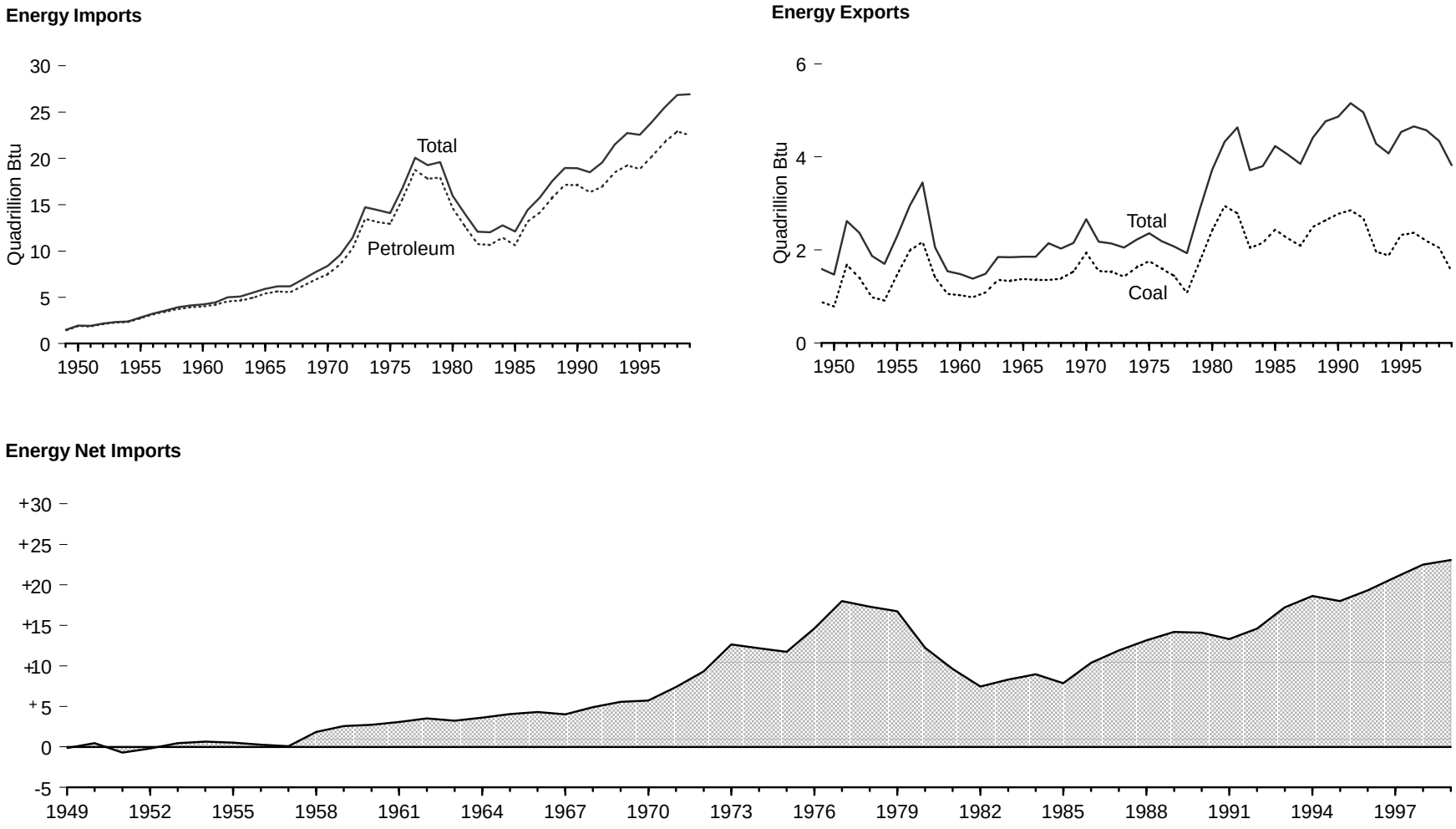
R=Revised. P=Preliminary. (s)=Less than 0.0005 and greater than -0.0005 quadrillion Btu. NA=Not available.

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

Web Page: http://www.eia.doe.gov/fueloverview.html.

Sources: See end of section.

Figure 1.4 Energy Imports, Exports, and Net Imports, 1949-1999



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, 1949-1999

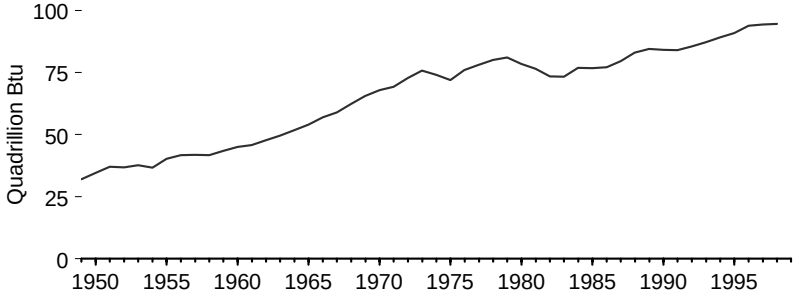
(Quadrillion Btu)

Year	Imports					Exports					Net Imports				
	Coal	Natural Gas (Dry)	Petroleum [1]	Other [2]	Total	Coal	Natural Gas (Dry)	Petroleum	Other [2]	Total	Coal	Natural Gas (Dry)	Petroleum [1]	Other [2]	Total
1949	0.01	0.00	1.43	0.03	1.47	0.88	0.02	0.68	0.02	1.59	-0.87	-0.02	0.75	0.02	-0.13
1950	0.01	0.00	1.89	0.04	1.93	0.79	0.03	0.64	0.01	1.47	-0.78	-0.03	1.24	0.03	0.47
1951	0.01	0.00	1.87	0.04	1.92	1.68	0.03	0.89	0.03	2.62	-1.67	-0.03	0.98	0.01	-0.71
1952	0.01	0.01	2.11	0.04	2.17	1.40	0.03	0.91	0.02	2.37	-1.40	-0.02	1.20	0.02	-0.20
1953	0.01	0.01	2.28	0.04	2.34	0.98	0.03	0.84	0.02	1.87	-0.97	-0.02	1.44	0.02	0.47
1954	0.01	0.01	2.32	0.04	2.37	0.91	0.03	0.75	0.01	1.70	-0.91	-0.02	1.58	0.02	0.67
1955	0.01	0.01	2.75	0.06	2.83	1.46	0.03	0.77	0.02	2.29	-1.46	-0.02	1.98	0.04	0.54
1956	0.01	0.01	3.17	0.06	3.25	1.98	0.04	0.91	0.02	2.95	-1.98	-0.03	2.26	0.04	0.30
1957	0.01	0.04	3.46	0.06	3.57	2.17	0.04	1.20	0.03	3.45	-2.16	(s)	2.26	0.02	0.12
1958	0.01	0.14	3.72	0.05	3.92	1.42	0.04	0.58	0.02	2.06	-1.41	0.10	3.14	0.03	1.86
1959	0.01	0.14	3.91	0.05	4.11	1.05	0.02	0.45	0.02	1.54	-1.04	0.12	3.46	0.03	2.57
1960	0.01	0.16	4.00	0.06	4.23	1.02	0.01	0.43	0.02	1.48	-1.02	0.15	3.57	0.04	2.74
1961	(s)	0.23	4.19	0.04	4.46	0.98	0.01	0.37	0.02	1.38	-0.98	0.22	3.82	0.02	3.08
1962	0.01	0.42	4.56	0.03	5.01	1.08	0.02	0.36	0.03	1.48	-1.08	0.40	4.20	(s)	3.53
1963	0.01	0.42	4.65	0.03	5.10	1.36	0.02	0.44	0.03	1.85	-1.35	0.40	4.21	-0.01	3.25
1964	0.01	0.46	4.96	0.07	5.49	1.34	0.02	0.43	0.06	1.84	-1.33	0.44	4.53	0.01	3.65
1965	(s)	0.47	5.40	0.04	5.92	1.38	0.03	0.39	0.06	1.85	-1.37	0.44	5.01	-0.02	4.06
1966	(s)	0.50	5.63	0.05	6.18	1.35	0.03	0.41	0.06	1.85	-1.35	0.47	5.21	-0.01	4.32
1967	0.01	0.58	5.56	0.04	6.19	1.35	0.08	0.65	0.06	2.15	-1.35	0.50	4.91	-0.02	4.04
1968	0.01	0.67	6.21	0.04	6.93	1.38	0.10	0.49	0.06	2.03	-1.37	0.58	5.73	-0.02	4.90
1969	(s)	0.75	6.90	0.06	7.71	1.53	0.05	0.49	0.08	2.15	-1.53	0.70	6.42	-0.02	5.56
1970	(s)	0.85	7.47	0.07	8.39	1.94	0.07	0.55	0.11	2.66	-1.93	0.77	6.92	-0.04	5.72
1971	(s)	0.96	8.54	0.08	9.58	1.55	0.08	0.47	0.07	2.18	-1.54	0.88	8.07	(s)	7.41
1972	(s)	1.05	10.30	0.11	11.46	1.53	0.08	0.47	0.06	2.14	-1.53	0.97	9.83	0.05	9.32
1973	(s)	1.06	13.47	0.20	14.73	1.43	0.08	0.49	0.06	2.05	-1.42	0.98	12.98	0.14	12.68
1974	0.05	0.99	13.13	0.25	14.41	1.62	0.08	0.46	0.06	2.22	-1.57	0.91	12.66	0.19	12.19
1975	0.02	0.98	12.95	0.16	14.11	1.76	0.07	0.44	0.08	2.36	-1.74	0.90	12.51	0.08	11.75
1976	0.03	0.99	15.67	0.15	16.84	1.60	0.07	0.47	0.06	2.19	-1.57	0.92	15.20	0.09	14.65
1977	0.04	1.04	18.76	0.26	20.09	1.44	0.06	0.51	0.06	2.07	-1.40	0.98	18.24	0.20	18.02
1978	0.07	0.99	17.82	0.36	19.25	1.08	0.05	0.77	0.03	1.93	-1.00	0.94	17.06	0.33	17.32
1979	0.05	1.30	17.93	0.33	19.62	1.75	0.06	1.00	0.06	2.87	-1.70	1.24	16.93	0.27	16.75
1980	0.03	1.01	14.66	0.28	15.97	2.42	0.05	1.16	0.09	3.72	-2.39	0.96	13.50	0.18	12.25
1981	0.03	0.92	12.64	0.39	13.97	2.94	0.06	1.26	0.06	4.33	-2.92	0.86	11.38	0.33	9.65
1982	0.02	0.95	10.78	0.35	12.09	2.79	0.05	1.73	0.06	4.63	-2.77	0.90	9.05	0.28	7.46
1983	0.03	0.94	10.65	0.41	12.03	2.04	0.06	1.57	0.05	3.72	-2.01	0.89	9.08	0.36	8.31
1984	0.03	0.85	11.43	0.46	12.77	2.15	0.06	1.54	0.05	3.80	-2.12	0.79	9.89	0.40	8.96
1985	0.05	0.95	10.61	0.49	12.10	2.44	0.06	1.66	0.08	4.23	-2.39	0.90	8.95	0.41	7.87
1986	0.06	0.75	13.20	0.43	14.44	2.25	0.06	1.67	0.08	4.06	-2.19	0.69	11.53	0.36	10.38
1987	0.04	0.99	14.16	0.57	15.76	2.09	0.05	1.63	0.08	3.85	-2.05	0.94	12.53	0.49	11.91
1988	0.05	1.30	15.75	0.47	17.56	2.50	0.07	1.74	0.10	4.42	-2.45	1.22	14.01	0.37	13.15
1989	0.07	1.39	17.16	0.34	18.96	2.64	0.11	1.84	0.18	4.77	-2.57	1.28	15.33	0.15	14.19
1990	0.07	1.55	17.12	R0.22	R18.95	2.77	0.09	1.82	R0.18	R4.87	-2.70	1.46	15.29	0.03	R14.09
1991	0.08	1.80	16.35	R0.27	R18.50	2.85	0.13	2.13	R0.04	R5.16	-2.77	1.67	14.22	R0.22	R13.34
1992	0.10	2.16	16.97	R0.35	R19.58	2.68	0.22	2.01	R0.05	R4.96	-2.59	1.94	14.96	R0.31	R14.62
1993	R0.20	2.40	18.51	R0.39	R21.50	1.96	0.14	2.12	R0.06	R4.28	R-1.76	2.25	16.40	0.32	R17.22
1994	R0.22	2.68	R19.24	R0.58	R22.73	1.88	0.16	1.99	R0.05	R4.08	R-1.66	2.52	17.26	R0.53	R18.65
1995	R0.24	2.90	18.86	R0.55	R22.54	2.32	0.16	1.99	R0.07	R4.54	R-2.08	2.74	16.87	R0.47	R18.00
1996	R0.20	3.00	20.27	0.52	R23.99	2.37	0.16	2.06	R0.07	R4.66	R-2.17	2.85	18.21	R0.45	R19.33
1997	0.19	3.06	R21.74	R0.52	R25.52	2.19	0.16	2.10	R0.12	R4.57	-2.01	2.90	R19.64	R0.40	R20.94
1998	0.22	R3.22	R22.91	R0.50	R26.86	R2.05	0.16	R1.97	R0.16	R4.34	R-1.83	R3.06	R20.94	R0.34	R22.51
1999P	0.23	3.64	22.53	0.52	26.92	1.53	0.16	1.96	0.17	3.82	-1.31	3.48	20.57	0.36	23.10

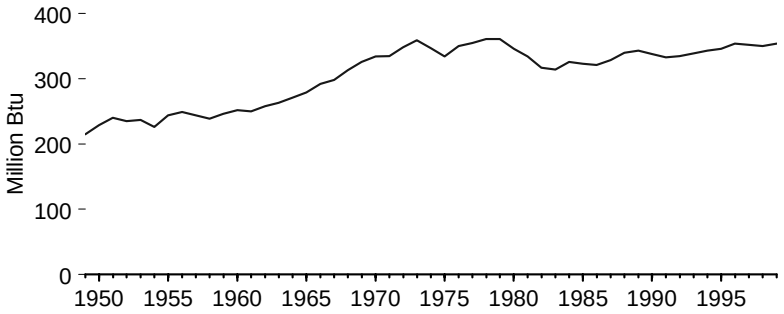
[1] Includes imports into the Strategic Petroleum Reserve, which began in 1977.
[2] Coal coke and small amounts of electricity transmitted across U.S. borders with Canada and Mexico.
R=Revised. P=Preliminary. (s)=Less than 0.005 quadrillion Btu and greater than -0.005 quadrillion Btu.
Notes: • Includes trade between the United States (50 States and the District of Columbia) and its territories and possessions. • Totals or net import items may not equal sum of components due to independent rounding.
Sources: Tables 5.1, 5.5, 6.1, 7.1, 7.7, and 8.1, and conversion factors in Appendix A.

Figure 1.5 Energy Consumption per Person and per Dollar of Gross Domestic Product

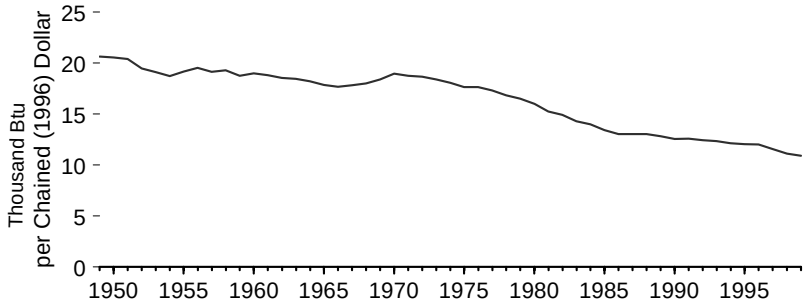
Energy Consumption, 1949-1999



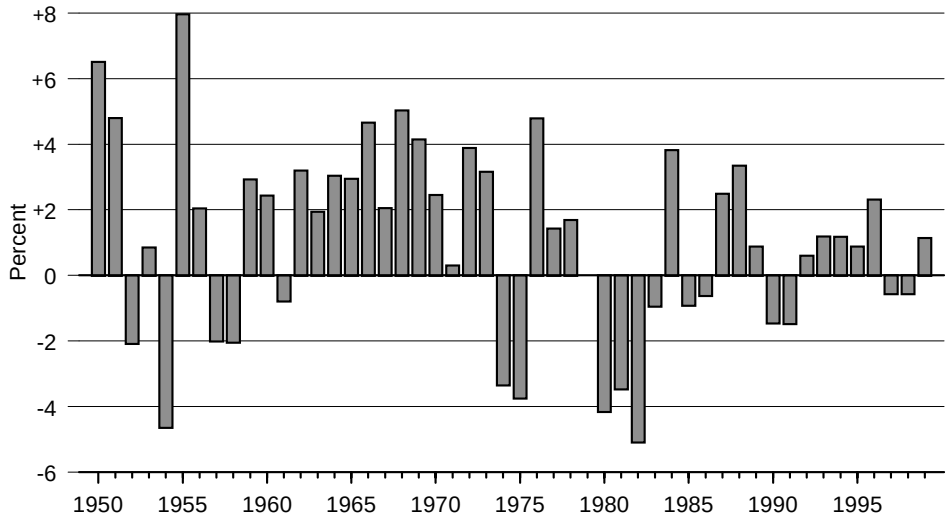
Energy Consumption per Person, 1949-1999



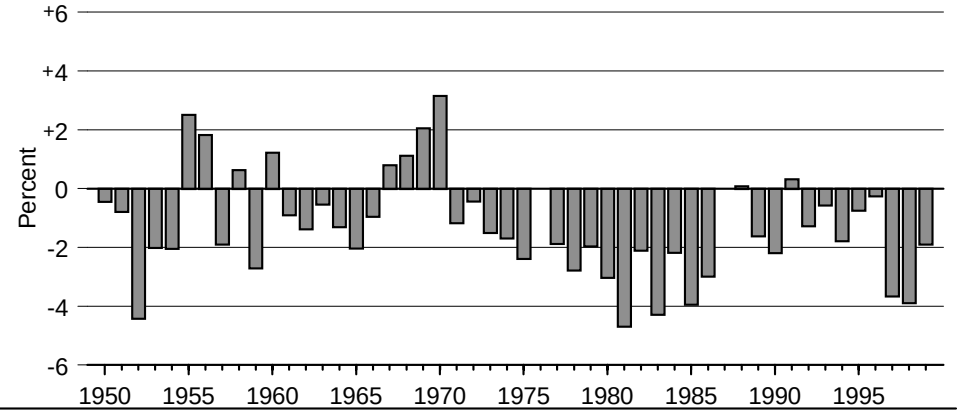
Energy Consumption per Dollar of Gross Domestic Product, 1949-1999



Energy Consumption per Person Change from Previous Year, 1950-1999



Energy Consumption per Dollar of Gross Domestic Product Change from Previous Year, 1950-1999



Note: There is a discontinuity in this time series between 1988 and 1989 due to the expanded coverage of renewable energy beginning in 1989.

Source: Table 1.5.

Table 1.5 Energy Consumption per Person and per Dollar of Gross Domestic Product, 1949-1999

Year	Total Energy Consumption (quadrillion Btu)	Per Person Indicator			Gross Domestic Product (GDP) Indicator		
		Population [1] (million people)	Energy Consumption per Person (million Btu)	Change from Previous Year (percent) [2]	GDP (billion chained (1996) dollars)	Energy Consumption per Dollar of GDP (thousand Btu per chained (1996) dollar)	Changed from Previous year (percent) [2]
1949	32.00	148.7	215	—	R1,550.9	R20.63	—
1950	34.63	151.3	229	6.5	R1,686.6	R20.54	R-0.4
1951	37.00	154.0	240	4.8	R1,815.1	R20.38	R-0.8
1952	36.77	156.4	235	-2.1	R1,887.3	R19.48	R-4.4
1953	37.68	159.0	237	0.9	R1,973.9	R19.09	-2.0
1954	36.66	161.9	226	-4.6	R1,960.5	R18.70	-2.0
1955	40.24	165.1	244	8.0	R2,099.5	R19.17	2.5
1956	41.79	168.1	249	2.0	R2,141.1	R19.52	1.8
1957	41.82	171.2	244	-2.0	R2,183.9	R19.15	R-1.9
1958	41.67	174.1	239	-2.0	R2,162.8	R19.27	0.6
1959	43.49	177.1	246	2.9	R2,319.0	R18.75	R-2.7
1960	45.12	179.3	252	2.4	R2,376.7	R18.98	R1.2
1961	45.76	183.0	250	-0.8	R2,432.0	R18.81	-0.9
1962	47.83	185.7	258	3.2	R2,578.9	R18.55	R-1.4
1963	49.65	188.4	263	1.9	R2,690.4	R18.45	R-0.5
1964	51.83	191.1	271	3.0	R2,846.5	R18.21	-1.3
1965	54.02	193.5	279	3.0	R3,028.5	R17.84	-2.0
1966	57.02	195.5	292	4.7	R3,227.5	R17.67	R-1.0
1967	58.91	197.4	298	2.1	R3,308.3	R17.81	0.8
1968	62.41	199.3	313	5.0	R3,466.1	R18.01	R1.1
1969	65.63	201.3	326	4.2	R3,571.4	R18.38	2.1
1970	67.86	203.3	334	2.5	R3,578.0	R18.96	R3.2
1971	69.31	206.8	335	0.3	R3,697.7	R18.74	R-1.2
1972	72.76	209.3	348	3.9	R3,898.4	R18.66	R-0.4
1973	75.81	211.4	359	3.2	R4,123.4	R18.38	-1.5
1974	74.08	213.3	347	-3.3	R4,099.0	R18.07	-1.7
1975	72.04	215.5	334	-3.7	R4,084.4	R17.64	R-2.4
1976	76.07	217.6	350	4.8	R4,311.7	R17.64	0.0
1977	78.12	219.8	355	1.4	R4,511.8	R17.31	-1.9
1978	80.12	222.1	361	1.7	R4,760.6	R16.83	R-2.8
1979	81.04	224.6	361	0.0	R4,912.1	R16.50	R-2.0
1980	R78.43	226.5	346	-4.2	R4,900.9	R16.00	R-3.0
1981	76.57	229.5	334	-3.5	R5,021.0	R15.25	R-4.7
1982	73.44	231.7	317	-5.1	R4,919.3	R14.93	R-2.1
1983	73.32	233.8	314	-0.9	R5,132.3	R14.29	R-4.3
1984	76.97	235.8	326	3.8	R5,505.2	R13.98	R-2.2
1985	R76.78	237.9	323	-0.9	R5,717.1	R13.43	R-3.9
1986	R77.06	240.1	321	-0.6	R5,912.4	R13.03	R-3.0
1987	R79.63	242.3	329	2.5	R6,113.3	R13.03	0.0
1988	R83.07	244.5	340	3.3	R6,368.4	R13.04	R0.1
1989	R,384.59	246.8	R,3343	30.9	R6,591.8	R,312.83	R,3-1.6
1990	R84.19	248.8	338	R-1.5	R6,707.9	R12.55	R-2.2
1991	R84.06	R252.2	333	-1.5	R6,676.4	R12.59	R0.3
1992	R85.51	255.0	335	0.6	R6,880.0	R12.43	R-1.3
1993	87.31	R257.8	339	1.2	R7,062.6	R12.36	R-0.6
1994	R89.23	260.3	343	1.2	R7,347.7	R12.14	R-1.8
1995	R90.94	262.8	346	0.9	R7,543.8	R12.05	R-0.7
1996	R93.91	265.2	354	2.3	R7,813.2	R12.02	-0.2
1997	R94.32	R267.8	352	-0.6	R8,144.8	R11.58	R-3.7
1998	R94.57	R270.2	R350	R-0.6	R8,495.7	R11.13	-3.9
1999P	96.60	272.7	354	1.1	8,848.2	10.92	-1.9

[1] 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.

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

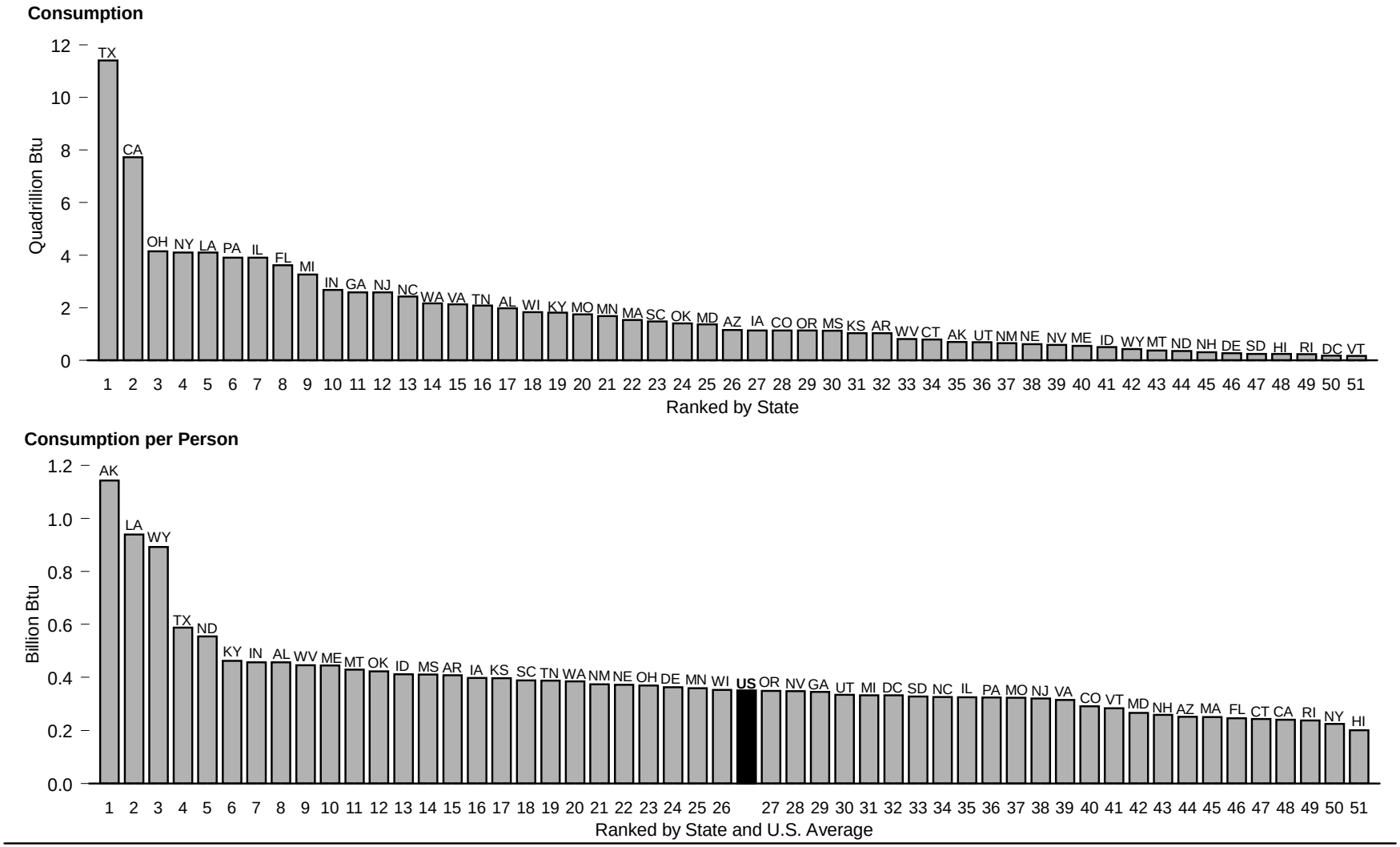
[3] There is a discontinuity in this time series between 1988 and 1989 due to the expanded coverage of renewable energy beginning in 1989.

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

Note: See "Chained Dollars" in the Glossary.

Sources: **Total Energy Consumption:** Table 1.3. **Population:** Table E1. **Gross Domestic Product:** Table E1. **Energy Consumption per Person and Energy Consumption per Dollar GDP:** calculated by Energy Information Administration.

Figure 1.6 State-Level Energy Consumption and Consumption per Person, 1997



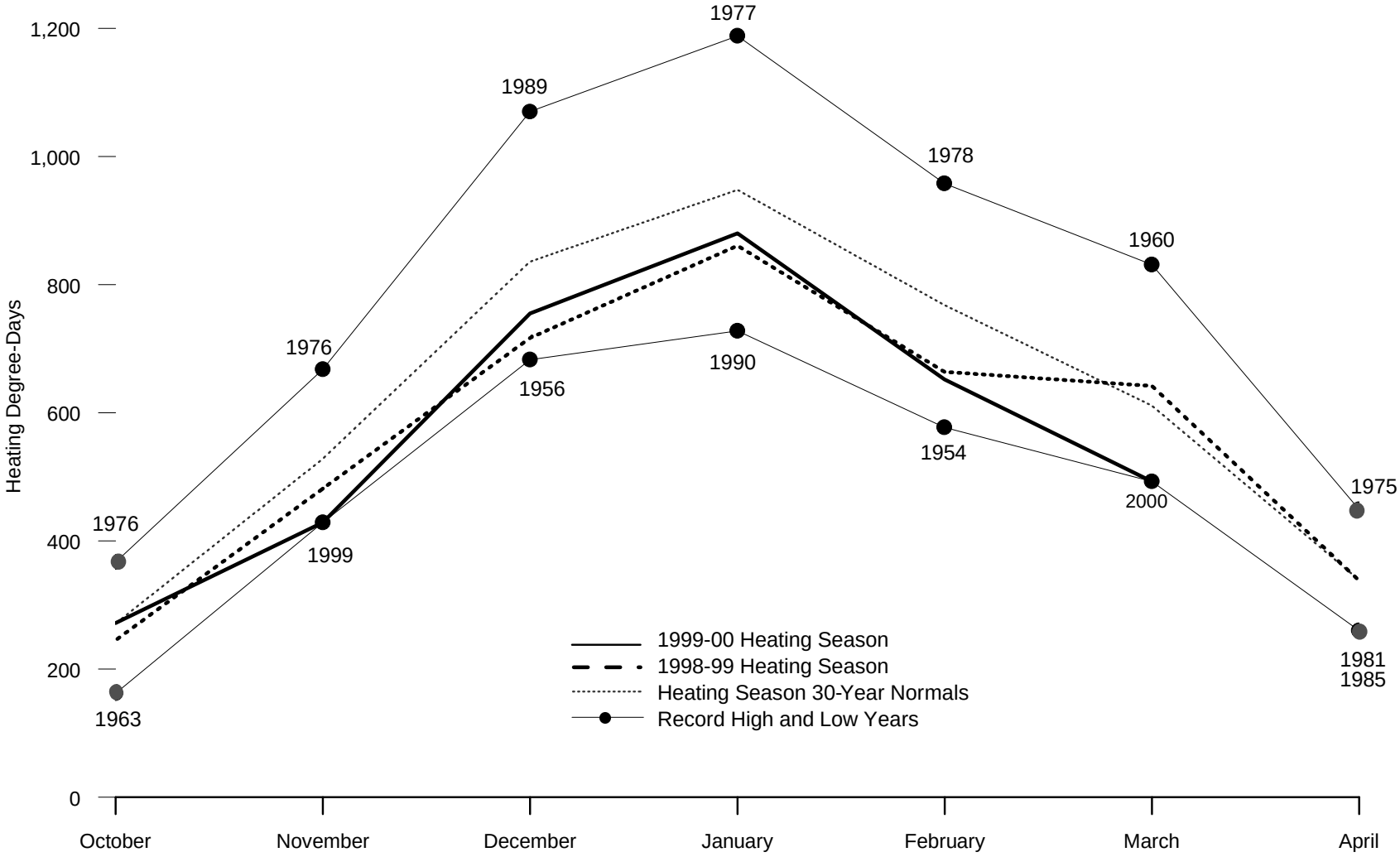
Source: Table 1.6.

Table 1.6 State-Level Energy Consumption, Expenditures, and Prices, 1997

Rank	Consumption		Consumption per Person		Expenditures		Expenditures per Person		Prices	
	State	Trillion Btu	State	Million Btu	State	Million Dollars	State	Dollars	State	Dollars per Million Btu
1	Texas	11,396.1	Alaska	1,143.5	California	55,187	Wyoming	3,902	Hawaii	13.34
2	California	7,727.5	Louisiana	940.0	Texas	55,070	Alaska	3,575	District of Columbia	12.84
3	Ohio	4,144.3	Wyoming	892.2	New York	34,089	Louisiana	3,473	Connecticut	12.56
4	New York	4,093.2	Texas	587.8	Pennsylvania	25,810	Texas	2,841	Arizona	11.75
5	Louisiana	4,093.0	North Dakota	554.9	Ohio	25,556	North Dakota	2,651	New Hampshire	11.58
6	Pennsylvania	3,900.7	Kentucky	462.6	Florida	25,117	Maine	2,543	Vermont	11.36
7	Illinois	3,900.2	Indiana	457.5	Illinois	25,089	District of Columbia	2,518	Massachusetts	11.35
8	Florida	3,614.7	Alabama	457.3	Michigan	19,758	Montana	2,471	New York	11.18
9	Michigan	3,259.1	West Virginia	445.6	New Jersey	18,764	Indiana	2,405	Rhode Island	11.04
10	Indiana	2,683.6	Maine	445.3	North Carolina	15,823	Iowa	2,330	Florida	10.99
11	Georgia	2,588.4	Montana	429.4	Georgia	15,642	New Jersey	2,329	Maryland	10.27
12	New Jersey	2,585.4	Oklahoma	422.9	Louisiana	15,120	Vermont	2,324	California	10.27
13	North Carolina	2,425.2	Idaho	411.6	Indiana	14,106	Kentucky	2,313	North Carolina	10.11
14	Washington	2,164.2	Mississippi	411.2	Virginia	13,451	Arkansas	2,304	Delaware	9.98
15	Virginia	2,126.4	Arkansas	408.1	Massachusetts	13,087	Nebraska	2,302	Nevada	9.81
16	Tennessee	2,084.2	Iowa	397.9	Tennessee	11,604	Delaware	2,301	New Jersey	9.46
17	Alabama	1,977.5	Kansas	397.0	Missouri	11,533	Ohio	2,283	New Mexico	9.45
18	Wisconsin	1,835.4	South Carolina	389.0	Washington	10,330	Alabama	2,271	Pennsylvania	9.32
19	Kentucky	1,809.6	Tennessee	387.8	Wisconsin	10,156	Kansas	2,249	Virginia	9.32
20	Missouri	1,748.9	Washington	385.3	Minnesota	9,869	Connecticut	2,219	Missouri	9.15
21	Minnesota	1,685.8	New Mexico	375.2	Alabama	9,816	South Dakota	2,208	Illinois	9.03
22	Massachusetts	1,534.1	Nebraska	372.3	Maryland	9,583	Oklahoma	2,208	Ohio	9.01
23	South Carolina	1,474.2	Ohio	370.1	Kentucky	9,045	West Virginia	2,204	South Dakota	8.98
24	Oklahoma	1,405.2	Delaware	363.2	Arizona	8,574	Mississippi	2,183	Georgia	8.86
25	Maryland	1,360.0	Minnesota	359.5	South Carolina	8,177	Nevada	2,166	Maine	8.82
26	Arizona	1,152.4	Wisconsin	352.8	Oklahoma	7,333	Tennessee	2,160	South Carolina	8.77
27	Iowa	1,136.4	Oregon	349.1	Connecticut	7,248	South Carolina	2,159	Kansas	8.77
28	Colorado	1,133.4	Nevada	348.0	Colorado	6,881	New Hampshire	2,154	Colorado	8.68
29	Oregon	1,132.9	Georgia	345.4	Iowa	6,649	Pennsylvania	2,149	Arkansas	8.65
30	Mississippi	1,123.7	Utah	334.6	Oregon	6,058	Massachusetts	2,140	Tennessee	8.60
31	Kansas	1,033.1	Michigan	333.1	Mississippi	5,963	Missouri	2,132	Mississippi	8.59
32	Arkansas	1,030.2	District of Columbia	333.1	Kansas	5,850	North Carolina	2,129	Nebraska	8.47
33	West Virginia	809.2	South Dakota	327.7	Arkansas	5,812	Idaho	2,109	Minnesota	8.46
34	Connecticut	795.8	North Carolina	326.2	West Virginia	4,002	Minnesota	2,105	Montana	8.41
35	Alaska	697.3	Illinois	325.2	Nebraska	3,814	Illinois	2,093	Oregon	8.40
36	Utah	691.2	Pennsylvania	324.6	Utah	3,708	Georgia	2,088	Wisconsin	8.25
37	New Mexico	647.1	Missouri	323.2	Nevada	3,637	Rhode Island	2,070	Michigan	8.18
38	Nebraska	617.1	New Jersey	320.7	New Mexico	3,428	Michigan	2,020	Iowa	8.10
39	Nevada	584.4	Virginia	315.4	Maine	3,158	Virginia	1,996	Oklahoma	8.07
40	Maine	553.4	Colorado	291.1	Idaho	2,550	New Mexico	1,988	Idaho	8.01
41	Idaho	497.7	Vermont	283.5	New Hampshire	2,525	Wisconsin	1,953	Alabama	7.81
42	Wyoming	428.3	Maryland	266.8	Hawaii	2,288	Hawaii	1,920	Kentucky	7.72
43	Montana	377.5	New Hampshire	259.0	Alaska	2,180	Arizona	1,883	Washington	7.64
44	North Dakota	355.8	Arizona	252.9	Montana	2,171	Maryland	1,881	Utah	7.58
45	New Hampshire	303.9	Massachusetts	250.6	Rhode Island	2,044	New York	1,879	West Virginia	7.33
46	Delaware	267.2	Florida	246.2	Wyoming	1,873	Oregon	1,868	Indiana	7.31
47	South Dakota	241.9	Connecticut	243.3	North Dakota	1,699	Washington	1,840	Texas	6.94
48	Hawaii	239.5	California	240.0	Delaware	1,692	Utah	1,795	Alaska	6.69
49	Rhode Island	235.1	Rhode Island	237.9	South Dakota	1,629	Colorado	1,768	Wyoming	6.51
50	District of Columbia	176.6	New York	225.3	Vermont	1,368	California	1,715	North Dakota	6.25
51	Vermont	167.1	Hawaii	201.0	District of Columbia	1,334	Florida	1,711	Louisiana	5.81
52	**United States**	[1]**94,063.6**	**United States**	**351.2**	United States	[2]**567,318**	**United States**	**2,119**	**United States**	**8.82**

[1] Includes 18.2 trillion Btu of coal coke net imports, which are not allocated to the States.
[2] Includes $72 million for coal coke net imports, which are not allocated to the States.
Note: Rankings based on unrounded data.
Web Page: http://www.eia.doe.gov/emeu/states/_states.html.
Sources: • **Consumption:** Energy Information Administration (EIA), *State Energy Data Report 1997, Consumption Estimates* (September 1999), Tables 9 and 10. • **Expenditures and Prices:** EIA, *State Energy Price and Expenditure Report 1997* (June 2000), Table 1. • Both publications include State-level data by end-use sector and type of energy. Consumption estimates are annual 1960 through 1997, and price and expenditures estimates are annual 1970 through 1997.

Figure 1.7 Heating Degree-Days by Month, 1949-2000



Source: Table 1.7.

Table 1.7 Heating Degree-Days by Month, 1949-2000

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1949	858	701	611	330	128	21	7	9	94	209	503	763	4,234
1950	761	721	693	412	162	40	11	18	85	196	565	872	4,536
1951	863	724	632	359	135	45	8	17	74	231	645	814	4,547
1952	807	677	670	315	154	32	5	11	54	324	540	785	4,374
1953	754	667	557	378	142	33	5	11	51	208	492	765	4,063
1954	886	577	646	261	192	32	8	18	56	224	523	809	4,232
1955	927	759	600	272	121	48	9	6	56	237	600	886	4,521
1956	900	723	648	387	157	27	10	14	82	215	541	683	4,387
1957	977	628	610	308	148	23	6	16	61	315	536	711	4,339
1958	909	866	690	324	143	54	7	8	60	250	484	917	4,712
1959	944	762	619	305	112	26	4	6	48	249	594	734	4,403
1960	884	780	831	278	160	33	7	11	48	254	502	936	4,724
1961	982	670	565	413	199	29	5	7	48	238	532	852	4,540
1962	976	747	689	337	118	35	14	13	91	234	554	886	4,694
1963	1,061	841	562	325	163	35	8	18	76	162	471	1,012	4,734
1964	871	803	636	339	124	39	5	22	72	301	489	814	4,515
1965	907	780	738	355	114	48	11	14	78	271	494	739	4,549
1966	1,010	790	580	377	188	30	6	14	81	298	496	830	4,700
1967	816	820	600	352	229	34	8	17	82	270	588	793	4,609
1968	979	832	567	309	192	35	6	14	59	240	548	894	4,675
1969	939	778	735	307	134	47	7	9	60	296	564	860	4,736
1970	1,063	758	685	344	120	31	4	9	55	253	541	801	4,664
1971	976	760	681	375	194	29	10	12	47	187	553	723	4,547
1972	890	785	608	377	137	49	7	12	65	330	613	832	4,705
1973	893	772	504	356	182	22	6	9	61	212	497	799	4,313
1974	838	754	556	310	171	42	6	13	94	303	524	795	4,406
1975	821	742	686	449	117	37	5	13	100	235	462	805	4,472
1976	974	609	544	309	178	28	8	19	81	367	668	941	4,726
1977	1,188	751	529	270	119	38	6	13	59	295	493	844	4,605
1978	1,061	958	677	350	157	31	7	11	59	283	517	847	4,958
1979	1,079	950	575	364	148	37	6	15	58	271	528	750	4,781
1980	887	831	680	338	142	49	5	10	54	316	564	831	4,707
1981	984	689	620	260	165	25	6	11	76	327	504	845	4,512
1982	1,067	776	620	408	114	62	7	19	75	264	515	692	4,619
1983	874	706	588	421	189	35	6	5	53	251	509	990	4,627
1984	1,000	645	704	371	172	28	7	7	88	223	565	704	4,514
1985	1,057	807	557	260	123	47	5	17	69	243	506	951	4,642
1986	859	734	542	295	123	30	9	18	76	258	558	793	4,295
1987	920	714	573	309	107	20	8	13	61	345	491	773	4,334
1988	1,004	778	594	344	134	30	3	5	72	352	506	831	4,653
1989	789	832	603	344	163	32	5	14	73	259	542	1,070	4,726
1990	728	655	535	321	184	29	6	10	56	246	457	789	4,016
1991	921	639	564	287	98	30	6	7	69	242	586	751	4,200
1992	852	644	603	345	152	46	14	24	74	301	564	822	4,441
1993	860	827	664	368	128	38	11	9	89	302	580	824	4,700
1994	1,031	813	594	293	174	21	6	16	65	268	479	723	4,483
1995	847	750	556	375	174	31	4	7	77	233	605	872	4,531
1996	945	748	713	360	165	27	8	9	72	276	630	760	4,713
1997	932	672	552	406	198	31	7	16	63	273	592	800	4,542
1998	R765	R623	R596	R331	R109	R41	R4	R5	R33	R245	R482	R717	R3,951
1999P	R861	R664	R642	338	151	52	5	9	67	272	429	755	4,244
2000P	880	652	493	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Normals[1]	948	768	611	339	150	36	7	13	69	271	528	836	4,576

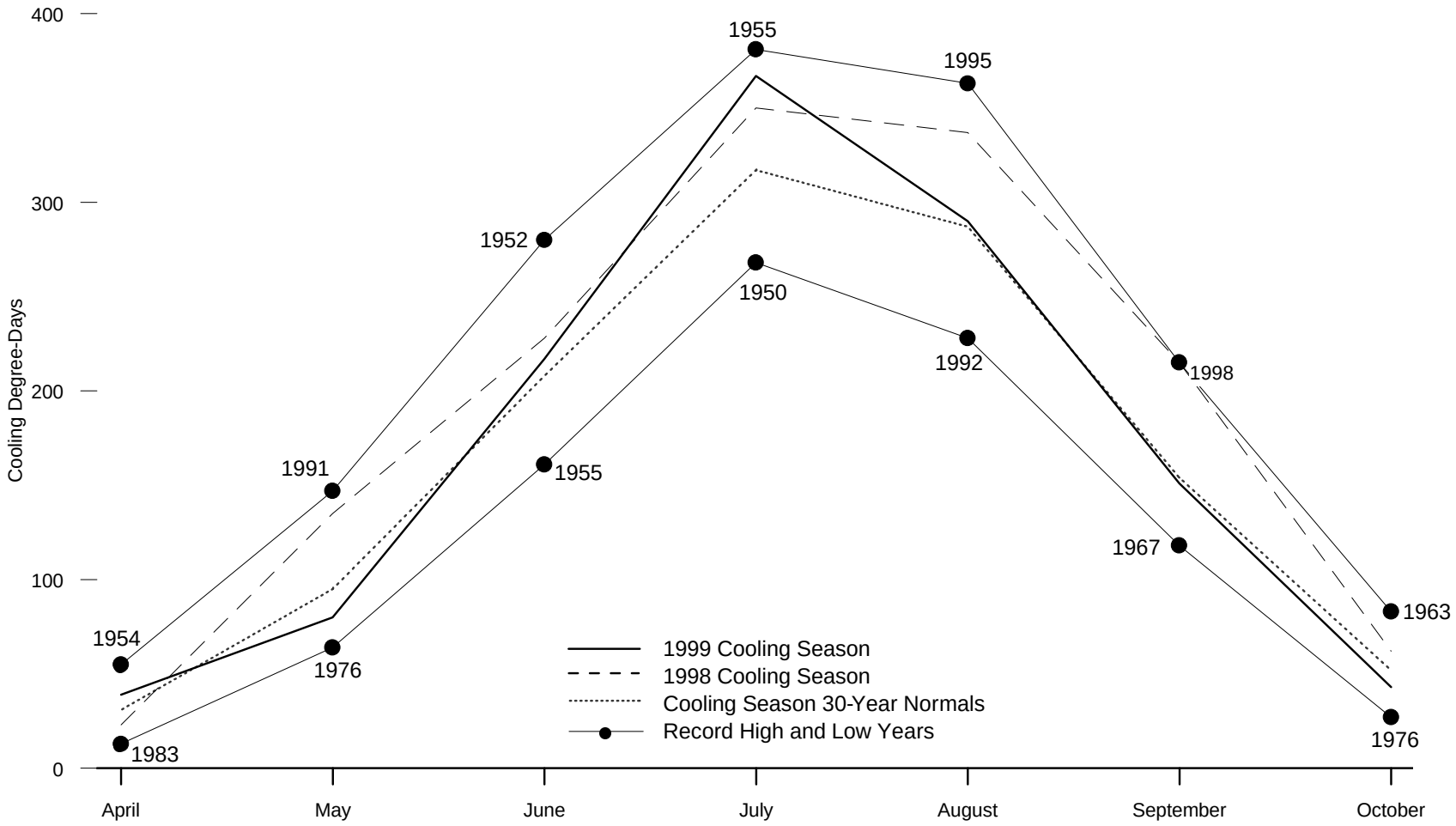
[1] Based on calculations of data from 1961 through 1990.

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

Notes: • This table excludes Alaska and Hawaii. • Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations 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 State-wide degree-day averages based on resident State population estimated for 1990. The population-weighted State figures are aggregated into Census divisions and the national average.

Sources: • 1949-1998 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-1. • 1999 and 2000—Energy Information Administration, *Monthly Energy Review,* June 1999-April 2000 issues, Table 1.11, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland.

Figure 1.8 Cooling Degree-Days by Month, 1949-1999



Source: Table 1.8.

Table 1.8 Cooling Degree-Days by Month, 1949-2000

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1949	16	14	14	27	110	253	367	294	131	70	12	10	1,318
1950	27	12	13	21	105	201	268	244	128	78	9	4	1,110
1951	8	5	15	22	95	198	318	293	158	65	7	11	1,195
1952	17	8	15	20	96	280	368	303	159	38	10	4	1,318
1953	12	8	26	25	118	263	338	292	168	58	11	7	1,326
1954	11	12	11	55	65	241	356	296	195	60	9	4	1,315
1955	6	7	20	45	121	161	381	355	182	50	10	6	1,344
1956	4	12	14	23	112	232	297	290	151	66	9	11	1,221
1957	12	17	13	33	96	243	337	275	155	30	13	6	1,230
1958	3	1	8	27	101	187	315	304	166	53	18	6	1,189
1959	6	12	13	31	129	228	325	344	179	64	12	5	1,348
1960	7	4	6	37	76	215	301	302	181	59	15	3	1,206
1961	5	9	23	20	71	195	306	287	186	47	12	7	1,168
1962	6	15	9	26	144	204	276	289	136	64	7	3	1,179
1963	5	5	22	42	94	213	308	266	153	83	11	2	1,204
1964	6	3	14	37	114	214	327	256	146	42	17	9	1,185
1965	9	7	10	42	125	179	280	273	155	48	19	6	1,153
1966	4	5	12	28	81	201	353	273	132	43	12	4	1,148
1967	9	5	24	48	70	206	278	253	118	45	12	9	1,077
1968	6	3	9	32	75	204	307	292	145	53	7	4	1,137
1969	7	4	4	33	94	200	331	304	153	48	8	4	1,190
1970	3	4	10	36	104	201	323	313	185	48	6	9	1,242
1971	8	7	10	22	68	244	288	269	182	77	12	17	1,204
1972	15	6	22	36	88	174	299	276	169	44	9	8	1,146
1973	7	3	24	18	75	236	318	303	166	66	21	4	1,241
1974	21	6	28	29	101	173	317	267	120	40	10	5	1,117
1975	14	11	14	24	117	203	301	296	120	55	12	5	1,172
1976	5	11	23	27	64	208	282	243	127	27	8	4	1,029
1977	2	5	21	35	121	212	351	293	180	44	15	6	1,285
1978	3	1	10	31	93	218	310	300	180	52	19	9	1,226
1979	4	4	13	32	82	187	295	266	160	53	11	6	1,113
1980	9	4	13	23	95	199	374	347	192	42	10	5	1,313
1981	3	6	10	52	75	257	333	275	138	43	12	5	1,209
1982	6	10	21	26	115	165	318	262	140	47	15	11	1,136
1983	6	5	9	13	72	193	353	362	172	58	12	5	1,260
1984	5	6	14	24	92	233	291	312	143	70	9	15	1,214
1985	3	5	22	39	108	193	313	269	145	68	25	4	1,194
1986	8	10	17	33	106	231	340	259	161	52	23	9	1,249
1987	5	7	13	23	127	244	334	298	156	40	14	8	1,269
1988	5	5	13	28	89	218	359	348	149	45	18	6	1,283
1989	15	7	19	36	88	208	312	266	138	49	16	2	1,156
1990	15	14	21	29	86	234	316	291	172	57	16	9	1,260
1991	10	9	19	42	147	235	336	305	149	62	8	9	1,331
1992	6	10	15	29	77	170	286	228	150	49	13	7	1,040
1993	13	5	11	19	91	207	347	317	146	47	11	4	1,218
1994	7	9	18	37	76	262	328	263	141	50	20	9	1,220
1995	7	7	18	29	91	202	348	363	150	61	12	5	1,293
1996	7	6	8	26	116	226	299	287	139	45	14	7	1,180
1997	8	11	31	19	81	189	315	268	171	48	10	5	1,156
1998	R12	R7	R10	R23	R135	R228	R350	R337	R215	R62	R20	R11	R1,410
1999P	R8	R9	R9	39	80	217	367	290	151	43	10	5	1,228
2000P	7	9	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Normals[1]	7	7	16	31	95	208	317	287	154	52	13	7	1,193

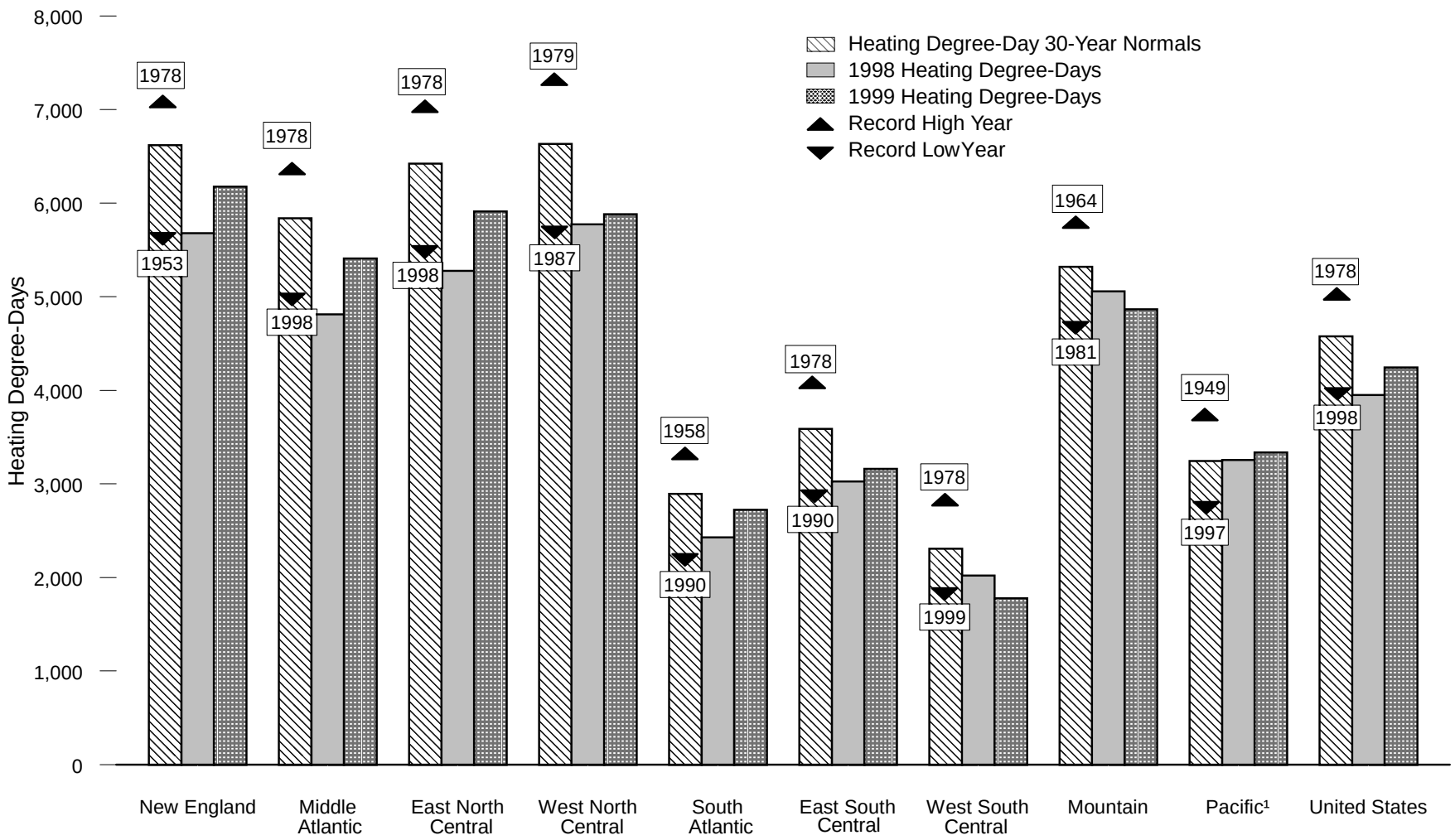
[1] Based on calculations of data from 1961 through 1990.

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

Notes: • This table excludes Alaska and Hawaii. • Degree-days are relative measurements of outdoor air temperature. Cooling degree-days are deviations 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 State-wide degree-day averages based on resident State population estimated for 1990. The population-weighted State figures are aggregated into Census divisions and the national average.

Sources: • 1949-1998 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-2. • 1999 and 2000—Energy Information Administration, *Monthly Energy Review,* June 1999-April 2000 issues, Table 1.12, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland.

Figure 1.9 Heating Degree-Days by Census Division, 1949-1999



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

Source: Table 1.9.

Table 1.9 Heating Degree-Days by Census Division, 1949-1999

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	6,728	5,948	6,646	7,168	2,981	3,768	2,489	5,514	3,052	4,700
1994	6,672	5,934	6,378	6,509	2,724	3,394	2,108	5,002	3,155	4,483
1995	6,559	5,831	6,664	6,804	2,967	3,626	2,145	4,953	2,784	4,531
1996	6,679	5,986	6,947	7,345	3,106	3,782	2,285	5,011	2,860	4,713
1997	6,662	5,809	6,617	6,762	2,845	3,664	2,418	5,189	2,754	4,542
1998	R5,680	R4,812	R5,278	R5,774	R2,429	R3,025	R2,021	R5,059	R3,255	R3,951
1999P	6,176	5,408	5,913	5,883	2,722	3,162	1,777	4,865	3,339	4,244
Normals [2]	6,621	5,839	6,421	6,635	2,895	3,589	2,306	5,321	3,245	4,576

[1] Excludes Alaska and Hawaii.

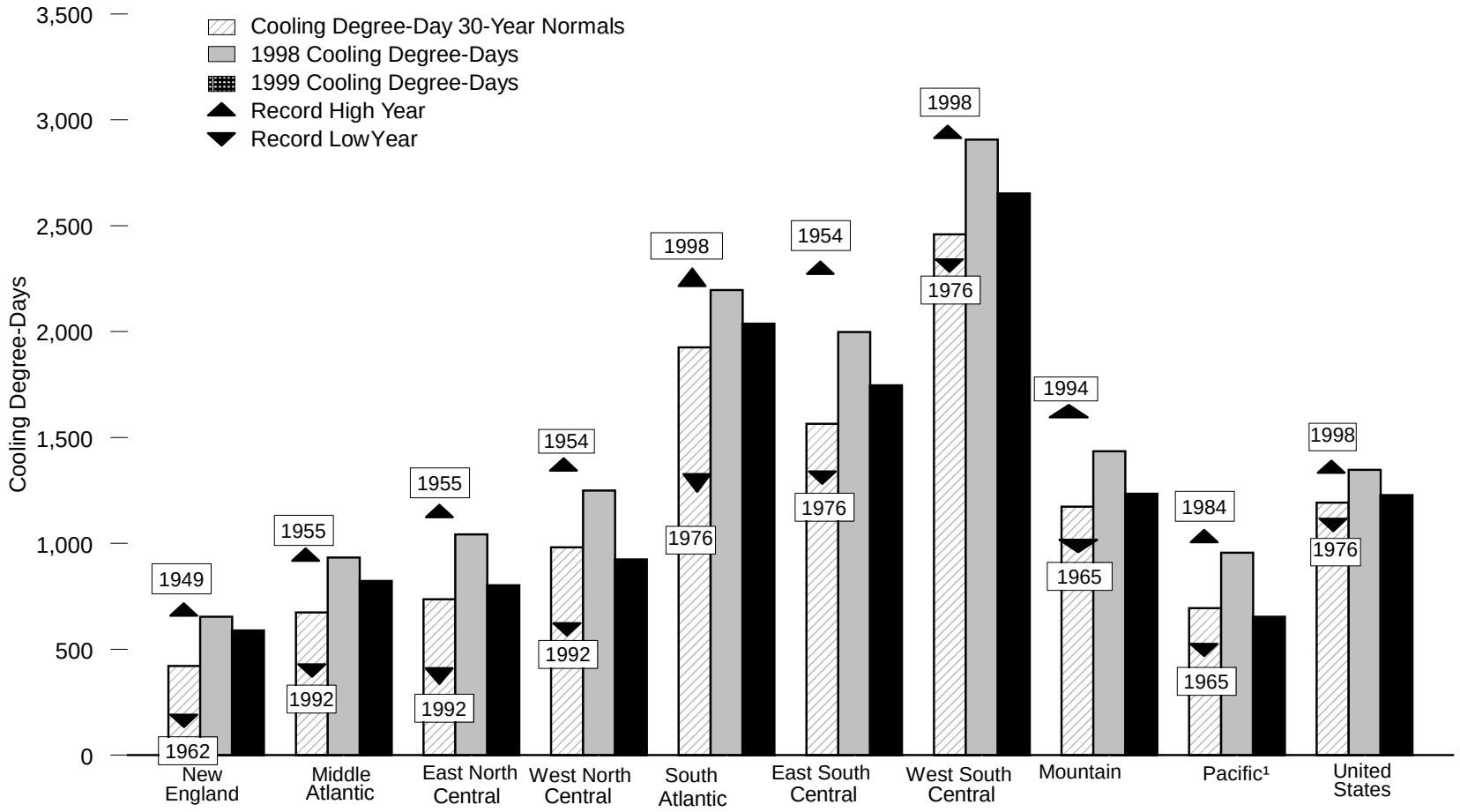
[2] Normals are based on calculations of data from 1961 through 1990.

R=Revised. P=Preliminary.

Notes: • Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations 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 State-wide degree-day averages based on resident State population estimated for 1990. The population-weighted State figures are aggregated into Census divisions and the national average. • See Appendix D for Census divisions.

Sources: • 1949-1998 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-1. • 1999—Energy Information Administration, *Monthly Energy Review (MER),* February 1999-January 2000 issues, Table 1.11, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland. Census Division data for 1999 are the sums of the current year monthly statistics shown in the cited issues of the *MER.* The U.S. total comes from Table 1.7.

Figure 1.10 Cooling Degree-Days by Census Division, 1949-1999



¹ Excludes Alaska and Hawaii.
Note: See Appendix D for Census divisions.

Source: Table 1.10.

Table 1.10 Cooling Degree-Days by Census Division, 1949-1999

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	486	764	735	817	2,092	1,622	2,369	1,113	708	1,218
1994	548	722	664	887	2,005	1,448	2,422	1,436	801	1,220
1995	507	803	921	985	2,081	1,671	2,448	1,234	754	1,293
1996	400	623	629	821	1,867	1,474	2,515	1,381	856	1,180
1997	395	586	574	873	1,886	1,393	2,361	1,335	921	1,156
1998	R505	R788	R889	R1,138	R2,277	R1,928	R3,026	R1,271	R732	R1,410
1999P	589	823	803	925	2,038	1,746	2,653	1,235	654	1,228
Normals[2]	421	675	736	981	1,926	1,565	2,460	1,174	694	1,193

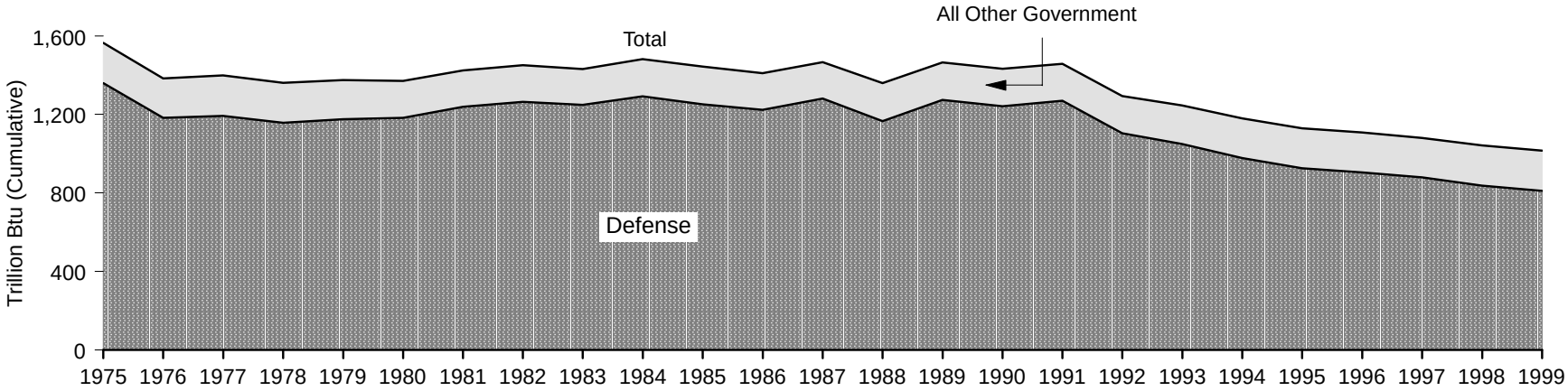
[1] Excludes Alaska and Hawaii.
[2] Normals are based on calculations of data from 1961 through 1990.
R=Revised. P=Preliminary.

Notes: • Degree-days are relative measurements of outdoor air temperature. Cooling degree-days are deviations 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 State-wide degree-day averages based on resident State population estimated for 1990. The population-weighted State figures are aggregated into Census divisions and the national average. • See Appendix D for Census divisions.

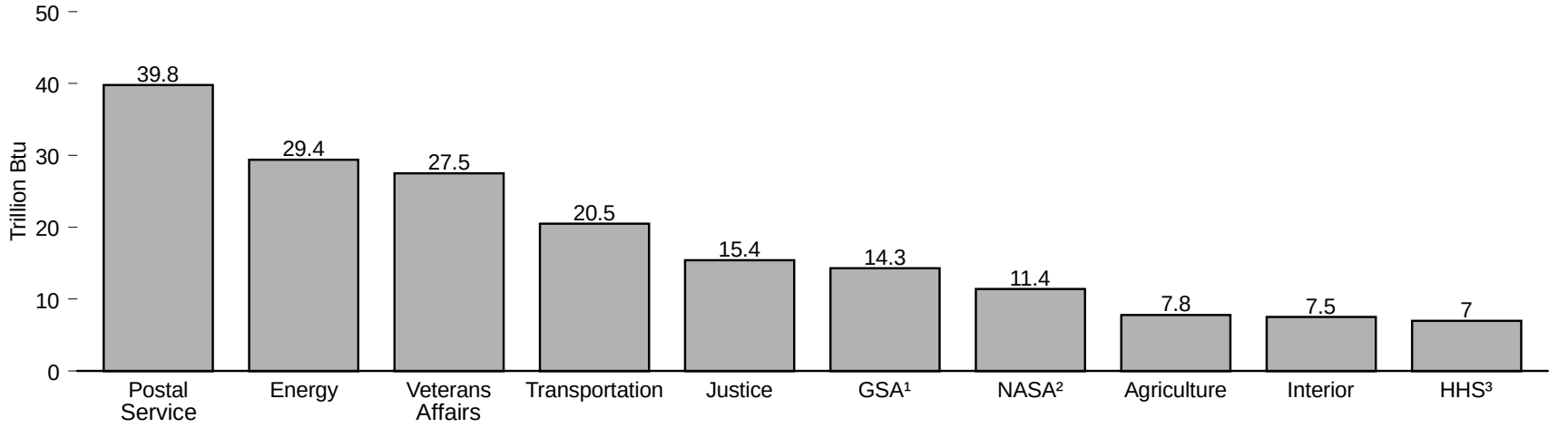
Sources: • 1949-1998 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-2. • 1999—Energy Information Administration, *Monthly Energy Review,* January 2000 issue, Table 1.12, which reports Census Division data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland. The U.S. total comes from Table 1.8.

Figure 1.11 U.S. Government Energy Consumption by Agency

Total and U.S. Department of Defense, Fiscal Years 1975-1999



Selected Non-Defense Agencies, Fiscal Year 1999



[1] General Services Administration.
[2] National Aeronautics and Space Administration.
[3] Health and Human Services.

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

Source: Table 1.11.

Table 1.11 U.S. Government Energy Consumption by Agency, Fiscal Years 1975-1999

(Trillion Btu)

Year	Agencies												
	Agriculture	Defense	Energy	GSA [1]	HHS [2]	Interior	Justice	NASA [3]	Postal Service	Trans-portation	Veterans Affairs	Other [4]	Total
1975	9.5	1,360.2	50.4	22.3	6.5	9.4	5.9	13.4	30.5	19.3	27.1	10.5	1,565.0
1976	9.3	1,183.3	50.3	20.6	6.7	9.4	5.7	12.4	30.0	19.5	25.0	11.2	1,383.4
1977	8.9	1,192.3	51.6	20.4	6.9	9.5	5.9	12.0	32.7	20.4	25.9	11.9	1,398.5
1978	9.1	1,157.8	50.1	20.4	6.5	9.2	5.9	11.2	30.9	20.6	26.8	12.4	1,360.9
1979	9.2	1,175.8	49.6	19.6	6.4	10.4	6.4	11.1	29.3	19.6	25.7	12.3	1,375.4
1980	8.6	1,183.1	47.4	18.1	6.0	8.5	5.7	10.4	27.2	19.2	24.8	12.3	1,371.2
1981	7.9	1,239.5	47.3	18.0	6.7	7.6	5.4	10.0	27.9	18.8	24.0	11.1	1,424.2
1982	7.6	1,264.5	49.0	18.1	6.4	7.4	5.8	10.1	27.5	19.1	24.2	11.6	1,451.4
1983	7.4	1,248.3	49.5	16.1	6.2	7.7	5.5	10.3	26.5	19.4	24.1	10.8	1,431.8
1984	7.9	1,292.1	51.6	16.2	6.4	8.4	6.4	10.6	27.7	19.8	24.6	10.7	1,482.5
1985	8.4	1,250.6	R51.5	17.3	R6.0	7.8	8.2	10.8	27.8	R19.5	25.1	11.0	R1,444.0
1986	6.8	1,222.8	50.4	14.0	6.2	6.9	8.6	11.2	28.0	19.4	25.0	10.8	1,410.1
1987	7.3	1,280.5	48.6	13.1	6.6	6.6	8.1	11.1	28.5	19.0	24.9	11.9	1,466.2
1988	7.8	1,165.8	49.9	12.4	6.4	7.0	9.4	R11.1	29.6	18.7	26.3	15.8	R1,360.2
1989	8.7	1,274.4	44.3	12.7	6.7	7.1	7.7	12.1	30.3	18.5	26.2	15.6	R1,464.5
1990	9.5	1,241.7	43.5	14.2	8.0	7.4	7.0	12.3	30.6	19.0	24.9	15.4	1,433.4
1991	9.6	1,269.3	42.2	14.0	7.1	7.1	8.0	R12.5	30.8	19.0	25.1	13.8	1,458.3
1992	9.1	1,104.0	44.3	13.8	8.0	7.0	7.5	12.5	31.7	17.0	25.3	14.0	1,294.3
1993	9.3	1,048.8	43.7	14.1	8.1	7.5	9.1	12.4	33.7	19.4	25.7	14.7	1,246.6
1994	9.4	977.0	42.3	14.0	8.4	7.9	10.3	12.6	35.0	19.8	25.6	17.0	R1,179.2
1995	9.7	926.0	47.1	13.7	6.1	6.4	10.2	12.4	36.2	R18.7	25.4	R17.0	R1,129.7
1996	9.1	904.2	44.4	14.5	6.6	4.3	12.1	11.5	36.4	R19.6	26.8	18.4	R1,107.9
1997	R7.4	880.0	33.9	14.4	7.9	6.6	12.0	12.0	40.8	R19.1	27.3	19.3	R1,080.5
1998	R7.9	R837.1	R31.5	14.1	7.4	R6.4	R15.8	R11.7	R39.5	R18.5	R27.6	R25.0	R1,042.6
1999P	7.8	810.7	29.4	14.3	7.0	7.5	15.4	11.4	39.8	20.5	27.5	25.1	1,016.3

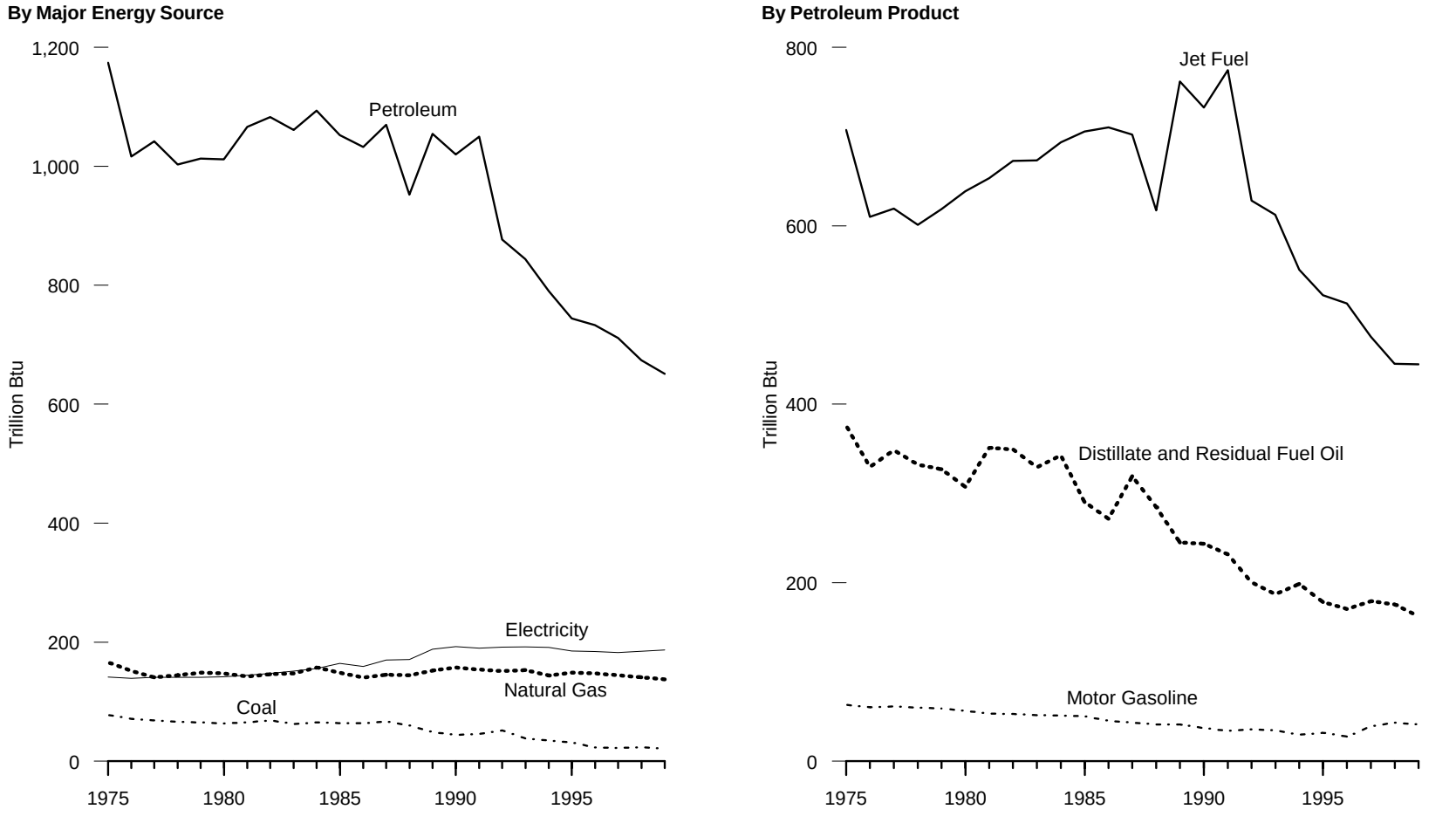
[1] General Services Administration.
[2] Health and Human Services.
[3] National Aeronautics and Space Administration.
[4] Includes National Archives and Records Administration, U.S. Department of Commerce, Panama Canal Commission, Tennessee Valley Authority, U.S. Department of Labor, National Science Foundation, Federal Trade Commission, Federal Communications Commission, Environmental Protection Agency, U.S. Department of Housing and Urban Development, Railroad Retirement Board, Commodity Futures Trading Commission, Equal Employment Opportunity Commission, Nuclear Regulatory Commission, U.S. Department of State, U.S. Department of the Treasury, Small Business Administration, Office of Personnel Management, Federal Emergency Management Agency, and U.S. Information Agency.

R = Revised. P = Preliminary.

Notes: • The U.S. Government's fiscal year was October 1 through September 30, except in 1975 and 1976, when it was July 1 through June 30. • Data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. Government energy use for electricity generation and uranium enrichment is excluded. • Totals may not equal sum of components due to independent rounding.

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

Figure 1.12 U.S. Government Energy Consumption by Source, Fiscal Years 1975-1999



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

Source: Table 1.12.

Table 1.12 U.S. Government Energy Consumption by Source, Fiscal Years 1975-1999

(Trillion Btu)

Year	Coal	Natural Gas	Petroleum						Electricity	Purchased Steam	Total
			Aviation Gasoline	Distillate and Residual Fuel Oil	Jet Fuel	LPG [1] and Other	Motor Gasoline	Total			
1975	77.9	166.2	22.0	376.0	707.4	5.6	63.2	1,174.2	141.5	5.1	1,565.0
1976	71.3	151.8	11.6	329.7	610.0	4.7	60.4	1,016.4	139.3	4.6	1,383.4
1977	68.4	141.2	8.8	348.5	619.2	4.1	61.4	1,042.1	141.1	5.7	1,398.5
1978	66.0	144.7	6.2	332.3	601.1	3.0	60.1	1,002.9	141.0	6.4	1,360.9
1979	65.1	148.9	4.7	327.1	618.6	3.7	59.1	1,013.1	141.2	7.1	1,375.4
1980	63.5	147.3	4.9	307.7	638.7	4.0	56.5	1,011.8	141.9	6.8	1,371.2
1981	65.1	142.2	4.6	351.3	653.3	3.7	53.2	1,066.2	144.5	6.2	1,424.2
1982	68.6	146.2	3.6	349.4	672.7	3.9	53.1	1,082.8	147.5	6.2	1,451.4
1983	62.4	147.8	2.6	329.5	673.4	4.0	51.6	1,061.1	151.5	9.0	1,431.8
1984	65.3	157.4	1.9	342.9	693.7	4.1	51.2	1,093.8	155.9	10.1	1,482.5
1985	64.0	R149.2	1.9	R290.4	705.7	4.0	50.5	R1,052.4	R164.5	R13.9	R1,444.0
1986	63.8	140.9	1.4	271.6	710.2	3.9	45.3	1,032.4	159.2	13.7	1,410.1
1987	67.0	145.6	1.0	319.5	702.3	4.0	43.1	1,069.8	169.9	13.9	1,466.2
1988	60.2	144.6	6.0	284.7	617.2	3.2	41.2	952.3	R171.2	32.0	R1,360.2
1989	48.7	152.4	0.8	245.1	761.7	5.7	41.1	1,054.4	R188.5	20.6	R1,464.5
1990	44.2	157.6	0.5	243.7	732.4	6.3	37.2	1,020.1	192.6	18.9	1,433.4
1991	45.9	154.0	0.4	231.9	774.5	9.0	34.1	1,049.9	190.1	18.4	1,458.3
1992	51.7	R151.3	1.0	200.5	628.2	11.4	35.6	876.8	191.7	22.8	1,294.3
1993	38.5	153.1	0.7	187.1	612.4	9.3	34.5	843.9	192.4	18.7	1,246.6
1994	35.0	144.0	0.6	198.6	550.7	10.9	29.5	790.3	191.6	18.3	R1,179.2
1995	31.7	149.2	0.3	R178.5	522.3	11.4	31.9	R744.4	R185.5	18.9	R1,129.7
1996	23.3	147.4	0.2	170.6	513.0	21.7	27.6	733.2	R184.3	19.8	R1,107.9
1997	22.5	R144.6	0.3	179.4	475.7	17.2	39.0	711.5	R182.6	R19.3	R1,080.5
1998	R23.9	R141.2	0.2	R175.9	R445.5	R9.4	R43.1	R674.0	R184.8	R18.6	R1,042.6
1999P	21.2	137.6	0.1	162.3	444.6	2.9	41.1	651.0	187.2	19.3	1,016.3

[1] Liquefied petroleum gases.

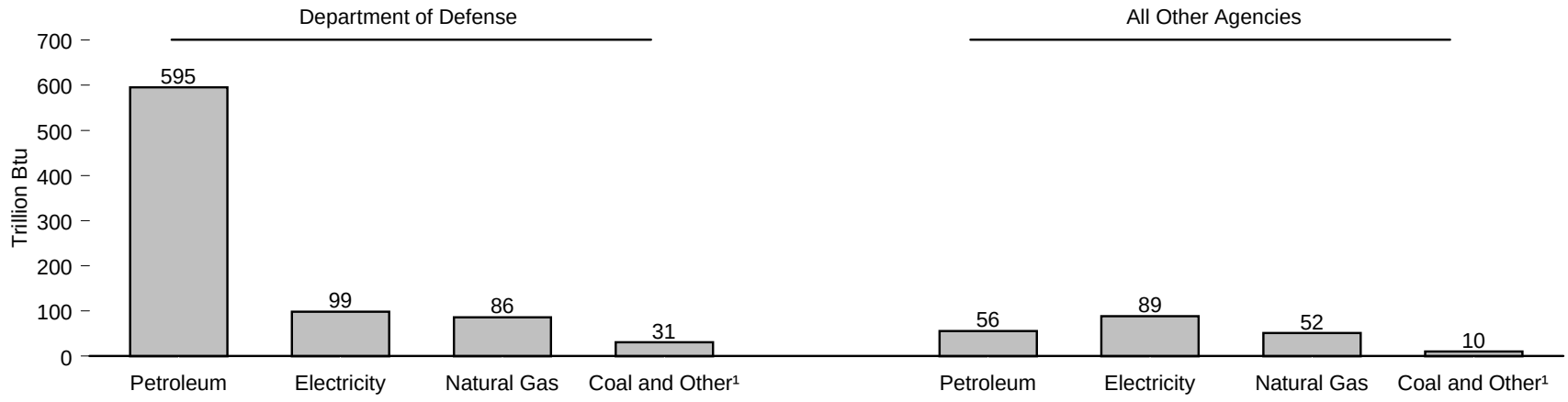
R = Revised. P = Preliminary.

Notes: • The U.S. Government's fiscal year was October 1 through September 30, except in 1975 and 1976, when it was July 1 through June 30. • This table uses a conversion factor for electricity of 3,412 Btu per kilowatthour and a conversion factor for purchased steam of 1,000 Btu per pound. • Data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. Government energy use for electricity generation and uranium enrichment is excluded. • Totals may not equal sum of components due to independent rounding.

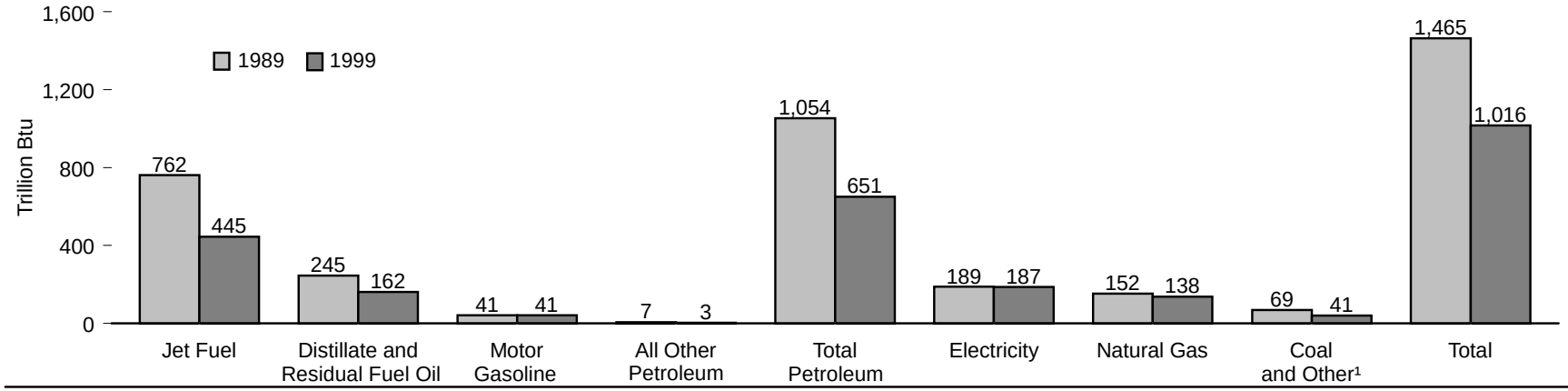
Source: U.S. Department of Energy, Energy Efficiency and Renewable Energy, Office of Federal Energy Management Programs.

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

By Agency, Fiscal Year 1999



By Source, Fiscal Years 1989 and 1999



[1] Purchased steam and other.

Source: Table 1.13.

Notes: • The U.S. Government's fiscal year runs from October 1 through September 30.

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

Table 1.13 U.S. Government Energy Consumption by Agency and Source, Fiscal Years 1989 and 1999

(Trillion Btu)

Agency	Coal and Other [2]	Natural Gas	Petroleum						Electricity	Total
			Aviation Gasoline	Distillate and Residual Fuel Oil	Jet Fuel	LPG [1] and Other	Motor Gasoline	Total		
Total, 1989	**69.2**	**152.4**	**0.8**	**245.1**	**761.7**	**5.7**	**41.1**	**1,054.4**	**188.5**	**1,464.5**
Defense	52.3	108.1	0.2	220.7	751.8	3.7	17.9	994.3	119.7	1,274.4
Postal Service	0.6	4.7	0.0	4.6	0.0	0.2	8.8	13.6	11.4	30.3
Energy	10.8	9.2	0.0	3.1	0.5	0.2	1.3	5.0	19.2	44.3
Veterans Affairs	1.2	14.3	0.0	2.4	0.0	0.0	0.5	3.0	7.8	26.2
Transportation	0.0	1.1	0.2	5.6	6.7	0.1	0.8	13.4	4.0	18.5
General Services Administration	1.9	2.7	0.0	0.5	0.0	0.0	0.1	0.7	7.4	12.7
Justice	1.1	2.5	0.1	0.3	0.1	0.0	1.9	2.5	1.7	7.7
NASA	0.3	2.8	0.0	1.0	1.4	0.0	0.2	2.6	6.4	12.1
Agriculture	0.1	1.4	0.1	0.7	0.0	0.2	4.5	5.4	1.8	8.7
Health and Human Services	0.1	1.8	0.0	1.9	0.0	0.1	0.2	2.3	2.5	6.7
Interior	0.1	1.0	0.1	1.2	0.1	1.1	1.9	4.5	1.5	7.1
Other [3]	0.6	2.7	0.1	3.1	1.1	0.0	3.0	7.3	5.0	15.6
Total, 1999 [P]	**40.5**	**137.6**	**0.1**	**162.3**	**444.6**	**2.9**	**41.1**	**651.0**	**187.2**	**1,016.3**
Defense	30.5	86.0	0.0	143.4	436.8	1.7	13.5	595.4	98.7	810.7
Postal Service	0.6	7.5	0.0	5.0	0.0	0.0	10.4	15.4	16.3	39.8
Energy	4.7	6.7	0.0	1.1	0.0	0.1	1.0	2.3	15.7	29.4
Veterans Affairs	1.5	14.3	0.0	1.1	0.0	0.0	1.2	2.3	9.4	27.5
Transportation	0.0	1.0	0.0	6.5	4.4	0.0	0.8	11.7	7.8	20.5
General Services Administration	1.5	3.2	0.0	0.1	0.0	0.0	0.1	0.2	9.5	14.3
Justice	0.4	4.5	0.1	0.4	1.4	0.0	4.8	6.7	3.8	15.4
NASA	0.2	3.0	0.0	0.4	1.1	0.0	0.2	1.8	6.4	11.4
Agriculture	0.5	2.0	0.0	0.1	0.0	0.1	3.3	3.5	1.9	7.8
Health and Human Services	0.1	3.3	0.0	0.3	0.0	0.1	0.4	0.9	2.8	7.0
Interior	0.1	1.4	0.0	0.8	0.1	0.7	2.8	4.5	1.5	7.5
Other [4]	0.6	4.8	0.0	3.1	0.9	0.0	2.4	6.4	13.3	25.1

[1] Liquefied petroleum gases.

[2] Purchased steam 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 the 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 the Treasury, Railroad Retirement Board, Tennessee Valley Authority, Federal Emergency Management Agency, and U.S. Information Agency.

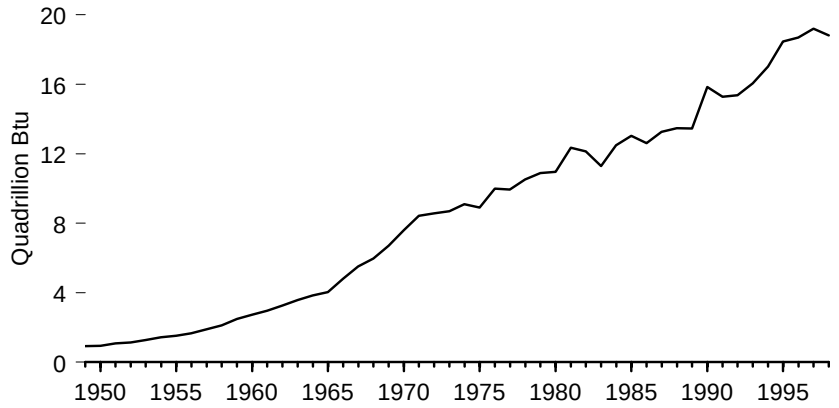
P=Preliminary.

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. • Data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. Government energy use for electricity generation and uranium enrichment is excluded. • The U.S. Government's fiscal year runs from October 1 through September 30. • Totals may not equal sum of components due to independent rounding.

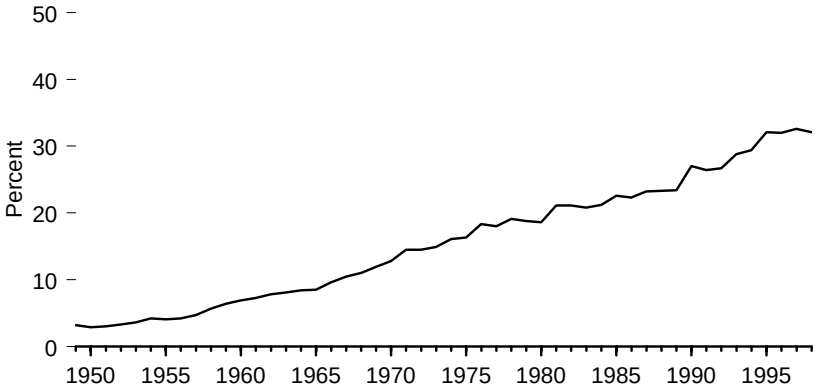
Source: U.S. Department of Energy, Energy Efficiency and Renewable Energy, Office of Federal Energy Management Programs.

Figure 1.14 Fossil Fuel Production on Federally Administered Lands

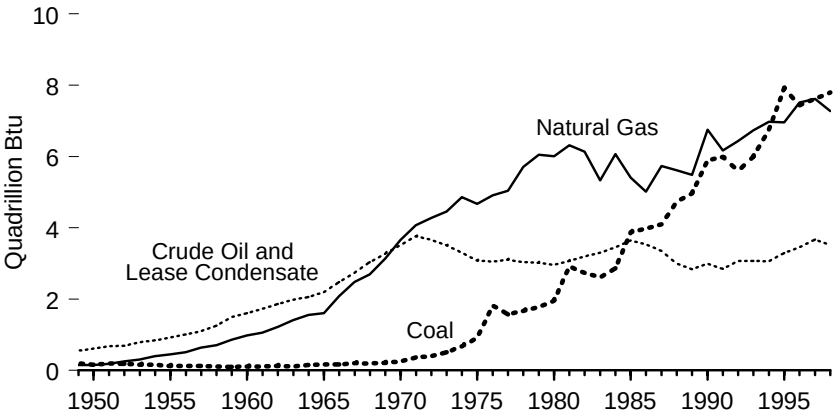
Total, 1949-1998



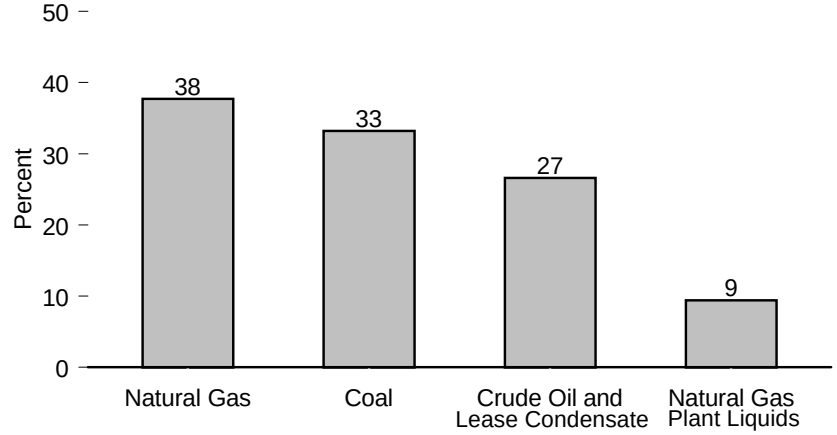
Total Production on Federal Lands as a Share of U.S. Total Production, 1998



By Source, 1949-1998



Production on Federal Lands as Share of U.S. Total Production, by Source, 1998



Notes: • Federally Administered Lands include all classes of land owned by the Federal Government, including acquired military, Outer Continental Shelf, and public lands.
• Because vertical scales differ, graphs should not be compared.

Source: Table 1.14.

Table 1.14 Fossil Fuel Production on Federally Administered Lands, 1949-1998

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	36.3	285.7	6.00	30.2	16.05	28.8
1994	527.7	3.06	21.7	60.0	0.23	9.5	6.78	6.97	36.0	321.4	6.75	31.1	17.01	29.4
1995	567.4	3.29	23.7	74.0	0.28	11.5	6.78	6.96	36.4	376.9	7.91	36.5	18.45	32.1
1996	596.5	3.46	25.2	71.2	0.27	10.6	7.31	7.51	R38.8	354.5	7.44	33.3	18.68	R32.0
1997	632.8	3.67	26.9	74.7	0.28	11.3	7.43	7.62	39.3	362.6	7.61	33.3	19.18	32.6
1998	[6]606.3	3.52	26.6	[6]60.3	0.23	9.4	[6]7.06	7.27	37.7	371.1	7.79	33.2	18.81	32.1

[1] Production from Naval Petroleum Reserve No. 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.

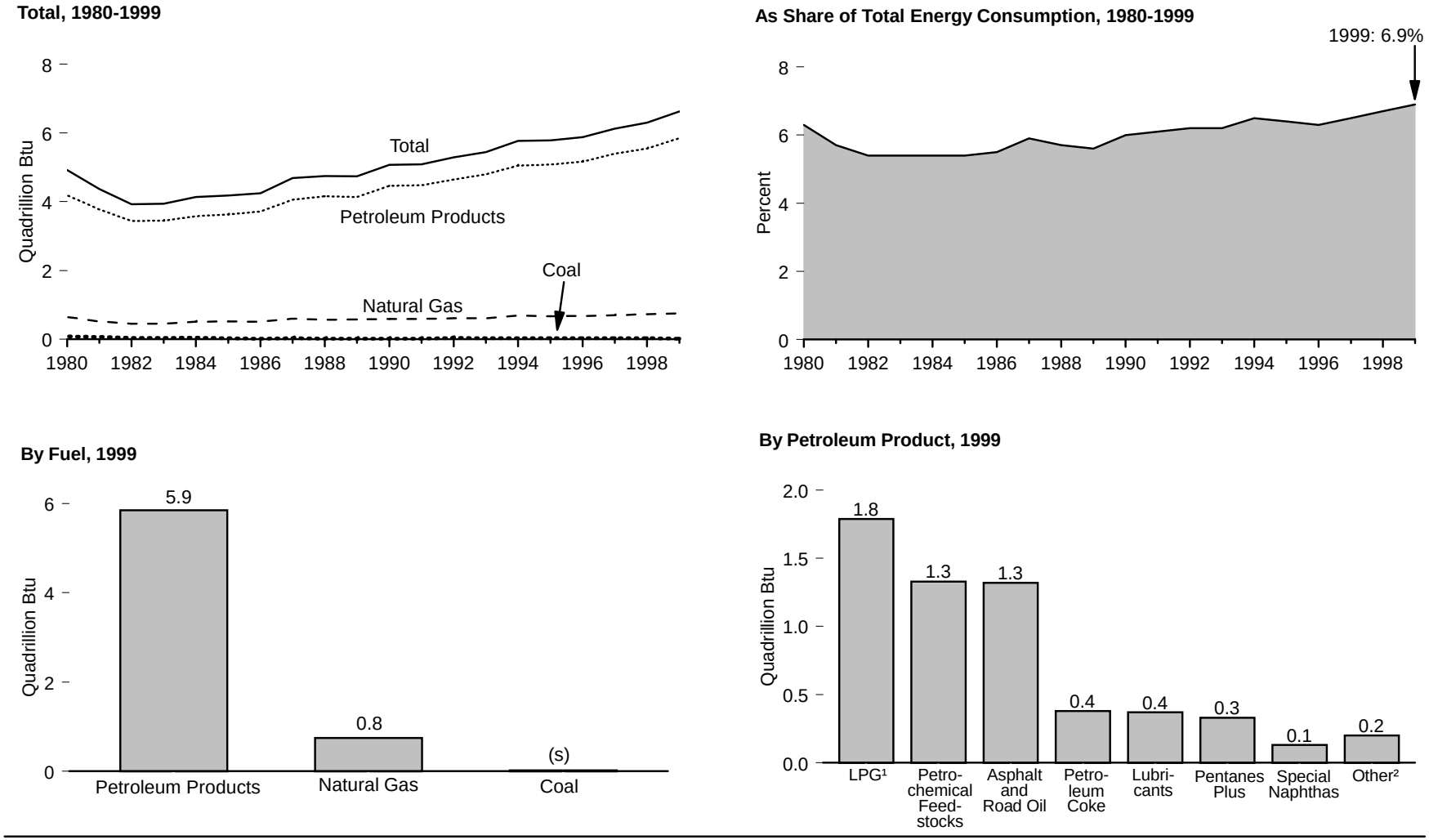
[6] There is a discontinuity in this time series between 1997 and 1998 due to the sale of "Elk Hills," Naval Petroleum Reserve No. 1.

R=Revised.

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

Sources: • 1949-1980—U.S. Geological Survey, *Oil and Gas Production, Royalty Income, and Production, Royalty Income, and Related Statistics,* and *Coal, Phosphate, Potash, Sodium, and Other Mineral Production, Royalty Income, and Related Statistics* (June 1981); Department of Energy, 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 Report on Receipts from Federal and Indian Leases,* (annual); 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 Report on Receipts from Federal and Indian Leases,* annual reports; and Department of Energy, Office of Naval Petroleum and Oil Shale Reserves, unpublished data.

Figure 1.15 Fossil Fuel Consumption for Nonfuel Use



¹ Liquefied petroleum gases.
² Distillate fuel oil, residual fuel oil, waxes, and miscellaneous products.
(s) = less than 0.05 quadrillion Btu.

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

Table 1.15 Fossil Fuel Consumption for Nonfuel Use, 1980-1999

Year	Petroleum Products									Natural Gas	Coal	Total	Percent of Total Energy Consumption
	Asphalt and Road Oil	Liquefied Petroleum Gases	Pentanes Plus	Lubricants	Petro-chemical Feedstocks	Petroleum Coke	Special Naphthas	Other [1]	Total				
	Physical Units [2]												
1980	145	230	(3)	58	253	R24	37	58	R805	639	2.4	—	—
1981	125	229	(3)	56	216	R29	27	54	R736	507	2.1	—	—
1982	125	256	(3)	51	157	R23	25	48	R686	R438	1.4	—	—
1983	136	264	(3)	53	151	R10	30	45	R689	R441	1.2	—	—
1984	150	247	10	57	145	R16	40	41	R705	R495	1.5	—	—
1985	156	265	13	53	144	R15	30	41	R718	500	1.1	—	—
1986	164	248	17	52	169	R14	25	38	R727	496	0.7	—	—
1987	170	303	12	59	170	R24	28	36	R802	578	0.8	—	—
1988	171	319	21	57	173	R25	22	40	R827	554	0.7	—	—
1989	165	332	17	58	172	R23	20	39	R827	563	0.6	—	—
1990	176	344	18	60	199	R30	20	39	R887	572	0.6	—	—
1991	162	394	10	53	200	R27	17	44	R907	573	0.6	—	—
1992	166	397	13	54	214	R41	20	35	R940	594	1.2	—	—
1993	174	389	60	55	216	R27	20	33	R976	R598	0.9	—	—
1994	176	437	56	58	222	R30	15	35	R1,029	673	0.9	—	—
1995	178	450	66	57	215	32	13	26	1,037	R655	0.9	—	—
1996	177	R470	69	55	R217	34	14	27	R1,063	R667	0.9	—	—
1997	184	R473	R65	58	250	29	14	27	R1,102	R681	0.9	—	—
1998	R190	R454	R58	61	R252	R51	20	R31	R1,117	R710	0.8	—	—
1999P	199	508	71	62	238	61	24	28	1,193	734	0.8	—	—
	Quadrillion Btu												
1980	0.96	0.78	(3)	0.35	1.43	0.14	0.19	0.34	4.19	0.65	0.08	4.92	6.3
1981	0.83	0.77	(3)	0.34	1.21	0.17	0.14	0.31	3.78	0.52	0.07	4.37	5.7
1982	0.83	0.87	(3)	0.31	0.88	0.14	0.13	0.28	R3.44	0.45	0.04	R3.93	R5.4
1983	0.90	0.89	(3)	0.32	0.85	R0.06	0.16	0.26	R3.45	R0.45	0.04	3.94	5.4
1984	0.99	0.84	0.05	0.35	0.82	0.09	0.21	0.24	R3.58	0.51	0.05	R4.14	5.4
1985	1.03	0.90	0.06	0.32	0.82	0.09	0.16	0.24	R3.63	0.52	0.03	R4.18	5.4
1986	1.09	0.85	0.08	0.31	0.95	R0.08	0.13	0.22	R3.72	0.51	0.02	R4.25	5.5
1987	1.13	1.06	0.06	0.36	0.96	R0.14	0.14	0.21	R4.06	0.60	0.03	R4.69	5.9
1988	1.14	1.11	0.10	0.34	0.97	R0.15	0.11	0.23	R4.16	0.57	0.02	R4.75	5.7
1989	1.10	1.18	0.08	0.35	0.96	R0.14	0.11	0.23	R4.14	0.58	0.02	R4.74	5.6
1990	1.17	1.20	0.08	0.36	1.12	R0.18	0.11	0.23	R4.46	0.59	0.02	R5.07	6.0
1991	1.08	1.38	0.04	0.32	1.15	R0.16	0.09	0.26	R4.48	0.59	0.02	R5.09	R6.1
1992	1.10	1.39	0.06	0.33	1.20	R0.25	0.10	0.20	R4.64	0.61	0.04	R5.29	6.2
1993	1.15	1.35	0.28	0.34	1.22	R0.17	0.10	0.20	R4.80	R0.61	0.03	R5.44	6.2
1994	1.17	1.55	0.26	0.35	1.26	R0.18	0.08	0.20	R5.05	0.69	0.03	R5.77	R6.5
1995	1.18	1.59	0.30	0.35	1.21	0.19	0.07	0.20	5.08	R0.67	0.03	R5.78	6.4
1996	1.18	1.65	0.32	0.34	R1.21	0.21	0.07	0.19	R5.17	R0.68	0.03	R5.88	6.3
1997	1.22	R1.67	0.30	0.35	1.40	0.18	0.07	0.20	R5.40	R0.70	0.03	R6.13	6.5
1998	R1.26	R1.60	R0.27	0.37	R1.40	R0.31	R0.11	R0.22	R5.54	R0.73	0.03	R6.30	R6.7
1999P	1.32	1.79	0.33	0.38	1.33	0.37	0.13	0.20	5.85	0.75	0.02	6.62	6.9

[1] Distillate fuel oil, residual fuel oil, waxes, and miscellaneous products.
[2] Petroleum - million barrels; natural gas - billion cubic feet; and coal - million short tons.
[3] Included in liquefied petroleum gases.
R=Revised. P=Preliminary. — = Not applicable.

Notes: • Because of changes in methodology, data series may be revised annually. • See Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States 1998* (October 1999), Appendix A, for a discussion of the estimates in the table. • 1999 is an early estimate by EIA and may differ from the emissions inventory to be published in late 2000. • Totals may not equal sum of components due to independent rounding.

Sources: **Petroleum Products:** • 1980—EIA, Energy Data Reports, *Petroleum Statement, Annual* and *Sales of Liquefied Petroleum Gases and Ethane in 1980.* • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports, and unpublished data. • 1999—EIA, *Petroleum Supply Monthly* (February 2000), and EIA estimates. **Natural Gas:** • 1980—Bureau of the Census, 1980 Survey of Manufactures, *Hydrocarbon, Coal, and Coke Materials Consumed.* • 1981 forward—U.S. Department of Commerce. **Coal:** • 1960-1995—U.S. International Trade Commission, *Synthetic Organic Chemicals, United States Production and Sales, 1995* (January 1997). • 1996 forward—Estimated because the data series has been discontinued. **Percent of Total Energy Consumption:** Derived by dividing total by total consumption on Table 1.3.

Energy Overview 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.

Sources

Table 1.1
Tables 5.1, 6.1, 7.1, 7.7, 8.1, 8.3, 10.1, 10.3, and Energy Information Administration (EIA) estimates for industrial hydroelectric power; conversion factors in Appendix A; and for the biomass estimates 1949-1980, EIA, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981* (August 1982), Table A2, and *Estimates of U.S. Wood Energy Consumption 1980-1983* (November 1984), Table ES1.

Table 1.2
Tables 5.1, 6.1, 7.1, 7.7, 8.1, 8.3, 10.1, 10.3, and Energy Information Administration (EIA) estimates for industrial hydroelectric power; conversion factors in Appendix A; and for the wood and waste estimates 1949-1980, EIA, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981* (August 1982), Table A2, and *Estimates of U.S. Wood Energy Consumption 1980-1983* (November 1984), Table ES1.

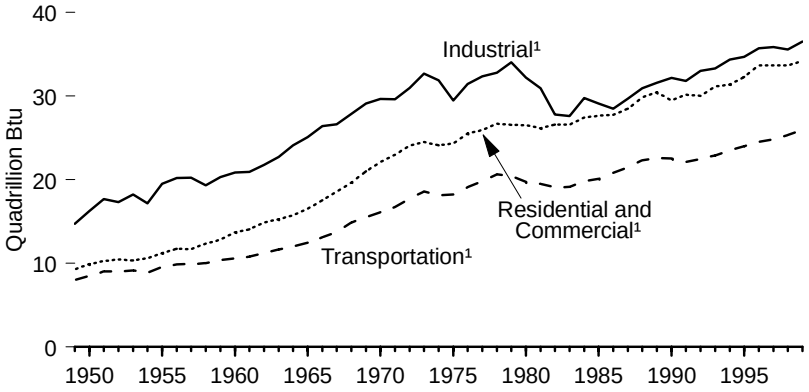
Table 1.3
Tables 5.1, 6.1, 7.1, 7.7, 8.1, 8.3, 10.1, 10.3, and Energy Information Administration (EIA) estimates for industrial hydroelectric power; conversion factors in Appendix A; and for the biomass estimates 1949-1980, EIA, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981* (August 1982), Table A2, and *Estimates of U.S. Wood Energy Consumption 1980-1983* (November 1984), Table ES1.

2 End-Use Energy Consumption

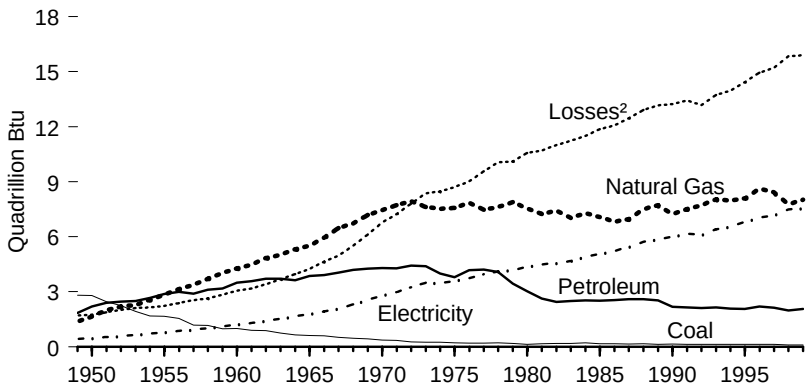
Office buildings, industries, residences, and transport systems, Baltimore, Maryland; east view from the Inner Harbor.
Source: U.S. Department of Energy.

Figure 2.1 Energy Consumption by End-Use Sector, 1949-1999

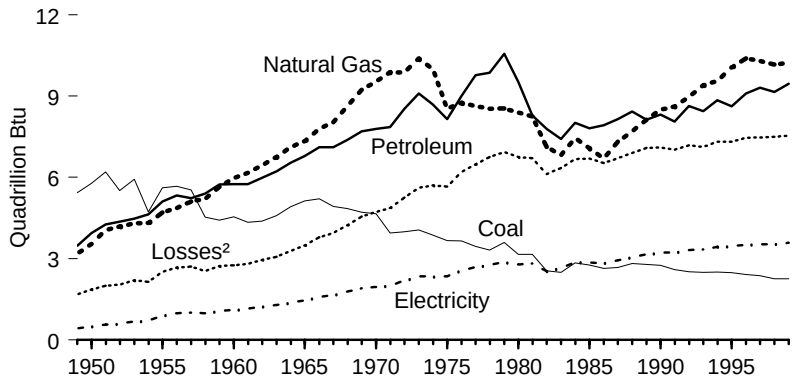
By End-Use Sector



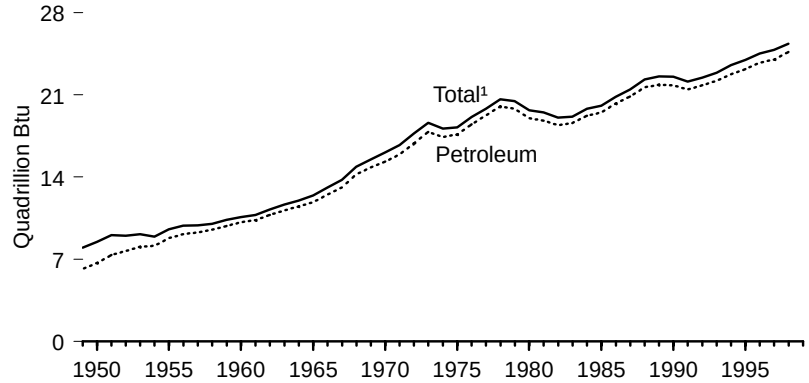
Residential and Commercial Sector



Industrial Sector



Transportation Sector



¹ There is a discontinuity in this time series between 1988 and 1989 due to the expanded coverage of renewable energy beginning in 1989.

² Electrical system energy losses associated with the generation, transmission, and distribution of energy in the form of electricity.

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

Table 2.1 Energy Consumption by End-Use Sector, 1949-1999

(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 [5]	Total
1949	2.83	1.39	1.85	0.43	1.72	9.28	5.43	3.19	3.47	0.42	1.68	14.73	6.15	7.99	32.00
1950	2.80	1.64	2.20	0.47	1.76	9.90	5.78	3.55	3.95	0.50	1.86	16.24	6.69	8.49	34.63
1951	2.47	2.01	2.40	0.54	1.89	10.27	6.20	4.05	4.27	0.57	2.00	17.68	7.36	9.04	37.00
1952	2.25	2.21	2.46	0.59	2.02	10.45	5.52	4.18	4.36	0.60	2.05	17.31	7.71	9.00	36.77
1953	1.93	2.29	2.50	0.65	2.12	10.35	5.93	4.30	4.48	0.68	2.20	18.21	8.06	9.12	37.68
1954	1.68	2.57	2.67	0.72	2.15	10.60	4.73	4.32	4.63	0.71	2.14	17.16	8.12	8.90	36.66
1955	1.67	2.85	2.87	0.79	2.23	11.20	5.62	4.70	5.11	0.89	2.51	19.49	8.80	9.55	40.24
1956	1.55	3.15	3.00	0.87	2.39	11.72	5.67	4.87	5.34	0.98	2.68	20.22	9.15	9.86	41.79
1957	1.19	3.39	2.91	0.95	2.55	11.70	5.54	5.11	5.24	1.00	2.70	20.22	9.29	9.90	41.82
1958	1.16	3.71	3.12	1.01	2.64	12.35	4.53	5.21	5.41	0.98	2.54	19.32	9.51	10.00	41.67
1959	0.99	4.02	3.18	1.12	2.84	12.81	4.41	5.65	5.74	1.08	2.73	20.33	9.85	10.35	43.49
1960	0.99	4.27	3.49	1.23	3.06	13.68	4.54	5.97	5.75	1.11	2.76	20.84	10.13	10.60	45.12
1961	0.90	4.48	3.58	1.30	3.18	14.04	4.35	6.17	5.75	1.15	2.80	20.94	10.32	10.77	45.76
1962	0.88	4.85	3.72	R1.42	3.40	14.84	4.38	6.45	6.00	1.23	2.95	21.77	10.77	R11.22	47.83
1963	0.76	5.01	3.72	1.54	R3.69	15.26	4.59	6.75	6.23	1.29	3.08	22.73	11.17	R11.65	49.65
1964	0.65	5.33	3.62	1.67	3.96	15.74	4.91	7.11	6.55	1.38	3.29	24.09	11.50	12.00	51.83
1965	0.62	5.52	3.87	1.78	4.25	16.51	5.13	7.34	6.79	1.46	3.49	25.07	11.87	12.43	54.02
1966	0.61	5.95	3.91	1.94	4.65	17.52	5.21	7.80	7.11	1.58	3.79	26.40	12.50	13.10	57.02
1967	0.52	6.47	4.04	2.09	R4.97	18.54	4.93	8.04	7.12	1.65	3.95	26.61	13.11	13.75	58.91
1968	0.47	6.73	4.20	2.32	5.52	R19.66	4.85	8.63	7.39	1.78	4.24	27.88	14.21	14.86	62.41
1969	0.44	7.20	4.26	R2.56	6.12	21.01	4.71	9.23	7.70	1.91	4.56	29.12	14.81	R15.51	65.63
1970	0.37	7.46	4.31	2.79	R6.77	R22.11	4.66	9.54	7.79	1.95	4.72	29.65	15.31	R16.10	67.86
1971	0.35	7.71	4.29	2.99	R7.24	R22.97	3.94	9.89	7.86	2.01	4.87	29.61	15.92	R16.73	69.31
1972	0.27	7.94	4.43	3.25	7.80	24.07	3.99	9.88	8.53	2.19	5.25	30.97	16.89	R17.72	72.76
1973	0.25	7.63	4.39	R3.49	R8.37	24.50	4.06	10.39	9.10	2.34	5.61	32.69	17.83	R18.61	75.81
1974	0.26	7.52	4.00	3.47	8.48	24.10	3.87	10.00	8.69	2.34	5.70	31.85	17.40	18.12	74.08
1975	0.21	7.58	3.80	3.60	8.70	24.33	3.67	8.53	8.15	2.35	5.66	29.46	17.62	18.25	72.04
1976	0.20	7.87	4.18	3.75	9.02	25.51	3.66	8.76	9.01	2.57	6.20	31.46	18.51	19.10	76.07
1977	0.21	7.46	4.21	3.96	9.56	25.94	3.45	8.64	9.78	2.68	6.48	32.36	19.24	19.82	78.12
1978	0.21	7.62	4.07	R4.11	R10.06	26.72	3.31	8.54	9.87	2.76	6.75	32.79	20.04	20.61	80.12
1979	0.19	7.89	3.45	4.18	10.10	26.55	3.59	8.55	10.57	2.87	6.94	34.02	19.82	20.47	81.04
1980	0.15	7.54	3.04	4.35	10.58	26.53	3.16	8.39	9.53	2.78	6.76	32.21	19.01	19.69	R78.43
1981	0.17	7.24	2.63	4.50	10.70	26.13	3.16	8.26	8.29	2.82	6.70	30.93	18.81	R19.50	76.57
1982	0.19	7.43	2.45	4.57	11.00	26.59	2.55	7.12	7.80	2.54	6.12	27.78	18.42	19.07	73.44
1983	0.19	7.02	2.50	4.68	R11.23	R26.57	2.49	6.83	7.42	2.65	6.36	27.60	18.59	R19.14	73.32
1984	0.21	7.29	2.54	4.93	11.51	27.42	2.84	7.45	8.01	2.86	6.68	29.75	19.22	R19.81	76.97
1985	0.18	7.08	2.52	5.06	R11.86	R27.62	2.76	7.08	7.81	2.86	6.69	29.09	19.50	20.07	R76.78
1986	0.18	6.82	2.56	R5.23	12.06	R27.75	2.64	6.69	7.92	2.83	6.53	28.50	20.27	R20.82	R77.06
1987	0.16	6.95	2.59	5.44	R12.47	R28.49	2.67	7.32	8.15	2.93	6.71	29.68	20.87	R21.46	R79.63
1988	0.17	7.51	2.60	5.72	R12.91	R29.83	2.83	7.70	8.43	3.06	6.90	30.92	21.63	22.31	R83.07
1989	0.15	7.73	2.53	5.86	R13.16	R,6 30.43	2.79	8.13	8.13	3.16	7.10	R,6 31.58	21.87	R22.57	R,6 84.59
1990	0.16	7.22	2.17	R6.01	13.24	R29.48	2.76	8.50	8.32	3.23	7.10	R32.15	21.81	R22.54	R84.19
1991	0.14	7.51	2.15	6.18	R13.44	R30.14	2.60	8.62	8.06	3.23	R7.02	R31.80	21.46	R22.13	R84.06
1992	0.14	7.73	2.13	R6.09	R13.18	R30.03	2.51	8.97	8.64	3.32	R7.18	33.01	21.81	R22.47	R85.51
1993	0.14	8.04	2.14	R6.41	R13.72	R31.12	2.50	9.41	8.45	3.33	R7.13	R33.30	22.20	R22.89	87.31
1994	0.14	7.97	2.09	6.56	R13.95	R31.37	2.51	9.56	8.85	3.44	7.32	R34.35	R22.76	R23.52	R89.23
1995	0.13	8.09	2.08	6.81	14.43	32.26	2.49	10.06	8.62	3.46	7.32	R34.70	R23.20	R23.97	R90.94
1996	0.14	8.63	2.20	7.04	R14.95	R33.67	2.42	10.39	9.10	3.52	R7.47	R35.71	R23.73	R24.52	R93.91
1997	0.15	8.42	2.14	R7.17	R15.21	R33.64	2.37	R10.31	9.31	3.52	R7.47	R35.85	R23.99	R24.82	R94.32
1998	R0.11	R7.77	R1.97	R7.49	R15.83	R33.68	R2.26	R10.17	R9.15	R3.55	R7.50	R35.54	R24.64	R25.36	R94.57
1999P	0.11	8.02	2.07	7.54	15.89	34.17	2.25	10.23	9.46	3.58	7.55	36.50	25.21	25.92	96.60

[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] "Total" also includes renewable energy, which is not shown separately on this table. See Table 10.2 for quantities since 1989.

[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 1988 and 1989 due to expanded coverage of renewable energy beginning in 1989. See Table 10.2 for quantities since 1989.

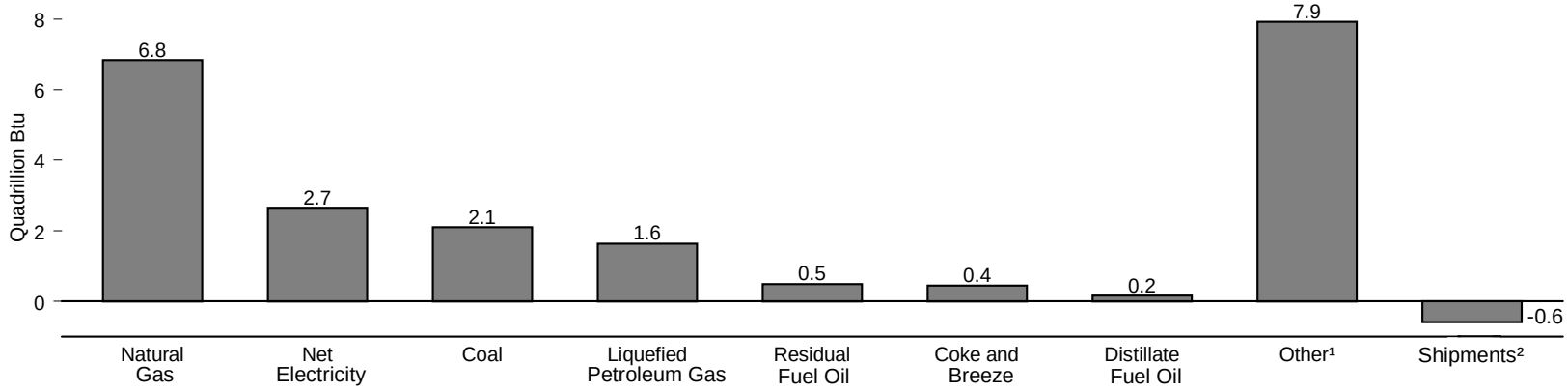
R=Revised. P=Preliminary.

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

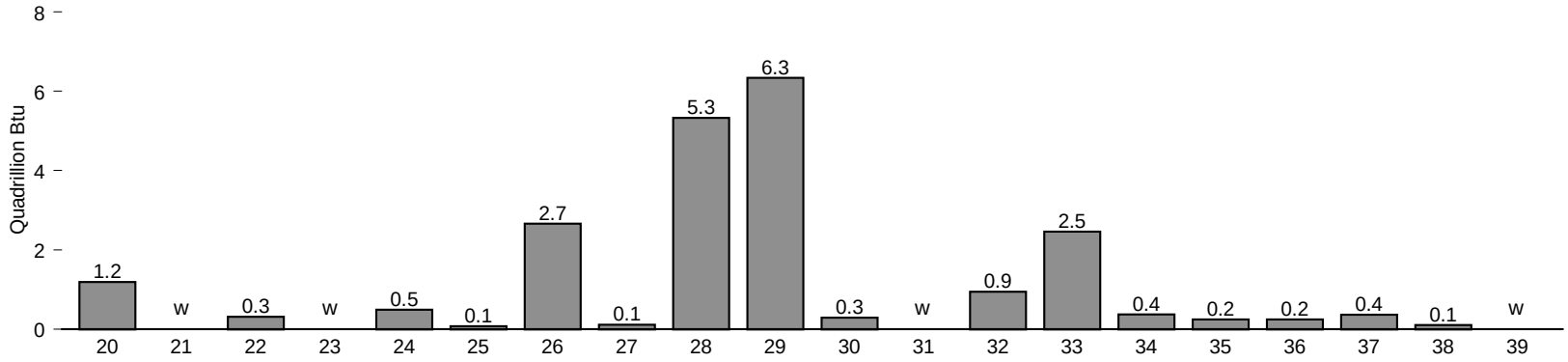
Sources: Tables 5.12a, 5.12b, 6.5, 7.3, 7.7, 8.1, 8.3, 8.9, A3-A6, and Energy Information Administration estimates for industrial hydroelectric power. "Other" from Table 8.9 is allocated to the Residential and Commercial Sector, except for approximately 5 percent used by railroads and railways and attributed to the Transportation Sector.

Figure 2.2 Manufacturing Total First Use of Energy for All Purposes, 1994

By Energy Source



By Standard Industrial Classification (SIC) Code[3]



[1] Includes all other types of energy that respondents indicated were consumed.

[2] Energy sources produced onsite from the use of other energy sources but sold to another entity.

[3] See Table 2.2 for Major Group titles of industries that correspond to the 2-digit SIC codes.

W=Withheld to avoid disclosure of data for individual establishments.

Source: Table 2.2.

Table 2.2 Manufacturing Total First Use of Energy for All Purposes, 1994

(Trillion Btu)

SIC [1] Code	Major Group	Coal	Coke and Breeze	Natural Gas	Distillate Fuel Oil	Liquefied Petroleum Gas	Residual Fuel Oil	Net Electricity [2]	Other [3]	Shipments of Energy Sources [4]	Total [5]
20	Food and Kindred Products	165	W	631	19	W	30	198	141	0	1,193
21	Tobacco Products	W	0	W	W	W	1	3	W	0	W
22	Textile Mill Products	40	0	117	7	4	17	111	14	0	310
23	Apparel and Other Textile Products	W	0	25	1	W	W	26	W	0	W
24	Lumber and Wood Products	W	0	48	25	W	2	68	341	0	491
25	Furniture and Fixtures	3	0	24	1	1	(s)	22	18	0	69
26	Paper and Allied Products	307	0	575	9	5	173	223	1,373	0	2,665
27	Printing and Publishing	0	0	48	2	W	W	59	2	0	112
28	Chemicals and Allied Products	293	11	2,569	14	1,535	110	520	442	166	5,328
29	Petroleum and Coal Products	W	W	811	22	47	71	121	5,344	87	6,339
30	Rubber and Miscellaneous Plastics Products	5	0	110	4	3	10	149	6	0	287
31	Leather and Leather Products	0	0	W	W	W	2	3	(s)	0	W
32	Stone, Clay, and Glass Products	274	8	432	23	4	7	123	73	0	944
33	Primary Metal Industries	922	424	811	13	5	43	493	85	334	2,462
34	Fabricated Metal Products	W	W	220	4	5	W	115	Q	0	367
35	Industrial Machinery and Equipment	11	W	111	4	3	W	109	5	0	246
36	Electronic and Other Electric Equipment	W	W	88	2	2	3	113	Q	0	243
37	Transportation Equipment	28	2	157	7	3	11	132	23	0	363
38	Instruments and Related Products	W	0	29	1	W	4	46	3	0	107
39	Miscellaneous Manufacturing Industries	1	0	19	1	1	1	19	W	0	W
—	Total Manufacturing	2,105	449	6,835	158	1,631	490	2,656	7,926	587	21,663

[1] Based on 1987 Standard Industrial Classification system.

[2] "Net Electricity" is obtained by summing purchases, transfers in, and generation from noncombustible renewable resources, minus quantities sold and transferred out. It excludes electricity generated from combustible fuels.

[3] Includes all other types of energy that respondents indicated were consumed.

[4] Energy sources produced onsite from the use of other energy sources but sold to another entity.

[5] The sum of net electricity, residual and distillate fuel oil, natural gas, liquefied petroleum gas, coal, coke and breeze and other, minus shipments of energy sources. Previous surveys did not subtract shipments.

(s)=Less than 0.5 trillion Btu. W=Withheld to avoid disclosure of data for individual establishments. Q=Data withheld because the relative standard error was greater than 50 percent.

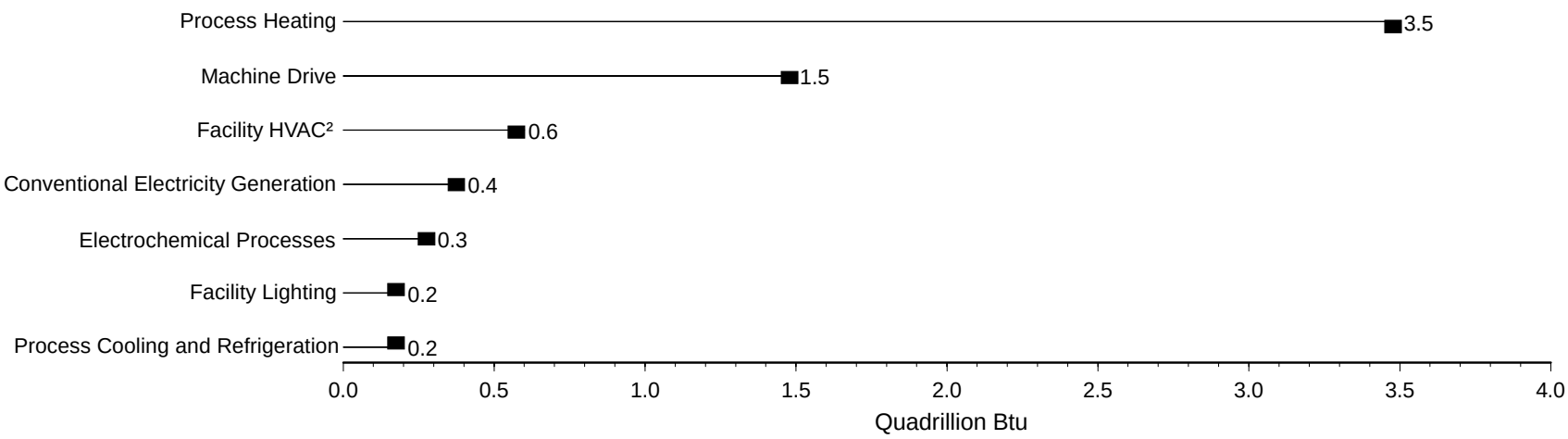
Notes: • "First Use" was "Primary Consumption" in previous releases of this table. The estimates are for the first use of energy for heat and power and as feedstocks or raw material inputs. First use is defined as the consumption of the energy that was originally produced offsite or was produced onsite from input materials not classified as energy. • See Table 12.4 for carbon dioxide emissions from energy consumption for manufacturing industries. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/emeu/consumption.

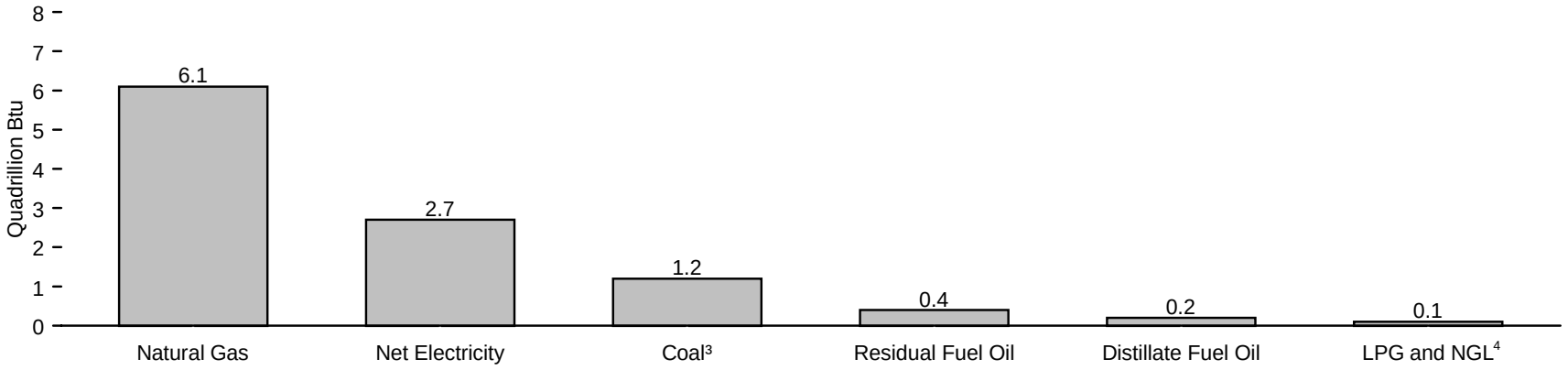
Source: Energy Information Administration, *Manufacturing Consumption of Energy 1994* (December 1997), Table A1, Part 3.

Figure 2.3 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation, 1994

By Selected End Use[1]



By Energy Source



[1]Excludes inputs of unallocated energy sources (5,828 trillion Btu).
[2]Heating, ventilation, and air conditioning.
[3]Excluding coal coke and breeze.
[4] Liquefied petroleum gases and natural gas liquids.
Source: Table 2.3.

Table 2.3 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation by End Use, 1994

End-Use Category	Net Electricity [1]	Residual Fuel Oil	Distillate Fuel Oil	Liquefied Petroleum Gases and Natural Gas Liquids	Natural Gas	Coal (Excluding Coal Coke and Breeze)	Total [2]
	Million Kilowatthours	Thousand Barrels			Billion Cubic Feet	Thousand Short Tons	
Indirect End Use (Boiler Fuel)	**8,250**	**49,731**	**7,296**	**3,829**	**2,326**	**39,496**	
Direct End Use							
All Process Uses	**608,190**	**16,825**	**8,795**	**14,051**	**2,788**	**13,697**	
Process Heating	83,151	16,326	4,919	12,515	2,623	13,545	
Process Cooling and Refrigeration	40,583	19	44	413	20	3	
Machine Drive	400,545	406	3,161	869	93	149	
Electrochemical Processes	79,549	—	—	—	—	—	
Other Process Uses	4,363	74	671	254	52	Q	
All Non-Process Uses	**134,020**	**2,197**	**8,394**	**6,860**	**705**	**378**	
Facility Heating, Ventilation, and Air Conditioning [3]	63,662	777	1,274	1,373	341	118	
Facility Lighting	54,332	—	—	—	—	—	
Other Facility Support	13,545	455	203	156	29	1	
Onsite Transportation	1,192	—	5,997	5,168	1	—	
Conventional Electricity Generation	—	797	604	119	325	259	
Other Non-Process Use	1,290	167	316	44	9	0	
End Use Not Reported	**27,874**	**1,359**	**1,622**	**1,209**	**143**	**571**	
Total	**778,335**	**70,111**	**26,107**	**25,949**	**5,962**	**54,143**	
	Trillion Btu						
Indirect End Use (Boiler Fuel)	**28**	**313**	**42**	**15**	**2,396**	**875**	**3,669**
Direct End Use							
All Process Uses	**2,075**	**106**	**51**	**54**	**2,872**	**302**	**5,460**
Process Heating	284	103	29	49	2,702	299	3,466
Process Cooling and Refrigeration	138	(s)	(s)	2	21	(s)	161
Machine Drive	1,367	3	18	3	95	3	1,489
Electrochemical Processes	271	—	—	—	—	—	271
Other Process Uses	15	(s)	4	1	53	(s)	73
All Non-Process Uses	**457**	**14**	**49**	**25**	**726**	**8**	**1,279**
Facility Heating, Ventilation, and Air Conditioning [3]	217	5	7	5	351	3	588
Facility Lighting	185	—	—	—	—	—	185
Other Facility Support	46	3	1	1	30	(s)	81
Onsite Transportation	4	—	35	19	1	—	59
Conventional Electricity Generation	—	5	4	1	335	6	351
Other Non-Process Use	4	1	2	(s)	9	0	16
End Use Not Reported	**96**	**9**	**9**	**4**	**148**	**13**	**279**
Total	**2,656**	**441**	**152**	**99**	**6,141**	**1,198**	**10,687**

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

[2] Total of listed energy sources. Excludes inputs of unallocated energy sources (5,828 trillion Btu). The top half of the "Total" column is blank because different physical units cannot be added.

[3] Excludes steam and hot water.

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

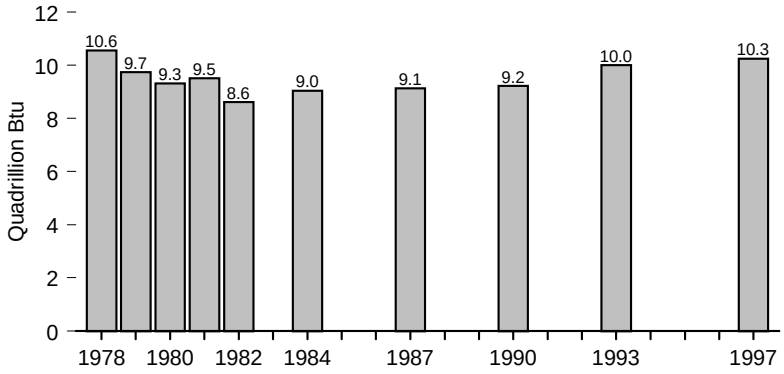
Notes: • Totals may not equal sum of components due to independent rounding. • The estimates presented in this table are for the total consumption of energy for the production of heat and power, regardless of where the energy was produced. Specifically, the estimates include the quantities of energy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

Web Page: http://www.eia.doe.gov/emeu/consumption.

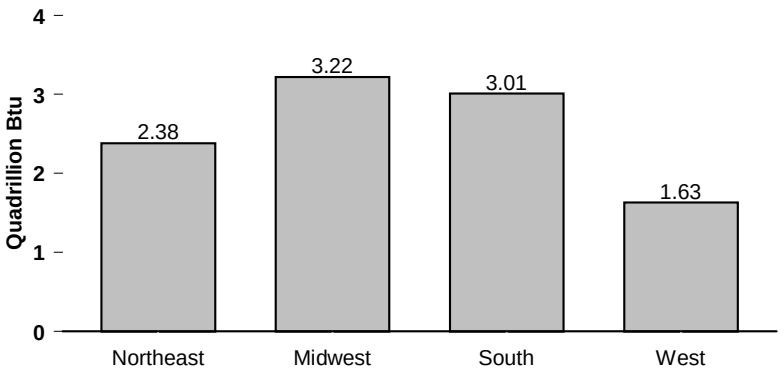
Source: Energy Information Administration, *Manufacturing Consumption of Energy 1994* (December 1997), Table A8, Parts 1 and 2.

Figure 2.4 Household Energy Consumption

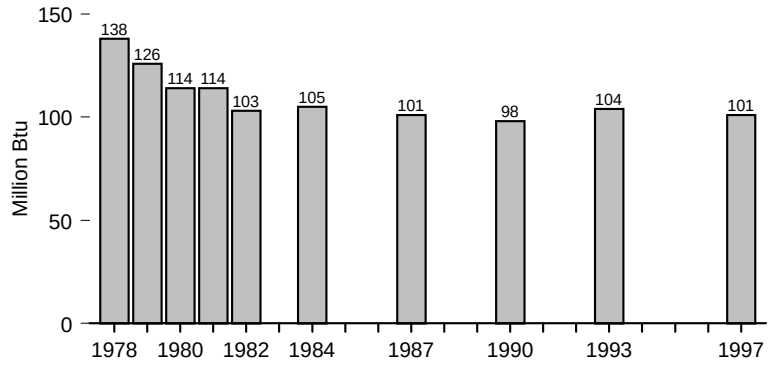
Consumption by All Households, Selected Years, 1978-1997



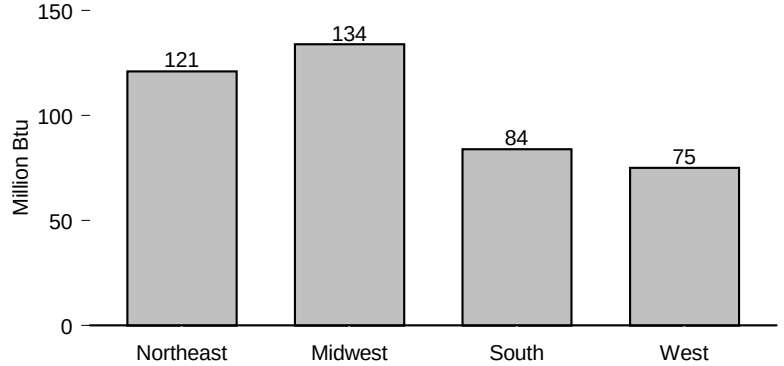
Consumption by All Households, by Census Region, 1997



Consumption per Household, Selected Years, 1978-1997



Consumption per Household, by Census Region, 1997



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

Source: Table 2.4. See Appendix D for Census regions.

Table 2.4 Household Energy Consumption by Census Region, Selected Years, 1978-1997

(Quadrillion Btu, Except as Noted)

Census Region [1]	1978	1979	1980	1981	1982	1984	1987	1990	1993	1997
Northeast	**2.89**	**2.50**	**2.43**	**2.47**	**2.18**	**2.29**	**2.37**	**2.30**	**2.38**	**2.38**
Natural Gas	1.14	1.05	0.92	1.06	0.99	0.93	1.03	1.03	1.11	1.03
Electricity [2]	0.39	0.39	0.39	0.42	0.38	0.41	0.44	0.47	0.47	0.49
Distillate Fuel Oil and Kerosene	1.32	1.03	1.09	0.96	0.79	0.93	0.87	0.78	0.78	0.84
Liquefied Petroleum Gases	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.02	0.03	0.03
Consumption per Household (million Btu)	166	145	138	138	122	125	124	120	122	121
Midwest	**3.70**	**3.48**	**2.92**	**3.12**	**2.60**	**2.80**	**2.73**	**2.81**	**3.13**	**3.22**
Natural Gas	2.53	2.48	2.02	2.24	1.76	1.99	1.83	1.88	2.07	2.20
Electricity [2]	0.60	0.59	0.60	0.57	0.57	0.55	0.61	0.66	0.74	0.75
Distillate Fuel Oil and Kerosene	0.46	0.31	0.16	0.17	0.15	0.13	0.16	0.13	0.13	0.11
Liquefied Petroleum Gases	0.12	0.10	0.15	0.13	0.11	0.13	0.13	0.13	0.19	0.17
Consumption per Household (million Btu)	180	168	139	147	122	129	123	122	134	134
South	**2.43**	**2.30**	**2.59**	**2.46**	**2.46**	**2.50**	**2.61**	**2.60**	**2.95**	**3.01**
Natural Gas	0.96	0.91	1.11	1.16	1.13	1.15	1.09	1.03	1.18	1.13
Electricity [2]	1.00	0.97	1.06	1.03	1.05	1.06	1.22	1.36	1.51	1.67
Distillate Fuel Oil and Kerosene	0.32	0.28	0.27	0.16	0.17	0.16	0.17	0.11	0.13	0.10
Liquefied Petroleum Gases	0.15	0.14	0.15	0.12	0.12	0.12	0.12	0.10	0.13	0.12
Consumption per Household (million Btu)	99	92	96	89	88	85	84	81	88	84
West	**1.54**	**1.47**	**1.38**	**1.47**	**1.38**	**1.45**	**1.42**	**1.51**	**1.55**	**1.63**
Natural Gas	0.95	0.88	0.89	0.93	0.89	0.91	0.88	0.92	0.91	0.93
Electricity [2]	0.48	0.47	0.41	0.46	0.42	0.47	0.48	0.54	0.56	0.64
Distillate Fuel Oil and Kerosene	0.09	0.09	0.04	0.03	0.03	0.04	0.02	0.02	0.03	0.03
Liquefied Petroleum Gases	0.03	0.04	0.04	0.04	0.04	0.03	0.05	0.03	0.04	0.04
Consumption per Household (million Btu)	110	100	86	90	84	85	78	78	76	75
United States	**10.56**	**9.74**	**9.32**	**9.51**	**8.62**	**9.04**	**9.13**	**9.22**	**10.01**	**10.25**
Natural Gas	5.58	5.31	4.94	5.39	4.77	4.98	4.83	4.86	5.27	5.28
Electricity [2]	2.47	2.42	2.46	2.48	2.42	2.48	2.76	3.03	3.28	3.54
Distillate Fuel Oil and Kerosene	2.19	1.71	1.55	1.33	1.14	1.26	1.22	1.04	1.07	1.07
Liquefied Petroleum Gases	0.33	0.31	0.36	0.31	0.29	0.31	0.32	0.28	0.38	0.36
Consumption per Household (million Btu)	138	126	114	114	103	105	101	98	104	101

[1] See Appendix D for Census regions.

[2] Site electricity. One kilowatthour = 3,412 Btu.

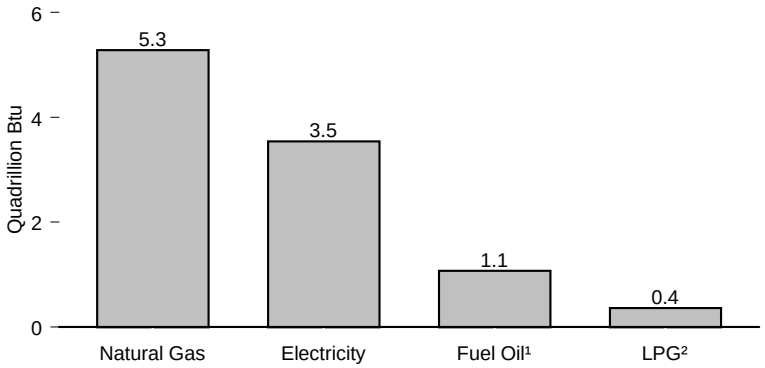
Notes: • This table shows major energy items only. • No data are available for years not shown. • Data for 1978-1984 are for April of year shown through March of following year; data for 1987, 1990, 1993, and 1997 are for the calendar year. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/emeu/consumption.

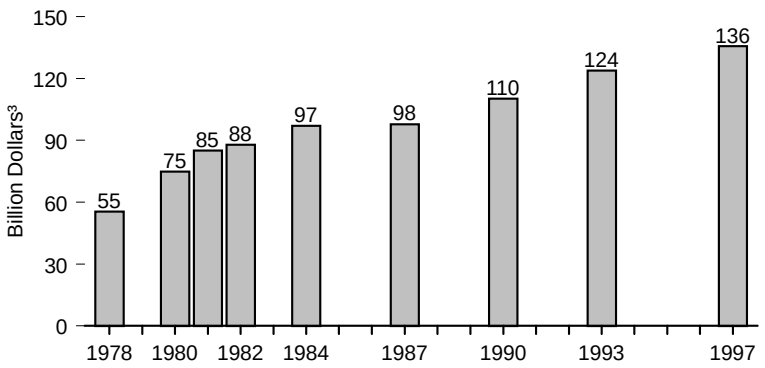
Sources: • 1978 and 1979—Energy Information Administration (EIA), Form EIA-84, "Residential Energy Consumption Survey." • 1980 forward—EIA, Form EIA-457, "Residential Energy Consumption Survey."

Figure 2.5 Household Energy Consumption and Expenditures

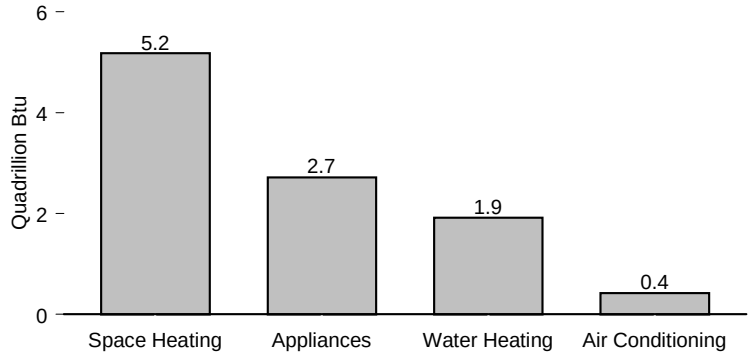
Consumption by Energy Source, 1997



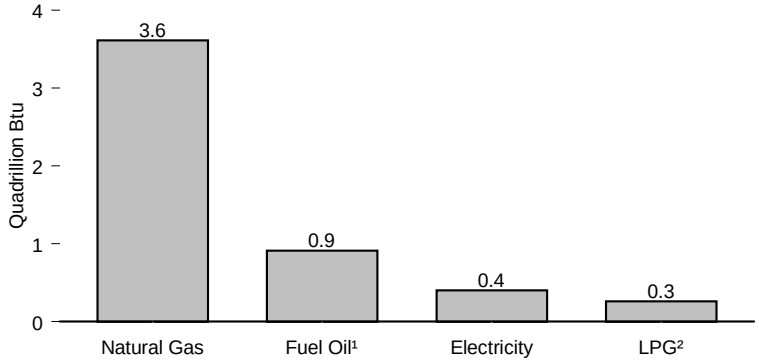
Expenditures, Selected Years, 1978-1997



Consumption by End Use, 1997



Consumption for Space Heating, 1997



¹ Distillate fuel oil and kerosene.
² Liquefied petroleum gases.
³ Nominal dollars.

Notes: • No data are available for years not shown. • Because vertical scales differ, graphs should not be compared.
Source: Table 2.5.

Table 2.5 Household Energy Consumption and Expenditures by End Use and Energy Source, Selected Years, 1978-1997

Year	Space Heating				Air Conditioning [1]	Water Heating				Appliances [2]			Total [1,2]			
	Natural Gas	Electricity [3]	Fuel Oil [4]	LPG [5]	Electricity [3]	Natural Gas	Electricity [3]	Fuel Oil [4]	LPG [5]	Natural Gas	Electricity [3]	LPG [5]	Natural Gas	Electricity [3]	Fuel Oil [4]	LPG [5]
	Consumption (quadrillion Btu)															
1978	4.26	0.40	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	3.80	0.30	1.12	0.22	0.33	1.10	0.33	0.20	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	1.11	0.21	0.33	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	0.93	0.19	0.48	1.16	0.34	0.11	0.06	0.33	1.91	0.03	4.86	3.03	1.04	0.28
1993	3.67	0.41	0.95	0.30	0.46	1.31	0.34	0.12	0.05	0.29	2.08	0.03	5.27	3.28	1.07	0.38
1997	3.61	0.40	0.91	0.26	0.42	1.29	0.39	0.16	0.08	0.37	2.33	0.02	5.28	3.54	1.07	0.36
	Expenditures (billion dollars [6])															
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	0.40	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	7.37	6.63	6.44	1.09	0.58	2.31	34.96	0.54	29.78	54.48	9.60	3.12
1987	18.05	5.53	6.25	1.85	9.77	6.02	6.45	0.94	0.50	2.02	39.83	0.46	26.15	61.58	7.21	2.81
1990	18.59	6.16	7.42	2.01	R11.23	6.59	7.21	0.83	0.65	2.03	46.95	0.48	27.26	71.54	8.25	3.14
1993	21.95	8.66	6.24	2.81	R11.31	8.08	7.58	0.74	0.58	1.98	53.52	0.42	32.04	81.08	6.98	3.81
1997	24.11	8.56	6.57	2.79	10.20	8.84	8.99	1.04	0.89	2.86	60.57	0.36	35.81	88.33	7.61	4.04

[1] A small amount of natural gas used for air conditioning is included in "Natural Gas" under "Total."
[2] Includes refrigerators. A small amount of fuel oil or kerosene used for appliances is included in "Fuel Oil" under "Total."
[3] Site electricity. One kilowatthour = 3,412 Btu.
[4] Fuel oil is distillate fuel oil and kerosene.
[5] Liquefied petroleum gases.
[6] Nominal dollars.

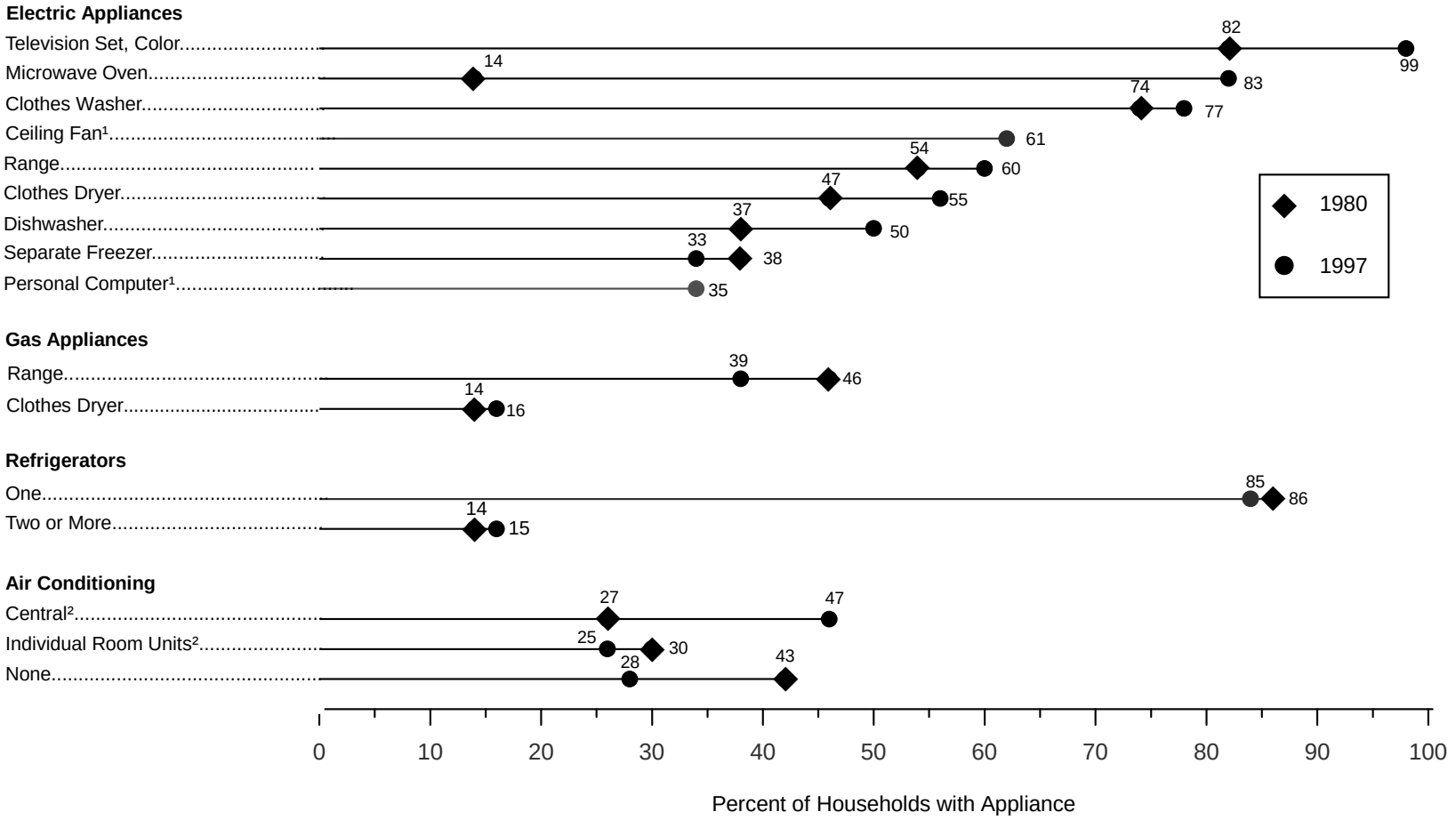
R=Revised.

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

Web Page: http://www.eia.doe.gov/emeu/consumption.

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

Figure 2.6 Households With Selected Appliances, 1980 and 1997



[1] Not collected in 1980.

[2] Households with both central and individual room units are counted only under "central."

Source: Table 2.6.

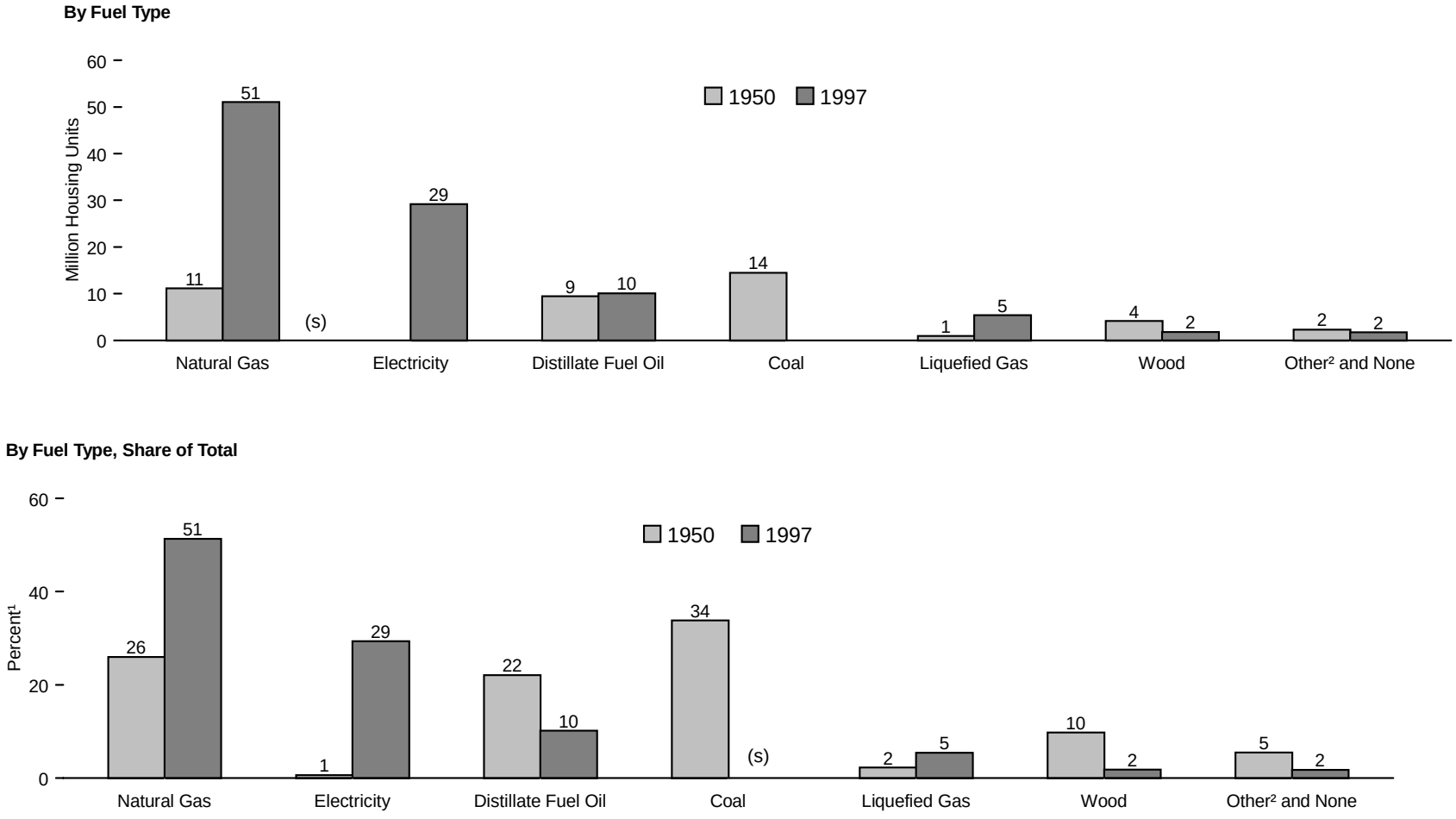
Table 2.6 Household Main Heating Fuel and Presence of Selected Appliances, Selected Years, 1978-1997

Appliance	Year										Change
	1978	1979	1980	1981	1982	1984	1987	1990	1993	1997	1980 to 1997
Total Households (millions)	R77	78	82	83	84	86	R91	94	97	101	+20
	Percent of Households										
Type of Main Heating Fuel											
Natural Gas	55	55	55	56	57	55	55	55	53	53	-2
Electricity	16	17	18	17	16	17	20	23	26	29	+12
Liquefied Petroleum Gas	4	5	5	4	5	5	5	5	5	5	0
Fuel Oil	20	17	15	14	13	12	12	11	11	9	-6
Wood	2	4	6	6	7	7	6	4	3	2	-4
Type of Appliances											
Electric Appliances											
Television Set (Color)	NA	NA	82	R83	85	88	93	96	98	99	+17
Television Set (B/W)	NA	NA	51	48	R46	43	36	31	20	NA	NA
Television Set (Any)	NA	NA	98	98	98	98	98	99	99	NA	NA
Clothes Washer	R74	NA	74	R73	R71	R73	R75	76	77	77	+3
Range (Stove-Top Burner)	53	NA	54	54	53	54	57	58	61	60	+7
Oven, Microwave	8	NA	14	17	21	34	61	79	84	83	+69
Clothes Dryer	45	NA	47	45	45	46	51	53	57	55	+8
Separate Freezer	35	NA	38	38	37	37	34	R34	35	33	-5
Dishwasher	35	NA	37	37	36	38	43	45	45	50	+13
Dehumidifier	NA	NA	9	9	9	9	10	12	9	NA	NA
Waterbed Heaters	NA	NA	NA	NA	NA	10	14	15	12	8	NA
Window or Ceiling Fan	NA	NA	NA	NA	28	35	46	51	60	NA	NA
Ceiling Fan	NA	NA	NA	NA	NA	NA	NA	NA	54	61	NA
Whole House Fan	NA	NA	NA	NA	8	8	9	10	4	NA	NA
Evaporative Cooler	NA	NA	4	4	4	4	3	4	3	NA	NA
Personal Computer	NA	NA	NA	NA	NA	NA	NA	16	23	35	NA
Pump for Well Water	NA	NA	NA	NA	NA	NA	NA	15	13	14	NA
Swimming-Pool Pump [1]	NA	NA	3	4	3	NA	NA	5	5	5	+2
Gas Appliances [2]											
Range (Stove-Top or Burner)	48	NA	46	46	47	45	43	42	38	39	-7
Clothes Dryer	14	NA	14	16	15	16	15	16	15	16	+2
Outdoor Gas Grill	R 6	NA	9	9	11	13	20	26	29	NA	NA
Outdoor Gas Light	2	NA	2	2	2	1	1	1	1	1	-1
Swimming Pool Heater [3]	NA	NA	(s)	(s)	(s)	1	1	R 1	1	1	0
Refrigerators [4]											
One	86	NA	86	87	86	88	86	84	85	85	-1
Two or More	14	NA	14	13	13	12	14	15	15	15	+1
Air Conditioning (A/C)											
Central [5]	23	24	27	27	28	30	R34	39	44	47	20
Individual Room Units [5]	33	31	30	31	30	30	30	29	25	25	-5
None	44	45	43	42	42	40	36	32	32	28	-15
Portable Kerosene Heaters	(s)	NA	(s)	1	3	6	6	5	R 3	2	+2

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

R=Revised data. NA=Not available. (s)=Less than 0.5 percent.
Note: No data are available for years not shown.
Web Page: http://www.eia.doe.gov/emeu/consumption.
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 2.7 Type of Heating in Occupied Housing Units, 1950 and 1997



¹ Sum of components may not equal 100 percent due to independent rounding.
² Kerosene, solar, and other.
(s)=Less than 0.5.

Source: Table 2.7.

Table 2.7 Type of Heating in Occupied Housing Units, Selected Years, 1950-1997

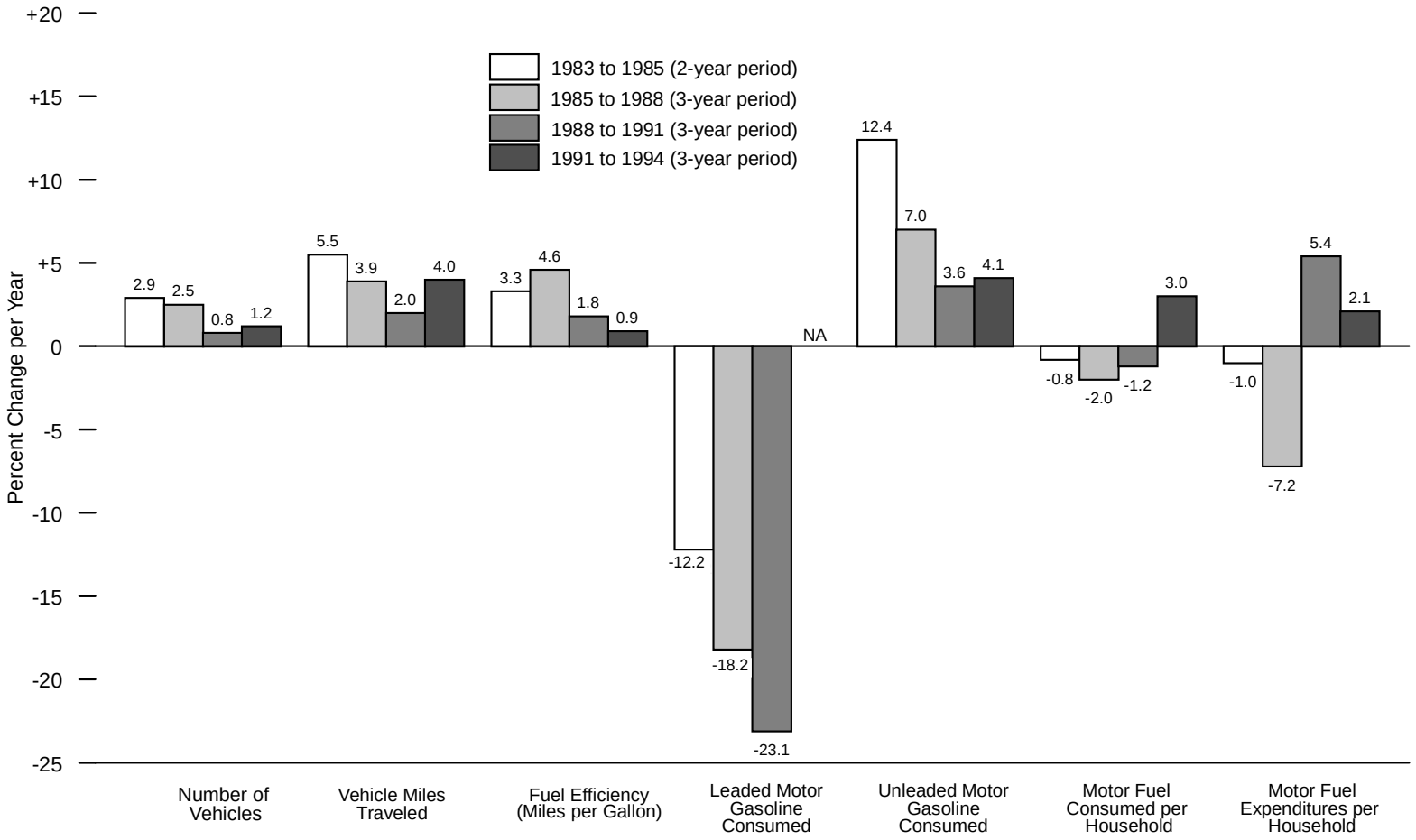
Year	Coal [1]	Natural Gas	Liquefied Gas	Distillate Fuel Oil	Kerosene	Electricity	Wood	Solar	Other	None [2]	Total
					Million						
1950	14.48	11.12	0.98	9.46	([3])	0.28	4.17	NA	0.77	1.57	42.83
1960	6.46	22.85	2.69	17.16	([3])	0.93	2.24	NA	0.22	0.48	53.02
1970	1.82	35.01	3.81	16.47	([3])	4.88	0.79	NA	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	0.04	0.40	0.66	93.68
1991	0.32	47.02	3.88	11.47	0.99	23.71	4.44	0.03	0.41	0.86	93.15
1993	0.30	47.67	3.92	11.17	1.02	25.11	4.10	0.03	0.50	0.91	94.73
1995	0.21	49.20	4.25	10.98	1.06	26.77	3.53	0.02	0.64	1.04	97.69
1997	0.18	51.05	5.40	10.10	0.75	29.20	1.79	0.03	0.36	0.62	99.49
					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
1993	0.3	50.3	4.1	11.8	1.1	26.5	4.3	(s)	0.5	1.0	100.0
1995	0.2	50.4	4.4	11.2	1.1	27.4	3.6	(s)	0.7	1.1	100.0
1997	0.2	51.3	5.4	10.2	0.8	29.4	1.8	(s)	0.4	0.6	100.0

[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 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 1997*, Table 2-5.

Figure 2.8 Household Motor Vehicle Data



Note: The percent changes are of all income categories; they are simple average annual percent changes (computed as the percent change over the period divided by the number of years in the period) and will differ slightly from compound average annual percent changes.

NA=Not Available.
Source: Table 2.8.

Table 2.8 Household Motor Vehicle Data, 1983, 1985, 1988, 1991, and 1994

Unit of Measure	Family Income														
	Less than $25,000					$25,000 or More					All Income Categories				
	1983	1985	1988	1991	1994	1983	1985	1988	1991	1994	1983	1985	1988	1991	1994
Households with Vehicles (millions)	42.9	43.3	38.9	36.5	34.5	30.5	34.5	42.2	48.2	50.3	73.4	77.7	81.3	84.6	84.9
Vehicles (millions)	66.7	65.4	58.7	52.7	52.0	63.0	71.9	88.8	98.5	104.8	129.7	137.3	147.5	151.2	156.8
Vehicle Miles Traveled (billions)	589	587	550	488	550.4	630	766	960	1,114	1,242.8	1,219	1,353	1,511	1,602	1,793
Motor Fuel Consumed (billion gallons)	40.8	38.2	31.4	26.9	28.3	39.8	45.7	51.0	55.9	62.3	80.5	83.9	82.4	82.8	90.6
Motor Gasoline Consumed (billion gallons)															
Leaded	19.2	13.5	5.4	1.8	Q	13.2	11.0	5.8	1.6	Q	32.4	24.5	11.1	3.4	Q
Unleaded	20.9	24.2	25.7	24.7	26.7	25.3	33.7	44.3	52.9	60.3	46.3	57.8	69.9	77.5	87.0
Motor Fuel Expenditures (billion dollars[1])	48.1	44.8	30.7	31.7	32.6	47.3	54.3	50.3	66.6	72.1	95.4	99.1	81.1	98.2	104.7
Averages per Household with Vehicles															
Vehicles	1.6	1.5	1.5	1.4	1.5	2.1	2.1	2.1	2.0	2.1	1.8	1.8	1.8	1.8	1.8
Vehicle Miles Traveled (thousands)	13.7	13.6	14.1	13.4	15.9	20.7	22.2	22.7	23.1	24.7	16.6	17.4	18.6	18.9	21.1
Motor Fuel Consumed (gallons)	950	883	807	737	818	1,305	1,326	1,205	1,160	1,238	1,097	1,079	1,014	979	1,067
Motor Fuel Expenditures (dollars[1])	1,121	1,035	789	869	943	1,552	1,575	1,191	1,382	1,433	1,300	1,274	998	1,161	1,234
Averages per Vehicle															
Vehicle Miles Traveled (thousands)	8.8	9.0	9.4	9.3	10.6	10.0	10.7	10.8	11.3	11.9	9.4	9.9	10.3	10.6	11.4
Motor Fuel Consumed (gallons)	612	585	536	510	545	631	636	574	568	594	621	611	559	548	578
Motor Fuel Expenditures (dollars[1])	722	685	524	602	628	751	755	567	676	688	736	722	550	650	668
Fuel Efficiency (miles per gallon)	14.4	15.3	17.5	18.1	19.5	15.8	16.8	18.8	19.9	20.0	15.1	16.1	18.3	19.3	19.8
Price of Motor Gasoline (dollars[1] per gallon)															
Leaded	1.14	1.11	0.90	1.10	Q	1.14	1.11	0.90	1.10	Q	1.14	1.11	0.90	1.10	Q
Unleaded	1.22	1.20	0.99	1.18	1.15	1.22	1.21	1.00	1.19	1.16	1.22	1.21	1.00	1.19	1.16

[1] Nominal dollars.

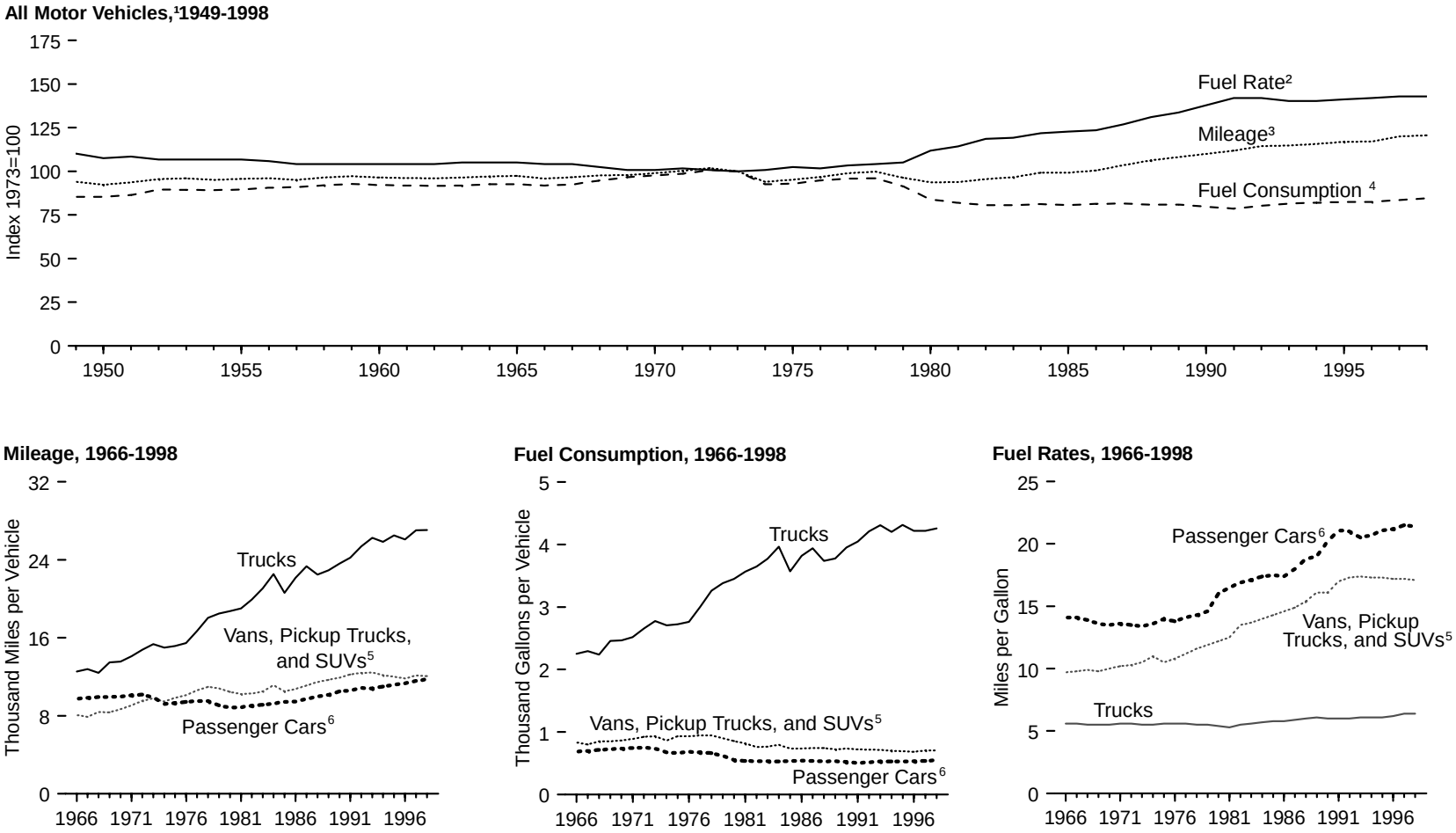
Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 10 households were sampled.

Notes: • Included are passenger cars, minivans, 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. Purchase diaries, which were fuel purchase logs retained by drivers in 1983 and 1985, were used as the basis for estimating data for those years. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/emeu/consumption.

Sources: **Fuel Efficiency:** • 1983 and 1985—Energy Information Administration (EIA), "Residential Transportation Energy Consumption Survey," purchase diaries. • 1988 through 1994—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 through 1994—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 2.9 Motor Vehicle Mileage, Fuel Consumption, and Fuel Rates



[1] Passenger cars, motorcycles, vans, pickup trucks, sport utility vehicles, trucks, and buses.
[2] Miles per gallon.
[3] Miles per vehicle.
[4] Gallons per vehicle.
[5] Sport utility vehicles.
[6] Motorcycles are included with passenger cars through 1989.
Source: Table 2.9.

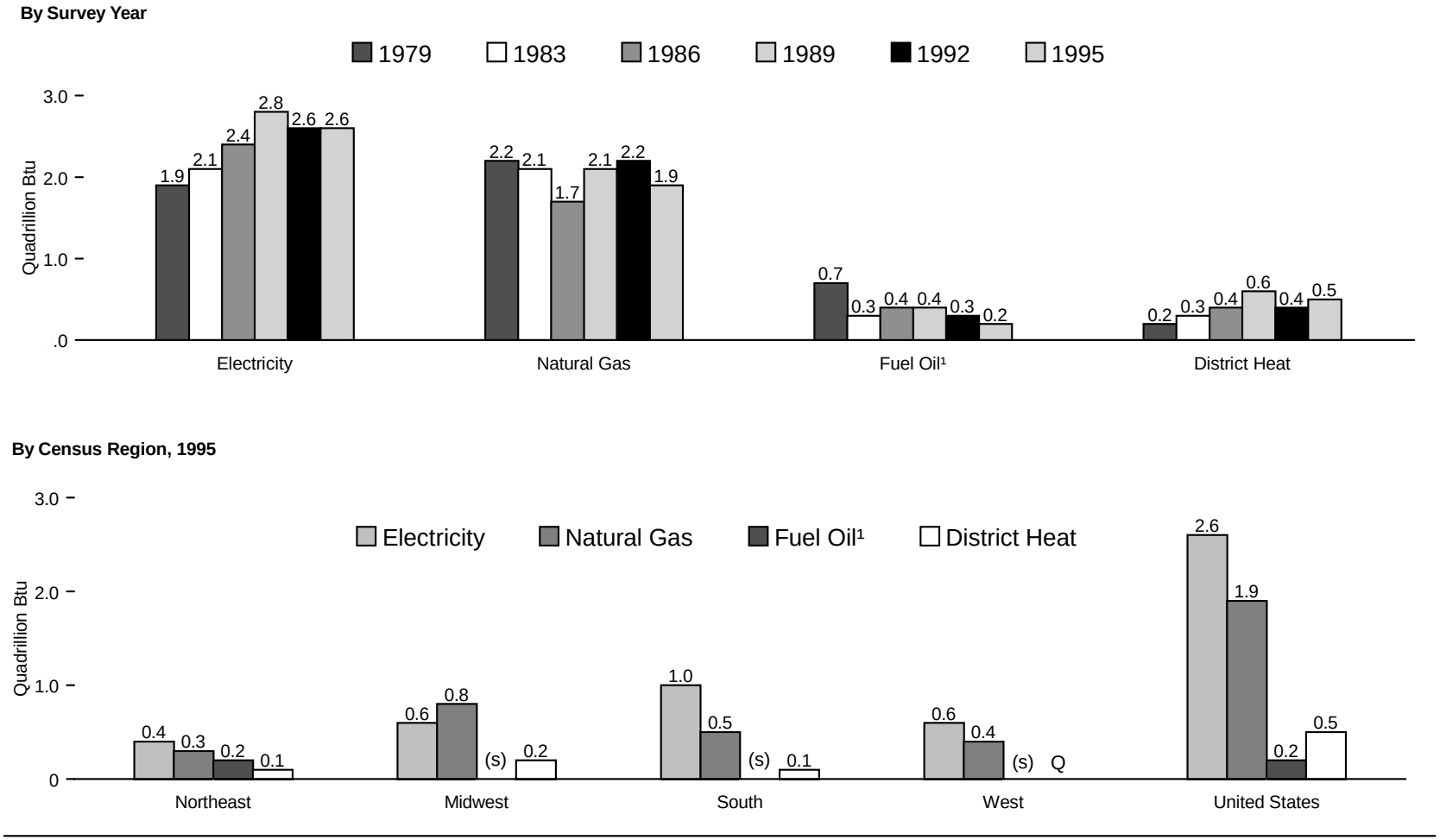
Table 2.9 Motor Vehicle Mileage, Fuel Consumption, and Fuel Rates, 1949-1998

Year	Passenger Cars			Vans, Pickup Trucks, and Sport Utility Vehicles [1]			Trucks [2]			All Motor Vehicles [3]		
	Mileage (miles per vehicle)	Fuel Consumption (gallons per vehicle)	Fuel Rate (miles per gallon)	Mileage (miles per vehicle)	Fuel Consumption (gallons per vehicle)	Fuel Rate (miles per gallon)	Mileage (miles per vehicle)	Fuel Consumption (gallons per vehicle)	Fuel Rate (miles per gallon)	Mileage (miles per vehicle)	Fuel Consumption (gallons per vehicle)	Fuel Rate (miles per gallon)
1949	[4]9,388	[4]627	[4]15.0	([5])	([5])	([5])	[6]9,712	[6]1,080	[6]9.0	9,498	726	13.1
1950	[4]9,060	[4]603	[4]15.0	([5])	([5])	([5])	[6]10,316	[6]1,229	[6]8.4	9,321	725	12.8
1951	[4]9,186	[4]614	[4]15.0	([5])	([5])	([5])	[6]10,545	[6]1,242	[6]8.5	9,460	735	12.9
1952	[4]9,360	[4]639	[4]14.7	([5])	([5])	([5])	[6]10,769	[6]1,288	[6]8.4	9,642	762	12.7
1953	[4]9,377	[4]640	[4]14.6	([5])	([5])	([5])	[6]10,963	[6]1,283	[6]8.5	9,684	760	12.7
1954	[4]9,349	[4]641	[4]14.6	([5])	([5])	([5])	[6]10,682	[6]1,281	[6]8.3	9,605	758	12.7
1955	[4]9,447	[4]645	[4]14.6	([5])	([5])	([5])	[6]10,576	[6]1,293	[6]8.2	9,661	761	12.7
1956	[4]9,496	[4]654	[4]14.5	([5])	([5])	([5])	[6]10,511	[6]1,309	[6]8.0	9,688	771	12.6
1957	[4]9,348	[4]658	[4]14.2	([5])	([5])	([5])	[6]10,774	[6]1,304	[6]8.3	9,609	773	12.4
1958	[4]9,500	[4]670	[4]14.2	([5])	([5])	([5])	[6]10,768	[6]1,303	[6]8.3	9,732	782	12.4
1959	[4]9,615	[4]674	[4]14.3	([5])	([5])	([5])	[6]10,702	[6]1,328	[6]8.1	9,817	789	12.4
1960	[4]9,518	[4]668	[4]14.3	([5])	([5])	([5])	[6]10,693	[6]1,333	[6]8.0	9,732	784	12.4
1961	[4]9,521	[4]663	[4]14.4	([5])	([5])	([5])	[6]10,537	[6]1,341	[6]7.9	9,708	781	12.4
1962	[4]9,494	[4]662	[4]14.3	([5])	([5])	([5])	[6]10,554	[6]1,337	[6]7.9	9,687	779	12.4
1963	[4]9,587	[4]655	[4]14.6	([5])	([5])	([5])	[6]10,395	[6]1,380	[6]7.5	9,737	780	12.5
1964	[4]9,665	[4]661	[4]14.6	([5])	([5])	([5])	[6]10,408	[6]1,389	[6]7.5	9,805	787	12.5
1965	[4]9,603	[4]661	[4]14.5	([5])	([5])	([5])	[6]10,851	[6]1,387	[6]7.8	9,826	787	12.5
1966	[4]9,733	[4]688	[4]14.1	8,077	833	9.7	12,537	2,250	5.6	9,675	780	12.4
1967	[4]9,849	[4]699	[4]14.1	7,877	801	9.8	12,789	2,294	5.6	9,751	786	12.4
1968	[4]9,922	[4]714	[4]13.9	8,376	849	9.9	12,402	2,240	5.5	9,864	805	12.2
1969	[4]9,921	[4]727	[4]13.6	8,355	851	9.8	13,484	2,459	5.5	9,885	821	12.0
1970	[4]9,989	[4]737	[4]13.5	8,676	866	10.0	13,565	2,467	5.5	9,976	830	12.0
1971	[4]10,097	[4]743	[4]13.6	9,082	888	10.2	14,117	2,519	5.6	10,133	839	12.1
1972	[4]10,171	[4]754	[4]13.5	9,534	922	10.3	14,780	2,657	5.6	10,279	857	12.0
1973	[4]9,884	[4]737	[4]13.4	9,779	931	10.5	15,370	2,775	5.5	10,099	850	11.9
1974	[4]9,221	[4]677	[4]13.6	9,452	862	11.0	14,995	2,708	5.5	9,493	788	12.0
1975	[4]9,309	[4]665	[4]14.0	9,829	934	10.5	15,167	2,722	5.6	9,627	790	12.2
1976	[4]9,418	[4]681	[4]13.8	10,127	934	10.8	15,438	2,764	5.6	9,774	806	12.1
1977	[4]9,517	[4]676	[4]14.1	10,607	947	11.2	16,700	3,002	5.6	9,978	814	12.3
1978	[4]9,500	[4]665	[4]14.3	10,968	948	11.6	18,045	3,263	5.5	10,077	816	12.4
1979	[4]9,062	[4]620	[4]14.6	10,802	905	11.9	18,502	3,380	5.5	9,722	776	12.5
1980	[4]8,813	[4]551	[4]16.0	10,437	854	12.2	18,736	3,447	5.4	9,458	712	13.3
1981	[4]8,873	[4]538	[4]16.5	10,244	819	12.5	19,016	3,565	5.3	9,477	697	13.6
1982	[4]9,050	[4]535	[4]16.9	10,276	762	13.5	19,931	3,647	5.5	9,644	686	14.1
1983	[4]9,118	[4]534	[4]17.1	10,497	767	13.7	21,083	3,769	5.6	9,760	686	14.2
1984	[4]9,248	[4]530	[4]17.4	11,151	797	14.0	22,550	3,967	5.7	10,017	691	14.5
1985	[4]9,419	[4]538	[4]17.5	10,506	735	14.3	20,597	3,570	5.8	10,020	685	14.6
1986	[4]9,464	[4]543	[4]17.4	10,764	738	14.6	22,143	3,821	5.8	10,143	692	14.7
1987	[4]9,720	[4]539	[4]18.0	11,114	744	14.9	23,349	3,937	5.9	10,453	694	15.1
1988	[4]9,972	[4]531	[4]18.8	11,465	745	15.4	22,485	3,736	6.0	10,721	688	15.6
1989	[4]10,157	[4]533	[4]19.0	11,676	724	16.1	22,926	3,776	6.1	10,932	688	15.9
1990	[R]10,504	[R]520	[R]20.2	11,902	738	16.1	23,603	3,953	6.0	11,107	677	16.4
1991	[R]10,571	[R]501	[R]21.1	12,245	721	17.0	24,229	4,047	6.0	11,294	669	16.9
1992	[R]10,857	[R]517	21.0	12,381	717	17.3	25,373	4,210	6.0	11,558	683	16.9
1993	[R]10,804	[R]527	[R]20.5	12,430	714	17.4	26,262	4,309	6.1	11,595	693	16.7
1994	[R]10,992	[R]531	[R]20.7	12,156	701	17.3	25,838	4,202	6.1	11,683	698	16.7
1995	11,203	530	21.1	12,018	694	17.3	26,514	4,315	6.1	11,793	700	16.8
1996	[R]11,330	534	21.2	11,811	685	17.2	26,092	4,221	6.2	11,813	700	16.9
1997	[R]11,581	[R]539	21.5	12,115	703	17.2	27,032	4,218	6.4	[R]12,107	711	17.0
1998[P]	11,725	548	21.4	12,061	704	17.1	27,064	4,257	6.4	12,183	719	17.0

[1] Includes a small number of trucks with 2 axles and 4 tires, such as step vans.
[2] Single-unit trucks with 2 axles and 6 or more tires, and combination trucks.
[3] Includes buses and motorcycles, which are not shown separately.
[4] Includes motorcycles.
[5] Included in "Trucks."
[6] Includes vans, pickup trucks, and sport utility vehicles.
R=Revised. P=Preliminary.

Note: For vehicle registrations data see the "Sources" or the "Web Page."
Web Page: http://www.fhwa.dot.gov/ohim.
Sources: **Passenger Cars:** • 1990-1994—U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 1998,* Table 4-13. **All Other Data:** • 1949-1994—Federal Highway Administration (FHWA), *Highway Statistics Summary to 1995,* Table VM-201A. • 1995 forward—FHWA, *Highway Statistics,* annual reports, Table VM-1.

Figure 2.10 Commercial Buildings Consumption by Energy Source



[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 0.05 quadrillion Btu.

Source: Table 2.10. See Appendix D for Census regions.

Table 2.10 Commercial Buildings Consumption by Energy Source, Selected Years, 1979-1995

(Trillion Btu)

Energy Source and Year	Square Footage Category			Principal Building Activity				Census Region [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	1,255	2,202	1,508	894	861	511	2,699	1,217	1,826	1,395	526	4,965
1983	1,242	1,935	1,646	812	1,018	480	2,513	858	1,821	1,462	682	4,823
1986	1,273	2,008	1,696	985	1,008	633	2,351	1,037	1,585	1,459	896	4,977
1989	1,259	2,402	2,127	1,048	1,230	704	2,806	1,354	1,659	1,648	1,126	5,788
1992	1,258	2,301	1,932	892	1,247	637	2,714	1,090	1,578	1,825	998	5,490
1995 [3]	1,332	2,152	1,838	973	1,019	614	2,716	1,035	1,497	1,684	1,106	5,321
Electricity												
1979	429	872	608	361	424	163	961	425	593	662	227	1,908
1983	469	903	758	426	509	152	1,041	324	673	801	331	2,129
1986	654	927	809	536	641	179	1,035	430	584	867	510	2,390
1989	572	1,145	1,056	550	781	217	1,225	586	609	975	604	2,773
1992	586	991	1,033	444	704	235	1,226	419	622	1,002	566	2,609
1995 [3]	618	1,064	926	508	676	221	1,204	436	558	1,027	587	2,608
Natural Gas												
1979	646	996	532	422	272	214	1,266	443	1,007	470	255	2,174
1983	684	809	597	327	365	246	1,152	278	978	523	311	2,091
1986	485	715	523	332	258	254	879	244	742	426	311	1,723
1989	568	836	670	417	238	323	1,095	353	831	498	391	2,073
1992	572	1,017	586	381	388	291	1,115	354	747	697	376	2,174
1995 [3]	535	830	580	395	239	245	1,066	297	750	528	371	1,946
Fuel Oil [4]												
1979	177	272	231	103	107	107	364	285	133	237	26	681
1983	85	140	90	43	75	61	135	172	28	104	Q	314
1986	114	206	121	105	39	103	194	270	63	86	23	442
1989	101	170	86	76	43	71	167	237	61	50	Q	357
1992	86	111	75	55	47	62	109	194	26	48	Q	272
1995 [3]	71	104	60	49	28	57	101	168	16	45	7	235
District Heat [5]												
1979	Q	61	136	Q	58	27	108	64	93	Q	Q	201
1983	Q	83	202	Q	68	21	184	84	141	34	30	289
1986	Q	159	243	12	71	97	243	94	196	81	51	422
1989	19	252	315	Q	167	Q	319	179	159	126	121	585
1992	Q	182	238	Q	109	49	264	123	183	78	51	435
1995 [3]	Q	154	271	Q	75	91	346	135	173	83	Q	533
Propane												
1979	23	15	5	10	Q	2	29	Q	16	15	10	43
1983	20	12	2	6	Q	2	24	Q	7	21	Q	34
1986	44	18	1	17	Q	3	42	9	19	26	Q	63

[1] See Appendix D for Census regions.

[2] For 1979, 1983, and 1986 includes electricity, natural gas, fuel oil, district heat, and propane. For 1989, 1992, and 1995 includes electricity, natural gas, fuel oil, and district heat. Propane consumption statistics were not collected after 1986.

[3] Commercial buildings on multibuilding manufacturing facilities and parking garages were excluded in the 1995 survey.

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

[5] For 1979 and 1983, includes only purchased steam. For 1986, 1989, 1992, and 1995 includes purchased and nonpurchased steam and purchased and nonpurchased hot water.

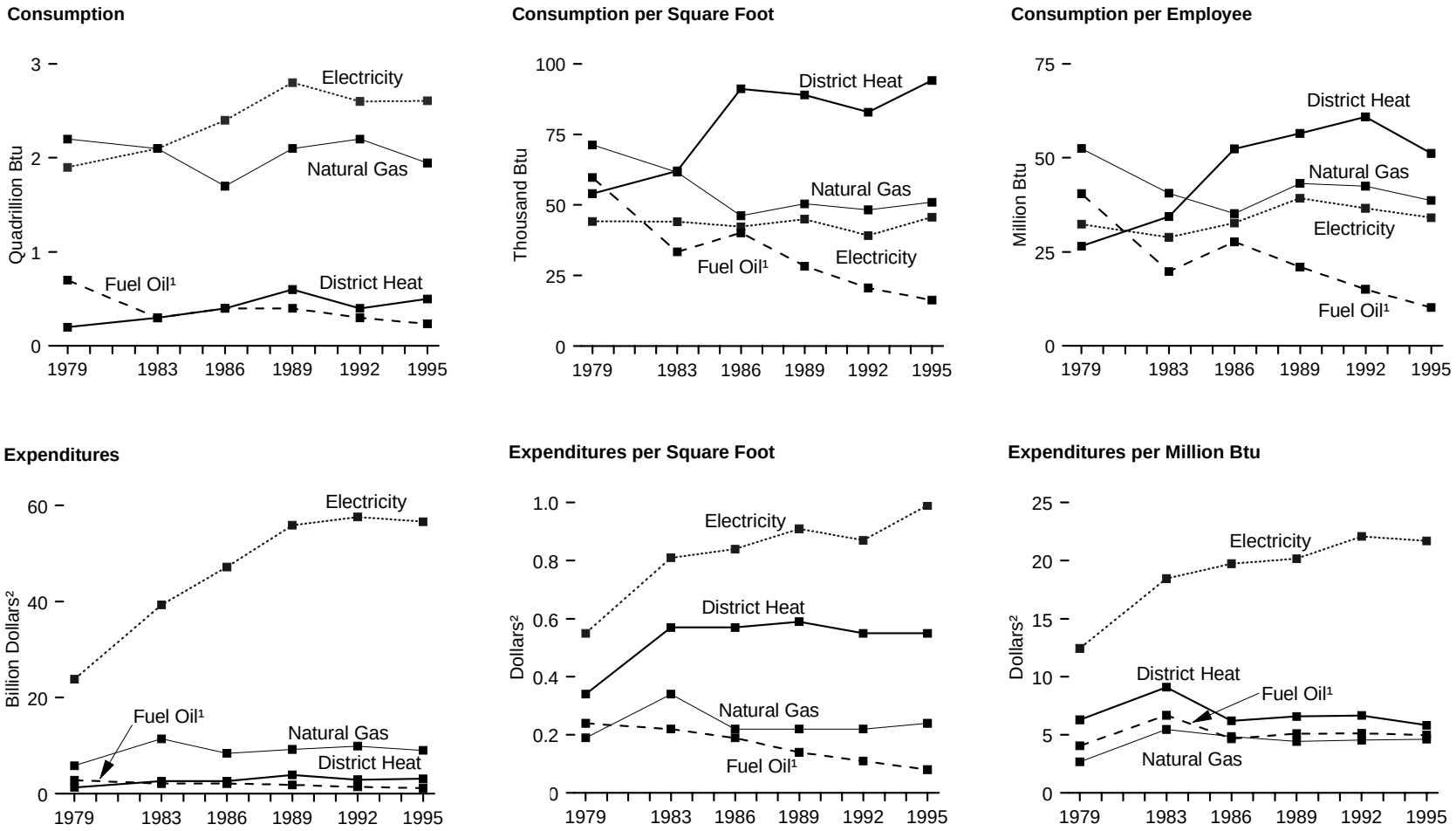
Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.

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

Web Page: http://www.eia.doe.gov/emeu/consumption.

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

Figure 2.11 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years, 1979-1995



¹ Distillate fuel oil, residual fuel oil, and kerosene.
² Nominal dollars.

Notes: • No data are available for 1980-1982, 1984, 1985, 1987, 1988, 1990, 1991, 1993, and 1994. • Because vertical scales differ, graphs should not be compared.
Source: Table 2.11.

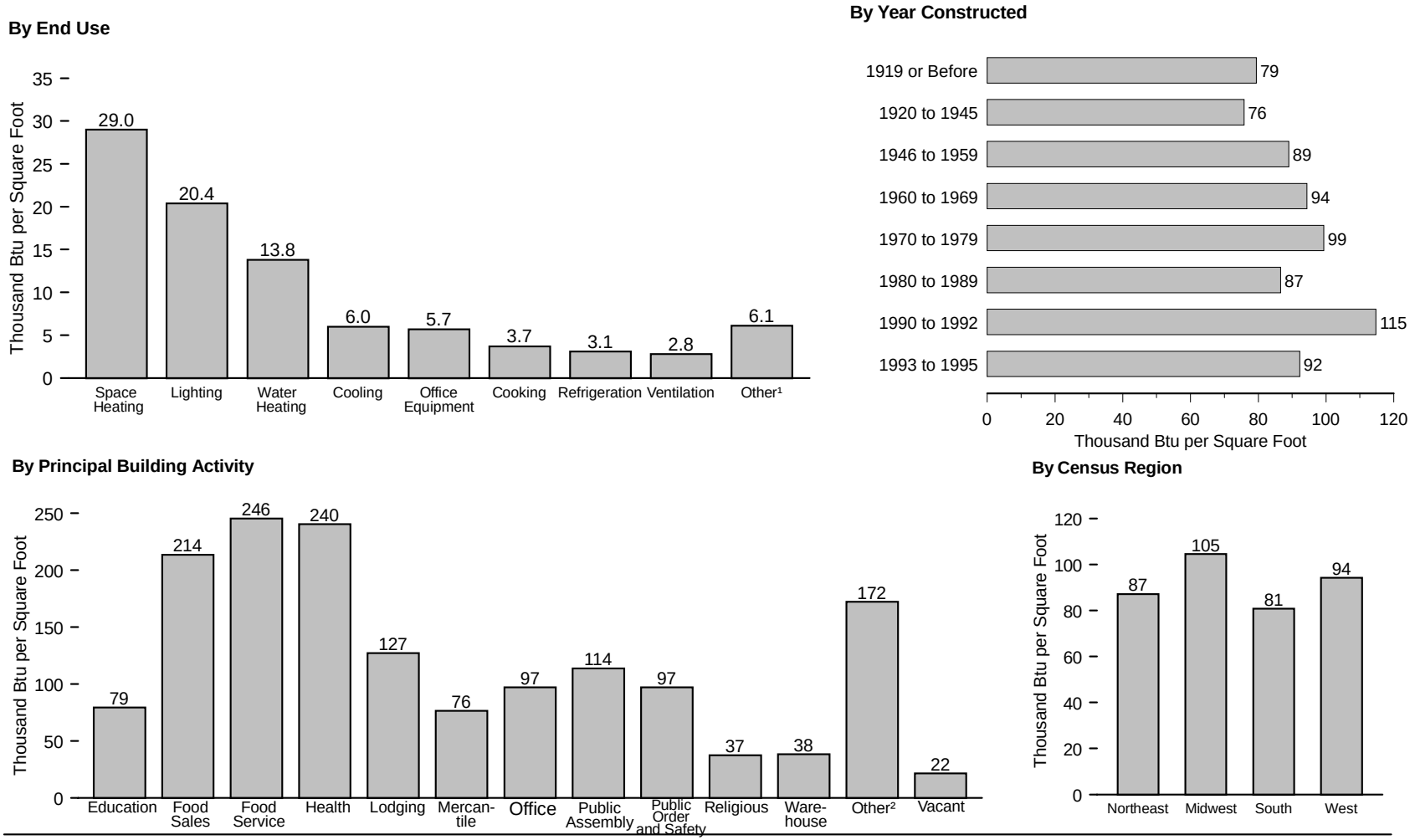
Table 2.11 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years, 1979-1995

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[1])	Per Building (thousand dollars[1])	Per Square Foot (dollars[1])	Per Million Btu (dollars[1])
Major Sources [2]											
1979	3,073	43,546	14.2	5,008	1,630	115.0	85.0	33,821	11.0	0.78	6.75
1983	3,185	49,471	15.5	4,856	1,525	98.2	65.7	55,764	17.5	1.13	11.48
1986	4,154	58,199	14.0	5,040	1,213	86.6	68.6	60,762	14.6	1.04	12.06
1989	4,528	63,184	14.0	5,788	1,278	91.6	81.9	70,826	15.6	1.12	12.24
1992	4,806	67,876	14.1	5,490	1,142	80.9	77.1	71,821	14.9	1.06	13.08
1995 [3]	4,579	58,772	12.8	5,321	1,162	90.5	69.3	69,918	15.3	1.19	13.14
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
1995 [3]	4,343	57,076	13.1	2,608	600	45.7	34.1	56,621	13.0	0.99	21.71
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	2,657	44,994	16.9	2,174	818	48.3	42.5	9,901	3.7	0.22	4.55
1995 [3]	2,478	38,145	15.4	1,946	785	51.0	38.7	9,018	3.6	0.24	4.63
Fuel Oil [4]											
1979	641	11,397	17.8	681	1,063	59.7	40.5	2,765	4.3	0.24	4.06
1983	441	9,409	21.3	314	714	33.4	19.8	2,102	4.8	0.22	6.68
1986	534	11,005	20.6	442	827	40.1	27.7	2,059	3.9	0.19	4.66
1989	581	12,600	21.7	357	614	28.3	21.0	1,822	3.1	0.14	5.11
1992	560	13,215	23.6	272	487	20.6	15.1	1,400	2.5	0.11	5.14
1995 [3]	607	14,421	23.7	235	387	16.3	10.2	1,175	1.9	0.08	5.00
District Heat [5]											
1979	47	3,722	79.0	201	4,267	54.0	26.5	1,267	26.9	0.34	6.30
1983	64	4,643	72.9	289	4,530	62.1	34.4	2,627	41.2	0.57	9.10
1986	77	4,625	59.7	422	5,446	91.2	52.4	2,620	33.8	0.57	6.21
1989	98	6,578	67.0	585	5,964	89.0	56.5	3,857	39.3	0.59	6.59
1992	95	5,245	55.4	435	4,596	82.9	60.9	2,901	30.7	0.55	6.67
1995 [3]	110	5,658	51.5	533	4,849	94.1	51.2	3,103	28.3	0.55	5.83
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
1995	589	5,344	9.1	NA	NA	NA	NA	NA	NA	NA	NA

[1] Nominal dollars.
[2] For 1979, 1983, and 1986 includes electricity, natural gas, fuel oil, district heat, and propane. For 1989, 1992, and 1995 includes electricity, natural gas, fuel oil, and district heat. Propane consumption statistics were not collected after 1986.
[3] Commercial buildings on multibuilding manufacturing facilities and parking garages were excluded in the 1995 survey.
[4] Distillate fuel oil, residual fuel oil, and kerosene.
[5] For 1979 and 1983, includes only purchased steam. For 1986, 1989, 1992, and 1995 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.
Web Page: http://www.eia.doe.gov/emeu/consumption.
Sources: • 1979—Energy Information Administration (EIA), Form EIA-143, "Nonresidential Buildings Energy Consumption Survey."• 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." • 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." • 1989, 1992, and 1995—EIA, Form EIA-871A-F, "Commercial Buildings Energy Consumption Survey."

Figure 2.12 Commercial Buildings Energy Intensities by Building Characteristic, 1995



[1] See Table 2.12, footnote 1, for description of "Other."

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

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

Source: Table 2.12.

Table 2.12 Commercial Buildings Energy Intensities by Building Characteristic, 1995

(Thousand Btu per Square Foot)

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

[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 D for Census regions.

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

Web Page: http://www.eia.doe.gov/emeu/consumption.

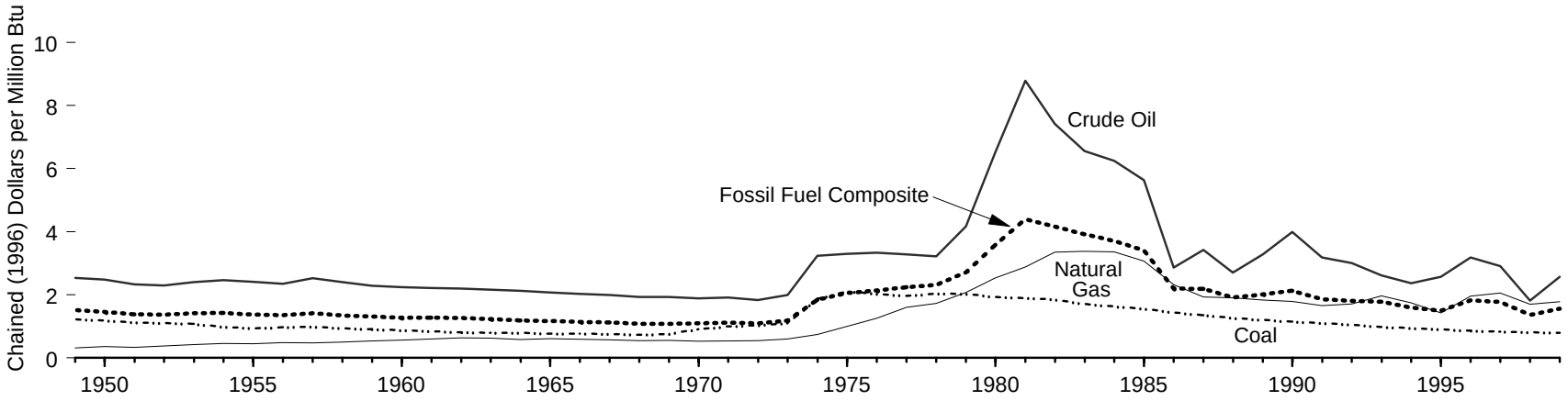
Source: Energy Information Administration, *A Look at Commercial Buildings in 1995: Characteristics, Energy Consumption, and Energy Expenditures* (October 1998), Table EU-2.

3 Financial Indicators

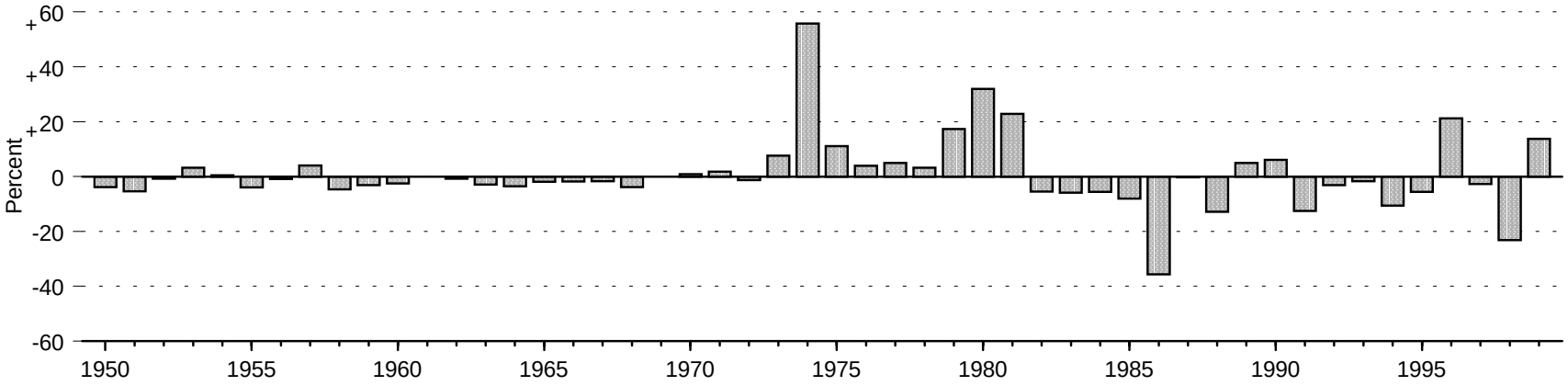
Gas Station, North Carolina, April 1999.

Figure 3.1 Fossil Fuel Production Prices

Prices, 1949-1999



Fossil Fuel Composite Price, Change from Previous Year, 1950-1999



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

Source: Table 3.1.

Table 3.1 Fossil Fuel Production Prices, 1949-1999

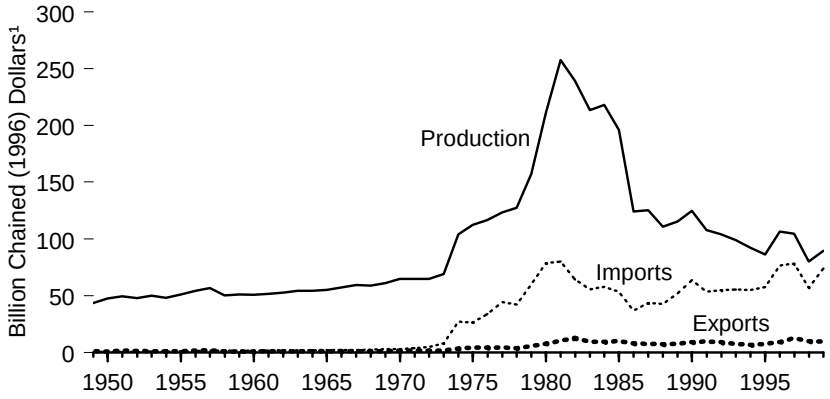
(Dollars per Million Btu)

Year	Coal [1]		Natural Gas [2]		Crude Oil [3]		Fossil Fuel Composite [4]		
	Nominal	Real [5]	Nominal	Real [5]	Nominal	Real [5]	Nominal	Real [5]	Percent Change [6]
1949	0.21	R1.22	0.05	R0.31	0.44	R2.54	0.26	R1.52	—
1950	0.21	R1.19	0.06	R0.36	0.43	R2.48	0.26	R1.46	-3.8
1951	0.21	R1.13	0.06	R0.34	0.44	R2.33	0.26	R1.38	R-5.3
1952	0.21	R1.10	0.07	R0.38	0.44	R2.30	0.26	R1.37	-0.7
1953	0.21	R1.08	0.08	R0.42	0.46	R2.40	0.27	R1.42	R3.2
1954	0.19	R0.99	0.09	R0.46	0.48	R2.46	0.28	R1.42	0.5
1955	0.19	R0.94	0.09	R0.45	0.48	R2.42	0.27	R1.37	R-3.9
1956	0.20	R0.97	0.10	R0.48	0.48	R2.35	0.28	R1.36	R-0.8
1957	0.21	R0.99	0.10	R0.47	0.53	R2.52	0.30	R1.42	R4.1
1958	0.20	R0.94	0.11	R0.50	0.52	R2.40	0.29	R1.35	R-4.7
1959	0.20	R0.91	0.12	R0.54	0.50	R2.28	0.29	R1.31	R-3.1
1960	0.19	R0.87	0.13	R0.57	0.50	R2.24	0.28	R1.28	R-2.4
1961	0.19	R0.85	0.14	R0.60	0.50	R2.22	0.29	R1.28	0.0
1962	0.19	R0.82	0.14	R0.64	0.50	R2.20	0.29	R1.27	R-0.7
1963	0.18	R0.80	0.14	R0.63	0.50	R2.16	0.28	R1.23	R-2.8
1964	0.18	R0.79	0.14	R0.58	0.50	R2.13	0.28	R1.19	R-3.5
1965	0.18	R0.77	0.14	R0.61	0.49	R2.07	0.28	R1.16	R-1.9
1966	0.19	R0.77	0.14	R0.59	0.50	R2.03	0.28	R1.14	-1.7
1967	0.19	R0.76	0.14	R0.58	0.50	R2.00	0.28	R1.13	-1.6
1968	0.19	R0.74	0.14	R0.54	0.51	R1.93	0.28	R1.08	R-3.8
1969	0.21	R0.76	0.15	R0.56	0.53	R1.93	0.30	R1.08	0.0
1970	0.27	R0.92	0.15	R0.53	0.55	R1.89	0.32	R1.09	R0.9
1971	0.30	R1.00	0.16	R0.53	0.58	R1.91	0.34	R1.11	R1.8
1972	0.33	R1.04	0.17	R0.54	0.58	R1.84	0.35	R1.10	R-1.3
1973	0.37	R1.09	0.20	R0.60	0.67	R2.00	0.40	R1.18	R7.7
1974	0.69	R1.87	0.27	R0.74	1.18	R3.23	0.68	R1.85	55.8
1975	0.84	R2.11	0.40	R1.00	1.32	R3.30	0.82	R2.05	R11.1
1976	0.86	R2.02	0.53	R1.26	1.41	R3.34	0.90	R2.13	R3.9
1977	0.88	R1.96	0.72	R1.61	1.48	R3.28	1.01	R2.24	R5.0
1978	0.98	R2.04	0.84	R1.73	1.55	R3.22	1.12	R2.31	R3.3
1979	1.06	R2.02	1.08	R2.07	2.18	R4.17	1.42	R2.71	R17.3
1980	1.10	R1.93	1.45	R2.54	3.72	R6.52	2.04	R3.58	R32.0
1981	1.18	R1.90	1.80	R2.88	5.48	R8.78	2.74	R4.40	R22.9
1982	1.22	R1.85	2.22	R3.35	4.92	R7.42	2.76	R4.16	R-5.4
1983	1.18	R1.71	2.32	R3.37	4.52	R6.56	2.70	R3.92	R-5.8
1984	1.16	R1.63	2.40	R3.36	4.46	R6.25	2.65	R3.70	-5.5
1985	1.15	R1.56	2.26	R3.06	4.15	R5.64	2.51	R3.41	R-8.0
1986	1.09	R1.44	1.75	R2.32	2.16	R2.86	1.65	R2.20	R-35.6
1987	1.05	R1.36	1.50	R1.94	2.66	R3.42	1.70	R2.19	-0.2
1988	1.01	R1.26	1.52	R1.90	2.17	R2.70	1.53	R1.91	R-12.8
1989	1.00	R1.20	1.53	R1.83	2.73	R3.28	1.67	R2.01	R5.0
1990	1.00	R1.15	1.55	R1.79	3.45	R3.99	1.84	R2.13	R6.1
1991	0.99	R1.10	1.48	R1.65	2.85	R3.18	1.67	R1.86	R-12.5
1992	0.97	R1.06	1.57	R1.71	2.76	R3.00	1.66	R1.80	R-3.1
1993	0.93	R0.99	1.84	R1.96	2.46	R2.61	1.67	R1.78	R-1.6
1994	0.91	R0.94	1.67	R1.74	2.27	R2.37	1.53	R1.59	R-10.5
1995	0.88	R0.90	1.40	R1.43	2.52	R2.57	1.47	R1.50	R-5.5
1996	0.87	R0.87	1.96	R1.96	3.18	R3.18	1.82	R1.82	R21.3
1997	0.85	R0.84	2.10	R2.06	2.97	R2.92	1.81	R1.77	-2.6
1998	0.83	R0.81	R1.75	R1.70	R1.87	R1.82	1.41	R1.36	R-23.1
1999P	70.83	70.80	1.86	1.78	2.68	2.56	71.63	71.55	713.8

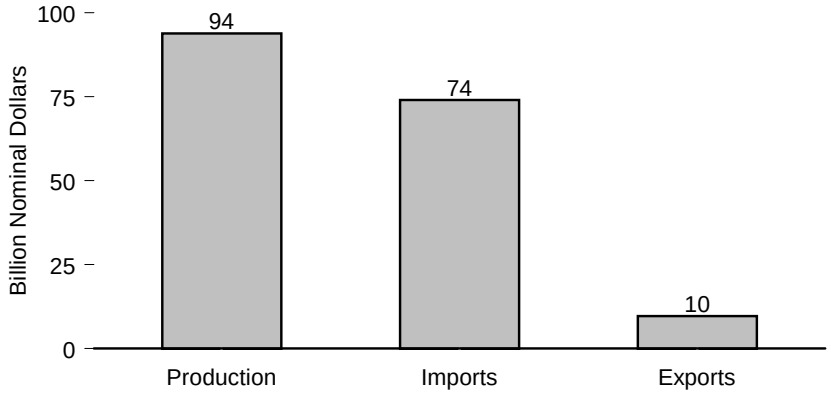
[1] Bituminous coal, subbituminous coal, and lignite prices are based on the value of coal produced at free-on-board (f.o.b.) mines; anthracite prices through 1978 are f.o.b. preparation plants and for 1979 forward are f.o.b. mines.
[2] Wellhead prices.
[3] Domestic first purchase prices.
[4] Derived 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.
[5] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.
[6] Based on real values.
[7] Calculated using the 1998 coal price for the 1999 value.
R=Revised. P=Preliminary. — = Not applicable.
Sources: Tables 5.16, 6.8, and 7.8, and Appendix A.

Figure 3.2 Value of Fossil Fuel Production

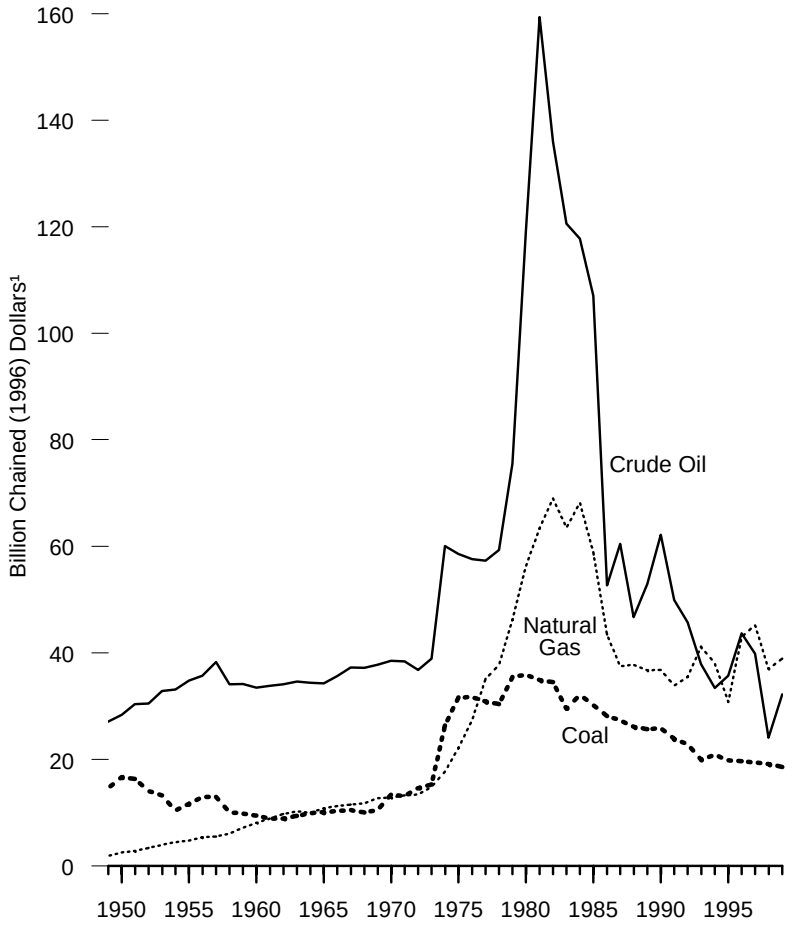
Overview, 1949-1999



Overview, 1999



Production by Fuel, 1949-1999



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

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

Sources: Tables 3.2, 3.5, and 3.6.

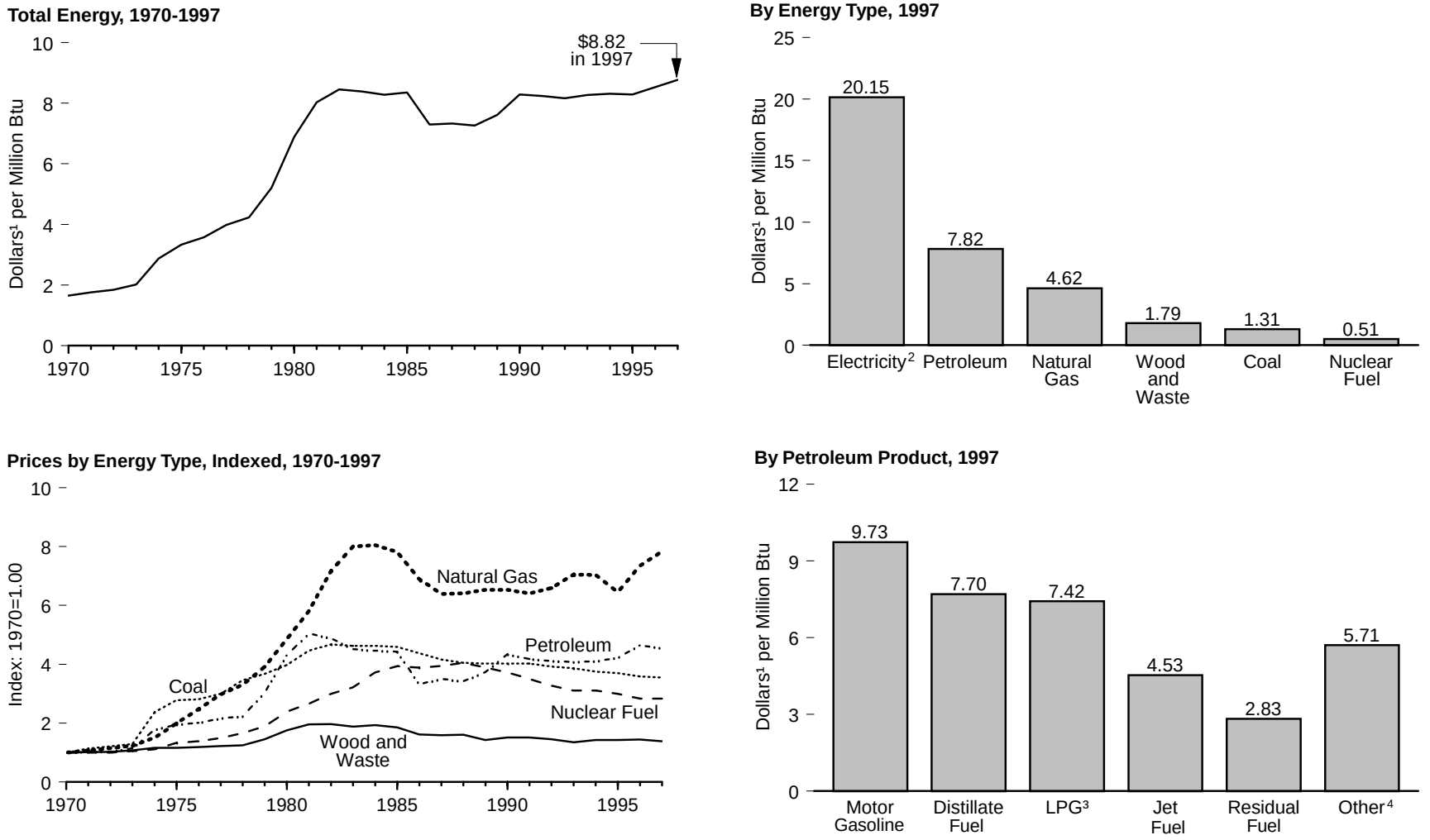
Table 3.2 Value of Fossil Fuel Production, 1949-1999

(Billion Dollars)

Year	Coal		Natural Gas [1]		Crude Oil [2]		Total	
	Nominal	Real [3]	Nominal	Real [3]	Nominal	Real [3]	Nominal	Real [3]
1949	2.52	R14.60	0.33	R1.91	4.68	R27.11	7.53	R43.62
1950	2.91	R16.68	0.44	R2.52	4.95	R28.37	8.30	R47.57
1951	3.05	R16.30	0.52	R2.78	5.69	R30.41	9.26	R49.49
1952	2.67	R14.05	0.64	R3.37	5.79	R30.47	9.10	R47.89
1953	2.55	R13.25	0.76	R3.95	6.32	R32.83	9.63	R50.03
1954	2.02	R10.39	0.87	R4.48	6.44	R33.13	9.33	R48.00
1955	2.30	R11.63	0.94	R4.75	6.88	R34.78	10.12	R51.16
1956	2.65	R12.96	1.11	R5.43	7.30	R35.70	11.06	R54.09
1957	2.74	R12.97	1.17	R5.54	8.09	R38.29	12.00	R56.80
1958	2.19	R10.12	1.32	R6.10	7.37	R34.06	10.88	R50.28
1959	2.14	R9.78	1.57	R7.18	7.47	R34.14	11.18	R51.10
1960	2.10	R9.46	1.79	R8.07	7.42	R33.44	11.31	R50.97
1961	1.99	R8.87	1.99	R8.87	7.58	R33.78	11.56	R51.52
1962	2.03	R8.93	2.22	R9.76	7.76	R34.12	12.01	R52.81
1963	2.17	R9.43	2.36	R10.26	7.96	R34.61	12.49	R54.30
1964	2.32	R9.94	2.33	R9.98	8.03	R34.40	12.68	R54.32
1965	2.40	R10.09	2.57	R10.81	8.15	R34.27	13.12	R55.17
1966	2.53	R10.34	2.75	R11.24	8.72	R35.65	14.00	R57.23
1967	2.65	R10.51	2.91	R11.54	9.39	R37.25	14.95	R59.30
1968	2.64	R10.04	3.09	R11.75	9.79	R37.22	15.52	R59.01
1969	2.90	R10.51	3.52	R12.76	10.42	R37.77	16.84	R61.04
1970	3.88	R13.35	3.73	R12.84	11.19	R38.51	18.80	R64.70
1971	4.01	R13.14	4.05	R13.27	11.71	R38.37	19.77	R64.78
1972	4.65	R14.61	4.28	R13.45	11.71	R36.80	20.64	R64.86
1973	5.14	R15.30	4.98	R14.82	13.07	R38.90	23.19	R69.02
1974	9.65	R26.35	6.48	R17.70	22.00	R60.08	38.13	R104.13
1975	12.67	R31.65	8.85	R22.11	23.45	R58.58	44.97	R112.34
1976	13.40	R31.68	11.57	R27.35	24.37	R57.61	49.34	R116.64
1977	13.91	R30.90	15.82	R35.14	25.79	R57.29	55.52	R123.33
1978	14.65	R30.38	18.18	R37.69	28.60	R59.30	61.43	R127.37
1979	18.55	R35.50	24.16	R46.24	39.45	R75.50	82.16	R157.24
1980	20.45	R35.85	32.09	R56.26	67.93	R119.09	120.47	R211.20
1981	21.75	R34.87	39.51	R63.35	99.40	R159.37	160.66	R257.59
1982	22.84	R34.48	45.71	R69.00	90.03	R135.89	158.58	R239.37
1983	20.32	R29.50	43.73	R63.49	83.05	R120.57	147.10	R213.56
1984	22.94	R32.11	48.69	R68.16	84.10	R117.72	155.73	R217.99
1985	22.27	R30.22	43.35	R58.83	78.88	R107.04	144.50	R196.09
1986	21.18	R28.12	32.71	R43.43	39.63	R52.62	93.52	R124.17
1987	21.20	R27.33	29.11	R37.52	46.93	R60.49	97.24	R125.34
1988	20.97	R26.14	30.28	R37.75	37.48	R46.73	88.73	R110.62
1989	21.40	R25.70	30.58	R36.72	44.07	R52.92	96.05	R115.34
1990	22.39	R25.88	31.80	R36.76	53.77	R62.15	107.96	R124.79
1991	21.40	R23.87	30.39	R33.89	44.77	R49.93	96.56	R107.69
1992	20.98	R22.84	32.56	R35.45	41.97	R45.70	95.51	R103.99
1993	18.77	R19.96	38.72	R41.17	35.61	R37.86	93.10	R98.99
1994	20.06	R20.89	36.46	R37.98	32.07	R33.40	88.59	R92.27
1995	19.45	R19.83	30.24	R30.83	35.00	R35.68	84.69	R86.34
1996	19.68	R19.68	R42.99	R42.99	43.68	R43.68	R106.35	R106.35
1997	19.77	R19.40	46.09	R45.23	40.57	R39.81	106.43	R104.44
1998	R19.75	R19.15	R38.11	R36.96	R24.80	R24.05	R82.66	R80.16
1999P	4 19.42	4 18.56	40.71	38.92	33.65	32.17	4 93.78	4 89.65

[1] Marketed production.
[2] Includes lease condensate.
[3] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.
[4] Calculated using the 1998 coal price for the 1999 value.
R=Revised. P=Preliminary.
Note: Value is based on fuel prices taken as closely as possible to the point of production.
Sources: Tables 5.1, 5.16, 6.2, 6.8, 7.2, and 7.8.

Figure 3.3 Consumer Price Estimates for Energy



[1] Nominal dollars.
[2] Electricity purchased by end users.
[3] Liquefied petroleum gases.
[4] Asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum coke, special naphthas, waxes, and miscellaneous petroleum products.

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

Source: Table 3.3.

Table 3.3 Consumer Price Estimates for Energy, 1970-1997

(Nominal Dollars per Million Btu)

Year	Primary Energy [1]												Electric Utility Fuel	Electricity Purchased by End-Users	Total Energy [4]
			Petroleum												
	Coal	Natural Gas	Distillate Fuel	Jet Fuel	LPG [2]	Motor Gasoline	Residual Fuel	Other [3]	Total	Nuclear Fuel	Wood and Waste	Total [4]			
1970	0.37	0.59	1.16	0.73	1.46	2.85	0.42	R1.38	R1.72	0.18	R1.29	1.08	0.32	R4.98	1.65
1971	0.42	0.63	1.22	0.77	1.49	2.90	0.58	R1.44	R1.79	0.18	R1.31	R1.15	0.38	5.30	1.76
1972	0.45	0.68	1.22	0.79	1.52	2.88	0.62	R1.49	1.78	0.18	R1.33	R1.18	0.41	5.54	1.84
1973	0.48	0.73	1.46	0.92	2.02	3.10	0.75	R1.57	R1.97	0.19	R1.39	1.29	0.46	5.86	2.02
1974	0.88	0.89	2.44	1.58	2.81	4.32	1.82	R2.59	R3.06	0.20	R1.50	1.94	0.86	7.42	2.87
1975	1.03	1.18	2.60	2.05	2.97	4.65	1.93	R2.92	R3.35	0.24	R1.50	2.19	0.96	8.61	3.33
1976	1.04	1.46	2.77	2.25	3.21	4.84	1.90	R3.07	R3.47	0.25	R1.53	2.34	1.02	9.13	3.57
1977	1.11	1.76	3.11	2.59	3.65	5.13	2.14	R3.25	R3.73	0.27	R1.58	R2.57	1.16	10.11	R3.98
1978	1.28	1.95	3.26	2.87	3.60	5.24	2.08	R3.44	R3.84	0.30	R1.61	R2.71	1.25	10.92	R4.23
1979	1.36	2.31	4.69	3.90	4.50	7.11	2.83	R4.69	R5.23	0.34	R1.88	3.47	1.48	11.78	R5.21
1980	1.47	2.86	6.70	6.36	5.64	9.84	3.88	R7.02	R7.40	0.43	R2.26	R4.57	1.75	13.95	R6.89
1981	1.65	3.43	8.03	7.57	6.18	10.94	4.91	R8.63	R8.68	0.48	R2.53	R5.24	2.00	16.14	R8.03
1982	1.73	4.23	7.78	7.23	6.66	10.39	4.65	R7.83	R8.39	0.54	R2.54	R5.32	2.01	18.16	R8.46
1983	1.71	4.72	7.32	6.53	7.17	9.12	4.50	R7.58	R7.77	0.58	R2.43	R5.11	1.98	18.62	R8.39
1984	1.71	4.75	7.36	6.25	6.93	8.89	4.75	R7.64	R7.67	0.67	R2.50	R5.02	1.97	18.50	R8.28
1985	1.70	4.61	7.18	5.91	6.54	9.01	4.30	R7.52	R7.62	0.71	R2.40	R4.90	1.85	19.05	R8.36
1986	1.62	4.07	5.66	3.92	6.42	6.79	2.37	R5.77	R5.72	0.70	R2.09	R3.95	1.55	R19.05	R7.30
1987	1.54	3.77	5.94	4.03	6.06	7.22	2.86	R5.59	R6.03	0.71	R2.06	R3.97	1.51	18.74	R7.33
1988	1.50	3.78	5.80	3.80	5.86	7.32	2.35	R5.23	R5.90	0.73	R2.07	R3.87	1.45	18.68	R7.26
1989	1.49	3.85	6.45	4.39	5.53	8.01	2.72	R5.47	R6.42	0.70	R1.85	R4.09	1.48	18.98	R7.61
1990	1.49	3.85	7.70	5.68	6.75	9.12	3.16	R5.80	R7.47	0.67	R,5 1.95	R,5 4.50	1.46	19.33	R,5 8.29
1991	1.49	3.78	7.28	4.83	6.79	8.93	2.62	R5.72	R7.19	0.63	R1.96	4.32	1.37	19.85	R8.24
1992	R1.45	3.89	7.11	4.52	6.19	8.96	2.27	R5.49	R7.07	0.59	R1.88	4.29	1.34	R20.06	R8.17
1993	1.43	4.16	7.10	4.29	6.20	8.82	2.25	R5.47	R7.01	0.56	R1.74	R4.31	1.35	20.38	R8.27
1994	R1.39	4.15	7.03	3.95	6.61	8.91	2.32	R5.46	R7.05	0.56	R1.84	4.32	1.30	20.34	R8.31
1995	1.37	3.81	7.02	4.00	6.54	9.14	2.46	R5.72	R7.26	0.54	R1.84	4.29	1.23	20.30	R8.29
1996	1.33	4.33	7.90	4.82	7.91	9.77	2.79	6.22	7.99	0.51	1.86	4.70	1.28	20.17	8.77
1997	1.31	4.62	7.70	4.53	7.42	9.73	2.83	5.71	7.82	0.51	1.79	4.72	1.30	20.15	8.82

[1] Primary energy is all energy, including that consumed to produce electricity but excluding the electricity produced.

[2] Liquefied petroleum gases.

[3] Asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum coke, special naphthas, waxes, and miscellaneous petroleum products.

[4] The "Primary Energy Total" and "Total Energy" prices include consumption-weighted average prices for coal coke imports and coal coke exports that are not shown in the other columns. In 1995, coal coke imports averaged 3.49 dollars per million Btu and coal coke exports averaged 2.71 dollars per million Btu.

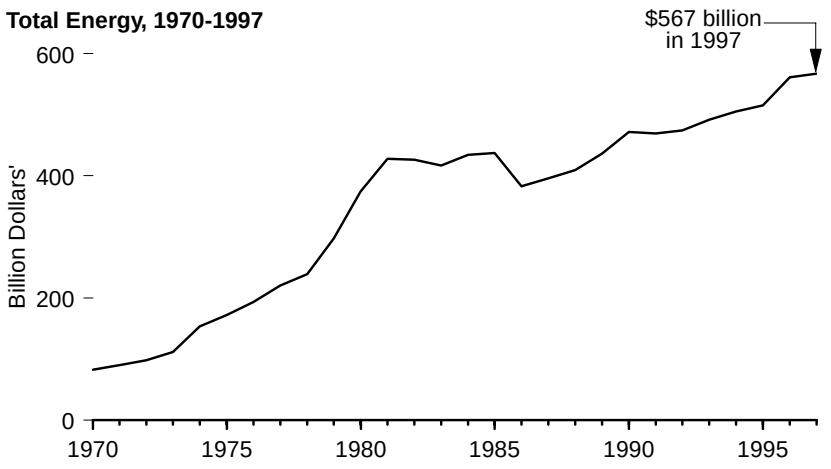
[5] There is a discontinuity in this time series between 1989 and 1990 due to expanded coverage of nonutility power producers' use of wood and waste beginning in 1990.

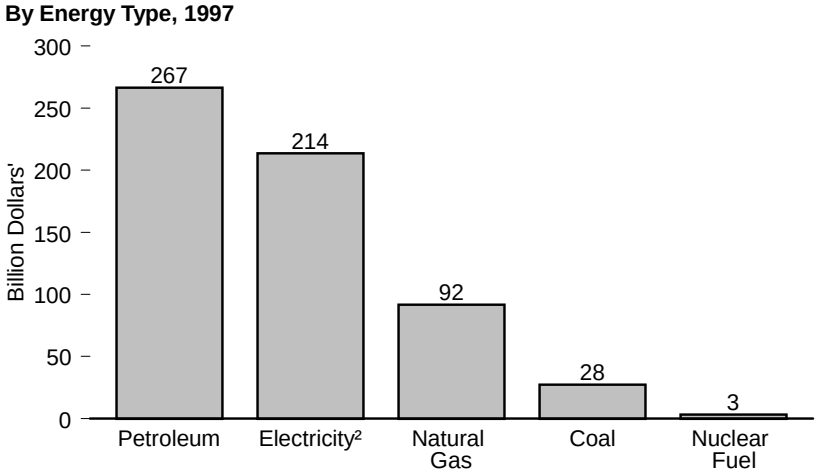
Note: There are no direct fuel costs for hydroelectric, geothermal, wind, or solar energy.

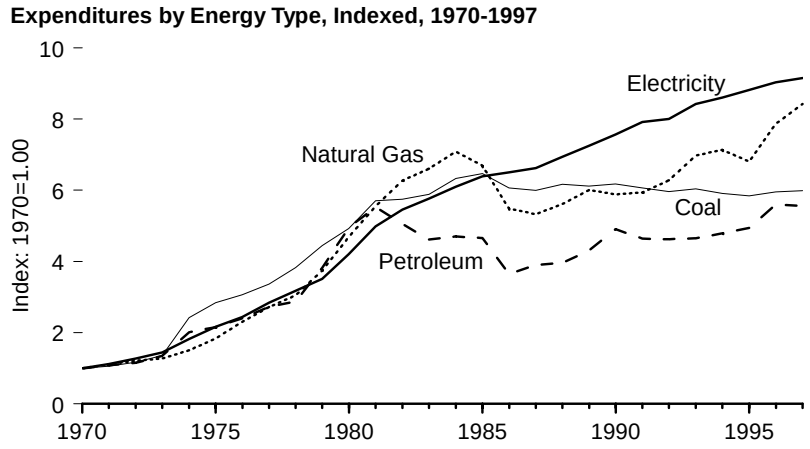
Web Page: http://www.eia.doe.gov/emeu/states/_states.html

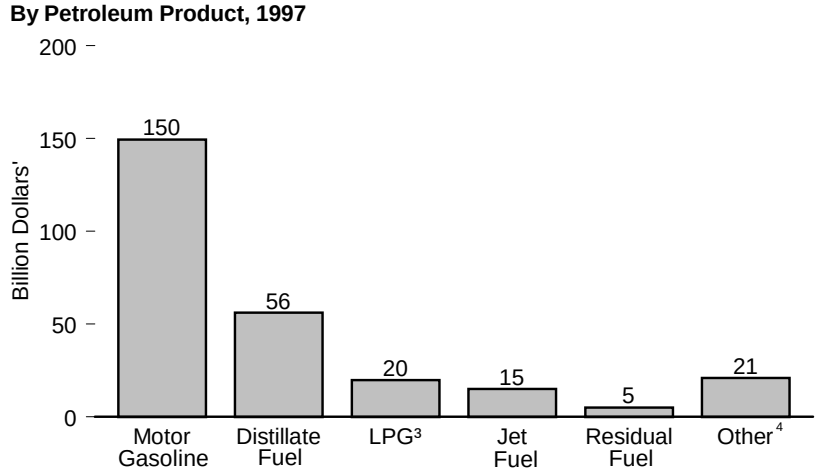
Source: Energy Information Administration (EIA), *State Energy Price and Expenditure Report 1997* (June 2000), Table 5, and EIA, Combined State Energy Data System 1997.

Figure 3.4 Consumer Expenditure Estimates for Energy









[1] Nominal dollars.

[2] Electricity purchased by end users.

[3] Liquefied petroleum gases.

[4] Asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum coke, special naphthas, waxes, and miscellaneous petroleum products.

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

Source: Table 3.4.

Table 3.4 Consumer Expenditure Estimates for Energy, 1970-1997

(Million Nominal Dollars)

Year	Primary Energy [1]													Electric Utility Fuel	Electricity Purchased by End-Users	Total Energy
				Petroleum												
	Coal	Net Imports of Coal Coke [2]	Natural Gas	Distillate Fuel	Jet Fuel	LPG [3]	Motor Gasoline	Residual Fuel	Other [4]	Total	Nuclear Fuel	Wood and Waste	Total			
1970	4,594	-75	10,891	6,253	1,441	2,446	31,596	2,046	R4,160	R47,942	44	R438	R63,833	-4,316	R23,345	R82,862
1971	4,883	-40	12,065	6,890	1,582	2,531	33,478	R2,934	R4,429	R51,844	73	R446	R69,271	-5,441	R26,202	R90,032
1972	5,412	-26	13,198	7,552	1,682	2,889	35,346	3,458	R4,755	R55,682	104	R476	R74,845	-6,473	R29,712	R98,084
1973	6,251	7	13,933	9,524	2,001	3,933	39,667	4,667	R5,299	R65,091	R178	R502	R85,961	-7,817	R33,774	R111,918
1974	11,145	150	16,380	R15,218	3,208	5,273	54,194	R10,548	R8,263	R96,704	259	R544	R125,182	-14,391	R42,586	R153,377
1975	13,047	82	20,061	15,680	4,193	R5,230	59,446	10,374	R8,449	R103,372	448	R534	R137,544	-16,396	50,680	R171,828
1976	14,079	44	25,097	18,402	4,567	5,993	64,977	11,648	R9,881	R115,468	520	R622	R155,830	-18,923	R56,972	R193,880
1977	15,448	67	29,602	22,004	5,517	6,824	70,591	14,381	R11,719	R131,036	743	R694	R177,590	-23,392	66,225	R220,423
1978	17,595	362	33,185	23,587	6,205	6,621	74,513	13,747	R13,294	R137,967	915	R782	R190,806	-25,746	R74,159	R239,219
1979	20,421	259	40,785	32,854	8,603	9,383	95,916	17,656	R18,761	R183,173	941	R964	R246,543	-31,031	R82,051	R297,563
1980	22,648	-78	R51,062	40,797	13,923	10,926	124,408	21,573	R26,001	R237,628	1,189	R1,251	R313,699	-37,435	R98,095	R374,359
1981	26,231	-31	60,544	48,200	15,607	11,900	138,138	22,668	R28,444	R264,957	1,436	R1,452	R354,589	-43,275	R116,455	R427,769
1982	26,426	-52	68,292	44,087	14,974	R12,926	R130,306	17,632	R22,354	R242,279	1,684	R1,475	R340,105	-41,311	R127,393	R426,187
1983	27,051	-44	72,000	41,846	13,979	14,083	115,816	14,099	R21,535	R221,358	1,859	R1,504	R323,728	-41,336	R134,731	R417,124
1984	R29,093	-22	77,169	44,580	15,097	14,143	114,438	14,410	R22,575	R225,243	2,384	R1,552	R335,418	-43,378	R142,420	R434,460
1985	R29,723	-34	72,938	43,759	14,747	13,545	R118,042	11,493	R22,005	R223,591	2,930	R1,471	R330,618	-42,558	R149,233	R437,292
1986	R27,895	-40	59,702	34,995	10,505	12,694	91,526	7,486	R17,579	R174,785	3,125	R1,299	R266,765	R-35,792	R151,793	R382,766
1987	R27,566	7	58,019	37,587	11,448	12,859	R99,803	8,062	R17,581	R187,340	3,486	R1,278	R277,696	-36,692	R154,685	R395,689
1988	R28,366	116	61,089	38,593	11,318	12,775	R103,206	7,259	R16,673	R189,824	4,111	R1,334	R284,841	-37,435	R162,063	R409,468
1989	R28,105	137	65,383	43,246	13,434	12,154	R112,586	8,354	R16,965	R206,739	3,992	R1,670	R306,125	R-38,995	R169,332	R436,463
1990	R28,372	22	64,102	49,430	17,784	13,680	R126,454	8,707	R19,169	R235,224	4,142	R,5 1,628	R,5 333,325	R-38,276	R176,737	R,5 471,786
1991	R27,871	42	64,697	45,181	14,609	14,922	R123,048	6,786	R18,162	R222,708	4,172	R1,703	R321,227	R-36,534	R184,814	R469,507
1992	R27,409	99	68,400	45,110	13,559	R14,162	R125,156	5,575	R18,267	R221,829	3,878	R1,711	R323,378	R-35,817	R186,954	R474,515
1993	R27,764	56	75,941	R45,884	13,002	13,961	R126,401	5,439	R18,249	R222,936	3,658	R1,621	R332,016	R-36,692	R196,579	R491,904
1994	R27,186	92	77,716	47,240	12,474	16,253	R129,896	5,288	R18,653	R229,804	3,858	R1,934	R340,801	R-36,166	R200,883	R505,518
1995	R26,861	R104	74,150	47,845	R12,526	16,250	136,475	4,667	R19,174	R236,937	R3,864	R2,143	R344,199	R-34,810	R205,932	R515,321
1996	27,368	46	85,634	56,675	15,770	20,898	148,230	5,297	21,201	268,071	3,666	2,215	387,076	-36,614	211,011	561,473
1997	27,522	72	91,769	56,199	15,000	19,865	149,549	5,036	20,946	266,595	3,396	1,986	391,489	-37,815	213,645	567,318

[1] Primary energy is all energy, including that consumed to produce electricity but excluding the electricity produced.

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

[3] Liquefied petroleum gases.

[4] Asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum coke, special naphthas, waxes, and miscellaneous petroleum products.

[5] There is a discontinuity in this time series between 1989 and 1990 due to expanded coverage of nonutility power producers' use of wood and waste beginning in 1990.

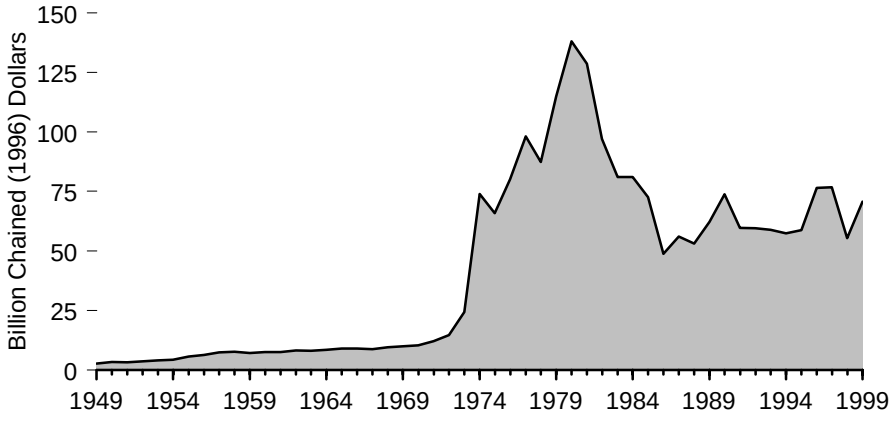
Notes: • There are no direct fuel costs for hydroelectric, geothermal, wind, or solar energy. • Totals may not equal the sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/emeu/states/_states.html.

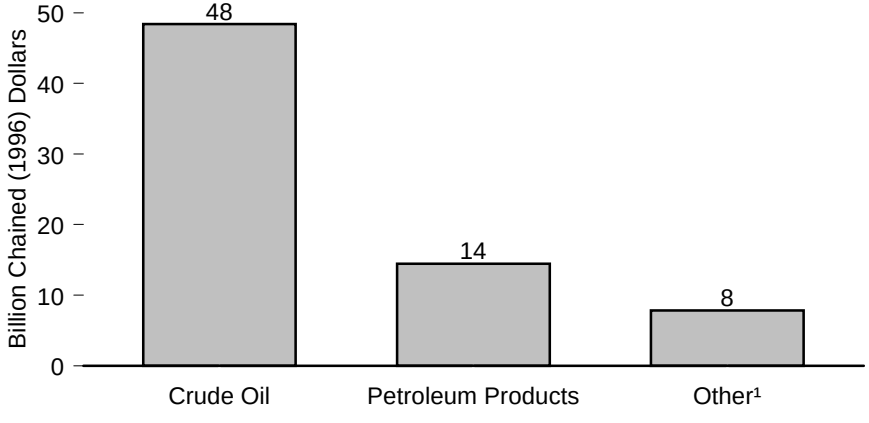
Source: Energy Information Administration (EIA), *State Energy Price and Expenditure Report 1997* (June 2000), Table 5, and EIA, Combined State Energy Data System 1997.

Figure 3.5 Value of Fossil Fuel Imports

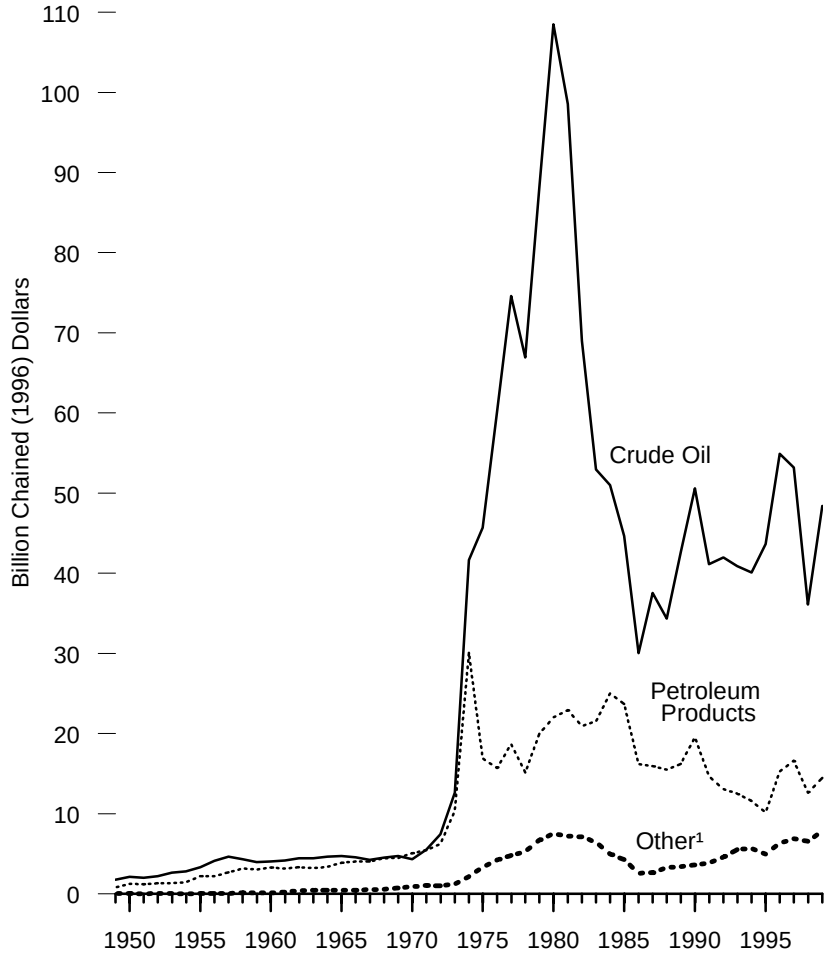
Total, 1949-1999



By Fuel, 1999



By Fuel, 1949-1999



¹ Natural gas, coal, and coal coke.

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

Source: Table 3.5.

Table 3.5 Value of Fossil Fuel Imports, 1949-1999

(Billion Dollars)

Year	Coal		Coal Coke		Natural Gas		Crude Oil [1]		Petroleum Products [2]		Total	
	Nominal	Real [3]	Nominal	Real [3]	Nominal	Real [3]	Nominal	Real [3]	Nominal	Real [3]	Nominal	Real [3]
1949	(s)	0.01	(s)	0.02	0.00	0.00	0.30	R1.77	0.14	R0.79	0.45	R2.60
1950	(s)	R0.02	0.01	0.03	0.00	0.00	0.37	R2.12	0.21	R1.23	0.59	R3.39
1951	(s)	0.01	(s)	0.01	0.00	0.00	0.37	R2.00	0.23	R1.21	0.61	R3.24
1952	(s)	0.01	(s)	0.02	(s)	(s)	0.42	R2.23	0.25	R1.33	0.68	R3.60
1953	(s)	0.01	(s)	0.01	(s)	0.01	0.51	R2.65	0.25	R1.31	0.77	R3.98
1954	(s)	0.01	(s)	0.01	(s)	(s)	0.54	R2.80	0.28	R1.46	0.83	R4.28
1955	(s)	0.01	(s)	0.01	(s)	0.01	0.65	R3.31	0.44	R2.23	1.10	R5.57
1956	(s)	0.01	(s)	0.01	(s)	R0.01	0.84	R4.10	0.45	R2.19	1.29	R6.31
1957	(s)	0.01	(s)	0.01	(s)	R0.02	0.98	R4.64	0.57	R2.69	1.56	R7.36
1958	(s)	0.01	(s)	0.01	0.02	0.10	0.94	R4.34	0.68	R3.16	1.65	R7.63
1959	(s)	0.01	(s)	0.01	0.03	R0.12	0.87	R3.99	0.66	R3.03	1.57	R7.16
1960	(s)	0.01	(s)	0.01	0.03	R0.13	0.90	R4.03	0.73	R3.30	1.66	R7.47
1961	(s)	0.01	(s)	0.01	0.04	R0.20	0.93	R4.16	0.71	R3.16	1.69	R7.54
1962	(s)	0.01	(s)	0.01	0.09	R0.38	1.01	R4.45	0.75	R3.31	1.86	R8.16
1963	(s)	0.01	(s)	0.01	0.10	R0.43	1.03	R4.46	0.74	R3.21	1.87	R8.11
1964	(s)	0.01	(s)	0.01	0.10	R0.43	1.08	R4.63	0.78	R3.35	1.97	R8.43
1965	(s)	0.01	(s)	0.01	0.11	R0.44	1.12	R4.71	0.92	R3.88	2.15	R9.05
1966	(s)	0.01	(s)	0.01	0.11	R0.43	1.12	R4.56	0.99	R4.04	2.21	R9.04
1967	(s)	0.01	(s)	0.01	0.13	R0.51	1.06	R4.22	1.02	R4.03	2.21	R8.78
1968	(s)	0.01	(s)	0.01	0.15	R0.56	1.18	R4.50	1.16	R4.43	2.50	R9.50
1969	(s)	(s)	(s)	0.01	0.20	R0.71	1.30	R4.71	1.24	R4.49	2.74	R9.92
1970	(s)	(s)	(s)	0.01	0.26	R0.89	1.26	R4.34	1.48	R5.10	3.00	R10.34
1971	(s)	0.01	0.01	0.02	0.31	R1.02	1.69	R5.53	1.66	R5.43	3.66	R12.00
1972	(s)	(s)	(s)	0.01	0.31	R0.99	2.37	R7.45	1.99	R6.25	4.68	R14.70
1973	(s)	(s)	0.04	R0.12	0.36	R1.08	4.24	R12.62	3.50	R10.41	8.14	R24.23
1974	0.06	R0.16	0.19	R0.53	0.53	R1.45	15.25	R41.65	11.01	R30.07	27.05	R73.86
1975	0.02	0.05	0.16	R0.39	1.15	R2.88	18.29	R45.69	6.77	R16.91	26.39	R65.92
1976	0.02	0.04	0.11	R0.26	1.66	R3.92	25.46	R60.18	6.65	R15.72	33.90	R80.13
1977	0.04	R0.09	0.13	R0.29	2.00	R4.44	33.59	R74.61	8.42	R18.70	44.18	R98.13
1978	0.07	0.15	0.41	R0.85	2.06	R4.27	32.30	R66.97	7.30	R15.14	42.15	R87.38
1979	0.05	R0.10	0.34	R0.65	3.13	R5.98	46.06	R88.15	10.45	R20.00	60.03	R114.88
1980	0.03	0.05	0.05	0.09	4.21	R7.39	61.90	R108.52	12.54	R21.99	78.74	R138.04
1981	0.03	0.05	0.04	R0.07	4.41	R7.07	61.46	R98.54	14.30	R22.92	80.24	R128.65
1982	0.02	0.03	0.01	0.01	4.69	R7.09	45.72	R69.02	13.86	R20.92	64.31	R97.08
1983	0.04	0.06	(s)	(s)	4.39	R6.37	36.49	R52.98	14.84	R21.55	55.77	R80.96
1984	0.05	0.06	0.05	R0.07	3.44	R4.81	36.44	R51.01	17.87	R25.01	57.84	R80.96
1985	0.07	R0.10	0.04	R0.06	3.05	R4.14	32.90	R44.65	17.47	R23.70	53.53	R72.64
1986	0.08	R0.11	0.03	0.03	1.82	R2.42	22.61	R30.02	12.18	R16.18	36.72	R48.75
1987	0.06	0.07	0.05	0.07	1.93	R2.49	29.13	R37.55	12.37	R15.94	43.54	R56.12
1988	0.06	R0.08	0.19	R0.24	2.38	R2.97	27.55	R34.34	12.43	R15.50	42.62	R53.13
1989	0.10	R0.12	0.22	R0.26	2.51	R3.01	35.53	R42.67	13.50	R16.21	51.85	R62.26
1990	0.09	R0.11	0.07	0.08	2.97	R3.44	43.78	R50.61	16.90	R19.54	63.83	R73.78
1991	0.11	R0.13	0.09	0.10	3.24	R3.61	36.90	R41.16	13.17	R14.69	53.51	R59.68
1992	0.13	R0.14	0.14	R0.16	3.96	R4.31	38.55	R41.98	11.98	R13.05	54.77	R59.63
1993	R0.25	R0.27	R0.17	R0.18	4.77	R5.07	38.47	R40.90	11.74	R12.48	R55.40	R58.90
1994	R0.27	R0.28	R0.27	R0.29	4.90	R5.11	38.48	R40.08	11.14	R11.61	R55.07	R57.36
1995	R0.32	R0.33	R0.33	R0.33	4.23	R4.31	42.81	R43.64	9.95	R10.14	R57.64	R58.75
1996	R0.27	R0.27	R0.24	R0.24	5.79	R5.79	54.93	R54.93	15.27	R15.27	R76.51	R76.51
1997	0.26	R0.25	R0.25	R0.25	6.50	R6.37	54.23	R53.21	R,4 16.93	R,4 16.61	R78.16	R76.69
1998	0.28	R0.27	R0.29	R0.28	R6.21	R6.02	R37.25	R36.13	13.01	R12.62	R57.05	R55.33
1999P	0.28	0.27	0.23	0.22	7.70	7.36	50.66	48.43	15.14	14.47	74.00	70.74

[1] Includes imports into the Strategic Petroleum Reserve, which began in 1977.
[2] Includes petroleum preparations; liquefied propane; and butane; and since 1997 other mineral fuels.
[3] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.
[4] There is a discontinuity in this time series between 1996 and 1997 due to the addition of the commodity category "other mineral fuels."

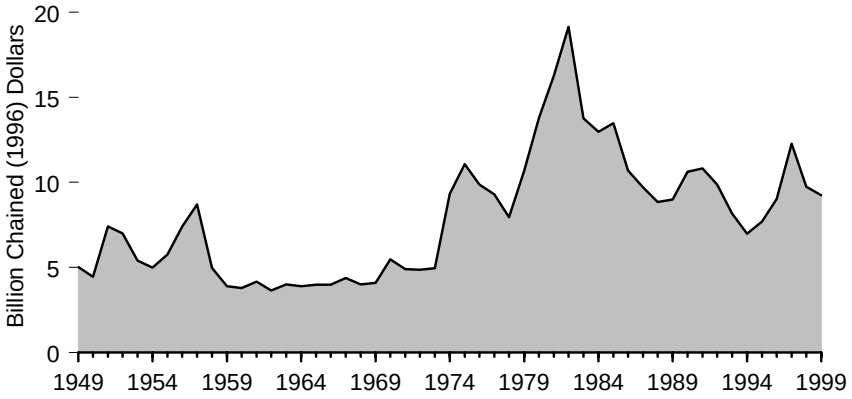
R=Revised. P=Preliminary. (s)=Less than .005 billion.

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

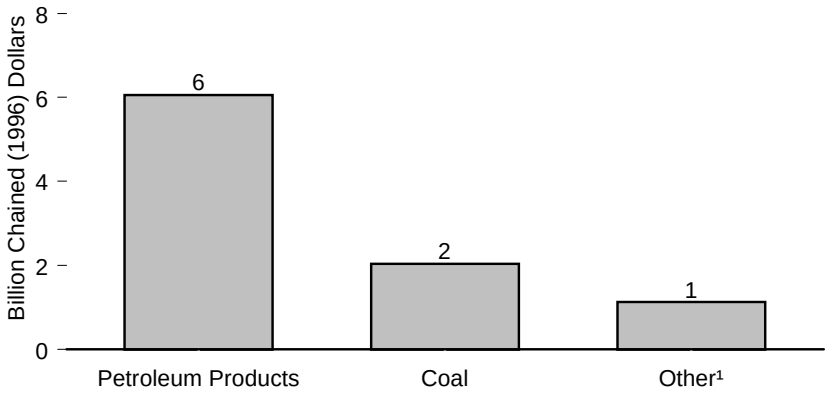
Sources: See end of section.

Figure 3.6 Value of Fossil Fuel Exports

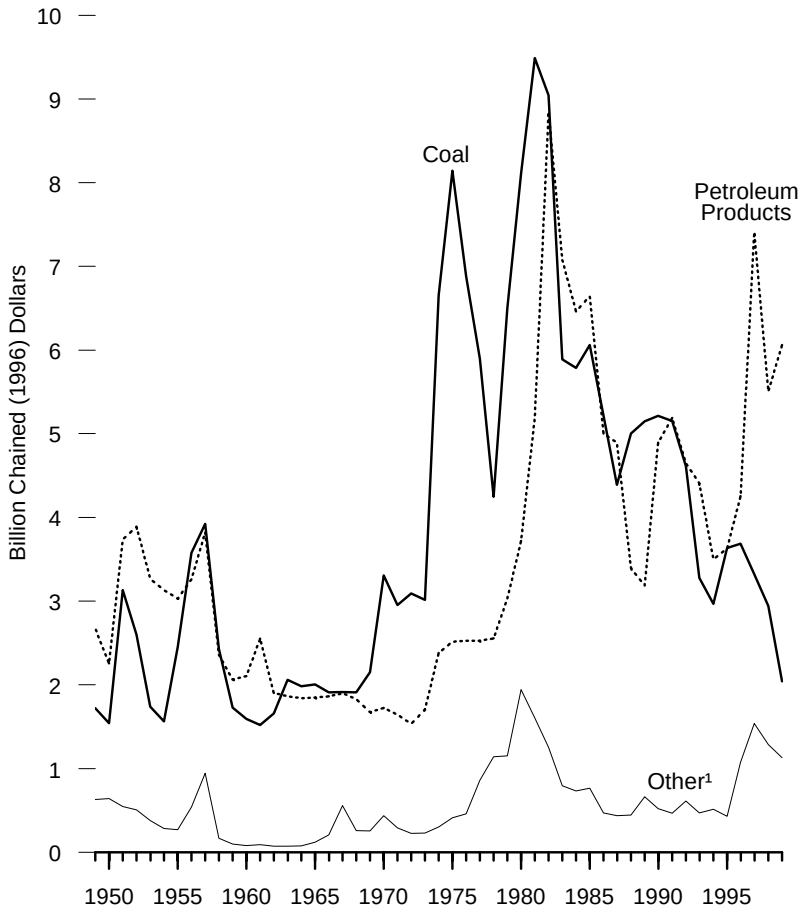
Total, 1949-1999



By Fuel, 1999



By Fuel, 1949-1999



¹ Natural gas, crude oil, and coal coke.

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

Source: Table 3.6.

Table 3.6 Value of Fossil Fuel Exports, 1949-1999

(Billion Dollars)

Year	Coal		Coal Coke		Natural Gas		Crude Oil		Petroleum Products [1]		Total	
	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]
1949	0.30	R1.72	0.01	0.05	(s)	0.01	0.10	R0.57	0.46	R2.67	0.87	R5.02
1950	0.27	R1.54	0.01	R0.04	(s)	0.02	0.10	R0.59	0.39	R2.26	0.78	R4.45
1951	0.59	R3.13	0.02	0.09	(s)	0.02	0.08	R0.44	0.70	R3.74	1.39	R7.42
1952	0.49	R2.60	0.01	0.07	(s)	0.02	0.08	R0.41	0.74	R3.89	1.33	R7.00
1953	0.34	R1.74	0.01	0.05	(s)	0.02	0.06	R0.31	0.63	R3.27	1.04	R5.39
1954	0.30	R1.57	0.01	0.03	(s)	0.02	0.05	R0.23	0.61	R3.13	0.97	R4.98
1955	0.48	R2.45	0.01	0.04	0.01	0.03	0.04	R0.20	0.60	R3.03	1.14	R5.75
1956	0.73	R3.58	0.01	R0.06	0.01	0.04	0.09	R0.44	0.67	R3.26	1.51	R7.38
1957	0.83	R3.92	0.01	R0.07	0.01	0.06	0.17	R0.82	0.81	R3.82	1.84	R8.69
1958	0.53	R2.43	0.01	0.03	0.01	R0.07	0.01	R0.07	0.51	R2.36	1.07	R4.96
1959	0.38	R1.73	0.01	0.04	0.01	0.03	0.01	0.03	0.45	R2.06	0.85	R3.89
1960	0.35	R1.59	0.01	0.03	(s)	0.02	0.01	R0.04	0.47	R2.10	0.84	R3.78
1961	0.34	R1.52	0.01	R0.04	(s)	0.02	0.01	0.04	0.57	R2.55	0.93	R4.16
1962	0.38	R1.66	0.01	0.03	(s)	0.02	0.01	0.02	0.43	R1.90	0.83	R3.63
1963	0.47	R2.06	0.01	R0.04	(s)	0.02	(s)	0.02	0.43	R1.86	0.92	R4.00
1964	0.46	R1.98	0.01	0.04	(s)	0.02	(s)	0.02	0.43	R1.84	0.91	R3.90
1965	0.48	R2.01	0.02	0.07	0.01	0.03	(s)	0.02	0.44	R1.85	0.95	R3.97
1966	0.47	R1.91	0.02	R0.10	0.02	0.07	0.01	0.04	0.46	R1.86	0.97	R3.99
1967	0.48	R1.91	0.02	R0.07	0.03	R0.13	0.09	R0.37	0.48	R1.90	1.10	R4.37
1968	0.50	R1.91	0.02	0.07	0.04	R0.15	0.01	0.04	0.48	R1.83	1.05	R4.00
1969	0.59	R2.15	0.04	R0.14	0.03	0.09	0.01	0.02	0.46	R1.68	1.13	R4.08
1970	0.96	R3.31	0.08	R0.27	0.03	0.10	0.02	0.06	0.50	R1.73	1.59	R5.47
1971	0.90	R2.95	0.04	R0.15	0.04	R0.13	0.01	0.02	0.50	R1.65	1.49	R4.89
1972	0.98	R3.09	0.03	R0.10	0.04	0.12	(s)	0.01	0.49	R1.54	1.55	R4.86
1973	1.01	R3.02	0.03	R0.10	0.04	0.12	(s)	0.01	0.57	R1.70	1.66	R4.95
1974	2.44	R6.65	0.04	R0.12	0.05	R0.15	0.01	0.04	0.87	R2.38	3.42	R9.34
1975	3.26	R8.14	0.07	R0.19	0.09	R0.23	(s)	(s)	1.01	R2.52	4.43	R11.07
1976	2.91	R6.88	0.07	R0.16	0.10	R0.24	0.03	0.06	1.07	R2.53	4.17	R9.87
1977	2.66	R5.90	0.07	R0.16	0.11	R0.24	0.21	R0.46	1.14	R2.53	4.18	R9.29
1978	2.05	R4.25	0.05	0.10	0.11	R0.23	0.39	R0.81	1.23	R2.56	3.83	R7.95
1979	3.40	R6.50	0.08	0.15	0.13	R0.24	0.39	R0.75	1.58	R3.03	5.58	R10.69
1980	4.63	R8.11	0.13	R0.23	0.23	R0.40	0.75	R1.32	2.12	R3.72	7.86	R13.78
1981	5.92	R9.49	0.07	R0.12	0.35	R0.56	0.58	R0.92	3.24	R5.19	10.16	R16.28
1982	5.99	R9.04	0.06	0.09	0.30	R0.45	0.47	R0.71	5.86	R8.85	12.68	R19.14
1983	4.06	R5.89	0.05	R0.07	0.28	R0.40	0.22	R0.33	4.88	R7.08	9.48	R13.77
1984	4.13	R5.78	0.07	R0.10	0.27	R0.38	0.19	R0.26	4.62	R6.46	9.27	R12.98
1985	4.47	R6.06	0.08	0.10	0.26	R0.36	0.23	R0.31	4.90	R6.64	9.93	R13.47
1986	3.93	R5.22	0.07	R0.09	0.17	R0.23	0.12	R0.16	3.77	R5.00	8.05	R10.69
1987	3.40	R4.39	0.05	0.06	0.17	R0.21	0.13	R0.16	3.80	R4.89	7.54	R9.72
1988	4.01	R5.00	0.08	R0.10	0.20	R0.25	0.08	R0.10	2.72	R3.40	7.09	R8.84
1989	4.29	R5.15	0.08	R0.10	0.27	R0.32	0.21	R0.25	2.65	R3.19	7.49	R9.00
1990	4.51	R5.21	0.05	R0.06	0.27	R0.31	0.14	R0.16	4.23	R4.89	9.20	R10.63
1991	4.62	R5.15	0.05	R0.06	0.33	R0.37	0.03	R0.04	4.65	R5.19	9.69	R10.81
1992	4.24	R4.61	0.04	R0.05	0.49	R0.53	0.03	R0.04	4.27	R4.65	9.07	R9.88
1993	3.09	R3.28	0.06	0.06	0.36	R0.39	0.02	0.02	4.15	R4.41	7.68	R8.16
1994	2.85	R2.97	0.04	0.04	0.40	R0.42	0.05	0.05	3.36	R3.50	6.71	R6.98
1995	3.57	R3.63	0.05	0.05	0.37	R0.38	0.01	0.01	3.56	R3.63	7.55	R7.70
1996	3.69	R3.69	0.06	0.06	0.46	R0.46	0.56	R0.56	4.25	R4.25	9.02	R9.02
1997	3.39	R3.32	0.05	0.05	0.47	R0.47	1.04	R1.02	37.55	R,37.41	12.51	R12.27
1998	R3.04	R2.94	0.04	0.04	R0.39	0.38	R0.90	R0.87	R5.68	R5.51	R10.04	R9.74
1999P	2.13	2.04	0.03	0.03	0.38	0.36	0.77	0.74	6.34	6.06	9.66	9.23

[1] Includes petroleum preparations, liquefied propane and butane and since 1997 other mineral fuels.

[2] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

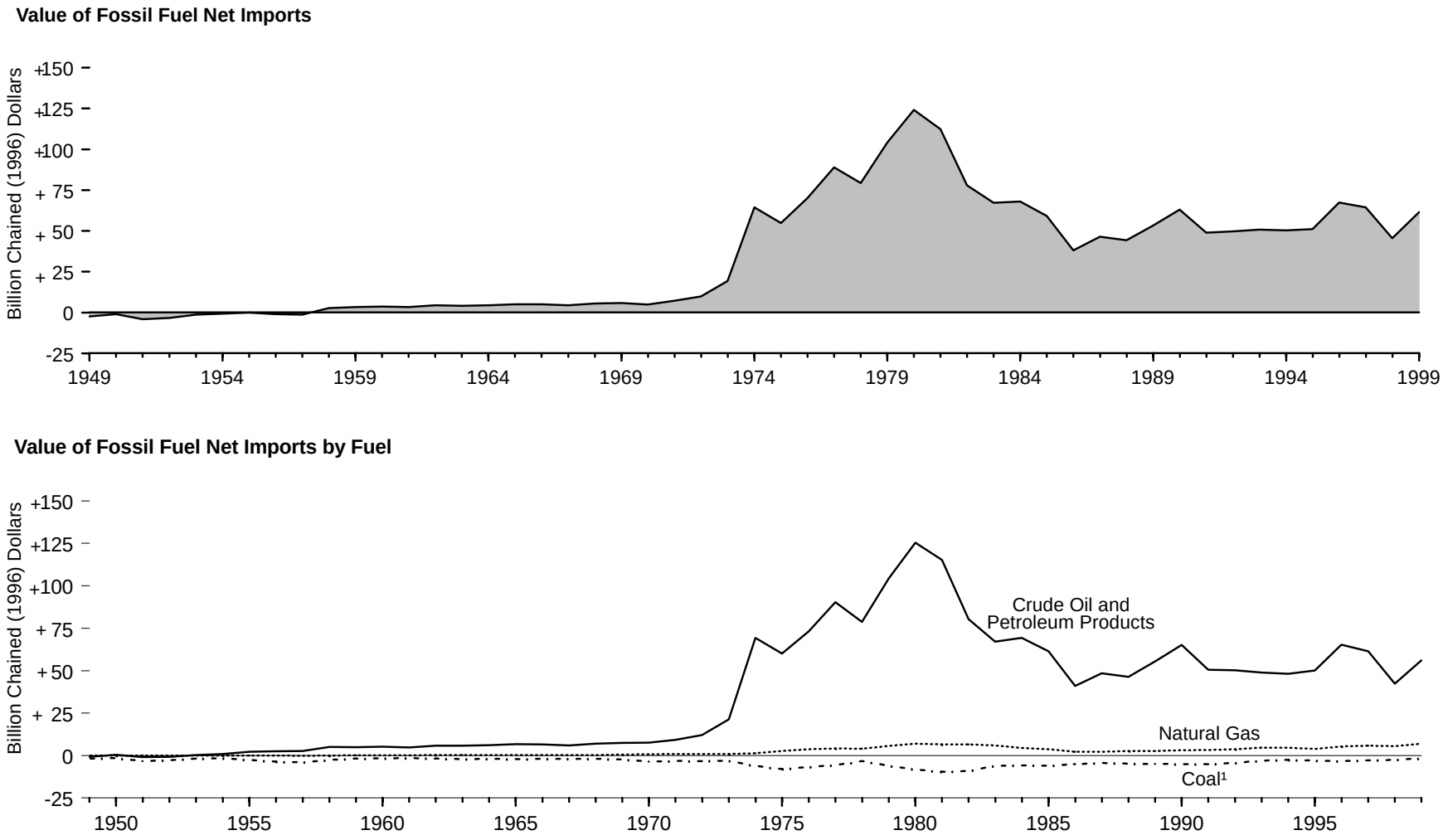
[3] There is a discontinuity in this time series between 1996 and 1997 due to the addition of the commodity category "other mineral fuels."

R=Revised. P=Preliminary. (s)=Less than .005 billion.

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

Sources: **Natural Gas:** • 1949-1971—Bureau of the Census, *U.S. Exports,* FT410. • 1972 and 1973—Federal Power Commission, *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG.* • 1974-1977—Federal Power Commission, *United States Imports and Exports of Natural Gas,* annual reports. • 1978-1981—Energy Information Administration (EIA), *U.S. Imports and Exports of Natural Gas,* annual reports. • 1982-1992—EIA, *Natural Gas Monthly,* monthly reports. • 1993-1998—EIA, *Natural Gas Monthly* (August 1999). • 1999—EIA estimates. **Crude oil and Petroleum Products:** • 1949-1988—Bureau of the Census, *U.S. Exports,* FT410. • 1989 forward—Bureau of the Census, Foreign Trade Division *U.S. Merchandise Trade,* FT900. "Exports and Imports of Goods by Principal SITC Commodity Groupings", December issues. **Coal:** • 1949 forward—Bureau of the Census, Foreign Trade Division, unpublished data.

Figure 3.7 Value of Fossil Fuel Net Imports, 1949-1999



¹ Includes small amounts of coal coke.

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

Source: Table 3.7.

Table 3.7 Value of Fossil Fuel Net Imports, 1949-1999

(Billion Dollars)

Year	Coal		Coal Coke		Natural Gas		Crude Oil		Petroleum Products [1]		Total	
	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]
1949	-0.29	R-1.71	(s)	R-0.03	(s)	-0.01	0.21	R1.19	-0.32	R-1.88	-0.42	R-2.43
1950	-0.27	R-1.53	(s)	(s)	(s)	-0.02	0.27	R1.53	-0.18	R-1.03	-0.18	R-1.05
1951	-0.58	R-3.12	-0.02	-0.08	(s)	-0.02	0.29	R1.57	-0.47	R-2.53	-0.78	R-4.18
1952	-0.49	R-2.59	-0.01	-0.05	(s)	-0.02	0.34	R1.82	-0.49	R-2.56	-0.65	R-3.40
1953	-0.33	R-1.73	-0.01	-0.04	(s)	-0.02	0.45	R2.34	-0.38	R-1.96	-0.27	R-1.41
1954	-0.30	R-1.56	(s)	R-0.03	(s)	-0.02	0.50	R2.57	-0.32	R-1.67	-0.14	R-0.70
1955	-0.48	R-2.44	-0.01	-0.03	-0.01	-0.03	0.62	R3.11	-0.16	R-0.80	-0.04	R-0.18
1956	-0.73	R-3.57	-0.01	-0.05	-0.01	-0.04	0.75	R3.65	-0.22	R-1.07	-0.22	R-1.07
1957	-0.83	R-3.91	-0.01	-0.06	-0.01	-0.04	0.81	R3.82	-0.24	R-1.14	-0.28	R-1.33
1958	-0.52	R-2.42	-0.01	R-0.03	0.01	0.03	0.92	R4.27	0.17	R0.80	0.58	R2.67
1959	-0.38	R-1.72	-0.01	-0.03	0.02	0.09	0.87	R3.96	0.21	R0.97	0.71	R3.26
1960	-0.35	R-1.59	-0.01	-0.02	0.02	0.11	0.89	R4.00	0.26	R1.19	0.82	R3.69
1961	-0.34	R-1.52	-0.01	-0.03	0.04	R0.18	0.92	R4.12	0.14	R0.61	0.76	R3.37
1962	-0.38	R-1.65	-0.01	-0.02	0.08	R0.36	1.01	R4.43	0.32	R1.41	1.03	R4.52
1963	-0.47	R-2.05	-0.01	-0.03	0.09	R0.41	1.02	R4.44	0.31	R1.35	0.95	R4.11
1964	-0.46	R-1.98	-0.01	-0.04	0.10	R0.41	1.08	R4.61	0.35	R1.51	1.06	R4.52
1965	-0.48	R-2.00	-0.01	-0.06	0.10	R0.41	1.11	R4.69	0.48	R2.03	1.21	R5.07
1966	-0.47	R-1.91	-0.02	R-0.09	0.09	R0.36	1.11	R4.52	0.53	R2.17	1.24	R5.06
1967	-0.48	R-1.91	-0.01	-0.06	0.10	R0.39	0.97	R3.86	0.54	R2.13	1.11	R4.41
1968	-0.50	R-1.90	-0.02	-0.06	0.11	R0.41	1.17	R4.46	0.68	R2.60	1.45	R5.50
1969	-0.59	R-2.15	-0.04	R-0.13	0.17	R0.61	1.29	R4.68	0.78	R2.82	1.61	R5.84
1970	-0.96	R-3.31	-0.08	R-0.26	0.23	R0.78	1.24	R4.27	0.98	R3.38	1.41	R4.87
1971	-0.90	R-2.95	-0.04	R-0.13	0.27	R0.90	1.68	R5.51	1.15	R3.78	2.17	R7.11
1972	-0.98	R-3.09	-0.03	-0.08	0.28	R0.87	2.37	R7.44	1.50	R4.71	3.13	R9.85
1973	-1.01	R-3.01	0.01	0.02	0.32	R0.95	4.24	R12.61	2.93	R8.71	6.48	R19.28
1974	-2.38	R-6.50	0.15	R0.41	0.48	R1.30	15.24	R41.61	10.14	R27.69	23.63	R64.52
1975	-3.24	R-8.09	0.08	R0.20	1.06	R2.65	18.29	R45.69	5.76	R14.39	21.96	R54.85
1976	-2.89	R-6.84	0.04	0.10	1.56	R3.69	25.43	R60.12	5.58	R13.20	29.72	R70.26
1977	-2.62	R-5.81	0.06	R0.13	1.89	R4.21	33.38	R74.15	7.28	R16.17	40.00	R88.84
1978	-1.98	R-4.10	0.36	R0.75	1.95	R4.04	31.91	R66.16	6.07	R12.59	38.31	R79.44
1979	-3.35	R-6.40	0.26	R0.50	3.00	R5.74	45.66	R87.40	8.87	R16.97	54.44	R104.20
1980	-4.60	R-8.06	-0.08	R-0.14	3.98	R6.99	61.15	R107.20	10.42	R18.27	70.88	R124.26
1981	-5.89	R-9.44	-0.03	-0.05	4.06	R6.51	60.88	R97.61	11.06	R17.73	70.09	R112.37
1982	-5.97	R-9.01	-0.05	R-0.08	4.39	R6.63	45.25	R68.31	8.00	R12.08	51.63	R77.93
1983	-4.01	R-5.83	-0.04	-0.06	4.11	R5.97	36.27	R52.65	9.96	R14.47	46.28	R67.20
1984	-4.09	R-5.72	-0.02	-0.03	3.17	R4.44	36.26	R50.75	13.25	R18.55	48.57	R67.98
1985	-4.39	R-5.96	-0.03	R-0.05	2.79	R3.78	32.68	R44.34	12.57	R17.06	43.60	R59.17
1986	-3.85	R-5.11	-0.04	-0.05	1.65	R2.19	22.49	R29.86	8.42	R11.17	28.67	R38.06
1987	-3.35	R-4.32	0.01	0.01	1.76	R2.27	29.00	R37.39	8.57	R11.05	36.00	R46.40
1988	-3.95	R-4.92	0.12	R0.15	2.18	R2.72	27.47	R34.25	9.71	R12.11	35.53	R44.29
1989	-4.19	R-5.03	0.14	R0.16	2.24	R2.69	35.32	R42.42	10.85	R13.02	44.35	R53.27
1990	-4.42	R-5.11	0.02	R0.03	2.71	R3.13	43.65	R50.45	12.67	R14.65	54.63	R63.15
1991	-4.51	R-5.03	0.04	R0.05	2.90	R3.23	36.87	R41.12	8.52	R9.50	43.82	R48.88
1992	-4.11	R-4.48	0.10	R0.11	3.47	R3.78	38.52	R41.94	7.72	R8.40	45.70	R49.76
1993	R-2.83	R-3.01	R0.11	R0.11	4.41	R4.69	38.45	R40.88	7.59	R8.07	R47.72	R50.74
1994	R-2.58	R-2.68	R0.23	R0.24	4.50	R4.68	38.43	R40.03	7.78	R8.10	R48.37	R50.38
1995	R-3.24	R-3.31	R0.27	R0.28	3.86	R3.93	42.81	R43.64	6.39	R6.51	R50.09	R51.06
1996	R-3.41	R-3.41	R0.18	R0.18	5.33	R5.33	54.37	R54.37	11.01	R11.01	R67.49	R67.49
1997	-3.13	R-3.07	R0.20	R0.19	6.02	R5.91	53.19	R52.19	39.37	R,39.20	R65.65	R64.42
1998	R-2.75	R-2.67	R0.25	R0.24	R5.82	R5.64	R36.36	R35.26	R7.33	R7.11	R47.00	R45.58
1999P	-1.85	-1.77	0.20	0.19	7.32	7.00	49.89	47.69	8.80	8.41	64.35	61.51

[1] Includes petroleum preparations, liquefied propane and butane and since 1997 other mineral fuels.

[2] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

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

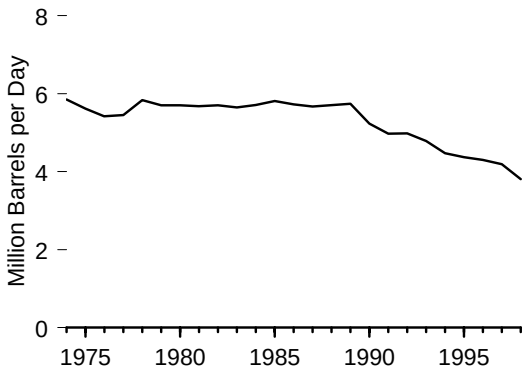
R=Revised. P=Preliminary. (s)=Less than .005 billion.

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

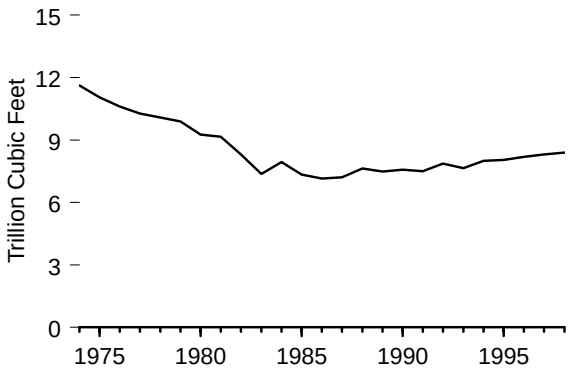
Sources: Tables 3.5 and 3.6.

Figure 3.8 Major U.S. Energy Companies' Domestic Production and Refining, 1974-1998

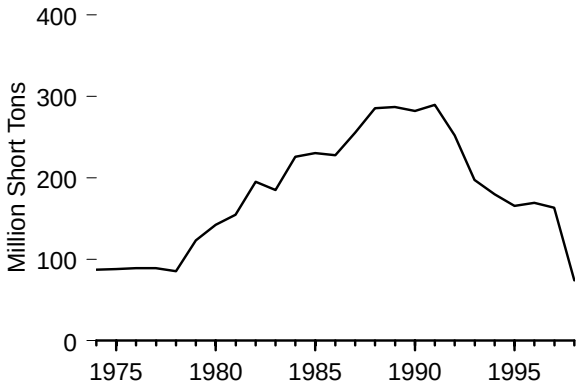
Crude Oil and Natural Gas Liquids Production by Major Energy Companies



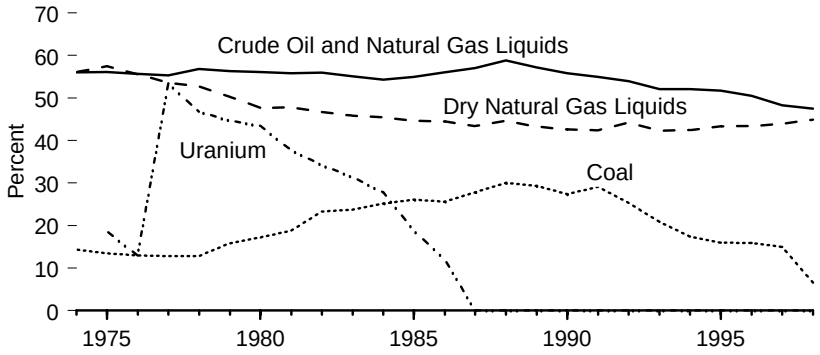
Dry Natural Gas Production by Major Energy Companies



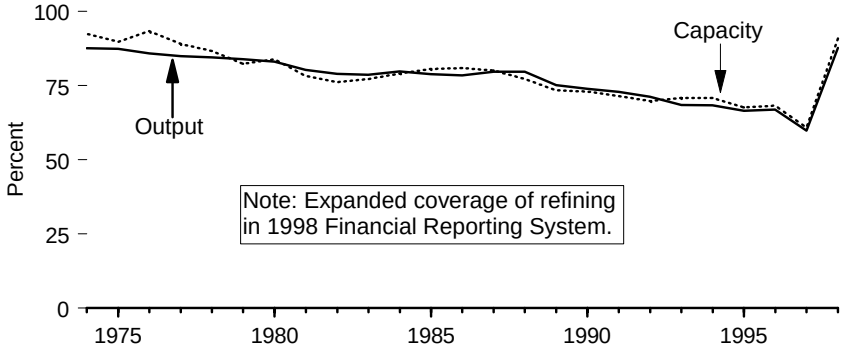
Coal Production by Major Energy Companies



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



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



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

Source: Table 3.8.

Table 3.8 Major U.S. Energy Companies'Domestic Production and Refining, 1974-1998

Year	Production				Refining	
	Crude Oil and Natural Gas Liquids (million barrels per day)	Dry Natural Gas (trillion cubic feet)	Coal [1] (million short tons)	Uranium (million pounds U_3O_8)	Capacity [2,3] (million barrels per day)	Output [3] (million barrels per day)
1974	5.9	11.6	87.4	NA	13.3	11.8
1975	5.6	11.0	88.1	4.3	13.4	12.0
1976	5.4	10.6	89.0	3.3	14.2	12.6
1977	5.5	10.3	89.1	16.0	14.6	13.5
1978	5.8	10.1	85.5	17.3	14.8	13.5
1979	5.7	9.9	123.3	16.7	14.4	13.2
1980	5.7	9.3	142.3	19.0	15.1	12.2
1981	5.7	9.2	154.8	14.5	14.6	11.2
1982	5.7	8.3	195.2	9.2	13.6	10.6
1983	5.6	7.4	185.2	6.6	13.0	10.3
1984	5.7	7.9	226.0	4.1	12.8	10.9
1985	5.8	7.3	230.4	2.1	12.6	10.8
1986	5.7	7.1	227.6	1.6	12.5	11.4
1987	5.7	7.2	255.3	0.0	12.5	11.7
1988	5.7	7.6	285.3	0.0	12.3	12.0
1989	5.2	7.5	286.9	0.0	11.5	11.4
1990	5.0	7.6	282.0	0.0	11.4	11.3
1991	5.0	7.5	289.6	0.0	11.2	11.1
1992	4.8	7.9	251.9	0.0	11.0	11.0
1993	4.5	7.7	197.3	0.0	10.7	10.8
1994	4.4	8.0	179.7	0.0	10.6	10.8
1995	4.3	8.1	165.4	0.0	10.4	10.6
1996	4.2	8.2	169.4	0.0	10.5	10.9
1997	4.0	8.3	163.3	0.0	9.4	10.0
1998	3.8	8.4	73.9	0.0	[4]14.3	[4]14.9
	Percent of U.S. Total					
1974	56.0	56.1	14.3	NA	92.5	87.6
1975	56.1	57.4	13.5	18.6	89.8	87.4
1976	55.7	55.6	13.0	13.0	93.4	85.9
1977	55.3	53.6	12.8	53.4	89.0	85.0
1978	56.8	52.7	12.8	46.8	86.7	84.5
1979	56.3	50.3	15.8	44.7	82.4	83.9
1980	56.1	47.7	17.2	43.5	83.9	83.1
1981	55.8	47.8	18.8	37.7	78.2	80.3
1982	55.9	46.7	23.3	34.2	76.2	79.0
1983	55.1	45.8	23.7	31.4	77.2	78.7
1984	54.3	45.5	25.2	27.8	79.1	79.8
1985	54.9	44.6	26.1	18.9	80.6	78.9
1986	56.0	44.5	25.6	12.1	81.0	78.5
1987	57.0	43.4	27.8	0.0	80.1	79.7
1988	58.8	44.6	30.0	0.0	77.2	79.7
1989	57.2	43.2	29.3	0.0	73.4	75.2
1990	55.8	42.6	27.4	0.0	73.0	74.0
1991	54.9	42.4	29.1	0.0	71.5	72.9
1992	53.9	44.2	25.3	0.0	69.8	71.2
1993	52.1	42.3	20.9	0.0	70.9	68.5
1994	52.1	42.5	17.4	0.0	70.8	68.4
1995	51.7	43.3	16.0	0.0	67.6	66.6
1996	50.5	[R]43.4	15.9	0.0	68.3	66.9
1997	48.3	43.9	15.0	0.0	60.9	59.8
1998	47.5	44.9	6.6	0.0	[4]90.9	[4]87.7

[1] Bituminous coal, subbituminous coal, and lignite.
[2] Operable capacity as of January 1 of the following year.
[3] Includes Puerto Rico and the Virgin Islands.
[4] There is a discontinuity in this time series between 1997 and 1998 due to the expanded coverage of the Financial Reporting System (FRS).

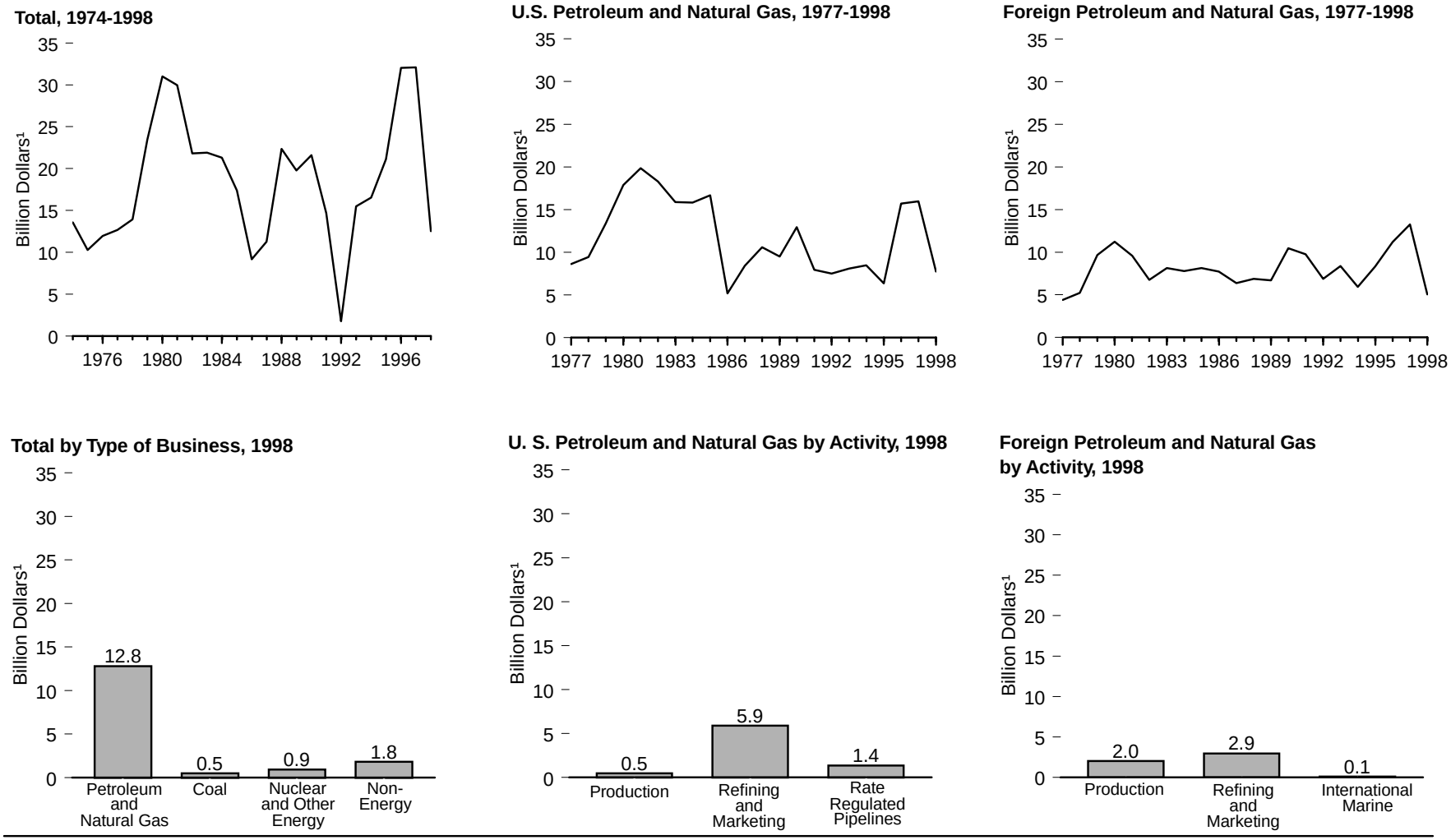
R=Revised. NA=Not available.

Notes: • Major U.S. Energy Companies are the top publicly-owned, U.S.-based crude oil and natural gas producers and petroleum refiners that form the FRS. See Table 3.12. • FRS Crude Oil and Natural Gas Liquids and Dry Natural Gas production are on a net ownership interest basis (see Glossary).

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

Sources: **Production and Refining:** • 1974-1976—Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System" database, November 1998. • 1977-1991—EIA, *Performance Profiles of Major Energy Producers,* annual reports. • 1992-1998—EIA, *Performance Profiles of Major Energy Producers, 1998* (January 2000), Table B1. **Percent of U.S. Total:** Tables 5.1, 5.8, 5.9, 6.1, 7.1, and 9.3.

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



[1] Nominal dollars.

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

Table 3.9 Major U.S. Energy Companies'Net Income, 1974-1998

(Billion Dollars[1])

	U.S. Petroleum and Natural Gas				Foreign Petroleum and Natural Gas				Type of Business				
Year	Production	Refining and Marketing	Rate Regulated Pipelines	Total [2]	Production	Refining and Marketing	International Marine	Total [2]	Petroleum and Natural Gas	Coal	Nuclear and Other Energy	Non-energy	Total [2]
1974	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13.6
1975	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.3
1976	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12.0
1977	6.4	1.5	0.8	8.6	3.6	0.7	0.1	4.4	13.0	0.2	(s)	1.7	12.7
1978	6.7	1.6	1.2	9.5	3.5	1.8	-0.1	5.2	14.7	0.1	-0.1	1.8	13.9
1979	9.4	2.3	1.7	13.4	5.2	4.3	0.1	9.7	23.0	0.3	-0.1	2.8	23.5
1980	13.8	2.5	1.7	17.9	6.9	4.3	0.1	11.2	29.1	0.3	(s)	2.3	31.0
1981	16.8	1.3	1.8	19.9	8.0	1.6	-0.1	9.6	29.5	0.4	-0.3	1.6	30.0
1982	14.1	1.9	2.3	18.3	6.1	0.8	-0.3	6.7	25.0	0.4	-0.3	0.4	21.8
1983	12.2	1.6	2.0	15.9	7.2	1.3	-0.5	8.2	24.0	0.5	(s)	1.8	21.9
1984	13.3	0.1	2.5	15.8	7.5	0.7	-0.4	7.8	23.6	0.6	-0.1	2.9	21.3
1985	12.1	2.3	2.3	16.7	8.0	0.5	-0.4	8.1	24.8	0.4	-0.3	2.5	17.4
1986	0.9	1.6	2.6	5.2	4.7	2.9	0.1	7.7	12.9	0.2	(s)	2.8	9.2
1987	4.7	1.1	2.6	8.4	5.4	1.0	-0.1	6.4	14.8	0.4	(s)	7.1	11.3
1988	3.2	5.4	2.0	10.6	4.3	2.4	0.1	6.9	17.5	0.6	-0.1	10.8	22.3
1989	3.1	4.5	1.9	9.5	4.7	1.8	0.2	6.7	16.2	0.4	-0.1	8.7	19.8
1990	8.7	2.2	2.1	12.9	7.4	2.8	0.2	10.5	23.4	0.3	0.1	4.3	21.6
1991	5.1	0.9	2.0	7.9	5.4	4.1	0.3	9.8	17.7	0.6	0.1	1.6	14.7
1992	5.6	-0.2	2.1	7.5	4.7	2.2	(s)	6.9	14.4	-0.5	0.1	1.2	1.8
1993	4.8	1.7	1.6	8.1	5.2	3.2	(s)	8.4	16.5	0.4	0.1	2.7	15.5
1994	4.8	1.8	1.8	8.5	4.0	2.0	(s)	5.9	14.4	0.2	0.2	6.2	16.5
1995	3.7	0.5	2.2	6.4	5.9	2.4	(s)	8.3	14.7	0.3	0.2	12.6	21.1
1996	11.8	2.3	1.6	15.7	9.2	2.0	(s)	11.2	26.9	0.5	0.2	8.0	32.0
1997	R11.6	R3.1	1.3	R16.0	R9.6	3.6	0.1	R13.3	R29.3	0.3	0.3	R6.3	32.1
1998	0.5	5.9	1.4	7.7	2.0	2.9	0.1	5.1	12.8	0.5	0.9	1.8	12.5

[1] Nominal dollars.

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

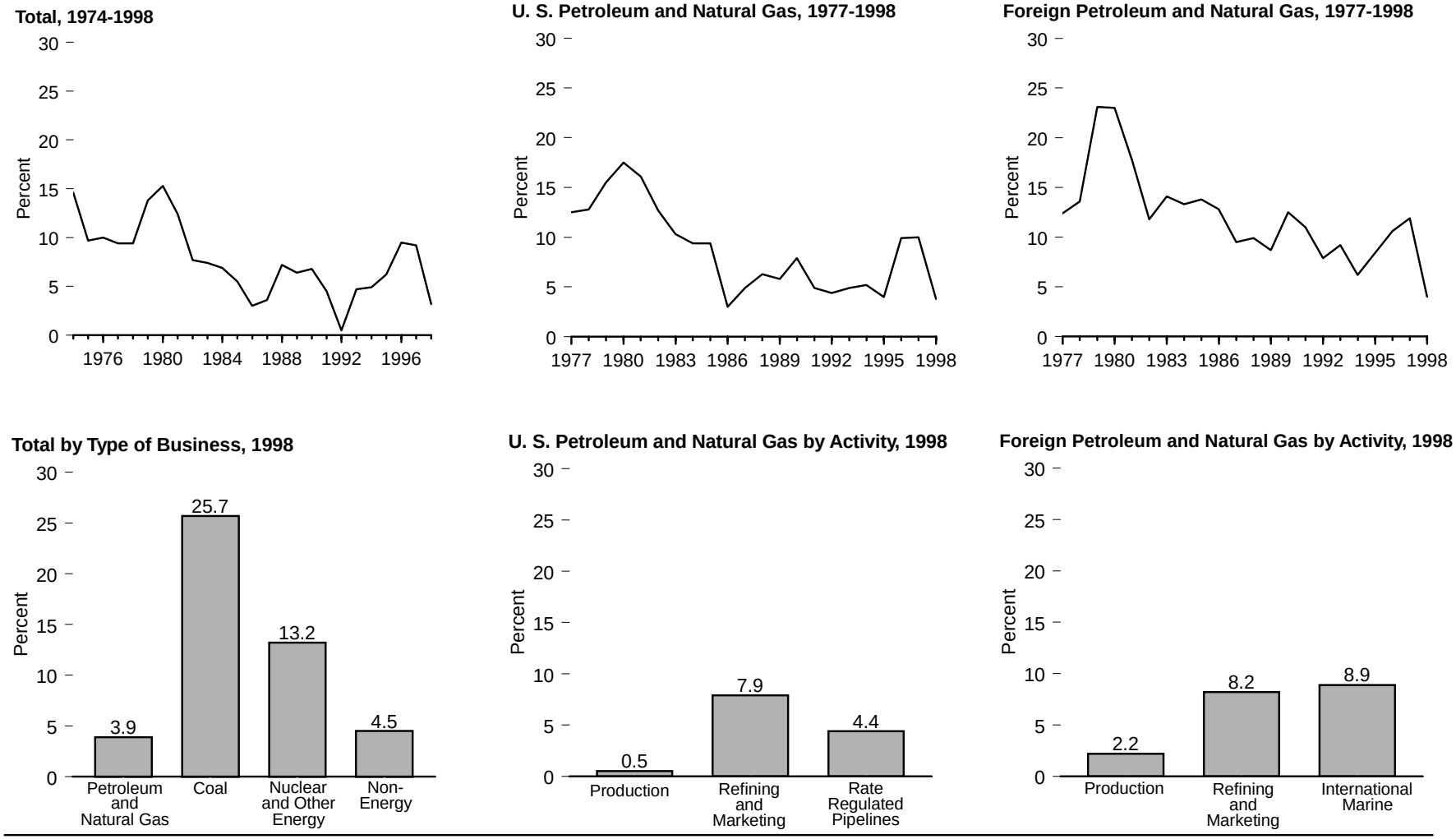
R=Revised. NA=Not available. (s)=Less than $0.05 billion and greater than -$0.05 billion.

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

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

Sources: • 1974-1976—Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System" database, November 1997. • 1977-1997—EIA, *Performance Profiles of Major Energy Producers,* annual reports. • 1998—EIA, *Performance Profiles of Major Energy Producers, 1998* (January 2000), Table 3.

Figure 3.10 Major U.S. Energy Companies' Return on Investment



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

Source: Table 3.10.

Table 3.10 Major U.S. Energy Companies'Return on Investment, 1974-1998

(Percent)

	U.S. Petroleum and Natural Gas				Foreign Petroleum and Natural Gas				Type of Business				
Year	Production	Refining and Marketing	Rate Regulated Pipelines	Total	Production	Refining and Marketing	International Marine	Total	Petroleum and Natural Gas	Coal	Nuclear and Other Energy	Non-energy	Total
1974	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14.6
1975	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.7
1976	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.0
1977	17.5	7.2	7.3	12.5	21.8	5.1	2.6	12.4	12.5	8.8	-2.6	7.1	9.4
1978	16.4	7.5	10.9	12.8	18.2	12.7	-1.0	13.6	13.1	4.1	-4.2	6.5	9.4
1979	18.2	9.8	15.1	15.5	23.8	29.1	2.6	23.1	18.0	6.3	-3.7	8.8	13.8
1980	20.9	9.8	15.1	17.5	25.1	26.4	2.4	23.0	19.2	5.6	-0.7	5.9	15.3
1981	20.2	4.4	15.6	16.1	25.5	9.0	-1.1	17.7	16.6	6.1	-6.8	3.5	12.4
1982	14.0	6.0	20.8	12.7	17.4	4.7	-6.3	11.8	12.5	4.4	-5.2	0.6	7.7
1983	11.3	4.8	16.6	10.3	19.6	7.7	-13.2	14.1	11.3	5.0	0.5	2.9	7.4
1984	10.8	0.3	20.8	9.4	18.8	4.5	-14.0	13.3	10.4	6.2	-1.8	4.8	6.9
1985	9.5	6.5	15.0	9.4	20.0	3.3	-19.0	13.8	10.5	4.6	-8.4	4.2	5.5
1986	0.8	4.5	13.2	3.0	11.6	16.3	5.3	12.8	5.5	2.7	-0.8	5.1	3.0
1987	4.1	2.9	12.8	4.9	12.4	4.7	-3.6	9.5	6.2	5.1	0.5	12.2	3.6
1988	2.8	14.7	9.6	6.3	9.2	11.6	6.8	9.9	7.3	6.7	-2.5	20.3	7.2
1989	2.9	11.5	10.2	5.8	8.9	8.0	12.4	8.7	6.7	5.0	-2.3	17.3	6.4
1990	8.5	5.1	11.2	7.9	13.1	11.2	11.7	12.5	9.5	3.3	2.6	7.8	6.8
1991	5.1	2.0	10.7	4.9	9.1	14.6	15.6	11.0	7.0	8.7	2.8	2.9	4.5
1992	5.9	-0.4	8.4	4.4	8.2	7.8	-1.2	7.9	5.6	-9.3	1.8	2.1	0.5
1993	5.3	3.4	6.4	4.9	8.6	10.6	1.2	9.2	6.4	7.6	4.1	4.7	4.7
1994	5.5	3.6	7.6	5.2	6.5	6.1	-2.0	6.2	5.6	4.0	4.8	10.5	4.9
1995	4.4	1.0	9.1	4.0	9.3	7.2	-2.5	8.4	5.7	6.9	6.1	19.4	6.2
1996	14.1	4.4	6.9	9.9	12.8	6.0	2.2	10.6	10.1	9.9	7.9	15.0	9.5
1997	R12.5	R6.6	R6.7	R10.0	R12.5	10.5	11.8	R11.9	10.8	7.2	7.0	R10.9	9.2
1998	0.5	7.9	4.4	3.8	2.2	8.2	8.9	4.0	3.9	25.7	13.2	4.5	3.2

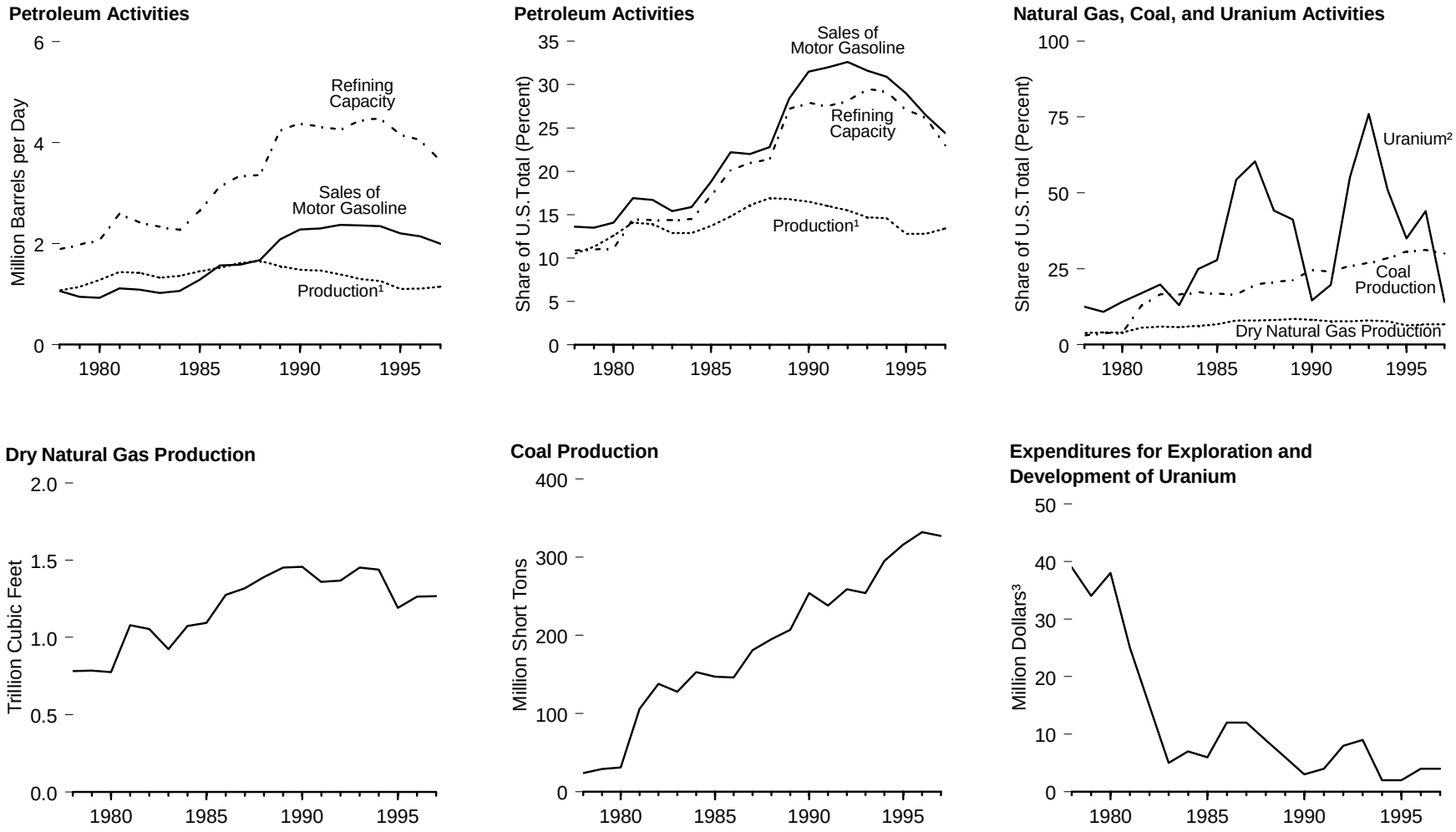
R=Revised. NA=Not available.

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

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

Sources: • 1974-1976—Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System" database, October 1996. • 1977-1997—EIA, *Performance Profiles of Major Energy Producers,* annual reports. • 1998—EIA, *Performance Profiles of Major Energy Producers, 1998* (January 2000), Table 4.

Figure 3.11 U.S. Energy Activities by Foreign-Affiliated Companies, 1978-1997



[1] Crude oil and natural gas liquids.
[2] Expenditures for exploration and development of uranium.
[3] Nominal dollars.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 3.11.

Table 3.11 U.S. Energy Activities by Foreign-Affiliated Companies, 1978-1997

Year	Production			Refining Capacity	Sales of Motor Gasoline	Expenditures for Exploration and Development of Uranium
	Crude Oil and Natural Gas Liquids	Dry Natural Gas	Coal			
	Thousand Barrels per Day	Billion Cubic Feet	Million Short Tons	Thousand Barrels per Day		Million Dollars [1]
1978	1,076	783	24	1,895	1,066	39
1979	1,145	786	29	1,984	948	34
1980	1,280	776	31	2,066	926	38
1981	1,438	1,080	106	2,595	1,114	25
1982	1,421	1,055	138	2,423	1,092	15
1983	1,325	924	128	2,337	1,022	5
1984	1,365	1,075	153	2,276	1,066	7
1985	1,455	1,093	147	2,656	1,285	6
1986	1,523	1,276	146	3,133	1,565	12
1987	1,614	1,318	181	3,342	1,586	12
1988	1,659	1,392	195	3,356	1,673	9
1989	1,553	1,452	207	4,243	2,084	6
1990	1,481	1,457	254	4,379	2,282	3
1991	1,469	1,360	238	4,312	2,299	4
1992	1,392	1,368	259	4,256	2,369	8
1993	1,299	1,451	254	4,440	2,362	9
1994	1,261	1,439	295	4,479	2,346	2
1995	[R]1,103	[R]1,191	316	[R]4,164	2,204	2
1996	[R]1,105	[R]1,265	[R]332	[R]4,050	2,145	4
1997	1,151	1,268	327	3,637	1,998	4
	Share of U.S. Total (Percent)					
1978	10.5	3.9	3.1	10.9	13.6	12.5
1979	11.3	4.0	3.8	11.0	13.5	10.8
1980	12.6	4.0	3.8	11.1	14.1	14.1
1981	14.1	5.6	12.9	14.5	16.9	17.0
1982	13.9	5.9	16.6	14.4	16.7	19.8
1983	12.9	5.8	16.5	14.4	15.4	13.0
1984	12.9	6.2	17.3	14.5	15.9	24.9
1985	13.7	6.7	16.8	17.2	18.8	27.9
1986	14.8	8.0	16.5	20.1	22.2	54.3
1987	16.1	8.0	19.8	21.0	22.0	60.4
1988	16.9	8.1	20.6	21.4	22.8	44.2
1989	16.8	8.4	21.2	27.2	28.4	41.2
1990	16.5	8.2	24.7	27.9	31.5	14.6
1991	16.0	7.7	24.0	27.5	32.0	19.7
1992	15.5	7.7	26.0	28.1	32.6	55.2
1993	14.7	8.0	27.0	29.5	31.6	76.0
1994	14.6	7.7	28.6	29.2	30.9	51.0
1995	[R]12.8	[R]6.4	30.7	27.1	29.0	35.0
1996	[R]12.8	[R]6.7	[R]31.2	26.2	[R]26.5	44.0
1997	13.4	6.7	30.0	23.0	24.4	14.0

[1] Nominal dollars.
R=Revised.
Web Page: http://www.eia.doe.gov/emeu/finance.
Sources: • 1978-1992—Energy Information Administration (EIA), *Profiles of Foreign Direct Investment in U.S. Energy,* annual report. • 1993—EIA, *Profiles of Foreign Direct Investment in U.S. Energy 1993* (May 1995), Tables 7, 9, 10, 11, and 12. • 1994-1996—EIA, *Performance Profiles of Major Energy Producers,* annual reports. • 1997—EIA, *Performance Profiles of Major Energy Producers 1998* (January 2000), Tables 33, 34, 35, 38, and 39.

Table 3.12 Companies Reporting to the Financial Reporting System, 1974-1998

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

Footnotes: See the following page.
Note: "X" indicates that the company was included in the FRS for the year indicated.

Web Page: http://www.eia.doe.gov/emeu/finance.
Source: Energy Information Administration, Form EIA-28, "Financial Reporting System."

Footnotes for Table 3.12

[1]American Petrofina, Inc. changed its name to Fina, Inc., effective April 17, 1991.
[2]Formerly Standard Oil Company (Indiana).
[3]Amoco merged with British Petroleum plc and became BP Amoco plc on December 31, 1998. BP America was renamed BP Amoco, Inc. The companies reported separately for 1998.
[4]Ashland was dropped from the Financial Reporting System (FRS) for 1998 after spinning off downstream and coal operations and disposing of upstream operations.
[5]In 1987, British Petroleum acquired all shares in Standard Oil Company (Ohio) that it did not already control and renamed its U.S. affiliate, BP America, Inc.
[6]Burlington Resources was added to the FRS and Burlington Northern was dropped for 1988. Data for Burlington Resources covers the full year 1988 even though that company was not created until May of that year.
[7]Formerly Standard Oil Company of California.
[8]Chevron acquired Gulf Oil in 1984, but separate data for Gulf continued to be available for the full 1984 year.
[9]Occidental acquired Cities Service in 1982. Separate financial reports were available for 1982, so each company continued to be treated separately until 1983.
[10]DuPont acquired Conoco in 1981. Separate data for Conoco were available for 1981; DuPont was included in the FRS in 1982.
[11]Dupont was dropped from the FRS when Conoco was spun-off in 1998. Conoco began reporting separately again in 1998.
[12]Equilon is a joint venture combining Shell's and Texaco's western and midwestern U.S. refining and marketing businesses and nationwide trading transportation and lubricants businesses. Net income is duplicated in the FRS system since Shell and Texaco account for this investment using the equity method.
[13]In December 1998, Exxon and Mobil agreed to merge. Both companies reported separately for 1998.
[14]Texaco acquired Getty in 1984; however, Getty was treated as a separate FRS company for that year.
[15]In 1998, Kerr-McGee and Oryx merged. The financial reporting for both was consolidated under Kerr-McGee for 1998.
[16]LYONDELL-CITGO is a limited partnership owned by Lyondell Chemical Company and Citgo. There will be some duplication of net income since Citgo accounts for its investment using the equity method.
[17]U.S. Steel (now USX) acquired Marathon in 1982.
[18]Mobil acquired Superior in 1984, but both companies were treated separately for that year.
[19]Motiva is a joint venture approximately equally owned by Shell, Texaco and Saudi Refining, Inc. The joint venture combines the company's Gulf and east coast refining and marketing businesses. Duplication exists for the net income related to Shell's and Texaco's interests, which are accounted for under the equity method.
[20]RTZ America acquired the common stock of Nerco, Inc., on Feb. 17, 1994. In Sept. 1993, Nerco, Inc. sold Nerco Oil & Gas, Inc., its subsidiary. Nerco's 1993 submission includes operations of Nerco Oil & Gas, Inc., through Sept. 28, 1993.
[21]Sun Company spun off Sun Exploration and Development Company (later renamed Oryx Energy Company) during 1988. Both companies were included in the FRS system for 1988; therefore, some degree of duplication exists for that year.
[22]Sun company withdrew from oil and gas exploration and production in 1996. Sun's 1996 submission includes oil and gas exploration and production activities through September 30, 1996. Refining/marketing activities are included for the entire 1996 calendar year.
[23]Tenneco sold its worldwide oil and gas assets and its refining and marketing assets in 1988. Other FRS companies purchased approximately 70 percent of Tenneco's assets.
[24]Effective June 1, 1991, Total's exploration, production, and marketing operations in Canada were spun off to Total Oil & Gas, a new public entity.
[25]Effective October 15, 1996, Union Pacific Corporation distributed its ownership in the Union Pacific Resources Group, Inc. to its shareholders. Prior to 1996, the FRS included Union Pacific Corporation. The FRS system includes only Union Pacific Resources Group, Inc. for 1996.

Sources

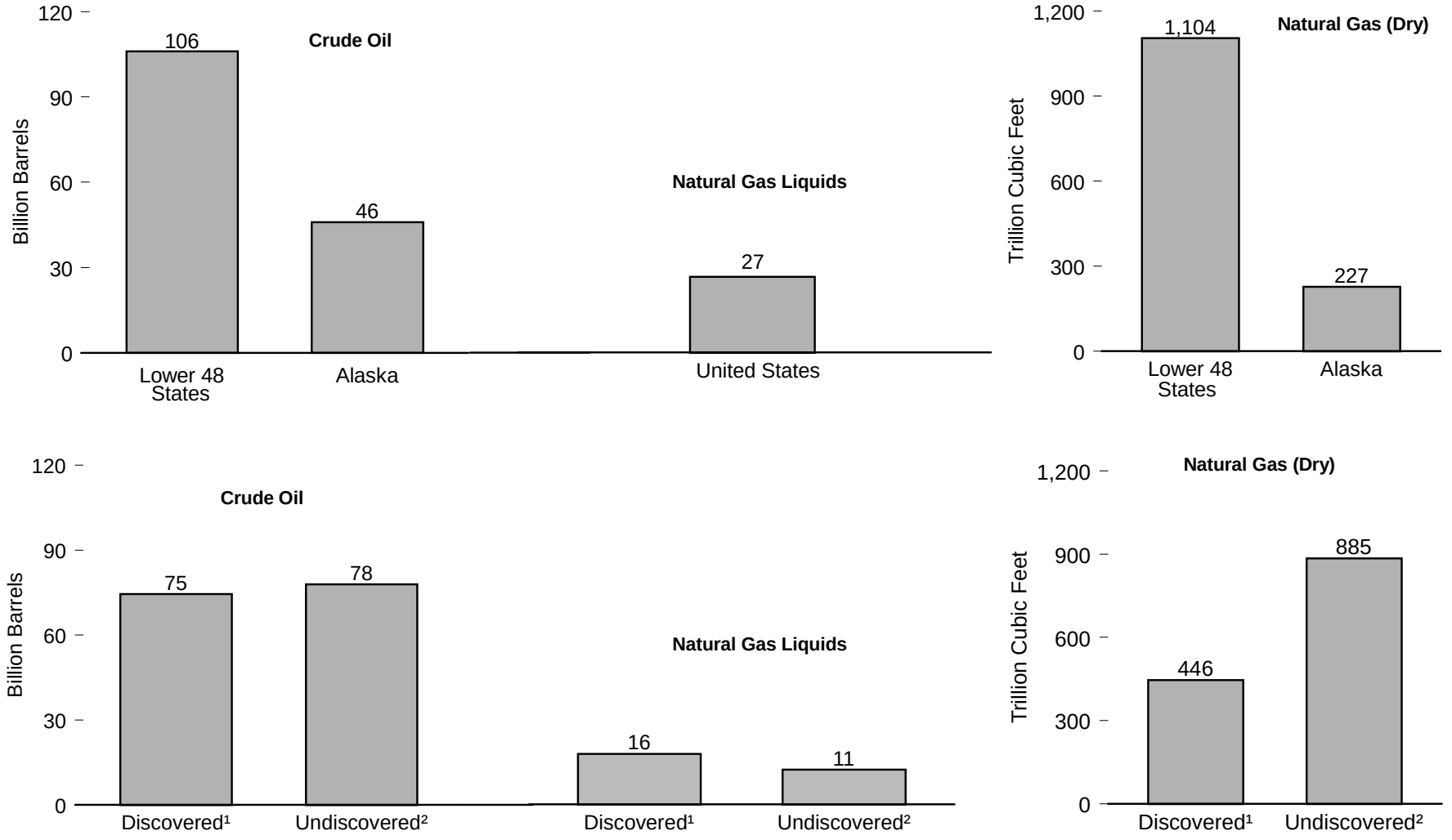
Table 3.5

Sources: **Natural Gas:** • 1949-1962—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT110. • 1963—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT125. • 1964-1971—Bureau of the Census, *U.S. Imports for Consumption and General Imports*, FT246. • 1972 and 1973—Federal Power Commission, *Pipeline Imports and Exports of Natural Gas-Imports and Exports of LNG*. • 1974-1977—Federal Power Commission, *United States Imports and Exports of Natural Gas*, annual reports. •1978-1981—Energy Information Administration (EIA), *U.S. Imports and Exports of Natural Gas*, annual reports. • 1982-1992—EIA, Natural Gas Monthly, monthly reports. 1993-1998—EIA, Natural Gas Monthly, (August 1999). • 1999—EIA estimates. **Crude oil and Petroleum Products:** • 1949-1962—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT110. • 1963—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT125. • 1964-1988—Bureau of the Census, *U.S. Imports for Consumption*, FT135. • 1989-forward—Bureau of the Census, Foreign Trade Division, *U.S. Merchandise Trade*, FT900, "Exports and Imports of Goods by Principal SITC Commodity Groupings," December issues. **Coal:** • 1949-forward—Bureau of the Census, Foreign Trade Division, unpublished data.

4 Energy Resources

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

Figure 4.1 Technically Recoverable Petroleum Resource Estimates, January 1, 1999



[1] Excludes "proved reserves," which are more certain than the resource estimates shown in this figure.

[2] Undiscovered, technically recoverable resources.

Source: Table 4.1.

Table 4.1 Technically Recoverable Petroleum Resource Estimates, January 1, 1999

Region	Crude Oil [1] (million barrels)			Natural Gas Liquids (million barrels)			Natural Gas (Dry) (billion cubic feet)		
	Alaska	Lower 48 States	United States	Alaska	Lower 48 States	United States	Alaska	Lower 48 States	United States
Discovered [2]									
Reserve Growth (Conventional; Onshore)	[3]13,000	[4]47,000	**60,000**	500	12,900	**13,400**	32,000	290,000	**322,000**
Reserve Growth (Conventional; Federal Offshore)	0	[5] 2,238	**2,238**	NE	NE	**NE**	0	[5] 32,719	**32,719**
Unproved Reserves (Conventional; Onshore)	NA	10,256	**10,256**	NA	2,273	**2,273**	NA	86,395	**86,395**
Unproved Reserves (Federal Offshore)	400	1,643	**2,043**	NE	NE	**NE**	700	4,436	**5,136**
Undiscovered, Technically Recoverable [2]									
Conventional (Onshore)	8,440	21,810	**30,250**	1,120	6,080	**7,200**	68,410	190,280	**258,690**
Conventional (Federal Offshore)	24,300	21,300	**45,600**	([6])	[6] 1,800	**1,800**	125,900	142,100	**268,000**
Continuous-type (in Sandstone, Shales and Chalks; Onshore)	NE	2,066	**2,066**	NE	2,119	**2,119**	NE	308,080	**308,080**
Continuous-type (in Coal Beds; Onshore)	NA	NA	**NA**	NA	NA	**NA**	NE	49,910	**49,910**
Total	**46,140**	**106,313**	**152,453**	**NA**	**NA**	**26,792**	**227,010**	**1,103,920**	**1,330,930**

[1] Condensate is included with crude oil for Minerals Management Service (MMS) estimates in Federal Offshore regions.

[2] Excludes "proved reserves," which are more certain than the resource estimates shown in this table.

[3] Using U.S. Geological Survey (USGS) definition, 952 million barrels of indicated additional oil reserves were included (Energy Information Administration (EIA), year end 1996).

[4] Using USGS definition, 1,924 million barrels of indicated additional oil reserves were included (EIA, year end 1996)

[5] Reserve growth in the Pacific Federal offshore is not included. It was not estimated by MMS.

[6] Alaska is included in Lower 48 States.

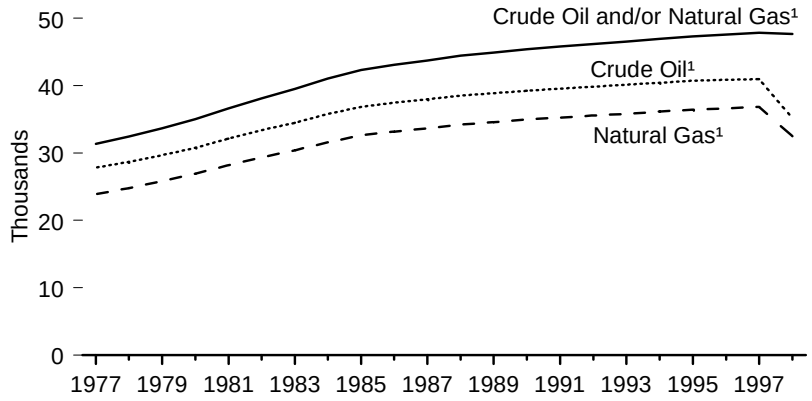
NA=Not available. NE= Not estimated.

Notes: • See Note 1 at end of section. • The category Unproved Reserves (Conventional; Onshore) is the result of low oil prices that caused temporary de-booking of formerly proved reserves in 1998. • Onshore indicates estimates for all Onshore plus State Offshore waters (near-shore, shallow-water areas under State jurisdiction). • Federal Offshore denotes MMS estimates for Federal Offshore jurisdictions (the Outer Continental Shelf and deeper water areas seaward of the State Offshore jurisdictional boundary). • The USGS mean estimates are as of year-end 1993 (onshore and State offshore). The MMS mean estimates are as of year-end 1994. Probable and possible reserves are considered by the USGS to be part of reserve growth but are separately estimated by MMS as unproved reserves. USGS did not set a time limit for the duration of reserves growth; MMS set the year 2020 as the time limit in its estimates of reserve growth in existing fields in the Gulf of Mexico. Excluded from these resource estimates are undiscovered oil resources in tar deposits and oil shales, and undiscovered gas resources in geopressured brines and gas hydrates. • Data may not sum to totals due to independent rounding.

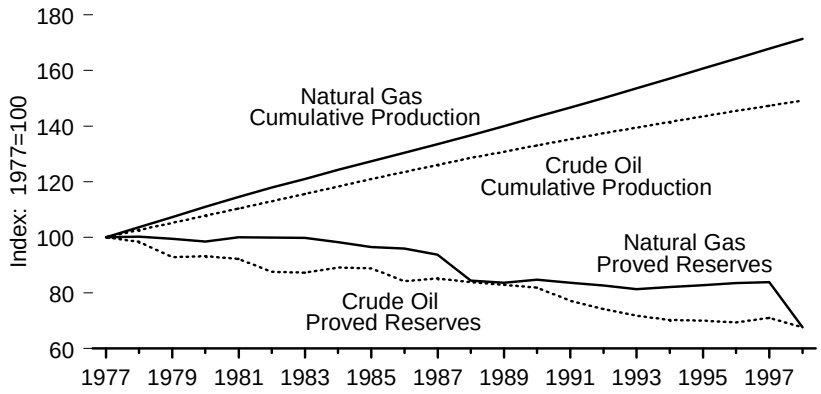
Sources: **Federal Offshore:** U.S. Department of the Interior, Minerals Management Service. *An Assessment of the Undiscovered Hydrocarbon Potential of the Nation's Outer Continental Shelf (1996),* OCS Report MMS 96-0034. **Onshore:** U.S. Department of the Interior, U.S. Geological Survey (USGS), *1995 National Assessment of United States Oil and Gas Resources,* USGS Circular 1118. **Unproved Reserves (Conventional; Onshore):** Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report 1998* (December 1999), Table G1.

Figure 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery, 1977-1998

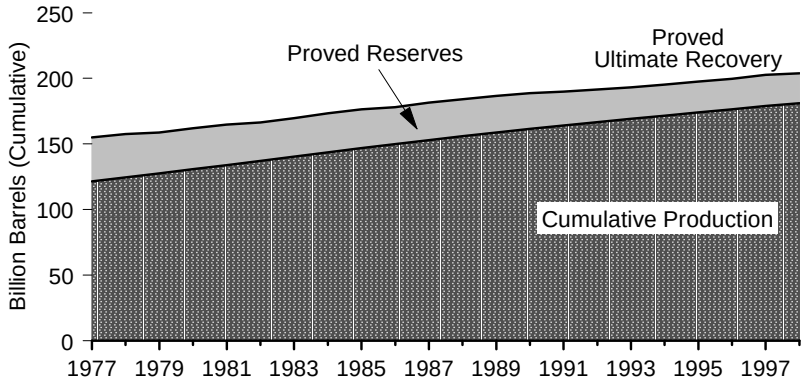
Cumulative Number of Fields



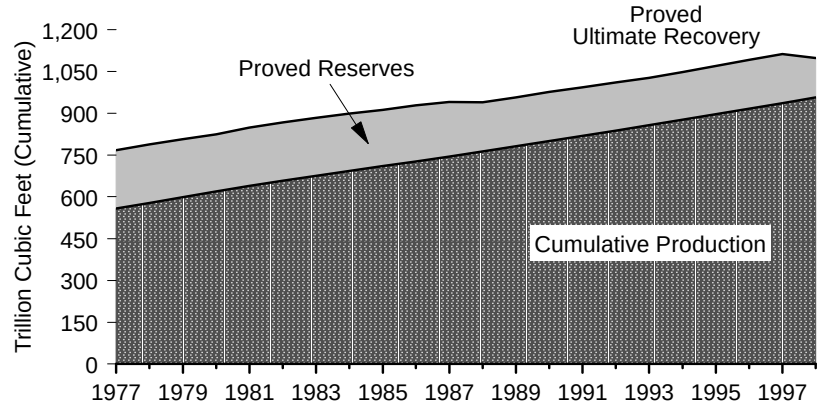
Cumulative Production and Proved Reserves, Indexed to 1977



Crude Oil



Natural Gas



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

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

Source: Table 4.2.

Table 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery, 1977-1998

Year	Cumulative Number of Fields with Crude Oil and/or Natural Gas	Cumulative Number of Fields with Crude Oil	Crude Oil and Lease Condensate (billion barrels)			Cumulative Number of Fields with Natural Gas	Natural Gas [1] (trillion cubic feet)		
			Cumulative Production	Proved Reserves	Proved Ultimate Recovery		Cumulative Production	Proved Reserves	Proved Ultimate Recovery
1977	31,360	27,835	121.4	33.6	155.0	23,883	558.3	209.5	767.8
1978	32,430	28,683	124.6	33.1	157.6	24,786	578.4	210.1	788.5
1979	33,644	29,671	127.7	31.2	158.9	25,823	599.1	208.3	807.4
1980	34,999	30,766	130.8	31.3	162.2	26,919	619.4	206.3	825.6
1981	36,621	32,111	133.9	31.0	165.0	28,213	639.4	209.4	848.9
1982	38,123	33,375	137.1	29.5	166.6	29,375	658.1	209.3	867.4
1983	39,489	34,495	140.3	29.3	169.6	30,419	675.1	209.0	884.1
1984	41,038	35,784	143.5	30.0	173.5	31,595	693.5	206.0	899.5
1985	42,317	36,849	146.8	29.9	176.7	32,595	710.9	202.2	913.1
1986	43,076	37,464	150.0	28.3	178.3	33,151	727.8	201.1	928.9
1987	43,742	37,982	153.0	28.7	181.7	33,657	745.4	196.4	941.8
1988	44,414	38,506	156.0	28.2	184.2	34,196	763.4	177.0	940.4
1989	44,883	38,858	158.8	27.9	186.7	34,579	781.7	175.4	957.1
1990	45,385	39,244	161.5	27.6	189.0	34,975	800.4	177.6	978.0
1991	45,776	39,558	164.2	25.9	190.1	35,254	819.1	175.3	994.4
1992	46,149	39,843	166.8	25.0	191.8	35,539	838.0	173.3	1,011.3
1993	46,513	40,124	169.3	24.1	193.4	35,798	857.2	170.5	1,027.7
1994	46,922	40,417	171.7	23.6	195.3	36,142	877.1	171.9	1,049.1
1995	47,296	40,694	174.1	23.5	197.7	36,433	896.9	173.5	1,070.4
1996	47,557	40,875	176.5	23.3	199.8	36,612	917.0	175.1	1,092.1
1997	47,854	40,977	178.9	23.9	202.8	36,830	937.1	175.7	1,112.8
1998	[2]47,664	[2]35,143	181.2	22.7	203.9	[2]32,458	957.0	141.8	1,098.8

[1] Wet, after lease separation.

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

Note: Data are at end of year.

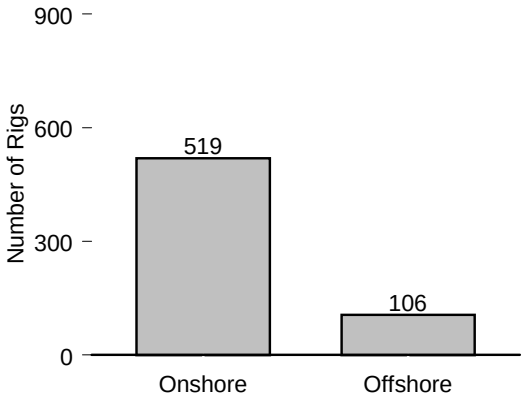
Web Page: http://www.eia.doe.gov/oil_gas/natural_gas/nat_frame.html.

Sources: **Cumulative Production:** Calculated from Energy Information Administration (EIA), *Petroleum Supply Annual,* annual reports and *Natural Gas Annual,* annual reports. **Proved Reserves:**
- 1977-1997—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves,* annual reports.
- 1998—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves* (December 1999), Tables 6, 9, and 16.

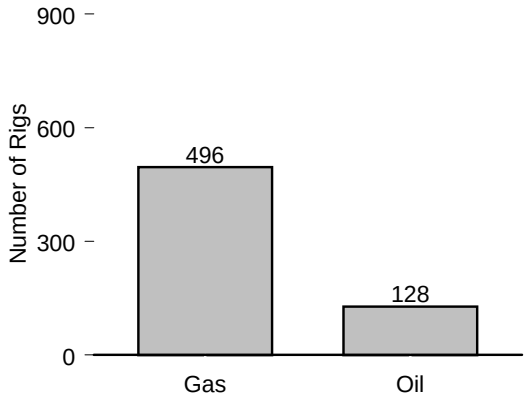
Field Counts: EIA, *Oil and Gas Field Code Master List,* annual reports, and EIA, Office of Oil and Gas, Oil and Gas Integrated Field File.

Figure 4.3 Oil and Gas Drilling Activity Measurements

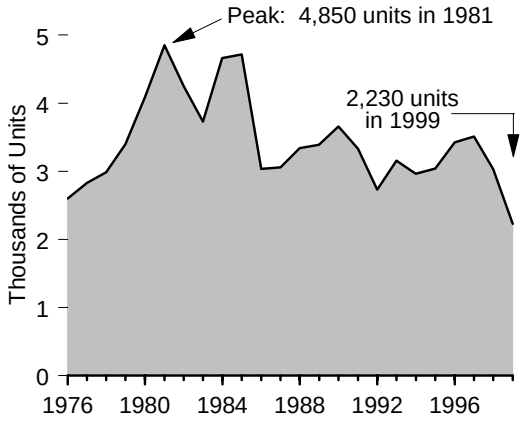
Rotary Rigs in Operation by Site, 1999



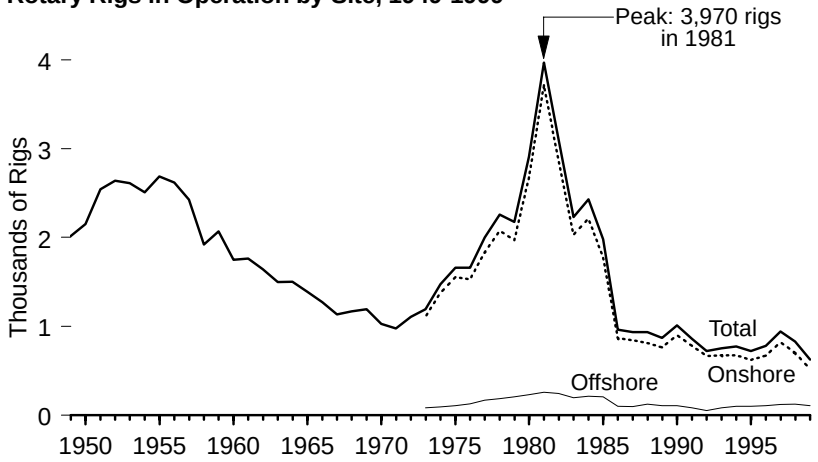
Rotary Rigs in Operation by Type, 1999



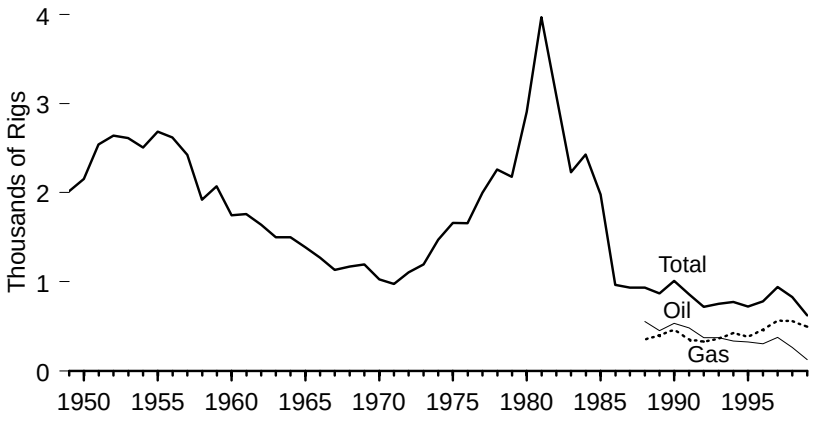
Active Well Servicing Units, 1976-1999



Rotary Rigs in Operation by Site, 1949-1999



Rotary Rigs in Operation by Type, 1949-1999



Source: Table 4.3.

Table 4.3 Oil and Gas Drilling Activity Measurements, 1949-1999

Year	Rotary Rigs in Operation [1]					Active Well Servicing Units
	By Site		By Type			
	Offshore	Onshore	Oil	Gas	Total [2]	
1949	NA	NA	NA	NA	2,017	NA
1950	NA	NA	NA	NA	2,154	NA
1951	NA	NA	NA	NA	2,543	NA
1952	NA	NA	NA	NA	2,641	NA
1953	NA	NA	NA	NA	2,613	NA
1954	NA	NA	NA	NA	2,508	NA
1955	NA	NA	NA	NA	2,686	NA
1956	NA	NA	NA	NA	2,620	NA
1957	NA	NA	NA	NA	2,426	NA
1958	NA	NA	NA	NA	1,922	NA
1959	NA	NA	NA	NA	2,071	NA
1960	NA	NA	NA	NA	1,748	NA
1961	NA	NA	NA	NA	1,761	NA
1962	NA	NA	NA	NA	1,641	NA
1963	NA	NA	NA	NA	1,499	NA
1964	NA	NA	NA	NA	1,501	NA
1965	NA	NA	NA	NA	1,388	NA
1966	NA	NA	NA	NA	1,272	NA
1967	NA	NA	NA	NA	1,135	NA
1968	NA	NA	NA	NA	1,169	NA
1969	NA	NA	NA	NA	1,194	NA
1970	NA	NA	NA	NA	1,028	NA
1971	NA	NA	NA	NA	976	NA
1972	NA	NA	NA	NA	1,107	NA
1973	84	1,110	NA	NA	1,194	NA
1974	94	1,378	NA	NA	1,472	NA
1975	106	1,554	NA	NA	1,660	NA
1976	129	1,529	NA	NA	1,658	2,601
1977	167	1,834	NA	NA	2,001	2,828
1978	185	2,074	NA	NA	2,259	2,988
1979	207	1,970	NA	NA	2,177	3,399
1980	231	2,678	NA	NA	2,909	4,089
1981	256	3,714	NA	NA	3,970	4,850
1982	243	2,862	NA	NA	3,105	4,248
1983	199	2,033	NA	NA	2,232	3,732
1984	213	2,215	NA	NA	2,428	4,663
1985	206	1,774	NA	NA	1,980	4,716
1986	99	865	NA	NA	964	3,036
1987	95	841	NA	NA	936	3,060
1988	123	813	554	354	936	3,341
1989	105	764	453	401	869	3,391
1990	108	902	532	464	1,010	3,658
1991	81	779	482	351	860	3,331
1992	52	669	373	331	721	2,732
1993	82	672	373	364	754	3,158
1994	102	673	335	427	775	2,961
1995	101	622	323	385	723	3,043
1996	108	671	306	464	779	3,425
1997	122	821	376	564	943	[R]3,499
1998	123	703	264	560	827	3,030
1999	106	519	128	496	625	2,230

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

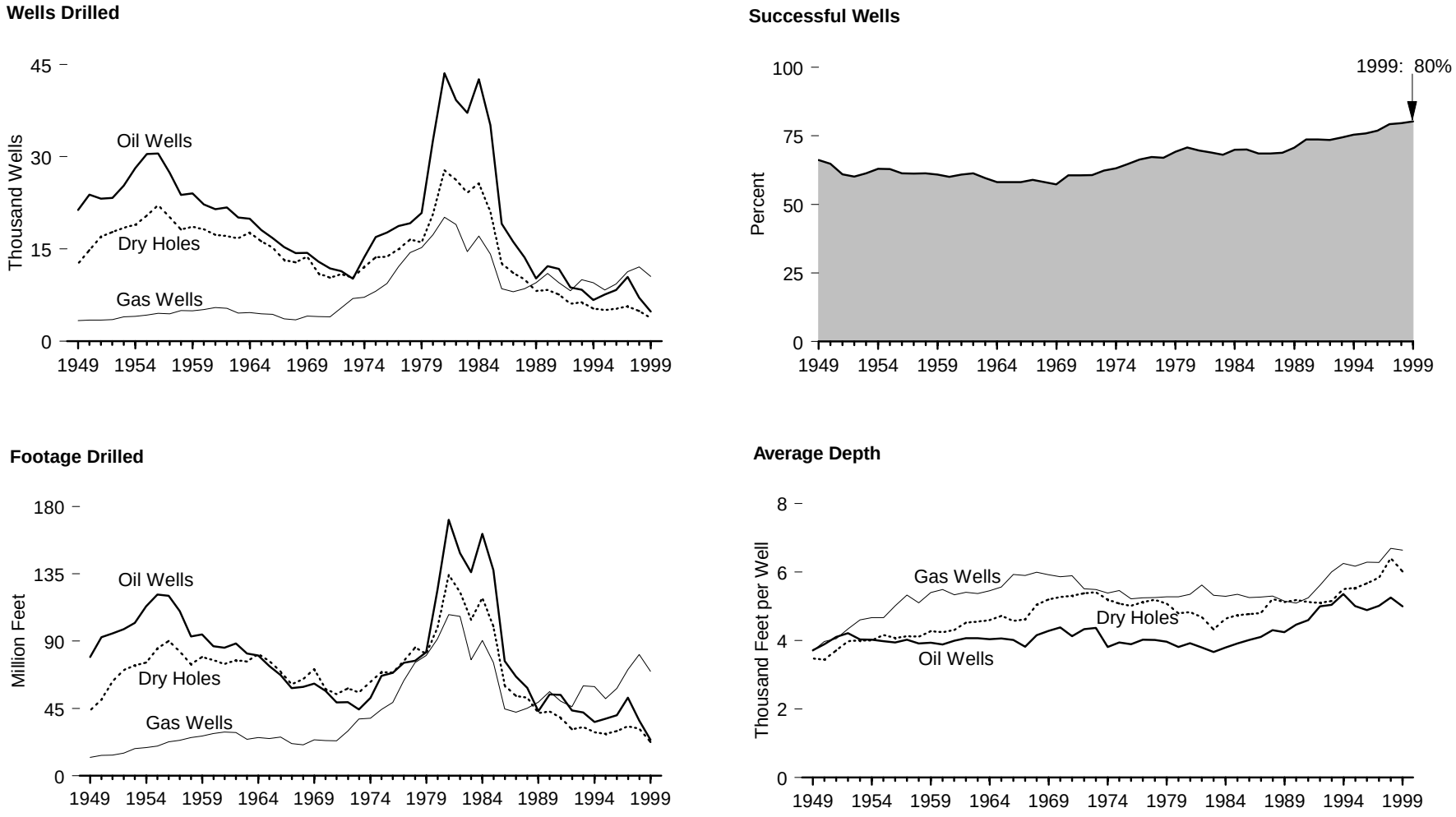
[2] Sum of oil, gas, and miscellaneous other rigs, which is not shown.

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: **Rotary Rigs in Operation:** Baker Hughes, Inc., Houston, Texas, *Rotary Rigs Running~~By~~ State*. **Active Well Servicing Units:** • 1976-July 1998—Association of Energy Service Companies, Dallas, Texas, *Field Reports*. • August 1998 forward—Guiberson Well Service Products, a Halliburton company, Carrollton, Texas.

Figure 4.4 Oil and Gas Exploratory and Development Wells, 1949-1999



Source: Table 4.4.

Table 4.4 Oil and Gas Exploratory and Development Wells, 1949-1999

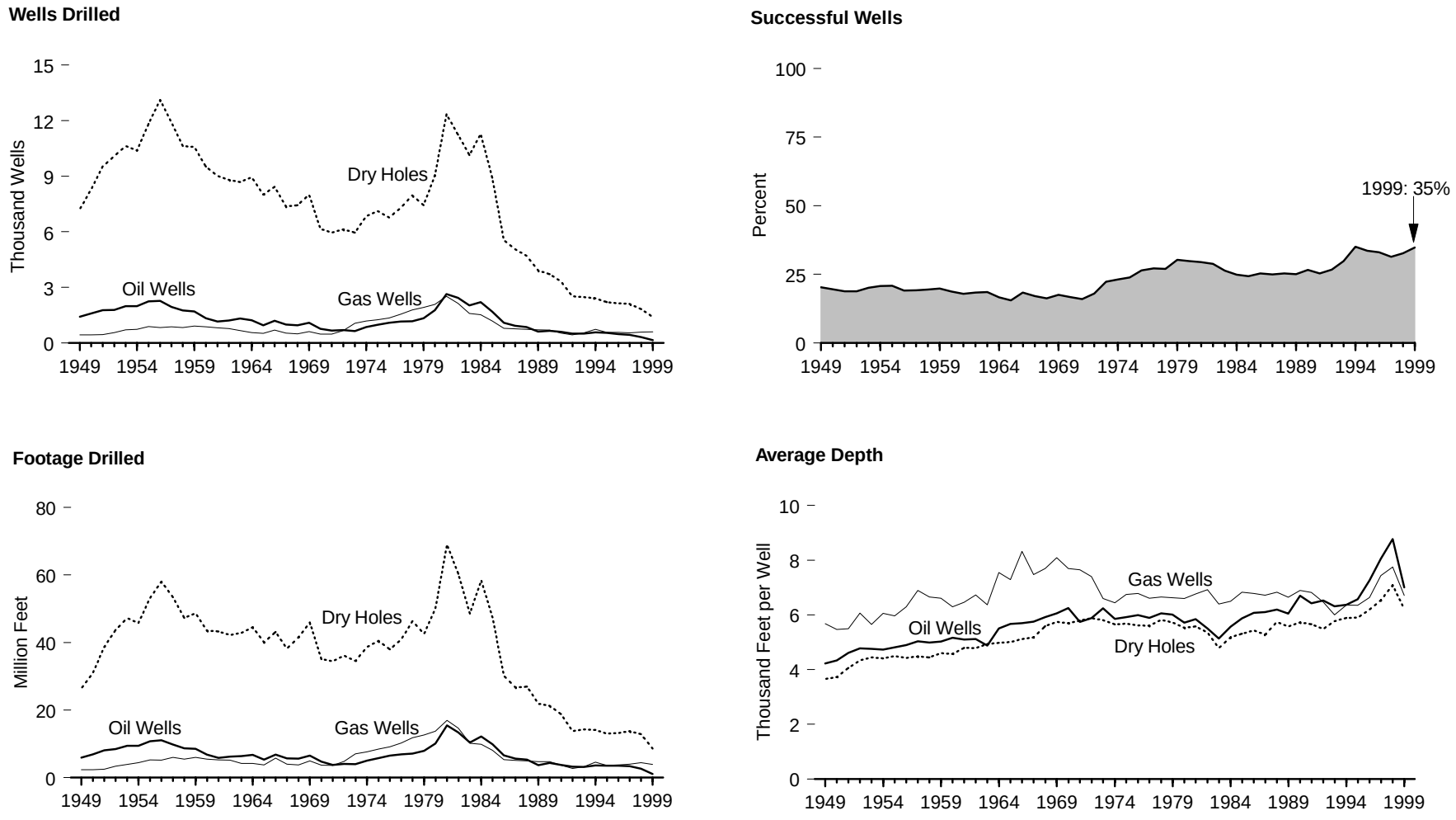
Year	Wells Drilled (thousands)				Successful Wells (percent)	Footage Drilled (million feet)				Average Depth (feet per well)			
	Oil	Gas	Dry Holes	Total		Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total
1949	21.35	3.36	12.60	37.31	66.2	79.4	12.4	43.8	135.6	3,720	3,698	3,473	3,635
1950	23.81	3.44	14.80	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	12.97	R4.01	11.03	R28.01	60.6	56.9	23.6	58.1	138.6	4,385	5,860	5,265	4,943
1971	R11.85	R3.97	10.31	R26.13	60.6	49.1	23.5	54.7	127.3	4,126	5,890	5,305	4,858
1972	11.38	5.44	10.89	27.71	60.7	49.3	30.0	58.6	137.8	4,330	5,516	5,377	4,974
1973	10.17	6.93	10.32	27.42	62.4	44.4	38.0	55.8	138.2	4,367	5,487	5,406	5,041
1974	13.65	7.14	12.12	32.90	63.2	52.0	38.4	62.9	153.4	3,810	5,385	5,195	4,662
1975	16.95	8.13	13.65	38.72	64.8	66.8	44.4	69.3	180.5	3,944	5,462	5,076	4,661
1976	17.69	9.41	13.76	40.86	66.3	68.8	49.1	69.0	187.0	3,891	5,221	5,018	4,577
1977	18.75	12.12	14.99	45.85	67.3	75.5	63.6	76.8	215.9	4,025	5,249	5,124	4,708
1978	19.18	14.41	16.55	50.15	67.0	77.0	75.8	R85.8	238.7	4,016	R5,259	R5,187	4,760
1979	20.85	15.25	16.10	52.20	69.2	82.6	80.5	81.7	244.8	R3,963	5,275	R5,075	4,689
1980	32.64	17.33	20.64	70.61	70.8	124.3	R91.5	98.9	314.7	R3,807	R5,278	R4,792	4,456
1981	43.60	20.17	27.79	91.55	69.6	171.1	107.8	134.2	413.1	3,925	5,346	4,828	4,512
1982	39.20	18.98	26.22	84.40	68.9	148.8	106.7	122.8	378.3	3,795	R5,621	4,685	4,482
1983	37.12	14.56	24.15	75.84	68.2	136.1	77.6	104.3	318.0	R3,667	R5,325	4,320	4,193
1984	42.61	17.13	25.68	85.41	69.9	R161.8	90.6	R119.0	371.4	R3,797	5,289	4,636	4,348
1985	35.12	14.17	21.06	70.34	70.1	137.3	R75.8	R99.9	313.0	3,911	R5,353	R4,743	4,450
1986	19.10	R8.52	R12.68	R40.29	R68.5	76.6	44.7	60.5	181.9	R4,013	R5,255	R4,770	R4,514
1987	16.16	8.06	R11.11	R35.33	R68.5	66.3	42.5	53.4	162.2	4,104	R5,273	R4,803	R4,590
1988	13.64	8.56	10.04	32.23	68.8	58.7	R45.3	52.3	156.4	R4,305	R5,298	R5,211	4,851
1989	10.20	9.54	8.19	27.93	70.7	43.3	49.2	41.9	134.4	4,243	R5,157	R5,123	4,813
1990	12.20	11.04	8.31	R31.56	73.7	54.4	56.2	43.1	153.7	R4,459	R5,091	R5,183	R4,871
1991	11.77	9.53	7.60	R28.89	73.7	54.1	R50.0	R38.9	143.0	4,597	R5,251	R5,121	4,950
1992	8.76	8.21	6.12	23.08	73.5	43.8	46.1	31.2	121.1	R4,999	R5,619	R5,103	5,247
1993	R8.41	10.02	R6.33	R24.75	74.4	42.4	60.1	R32.6	135.1	R5,046	R6,000	R5,150	R5,459
1994	R6.72	9.54	R5.31	R21.57	R75.4	R36.0	59.6	R29.2	R124.8	R5,355	R6,251	R5,502	R5,787
1995E	7.63	R8.35	5.08	R21.06	75.9	R38.2	R51.6	R28.1	R117.8	R5,007	R6,171	R5,535	R5,596
1996E	R8.31	R9.30	R5.28	R22.90	76.9	R40.6	R58.5	R30.0	R129.0	R4,885	R6,286	R5,672	R5,636
1997E	R10.44	R11.33	R5.70	R27.47	79.2	R52.3	R71.1	R33.3	R156.7	R5,009	R6,279	R5,833	R5,704
1998E	R7.06	R12.11	R4.91	R24.08	R79.6	R37.1	R81.0	R31.5	R149.6	R5,256	R6,693	R6,406	R6,213
1999E	4.80	10.51	3.76	19.08	80.3	24.0	69.8	22.6	116.4	5,004	6,640	6,013	6,105

R=Revised. E=Estimated.

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 2 at end of section. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

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

Figure 4.5 Oil and Gas Exploratory Wells, 1949-1999



Source: Table 4.5.

Table 4.5 Oil and Gas Exploratory Wells, 1949-1999

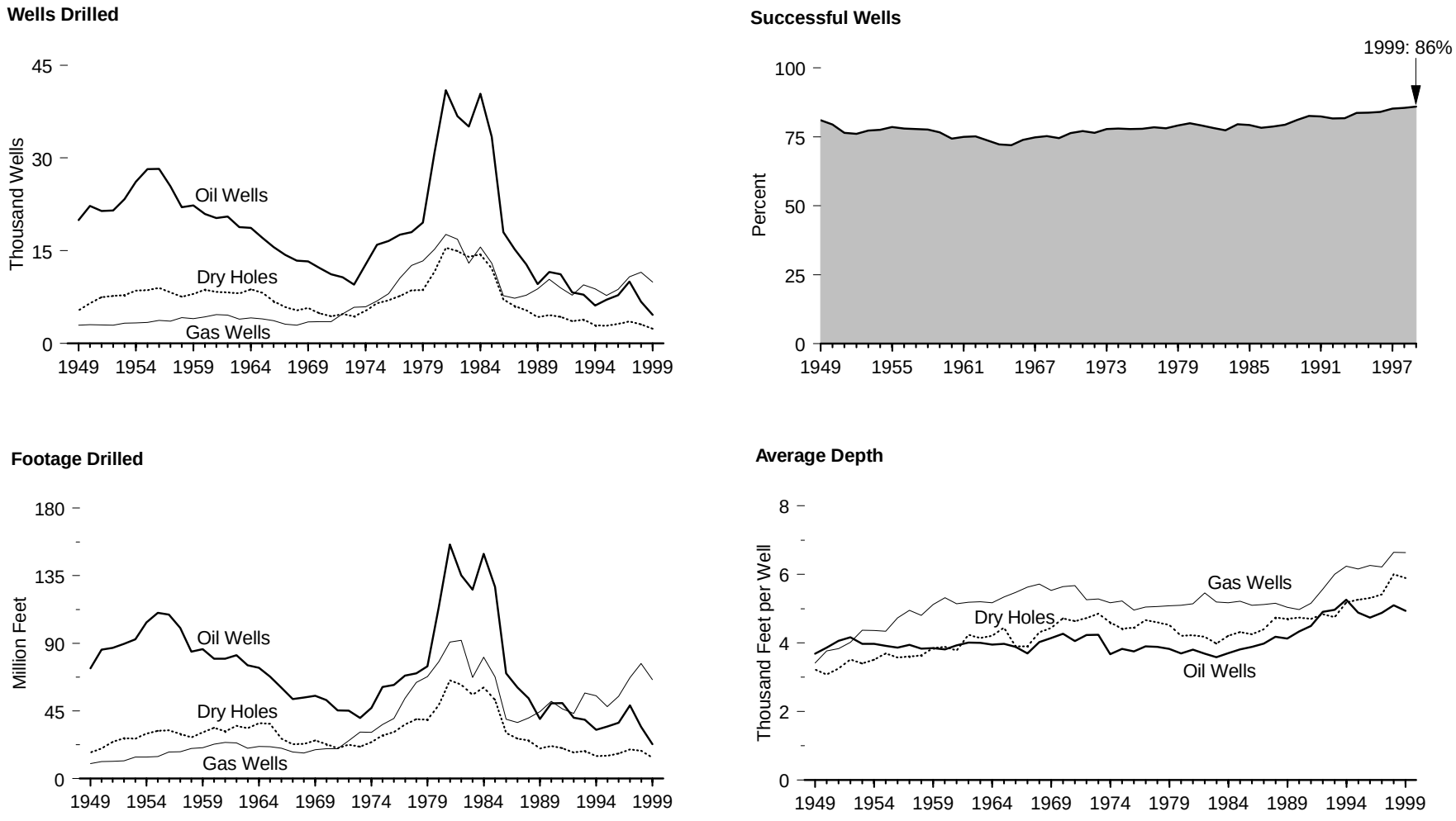
Year	Wells Drilled (thousands)				Successful Wells (percent)	Footage Drilled (million feet)				Average Depth (feet per well)			
	Oil	Gas	Dry Holes	Total		Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total
1949	1.41	0.42	7.23	9.06	20.2	6.0	2.4	26.4	34.8	4,232	5,682	3,658	3,842
1950	1.58	0.43	8.29	10.31	19.5	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	6.16	7.40	16.7	4.7	3.7	35.1	43.5	6,247	7,695	5,700	5,885
1971	0.66	0.47	5.95	7.08	R15.9	3.8	3.6	34.5	41.9	5,745	7,649	5,796	5,915
1972	0.69	0.66	6.13	R7.48	17.9	4.0	4.8	36.1	45.0	5,880	7,400	5,882	6,015
1973	0.64	1.07	5.95	7.66	22.3	4.0	7.0	34.6	45.6	6,246	6,600	5,811	5,957
1974	0.86	1.19	6.83	8.88	23.1	5.0	7.7	38.6	51.3	5,854	6,450	5,653	5,780
1975	0.98	1.25	7.13	9.36	23.8	5.8	8.4	40.5	54.7	5,919	6,751	5,679	5,847
1976	1.09	1.35	6.77	9.20	26.4	6.5	9.1	38.0	R53.6	R5,991	6,786	5,613	5,829
1977	1.16	1.55	7.28	10.00	27.1	6.9	10.2	40.9	57.9	5,895	6,611	5,609	5,798
1978	1.17	1.77	7.97	10.91	27.0	7.1	11.8	46.3	65.2	6,065	6,659	R5,816	R5,979
1979	1.32	1.91	7.44	10.67	30.3	7.9	12.6	42.6	R63.1	6,017	R6,628	R5,722	R5,920
1980	1.76	2.08	9.04	12.88	29.8	10.1	13.7	50.1	73.9	R5,717	R6,602	R5,538	R5,734
1981	2.64	2.51	12.35	17.50	29.4	15.4	17.0	68.9	101.4	R5,849	R6,762	5,583	5,792
1982	2.43	2.13	11.25	15.80	28.8	13.4	14.7	60.3	88.4	R5,500	R6,919	5,360	5,591
1983	2.02	1.59	10.15	13.76	26.3	10.4	10.2	48.6	69.2	R5,133	R6,400	R4,789	R5,026
1984	2.20	1.52	11.28	15.00	24.8	12.2	9.9	58.4	R80.5	R5,568	R6,498	R5,179	R5,370
1985	1.68	1.19	8.92	11.79	24.3	9.9	8.1	R47.4	R65.4	R5,869	R6,828	R5,316	R5,548
1986	1.08	0.79	5.55	7.43	25.3	6.6	5.4	R30.1	R42.1	R6,072	R6,782	R5,431	R5,669
1987	0.93	0.75	5.05	6.73	25.0	R5.6	5.1	26.7	37.4	R6,102	R6,714	R5,287	R5,559
1988	0.86	0.73	4.69	6.28	25.3	5.3	5.0	27.0	37.3	R6,198	R6,832	R5,749	R5,936
1989	0.61	R0.71	3.92	5.24	R25.1	3.7	4.7	21.9	30.2	R6,053	R6,644	R5,577	5,776
1990	0.65	0.69	3.72	5.06	26.6	4.4	R4.7	21.3	30.4	R6,703	R6,894	R5,728	R6,013
1991	0.59	0.53	3.31	4.44	25.4	3.8	3.6	18.8	R26.2	R6,429	R6,820	R5,666	R5,907
1992	0.49	0.42	2.51	3.43	26.7	3.2	R2.7	13.8	19.8	R6,529	R6,474	R5,490	R5,761
1993	0.50	0.55	2.47	3.52	29.8	3.2	3.3	14.3	20.7	R6,317	R5,997	R5,773	R5,886
1994	0.57	R0.73	R2.41	R3.70	R35.0	3.6	4.6	R14.2	R22.4	R6,374	R6,365	R5,891	R6,059
1995E	0.54	0.57	2.20	3.31	33.6	R3.6	3.6	R13.0	R20.1	R6,572	R6,349	R5,897	R6,086
1996E	0.48	R0.57	R2.14	R3.19	R33.0	3.5	R3.8	R13.2	R20.5	R7,266	R6,640	R6,199	R6,440
1997E	R0.43	R0.54	R2.11	R3.07	R31.4	R3.4	R4.0	R13.8	R21.2	R8,059	R7,441	R6,539	R6,908
1998E	R0.30	R0.58	R1.82	R2.70	R32.7	R2.7	R4.5	R12.9	R20.0	R8,777	R7,750	R7,092	R7,423
1999E	0.15	0.59	1.39	2.13	34.7	1.1	3.9	8.6	13.6	7,011	6,709	6,214	6,407

R=Revised. E=Estimated.

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 2 at end of section. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

Sources: • 1949-1960—American Association of Petroleum Geologists, *Statistics on Exploratory Drilling in the United States, 1940 through 1960* (1962), pp. 4-19. • 1961-1965—*Bulletin of the American Association of Petroleum Geologists,* "North American Developments" issue. • 1966-1969—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States,* annual summaries and monthly reports. • 1970-1994—Energy Information Administration (EIA) computations based on well reports submitted to the American Petroleum Institute. • 1995 forward—EIA computations based on well reports submitted to the Information Handling Services Energy Group, Inc. For current data see the EIA *Monthly Energy Review,* Section 5.

Figure 4.6 Oil and Gas Development Wells, 1949-1999



Source: Table 4.6.

Table 4.6 Oil and Gas Development Wells, 1949-1999

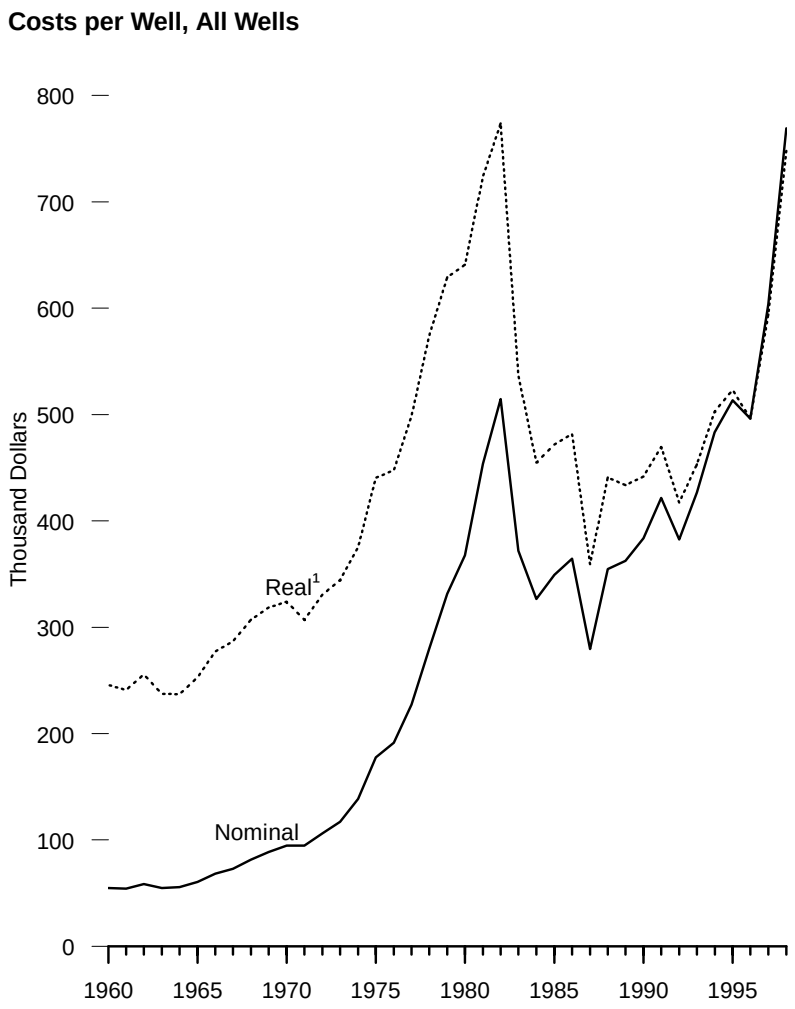
Year	Wells Drilled (thousands)				Successful Wells (percent)	Footage Drilled (million feet)				Average Depth (feet per well)			
	Oil	Gas	Dry Holes	Total		Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total
1949	19.95	2.94	5.37	28.25	81.0	73.5	10.0	17.3	100.8	3,684	3,412	3,225	3,568
1950	22.23	3.01	6.51	31.74	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	12.21	R3.53	4.87	R20.61	76.4	52.1	19.9	23.0	95.0	4,269	R5,644	4,714	R4,610
1971	R11.19	R3.50	4.36	R19.05	R77.1	45.3	19.8	20.2	85.4	R4,049	R5,670	4,633	R4,480
1972	10.69	R4.78	4.76	R20.23	76.5	45.2	25.2	22.5	92.9	4,231	R5,259	4,725	4,590
1973	9.53	5.87	4.37	19.76	77.9	40.4	31.0	21.2	92.6	4,240	5,285	4,853	4,686
1974	12.79	5.95	5.28	24.02	78.0	47.0	30.8	24.3	102.0	3,672	5,172	4,602	4,248
1975	15.97	6.88	6.52	29.36	77.8	61.0	36.0	28.8	125.8	3,822	5,228	4,417	4,284
1976	16.60	8.06	6.99	31.65	77.9	62.3	40.0	31.0	133.3	3,753	4,960	4,441	4,213
1977	17.58	10.57	7.70	35.86	78.5	68.6	53.4	35.9	157.9	R3,902	5,050	4,664	4,404
1978	18.01	12.64	8.59	39.24	78.1	69.9	64.0	39.5	R173.5	R3,882	R5,063	R4,603	R4,421
1979	19.53	13.35	8.66	41.54	79.1	74.7	67.8	R39.2	R181.7	R3,824	R5,081	R4,521	4,373
1980	30.88	15.25	11.60	57.73	79.9	114.2	77.7	48.8	240.8	R3,698	R5,098	4,211	4,171
1981	40.96	17.65	15.44	74.05	79.2	155.7	90.8	65.2	311.8	R3,802	5,145	4,224	4,210
1982	36.77	16.85	14.97	68.59	78.2	135.4	92.0	62.5	289.9	3,683	5,458	4,177	4,227
1983	35.10	12.97	14.01	62.07	77.4	125.7	67.4	55.7	248.8	R3,582	R5,193	3,980	4,008
1984	40.41	15.61	14.40	70.42	79.5	149.5	80.7	60.6	R290.9	R3,701	5,171	R4,210	R4,131
1985	33.44	12.98	12.13	58.55	79.3	127.5	67.7	52.4	247.6	R3,813	R5,218	R4,320	4,229
1986	18.01	7.72	R7.13	R32.87	78.3	70.1	39.4	30.3	R139.8	R3,889	R5,098	R4,255	R4,253
1987	15.24	7.30	R6.06	R28.60	78.8	60.7	37.4	26.7	R124.8	3,983	R5,124	R4,399	R4,362
1988	12.78	7.82	5.35	R25.95	79.4	53.4	R40.3	25.3	119.1	R4,179	R5,155	R4,739	R4,588
1989	9.60	R8.83	4.26	22.70	81.2	39.6	44.5	R20.1	104.2	R4,129	R5,039	R4,705	4,591
1990	R11.54	R10.36	R4.60	R26.50	R82.6	50.0	51.5	21.8	123.3	R4,332	R4,971	R4,742	R4,653
1991	11.18	8.99	R4.28	R24.45	82.5	50.3	46.4	20.1	116.8	R4,500	R5,158	R4,699	R4,777
1992	8.26	7.79	3.61	19.66	81.7	40.6	43.4	17.4	101.4	4,908	5,573	R4,834	R5,158
1993	R7.91	9.47	R3.86	R21.23	81.8	39.2	R56.8	18.3	114.4	R4,965	R6,001	R4,752	R5,388
1994	R6.15	R8.81	R2.90	R17.87	83.8	32.4	55.0	R15.0	R102.4	R5,260	R6,241	R5,180	R5,731
1995E	7.09	R7.78	2.88	R17.75	83.8	34.6	R47.9	R15.1	R97.7	R4,887	R6,158	R5,259	R5,505
1996E	R7.83	R8.73	R3.15	R19.71	R84.0	37.1	R54.7	R16.7	R108.5	R4,738	R6,263	R5,314	R5,506
1997E	R10.01	R10.79	R3.59	R24.39	R85.3	48.8	R67.1	R19.5	R135.4	R4,879	R6,222	R5,418	R5,552
1998E	R6.76	R11.53	R3.10	R21.39	R85.5	34.5	R76.5	R18.6	R129.6	R5,098	R6,640	R6,003	R6,060
1999E	4.65	9.93	2.37	16.95	86.0	23.0	65.9	14.0	102.8	4,938	6,636	5,895	6,067

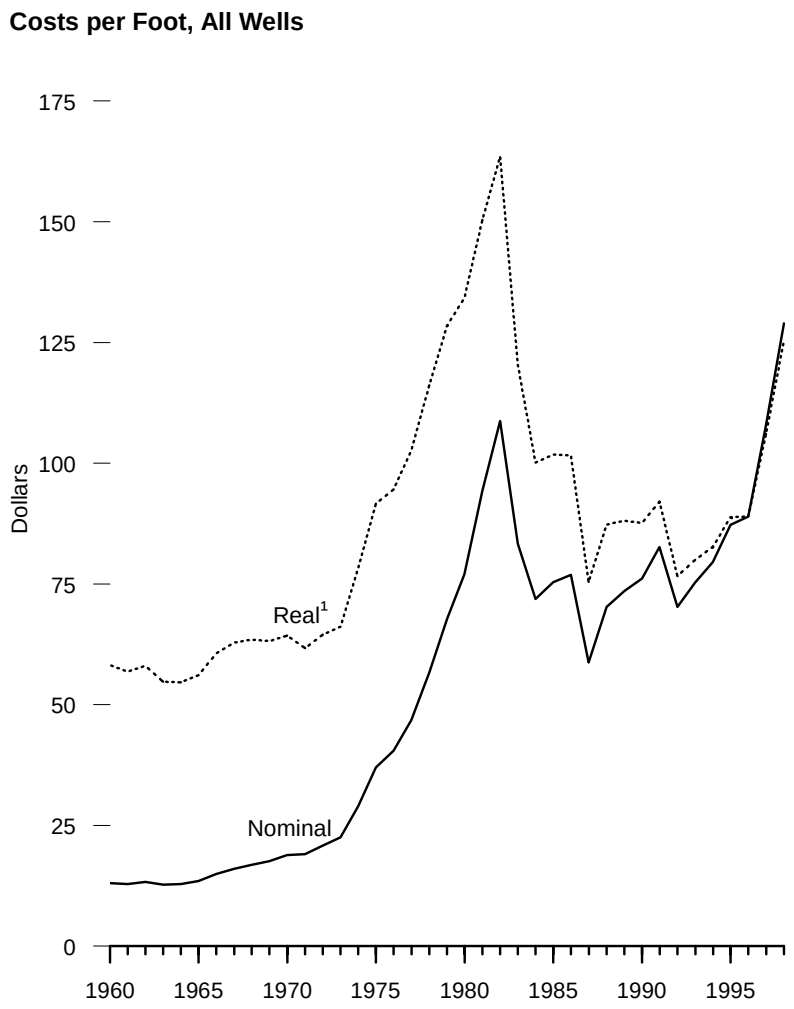
R=Revised. E=Estimated.

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 2 at end of section. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

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

Figure 4.7 Costs of Oil and Gas Wells Drilled, 1960-1998





[1]In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

Source: Table 4.7.

Table 4.7 Costs of Oil and Gas Wells Drilled, 1960-1998

Year	Costs per Well (thousand dollars)					Costs per Foot (dollars)				
				All					All	
	Oil (nominal)	Gas (nominal)	Dry Holes (nominal)	(nominal)	(real) [1]	Oil (nominal)	Gas (nominal)	Dry Holes (nominal)	(nominal)	(real) [1]
1960	52.2	102.7	44.0	54.9	R247.6	13.22	18.57	10.56	13.01	R58.63
1961	51.3	94.7	45.2	54.5	R243.0	13.11	17.65	10.56	12.85	R57.26
1962	54.2	97.1	50.8	58.6	R257.9	13.41	18.10	11.20	13.31	R58.53
1963	51.8	92.4	48.2	55.0	R239.2	13.20	17.19	10.58	12.69	R55.17
1964	50.6	104.8	48.5	55.8	R239.2	13.12	18.57	10.64	12.86	R55.10
1965	56.6	101.9	53.1	60.6	R255.0	13.94	18.35	11.21	13.44	R56.52
1966	62.2	133.8	56.9	68.4	R279.6	15.04	21.75	12.34	14.95	R61.12
1967	66.6	141.0	61.5	72.9	R289.2	16.61	23.05	12.87	15.97	R63.35
1968	79.1	148.5	66.2	81.5	R309.7	18.63	24.05	12.88	16.83	R63.99
1969	86.5	154.3	70.2	88.6	R321.0	19.28	25.58	13.23	17.56	R63.65
1970	86.7	160.7	80.9	94.9	R326.5	19.29	26.75	15.21	18.84	R64.83
1971	78.4	166.6	86.8	94.7	R310.3	18.41	27.70	16.02	19.03	R62.35
1972	93.5	157.8	94.9	106.4	R334.5	20.77	27.78	17.28	20.76	R65.24
1973	103.8	155.3	105.8	117.2	R348.7	22.54	27.46	19.22	22.50	R66.96
1974	110.2	189.2	141.7	138.7	R378.8	27.82	34.11	26.76	28.93	R79.00
1975	138.6	262.0	177.2	177.8	R444.1	34.17	46.23	33.86	36.99	R92.41
1976	151.1	270.4	190.3	191.6	R453.0	37.35	49.78	36.94	40.46	R95.65
1977	170.0	313.5	230.2	227.2	R504.6	41.16	57.57	43.49	46.81	R103.98
1978	208.0	374.2	281.7	280.0	R580.4	49.72	68.37	52.55	56.63	R117.42
1979	243.1	443.1	339.6	331.4	R634.2	58.29	80.66	64.60	67.70	R129.57
1980	272.1	536.4	376.5	367.7	R644.6	66.36	95.16	73.70	77.02	R135.03
1981	336.3	698.6	464.0	453.7	R727.4	80.40	122.17	90.03	94.30	R151.19
1982	347.4	864.3	515.4	514.4	R776.4	86.34	146.20	104.09	108.73	R164.12
1983	283.8	608.1	366.5	371.7	R539.7	72.65	108.37	79.10	83.34	R120.99
1984	262.1	489.8	329.2	326.5	R457.0	66.32	88.80	67.18	71.90	R100.64
1985	270.4	508.7	372.3	349.4	R474.1	66.78	93.09	73.69	75.35	R102.25
1986	284.9	522.9	389.2	364.6	R484.1	68.35	93.02	76.53	76.88	R102.08
1987	246.0	380.4	259.1	279.6	R360.4	58.35	69.55	51.05	58.71	R75.68
1988	279.4	460.3	366.4	354.7	R442.2	62.28	84.65	66.96	70.23	R87.56
1989	282.3	457.8	355.4	362.2	R435.0	64.92	86.86	67.61	73.55	R88.33
1990	321.8	471.3	367.5	383.6	R443.4	69.17	90.73	67.49	76.07	R87.93
1991	346.9	506.6	441.2	421.5	R470.1	73.75	93.10	83.05	82.64	R92.17
1992	362.3	426.1	357.6	382.6	R416.6	69.50	72.83	67.82	70.27	R76.51
1993	356.6	521.2	387.7	426.8	R453.8	67.52	83.15	72.56	75.30	R80.06
1994	409.5	535.1	491.5	483.2	R503.3	70.57	81.90	86.60	79.49	R82.79
1995	415.8	629.7	481.2	513.4	R523.4	78.09	95.97	84.60	87.22	R88.91
1996	341.0	616.0	541.0	496.1	R496.1	70.60	98.67	95.74	88.92	R88.92
1997	445.6	728.6	655.6	603.9	R592.6	90.48	117.55	115.09	107.83	R105.81
1998	566.0	815.6	973.2	769.1	745.9	108.88	127.94	157.79	128.97	125.08

[1] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

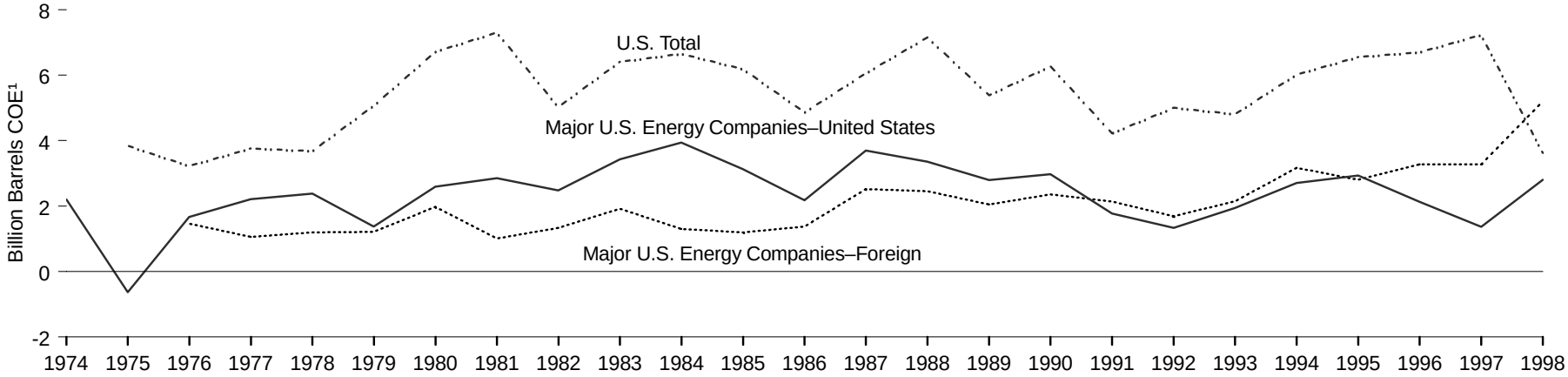
R=Revised.

Notes: • The information reported for 1965 and prior years is not strictly comparable to that in the more recent surveys. • Average cost is the arithmetic mean and includes all costs for drilling and equipping wells and for surface-producing facilities. Wells drilled include exploratory and development wells; excludes service wells, stratigraphic tests, and core tests.

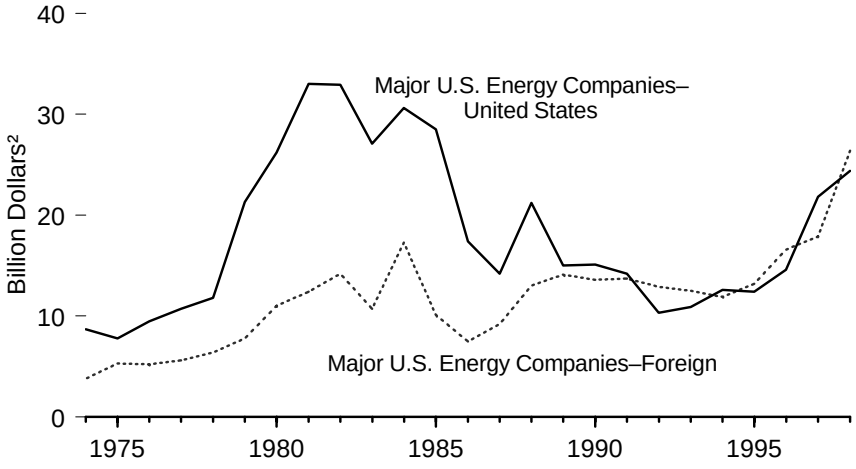
Source: American Petroleum Institute, Independent Petroleum Association of America, Mid-Continent Oil and Gas Association, *1999 Joint Association Survey on Drilling Costs.*

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

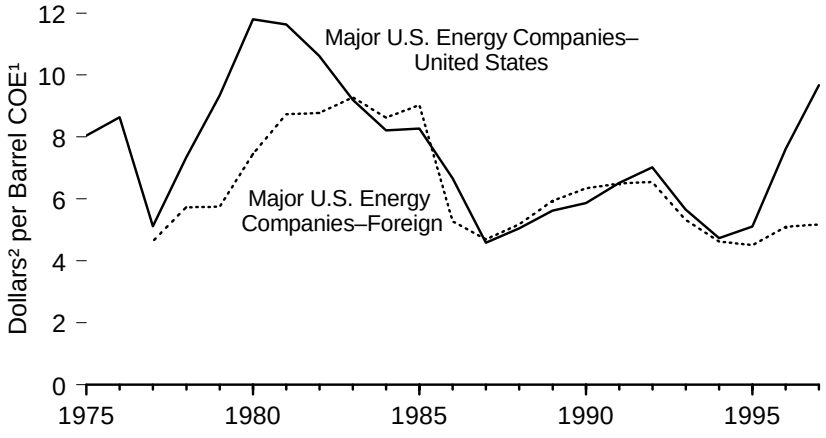
Gross Additions to Proved Reserves of Liquid and Gaseous Hydrocarbons, 1974-1998



Exploration and Development Expenditures, 1974-1998



Expenditures per Barrel of Reserve Additions, 1975-1997
Three-Year Weighted Average



[1] Crude oil equivalent.
[2] Nominal dollars.

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

Source: Table 4.8.

Table 4.8 Gross Additions to Proved Reserves and Exploration and Development Expenditures by Geographic Area, 1974-1998

Year	Gross Additions to Proved Reserves [1] of Liquid and Gaseous Hydrocarbons [2] (million barrels COE [3])			Exploration and Development Expenditures (billion dollars [4])		Expenditures per Barrel of Reserve Additions, Three-Year Weighted Average (dollars [4] per barrel COE [3])	
		Major U.S. Energy Companies [5]		Major U.S. Energy Companies [5]		Major U.S. Energy Companies [5]	
	U.S. Total	United States	Foreign	United States	Foreign	United States	Foreign
1974	NA	2,205	NA	8.7	3.8	NA	NA
1975	3,846	-634	NA	7.8	5.3	8.05	NA
1976	3,224	1,663	1,459	9.5	5.2	8.64	NA
1977	3,765	2,210	1,055	10.7	5.6	5.12	4.64
1978	3,679	2,383	1,191	11.8	6.4	7.34	5.73
1979	5,071	1,378	[6]1,208	21.3	7.8	9.34	[6]5.75
1980	6,723	2,590	1,977	26.2	11.0	11.80	7.45
1981	7,304	2,848	1,006	33.0	12.4	11.63	8.74
1982	5,030	2,482	1,332	32.9	14.2	[7]10.62	[7]8.78
1983	6,412	3,427	1,918	27.1	10.7	9.20	9.28
1984	6,653	3,941	1,298	30.6	17.3	[7]8.21	[7]8.63
1985	6,190	[8]3,129	1,192	28.5	10.1	[8]8.27	9.03
1986	4,866	2,178	[6]1,375	17.4	7.5	6.67	[6]5.28
1987	6,059	[8]3,698	2,516	14.2	9.2	[8]4.58	4.69
1988	7,156	3,359	2,460	21.2	13.0	5.05	5.18
1989	5,385	2,798	2,043	15.0	14.1	5.62	5.94
1990	6,275	2,979	2,355	15.1	13.6	5.87	6.34
1991	4,227	1,772	2,135	14.2	13.7	6.52	6.50
1992	5,006	1,332	1,694	10.3	12.9	7.02	6.55
1993	4,814	1,945	2,147	10.9	12.5	5.66	5.33
1994	6,021	2,703	3,173	12.6	11.9	4.74	4.63
1995	6,558	2,929	2,799	12.4	13.2	5.11	4.51
1996	6,707	2,131	3,280	14.6	16.6	[R]7.61	[R]5.10
1997	7,233	[R]1,367	[R]3,279	[R]21.8	17.9	[R]9.67	[R]5.18
1998	3,628	2,801	5,206	24.4	26.4	NA	NA

[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] Nominal dollars.

[5] Major U.S. Energy Companies are the top publicly-owned, U.S.-based crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS) (see Table 3.12).

[6] Data for 1979 exclude downward revisions of 1,225 million barrels COE due to Iranian policies. Data for 1986 exclude downward revisions due to Libyan sanctions.

[7] Data for 1982 and 1984 are adjusted to exclude purchases of proved reserves associated with mergers among the Financial Reporting System companies.

[8] Data for 1985 and 1987 exclude downward revisions of 1,477 million barrels COE and 2,396 million barrels COE, respectively, of Alaska North Slope natural gas reserves.

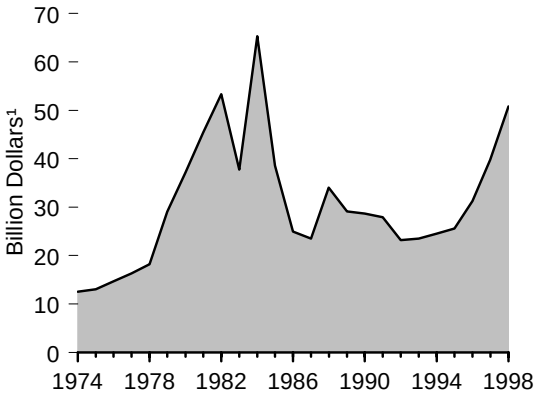
R=Revised. NA=Not available.

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

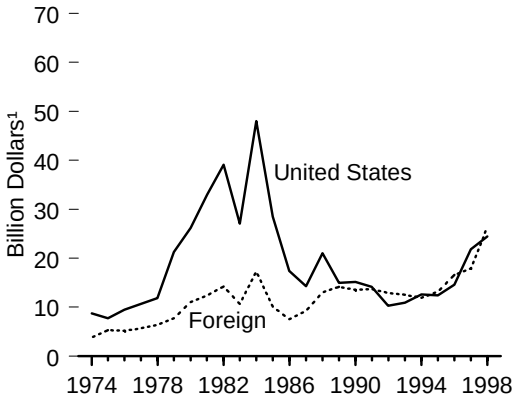
Sources: **Major U.S. Energy Companies:** • 1974-1976—Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System" database, November 1997. • 1977-1997—EIA, *Performance Profiles of Major Energy Producers,* annual reports. • 1998—EIA, *Performance Profiles of Major Energy Producers 1998* (January 2000). **U.S. Total, Gross Additions to Proved Reserves of Liquid and Gaseous Hydrocarbons:** • 1975-1979—American Gas Association, American Petroleum Institute, and Canadian Petroleum Association (published jointly), *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada as of December 31, 1979,* Volume 34, June 1980. • 1980 forward—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves,* annual reports.

Figure 4.9 Major U.S. Energy Companies' Expenditures for Oil and Gas Exploration and Development by Region

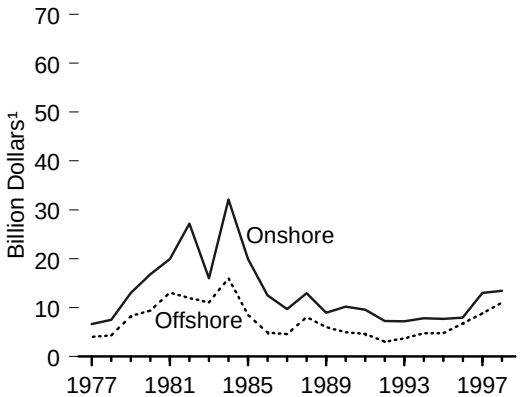
Total, 1974-1998



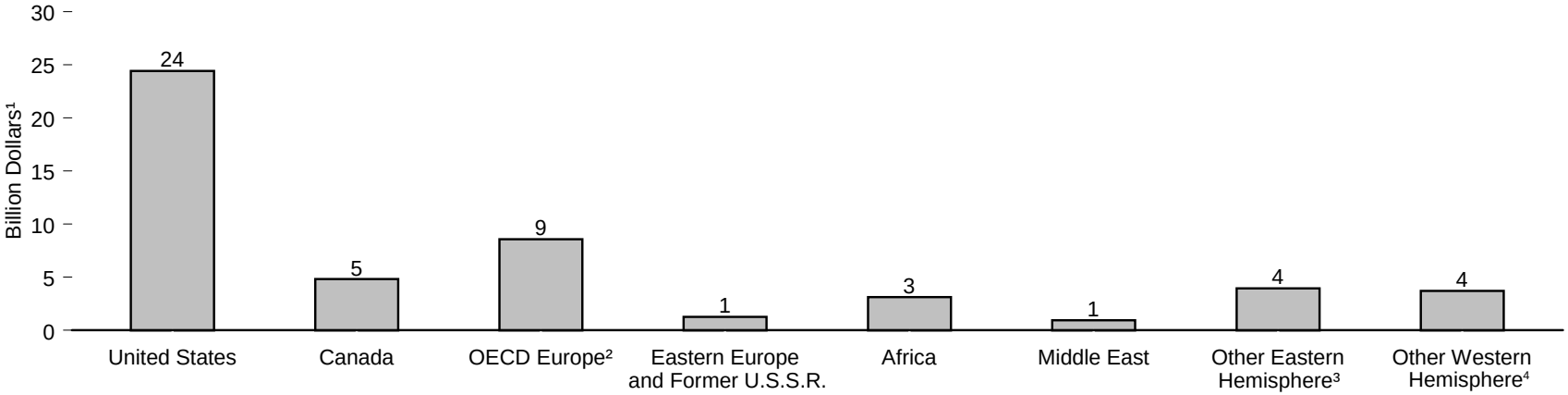
U.S. and Foreign, 1974-1998



U.S. Onshore and Offshore, 1977-1998



By Region, 1998



[1] Nominal dollars.

[2] Organization for Economic Cooperation and Development. See OECD Europe in Glossary.

[3] This region includes areas that are eastward of the Greenwich prime meridian to 180° longitude and that are not included in other specific domestic or foreign classifications.

[4] This region includes areas that are westward of the Greenwich prime meridian to 180° longitude and that are not included in other specific domestic or foreign classifications.

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

Source: Table 4.9.

Table 4.9 Major U.S. Energy Companies' Expenditures for Oil and Gas Exploration and Development by Region, 1974-1998

(Billion Dollars[1])

Year	United States			Foreign								Total
	Onshore	Offshore	Total	Canada	OECD [2] Europe	Eastern Europe and Former U.S.S.R.	Africa	Middle East	Other Eastern Hemisphere [3]	Other Western Hemisphere [4]	Total	
1974	NA	NA	8.7	NA	NA	—	NA	NA	NA	NA	3.8	12.5
1975	NA	NA	7.8	NA	NA	—	NA	NA	NA	NA	5.3	13.1
1976	NA	NA	9.5	NA	NA	—	NA	NA	NA	NA	5.2	14.7
1977	6.7	4.0	10.7	1.5	2.5	—	0.7	0.2	0.3	0.4	5.6	16.3
1978	7.5	4.3	11.8	1.6	2.6	—	0.8	0.3	0.4	0.6	6.4	18.2
1979	13.0	8.3	21.3	2.3	3.0	—	0.8	0.2	0.5	0.8	7.8	29.1
1980	16.8	9.4	26.2	3.1	4.3	—	1.4	0.2	0.8	1.0	11.0	37.2
1981	19.9	13.0	33.0	1.8	5.0	—	2.1	0.3	1.9	1.3	12.4	45.4
1982	27.2	11.9	39.1	1.9	6.3	—	2.1	0.4	2.4	1.1	14.2	53.3
1983	16.0	11.1	27.1	1.6	4.3	—	1.7	0.5	2.0	0.6	10.7	37.7
1984	32.1	16.0	48.1	5.4	5.5	—	3.4	0.5	2.0	0.5	17.3	65.3
1985	20.0	8.5	28.5	1.9	3.7	—	1.6	0.9	1.3	0.7	10.1	38.6
1986	12.5	4.9	17.4	1.1	3.2	—	1.1	0.3	1.2	0.6	7.5	24.9
1987	9.7	4.5	14.3	1.9	3.0	—	0.8	0.4	2.8	0.5	9.2	23.5
1988	12.9	8.1	21.0	5.4	4.3	—	0.8	0.4	1.4	0.7	13.0	34.1
1989	9.0	6.0	15.0	6.3	3.5	—	1.0	0.4	2.3	0.6	14.1	29.1
1990	10.2	4.9	15.1	1.8	6.6	—	1.4	0.6	2.4	0.7	13.6	28.7
1991	9.6	4.6	14.2	1.7	6.8	—	1.5	0.5	2.4	0.7	13.7	27.9
1992	7.3	3.0	10.3	1.1	6.8	—	1.4	0.6	2.4	0.6	12.9	23.2
1993	7.2	3.7	10.9	1.6	5.5	0.3	1.5	0.7	2.5	0.6	12.5	23.5
1994	7.8	4.8	12.6	1.8	4.4	0.3	1.4	0.4	2.8	0.7	11.9	24.5
1995	7.7	4.7	12.4	1.9	5.2	0.4	2.0	0.4	2.4	0.9	13.2	25.6
1996	7.9	6.7	14.6	1.6	5.6	0.5	2.8	0.5	4.1	1.6	16.6	31.3
1997	[R]13.0	8.8	[R]21.8	2.0	7.1	0.6	3.0	0.6	3.0	1.6	17.9	[R]39.8
1998	13.5	11.0	24.4	4.8	8.6	1.3	3.1	0.9	3.9	3.7	26.4	50.8

[1] Nominal dollars.

[2] Organization for Economic Cooperation and Development. See OECD Europe in Glossary.

[3] This region includes areas that are eastward of the Greenwich prime meridian to 180° longitude and that are not included in other domestic or foreign classifications.

[4] This region includes areas that are westward of the Greenwich prime meridian to 180° longitude and that are not included in other domestic or foreign classifications.

R=Revised. — = Not applicable. NA=Not available.

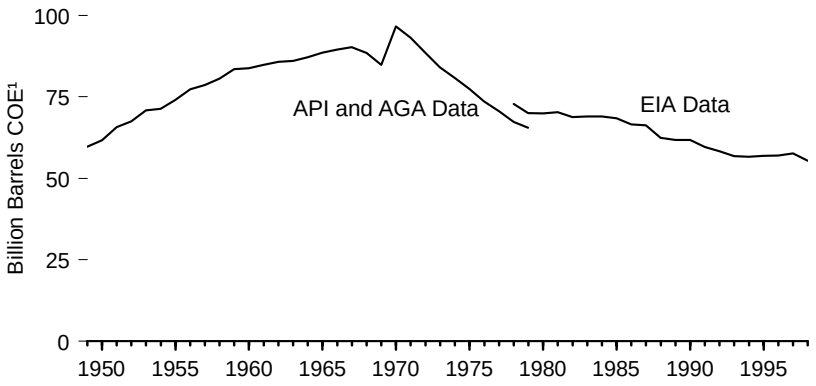
Notes: • Major U.S. Energy Companies are the top publicly-owned, U.S.-based crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12. • Totals may not equal sum of components due to independent rounding.

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

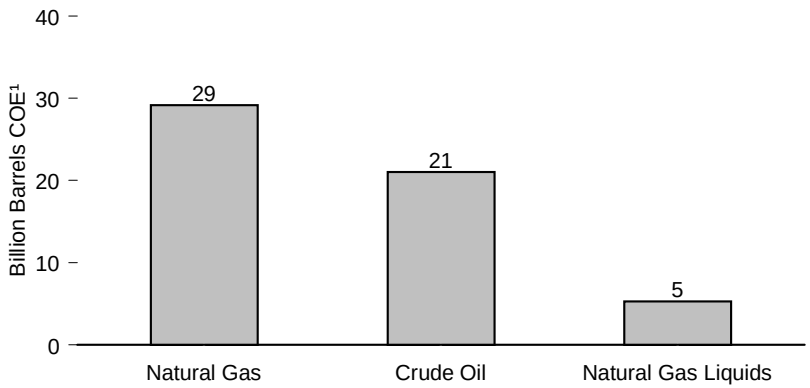
Sources: • 1974-1976—Energy Information Administration (EIA), Office of Energy Markets and End Use, Financial Reporting System Database, November 1997. • 1977-1991—EIA, *Performance Profiles of Major Energy Producers,* annual reports. • 1992-1998—EIA, *Performance Profiles of Major Energy Producers, 1998* (January 2000), Table B16.

Figure 4.10 Liquid and Gaseous Hydrocarbon Proved Reserves

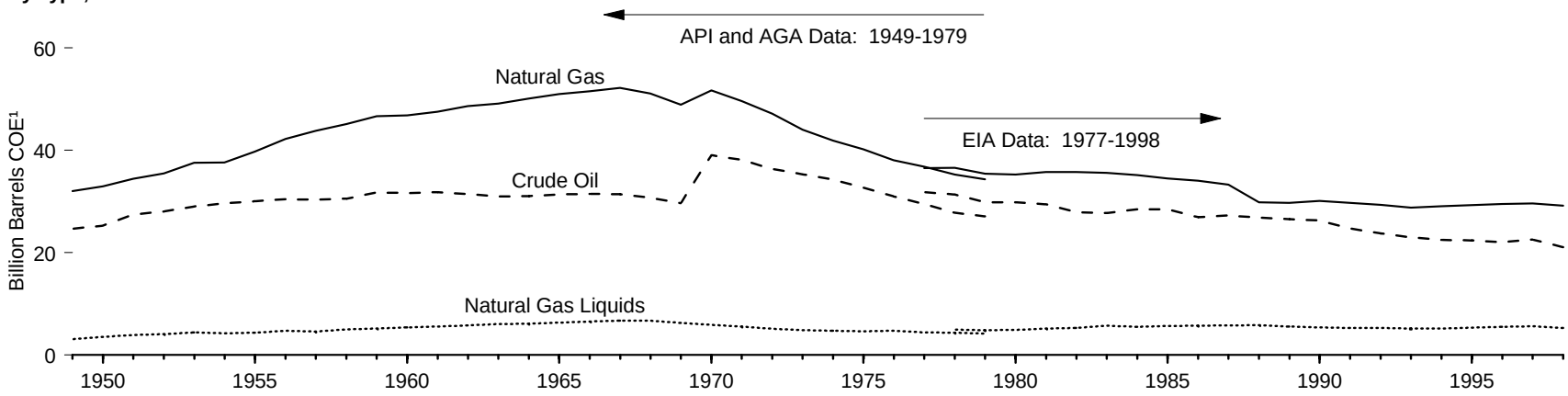
Total, 1949-1998



By Type, 1998



By Type, 1949-1998



¹ COE=crude oil equivalent.

Notes: • Data are at end of year. • API=American Petroleum Institute. AGA=American Gas Association. • EIA=Energy Information Administration.

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

Source: Table 4.10.

Table 4.10 Liquid and Gaseous Hydrocarbon Proved Reserves, 1949-1998

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
1994	22.5	163.8	29.0	7.2	5.1	56.6
1995	22.4	165.1	29.2	7.4	5.3	56.9
1996	22.0	166.5	29.5	7.8	5.5	57.0
1997	22.5	167.2	29.6	8.0	5.6	57.7
1998	21.0	164.0	29.2	7.5	5.3	55.5

[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.

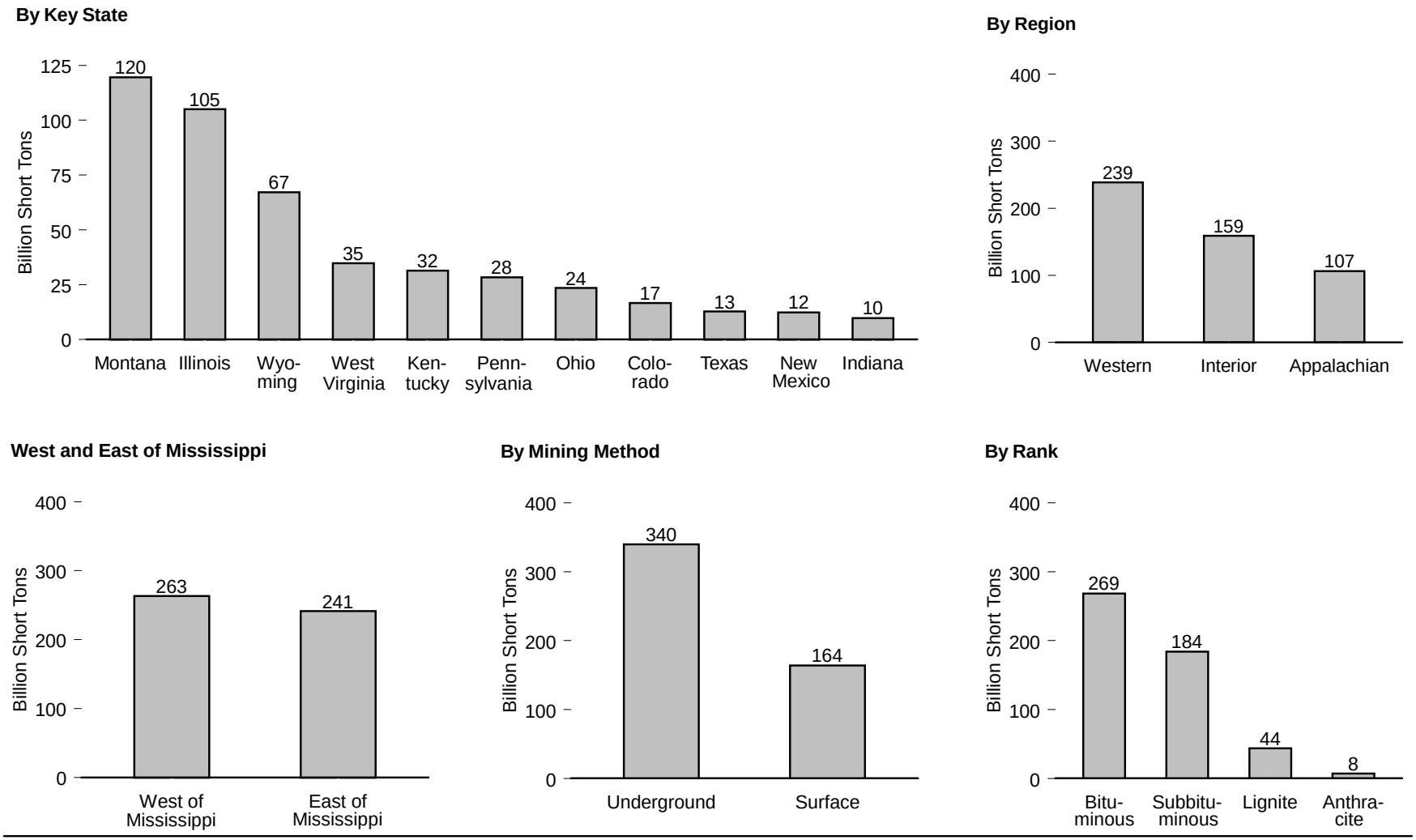
NA=Not available.

Note: Data are at end of year.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

Sources: **API/AGA Data:** American Gas Association, American Petroleum Institute, and Canadian Petroleum Association (published jointly). *Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the United States and Canada as of December 31, 1979.* Volume 34, June 1980. **EIA Data:**
- 1977-1987—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves,* annual reports.
- 1988 forward—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report 1998* (December 1999), Table 1.

Figure 4.11 Coal Demonstrated Reserve Base, January 1, 1999



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

Source: Table 4.11.

Table 4.11 Coal Demonstrated Reserve Base, January 1, 1999

(Billion Short Tons)

Region and State	Anthracite	Bituminous Coal		Subbituminous Coal		Lignite	Total		
		Underground	Surface	Underground	Surface	Surface [1]	Underground	Surface	Total
Appalachian	**7.3**	**74.0**	**24.0**	**0.0**	**0.0**	**1.1**	**78.0**	**28.5**	**106.5**
Alabama	0.0	1.2	2.2	0.0	0.0	1.1	1.2	3.2	4.5
Kentucky, Eastern	0.0	2.0	9.7	0.0	0.0	0.0	2.0	9.7	11.7
Ohio	0.0	17.7	5.8	0.0	0.0	0.0	17.7	5.8	23.6
Pennsylvania	7.2	20.2	1.0	0.0	0.0	0.0	24.0	4.4	28.4
Virginia	0.1	1.3	0.7	0.0	0.0	0.0	1.4	0.7	2.1
West Virginia	0.0	30.5	4.3	0.0	0.0	0.0	30.5	4.3	34.8
Other [2]	0.0	1.2	0.4	0.0	0.0	0.0	1.2	0.4	1.5
Interior	**0.1**	**118.1**	**27.6**	**0.0**	**0.0**	**13.3**	**118.2**	**40.9**	**159.1**
Illinois	0.0	88.3	16.6	0.0	0.0	0.0	88.3	16.6	104.9
Indiana	0.0	8.8	1.0	0.0	0.0	0.0	8.8	1.0	9.8
Iowa	0.0	1.7	0.5	0.0	0.0	0.0	1.7	0.5	2.2
Kentucky, Western	0.0	16.2	3.7	0.0	0.0	0.0	16.2	3.7	19.8
Missouri	0.0	1.5	4.5	0.0	0.0	0.0	1.5	4.5	6.0
Oklahoma	0.0	1.2	0.3	0.0	0.0	0.0	1.2	0.3	1.6
Texas	0.0	0.0	0.0	0.0	0.0	12.8	0.0	12.8	12.8
Other [3]	0.1	0.3	1.1	0.0	0.0	0.5	0.4	1.6	2.0
Western	**(s)**	**22.5**	**2.4**	**121.4**	**62.8**	**29.7**	**143.9**	**94.8**	**238.7**
Alaska	0.0	0.6	0.1	4.8	0.6	(s)	5.4	0.7	6.1
Colorado	(s)	8.0	0.6	3.8	0.0	4.2	11.9	4.8	16.7
Montana	0.0	1.4	0.0	69.6	32.9	15.8	71.0	48.6	119.6
New Mexico	(s)	2.7	0.9	3.5	5.2	0.0	6.2	6.2	12.4
North Dakota	0.0	0.0	0.0	0.0	0.0	9.3	0.0	9.3	9.3
Utah	0.0	5.5	0.3	(s)	0.0	0.0	5.5	0.3	5.7
Washington	0.0	0.3	0.0	1.0	(s)	(s)	1.3	(s)	1.4
Wyoming	0.0	3.8	0.5	38.7	24.1	0.0	42.5	24.6	67.1
Other [4]	0.0	0.1	0.0	(s)	(s)	0.4	0.1	0.4	0.5
U.S. Total	**7.5**	**214.6**	**54.0**	**121.4**	**62.8**	**44.0**	**340.1**	**164.2**	**504.3**
States East of the Mississippi River	7.3	187.5	45.3	0.0	0.0	1.1	191.5	49.7	241.2
States West of the Mississippi River	0.1	27.1	8.7	121.4	62.8	42.9	148.6	114.5	263.1

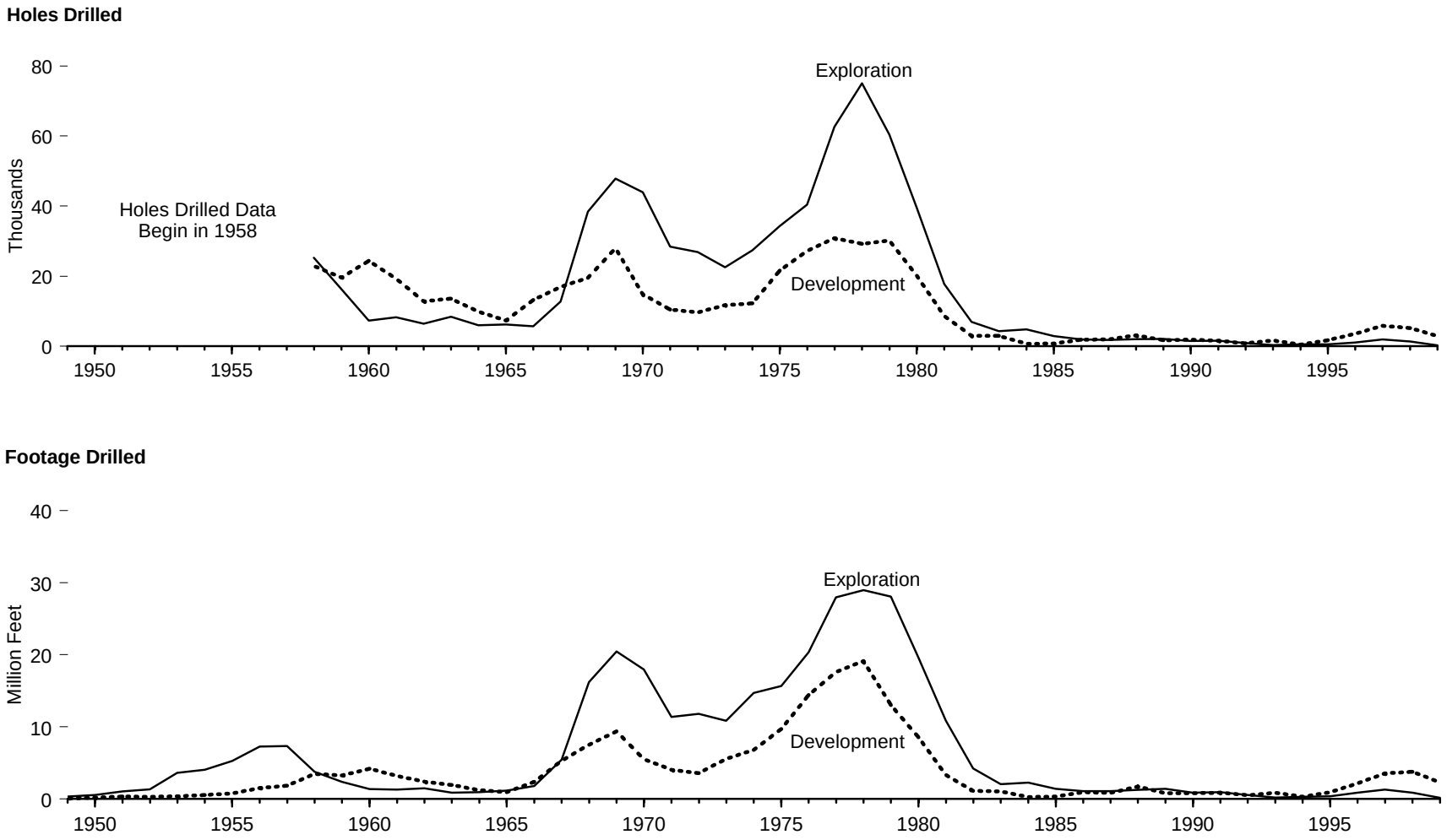
[1] Lignite resources are not mined underground in the United States.
[2] Georgia, Maryland, North Carolina, and Tennessee.
[3] Arkansas, Kansas, Louisiana, and Michigan.
[4] Arizona, Idaho, Oregon, and South Dakota.
(s)=Less than 0.05 billion short tons.

Notes: • See *U.S. Coal Reserves: 1997 Update* on the Web Page for a description of the methodology used to produce these data. • Data represent known measured and indicated coal resources meeting minimum seam and depth criteria, in the ground as of January 1, 1999. These coal resources are not totally recoverable. Net recoverability ranges from 0 percent to more than 90 percent. Fifty-four percent of the demonstrated reserve base of coal in the United States is estimated to be recoverable. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelcoal.html.

Source: Energy Information Administration, Coal Reserves Data Base.

Figure 4.12 Uranium Exploration and Development Drilling, 1949-1999



Source: Table 4.12.

Table 4.12 Uranium Exploration and Development Drilling, 1949-1999

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	1.97
1988	2.03	1.28	3.18	1.73	5.21	3.01
1989	2.09	1.43	1.75	0.80	3.84	2.23
1990	1.51	0.87	1.91	0.81	3.42	1.68
1991	1.62	0.97	1.57	0.87	3.20	1.84
1992	0.94	0.56	0.83	0.50	1.77	1.06
1993	0.36	0.22	1.67	0.89	2.02	1.11
1994	0.52	0.34	0.48	0.32	1.00	0.66
1995	0.58	0.40	1.73	0.95	2.31	1.35
1996	1.12	0.88	3.58	2.16	4.70	3.05
1997	1.94	1.33	5.86	3.56	7.79	4.88
1998	1.37	0.89	5.23	3.75	6.60	4.64
1999	0.27	0.18	2.91	2.33	3.18	2.50

[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.

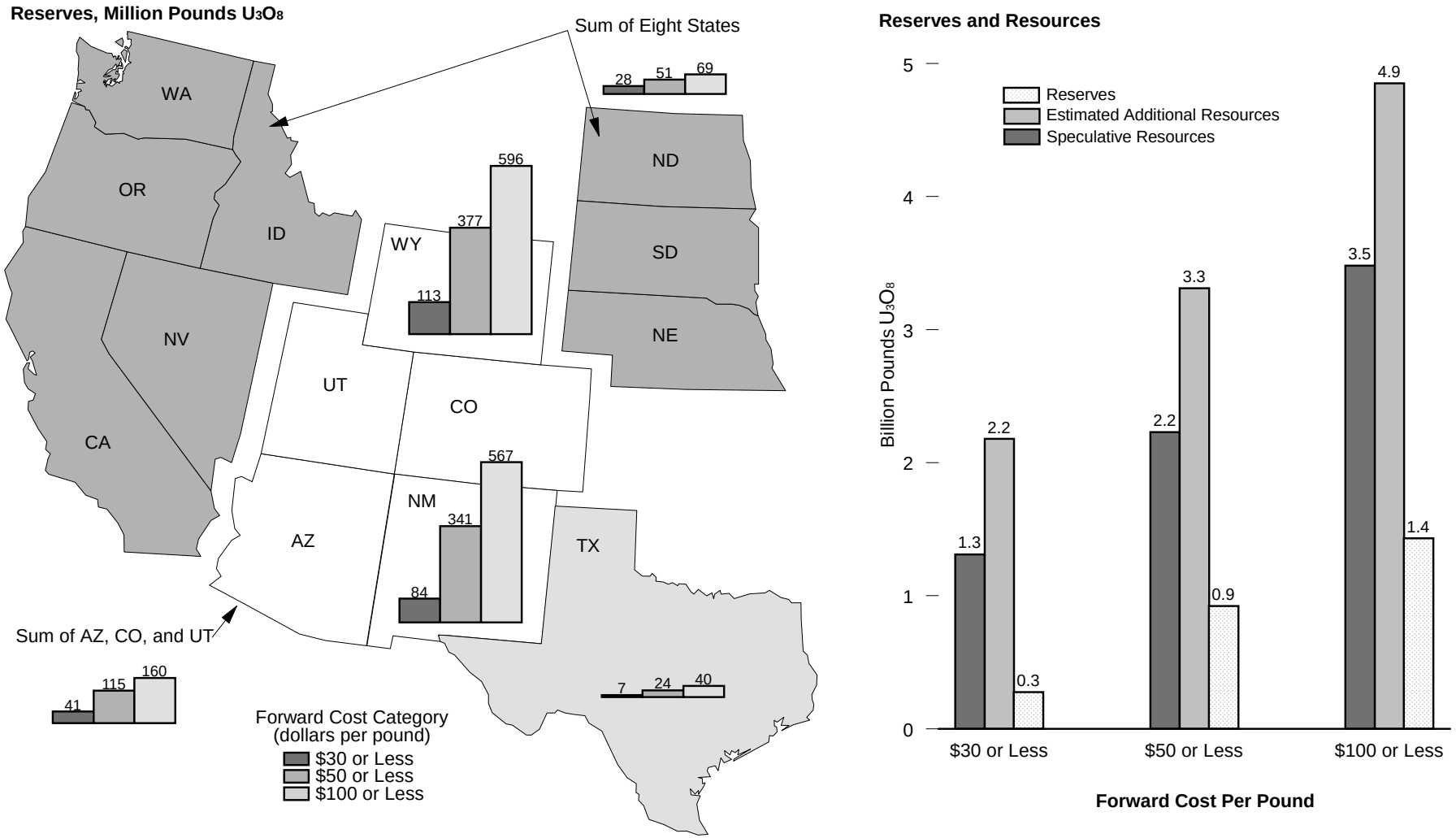
NA=Not available.

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

Web Page: http://www.eia.doe.gov/fuelnuclear.html.

Sources: • 1949-1981—U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry,* January 1, 1983, Report No. GJO-100 (1983), Table VIII-5. • 1982-1989—Energy Information Administration (EIA), *Uranium Industry Annual,* annual reports. • 1990 forward—EIA, *Uranium Industry Annual 1999* (May 2000), Table 1.

Figure 4.13 Uranium Reserves and Resources, 1999



Notes: • Data are at end of year. • States shaded by group correspond to categories listed under "Reserves" on Table 4.13.

Source: Table 4.13.

Table 4.13 Uranium Reserves and Resources, 1999

(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]	**274**	**908**	**1,432**
New Mexico	84	341	567
Wyoming	113	377	596
Texas	7	24	40
Arizona, Colorado, Utah	41	115	160
Others [3]	28	51	69
Potential Resources [4]			
Estimated Additional Resources	2,180	3,310	4,850
Speculative Resources	1,310	2,230	3,480

[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 million pounds U_3O_8.

Note: Data are at end of year.

Web Page: http://www.eia.doe.gov/fuelnuclear.html.

Sources: • Forward Costs $30 or Less or $50 or Less—Energy Information Administration (EIA), *Uranium Industry Annual 1999* (May 2000), Tables B1 and B4. • Forward Costs $100 or Less—EIA, Office of Coal, Nuclear, Electric and Alternate Fuels database as of December 31, 1999.

Energy Resources Notes

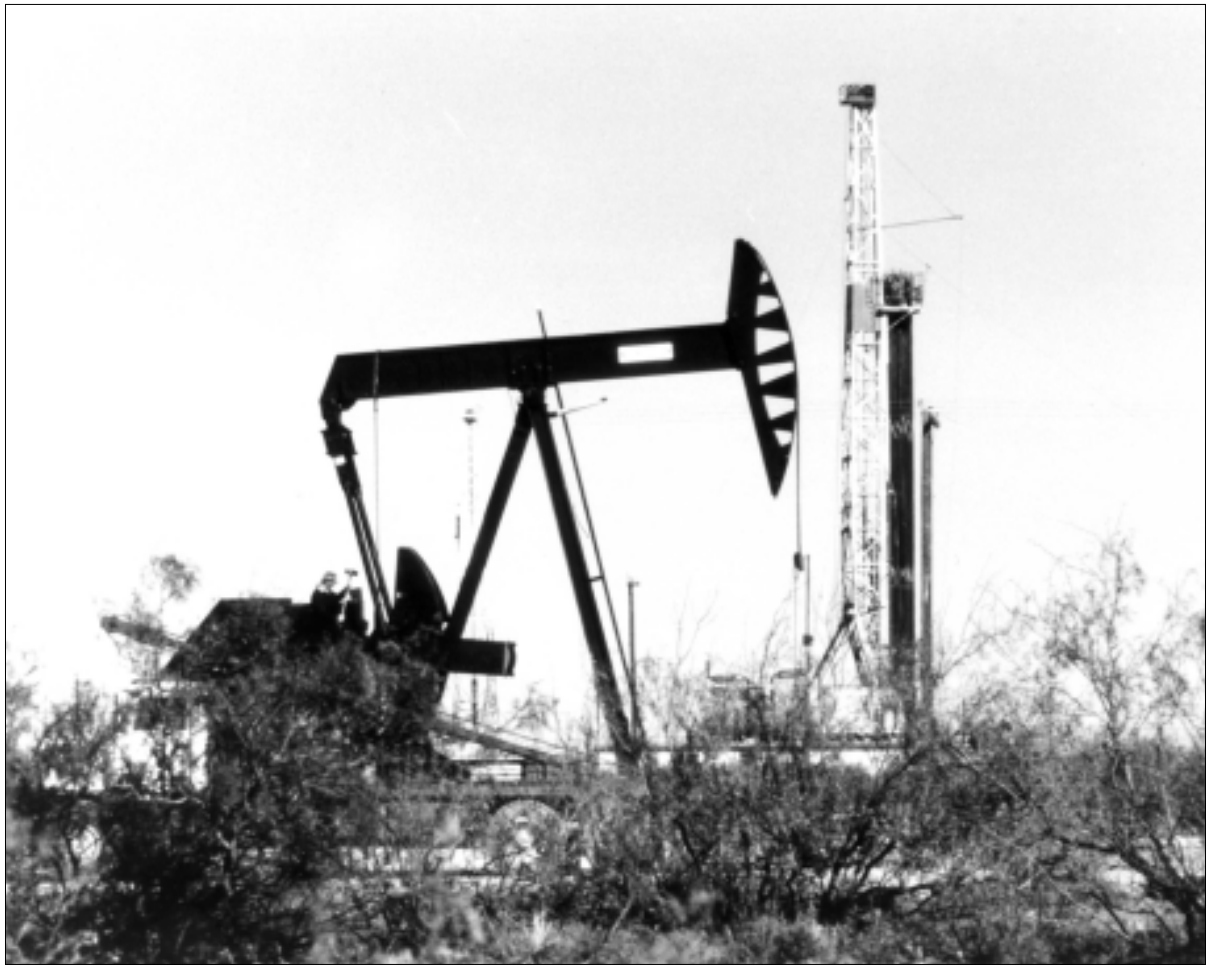
1. These volumes are the sum of the respective mean estimates in United States Geological Survey, *1995 National Assessment of United States Oil and Gas Resources*, Circular 1118 (Washington DC, 1995), pp. 2 and 17-19, for the onshore United States and jurisdiction offshore waters, and in Minerals Management Services, *An Assessment of the Undiscovered Hydrocarbon Potential of the Nation's Outer Continental Shelf*, OCS Report MMS 96-0034 (Washington DC, 1996), pp. 14 and 18, for the Federal jurisdiction offshore.

Conventionally reservoired deposits are discrete subsurface accumulations of crude oil or natural gas usually defined, controlled, or limited by hydrocarbon/water contacts. **Unconventionally reservoired deposits (continuous-type accumulations)** are geographically extensive subsurface accumulations of crude oil or natural gas that generally lack well-defined hydrocarbon/water contacts. Examples include coalbed methane, "tight gas," and auto-sourced oil- and gas-shale reservoirs. **Ultimate recovery appreciation (reserve growth)** is the volume by which the estimate of total recovery from a known oil or gas reservoir or aggregation of such reservoirs is expected to increase during the time between discovery and permanent abandonment.

For purposes of comparison, the Potential Gas Committee, an industry-sponsored group of experts, biennially provides another geologically-based estimate of the Nation's natural gas resources. The latest mean estimate, published in "Potential Supply of Natural Gas in the United States," December 31, 1996, is 1,067 trillion cubic feet. This volume includes undiscovered conventionally reservoired deposits, expected ultimate recovery appreciation, coalbed methane, and tight gas where it is believed to be technically recoverable and marketable at reasonable costs.

2. For 1970 forward, annual well completions are estimated by EIA based on individual well reports submitted to the American Petroleum Institute (1970-1994) and to Petroleum Information/Dwights LLC (1995 forward). The as-received well completion data for recent years are incomplete due to delays in the reporting of wells drilled. EIA therefore statistically imputes the missing data to provided estimates of total well completions and footage where necessary.

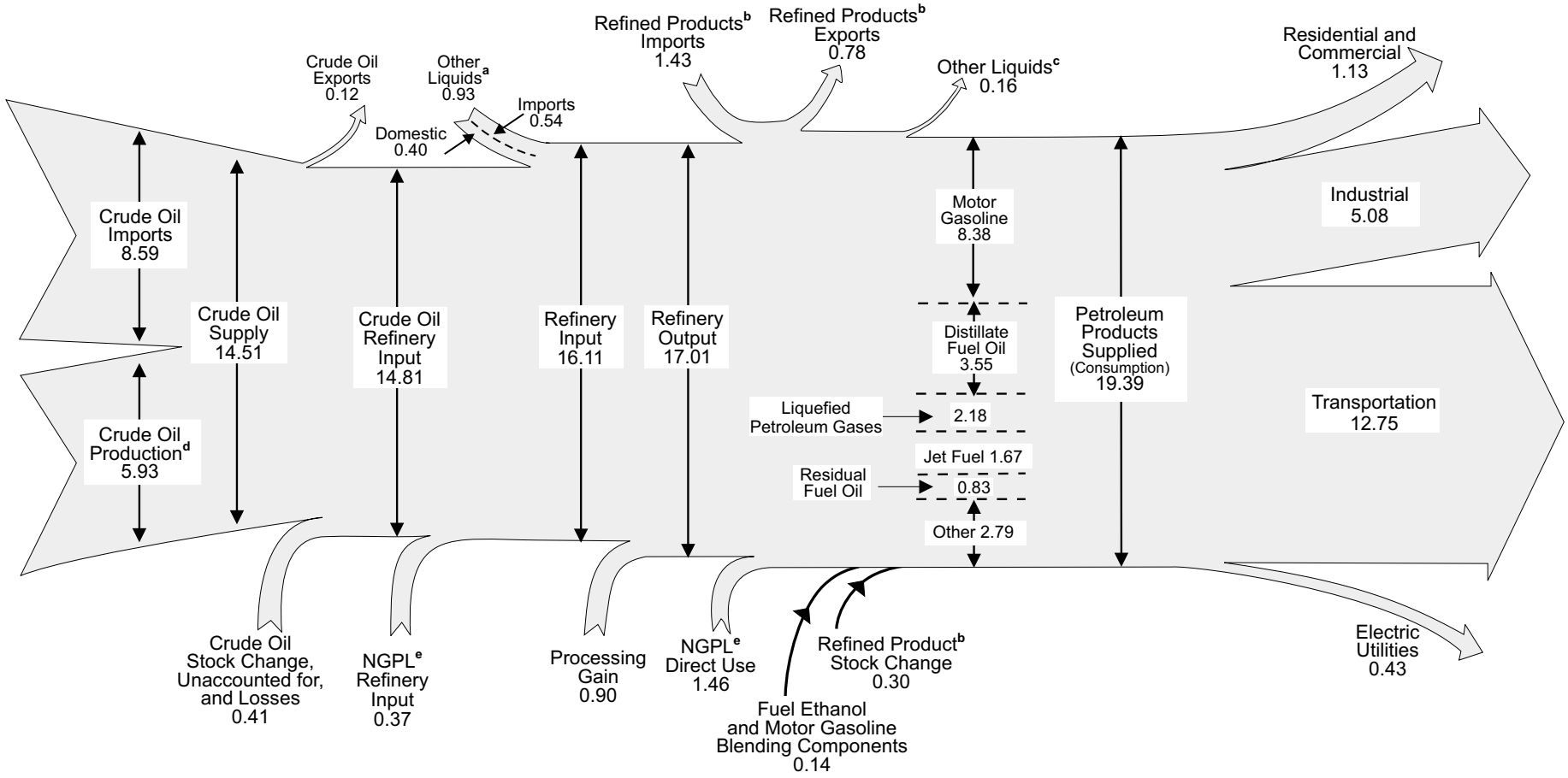
5 Petroleum



Oil pumping unit and drilling rig, Texas. Source: U.S. Department of Energy.

Diagram 2. Petroleum Flow, 1999

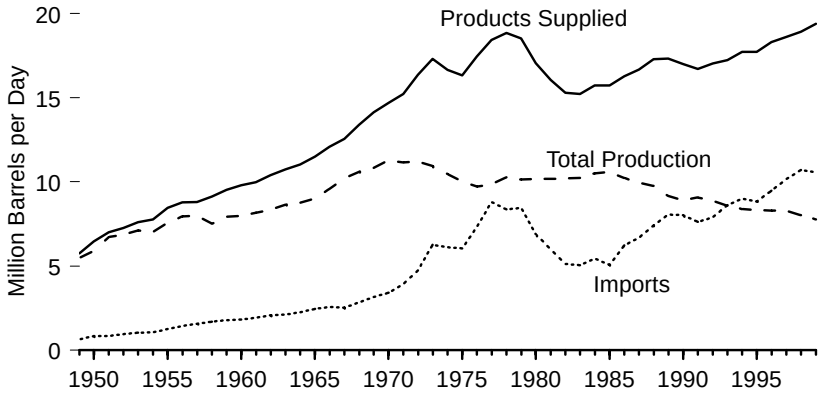
(Million Barrels per Day)



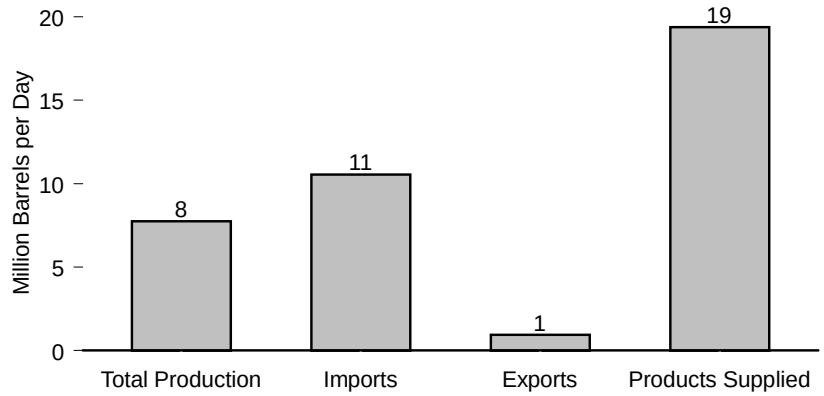
[a] Unfinished oils, motor gasoline blending components, aviation gasoline blending components, and other hydrocarbons and oxygenates.
[b] Finished petroleum products, liquefied petroleum gases, and pentanes plus.
[c] Unfinished oils requiring further refinery processing, and aviation blending components.
[d] Includes lease condensate.
[e] Natural gas plant liquids.
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, 5.12b, 5.14, and *Petroleum Supply Monthly*, February 2000, Table 3.

Figure 5.1 Petroleum Overview

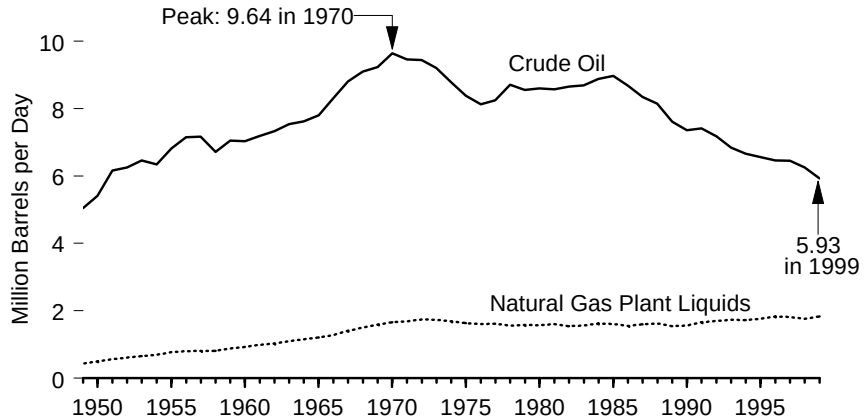
Overview, 1949-1999



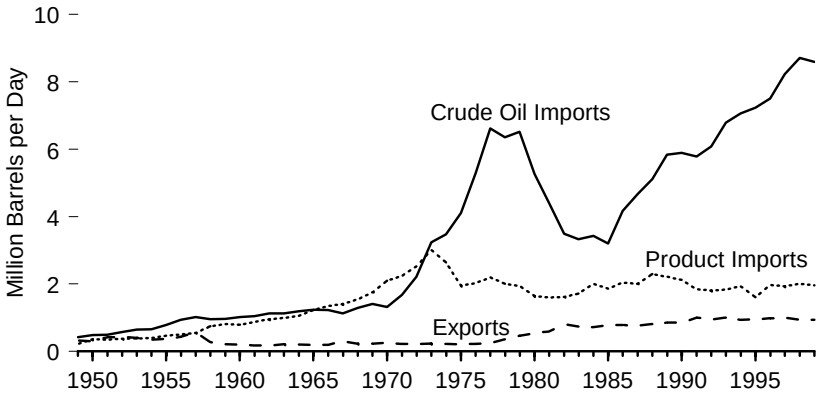
Overview, 1999



Production, 1949-1999



Trade, 1949-1999



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

Source: Table 5.1.

Table 5.1 Petroleum Overview, 1949-1999

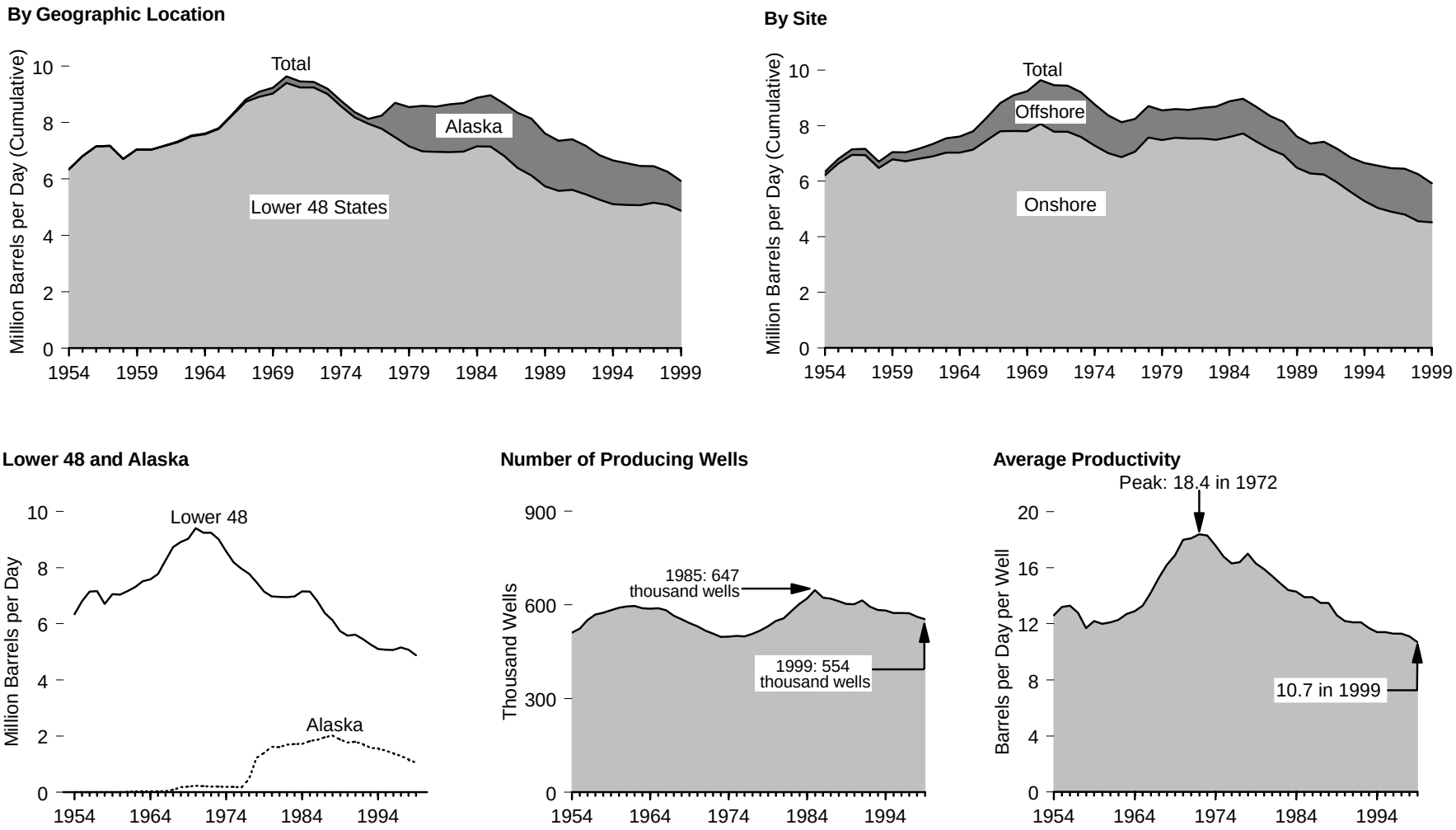
(Million Barrels per Day)

Year	Production			Other Domestic Supply [2]	Trade					Crude Oil Losses	Stock Change [6]	Petroleum Products Supplied
	Crude Oil [1]	Natural Gas Plant Liquids	Total Petroleum		Crude Oil Imports [3]	Petroleum Product Imports [4]	Total Imports	Total 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	6.85	1.74	8.58	1.19	6.79	1.83	8.62	1.00	7.62	(s)	0.15	17.24
1994	6.66	1.73	8.39	1.29	7.06	1.93	9.00	0.94	8.05	(s)	0.02	17.72
1995	6.56	1.76	8.32	1.27	7.23	1.61	8.83	0.95	7.89	(s)	-0.25	17.72
1996	6.46	1.83	8.29	1.36	7.51	1.97	9.48	0.98	8.50	(s)	-0.15	18.31
1997	6.45	1.82	8.27	1.34	8.23	1.94	10.16	1.00	9.16	0.00	0.14	18.62
1998	R6.25	R1.76	R8.01	R1.38	R8.71	R2.00	R10.71	R0.94	R9.76	(s)	R0.24	R18.92
1999P	5.93	1.83	7.76	1.59	8.59	1.96	10.55	0.94	9.61	(s)	-0.44	19.39

[1] Includes lease condensate.
[2] Other hydrocarbons, hydrogen, oxygenates (ethers and alcohols), gasoline blending components, finished petroleum products, processing gains, and unaccounted-for crude oil.
[3] Includes any 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 imports = imports minus exports.
[6] A negative value indicates a net decrease in stocks; a positive value indicates a net increase in stocks.
R=Revised. P=Preliminary. (s)=Less than 0.005 million barrels per day and greater than -0.005 million barrels per day.

Notes: • For the definition of petroleum products supplied, see Notes 1, 2, and 3 at end of section. • Totals may not equal sum of components due to independent rounding.
Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.2 Crude Oil Production and Oil Well Productivity, 1954-1999



Note: Crude oil includes lease condensate.

Source: Table 5.2.

Table 5.2 Crude Oil Production and Oil Well Productivity, 1954-1999

(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	5,264	1,582	5,606	1,241	6,847	(3)	6,847	584	11.7
1994	5,103	1,559	5,291	1,370	6,662	(3)	6,662	582	11.4
1995	5,076	1,484	5,035	1,525	6,560	(3)	6,560	574	11.4
1996	5,071	1,393	4,902	1,562	6,465	(3)	6,465	574	11.3
1997	5,156	1,296	4,803	1,648	6,452	(3)	6,452	573	11.3
1998	R5,077	1,175	R4,560	R1,692	R6,252	(3)	R6,252	R562	R11.1
1999P	4,875	1,050	4,521	1,405	5,925	(3)	5,925	554	10.7

[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. P=Preliminary.

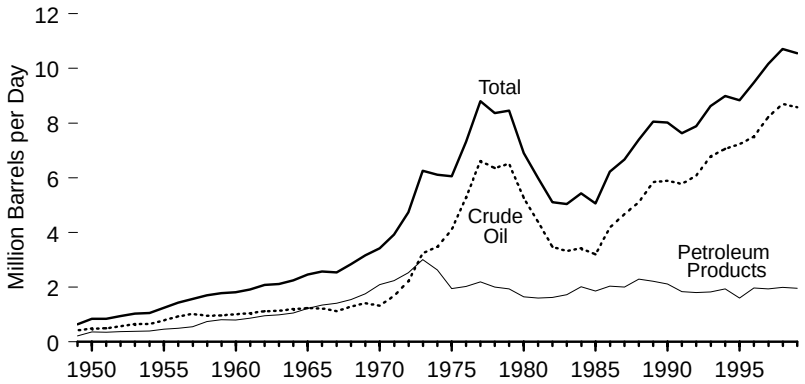
Note: Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

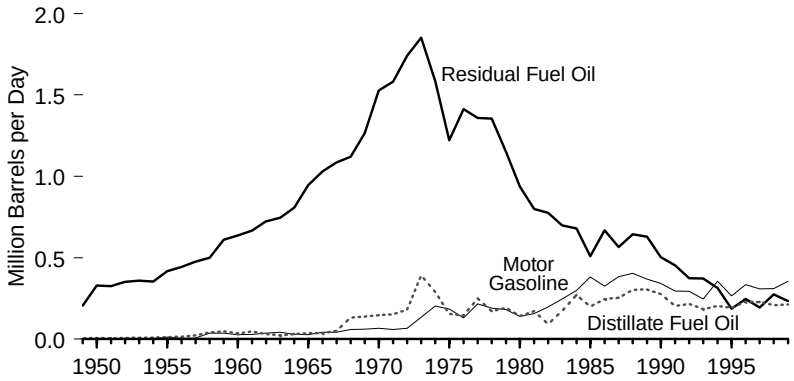
Sources: **Offshore:** • 1954-1969—U.S. Geological Survey, *Outer Continental Shelf Statistics,* June 1979. • 1970-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000). **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,* annual reports. • 1981-1994—Independent Petroleum Association of America, *The Oil Producing Industry in Your State.* • 1995 forward—Gulf Publishing Co., *World Oil,* February issue. **All Other Data:** • 1954-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports. • 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.3 Petroleum Imports by Type

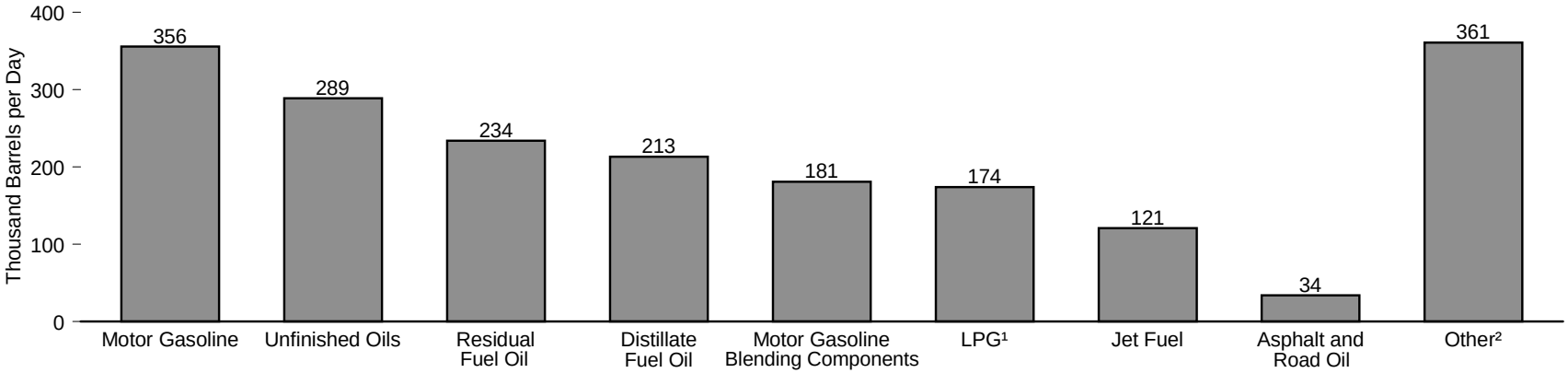
Total, 1949-1999



By Selected Product, 1949-1999



By Product, 1999



¹ Liquefied petrolum gases.

² Aviation gasoline and blending components, kerosene, lubricants, pentanes plus, petrochemical feedstocks, petroleum coke, special naphthas, wax, and miscellaneous products.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 5.3.

Table 5.3 Petroleum Imports by Type, 1949-1999

(Thousand Barrels per Day)

Year	Crude Oil [1]	Petroleum Products											Total Petroleum
		Asphalt and Road Oil	Distillate Fuel Oil	Jet Fuel [2]	Liquefied Petroleum Gases		Motor Gasoline [4]	Motor Gasoline Blending Components	Residual Fuel Oil	Unfinished Oils	Other Products [5]	Total	
					Propane [3]	Total							
1949	421	3	5	(6)	0	0	0	0	206	10	0	224	645
1950	487	5	7	(6)	0	0	(s)	(7)	329	21	1	363	850
1951	491	7	5	(6)	0	0	1	(7)	326	14	0	354	844
1952	573	7	7	(6)	0	0	5	(7)	351	9	0	380	952
1953	648	7	9	(6)	0	0	1	(7)	360	9	0	386	1,034
1954	656	9	9	(6)	0	0	3	(7)	354	21	(s)	396	1,052
1955	782	9	12	(6)	0	0	13	(7)	417	15	0	466	1,248
1956	934	10	14	21	0	0	5	(7)	445	7	(s)	502	1,436
1957	1,023	18	23	25	0	0	8	(7)	475	3	(s)	552	1,574
1958	953	20	41	57	0	0	38	(7)	499	92	(s)	747	1,700
1959	965	19	48	37	0	0	37	(7)	610	63	(s)	814	1,780
1960	1,015	17	35	34	NA	4	27	(7)	637	45	(s)	799	1,815
1961	1,045	18	48	28	NA	5	29	(7)	666	69	8	872	1,917
1962	1,126	18	32	30	NA	6	38	(7)	724	89	18	955	2,082
1963	1,131	17	25	41	NA	7	44	(7)	747	87	24	992	2,123
1964	1,198	16	32	33	NA	11	29	(7)	808	89	42	1,060	2,259
1965	1,238	17	36	81	NA	21	28	(7)	946	92	10	1,229	2,468
1966	1,225	17	38	86	NA	29	43	(7)	1,032	97	7	1,348	2,573
1967	1,128	18	51	89	11	27	42	(7)	1,085	97	2	1,409	2,537
1968	1,291	17	132	105	15	32	59	(7)	1,120	80	4	1,549	2,840
1969	1,409	13	139	125	14	35	62	(7)	1,265	106	12	1,757	3,166
1970	1,324	17	147	144	26	52	67	(7)	1,528	108	32	2,095	3,419
1971	1,681	20	153	180	32	70	59	(7)	1,583	124	56	2,245	3,926
1972	2,216	25	182	194	43	89	68	(7)	1,742	125	101	2,525	4,741
1973	3,244	23	392	212	71	132	134	(7)	1,853	137	129	3,012	6,256
1974	3,477	31	289	163	59	123	204	(7)	1,587	121	117	2,635	6,112
1975	4,105	14	155	133	60	112	184	(7)	1,223	36	95	1,951	6,056
1976	5,287	11	146	76	68	130	131	(7)	1,413	32	87	2,026	7,313
1977	6,615	4	250	75	86	161	217	(7)	1,359	31	95	2,193	8,807
1978	6,356	2	173	86	57	123	190	(7)	1,355	27	50	2,008	8,363
1979	6,519	4	193	78	88	217	181	(7)	1,151	59	54	1,937	8,456
1980	5,263	4	142	80	69	216	140	(7)	939	55	72	1,646	6,909
1981	4,396	4	173	38	70	244	157	24	800	112	48	1,599	5,996
1982	3,488	5	93	29	63	226	197	42	776	174	84	1,625	5,113
1983	3,329	7	174	29	44	190	247	47	699	234	94	1,722	5,051
1984	3,426	18	272	62	67	195	299	83	681	231	171	2,011	5,437
1985	3,201	35	200	39	67	187	381	67	510	318	130	1,866	5,067
1986	4,178	29	247	57	110	242	326	72	669	250	153	2,045	6,224
1987	4,674	36	255	67	88	190	384	60	565	299	146	2,004	6,678
1988	5,107	31	302	90	106	209	405	57	644	360	196	2,295	7,402
1989	5,843	31	306	106	111	181	369	66	629	348	183	2,217	8,061
1990	5,894	32	278	108	115	188	342	62	504	413	198	2,123	8,018
1991	5,782	28	205	67	91	147	297	36	453	413	198	1,844	7,627
1992	6,083	27	216	82	85	131	294	41	375	443	195	1,805	7,888
1993	6,787	32	184	100	103	160	247	27	373	491	219	1,833	8,620
1994	7,063	37	203	117	124	183	356	20	314	413	291	1,933	8,996
1995	7,230	36	193	106	102	146	265	48	187	349	276	1,605	8,835
1996	7,508	27	230	111	119	166	336	166	248	367	319	1,971	9,478
1997	8,225	32	228	91	113	169	309	200	194	353	360	1,936	10,162
1998	R8,706	28	R210	R124	R137	194	R311	R209	R275	R302	R350	R2,002	R10,708
1999P	8,588	34	213	121	121	174	356	181	234	289	361	1,964	10,551

[1] Includes any 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] Prior to 1964, motor gasoline data were for total gasoline, including motor gasoline, aviation gasoline, and special naphthas. After 1980, excludes motor gasoline blending components.

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

[6] Included in motor gasoline.

[7] If applicable, included in motor gasoline.

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

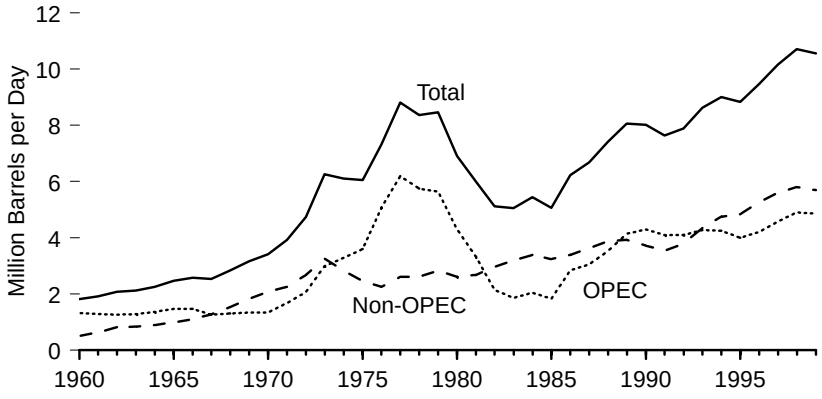
Notes: • Includes imports from U.S. possessions and territories. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

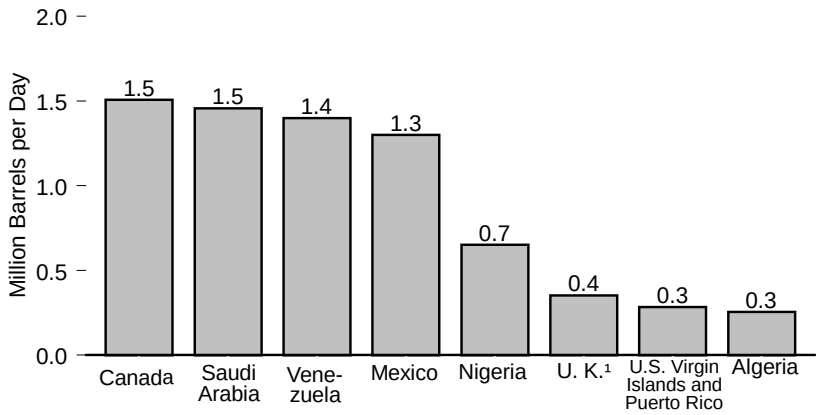
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.4 Petroleum Imports by Country of Origin

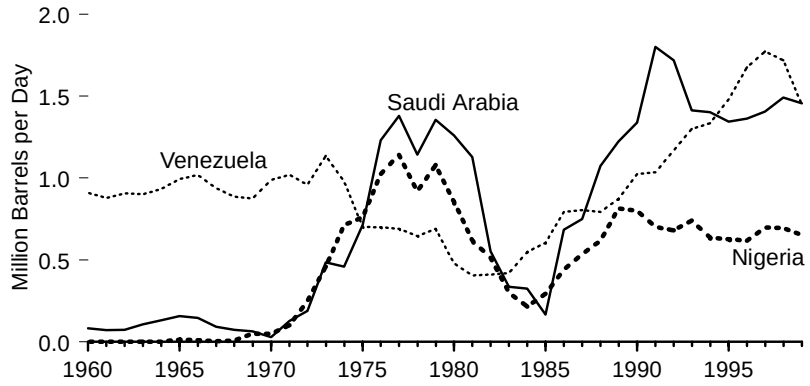
Total, OPEC, and Non-OPEC, 1960-1999



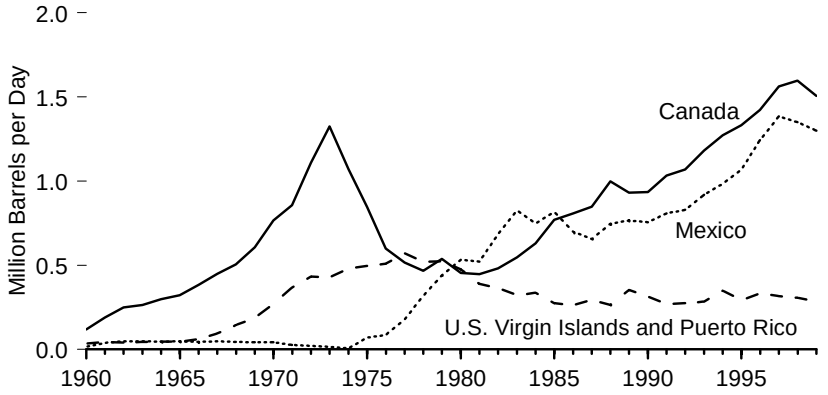
Selected Countries, 1999



Selected OPEC Countries, 1960-1999



Selected Non-OPEC Countries, 1960-1999



[1] United Kingdom.
Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.4.

Table 5.4 Petroleum Imports by Country of Origin, 1960-1999

Year	Persian Gulf Nations [2]	Selected OPEC [1] Countries					Selected Non-OPEC Countries					Total Imports	Imports from Persian Gulf Nations as Share of Total Imports	Imports from OPEC as Share of Total Imports
		Algeria	Nigeria	Saudi Arabia	Venezuela	Total OPEC [3]	Canada	Mexico	United Kingdom	U.S. Virgin Islands and Puerto Rico	Total Non-OPEC			
	Thousand Barrels per Day												Percent	
1960	NA	NA	0	84	911	1,314	120	16	(s)	36	500	1,815	NA	72.4
1961	NA	NA	0	73	879	1,286	190	40	1	44	631	1,917	NA	67.1
1962	NA	NA	0	74	906	1,265	250	49	2	41	816	2,082	NA	60.8
1963	NA	NA	0	108	900	1,283	265	48	3	44	839	2,123	NA	60.5
1964	NA	NA	0	131	933	1,361	299	47	(s)	47	898	2,259	NA	60.2
1965	NA	NA	15	158	994	1,476	323	48	(s)	47	992	2,468	NA	59.8
1966	NA	NA	11	147	1,018	1,471	384	45	6	61	1,102	2,573	NA	57.2
1967	NA	NA	5	92	938	1,259	450	49	11	96	1,278	2,537	NA	49.6
1968	NA	NA	9	74	886	1,302	506	45	28	145	1,538	2,840	NA	45.9
1969	NA	NA	49	65	875	1,336	608	43	20	189	1,830	3,166	NA	42.2
1970	NA	NA	50	30	989	1,343	766	42	11	271	2,076	3,419	NA	39.3
1971	NA	NA	102	128	1,020	1,673	857	27	10	368	2,253	3,926	NA	42.6
1972	471	92	251	190	959	2,063	1,108	21	9	432	2,678	4,741	9.9	43.5
1973	848	136	459	486	1,135	2,993	1,325	16	15	429	3,263	6,256	13.6	47.8
1974	1,039	190	713	461	979	3,280	1,070	8	8	481	2,832	6,112	17.0	53.7
1975	1,165	282	762	715	702	3,601	846	71	14	496	2,454	6,056	19.2	59.5
1976	1,840	432	1,025	1,230	700	5,066	599	87	31	510	2,247	7,313	25.2	69.3
1977	2,448	559	1,143	1,380	690	6,193	517	179	126	571	2,614	8,807	27.8	70.3
1978	2,219	649	919	1,144	646	5,751	467	318	180	522	2,612	8,363	26.5	68.8
1979	2,069	636	1,080	1,356	690	5,637	538	439	202	523	2,819	8,456	24.5	66.7
1980	1,519	488	857	1,261	481	4,300	455	533	176	476	2,609	6,909	22.0	62.2
1981	1,219	311	620	1,129	406	3,323	447	522	375	389	2,672	5,996	20.3	55.4
1982	696	170	514	552	412	2,146	482	685	456	366	2,968	5,113	13.6	42.0
1983	442	240	302	337	422	1,862	547	826	382	322	3,189	5,051	8.8	36.9
1984	506	323	216	325	548	2,049	630	748	402	336	3,388	5,437	9.3	37.7
1985	311	187	293	168	605	1,830	770	816	310	275	3,237	5,067	6.1	36.1
1986	912	271	440	685	793	2,837	807	699	350	265	3,387	6,224	14.7	45.6
1987	1,077	295	535	751	804	3,060	848	655	352	294	3,617	6,678	16.1	45.8
1988	1,541	300	618	1,073	794	3,520	999	747	315	264	3,882	7,402	20.8	47.6
1989	1,861	269	815	1,224	873	4,140	931	767	215	353	3,921	8,061	23.1	51.4
1990	1,966	280	800	1,339	1,025	4,296	934	755	189	315	3,721	8,018	24.5	53.6
1991	1,845	253	703	1,802	1,035	4,092	1,033	807	138	270	3,535	7,627	24.2	53.7
1992	1,778	196	681	1,720	1,170	4,092	1,069	830	230	275	3,796	7,888	22.5	51.9
1993	1,782	220	740	1,414	1,300	4,273	1,181	919	350	283	4,347	8,620	20.7	49.6
1994	1,728	243	637	1,402	1,334	4,247	1,272	984	458	350	4,749	8,996	19.2	47.2
1995	1,573	234	627	1,344	1,480	4,002	1,332	1,068	383	293	4,833	8,835	17.8	45.3
1996	1,604	256	617	1,363	1,676	4,211	1,424	1,244	308	333	5,267	9,478	16.9	44.4
1997	1,755	285	698	1,407	1,773	4,569	1,563	1,385	226	317	5,593	10,162	17.3	45.0
1998	R2,136	R290	R696	R1,491	R1,719	R4,905	R1,598	R1,351	R250	308	R5,803	R10,708	R19.9	R45.8
1999P	2,423	255	652	1,456	1,447	4,853	1,507	1,300	351	284	5,699	10,551	23.0	46.0

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

[2] Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and United Arab Emirates.

[3] Ecuador withdrew from OPEC on December 31, 1992. Beginning in 1993, imports from Ecuador appear under "Non-OPEC." Gabon withdrew from OPEC on December 31, 1994. Beginning in 1995, imports from Gabon appear under "Non-OPEC."

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

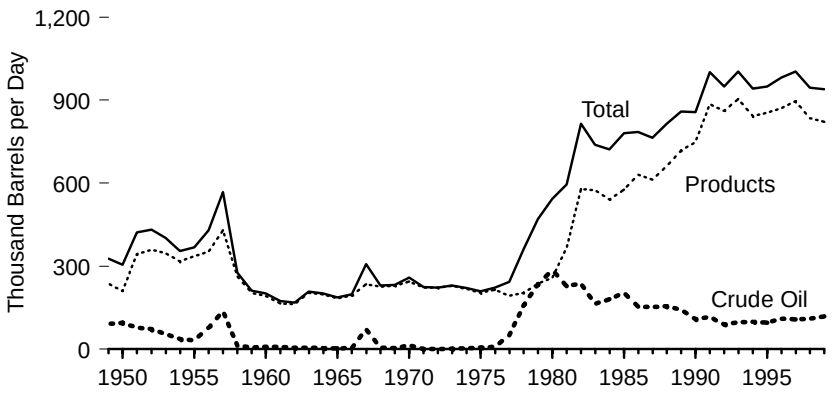
Notes: • The country of origin for refined petroleum products may not be the country of origin for the crude oil from which the refined products were produced. For example, refined products imported from refineries in the Caribbean may have been produced from Middle East crude oil. • Data include any imports for the Strategic Petroleum Reserve, which began in 1977. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

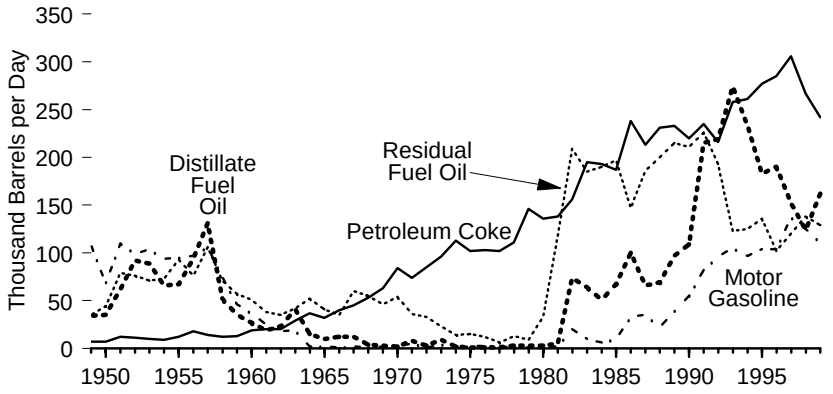
Sources: • 1960-1975—Bureau of Mines, *Minerals Yearbook,* "Crude Petroleum and Petroleum Products" chapter. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *P.A.D. Districts Supply/Demand, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.5 Petroleum Exports by Type

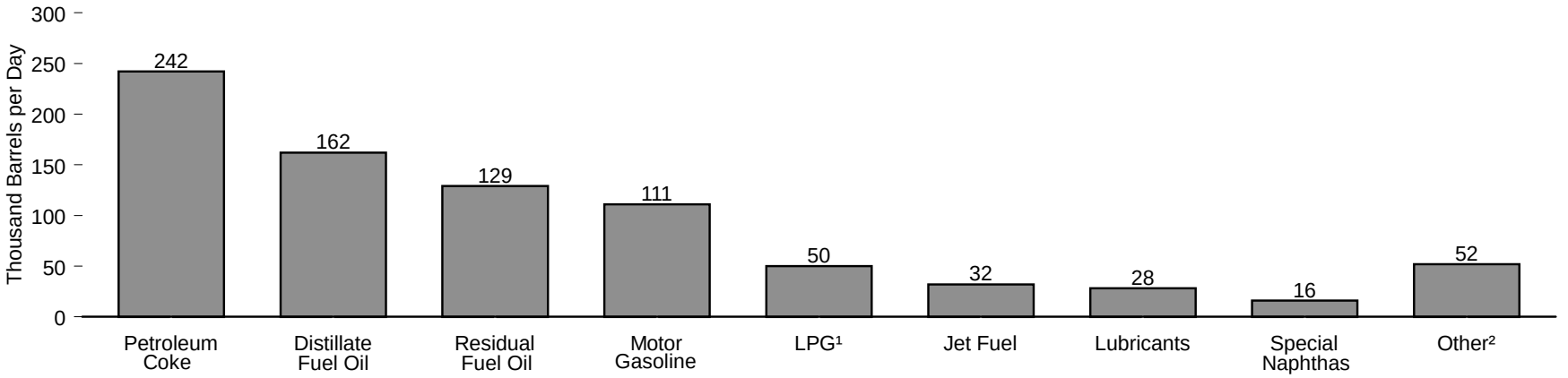
Total, 1949-1999



By Selected Product, 1949-1999



By Product, 1999



[1] Liquefied petroleum gases.

[2] Asphalt and road oil, aviation gasoline, kerosene, motor gasoline blending components, pentanes plus, wax, and miscellaneous products.

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

Source: Table 5.5.

Table 5.5 Petroleum Exports by Type, 1949-1999

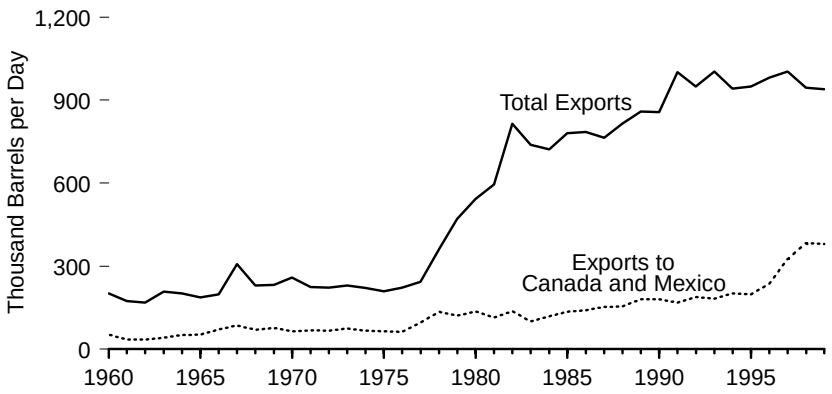
(Thousand Barrels per Day)

Year	Crude Oil	Petroleum Products												Total Petroleum
		Distillate Fuel Oil	Jet Fuel	Liquefied Petroleum Gases		Lubricants	Motor Gasoline [2]	Petroleum Coke	Petrochemical Feedstocks	Residual Fuel Oil	Special Naphthas	Other Products [3]	Total	
				Propane [1]	Total									
1949	91	34	(4)	NA	4	35	108	7	0	35	NA	15	236	327
1950	95	35	(4)	NA	4	39	68	7	0	44	NA	12	210	305
1951	78	62	(4)	NA	6	48	110	12	0	79	NA	27	344	422
1952	73	92	(4)	NA	7	44	99	11	0	76	NA	31	359	432
1953	55	89	1	NA	8	36	104	10	0	71	NA	28	347	402
1954	37	66	(s)	NA	11	41	94	9	0	73	NA	23	318	355
1955	32	67	(s)	NA	12	39	95	12	0	93	NA	18	336	368
1956	78	94	1	NA	12	38	97	18	0	76	NA	16	352	430
1957	138	131	(s)	NA	12	38	106	14	0	106	NA	23	430	568
1958	12	52	1	NA	8	36	75	12	0	71	NA	10	264	276
1959	7	35	1	NA	6	38	46	13	0	57	NA	8	204	211
1960	8	27	(s)	NA	8	43	37	19	0	51	NA	9	193	202
1961	9	19	(s)	NA	10	47	25	20	0	38	NA	7	165	174
1962	5	23	(s)	NA	11	48	18	20	0	35	NA	8	163	168
1963	5	41	1	NA	13	50	19	29	0	42	NA	8	203	208
1964	4	15	(s)	NA	15	50	2	37	0	52	5	23	198	202
1965	3	10	3	NA	21	45	2	32	5	41	4	20	184	187
1966	4	12	5	NA	22	47	1	40	7	35	6	19	194	198
1967	73	12	6	5	25	51	2	45	8	60	5	20	234	307
1968	5	4	6	7	29	49	1	53	8	55	7	15	226	231
1969	4	3	5	7	35	45	2	63	11	46	6	13	229	233
1970	14	2	6	6	27	44	2	84	10	54	4	10	245	259
1971	1	8	4	13	26	43	5	74	14	36	4	9	223	224
1972	1	3	3	18	31	41	1	85	13	33	4	8	222	222
1973	2	9	4	15	27	35	4	96	19	23	5	8	229	231
1974	3	2	3	14	25	33	2	113	15	14	4	7	218	221
1975	6	1	2	13	26	25	2	102	22	15	3	6	204	209
1976	8	1	2	13	25	26	3	103	30	12	7	6	215	223
1977	50	1	2	10	18	26	2	102	24	6	4	7	193	243
1978	158	3	1	9	20	27	1	111	23	13	2	2	204	362
1979	235	3	1	8	15	23	(s)	146	31	9	5	3	236	471
1980	287	3	1	10	21	23	1	136	29	33	5	4	258	544
1981	228	5	2	18	42	19	2	138	26	118	11	4	367	595
1982	236	74	6	31	65	16	20	156	24	209	5	4	579	815
1983	164	64	6	43	73	16	10	195	20	185	3	3	575	739
1984	181	51	9	30	48	15	6	193	21	190	2	6	541	722
1985	204	67	13	48	62	15	10	187	19	197	1	4	577	781
1986	154	100	18	28	42	23	33	238	22	147	1	8	631	785
1987	151	66	24	24	38	23	35	213	20	186	2	7	613	764
1988	155	69	28	31	49	26	22	231	23	200	7	6	661	815
1989	142	97	27	24	35	19	39	233	26	215	12	15	717	859
1990	109	109	43	28	40	20	55	220	26	211	11	13	748	857
1991	116	215	43	28	41	18	82	235	0	226	15	9	885	1,001
1992	89	219	43	33	49	16	96	216	0	193	14	16	861	950
1993	98	274	59	26	43	19	105	258	0	123	4	20	904	1,003
1994	99	234	20	24	38	22	97	261	0	125	20	26	843	942
1995	95	183	26	38	58	25	104	277	0	136	21	25	855	949
1996	110	190	48	28	51	34	104	285	0	102	21	36	871	981
1997	108	152	35	32	50	31	137	306	0	120	22	44	896	1,003
1998	110	124	26	25	42	25	125	267	0	138	18	R70	R835	R945
1999P	118	162	32	33	50	28	111	242	0	129	16	52	822	940

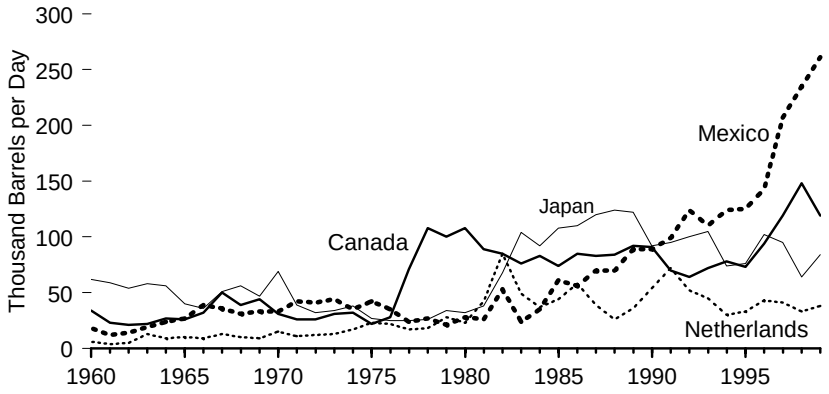
[1] Includes propylene.
[2] Includes aviation gasoline for the years 1949-1963.
[3] Asphalt and road oil, aviation gasoline, kerosene, motor gasoline blending components, pentanes plus, wax, and miscellaneous products.
[4] Included in the products from which jet fuel was blended.
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 500 barrels per day.
Notes: • Includes exports to U.S. possessions and territories. • Totals may not equal sum of components due to independent rounding.
Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.6 Petroleum Exports by Country of Destination

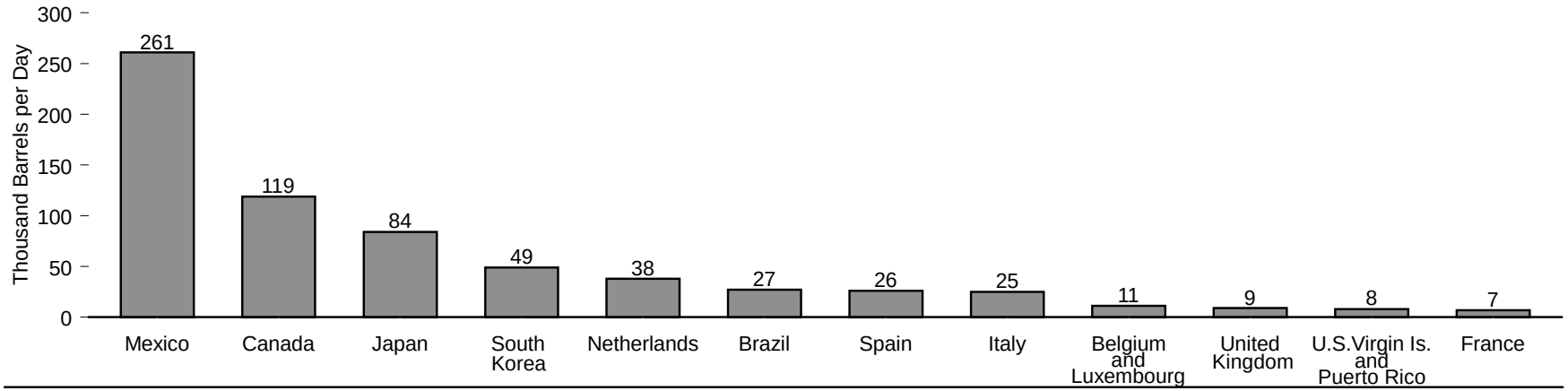
Total Exports and Exports to Canada and Mexico, 1960-1999



By Selected Country, 1960-1999



By Selected Country, 1999



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

Source: Table 5.6.

Table 5.6 Petroleum Exports by Country of Destination, 1960-1999

(Thousand Barrels per Day)

Year	Belgium and Luxembourg	Brazil	Canada	France	Italy	Japan	Mexico	Nether-lands	South Korea	Spain	United Kingdom	U.S. Virgin Islands and Puerto Rico	Other	Total
1960	3	4	34	4	6	62	18	6	NA	NA	12	1	52	202
1961	4	4	23	4	5	59	12	4	NA	NA	10	1	48	174
1962	3	5	21	3	5	54	14	5	NA	NA	8	1	50	168
1963	9	4	22	4	8	58	19	13	NA	NA	11	1	59	208
1964	4	4	27	4	8	56	24	9	NA	NA	10	2	55	202
1965	3	3	26	3	7	40	27	10	NA	NA	12	1	54	187
1966	3	4	32	4	7	36	39	9	NA	NA	12	3	49	198
1967	5	6	50	3	9	51	36	13	NA	NA	62	7	65	307
1968	4	8	39	4	8	56	31	10	NA	NA	14	2	55	231
1969	4	7	44	4	9	47	33	9	NA	NA	13	2	59	233
1970	5	7	31	5	10	69	33	15	NA	NA	12	2	71	259
1971	7	9	26	5	8	39	42	11	NA	NA	9	3	67	224
1972	13	9	26	5	9	32	41	12	NA	4	10	4	59	222
1973	15	8	31	5	9	34	44	13	NA	4	9	3	56	231
1974	13	9	32	4	9	38	35	17	NA	4	6	6	48	221
1975	9	6	22	6	10	27	42	23	NA	4	7	12	40	209
1976	12	7	28	6	10	25	35	22	NA	4	13	22	39	223
1977	16	6	71	9	10	25	24	17	NA	5	9	11	39	243
1978	15	8	108	9	10	26	27	18	NA	5	7	86	42	362
1979	19	7	100	13	15	34	21	28	2	9	7	170	45	471
1980	20	4	108	11	14	32	28	23	2	8	7	220	70	544
1981	12	1	89	15	22	38	26	42	10	18	5	220	97	595
1982	17	8	85	24	32	68	53	85	28	24	14	212	165	815
1983	22	2	76	23	35	104	24	49	15	34	8	144	202	739
1984	21	1	83	18	39	92	35	37	17	29	14	152	182	722
1985	26	3	74	11	30	108	61	44	27	28	14	162	193	781
1986	30	3	85	11	39	110	56	58	12	39	8	113	222	785
1987	17	2	83	12	42	120	70	39	25	31	6	136	179	764
1988	25	3	84	12	29	124	70	26	24	36	9	147	226	815
1989	23	5	92	11	37	122	89	36	17	28	9	141	249	859
1990	20	2	91	17	48	92	89	54	60	33	11	101	240	857
1991	22	13	70	27	55	95	99	72	66	23	13	117	330	1,001
1992	22	20	64	9	38	100	124	52	80	21	12	95	315	950
1993	21	16	72	8	34	105	110	45	74	30	10	108	370	1,003
1994	26	15	78	11	35	74	124	30	66	30	10	104	338	942
1995	21	16	73	11	46	76	125	33	57	38	14	123	317	949
1996	27	29	94	18	32	102	143	43	60	34	9	72	318	981
1997	21	15	119	11	30	95	207	41	50	42	12	18	340	1,003
1998	14	18	148	8	30	64	[R]235	[R]33	[R]33	30	11	4	[R]317	[R]945
1999[P]	11	27	119	7	25	84	261	38	49	26	9	8	276	940

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

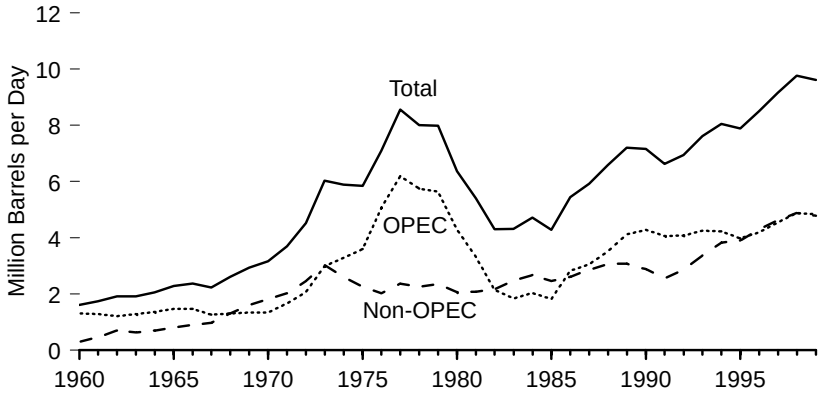
Note: Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

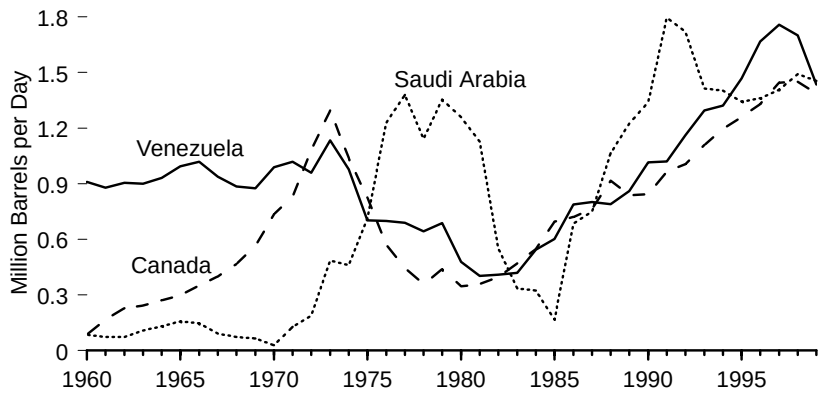
Sources: • 1960-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.7 Petroleum Net Imports by Country of Origin, 1960-1999

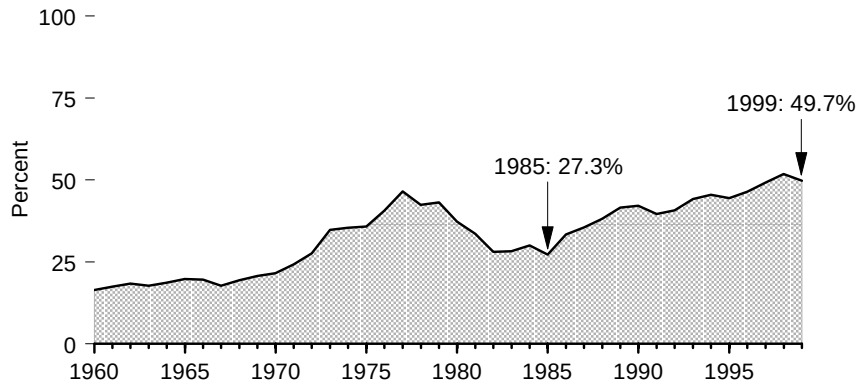
Total, OPEC, and Non-OPEC



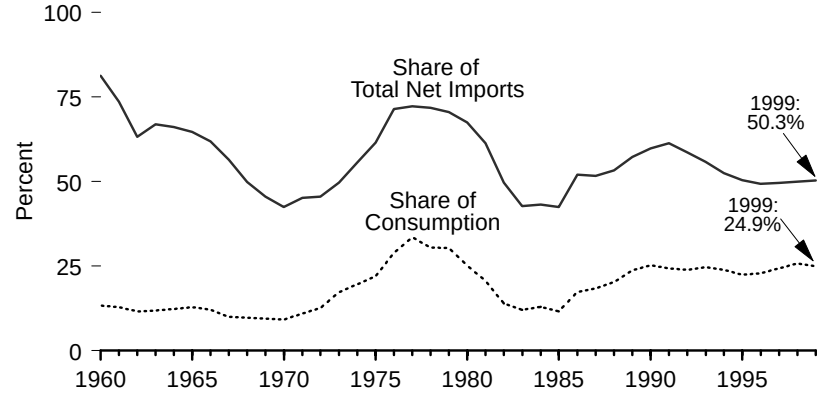
By Selected Country



Total Net Imports as Share of Consumption



Net Imports from OPEC



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

Source: Table 5.7.

Table 5.7 Petroleum Net Imports by Country of Origin, 1960-1999

Year	Selected OPEC [1] Countries						Selected Non-OPEC Countries					Total Net Imports	Total Net Imports as Share of Consumption [3]	Net Imports from OPEC	
	Persian Gulf Nations [2]	Algeria	Nigeria	Saudi Arabia	Venezuela	Total OPEC	Canada	Mexico	United Kingdom	U.S. Virgin Islands and Puerto Rico	Total Non-OPEC			Share of Total Net Imports [4]	Share of Consumption [5]
	Thousand Barrels per Day												Percent		
1960	NA	NA	0	84	910	1,311	86	-2	-12	34	302	1,613	16.5	81.3	13.4
1961	NA	NA	0	73	878	1,283	167	27	-10	42	460	1,743	17.5	73.6	12.9
1962	NA	NA	0	74	905	1,210	229	35	-6	40	703	1,913	18.4	63.3	11.6
1963	NA	NA	0	108	899	1,282	243	29	-7	43	632	1,915	17.8	67.0	11.9
1964	NA	NA	0	131	932	1,359	272	23	-9	45	698	2,057	18.7	66.1	12.3
1965	NA	NA	15	158	994	1,475	297	21	-11	45	806	2,281	19.8	64.7	12.8
1966	NA	NA	11	147	1,018	1,470	352	6	-6	58	904	2,375	19.7	61.9	12.2
1967	NA	NA	5	92	937	1,258	400	13	-51	89	972	2,230	17.8	56.4	10.0
1968	NA	NA	9	74	886	1,302	468	15	13	143	1,307	2,609	19.5	49.9	9.7
1969	NA	NA	49	65	875	1,336	564	10	7	186	1,598	2,933	20.8	45.5	9.5
1970	NA	NA	50	30	989	1,343	736	9	-1	270	1,817	3,161	21.5	42.5	9.1
1971	NA	NA	102	128	1,019	1,671	831	-14	1	365	2,030	3,701	24.3	45.2	11.0
1972	NA	NA	251	189	959	2,061	1,082	-20	-1	428	2,458	4,519	27.6	45.6	12.6
1973	NA	NA	459	485	1,134	2,991	1,294	-28	6	426	3,034	6,025	34.8	49.6	17.3
1974	NA	NA	713	461	978	3,277	1,038	-27	1	475	2,615	5,892	35.4	55.6	19.7
1975	NA	NA	762	714	702	3,599	824	29	7	484	2,248	5,846	35.8	61.6	22.1
1976	NA	NA	1,025	1,229	699	5,063	571	53	19	488	2,027	7,090	40.6	71.4	29.0
1977	NA	NA	1,143	1,379	689	6,190	446	155	117	560	2,375	8,565	46.5	72.3	33.6
1978	NA	NA	919	1,142	644	5,747	359	291	173	436	2,255	8,002	42.5	71.8	30.5
1979	NA	NA	1,080	1,354	688	5,633	438	418	196	353	2,352	7,985	43.1	70.5	30.4
1980	NA	NA	857	1,259	478	4,293	347	506	169	256	2,071	6,365	37.3	67.5	25.2
1981	1,215	311	620	1,128	403	3,315	358	497	370	169	2,086	5,401	33.6	61.4	20.6
1982	692	170	512	551	409	2,136	397	632	442	154	2,163	4,298	28.1	49.7	14.0
1983	439	240	299	336	420	1,843	471	802	374	178	2,469	4,312	28.3	42.7	12.1
1984	502	323	215	324	544	2,037	547	714	388	184	2,679	4,715	30.0	43.2	13.0
1985	309	187	293	167	602	1,821	696	755	295	114	2,465	4,286	27.3	42.5	11.6
1986	909	271	440	685	788	2,828	721	642	342	152	2,611	5,439	33.4	52.0	17.4
1987	1,074	295	535	751	801	3,055	765	585	346	158	2,859	5,914	35.5	51.7	18.3
1988	1,529	300	618	1,064	790	3,513	916	677	306	117	3,074	6,587	38.1	53.3	20.3
1989	1,858	269	815	1,224	861	4,124	839	678	206	212	3,078	7,202	41.6	57.3	23.8
1990	1,962	280	800	1,339	1,016	4,285	843	666	179	213	2,876	7,161	42.2	59.8	25.2
1991	1,833	253	703	1,796	1,020	4,065	963	707	125	153	2,561	6,626	39.6	61.3	24.3
1992	1,773	196	680	1,720	1,161	4,071	1,005	706	219	180	2,867	6,938	40.7	58.7	23.9
1993	1,774	219	736	1,413	1,296	4,253	1,109	809	340	175	3,365	7,618	44.2	55.8	24.7
1994	1,723	243	637	1,402	1,322	4,233	1,194	860	448	246	3,822	8,054	45.5	52.6	23.9
1995	1,563	234	626	1,343	1,468	3,980	1,260	943	369	170	3,906	7,886	44.5	50.5	22.5
1996	1,596	256	616	1,362	1,667	4,193	1,330	1,101	299	262	4,305	8,498	46.4	49.3	22.9
1997	1,747	285	693	1,407	1,758	4,542	1,444	1,178	214	298	4,616	9,158	49.2	49.6	24.4
1998	R2,132	R290	R693	R1,491	R1,700	R4,880	R1,451	R1,116	R239	R305	R4,884	R9,764	R51.6	R50.0	R25.8
1999P	2,419	255	651	1,455	1,435	4,834	1,388	1,039	342	276	4,778	9,612	49.6	50.3	24.9

[1] Organization of Petroleum Exporting Countries. See Glossary for membership.
[2] Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and United Arab Emirates.
[3] Calculated by dividing total net petroleum imports by total U.S. petroleum products supplied (consumption).
[4] Calculated by dividing net petroleum imports from OPEC countries by total net petroleum imports.
[5] Calculated by dividing net petroleum imports from OPEC countries by total U.S. petroleum product supplied (consumption).

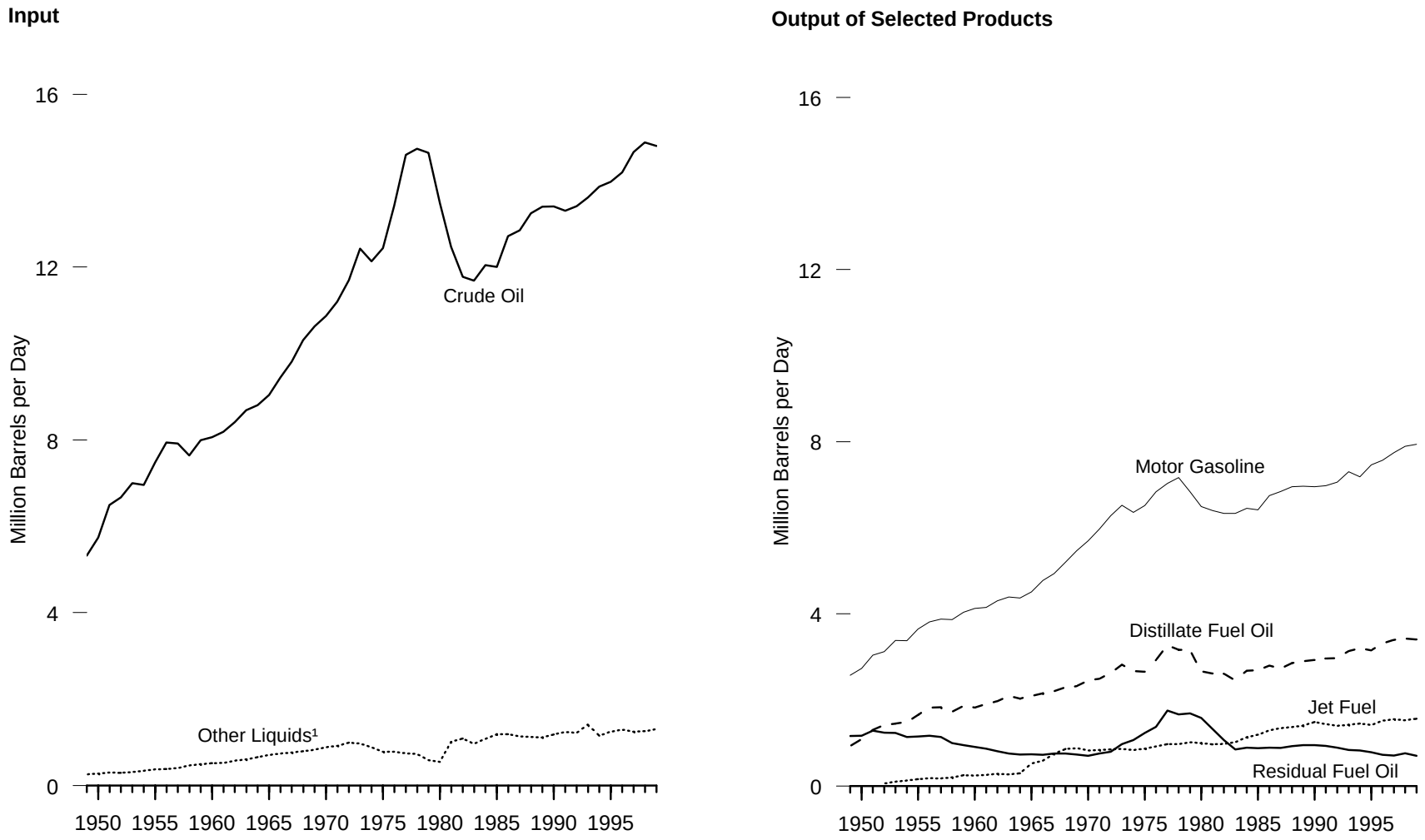
R=Revised. P=Preliminary. NA=Not available.

Notes: • The country of origin for refined petroleum products may not be the country of origin for the crude oil from which the refined products were produced. For example, refined products imported from refineries in the Caribbean may have been produced from Middle East crude oil. • Net imports are imports minus exports; negative numbers indicate that exports exceed imports. • Data include any imports for the Strategic Petroleum Reserve, which began in 1977. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

Sources: • 1960-1975—Bureau of Mines, *Minerals Yearbook,* "Crude Petroleum and Petroleum Products" chapter. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *P.A.D. Districts Supply/Demand, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.8 Refinery Input and Output, 1949-1999



[1] Includes natural gas plant liquids and other liquids.

Source: Table 5.8.

Table 5.8 Refinery Input and Output, 1949-1999

(Million Barrels per Day)

Year	Input				Output										Processing Gain
	Crude Oil	Natural Gas Plant Liquids	Other Liquids [1]	Total Input	Asphalt and Road Oil	Distillate Fuel Oil	Jet Fuel	Liquefied Petroleum Gases	Motor Gasoline [2]	Petroleum Coke	Residual Fuel Oil	Still Gas	Other Products [3]	Total Output	
1949	5.33	0.23	0.03	5.59	0.16	0.93	(4)	0.06	2.57	0.05	1.16	0.23	0.42	5.59	(s)
1950	5.74	0.26	0.02	6.02	0.18	1.09	(4)	0.08	2.74	0.05	1.16	0.23	0.49	6.02	(s)
1951	6.49	0.27	0.03	6.80	0.20	1.30	(4)	0.09	3.04	0.05	1.29	0.26	0.57	6.80	0.01
1952	6.67	0.28	0.01	6.97	0.21	1.42	0.06	0.08	3.12	0.05	1.24	0.26	0.54	6.97	0.01
1953	7.00	0.30	(s)	7.31	0.22	1.45	0.10	0.09	3.38	0.06	1.23	0.28	0.52	7.33	0.02
1954	6.96	0.32	0.02	7.30	0.23	1.49	0.13	0.09	3.38	0.07	1.14	0.28	0.53	7.32	0.02
1955	7.48	0.34	0.03	7.86	0.25	1.65	0.16	0.12	3.65	0.08	1.15	0.32	0.52	7.89	0.03
1956	7.94	0.37	0.01	8.32	0.27	1.82	0.18	0.14	3.82	0.08	1.17	0.33	0.55	8.36	0.04
1957	7.92	0.41	(s)	8.33	0.25	1.83	0.17	0.15	3.88	0.09	1.14	0.34	0.51	8.37	0.04
1958	7.64	0.37	0.09	8.11	0.26	1.73	0.20	0.16	3.87	0.10	1.00	0.35	0.51	8.17	0.06
1959	7.99	0.42	0.07	8.48	0.29	1.86	0.25	0.19	4.04	0.11	0.95	0.35	0.53	8.57	0.09
1960	8.07	0.45	0.06	8.58	0.29	1.82	0.24	0.21	4.13	0.16	0.91	0.35	0.62	8.73	0.15
1961	8.18	0.46	0.06	8.71	0.29	1.91	0.26	0.22	4.15	0.21	0.86	0.35	0.64	8.89	0.18
1962	8.41	0.50	0.08	8.99	0.32	1.97	0.28	0.21	4.30	0.22	0.81	0.36	0.69	9.16	0.18
1963	8.69	0.52	0.09	9.30	0.33	2.09	0.27	0.26	4.39	0.22	0.76	0.38	0.80	9.50	0.20
1964	8.81	0.58	0.07	9.46	0.33	2.03	0.29	0.29	4.37	0.23	0.73	0.38	1.03	9.68	0.22
1965	9.04	0.62	0.09	9.75	0.36	2.10	[5]0.52	0.29	4.51	0.24	0.74	0.39	0.83	9.97	0.22
1966	9.44	0.65	0.09	10.18	0.37	2.15	0.59	0.29	4.77	0.24	0.72	0.40	0.89	10.43	0.25
1967	9.82	0.67	0.09	10.58	0.37	2.20	0.75	0.31	4.94	0.25	0.76	0.41	0.89	10.87	0.29
1968	10.31	0.71	0.08	11.10	0.39	2.29	0.86	0.32	5.20	0.26	0.75	0.44	0.91	11.42	0.32
1969	10.63	0.72	0.11	11.46	0.40	2.32	0.88	0.34	5.47	0.28	0.73	0.47	0.91	11.79	0.34
1970	10.87	0.76	0.12	11.75	0.43	2.45	0.83	0.35	5.70	0.30	0.71	0.48	0.88	12.11	0.36
1971	11.20	0.78	0.14	12.12	0.45	2.50	0.83	0.36	5.97	0.30	0.75	0.47	0.86	12.50	0.38
1972	11.70	0.83	0.17	12.69	0.45	2.63	0.85	0.36	6.28	0.33	0.80	0.51	0.89	13.08	0.39
1973	12.43	0.82	0.15	13.40	0.48	2.82	0.86	0.37	6.53	0.36	0.97	0.52	0.94	13.85	0.45
1974	12.13	0.75	0.14	13.02	0.47	2.67	0.84	0.34	6.36	0.34	1.07	0.52	0.90	13.50	0.48
1975	12.44	0.71	0.07	13.23	0.41	2.65	0.87	0.31	6.52	0.35	1.24	0.52	0.81	13.68	0.46
1976	13.42	0.73	0.06	14.20	0.39	2.92	0.92	0.34	6.84	0.36	1.38	0.54	0.99	14.68	0.48
1977	14.60	0.67	0.07	15.35	0.43	3.28	0.97	0.35	7.03	0.37	1.75	0.57	1.11	15.87	0.52
1978	14.74	0.64	0.09	15.47	0.48	3.17	0.97	0.35	7.17	0.37	1.67	0.60	1.19	15.97	0.50
1979	14.65	0.51	0.08	15.24	0.47	3.15	1.01	0.34	6.84	0.38	1.69	0.60	1.30	15.76	0.53
1980	13.48	0.46	0.08	14.02	0.39	2.66	1.00	0.33	6.49	0.37	1.58	0.58	1.22	14.62	0.60
1981	12.47	0.52	0.49	13.48	0.34	2.61	0.97	0.31	6.40	0.39	1.32	0.57	1.08	13.99	0.51
1982	11.77	0.52	0.57	12.86	0.33	2.61	0.98	0.27	6.34	0.41	1.07	0.55	0.84	13.39	0.53
1983	11.69	0.46	0.50	12.65	0.37	2.46	1.02	0.33	6.34	0.42	0.85	0.55	0.80	13.14	0.49
1984	12.04	0.50	0.58	13.13	0.39	2.68	1.13	0.36	6.45	0.44	0.89	0.56	0.78	13.68	0.55
1985	12.00	0.51	0.68	13.19	0.40	2.69	1.19	0.39	6.42	0.45	0.88	0.58	0.74	13.75	0.56
1986	12.72	0.48	0.71	13.91	0.41	2.80	1.29	0.42	6.75	0.51	0.89	0.64	0.82	14.52	0.62
1987	12.85	0.47	0.67	13.99	0.43	2.73	1.34	0.45	6.84	0.51	0.89	0.64	0.79	14.63	0.64
1988	13.25	0.51	0.61	14.37	0.44	2.86	1.37	0.50	6.96	0.54	0.93	0.67	0.76	15.02	0.66
1989	13.40	0.50	0.61	14.51	0.42	2.90	1.40	0.55	6.96	0.54	0.95	0.68	0.75	15.17	0.66
1990	13.41	0.47	0.71	14.59	0.45	2.92	1.49	0.50	6.96	0.55	0.95	0.67	0.78	15.27	0.68
1991	13.30	0.47	0.77	14.54	0.43	2.96	1.44	0.54	6.98	0.57	0.93	0.65	0.76	15.26	0.71
1992	13.41	0.47	0.75	14.63	0.42	2.97	1.40	0.61	7.06	0.60	0.89	0.66	0.80	15.40	0.77
1993	13.61	0.49	0.92	15.02	0.45	3.13	1.42	0.59	7.30	0.62	0.84	0.65	0.78	15.79	0.77
1994	13.87	0.47	0.69	15.02	0.45	3.20	1.45	0.61	7.18	0.62	0.83	0.66	0.79	15.79	0.77
1995	13.97	0.47	0.78	15.22	0.47	3.16	1.42	0.65	7.46	0.63	0.79	0.65	0.78	15.99	0.77
1996	14.19	0.45	0.84	15.49	0.46	3.32	1.52	0.66	7.56	0.66	0.73	0.65	0.76	16.32	0.84
1997	14.66	0.42	0.83	15.91	0.48	3.39	1.55	0.69	7.74	0.69	0.71	0.66	0.84	16.76	0.85
1998	[R]14.89	[R]0.40	[R]0.85	[R]16.14	[R]0.50	3.42	[R]1.53	0.67	[R]7.89	[R]0.71	0.76	[R]0.66	0.89	[R]17.03	[R]0.89
1999[P]	14.81	0.37	0.93	16.11	0.50	3.41	1.57	0.69	7.94	0.71	0.70	0.66	0.84	17.01	0.90

[1] Prior to 1981, included unfinished oils (net), hydrogen, and hydrocarbons not included elsewhere; 1981 forward, included unfinished oils (net), motor gasoline blending components (net), aviation gasoline blending components (net), hydrogen, other hydrocarbons, and alcohol. See Note 1 at end of section.

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

[3] Kerosene, petrochemical feedstocks (excluding still gas), lubricants, wax, and miscellaneous products. Since 1964, aviation gasoline and special naphthas have been included.

[4] Included in the products from which jet fuel was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel.

[5] Prior to 1965, kerosene-type jet fuel was included in kerosene.

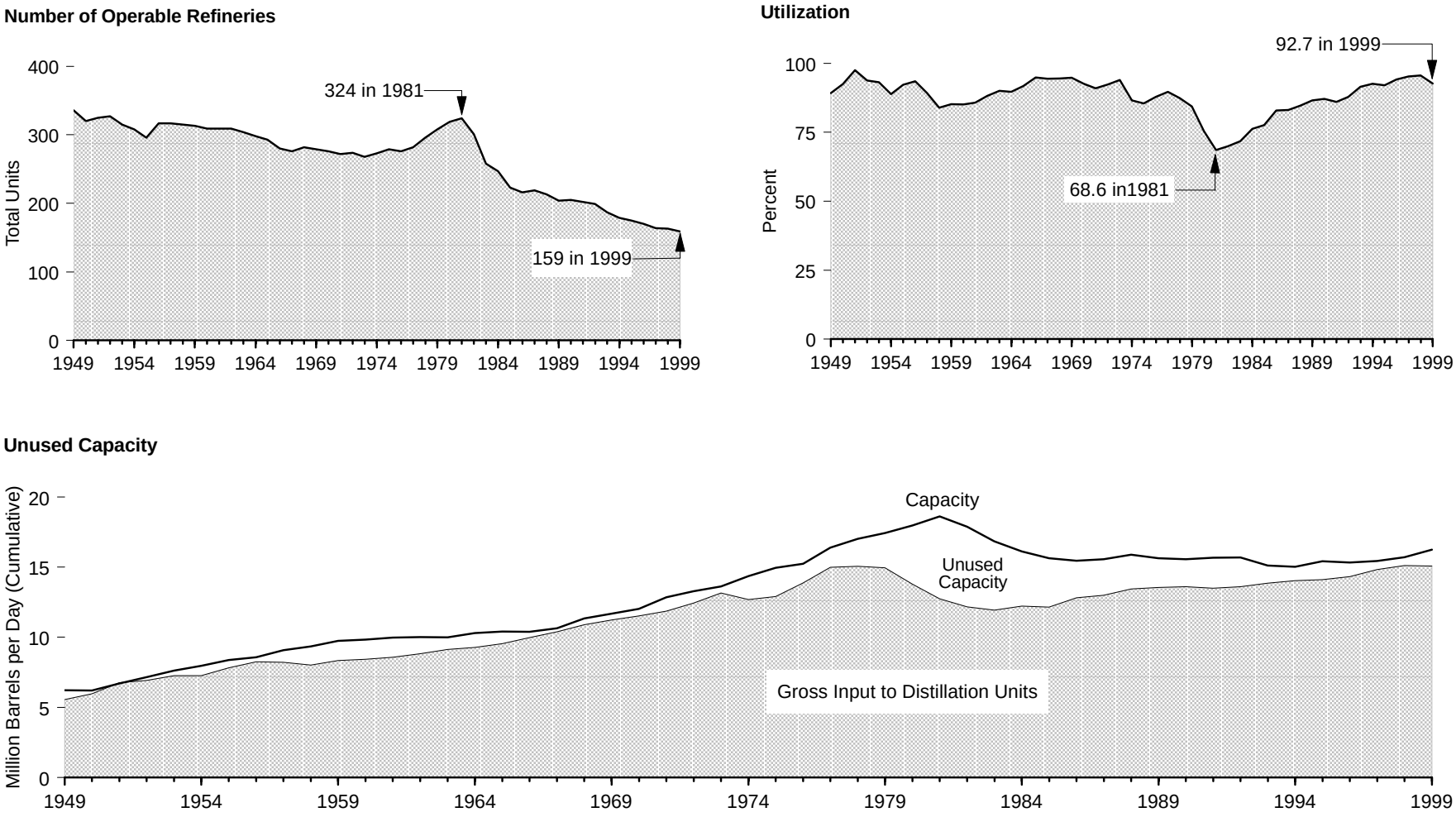
R=Revised. P=Preliminary. (s)=Less than 0.005 million barrels per day.

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

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.9 Refinery Capacity and Utilization, 1949-1999



Source: Table 5.9.

Table 5.9 Refinery Capacity and Utilization, 1949-1999

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	13.85	91.5
1994	179	15.03	14.03	92.6
1995	175	15.43	14.12	92.0
1996	170	15.33	14.34	94.1
1997	164	15.45	14.84	95.2
1998	163	15.71	R15.11	R95.6
1999P	159	16.26	15.09	92.7

[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 4 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 is derived by averaging reported monthly utilization.

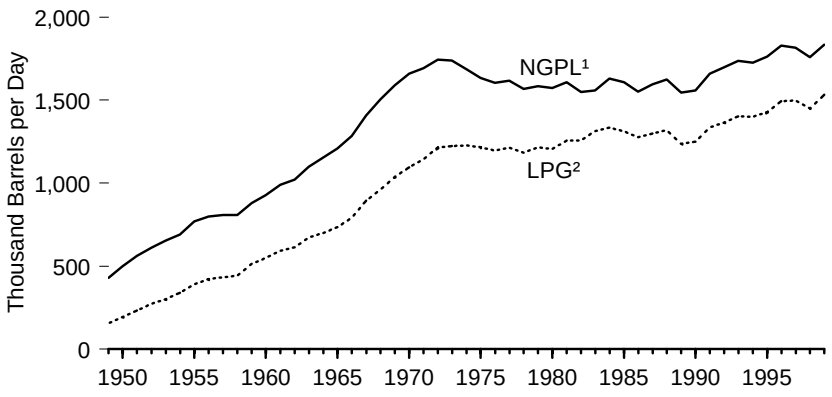
R=Revised. P=Preliminary.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

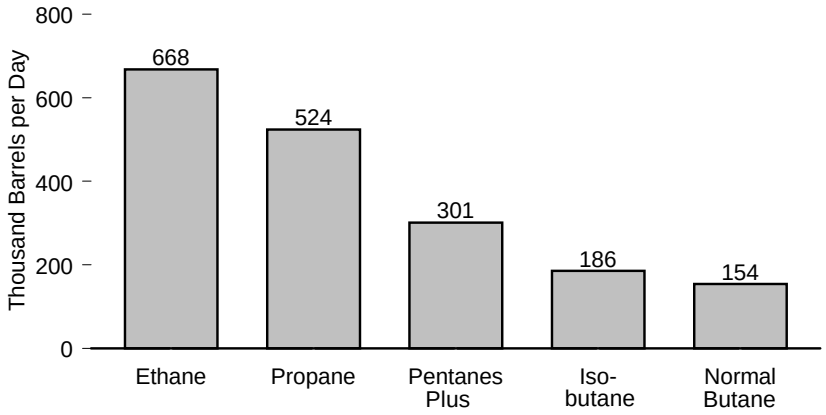
Sources: **Operable Refineries:** • 1949-1961—Bureau of Mines Information Circular, "Petroleum Refineries, Including Cracking Plants in the United States." • 1962-1977—Bureau of Mines, Mineral Industry Surveys, *Petroleum Refineries, Annual,* annual reports. • 1978-1981—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Refineries in the United States.* • 1982-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (January 1999). **Gross Input to Distillation Units:** • 1949-1966—Bureau of Mines, *Minerals Yearbook,* "Natural Gas Liquids" and "Crude Petroleum and Petroleum Products" chapters. • 1967-1977—Bureau of Mines, Mineral Industry Surveys, *Petroleum Refineries, Annual,* annual reports. • 1978-1980—EIA, Energy Data Reports, *Petroleum Refineries in the United States and U.S. Territories.* • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (January-December 1999 issues). **Utilization:** • 1949-1980—Calculated. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, Calculated.

Figure 5.10 Natural Gas Plant Liquids Production

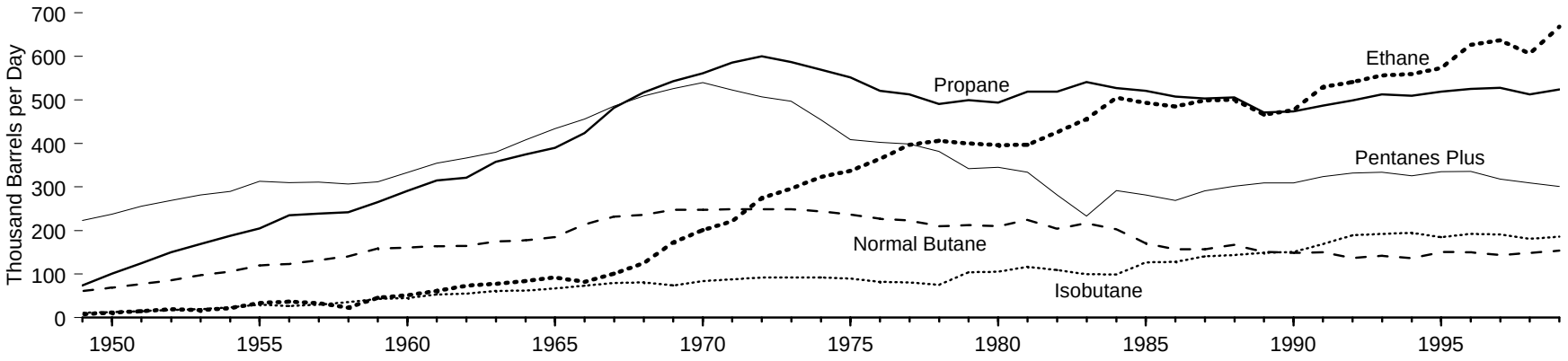
Total, 1949-1999



By Product, 1999



By Selected Product, 1949-1999



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, 1949-1999

(Thousand Barrels per Day)

Year	Finished Petroleum Products [1]	Liquefied Petroleum Gases					Pentanes Plus [4]	Total
		Ethane [2]	Isobutane	Normal Butane [3]	Propane [2,3]	Total		
1949	53	8	11	61	74	155	223	430
1950	66	12	13	69	101	195	238	499
1951	73	15	15	77	125	232	256	561
1952	70	19	18	86	150	273	269	611
1953	71	17	19	97	169	301	282	654
1954	61	22	24	106	188	339	290	691
1955	68	34	30	120	205	390	313	771
1956	68	37	27	123	235	422	310	800
1957	63	33	30	132	239	434	311	808
1958	58	23	36	141	242	442	307	808
1959	54	46	43	159	265	514	312	879
1960	47	51	45	161	291	549	333	929
1961	43	61	53	164	315	593	355	991
1962	41	73	55	165	321	614	367	1,021
1963	47	78	61	175	358	672	380	1,098
1964	48	84	62	178	375	699	408	1,154
1965	41	92	67	185	390	734	434	1,210
1966	37	82	73	214	424	792	456	1,284
1967	29	101	80	232	482	895	486	1,409
1968	35	125	81	236	517	960	509	1,504
1969	27	173	74	248	543	1,037	526	1,590
1970	25	201	84	248	561	1,095	540	1,660
1971	25	221	88	249	586	1,144	523	1,693
1972	21	275	92	249	600	1,215	507	1,744
1973	16	296	92	249	587	1,225	497	1,738
1974	7	323	92	244	569	1,227	454	1,688
1975	7	337	90	237	552	1,217	409	1,633
1976	6	365	82	227	521	1,195	403	1,604
1977	5	397	81	223	513	1,214	399	1,618
1978	3	406	75	210	491	1,182	382	1,567
1979	26	400	104	212	500	1,216	342	1,584
1980	23	396	105	210	494	1,205	345	1,573
1981	18	397	117	224	519	1,256	334	1,609
1982	11	426	109	204	519	1,258	282	1,550
1983	12	456	100	217	541	1,314	233	1,559
1984	4	505	99	203	527	1,334	292	1,630
1985	14	493	127	171	521	1,313	282	1,609
1986	4	485	128	157	508	1,277	269	1,551
1987	4	499	141	157	503	1,300	291	1,595
1988	4	501	144	167	506	1,319	302	1,625
1989	([5])	466	149	151	471	1,237	309	1,546
1990	([5])	477	151	149	474	1,250	309	1,559
1991	([5])	530	169	150	487	1,336	324	1,659
1992	([5])	541	189	137	499	1,365	332	1,697
1993	([5])	556	192	142	513	1,402	334	1,736
1994	([5])	559	195	136	510	1,400	326	1,727
1995	([5])	573	185	151	519	1,428	335	1,762
1996	([5])	627	192	150	525	1,494	336	1,830
1997	([5])	637	191	144	528	1,499	318	1,817
1998	([5])	R607	181	R148	R513	R1,450	R309	R1,759
1999P	([5])	668	186	154	524	1,533	301	1,834

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

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

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

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

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

R=Revised. P=Preliminary.

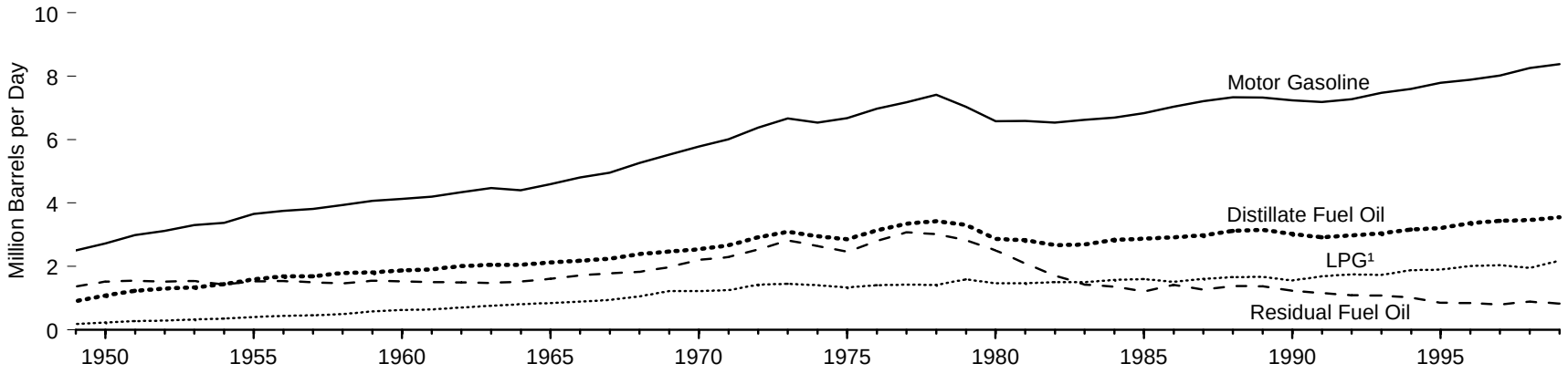
Note: Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

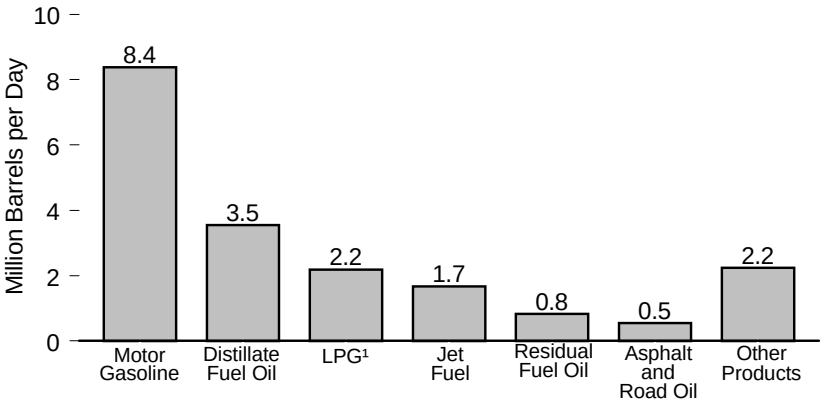
Sources: • 1949-1968—Bureau of Mines, *Minerals Yearbook,* "Crude Petroleum and Petroleum Products" chapter. • 1969-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.11 Petroleum Products Supplied by Type

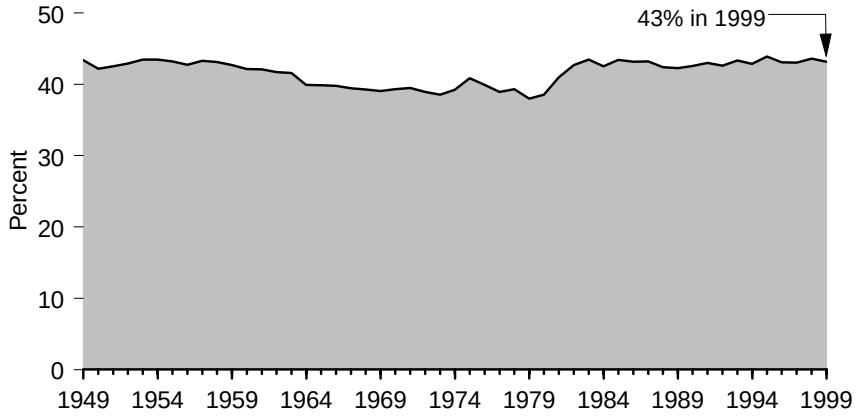
By Selected Product, 1949-1999



By Product, 1999



Motor Gasoline's Share of Total Petroleum Products Supplied, 1949-1999



¹ Liquefied petroleum gases.

Source: Table 5.11.

Table 5.11 Petroleum Products Supplied by Type, 1949-1999

(Million Barrels per Day)

Year	Asphalt and Road Oil	Distillate Fuel Oil	Jet Fuel	Liquefied Petroleum Gases		Motor Gasoline [2]	Residual Fuel Oil	Other Products [3]	Total Products	Percentage Change from Previous Year [4]
				Propane [1]	Total					
1949	0.16	0.90	(5)	NA	0.19	2.50	1.36	0.65	5.76	—
1950	0.18	1.08	(5)	NA	0.23	2.72	1.52	0.72	6.46	12.1
1951	0.20	1.23	(5)	NA	0.28	2.99	1.55	0.78	7.02	8.6
1952	0.21	1.30	0.05	NA	0.30	3.12	1.52	0.76	7.27	3.9
1953	0.22	1.34	0.09	NA	0.33	3.30	1.54	0.79	7.60	4.3
1954	0.23	1.44	0.13	NA	0.35	3.37	1.43	0.80	7.76	2.1
1955	0.25	1.59	0.15	NA	0.40	3.66	1.53	0.87	8.46	9.0
1956	0.27	1.68	0.20	NA	0.44	3.75	1.54	0.89	8.78	4.1
1957	0.26	1.69	0.20	NA	0.45	3.82	1.50	0.88	8.81	0.1
1958	0.28	1.79	0.26	NA	0.49	3.93	1.45	0.91	9.12	3.5
1959	0.30	1.81	0.29	NA	0.58	4.07	1.54	0.94	9.53	4.5
1960	0.30	1.87	0.28	NA	0.62	4.13	1.53	1.06	9.80	3.1
1961	0.31	1.90	0.29	NA	0.64	4.20	1.50	1.13	9.98	1.5
1962	0.33	2.01	0.31	NA	0.70	4.34	1.50	1.22	10.40	4.2
1963	0.34	2.05	0.32	NA	0.76	4.47	1.48	1.34	10.74	3.3
1964	0.35	2.05	0.32	NA	0.81	4.40	1.52	1.58	11.02	2.9
1965	0.37	2.13	0.60	NA	0.84	4.59	1.61	1.38	11.51	4.2
1966	0.39	2.18	0.67	NA	0.89	4.81	1.72	1.43	12.08	5.0
1967	0.38	2.24	0.82	0.62	0.94	4.96	1.79	1.43	12.56	3.9
1968	0.41	2.39	0.95	0.69	1.05	5.26	1.83	1.50	13.39	6.9
1969	0.42	2.47	0.99	0.78	1.22	5.53	1.98	1.54	14.14	5.3
1970	0.45	2.54	0.97	0.78	1.22	5.78	2.20	1.53	14.70	4.0
1971	0.46	2.66	1.01	0.79	1.25	6.01	2.30	1.52	15.21	3.5
1972	0.47	2.91	1.05	0.89	1.42	6.38	2.53	1.62	16.37	7.9
1973	0.52	3.09	1.06	0.87	1.45	6.67	2.82	1.69	17.31	5.5
1974	0.48	2.95	0.99	0.83	1.41	6.54	2.64	1.65	16.65	-3.8
1975	0.42	2.85	1.00	0.78	1.33	6.67	2.46	1.58	16.32	-2.0
1976	0.41	3.13	0.99	0.83	1.40	6.98	2.80	1.75	17.46	7.3
1977	0.44	3.35	1.04	0.82	1.42	7.18	3.07	1.94	18.43	5.3
1978	0.48	3.43	1.06	0.78	1.41	7.41	3.02	2.03	18.85	2.3
1979	0.48	3.31	1.08	0.85	1.59	7.03	2.83	2.20	18.51	-1.8
1980	0.40	2.87	1.07	0.75	1.47	6.58	2.51	2.17	17.06	-7.6
1981	0.34	2.83	1.01	0.77	1.47	6.59	2.09	1.74	16.06	-6.1
1982	0.34	2.67	1.01	0.80	1.50	6.54	1.72	1.51	15.30	-4.7
1983	0.37	2.69	1.05	0.75	1.51	6.62	1.42	1.57	15.23	-0.4
1984	0.41	2.84	1.18	0.83	1.57	6.69	1.37	1.66	15.73	3.5
1985	0.43	2.87	1.22	0.88	1.60	6.83	1.20	1.58	15.73	-0.3
1986	0.45	2.91	1.31	0.83	1.51	7.03	1.42	1.65	16.28	3.5
1987	0.47	2.98	1.38	0.92	1.61	7.21	1.26	1.76	16.67	2.4
1988	0.47	3.12	1.45	0.92	1.66	7.34	1.38	1.87	17.28	4.0
1989	0.45	3.16	1.49	0.99	1.67	7.33	1.37	1.86	17.33	0.0
1990	0.48	3.02	1.52	0.92	1.56	7.23	1.23	1.94	16.99	-1.9
1991	0.44	2.92	1.47	0.98	1.69	7.19	1.16	1.84	16.71	-1.6
1992	0.45	2.98	1.45	1.03	1.76	7.27	1.09	2.03	17.03	2.2
1993	0.47	3.04	1.47	1.01	1.73	7.48	1.08	1.96	17.24	0.9
1994	0.48	3.16	1.53	1.08	1.88	7.60	1.02	2.04	17.72	2.8
1995	0.49	3.21	1.51	1.10	1.90	7.79	0.85	1.98	17.72	0.0
1996	0.48	3.37	1.58	1.14	2.01	7.89	0.85	2.13	18.31	3.6
1997	0.51	3.44	1.60	1.17	2.04	8.02	0.80	2.23	18.62	1.4
1998	0.52	R3.46	R1.62	R1.12	R1.95	R8.25	R0.89	R2.22	R18.92	R1.6
1999P	0.55	3.55	1.67	1.25	2.18	8.38	0.83	2.24	19.39	2.5

[1] Includes propylene.

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

[3] Kerosene, petrochemical feedstocks, lubricants, wax, petroleum coke, 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 in thousand barrels per year.

[5] Included in the products from which jet fuel was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel.

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

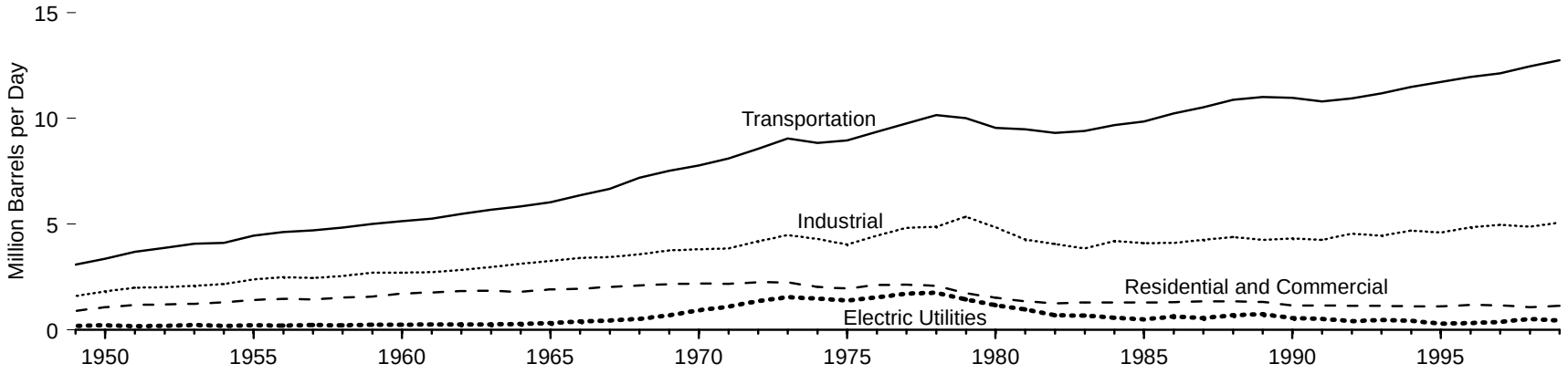
Notes: • For the definition of petroleum products supplied, see Notes 1, 2, and 3 at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

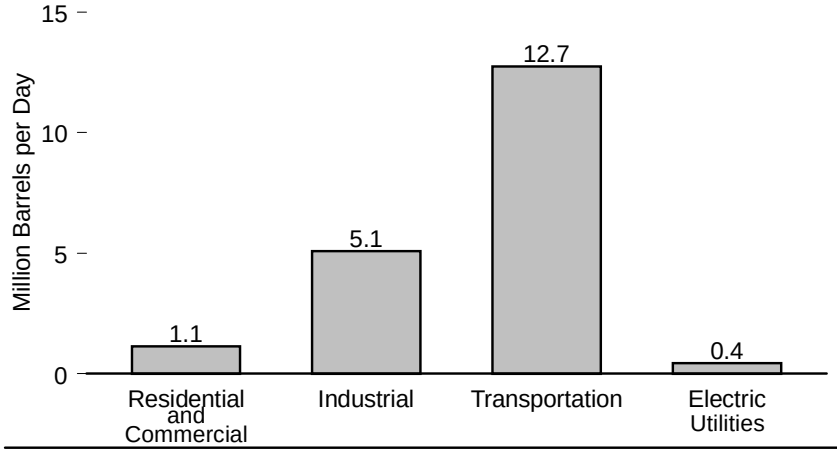
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.12a Petroleum Products Supplied by Sector

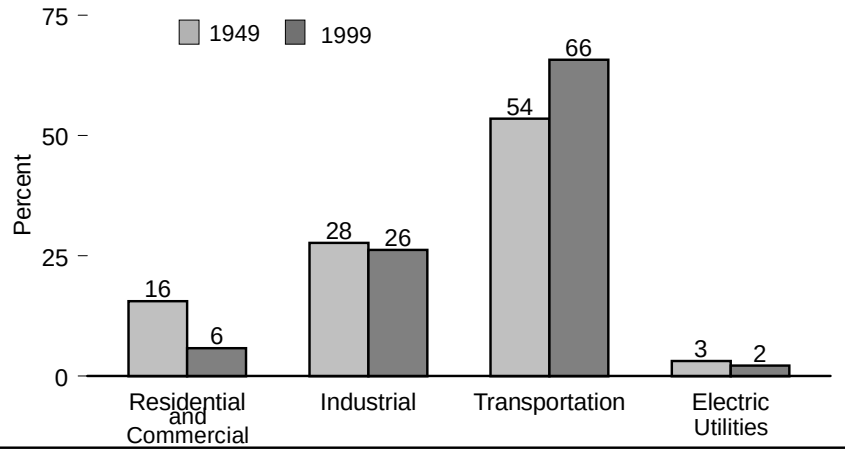
By Sector, 1949-1999



By Sector, 1999



Shares[1] by Sector, 1949 and 1999



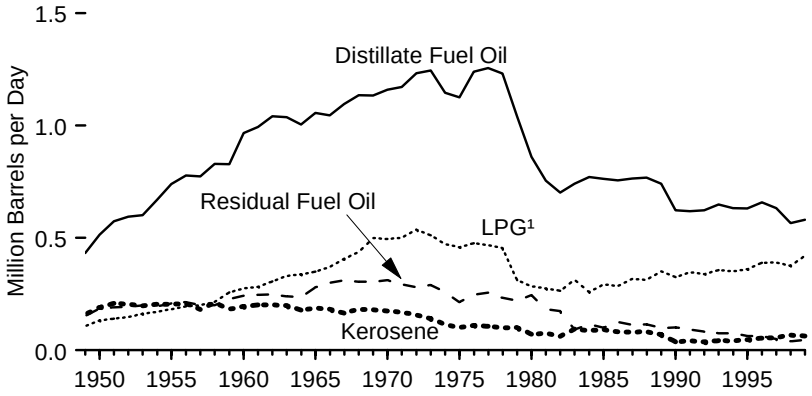
[1] Sum of shares may not equal 100 percent due to independent rounding.

Note: See related Figure 5.12b.

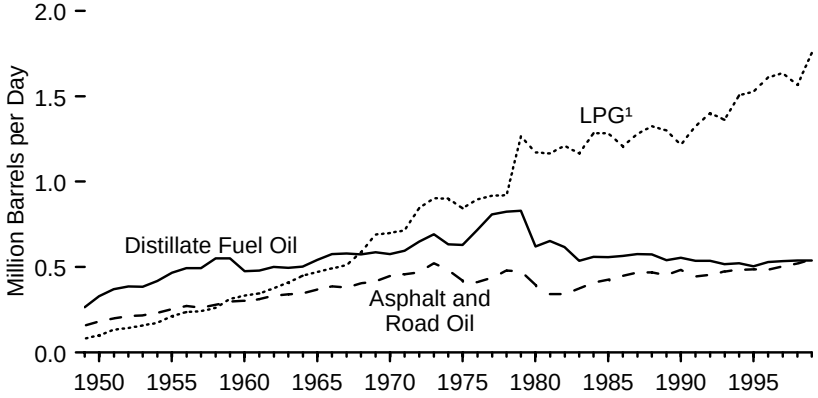
Sources: Tables 5.12a and 5.12b.

Figure 5.12b Petroleum Products Supplied by Product by Sector, 1949-1999

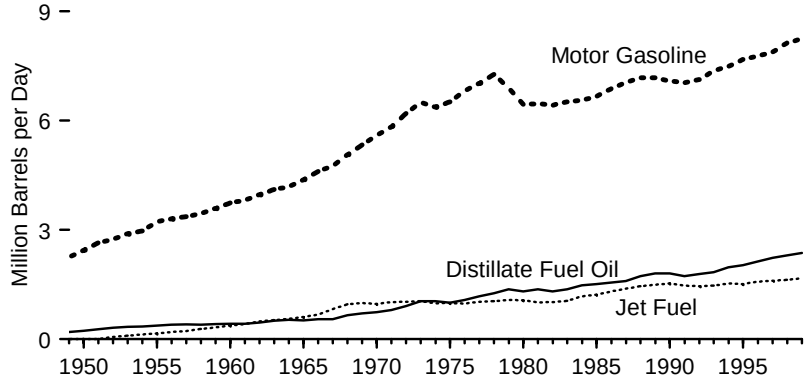
Residential and Commercial Sector, Selected Products



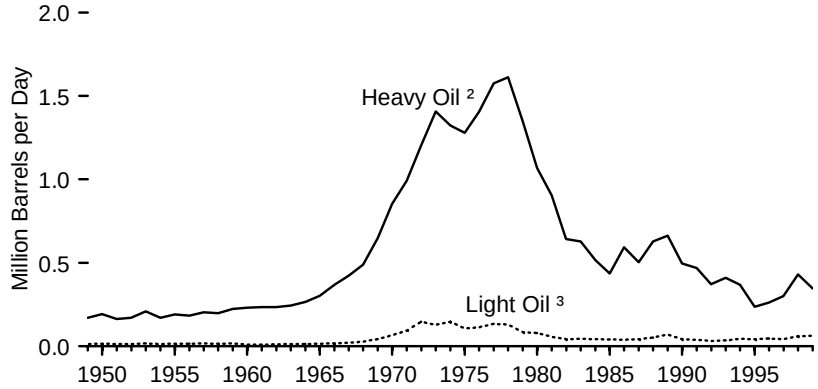
Industrial Sector, Selected Products



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 oil.

[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 to the Residential and Commercial Sector and the Industrial Sector, 1949-1999

(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	0.63	0.04	0.35	0.01	0.08	1.11	0.48	0.52	0.01	1.50	0.08	0.10	0.19	1.80	4.69
1995	0.63	0.05	0.36	0.01	0.06	1.11	0.49	0.51	0.01	1.53	0.08	0.11	0.15	1.74	4.60
1996	0.66	0.05	0.39	0.01	0.06	1.18	0.48	0.53	0.01	1.61	0.08	0.10	0.15	1.89	4.85
1997	0.63	0.06	0.39	0.02	0.05	1.15	0.51	0.53	0.01	1.64	0.08	0.11	0.13	1.96	4.97
1998[E]	R0.57	0.07	0.37	0.02	0.04	R1.07	0.52	R0.54	0.01	R1.57	0.09	R0.10	R0.11	R1.93	R4.87
1999[E]	0.58	0.06	0.42	0.02	0.04	1.13	0.55	0.54	0.01	1.75	0.09	0.11	0.09	1.95	5.08

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

R=Revised. E=Estimated. (s)=Less than 0.005 million barrels per day.

Notes: • See Table 5.12b for the transportation sector, electric utilities, and overall total. • See Notes 1, 2, 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.

Web Page: http://www.eia.doe.gov/emeu/sep/us/frame.html.

Sources: • 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports, and Energy Information Administration (EIA) estimates. • 1960-1997—EIA, *State Energy Data Report 1997* (September 1999). • 1998 and 1999—EIA, Integrated Modeling Data System output for the *Monthly Energy Review* (March 2000).

Table 5.12b Petroleum Products Supplied to the Transportation Sector, Electric Utilities, and Total, 1949-1999

(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	10.88	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	0.02	1.96	1.53	0.02	0.08	7.49	0.39	11.49	0.37	0.04	0.01	0.43	17.72
1995	0.02	2.03	1.51	0.01	0.08	7.67	0.40	11.73	0.24	0.04	0.01	0.29	17.72
1996	0.02	2.13	1.58	0.01	0.07	7.77	0.38	11.96	0.26	0.05	0.01	0.32	18.31
1997	0.02	2.23	1.60	0.01	0.08	7.88	0.32	12.14	0.30	0.04	0.02	0.36	18.62
1998[E]	0.02	[R]2.30	[R]1.62	0.01	0.08	[R]8.13	[R]0.31	[R]12.47	0.43	0.06	0.02	[R]0.51	[R]18.92
1999[E]	0.02	2.36	1.67	0.01	0.08	8.25	0.35	12.75	0.35	0.06	0.02	0.43	19.39

[1] 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 oil.

[2] 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.

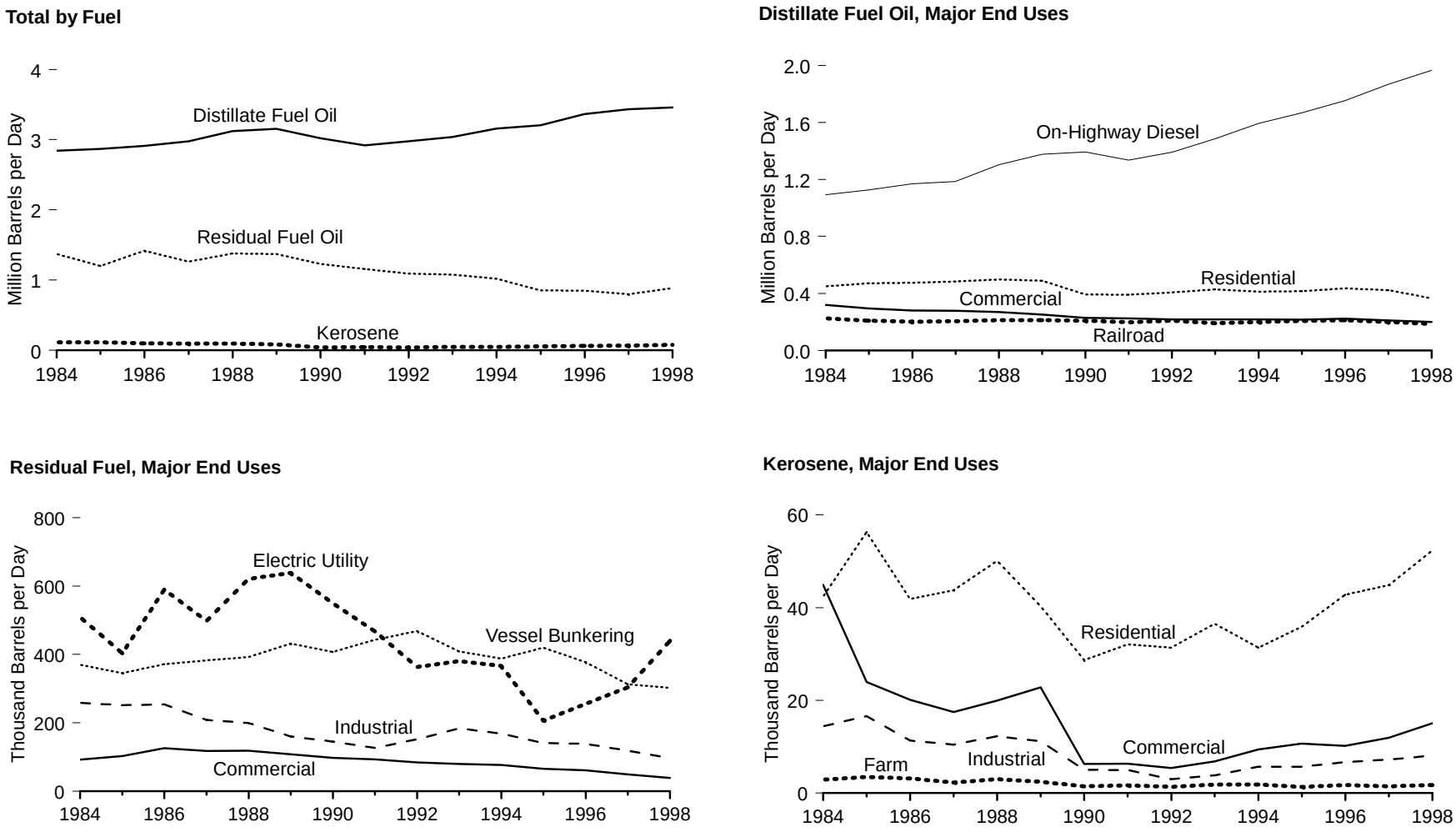
R=Revised. E=Estimated. (s)=Less than 0.005 million barrels per day.

Notes: • See Table 5.12a for the residential and commercial sector and the industrial sector. • See Notes 1, 2, 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.

Web Page: http://www.eia.doe.gov/emeu/sep/us/frame.html.

Sources: • 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports, and Energy Information Administration (EIA) estimates. • 1960-1997—EIA, *State Energy Data Report 1997* (September 1999). • 1998 and 1999—EIA, Integrated Modeling Data System output for the *Monthly Energy Review* (March 2000).

Figure 5.13 Fuel Oil and Kerosene Adjusted Sales, 1984-1998



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

Source: Table 5.13.

Table 5.13 Fuel Oil and Kerosene Adjusted Sales, 1984-1998

(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	406	218	144	51	228	30	209	146	1,391	42	113	(s)	2,979
1993	429	218	128	50	211	38	190	133	1,485	31	127	(s)	3,041
1994	413	218	136	46	209	49	200	132	1,594	34	130	(s)	3,162
1995	416	216	132	36	211	39	208	129	1,668	24	126	—	3,207
1996	436	223	137	41	217	45	213	142	1,754	24	134	—	3,365
1997	423	210	141	41	216	42	200	137	1,867	22	136	—	3,435
1998	367	199	147	37	198	63	185	139	1,967	18	142	—	3,461
						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	—	[E]12	—	15	1,418
1987	—	118	208	42	—	498	([1])	383	—	12	—	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	—	363	NA	468	—	7	—	1	1,094
1993	—	79	184	21	—	381	NA	409	—	6	—	(s)	1,080
1994	—	76	168	17	—	366	NA	388	—	4	—	(s)	1,021
1995	—	66	141	15	—	206	NA	420	—	4	—	(s)	852
1996	—	61	138	11	—	255	NA	378	—	4	—	1	848
1997	—	49	118	10	—	304	NA	312	—	3	—	(s)	797
1998	—	39	97	7	—	440	NA	303	—	2	—	(s)	887
						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)	41
1993	37	7	4	—	2	—	—	—	—	—	—	1	50
1994	31	9	6	—	2	—	—	—	—	—	—	1	49
1995	36	11	6	—	1	—	—	—	—	—	—	(s)	54
1996	43	10	7	—	2	—	—	—	—	—	—	(s)	62
1997	45	12	7	—	1	—	—	—	—	—	—	(s)	66
1998	52	15	8	—	2	—	—	—	—	—	—	1	78

[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.

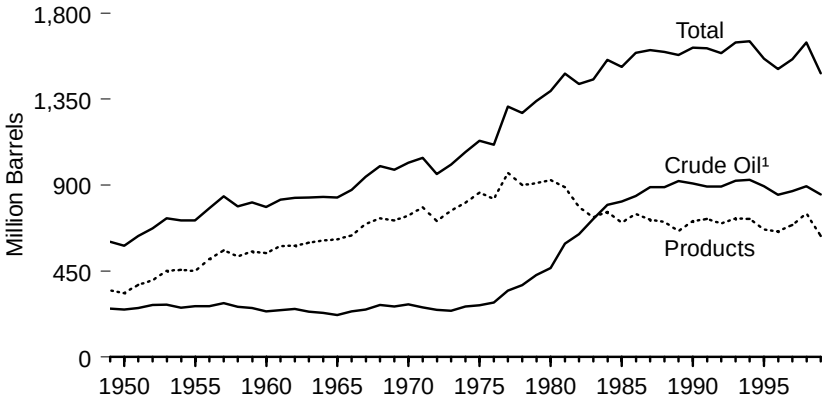
Notes: • Distillate fuel oil and kerosene data are sales data that were adjusted at the Petroleum Administration for Defense district level to equal Energy Information Administration (EIA) volume estimates of products supplied in the U.S. marketplace. The residual fuel data are sales data adjusted at 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.* • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

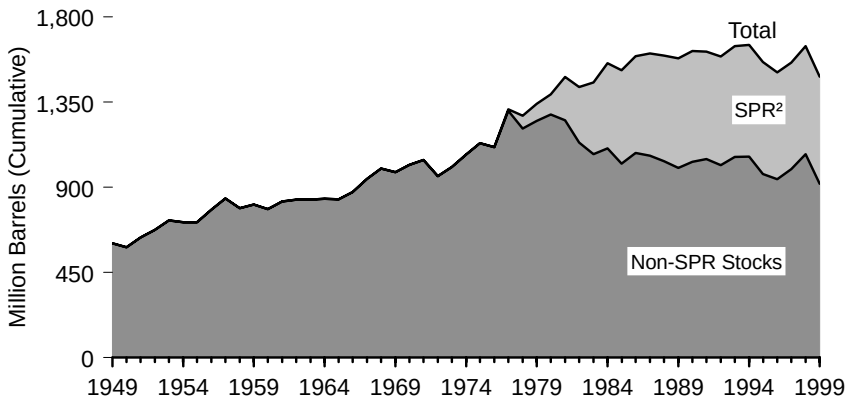
Sources: • 1984—EIA, *Petroleum Marketing Monthly* (July 1986), Table A11. • 1985-1993—EIA, *Fuel Oil and Kerosene Sales,* annual reports. • 1994 forward—EIA, *Fuel Oil and Kerosene Sales 1998* (August 1999), Tables 13, 14, and 15.

Figure 5.14 Petroleum Primary Stocks by Type

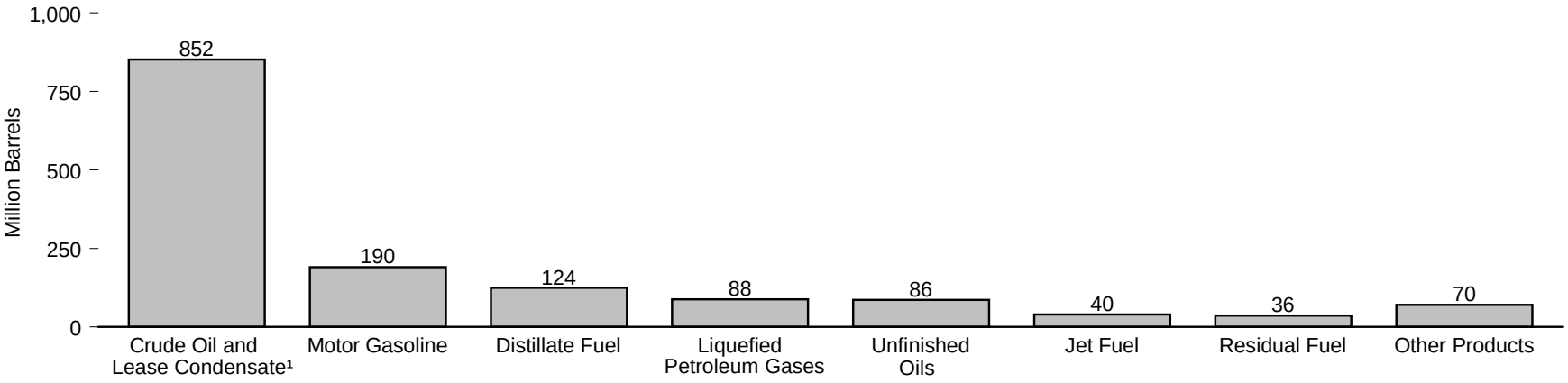
Total, Products, and Crude Oil,[1] 1949-1999



SPR,[2] Non-SPR, and Total Stocks, 1949-1999



By Type, 1999



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

Notes: • Stocks are at end of year. • Because vertical scales differ, graphs should not be compared.
Sources: Tables 5.14 and 5.15.

Table 5.14 Petroleum Primary Stocks by Type, 1949-1999

(Million Barrels)

Year	Crude Oil and Lease Condensate			Petroleum Products										Total Petroleum
	Strategic Petroleum Reserve	Other Primary	Total	Distillate Fuel Oil		Jet Fuel	Liquefied Petroleum Gases		Motor Gasoline [3]	Residual Fuel Oil	Unfinished Oils	Other Products [4]	Total Products	
				Low Sulfur [1]	Total		Propane [2]	Total						
1949	0	253	253	NA	75	(5)	(6)	1	110	60	66	37	350	603
1950	0	248	248	NA	72	(5)	(6)	2	116	41	70	34	334	583
1951	0	256	256	NA	87	(5)	(6)	2	135	43	67	45	378	634
1952	0	272	272	NA	99	2	(6)	3	135	49	62	53	402	674
1953	0	274	274	NA	112	3	(6)	4	158	49	69	56	451	726
1954	0	258	258	NA	108	3	(6)	7	155	52	74	57	457	715
1955	0	266	266	NA	111	3	(6)	7	165	39	68	55	449	715
1956	0	266	266	NA	134	5	(6)	14	187	44	67	63	514	780
1957	0	282	282	NA	149	5	(6)	14	197	60	69	66	560	841
1958	0	263	263	NA	125	6	(6)	16	187	60	70	63	526	789
1959	0	257	257	NA	151	8	(6)	19	188	54	67	66	552	809
1960	0	240	240	NA	138	7	(6)	23	195	45	62	76	545	785
1961	0	245	245	NA	152	8	(6)	31	184	45	79	81	580	825
1962	0	252	252	NA	144	10	(6)	25	189	50	82	83	582	834
1963	0	237	237	NA	157	9	(6)	28	191	48	82	85	598	836
1964	0	230	230	NA	156	19	(6)	30	186	40	87	92	609	839
1965	0	220	220	NA	155	19	(6)	30	175	56	89	92	616	836
1966	0	238	238	NA	154	19	(6)	35	186	61	89	91	636	874
1967	0	249	249	NA	160	22	(6)	64	200	66	90	93	695	944
1968	0	272	272	NA	173	24	(6)	76	204	67	93	89	727	1,000
1969	0	265	265	NA	172	28	(6)	60	211	58	98	88	715	980
1970	0	276	276	NA	195	28	(6)	67	209	54	99	89	741	1,018
1971	0	260	260	NA	191	28	(6)	95	219	60	101	92	784	1,044
1972	0	246	246	NA	154	25	(6)	86	213	55	95	84	713	959
1973	0	242	242	NA	196	29	65	99	209	53	99	80	766	1,008
1974	0	265	265	NA	200	29	69	113	218	60	106	82	809	1,074
1975	0	271	271	NA	209	30	82	125	235	74	106	82	862	1,133
1976	0	285	285	NA	186	32	74	116	231	72	110	78	826	1,112
1977	7	340	348	NA	250	35	81	136	258	90	113	82	964	1,312
1978	67	309	376	NA	216	34	87	132	238	90	109	82	901	1,278
1979	91	339	430	NA	229	39	64	111	237	96	118	82	911	1,341
1980	108	358	466	NA	205	42	65	120	261	92	124	82	926	1,392
1981	230	363	594	NA	192	41	76	135	253	78	111	80	890	1,484
1982	294	350	644	NA	179	37	54	94	235	66	105	70	786	1,430
1983	379	344	723	NA	140	39	48	101	222	49	108	72	731	1,454
1984	451	345	796	NA	161	42	58	101	243	53	94	67	760	1,556
1985	493	321	814	NA	144	40	39	74	223	50	107	67	705	1,519
1986	512	331	843	NA	155	50	63	103	233	47	94	68	750	1,593
1987	541	349	890	NA	134	50	48	97	226	47	93	70	718	1,607
1988	560	330	890	NA	124	44	50	97	228	45	100	70	707	1,597
1989	580	341	921	NA	106	41	32	80	213	44	106	70	660	1,581
1990	586	323	908	NA	132	52	49	98	220	49	99	63	712	1,621
1991	569	325	893	NA	144	49	48	92	219	50	98	72	724	1,617
1992	575	318	893	NA	141	43	39	89	216	43	95	73	699	1,592
1993	587	335	922	64	141	40	51	106	226	44	88	78	725	1,647
1994	592	337	929	73	145	47	46	99	215	42	91	84	724	1,653
1995	592	303	895	67	130	40	43	93	202	37	86	79	668	1,563
1996	566	284	850	68	127	40	43	86	195	46	88	76	658	1,507
1997	563	305	868	68	138	44	44	89	210	40	89	81	692	1,560
1998	571	R324	R895	77	156	45	65	R115	216	R45	91	85	R752	1,647
1999P	567	284	852	68	124	40	43	88	190	36	86	70	634	1,486

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

[2] Includes propylene.

[3] 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.

[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 the products from which jet fuel was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel.

[6] Included in liquefied petroleum gases total.

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

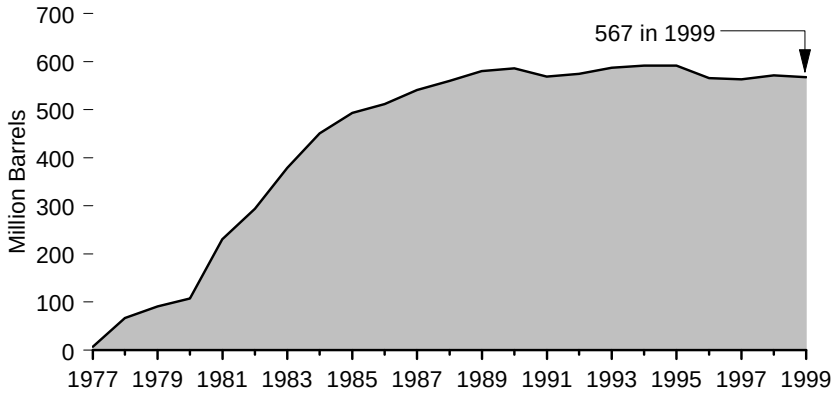
Notes: • Stocks are at end of year. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

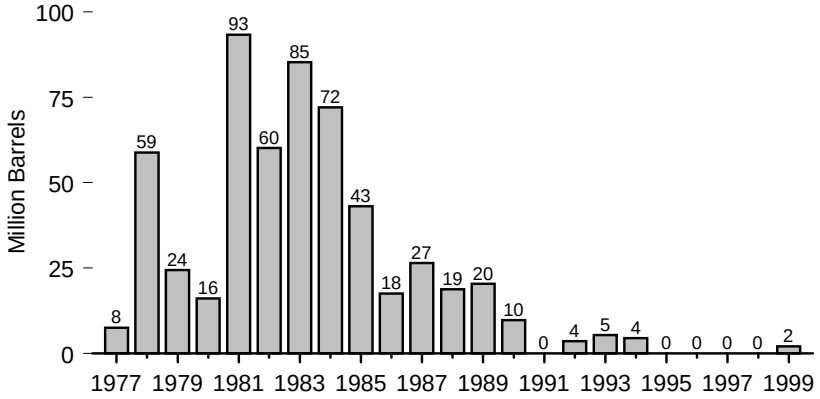
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* annual reports. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.15 Strategic Petroleum Reserve, 1977-1999

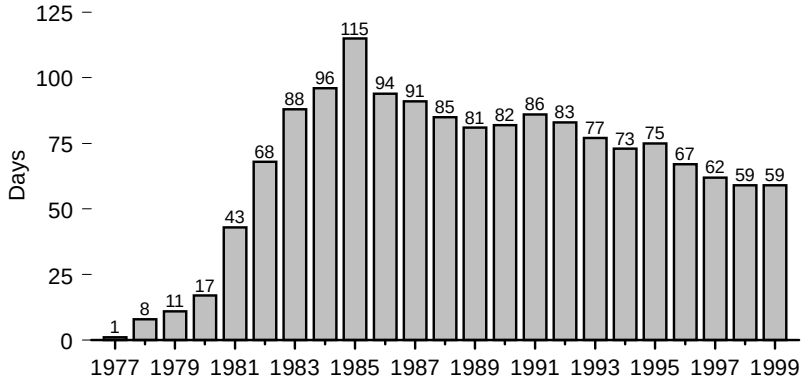
End-of-Year Stocks in SPR



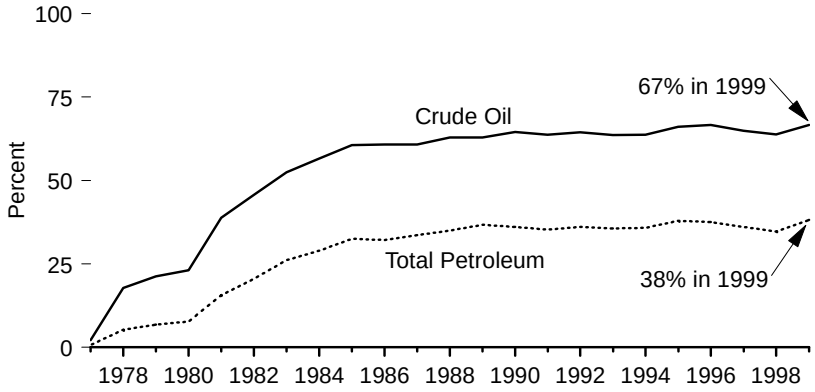
Crude Oil Imports for SPR



SPR Stocks as Days of Net Imports[1]



SPR as Share of Domestic Stocks



[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, 1977-1999

(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	35.6	77
1994	4.49	0.11	0.00	591.67	63.7	35.8	73
1995	0.00	0.00	0.00	591.64	66.1	37.9	75
1996	0.00	0.00	25.82	565.82	66.6	37.5	67
1997	0.00	0.00	2.33	563.43	64.9	36.1	62
1998	0.00	0.00	0.00	571.41	[R]63.8	34.7	[R]59
1999	2.07	1.42	0.00	567.24	66.6	38.2	59

[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.

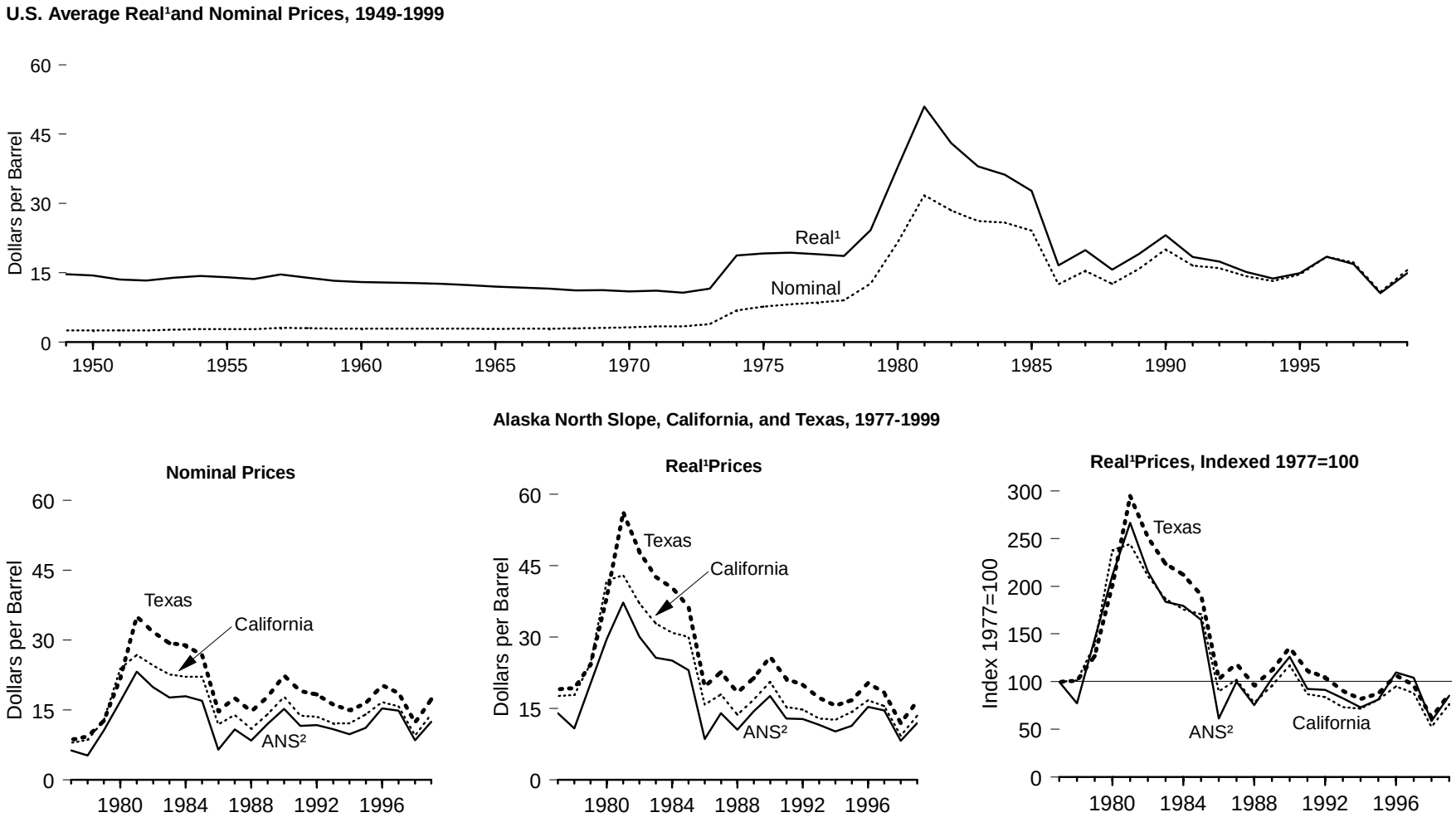
[4] The quantity of domestic fuel oil which was in storage prior to injection of foreign crude oil.

R=Revised. (s)=Less than 0.005 million barrels.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

Sources: **Domestic Crude Oil Deliveries and Domestic Crude Oil Sales:** U.S. Department of Energy, Assistant Secretary for Fossil Energy, unpublished data. **All Other Data:** • 1977-1980—Energy Information Administration (EIA), Energy Data Report, *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.16 Crude Oil Domestic First Purchase Prices



[1] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

[2] Alaska North Slope.

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

Source: Table 5.16.

Table 5.16 Crude Oil Domestic First Purchase Prices, 1949-1999

(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	R14.72
1950	—	—	—	—	—	—	2.51	R14.38
1951	—	—	—	—	—	—	2.53	R13.52
1952	—	—	—	—	—	—	2.53	R13.32
1953	—	—	—	—	—	—	2.68	R13.92
1954	—	—	—	—	—	—	2.78	R14.30
1955	—	—	—	—	—	—	2.77	R14.00
1956	—	—	—	—	—	—	2.79	R13.64
1957	—	—	—	—	—	—	3.09	R14.62
1958	—	—	—	—	—	—	3.01	R13.91
1959	—	—	—	—	—	—	2.90	R13.25
1960	—	—	—	—	—	—	2.88	R12.98
1961	—	—	—	—	—	—	2.89	R12.88
1962	—	—	—	—	—	—	2.90	R12.75
1963	—	—	—	—	—	—	2.89	R12.57
1964	—	—	—	—	—	—	2.88	R12.34
1965	—	—	—	—	—	—	2.86	R12.03
1966	—	—	—	—	—	—	2.88	R11.77
1967	—	—	—	—	—	—	2.92	R11.58
1968	—	—	—	—	—	—	2.94	R11.18
1969	—	—	—	—	—	—	3.09	R11.20
1970	—	—	—	—	—	—	3.18	R10.94
1971	—	—	—	—	—	—	3.39	R11.11
1972	—	—	—	—	—	—	3.39	R10.65
1973	—	—	—	—	—	—	3.89	R11.58
1974	—	—	—	—	—	—	6.87	R18.76
1975	—	—	—	—	—	—	7.67	R19.16
1976	—	—	—	—	—	—	8.19	R19.36
1977	[2]6.29	[2]13.97	7.92	R17.59	8.58	R19.06	8.57	R19.04
1978	5.21	R10.80	8.58	R17.79	9.29	R19.26	9.00	R18.66
1979	10.57	R20.23	12.78	R24.46	12.65	R24.21	12.64	R24.19
1980	16.87	R29.58	23.87	R41.85	21.84	R38.29	21.59	R37.85
1981	23.23	R37.25	26.80	R42.97	35.06	R56.21	31.77	R50.94
1982	19.92	R30.07	24.58	R37.10	31.77	R47.95	28.52	R43.05
1983	17.69	R25.68	22.61	R32.83	29.35	R42.61	26.19	R38.02
1984	17.91	R25.07	22.09	R30.92	28.87	R40.41	25.88	R36.23
1985	16.98	R23.04	22.14	R30.04	26.80	R36.37	24.09	R32.69
1986	6.45	R8.56	11.90	R15.80	14.73	R19.56	12.51	R16.61
1987	10.83	R13.96	13.92	R17.94	17.55	R22.62	15.40	R19.85
1988	8.43	R10.51	10.97	R13.68	14.71	R18.34	12.58	R15.68
1989	12.00	R14.41	14.06	R16.88	17.81	R21.39	15.86	R19.05
1990	15.23	R17.60	17.81	R20.59	22.37	R25.86	20.03	R23.15
1991	11.57	R12.90	13.72	R15.30	19.04	R21.24	16.54	R18.45
1992	11.73	R12.77	13.55	R14.75	18.32	R19.95	15.99	R17.41
1993	10.84	R11.53	12.11	R12.88	16.19	R17.21	14.25	R15.15
1994	9.77	R10.18	12.12	R12.62	14.98	R15.60	13.19	R13.74
1995	11.12	R11.34	14.00	R14.27	16.38	R16.70	14.62	R14.90
1996	15.32	R15.32	16.72	R16.72	20.31	R20.31	18.46	R18.46
1997	14.84	R14.56	15.78	R15.48	18.66	R18.31	17.23	R16.91
1998	R8.47	R8.21	R9.55	R9.26	R12.28	R11.91	R10.87	R10.54
1999P	12.46	11.91	14.08	13.46	17.29	16.53	15.56	14.87

[1] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

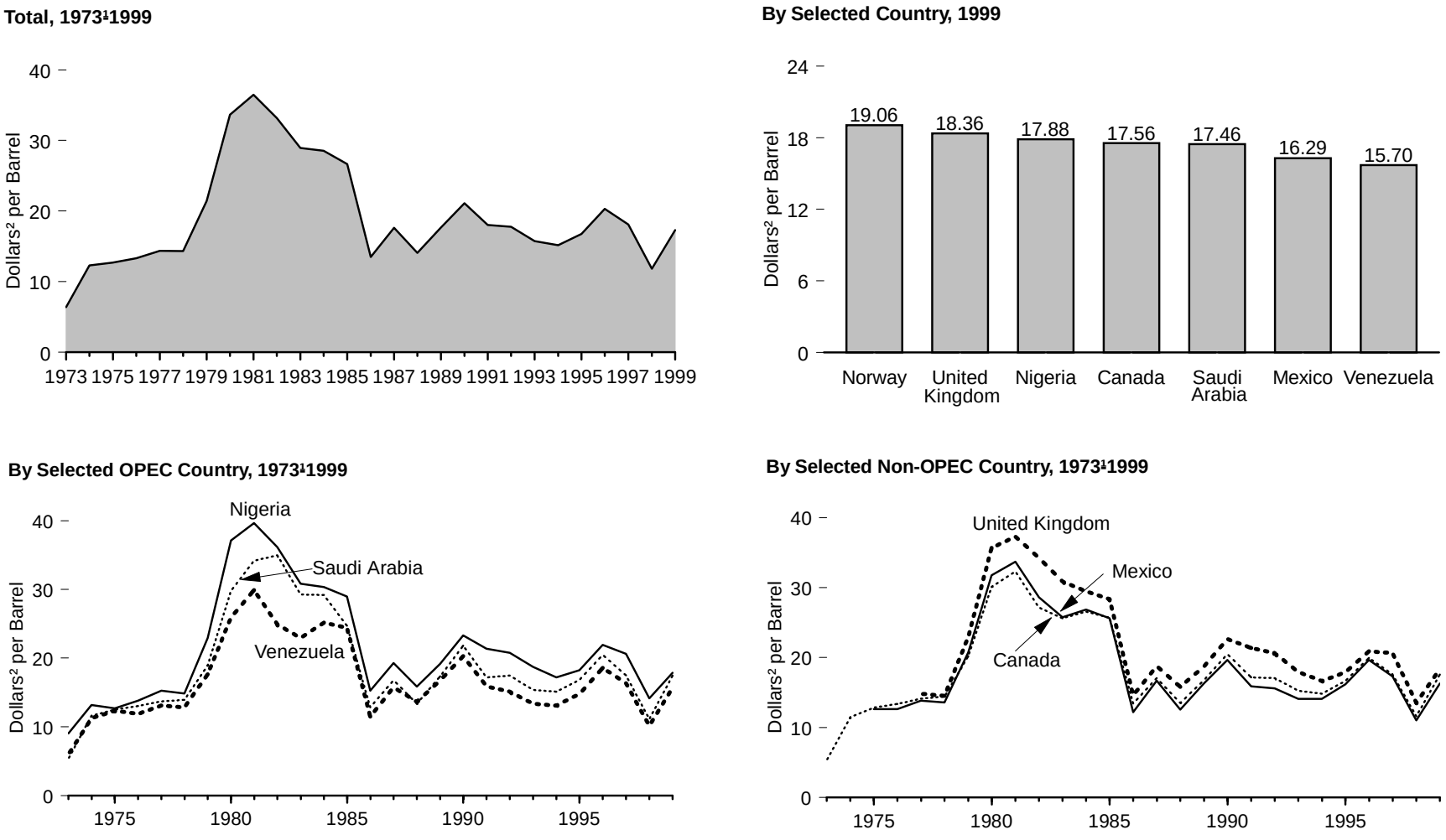
[2] Average for July through December only.

R=Revised. P=Preliminary. — = 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 1977—FEA, Form FEA-P-124, "Domestic Crude Oil Purchaser's Monthly Report." • 1978 forward—Energy Information Administration, *Petroleum Marketing Monthly* (March 2000), Table 21.

Figure 5.17 Landed Costs of Crude Oil Imports From Selected Countries



[1] Based on October, November, and December data only.
[2] Nominal dollars.

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, 1973-1999

(Dollars[1] per Barrel)

Year	Persian Gulf Nations	Selected OPEC [2] Countries					Selected Non-OPEC Countries							Total
		Kuwait	Nigeria	Saudi Arabia	Venezuela	Total OPEC [3]	Angola	Canada	Colombia	Mexico	Norway	United Kingdom	Total Non-OPEC	
1973[4]	5.91	W	9.08	5.37	5.99	6.85	W	5.33	W	NA	NA	NA	5.64	6.41
1974	12.21	W	13.16	11.63	11.25	12.49	12.48	11.48	W	W	NA	NA	11.81	12.32
1975	12.64	W	12.70	12.50	12.36	12.70	11.81	12.84	([5])	12.61	12.80	NA	12.70	12.70
1976	13.03	W	13.81	13.06	11.89	13.32	12.71	13.36	([5])	12.64	13.74	W	13.35	13.32
1977	13.85	W	15.29	13.69	13.11	14.35	14.04	14.13	([5])	13.82	14.93	14.83	14.42	14.36
1978	14.01	W	14.88	13.94	12.84	14.34	14.07	14.41	([5])	13.56	14.68	14.53	14.38	14.35
1979	20.42	W	22.97	18.95	17.65	21.29	21.06	20.22	([5])	20.77	22.55	22.97	22.10	21.45
1980	30.59	W	37.15	29.80	25.92	33.56	34.76	30.11	W	31.77	36.82	35.68	33.99	33.67
1981	34.61	NA	39.66	34.20	29.91	36.60	36.84	32.32	([5])	33.70	38.70	37.29	36.14	36.47
1982	34.94	NA	36.16	34.99	24.93	34.81	33.08	27.15	([5])	28.63	34.70	34.25	31.47	33.18
1983	29.37	NA	30.85	29.27	22.94	29.84	29.31	25.63	([5])	25.78	30.72	30.87	28.08	28.93
1984	29.07	W	30.36	29.20	25.19	29.06	28.49	26.56	([5])	26.85	30.05	29.45	28.14	28.54
1985	25.50	NA	28.96	24.72	24.43	26.86	27.39	25.71	([5])	25.63	28.32	28.36	26.53	26.67
1986	12.92	11.70	15.29	12.84	11.52	13.46	14.09	13.43	12.85	12.17	15.98	14.63	13.52	13.49
1987	17.47	18.14	19.32	16.81	15.76	17.64	18.20	17.04	18.43	16.69	19.10	18.78	17.66	17.65
1988	13.51	12.84	15.88	13.37	13.66	14.18	14.48	13.50	14.47	12.58	15.43	15.82	13.96	14.08
1989	17.37	16.90	19.19	17.34	16.78	17.78	18.36	16.81	18.10	16.35	19.06	18.74	17.54	17.68
1990	20.55	17.01	23.33	21.82	20.31	21.23	21.51	20.48	22.34	19.64	21.11	22.65	20.98	21.13
1991	17.34	18.48	21.39	17.22	15.92	18.08	19.90	17.16	19.55	15.89	21.44	21.37	17.93	18.02
1992	17.58	16.99	20.78	17.48	15.13	17.81	19.36	17.04	18.46	15.60	20.90	20.63	17.67	17.75
1993	15.26	14.23	18.73	15.40	13.39	15.68	17.40	15.27	16.54	14.11	18.99	17.92	15.78	15.72
1994	15.00	14.49	17.21	15.11	13.12	15.08	16.36	14.83	15.80	14.09	17.09	16.64	15.29	15.18
1995	16.78	16.47	18.25	16.84	14.81	16.61	17.66	16.65	17.45	16.19	18.06	17.91	16.95	16.78
1996	20.44	20.32	21.95	20.49	18.59	20.14	21.86	19.94	22.02	19.64	21.34	20.88	20.47	20.31
1997	17.44	17.03	20.64	17.52	16.35	17.73	20.24	17.63	19.71	17.30	20.26	20.64	18.45	18.11
1998	[R]11.18	[R]11.00	[R]14.14	[R]11.16	[R]10.16	[R]11.46	[R]13.37	[R]11.62	[R]13.26	[R]11.04	[R]13.83	[R]13.55	[R]12.22	[R]11.84
1999[P]	17.32	16.77	17.88	17.46	15.70	16.99	18.25	17.56	18.10	16.29	19.06	18.36	17.58	17.29

[1] Nominal dollars.

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

[3] Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. In June 1996, OPEC retroactively ended Gabon's membership in OPEC effective December 31, 1994. However, data for Gabon are still included here for 1995.

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

[5] No data reported.

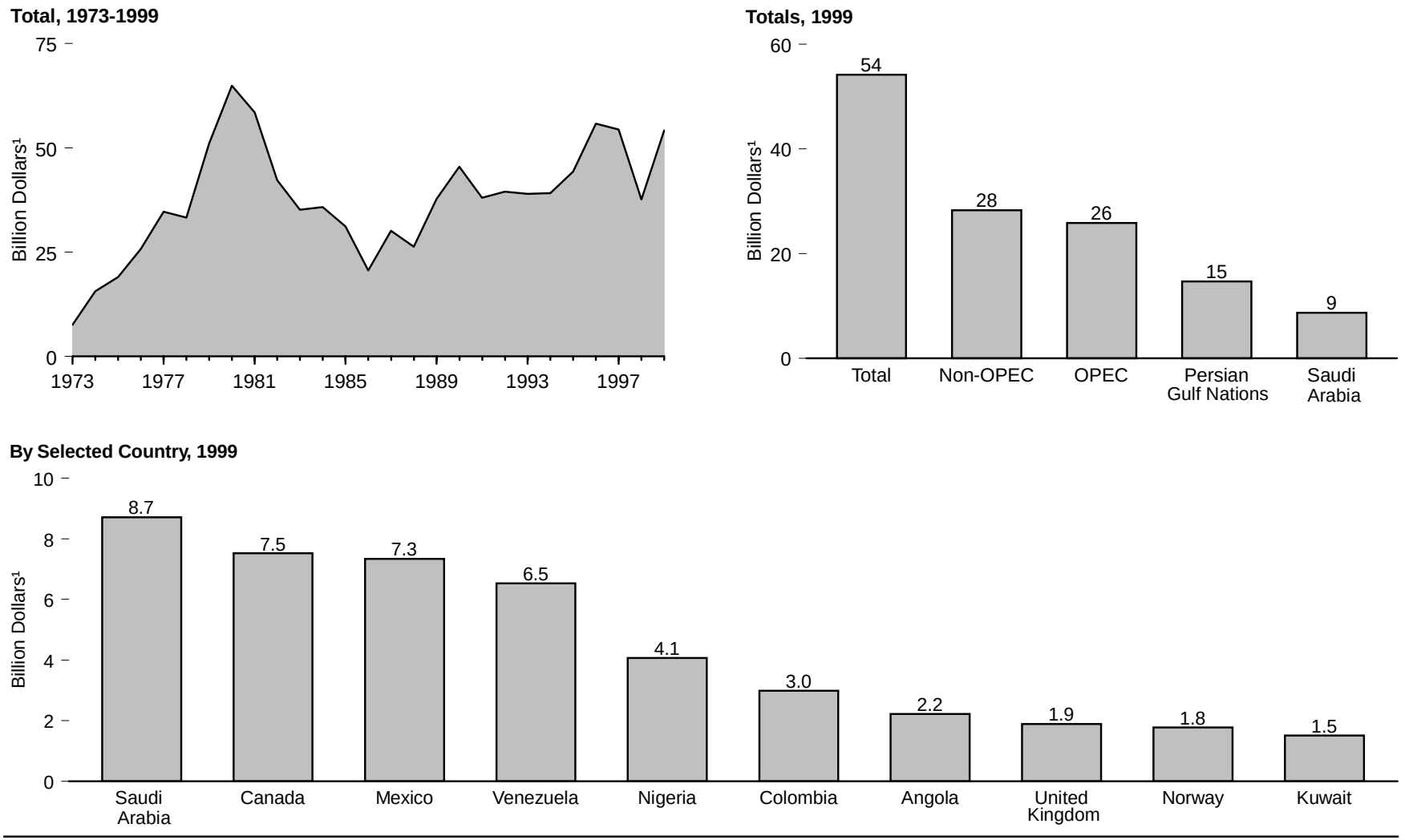
R=Revised. P=Preliminary. NA=Not available. W=Value withheld to avoid disclosure of individual company data.

Notes: • This table reports landed costs of crude oil imports only; it does not account for refined petroleum products imported into the United States. • Data include any imports for the Strategic Petroleum Reserve, which began in 1977. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

Sources: • 1973 through September 1977—Federal Energy Administration, Form FEA-F701-M-0, "Transfer Pricing Report." • October 1977 through January 1979—Energy Information Administration (EIA), Form FEA-F701-M-0, "Transfer Pricing Report." • February 1979 through September 1982—EIA, Form ERA-51, "Transfer Pricing Report." • October 1982 through June 1984—EIA, Form EP-51, "Monthly Foreign Crude Oil Transaction Report." • July 1984 forward—EIA, Form EIA-856, "Monthly Foreign Crude Oil Acquisition Report."

Figure 5.18 Value of Crude Oil Imports



[1]Nominal Dollars.

Notes: • OPEC = Organization of Petroleum Exporting Countries. • Because vertical scales differ, graphs should not be compared.

Source: Table 5.18.

Table 5.18 Value of Crude Oil Imports From Selected Countries, 1973-1999

(Billion Dollars[1])

Year	Persian Gulf Nations	Selected OPEC [2] Countries					Selected Non-OPEC Countries							Total [4]
		Kuwait	Nigeria	Saudi Arabia	Venezuela	Total OPEC [3]	Angola	Canada	Colombia	Mexico	Norway	United Kingdom	Total Non-OPEC	
1973	1.7	W	1.5	0.9	0.8	5.2	W	1.9	W	W	NA	NA	2.4	7.6
1974	4.4	W	3.3	1.9	1.3	11.6	0.2	3.3	NA	W	W	NA	4.1	15.6
1975	5.2	W	3.5	3.2	1.8	14.9	0.3	2.8	NA	0.3	0.1	W	4.1	19.0
1976	8.7	W	5.1	5.8	1.0	22.2	(s)	1.8	W	0.4	0.2	W	3.6	25.8
1977	12.2	W	6.3	6.9	1.2	29.6	0.1	1.4	NA	0.9	0.3	0.5	5.1	34.7
1978	11.3	W	4.9	5.8	0.8	27.1	(s)	1.3	NA	1.6	0.6	0.9	6.2	33.3
1979	15.3	W	9.0	9.3	1.9	39.7	0.3	2.0	NA	3.3	0.6	1.7	11.3	51.0
1980	16.9	W	11.4	13.6	1.5	47.5	0.5	2.2	NA	5.9	1.9	2.3	17.4	64.9
1981	15.1	NA	8.8	13.9	1.6	39.0	0.6	1.9	NA	5.8	1.6	5.0	19.5	58.5
1982	8.4	W	6.7	6.8	1.4	22.0	0.5	2.1	NA	6.7	1.3	5.5	20.2	42.2
1983	4.3	W	3.4	3.4	1.4	16.1	0.8	2.6	NA	7.2	0.7	4.1	19.1	35.2
1984	4.8	W	2.3	3.3	2.3	16.1	0.9	3.3	NA	6.5	1.2	4.1	19.7	35.8
1985	2.3	W	3.0	1.2	2.7	12.9	1.0	4.4	NA	6.7	0.3	2.9	18.3	31.2
1986	3.8	0.1	2.4	2.9	1.8	10.4	0.5	2.8	0.3	2.8	0.3	1.7	10.2	20.6
1987	6.0	0.5	3.7	3.9	2.8	15.5	1.2	3.8	0.8	3.7	0.5	2.1	14.7	30.1
1988	6.7	0.4	3.5	4.4	2.2	14.0	1.1	3.4	0.6	3.1	0.3	1.5	12.3	26.3
1989	11.0	1.0	5.6	7.1	3.0	21.9	1.9	3.9	0.9	4.3	0.9	1.1	15.8	37.7
1990	13.5	0.5	6.7	9.5	4.9	27.2	1.9	4.8	1.1	4.9	0.7	1.3	18.2	45.5
1991	11.0	(s)	5.3	10.7	3.9	22.3	1.8	4.7	0.9	4.4	0.6	0.8	15.7	38.0
1992	10.5	0.2	5.1	10.2	4.6	22.2	2.4	5.0	0.7	4.5	0.9	1.5	17.3	39.5
1993	9.1	1.8	4.9	7.2	4.9	20.7	2.1	5.0	0.9	4.4	0.9	2.0	18.3	38.9
1994	8.8	1.6	3.9	7.2	5.0	19.7	1.9	5.3	0.8	4.8	1.2	2.4	19.4	39.1
1995	9.1	1.3	4.1	7.7	6.2	21.6	2.3	6.3	1.3	6.1	1.7	2.2	22.6	44.3
1996	11.1	1.8	4.8	9.4	8.9	25.3	2.8	7.8	1.8	8.7	2.3	1.6	30.5	55.8
1997	10.4	1.6	5.2	8.3	8.3	24.4	R3.1	7.7	1.9	8.6	2.1	1.3	29.9	54.4
1998	R8.3	R1.2	R3.6	5.7	R5.1	R17.4	R2.3	5.4	R1.7	5.3	R1.1	0.8	R20.2	R37.6
1999P	14.7	1.5	4.1	8.7	6.5	25.9	2.2	7.5	3.0	7.3	1.8	1.9	28.3	54.2

[1] Nominal dollars.

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

[3] Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. In June 1996, OPEC retroactively ended Gabon's membership in OPEC effective December 31, 1994. However, data for Gabon are still included here for 1995.

[4] Data shown here represent landed value; they differ from data in Table 3.7, which are data from U.S. Customs that represent crude oil value at the port of loading.

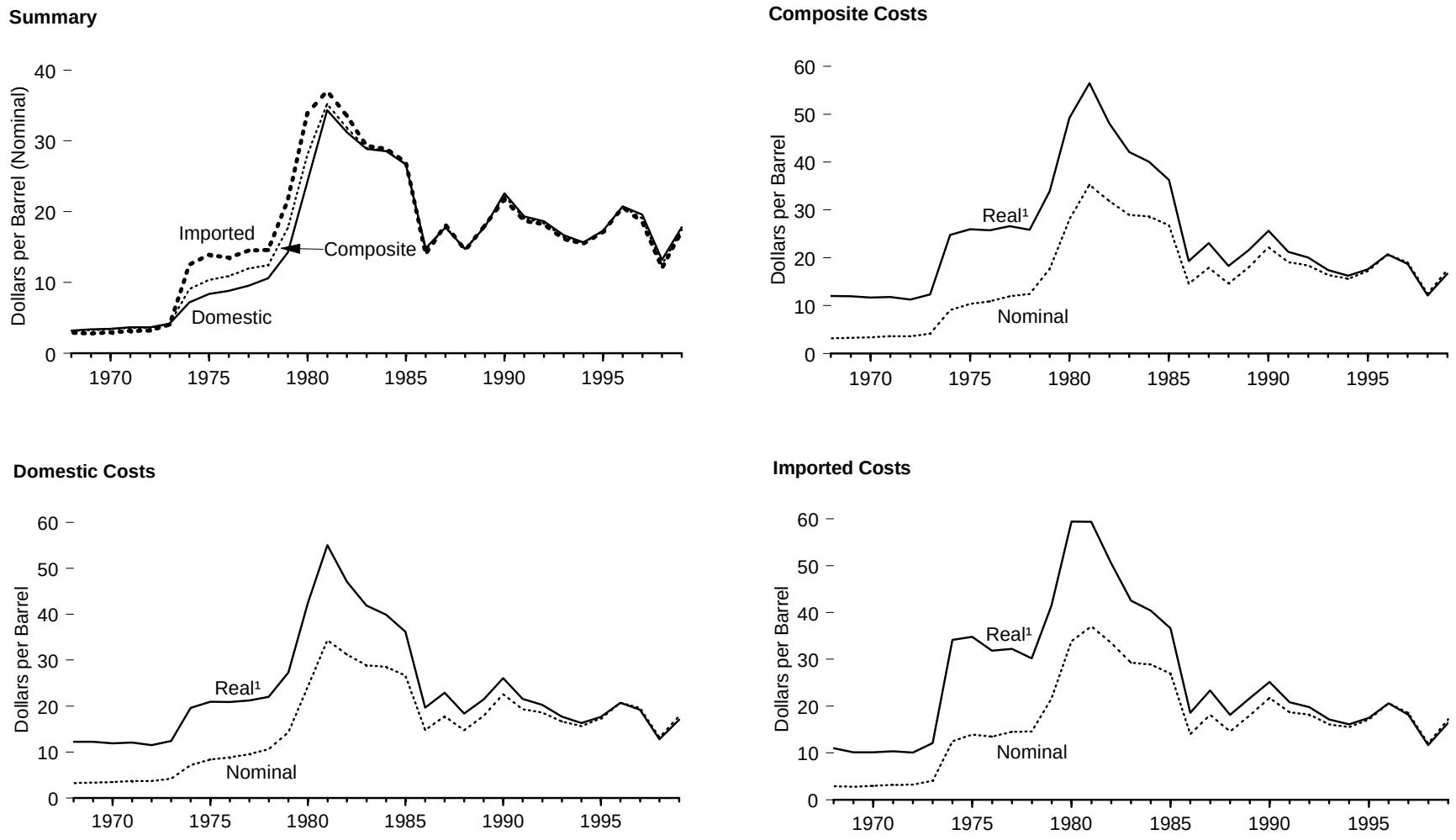
R=Revised. P=Preliminary. NA=Not available. W=Value withheld to avoid disclosure of individual company data. (s)=Less than $0.05 billion.

Notes: • Crude oil import volumes used to calculate values in this table are for the 50 states and the District of Columbia. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

Sources: Calculated by using prices on Table 5.17 and volume data as follows: • 1973-1975—U.S. Department of the Interior, Bureau of Mines, *Petroleum Statement, Annual,* annual reports. • 1976-1980—Energy Information Administration (EIA), *Petroleum Statement, Annual,* annual reports. • 1981-1998—EIA, *Petroleum Supply Annual,* annual reports. • 1999—EIA, *Petroleum Supply Monthly* (February 2000).

Figure 5.19 Crude Oil Refiner Acquisition Costs, 1968-1999



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

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 5.19.

Table 5.19 Crude Oil Refiner Acquisition Costs, 1968-1999

(Dollars per Barrel)

Year	Domestic		Imported		Composite	
	Nominal	Real [1]	Nominal	Real [1]	Nominal	Real [1]
1968	3.21	R12.21	2.90	R11.03	3.17	R12.05
1969	3.37	R12.21	2.80	R10.15	3.29	R11.92
1970	3.46	R11.91	2.96	R10.19	3.40	R11.70
1971	3.68	R12.06	3.17	R10.39	3.60	R11.80
1972	3.67	R11.53	3.22	R10.12	3.58	R11.25
1973	4.17	R12.41	4.08	R12.14	4.15	R12.35
1974	7.18	R19.61	12.52	R34.19	9.07	R24.77
1975	8.39	R20.96	13.93	R34.80	10.38	R25.93
1976	8.84	R20.90	13.48	R31.87	10.89	R25.74
1977	9.55	R21.21	14.53	R32.27	11.96	R26.57
1978	10.61	R22.00	14.57	R30.21	12.46	R25.83
1979	14.27	R27.31	21.67	R41.47	17.72	R33.91
1980	24.23	R42.48	33.89	R59.41	28.07	R49.21
1981	34.33	R55.04	37.05	R59.40	35.24	R56.50
1982	31.22	R47.12	33.55	R50.64	31.87	R48.11
1983	28.87	R41.91	29.30	R42.54	28.99	R42.09
1984	28.53	R39.94	28.88	R40.43	28.63	R40.08
1985	26.66	R36.18	26.99	R36.63	26.75	R36.30
1986	14.82	R19.68	14.00	R18.59	14.55	R19.32
1987	17.76	R22.89	18.13	R23.37	17.90	R23.07
1988	14.74	R18.38	14.56	R18.15	14.67	R18.29
1989	17.87	R21.46	18.08	R21.71	17.97	R21.58
1990	22.59	R26.11	21.76	R25.15	22.22	R25.68
1991	19.33	R21.56	18.70	R20.86	19.06	R21.26
1992	18.63	R20.29	18.20	R19.82	18.43	R20.07
1993	16.67	R17.72	16.14	R17.16	16.41	R17.45
1994	15.67	R16.32	15.51	R16.15	15.59	R16.24
1995	17.33	R17.67	17.14	R17.47	17.23	R17.56
1996	20.77	R20.77	20.64	R20.64	20.71	R20.71
1997	19.61	R19.24	18.53	R18.18	19.04	R18.68
1998	R13.18	R12.78	R12.04	R11.68	R12.52	R12.14
1999P	17.82	17.03	17.23	16.47	17.46	16.69

[1] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

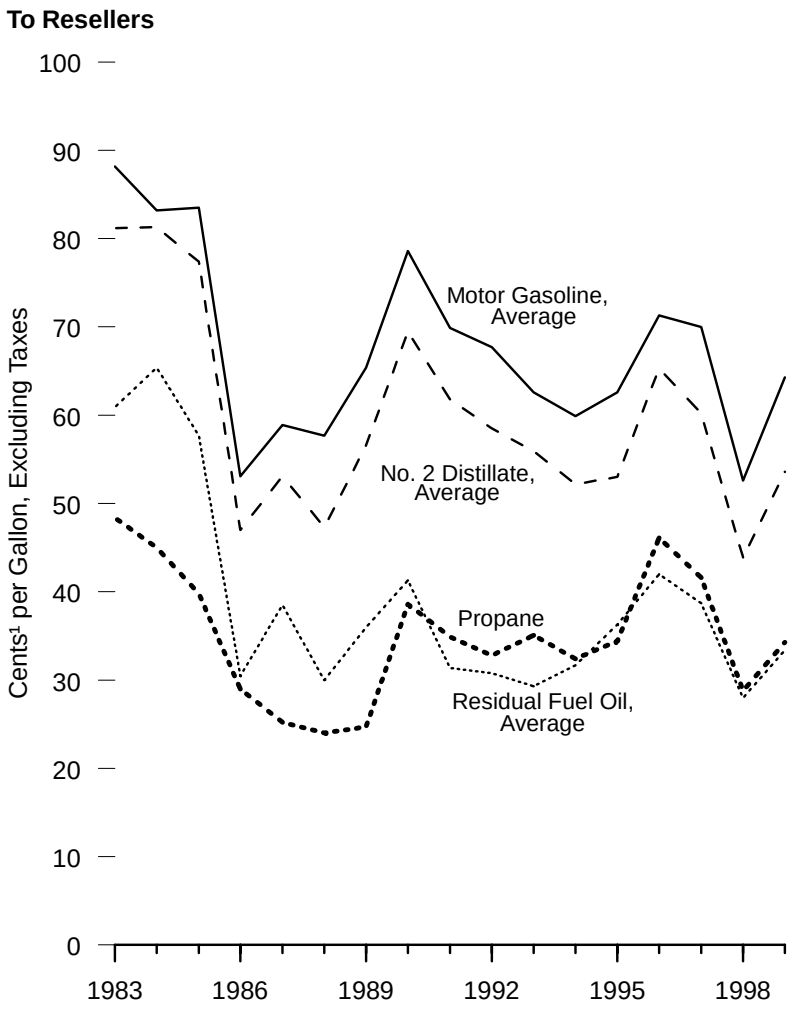
R=Revised. P=Preliminary.

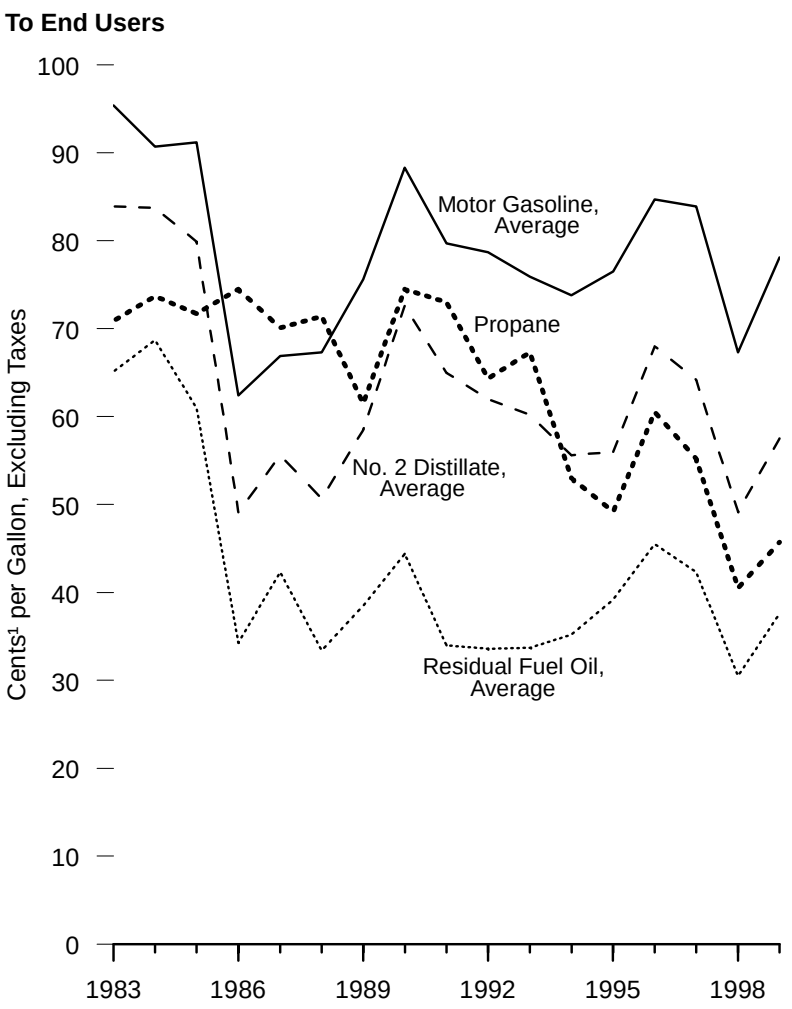
Note: Refiner acquisition cost of crude oil for each category and for the composite is derived by dividing the sum of the total purchasing (acquisition) costs of all refiners by the total volume of all refiners' purchases.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

Sources: • 1968-1973—Estimated. See Note 6 at end of section. • 1974 through January 1976—Federal Energy Administration (FEA), Form FEA-96, "Monthly Cost Allocation Report." • February 1976 through December 1977—FEA, Form FEA-P110-M-1, "Refiners' Monthly Cost Allocation Report." • 1978 forward—EIA, *Petroleum Marketing Monthly* (March 2000), Table 1.

Figure 5.20 Refiner Sales Prices for Selected Petroleum Products, 1983-1999





[1] Nominal value.

Source: Table 5.20.

Table 5.20 Refiner Sales Prices and Refiner Margins for Selected Petroleum Products, 1983-1999

(Cents[1] per Gallon, Excluding Taxes)

Product	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999 P
Sales Prices to Resellers: [2]																	
Aviation Gasoline	117.8	116.5	113.0	91.2	85.9	85.0	95.0	106.3	100.1	99.1	96.5	93.3	97.5	105.5	106.5	R91.2	100.5
Motor Gasoline	88.2	83.2	83.5	53.1	58.9	57.7	65.4	78.6	69.9	67.7	62.6	59.9	62.6	71.3	70.0	R52.6	64.3
Leaded Regular	85.0	79.5	79.3	50.1	56.5	54.8	63.1	75.4	65.7	69.3	NA	NA	NA	NA	NA	NA	NA
Unleaded Regular	89.5	84.2	84.3	52.2	56.9	54.8	61.8	75.8	67.2	64.5	59.3	56.6	59.3	68.5	67.3	49.9	61.9
Unleaded Midgrade	NA	NA	NA	NA	NA	NA	68.6	81.4	73.3	70.8	66.0	63.8	67.0	75.9	74.9	R57.6	69.3
Premium	96.4	91.6	92.2	61.0	67.1	67.2	74.9	87.4	79.2	77.4	72.2	69.5	72.2	80.3	79.2	61.7	72.5
Kerosene	89.2	91.6	87.4	60.6	59.2	54.9	66.9	83.9	72.2	63.2	60.4	61.8	58.0	71.4	65.3	46.5	55.3
Jet Fuel, Kerosene-Type	85.4	83.0	79.4	49.5	53.8	49.5	58.3	77.3	65.0	60.5	57.7	53.4	53.9	64.6	61.3	R45.0	53.8
No. 1 Distillate	89.6	89.2	86.3	57.9	59.9	54.9	66.8	83.8	73.0	65.2	64.6	61.5	62.5	75.1	72.3	R51.3	64.0
No. 2 Distillate	81.2	81.3	77.4	47.0	53.1	47.3	56.6	69.5	61.8	58.5	55.9	52.2	53.0	65.3	60.2	43.9	53.6
No. 2 Fuel Oil	81.5	82.1	77.6	48.6	52.7	47.3	56.5	69.7	62.2	57.9	54.4	50.6	51.1	63.9	59.0	42.2	49.2
No. 2 Diesel Fuel	80.8	80.3	77.2	45.2	53.4	47.3	56.7	69.4	61.5	59.1	57.0	52.9	53.8	65.9	60.6	44.4	54.7
No. 4 Fuel [3]	72.6	70.7	67.2	40.9	46.2	42.5	48.0	59.0	55.6	49.5	48.8	46.2	46.3	60.3	55.1	R38.3	43.0
Residual Fuel Oil	60.9	65.4	57.7	30.5	38.5	30.0	36.0	41.3	31.4	30.8	29.3	31.7	36.3	42.0	38.7	R28.0	33.4
1% or Less Sulfur Content	64.3	68.5	61.0	32.8	41.2	33.3	40.7	47.2	36.4	35.1	33.7	34.5	38.3	45.6	41.5	29.9	36.9
Greater than 1% Sulfur Content	59.1	63.9	56.0	28.9	36.2	27.1	33.1	37.2	29.2	28.6	25.6	28.7	33.8	38.9	36.6	R26.9	31.1
Propane (Consumer Grade)	48.4	45.0	39.8	29.0	25.2	24.0	24.7	38.6	34.9	32.8	35.1	32.4	34.4	46.1	41.6	R28.8	34.3
Sales Prices to End Users: [2]																	
Aviation Gasoline	125.5	123.4	120.1	101.1	90.7	89.1	99.5	112.0	104.7	102.7	99.0	95.7	100.5	111.6	112.8	R97.5	105.9
Motor Gasoline	95.4	90.7	91.2	62.4	66.9	67.3	75.6	88.3	79.7	78.7	75.9	73.8	76.5	84.7	83.9	R67.3	78.1
Leaded Regular	90.6	84.8	84.2	57.3	61.8	61.9	71.0	83.1	71.5	78.5	NA	NA	NA	NA	NA	NA	NA
Unleaded Regular	97.0	91.5	91.7	61.6	65.0	64.1	71.4	84.9	76.1	74.3	71.2	68.9	71.7	80.7	79.8	R63.0	74.3
Unleaded Midgrade	NA	NA	NA	NA	NA	NA	79.2	92.1	84.3	82.7	80.5	78.5	80.8	89.6	89.5	72.8	83.4
Premium	105.7	101.5	102.3	73.7	78.4	78.8	86.7	98.5	90.7	91.4	88.9	86.5	89.0	97.2	97.3	R80.5	90.3
Kerosene	96.1	103.6	103.0	79.0	77.0	73.8	70.9	92.3	83.8	78.8	75.4	66.0	58.9	74.0	74.5	R50.1	56.4
Jet Fuel, Kerosene-Type	87.8	84.2	79.6	52.9	54.3	51.3	59.2	76.6	65.2	61.0	58.0	53.4	54.0	65.1	61.3	R45.2	53.8
No. 1 Distillate	96.2	92.7	88.0	62.0	60.4	56.4	66.1	81.9	74.0	66.6	66.6	64.0	62.0	72.6	68.9	R55.1	61.3
No. 2 Distillate	83.9	83.7	79.9	49.1	55.6	50.7	58.5	72.6	65.0	62.0	60.2	55.6	56.0	68.0	64.2	R49.2	57.5
No. 2 Fuel Oil	91.6	91.6	84.9	56.0	58.1	54.4	58.7	73.4	66.5	62.7	60.2	57.2	56.2	67.3	63.6	R48.2	54.8
No. 2 Diesel Fuel	82.6	82.3	78.9	47.8	55.1	50.0	58.5	72.5	64.8	61.9	60.2	55.4	56.0	68.1	64.2	R49.4	57.9
No. 4 Fuel [3]	76.6	79.6	77.3	48.9	51.3	46.1	51.2	62.2	58.0	52.6	50.1	50.1	50.5	60.3	56.5	42.8	47.4
Residual Fuel Oil	65.1	68.7	61.0	34.3	42.3	33.4	38.5	44.4	34.0	33.6	33.7	35.2	39.2	45.5	42.3	R30.5	37.6
1% or Less Sulfur Content	69.5	72.0	64.4	37.2	44.7	37.2	43.6	50.5	40.2	38.9	39.7	40.1	43.6	52.6	48.8	35.4	40.7
Greater than 1% Sulfur Content	61.1	65.9	58.2	31.7	39.6	30.0	34.4	40.0	30.6	31.2	30.3	33.0	37.7	43.3	40.3	R28.7	36.3
Propane (Consumer Grade)	70.9	73.7	71.7	74.5	70.1	71.4	61.5	74.5	73.0	64.3	67.3	53.0	49.2	60.5	55.2	40.5	45.7
Refiner Margins [4]																	
Motor Gasoline	19.2	15.1	19.8	18.4	16.3	22.8	22.6	25.7	24.5	23.8	23.5	22.8	21.6	22.0	24.7	22.8	22.7
Jet Fuel, Kerosene-Type	16.4	14.9	15.8	14.9	11.2	14.6	15.5	24.4	19.6	16.5	18.6	16.3	12.9	15.3	16.0	15.2	12.2
No. 2 Distillate	12.2	13.1	13.8	12.4	10.4	12.4	13.8	16.6	16.4	14.6	16.8	15.1	12.0	16.0	14.9	R14.1	12.0
Residual Fuel Oil	-8.1	-2.8	-6.0	-4.1	-4.1	-5.0	-6.8	-11.6	-14.0	-13.2	-9.8	-5.4	-4.8	-7.2	-6.6	R-1.8	-8.2
Composite [5]	16.0	13.7	17.0	15.8	13.8	18.7	18.8	22.1	20.7	19.8	19.0	19.8	18.1	19.4	20.0	R19.5	18.8

[1] Nominal value.

[2] 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.

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

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

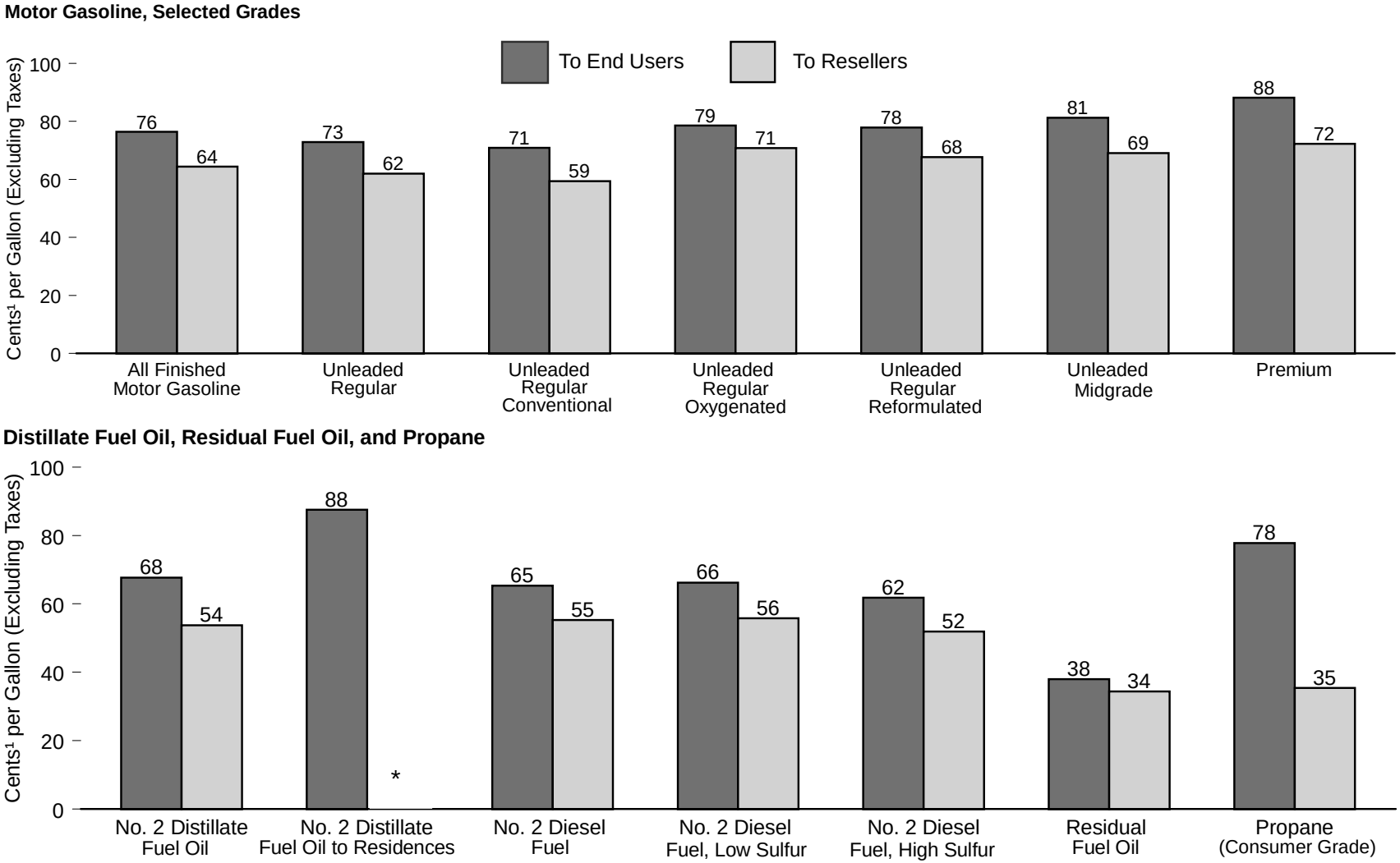
[5] Composite of aviation gasoline, kerosene-type jet fuel, kerosene, motor gasoline, distillate fuel nos. 1, 2, and 4, and residual fuel.

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

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

Sources: • 1983-1998—EIA, *Petroleum Marketing Annual,* annual reports. • 1999—EIA, *Petroleum Marketing Monthly* (March 2000).

Figure 5.21 All Sellers Sales Prices for Selected Petroleum Products, 1999



[1] Nominal value.
* Not applicable.

Note: Data are preliminary.
Source: Table 5.21.

Table 5.21 All Sellers Sales Prices for Selected Petroleum Products, 1983-1999

(Cents[1] per Gallon, Excluding Taxes)

Product	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999 P
Sales Prices to Resellers [2]																	
Motor Gasoline	NA	83.8	84.1	53.8	59.2	58.0	65.8	78.9	70.8	68.0	62.8	60.2	63.0	71.5	70.3	53.0	64.4
Unleaded Regular	NA	84.9	84.9	52.9	57.2	55.1	62.3	76.2	68.2	64.9	59.7	57.1	59.9	68.9	67.7	R50.4	62.0
Conventional	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	56.5	58.3	67.2	65.8	48.4	59.4
Oxygenated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	62.7	66.2	74.5	75.4	57.5	70.8
Reformulated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63.2	64.6	73.3	72.5	R55.1	67.7
Unleaded Midgrade	NA	NA	NA	NA	NA	NA	69.1	82.3	74.4	71.3	66.4	64.1	67.3	76.0	75.1	R57.9	69.1
Conventional	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	63.3	65.1	73.7	72.3	R55.0	65.6
Oxygenated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	68.9	71.1	78.9	79.1	R59.9	70.2
Reformulated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	72.2	71.9	80.2	80.1	63.2	75.4
Premium	NA	92.4	92.8	61.7	67.4	67.5	75.2	87.7	80.0	77.6	72.2	69.6	72.4	80.4	79.4	R61.8	72.3
Conventional	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	68.6	69.5	77.7	76.4	58.7	68.7
Oxygenated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75.7	78.7	85.1	85.6	R67.4	79.8
Reformulated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.9	77.9	85.1	84.5	67.1	78.3
No. 2 Distillate	81.8	81.9	78.1	48.0	53.5	48.2	57.2	70.6	62.7	59.1	56.6	52.9	53.6	66.0	61.1	45.0	53.8
No. 2 Diesel Fuel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53.8	54.6	66.7	61.6	R45.4	55.3
Low Sulfur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	54.2	55.1	67.3	61.9	R45.7	55.8
High Sulfur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	51.9	52.4	63.9	60.2	43.7	51.9
Residual Fuel Oil	60.9	65.8	58.2	31.5	39.9	31.5	37.8	43.4	33.0	32.6	30.1	32.2	36.6	42.7	39.6	R28.4	34.4
1% or Less Sulfur Content	64.3	68.5	60.6	33.6	42.0	34.1	41.5	48.1	37.9	36.8	34.1	35.0	38.3	46.1	42.4	R30.5	37.3
Greater than 1% Sulfur Content	59.1	64.1	56.1	29.5	38.1	28.2	34.0	38.8	29.7	30.0	27.2	29.8	34.4	39.7	37.5	R27.1	32.5
Propane (Consumer Grade)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	33.6	35.4	47.1	42.6	R29.7	35.4
Sales Prices to End Users [2]																	
Motor Gasoline	NA	91.6	91.9	63.7	67.7	68.0	76.8	89.9	81.1	78.7	75.3	72.9	76.1	84.3	83.1	R66.0	76.4
Unleaded Regular	NA	92.7	92.8	63.0	66.3	65.5	73.2	87.0	78.0	75.0	71.4	69.0	72.1	80.9	79.7	R62.3	72.9
Conventional	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	68.5	71.4	80.1	78.5	R61.0	70.9
Oxygenated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.7	77.3	86.1	88.7	R69.4	78.6
Reformulated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.3	74.1	83.3	82.2	R65.1	77.9
Unleaded Midgrade	NA	NA	NA	NA	NA	NA	NA	NA	NA	82.4	79.2	77.0	80.2	88.5	88.0	R71.1	81.3
Conventional	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	76.6	79.3	87.4	86.5	69.5	78.9
Oxygenated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	82.1	83.8	92.9	96.4	R76.3	85.7
Reformulated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	85.1	82.9	91.6	91.5	R74.8	87.1
Premium	NA	101.2	101.6	73.6	78.0	78.6	87.4	99.6	91.9	90.6	87.5	85.2	88.3	96.2	95.5	R78.6	88.2
Conventional	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	84.6	87.1	95.0	93.9	R76.9	85.7
Oxygenated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	90.8	93.8	101.9	105.4	R84.5	94.4
Reformulated	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	93.7	91.4	99.1	98.8	R82.2	93.3
No. 2 Distillate	93.3	92.6	89.0	61.4	64.3	61.2	69.5	84.1	76.0	72.6	71.0	67.5	67.3	79.3	75.3	R59.9	67.7
No. 2 Distillate to Residences [3]	107.8	109.1	105.3	83.6	80.3	81.3	90.0	106.3	101.9	93.4	91.1	88.4	86.7	98.9	98.4	85.2	87.5
No. 2 Diesel Fuel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	62.8	63.6	75.7	71.4	R56.2	65.3
Low Sulfur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	64.2	64.5	76.7	71.9	R56.5	66.2
High Sulfur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	59.8	61.4	73.2	69.8	R55.5	61.8
Residual Fuel Oil	65.1	69.6	62.3	35.8	42.6	33.9	39.3	45.5	34.7	34.6	34.1	35.8	39.7	46.4	42.9	R31.1	38.0
1% or Less Sulfur Content	69.5	72.9	66.0	38.9	44.9	37.3	43.6	51.2	40.0	39.4	39.3	40.3	43.3	52.9	47.2	R35.6	40.7
Greater than 1% Sulfur Content	61.1	66.4	58.9	32.8	39.9	30.6	35.1	40.5	31.1	31.9	31.2	32.7	37.6	43.0	40.7	R29.2	36.9
Propane (Consumer Grade)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.6	76.6	88.6	87.8	R77.4	77.8

[1] Nominal value.

[2] 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.

[3] See Note 7 at end of section for historical data.

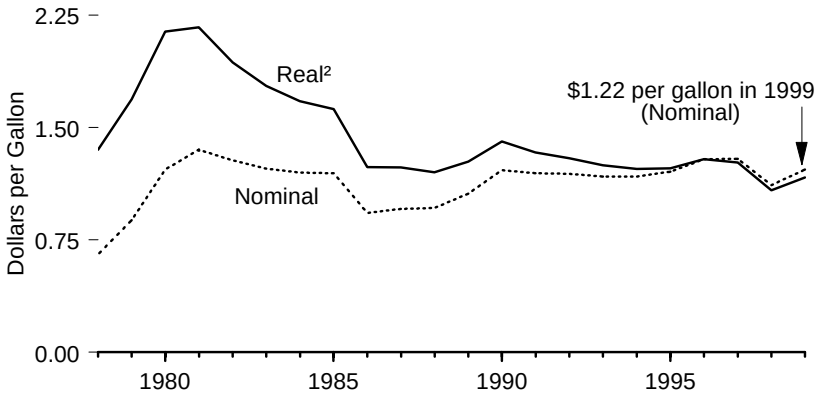
R=Revised. P=Preliminary. NA=Not available.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

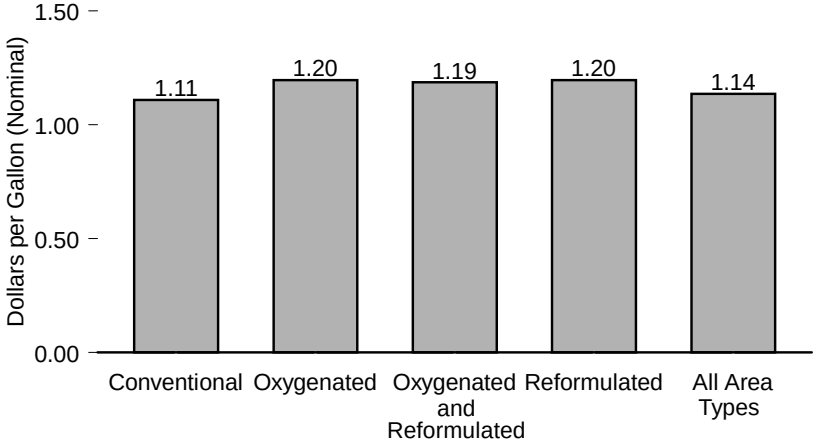
Sources: • 1983-1998—Energy Information Administration (EIA), *Petroleum Marketing Annual,* annual reports. • 1999—EIA, *Petroleum Marketing Monthly* (March 2000).

Figure 5.22 Retail Motor Gasoline Prices

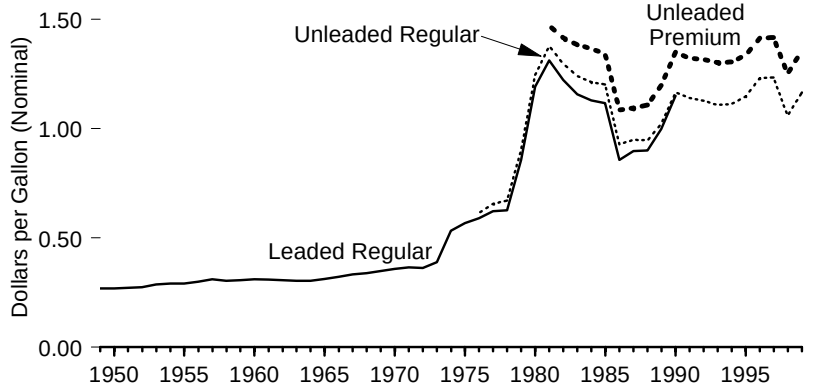
Motor Gasoline, All Types, 1978-1999



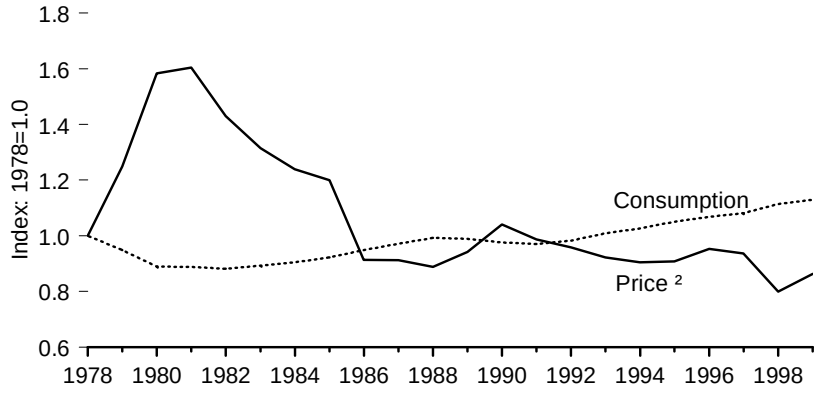
Regular Motor Gasoline by Area Type,[1] 1999



Motor Gasoline by Type, 1949-1999



Motor Gasoline[3] Price and Consumption, 1978-1999, Indexed to 1978



[1] "Area type" refers to the specific types of motor gasoline that are mandated by the Environmental Protection Agency to be sold in designated areas of the country. Only cash self-service prices are included.

[2] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

[3] All types.

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

Sources: Tables 5.11 and 5.22.

Table 5.22 Retail Motor Gasoline and On-Highway Diesel Fuel Prices, 1949-1999

(Dollars per Gallon)

Year	Motor Gasoline by Grade [1]								Regular Motor Gasoline by Area Type [2,3]					On-Highway Diesel Fuel [3]
	Leaded Regular		Unleaded Regular		Unleaded Premium		All Types							
	Nominal	Real [4]	Nominal	Real [4]	Nominal	Real [4]	Nominal	Real [4]	Conventional	Oxygenated	Oxygenated and Reformulated	Reformulated	All Area Types	
1949	0.27	R1.55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1950	0.27	R1.54	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1951	0.27	R1.45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1952	0.27	R1.44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1953	0.29	R1.49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1954	0.29	R1.49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1955	0.29	R1.47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1956	0.30	R1.46	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1957	0.31	R1.47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1958	0.30	R1.41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1959	0.31	R1.39	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1960	0.31	R1.40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1961	0.31	R1.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1962	0.31	R1.35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1963	0.30	R1.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1964	0.30	R1.30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1965	0.31	R1.31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1966	0.32	R1.31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1967	0.33	R1.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1968	0.34	R1.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1969	0.35	R1.26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1970	0.36	R1.23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1971	0.36	R1.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1972	0.36	R1.14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1973	0.39	R1.16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1974	0.53	R1.45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1975	0.57	R1.42	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1976	0.59	R1.40	0.61	R1.45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1977	0.62	R1.38	0.66	R1.46	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1978	0.63	R1.30	0.67	R1.39	NA	NA	0.65	R1.35	NA	NA	NA	NA	NA	NA
1979	0.86	R1.64	0.90	R1.73	NA	NA	0.88	R1.69	NA	NA	NA	NA	NA	NA
1980	1.19	R2.09	1.25	R2.18	NA	NA	1.22	R2.14	NA	NA	NA	NA	NA	NA
1981	1.31	R2.10	1.38	R2.21	1.47	R2.36	1.35	R2.17	NA	NA	NA	NA	NA	NA
1982	1.22	R1.85	1.30	R1.96	1.42	R2.14	1.28	R1.93	NA	NA	NA	NA	NA	NA
1983	1.16	R1.68	1.24	R1.80	1.38	R2.01	1.23	R1.78	NA	NA	NA	NA	NA	NA
1984	1.13	R1.58	1.21	R1.70	1.37	R1.91	1.20	R1.68	NA	NA	NA	NA	NA	NA
1985	1.12	R1.51	1.20	R1.63	1.34	R1.82	1.20	R1.62	NA	NA	NA	NA	NA	NA
1986	0.86	R1.14	0.93	R1.23	1.09	R1.44	0.93	R1.24	NA	NA	NA	NA	NA	NA
1987	0.90	R1.16	0.95	R1.22	1.09	R1.41	0.96	R1.23	NA	NA	NA	NA	NA	NA
1988	0.90	R1.12	0.95	R1.18	1.11	R1.38	0.96	R1.20	NA	NA	NA	NA	NA	NA
1989	1.00	R1.20	1.02	R1.23	1.20	R1.44	1.06	R1.27	NA	NA	NA	NA	NA	NA
1990	1.15	R1.33	1.16	R1.35	1.35	R1.56	1.22	R1.41	NA	NA	NA	NA	NA	NA
1991	NA	NA	1.14	R1.27	1.32	R1.47	1.20	R1.33	1.10	NA	NA	NA	1.10	NA
1992	NA	NA	1.13	R1.23	1.32	R1.43	1.19	R1.30	1.09	NA	NA	NA	1.09	NA
1993	NA	NA	1.11	R1.18	1.30	R1.38	1.17	R1.25	1.05	1.14	NA	NA	1.07	NA
1994	NA	NA	1.11	R1.16	1.31	R1.36	1.17	R1.22	1.06	1.14	NA	NA	1.08	NA
1995	NA	NA	1.15	R1.17	1.34	R1.36	1.21	R1.23	1.09	1.16	1.18	1.16	1.11	1.11
1996	NA	NA	1.23	R1.23	1.41	R1.41	1.29	R1.29	1.18	1.27	1.27	1.24	1.20	1.24
1997	NA	NA	1.23	R1.21	1.42	R1.39	1.29	R1.27	1.18	1.26	1.28	1.25	1.20	1.20
1998	NA	NA	1.06	R1.03	1.25	R1.21	1.12	R1.08	1.01	1.08	1.09	1.08	1.03	1.04
1999	NA	NA	1.17	1.11	1.36	1.30	1.22	1.17	1.11	1.20	1.19	1.20	1.14	1.12

[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] "Area Type" refers to the specific types of motor gasoline that are mandated by the Environmental Protection Agency to be sold in designated areas of the country. Only cash self-service prices are included.

[3] Nominal dollars.

[4] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

R=Revised. NA=Not available.

Web Page: http://www.eia.doe.gov/oil_gas/petroleum/pet_frame.html.

Sources: **Motor Gasoline by Grade:** • 1949-1973—*Platt's Oil Price Handbook and Oilmanac, 1974,* 51st Edition. • 1974 forward—Energy Information Administration (EIA), annual averages of monthly data from Bureau of Labor Statistics, *Consumer Prices: Energy.* **Motor Gasoline by Area Type:** EIA, annual averages of data from Weekly Retail Gasoline Prices. **On-Highway Diesel:** EIA, annual averages of data from Weekly On-Highway Diesel Prices.

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. Total petroleum products supplied is the sum of the products supplied for each petroleum product, crude oil, unfinished oils, and gasoline blending components. For each of these, except crude oil, product supplied is calculated by adding refinery production, natural gas plant liquids production, new supply of other liquids, imports, and stock withdrawals, and subtracting stock additions, refinery inputs, and exports. Crude oil product supplied is the sum of crude oil burned on leases and at pipeline pump stations as reported on Form EIA-813. Prior to 1983, crude oil burned on leases and at pipeline pump stations was reported as either distillate or residual fuel oil and was included as product supplied for these products. Petroleum product supplied is an approximation of petroleum consumption and is synonymous with the term "Petroleum Consumption" in Section 1. Sector data for petroleum products used in more than one sector are derived from surveys of sales to ultimate consumers by refiners, marketers, distributors, and dealers and from receipts at electric utilities.

3. Beginning in January 1981, several Energy Information Administration survey forms and calculation methodologies were changed to reflect new developments in refinery and blending plant practices and to improve data integrity. Those changes affect production and product supplied statistics for motor gasoline, distillate fuel oil, and residual fuel oil, and stocks of motor gasoline. On the basis of those changes, motor gasoline production during the last half of 1980 would have averaged 289,000 barrels per day higher than that which was published on the old basis. Distillate and residual fuel oil production and product supplied for all of 1980 would have averaged, respectively, 105,000 and 54,000 barrels per day higher than the numbers that were published.

4. The methods of deriving Gross Input to Distillation Units (GIDU) in this report are as follows: 1949-1966, GIDU is estimated by summing annual crude oil runs to stills, net unfinished oil reruns at refineries, and shipments of natural gasoline and plant condensate from natural gas processing plants to refineries. 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.

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.

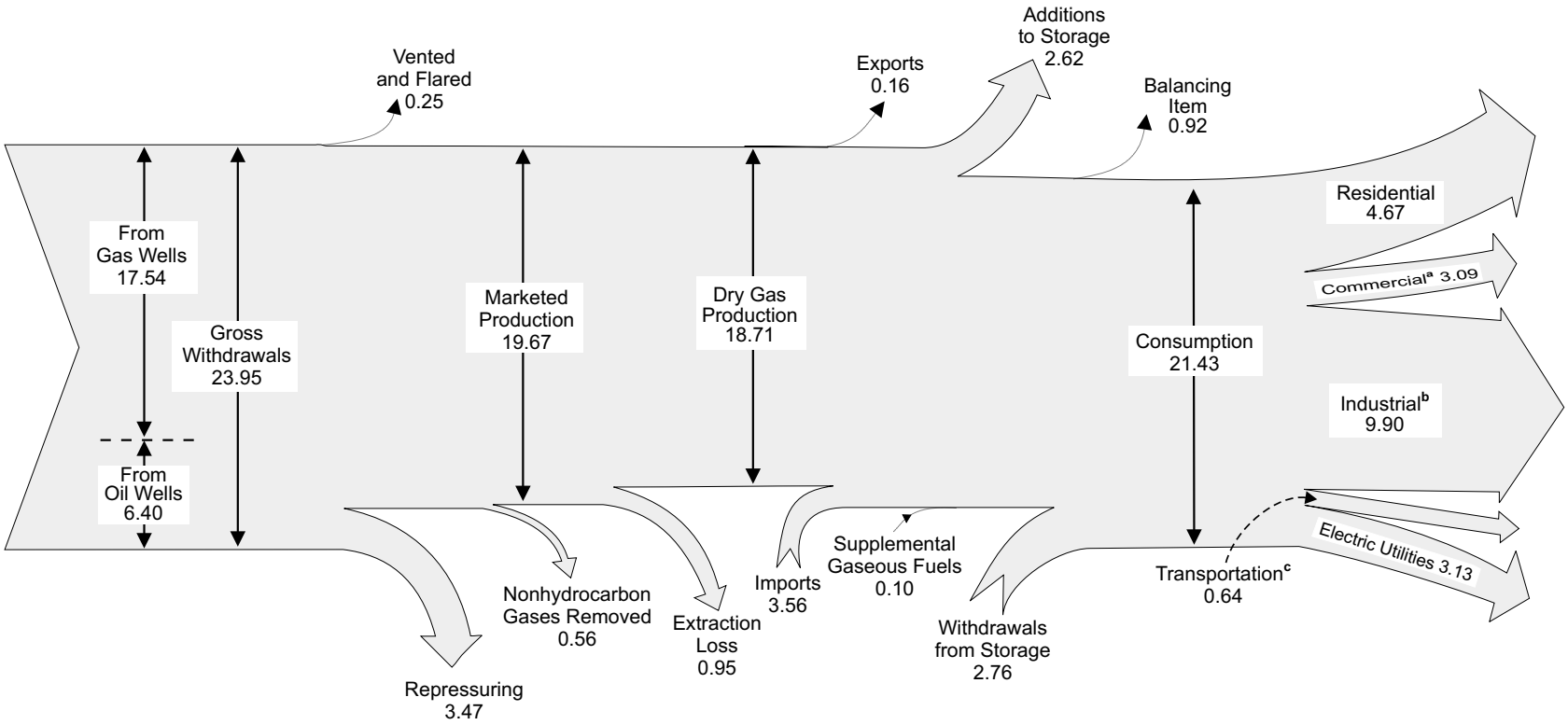
6. The Refiner Acquisition Cost of Crude Oil was estimated for 1968-1973. The cost of domestic crude oil was derived by adding estimated transportation costs to the reported average domestic first purchase value. The cost of imported crude oil was derived by adding an estimated ocean transport cost based on the published "Average Freight Rate Assessment" to the average "Free Alongside Ship" value published by the U.S. Bureau of the Census. The composite cost was derived by weighting domestic costs and imported costs on the basis of quantities produced and imported.

7. Residential heating oil prices for 1956 through 1982 were formerly published in the *Annual Energy Review.* Those data, in cents per gallon, are: 15.2, 16.0, 15.1, 15.3, 15.0, 15.6, 15.6, 16.0, 16.1, 16.0, 16.4, 16.9, 17.4, 17.8, 18.5, 19.6, 19.7, 22.8, 36.0, 37.7, 40.6, 46.0, 49.0, 70.4, 97.4, 119.4, 116.0. The sources of these data are: 1956-1974— Bureau of Labor Statistics, *Retail Prices and Indexes of Fuels and Utilities for Residential Usage*, monthly. January 1975 through September 1977—Federal Energy Administration, Form FEA-P112-M-1, "No. 2 Heating Oil Supply/Price Monitoring Report." October 1977 Through December 1977—Energy Information Administration (EIA), Form EIA-9, "No. 2 Heating Oil Supply/Price Monitoring Report." 1978-forward—EIA, *Petroleum Marketing Monthly*, Table 18.

6 Natural Gas

Natural gas pipeline, El Paso County, Texas. Source: U.S. Department of Energy.

Diagram 3. Natural Gas Flow, 1999
(Trillion Cubic Feet)



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

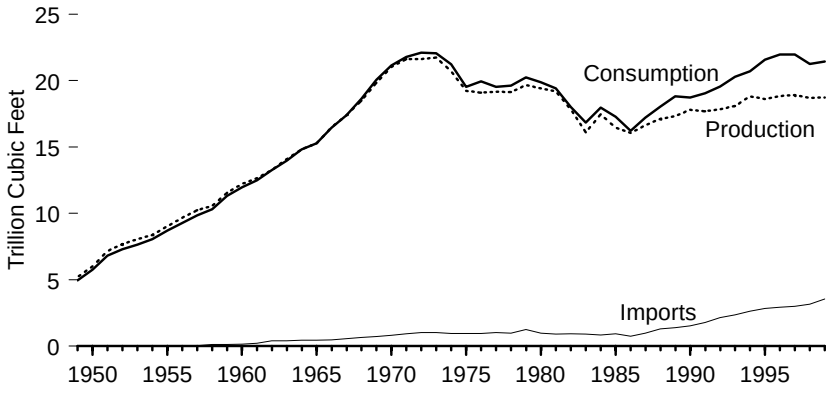
[b] Includes lease and plant fuel. Most deliveries to nonutility power producers are included in the industrial sectors. In instances where the nonutility is primarily a commercial establishment, deliveries are included in the commercial sector.

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

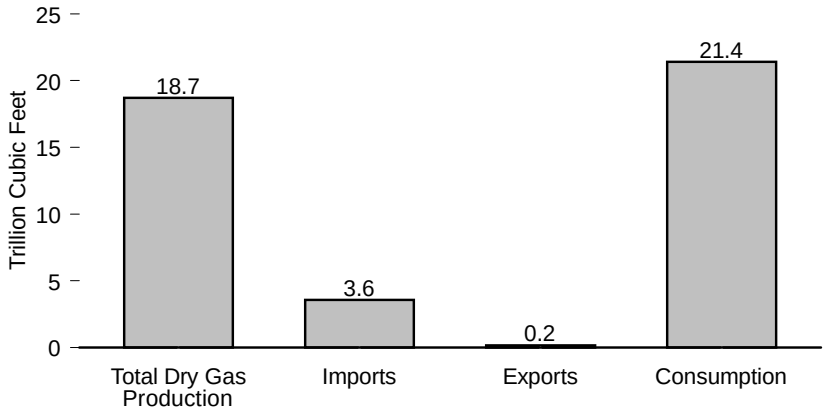
Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.
Sources: Tables 6.1, 6.2, and 6.5.

Figure 6.1 Natural Gas Overview

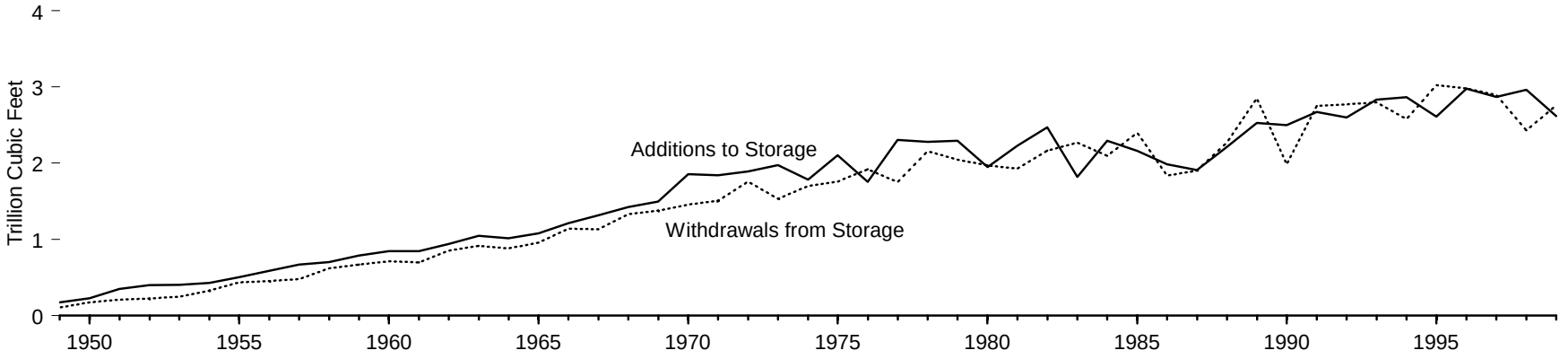
Overview, 1949-1999



Overview, 1999



Storage Additions and Withdrawals,[1] 1949-1999



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

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

Source: Table 6.1.

Table 6.1 Natural Gas Overview, 1949-1999

(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	R-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	18.10	0.12	2.35	0.14	2.80	2.83	-0.11	20.28
1994	18.82	0.11	2.62	0.16	2.58	2.86	-0.40	20.71
1995	18.60	0.11	2.84	0.15	3.02	2.61	-0.23	21.58
1996	R18.85	0.11	2.94	0.15	2.98	2.98	R0.22	21.97
1997	18.90	0.10	2.99	0.16	2.89	2.87	R0.09	R21.96
1998	R18.71	R0.10	R3.15	0.16	R2.43	R2.96	R-0.01	R21.26
1999P	18.71	0.10	3.56	0.16	2.76	2.62	-0.92	21.43

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

[2] Quantities lost and imbalances in data due to differences among data sources. Since 1980, excludes intransit shipments that cross the U.S.-Canada border (i.e., natural gas delivered to its destination via the other country).

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

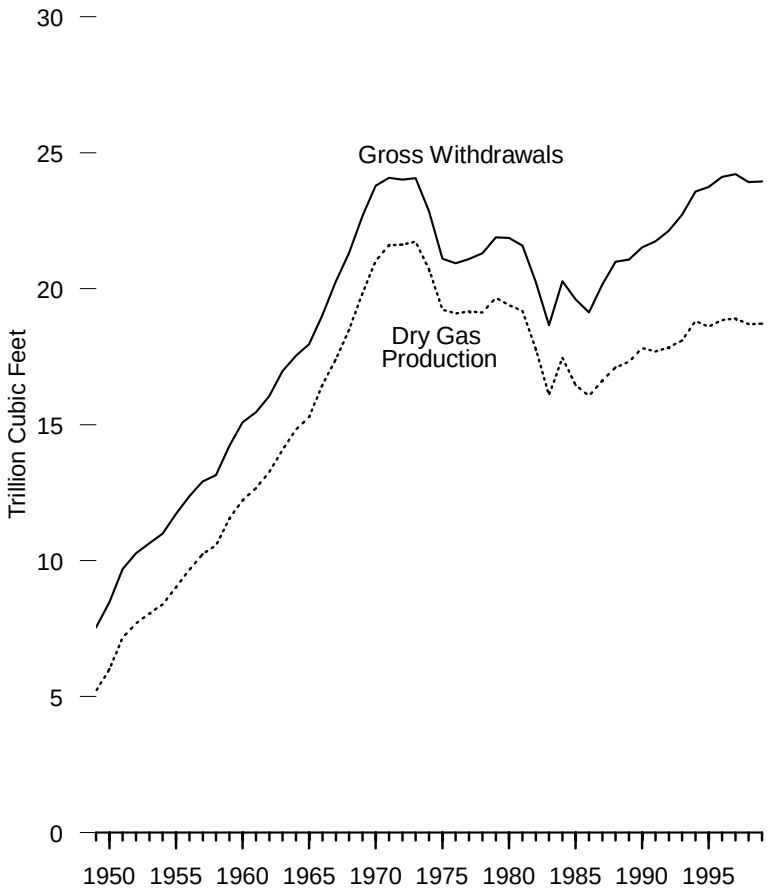
Notes: • Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/natural_gas/nat_frame.html.

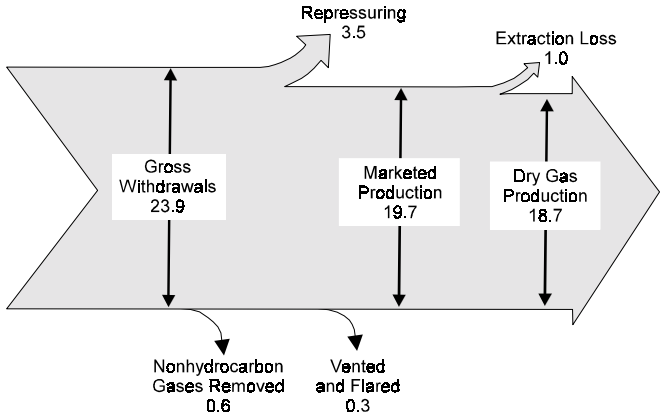
Sources: **Supplemental Gaseous Fuels:** • 1980-1993—EIA, *Natural Gas Annual,* annual reports. • 1994 forward—EIA, *Natural Gas Monthly* (February 2000), Table 2. **All Other Data:** • 1949-1993—EIA, *Natural Gas Annual 1998* (October 1999), Table 99. • 1994 forward—EIA, *Natural Gas Monthly* (February 2000), Table 2.

Figure 6.2 Natural Gas Production

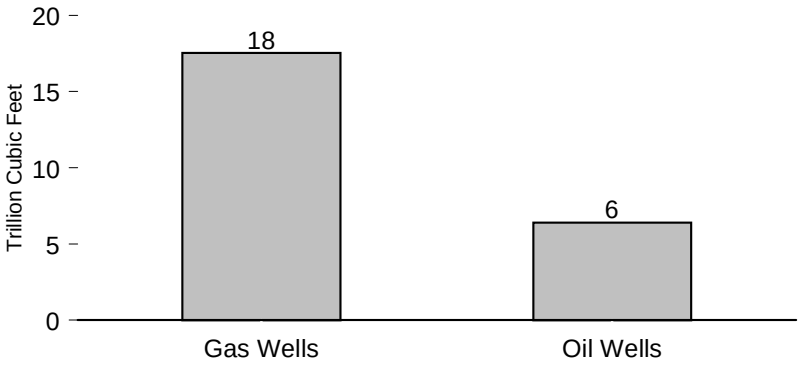
Gross Withdrawals and Dry Gas Production, 1949-1999



Production Flow, 1999
(Trillion Cubic Feet)



Gross Withdrawals by Well Type, 1999



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

Source: Table 6.2.

Table 6.2 Natural Gas Production, 1949-1999

(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	16.69	6.03	22.73	3.10	0.41	0.23	18.98	0.89	18.10
1994	17.35	6.23	23.58	3.23	0.41	0.23	19.71	0.89	18.82
1995	17.28	6.46	23.74	3.57	0.39	0.28	19.51	0.91	18.60
1996	R17.74	R6.38	R24.11	3.51	0.52	0.27	R19.81	0.96	R18.85
1997	17.84	6.37	24.21	3.49	0.60	0.26	19.87	0.96	18.90
1998	R17.56	R6.37	R23.92	R3.43	R0.61	R0.23	R19.65	R0.94	R18.71
1999	E17.54	E6.40	P23.95	P3.47	P0.56	P0.25	P19.67	P0.95	P18.71

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

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

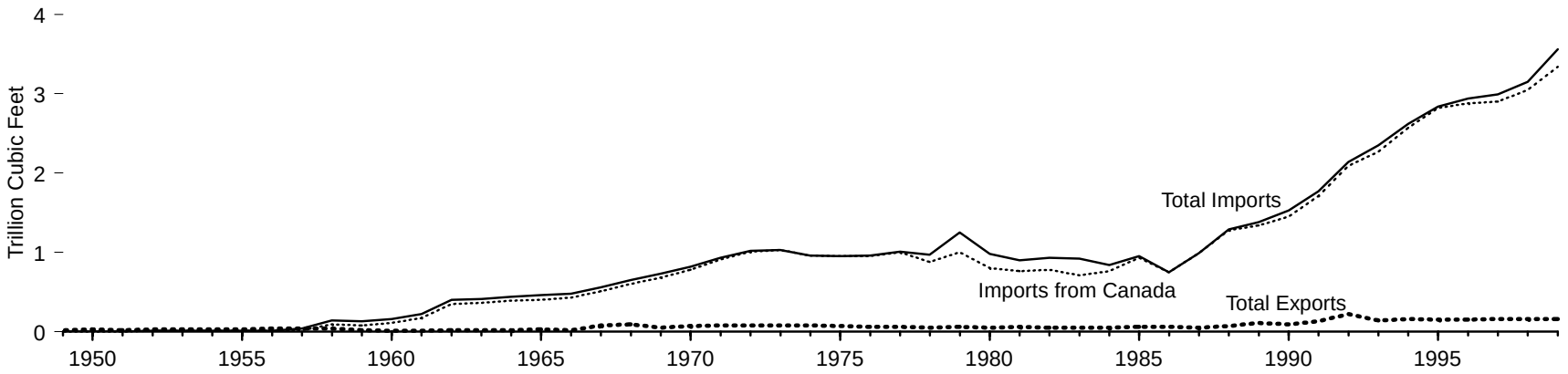
Notes: • Beginning with 1965 data, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/naturaL_gas/nat_frame.html.

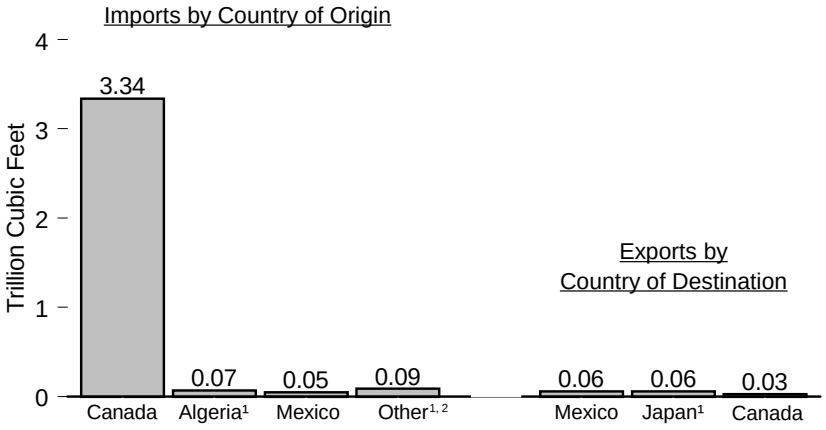
Sources: **From Gas Wells and From Oil Wells:** • 1949-1966—Bureau of Mines, *Minerals Yearbook,* "Natural Gas" chapter. • 1967-1993—Energy Information Administration (EIA), *Natural Gas Annual,* annual reports. • 1994-1998—EIA, *Natural Gas Annual 1998* (October 1999), Table 3. • 1999—EIA estimates. **All Other Data:** • 1949-1993—EIA, *Natural Gas Annual 1998* (October 1999), Table 99. • 1994 forward—EIA, *Natural Gas Monthly* (February 2000), Table 1.

Figure 6.3 Natural Gas Imports, Exports, and Net Imports

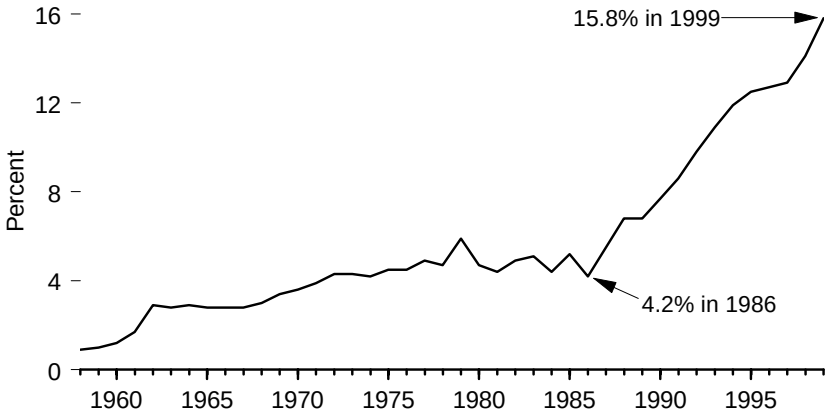
Trade Overview, 1949-1999



Trade, 1999



Net Imports as Share of Consumption, 1958-1999



[1] Liquefied natural gases.
[2] Australia, Malaysia, Qatar, Trinidad and Tobago, and United Arab Emirates.

Source: Table 6.3.

Table 6.3 Natural Gas Imports, Exports, and Net Imports, 1949-1999

(Billion Cubic Feet, Except as Noted)

Year	Imports by Country of Origin							Exports by Country of Destination				Net Imports [1]	
	Algeria [2]	Australia [2]	Canada	Indonesia [2]	Mexico	United Arab Emirates [2]	Total [3]	Canada	Japan [2]	Mexico	Total	Total	Percent of U.S. Consumption
1949	0	0	0	0	0	0	0	(s)	0	20	20	-20	([4])
1950	0	0	0	0	0	0	0	3	0	23	26	-26	([4])
1951	0	0	0	0	0	0	0	4	0	21	24	-24	([4])
1952	0	0	8	0	(s)	0	8	6	0	22	27	-20	([4])
1953	0	0	9	0	0	0	9	6	0	22	28	-19	([4])
1954	0	0	7	0	0	0	7	6	0	23	29	-22	([4])
1955	0	0	11	0	(s)	0	11	11	0	20	31	-20	([4])
1956	0	0	10	0	(s)	0	10	17	0	19	36	-26	([4])
1957	0	0	21	0	17	0	38	31	0	11	42	-4	([4])
1958	0	0	90	0	46	0	136	32	0	7	39	97	0.9
1959	0	0	83	0	51	0	134	12	0	7	18	116	1.0
1960	0	0	109	0	47	0	156	6	0	6	11	144	1.2
1961	0	0	167	0	52	0	219	6	0	5	11	208	1.7
1962	0	0	350	0	51	0	402	6	0	10	16	386	2.9
1963	0	0	356	0	50	0	406	7	0	10	17	389	2.8
1964	0	0	391	0	53	0	443	10	0	10	20	424	2.9
1965	0	0	405	0	52	0	456	18	0	8	26	430	2.8
1966	0	0	430	0	50	0	480	20	0	4	25	455	2.8
1967	0	0	513	0	51	0	564	70	0	11	82	483	2.8
1968	0	0	604	0	47	0	652	82	0	12	94	558	3.0
1969	0	0	680	0	47	0	727	35	3	13	51	676	3.4
1970	1	0	779	0	41	0	821	11	44	15	70	751	3.6
1971	1	0	912	0	21	0	935	14	50	16	80	854	3.9
1972	2	0	1,009	0	8	0	1,019	16	48	15	78	941	4.3
1973	3	0	1,028	0	2	0	1,033	15	48	14	77	956	4.3
1974	0	0	959	0	(s)	0	959	13	50	13	77	882	4.2
1975	5	0	948	0	0	0	953	10	53	9	73	880	4.5
1976	10	0	954	0	0	0	964	8	50	7	65	899	4.5
1977	11	0	997	0	2	0	1,011	(s)	52	4	56	955	4.9
1978	84	0	881	0	0	0	966	(s)	48	4	53	913	4.7
1979	253	0	1,001	0	0	0	1,253	(s)	51	4	56	1,198	5.9
1980	86	0	797	0	102	0	985	(s)	45	4	49	936	4.7
1981	37	0	762	0	105	0	904	(s)	56	3	59	845	4.4
1982	55	0	783	0	95	0	933	(s)	50	2	52	882	4.9
1983	131	0	712	0	75	0	918	(s)	53	2	55	864	5.1
1984	36	0	755	0	52	0	843	(s)	53	2	55	788	4.4
1985	24	0	926	0	0	0	950	(s)	53	2	55	894	5.2
1986	0	0	749	2	0	0	750	9	50	2	61	689	4.2
1987	0	0	993	0	0	0	993	3	49	2	54	939	5.5
1988	17	0	1,276	0	0	0	1,294	20	52	2	74	1,220	6.8
1989	42	0	1,339	0	0	0	1,382	38	51	17	107	1,275	6.8
1990	84	0	1,448	0	0	0	1,532	17	53	16	86	1,447	7.7
1991	64	0	1,710	0	0	0	1,773	15	54	60	129	1,644	8.6
1992	43	0	2,094	0	0	0	2,138	68	53	96	216	1,921	9.8
1993	82	0	2,267	0	2	0	2,350	45	56	40	140	2,210	10.9
1994	51	0	2,566	0	7	0	2,624	53	63	47	162	2,462	11.9
1995	18	0	2,816	0	7	0	2,841	28	65	61	154	2,687	12.5
1996	35	0	2,883	0	14	5	2,937	52	68	34	153	2,784	12.7
1997	66	10	2,899	0	17	2	2,994	56	62	38	157	2,837	12.9
1998	69	R12	R3,052	0	R15	R5	R3,152	R40	66	R53	R159	R2,993	R14.1
1999	75	12	E3,340	0	E55	E3	E3,556	E32	E64	E64	E159	E3,397	E15.8

[1] Net imports = imports minus exports.

[2] Imports from Algeria, Australia, Indonesia, and United Arab Emirates, and exports to Japan are liquefied natural gas. Imports from Mexico are pipeline and some exports are liquefied natural gas.

[3] For 1999, total imports also include Malaysia (3 billion cubic feet); Qatar (20 billion cubic feet), and Trinidad and Tobago (49 billion cubic feet).

[4] Not meaningful because there were net exports during this year.

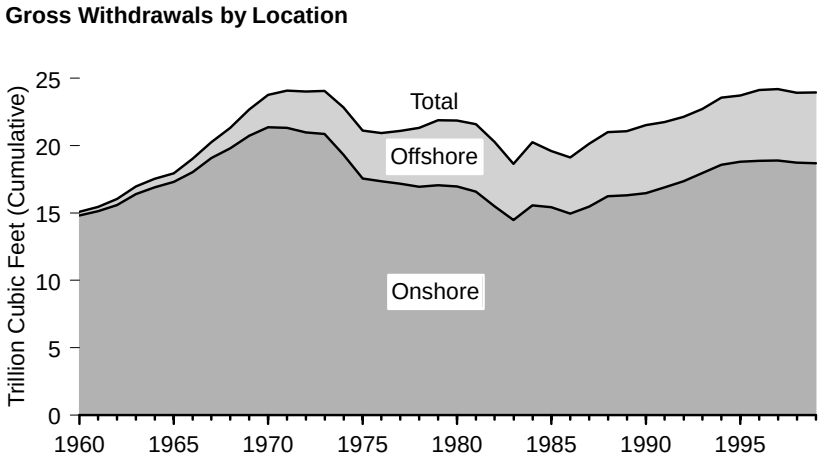
R=Revised. E=Estimate. (s)=Less than 0.5 billion cubic feet.

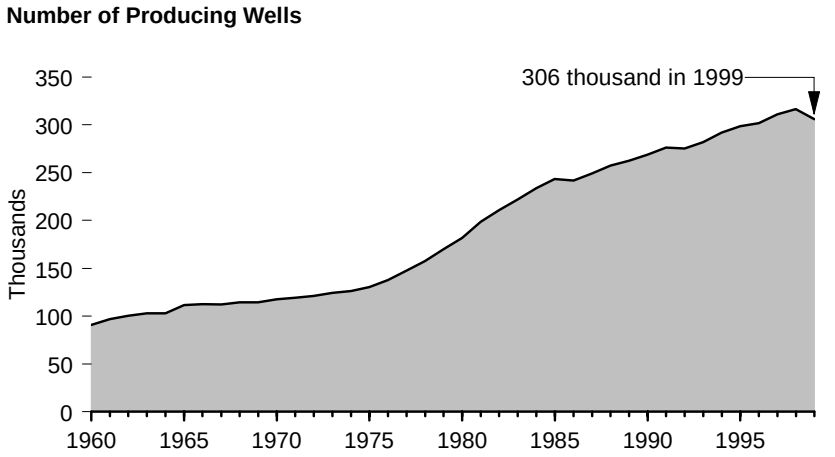
Note: Totals may not equal sum of components due to independent rounding.

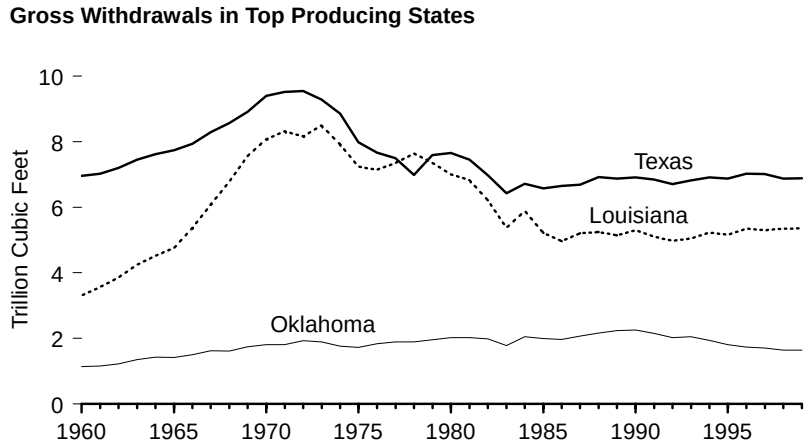
Web Page: http://www.eia.doe.gov/oil_gas/natural_gas/nat_frame.html.

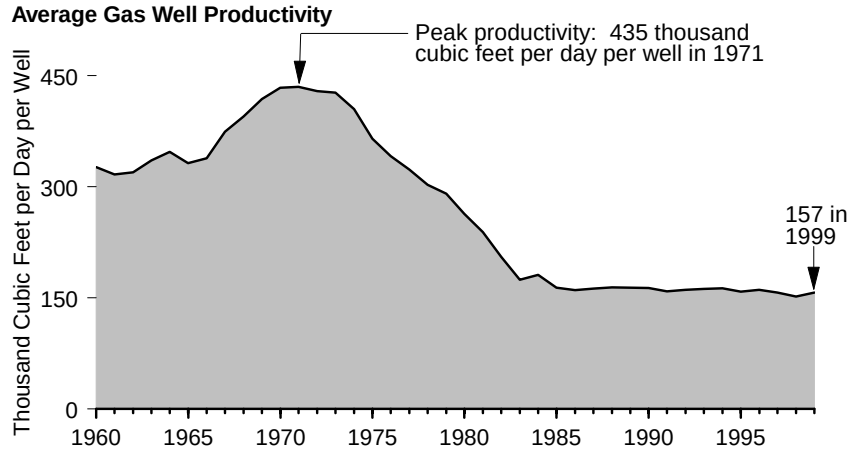
Sources: • 1949-1954—Energy Information Administration (EIA), Office of Oil and Gas, Reserves and Natural Gas Division, unpublished data. • 1955-1971—EIA, Federal Power Commission, by telephone. • 1972-1987—EIA, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." • 1988-1992—EIA, *Natural Gas Annual,* annual reports. • 1993 Forward—EIA, *Natural Gas Monthly* (February 2000), Tables 5 and 6.

Figure 6.4 Natural Gas Gross Withdrawals by State and Location and Gas Well Productivity, 1960-1999









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, 1960-1999

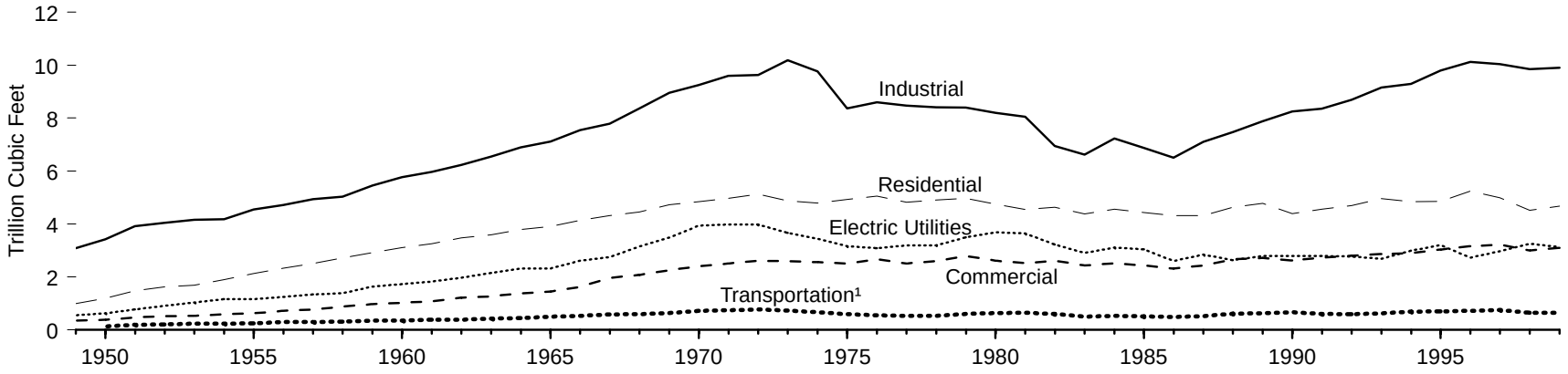
(Trillion Cubic Feet, Except as Noted)

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	Producing Wells [4] (thousands)	Average Productivity (thousand cubic feet per day)
1960	6.96	3.31	1.13	3.68	14.81	0.27	15.09	10.85	91	326.7
1961	7.02	3.57	1.16	3.71	15.14	0.32	15.46	11.20	97	316.8
1962	7.20	3.85	1.22	3.76	15.59	0.45	16.04	11.70	100	319.8
1963	7.45	4.25	1.35	3.92	16.41	0.56	16.97	12.61	103	335.4
1964	7.62	4.52	1.42	3.98	16.91	0.62	17.54	13.11	103	347.4
1965	7.74	4.76	1.41	4.04	17.32	0.65	17.96	13.52	112	331.8
1966	7.93	5.37	1.50	4.23	18.03	1.01	19.03	13.89	112	338.4
1967	8.29	6.09	1.62	4.25	19.06	1.19	20.25	15.35	112	374.3
1968	8.57	6.78	1.61	4.37	19.80	1.52	21.33	16.54	114	395.1
1969	8.91	7.56	1.74	4.46	20.72	1.95	22.68	17.49	114	418.6
1970	9.40	8.08	1.81	4.50	21.37	2.42	23.79	18.59	117	433.6
1971	9.52	8.32	1.81	4.44	21.31	2.78	24.09	18.93	119	434.8
1972	9.55	8.16	1.93	4.38	20.98	3.04	24.02	19.04	121	429.4
1973	9.29	8.49	1.89	4.40	20.86	3.21	24.07	19.37	124	427.4
1974	8.86	7.92	1.76	4.31	19.34	3.51	22.85	18.67	126	404.9
1975	7.99	7.24	1.72	4.15	17.55	3.55	21.10	17.38	130	365.3
1976	7.67	7.14	1.84	4.29	17.35	3.60	20.94	17.19	138	341.5
1977	7.50	7.35	1.89	4.36	17.16	3.93	21.10	17.42	148	323.1
1978	6.99	7.64	1.89	4.79	16.95	4.36	21.31	17.39	157	302.7
1979	7.59	7.36	1.96	4.97	17.06	4.82	21.88	18.03	170	290.8
1980	7.66	7.01	2.02	5.19	16.97	4.90	21.87	17.57	182	263.8
1981	7.45	6.83	2.02	5.29	16.60	4.99	21.59	17.34	199	238.9
1982	6.98	6.22	1.99	5.09	15.50	4.77	20.27	15.81	211	205.5
1983	6.43	5.38	1.78	5.07	14.48	4.18	18.66	14.15	222	174.7
1984	6.71	5.89	2.05	5.62	15.56	4.71	20.27	15.51	234	181.2
1985	6.58	5.22	1.99	5.82	15.42	4.19	19.61	14.54	243	163.6
1986	6.66	4.96	1.97	5.54	14.95	4.19	19.13	14.15	242	160.6
1987	6.69	5.20	2.07	6.17	15.47	4.67	20.14	14.81	249	162.8
1988	6.92	5.25	2.17	6.67	16.25	4.75	21.00	15.47	257	164.3
1989	6.88	5.14	2.24	6.81	16.30	4.77	21.07	15.71	262	164.0
1990	6.91	5.30	2.26	7.05	16.48	5.05	21.52	16.05	269	163.4
1991	6.85	5.10	2.15	7.65	16.90	4.85	21.75	16.02	276	158.8
1992	6.71	4.98	2.02	8.43	17.36	4.77	22.13	16.16	275	160.8
1993	6.82	5.05	2.05	8.81	17.96	4.77	22.73	16.69	282	162.1
1994	6.91	5.23	1.93	9.51	18.58	5.00	23.58	17.35	292	162.9
1995	6.87	5.16	1.81	9.90	18.80	4.94	23.74	17.28	299	158.6
1996	R7.03	R5.35	1.73	R10.00	R18.87	R5.25	R24.11	R17.74	302	R161.0
1997	7.02	5.30	1.70	10.19	18.90	5.32	24.21	17.84	R311	R157.2
1998	R6.88	R5.35	R1.64	R10.05	R18.72	R5.20	R23.92	R17.56	R316	R152.1
1999	E6.88	E5.35	E1.65	E10.06	E18.69	E5.26	P23.95	E17.54	P306	E157.1

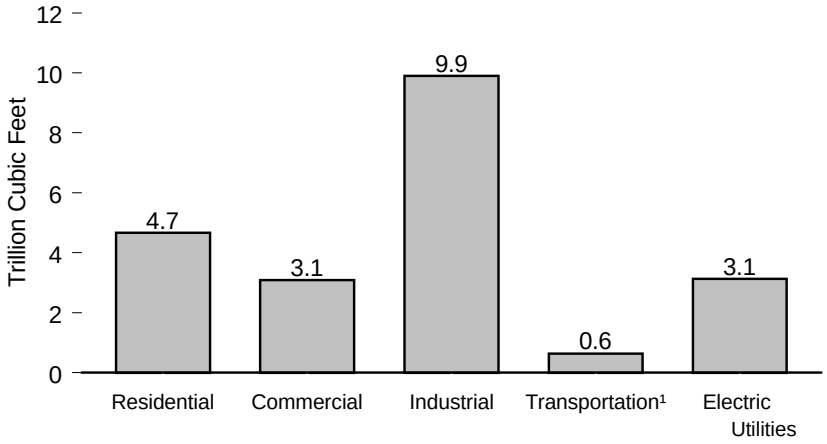
[1] See Glossary.
[2] Includes State offshore gross withdrawals.
[3] Excludes State offshore gross withdrawals; includes Federal offshore (Outer Continental Shelf) gross withdrawals.
[4] As of December 31 each year.
R=Revised. P=Preliminary. E=Estimate.
Web Page: http://www.eia.doe.gov/oil_gas/natural_gas/nat_frame.html.
Sources: **Offshore** (Outer Continental Shelf): • 1960-1981—U.S. Geological Survey. • 1982-1985—The United States Minerals Management Service, *Mineral Revenues - The 1989 Report on Receipts from Federal and Indian Leases,* and predecessor annual reports. • 1986-1993—EIA, *Natural Gas Annual,* annual reports. • 1994-1998—EIA, *Natural Gas Annual 1998* (October 1999), Table 4. • 1999—EIA estimates. **Gross Withdrawals from Oil and Gas Wells:** • 1960-1993—EIA, *Natural Gas Annual 1998* (October 1999), Table 99. • 1994 forward—EIA, *Natural Gas Monthly* (February 2000), Table 1. **Producing Wells:** • 1960-1966—Bureau of Mines, *Natural Gas Production and Consumption.* • 1967-1993—EIA, *Natural Gas Annual,* annual reports. • 1994-1998—EIA, *Natural Gas Annual 1998* (October 1999), Table 1. • 1999—Gulf Publishing Company, *World Oil* (February 2000). **All Other Data:** • 1960-1966—Bureau of Mines, *Natural Gas Production and Consumption.* • 1967-1998—EIA, *Natural Gas Annual,* annual reports. • 1999—EIA estimates.

Figure 6.5 Natural Gas Consumption by Sector

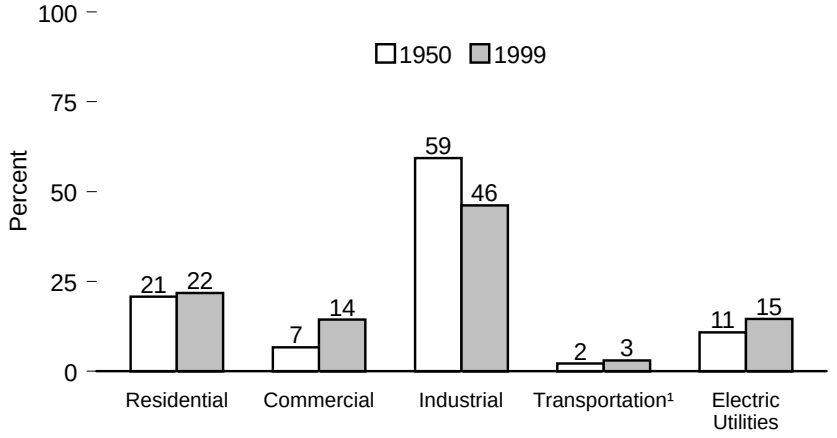
By Sector, 1949-1999



By Sector, 1999



Shares²by Sector, 1950 and 1999



¹ Pipeline fuel, and vehicle fuel for 1990-1998; for 1999, vehicle fuel data were not available.

² Shares are based on data prior to rounding for publication and may not sum exactly to 100 percent.

Source: Table 6.5.

Table 6.5 Natural Gas Consumption by Sector, 1949-1999

(Trillion Cubic Feet)

Year	Residential	Commercial	Industrial [1]			Transportation			Electric Utilties	
	Delivered to Residences	Delivered to Commercial Facilities [2]	Delivered to Industrial Facilities	Lease and Plant Fuel	Total	Pipeline Fuel [3]	Delivered For Vehicle Fuel Use	Total	Delivered to Electric Utilities	Total
1949	0.99	0.35	2.25	0.84	3.08	NA	NA	NA	0.55	4.97
1950	1.20	0.39	2.50	0.93	3.43	0.13	NA	0.13	0.63	5.77
1951	1.47	0.46	2.77	1.15	3.91	0.19	NA	0.19	0.76	6.81
1952	1.62	0.52	2.87	1.16	4.04	0.21	NA	0.21	0.91	7.29
1953	1.69	0.53	3.03	1.13	4.16	0.23	NA	0.23	1.03	7.64
1954	1.89	0.58	3.07	1.10	4.17	0.23	NA	0.23	1.17	8.05
1955	2.12	0.63	3.41	1.13	4.54	0.25	NA	0.25	1.15	8.69
1956	2.33	0.72	3.71	1.00	4.71	0.30	NA	0.30	1.24	9.29
1957	2.50	0.78	3.89	1.05	4.93	0.30	NA	0.30	1.34	9.85
1958	2.71	0.87	3.89	1.15	5.03	0.31	NA	0.31	1.37	10.30
1959	2.91	0.98	4.22	1.24	5.46	0.35	NA	0.35	1.63	11.32
1960	3.10	1.02	4.53	1.24	5.77	0.35	NA	0.35	1.72	11.97
1961	3.25	1.08	4.67	1.29	5.96	0.38	NA	0.38	1.83	12.49
1962	3.48	1.21	4.86	1.37	6.23	0.38	NA	0.38	1.97	13.27
1963	3.59	1.27	5.13	1.41	6.55	0.42	NA	0.42	2.14	13.97
1964	3.79	1.37	5.52	1.37	6.89	0.44	NA	0.44	2.32	14.81
1965	3.90	1.44	5.96	1.16	7.11	0.50	NA	0.50	2.32	15.28
1966	4.14	1.62	6.51	1.03	7.55	0.54	NA	0.54	2.61	16.45
1967	4.31	1.96	6.65	1.14	7.79	0.58	NA	0.58	2.75	17.39
1968	4.45	2.08	7.13	1.24	8.37	0.59	NA	0.59	3.15	18.63
1969	4.73	2.25	7.61	1.35	8.96	0.63	NA	0.63	3.49	20.06
1970	4.84	2.40	7.85	1.40	9.25	0.72	NA	0.72	3.93	21.14
1971	4.97	2.51	8.18	1.41	9.59	0.74	NA	0.74	3.98	21.79
1972	5.13	2.61	8.17	1.46	9.62	0.77	NA	0.77	3.98	22.10
1973	4.88	2.60	8.69	1.50	10.18	0.73	NA	0.73	3.66	22.05
1974	4.79	2.56	8.29	1.48	9.77	0.67	NA	0.67	3.44	21.22
1975	4.92	2.51	6.97	1.40	8.36	0.58	NA	0.58	3.16	19.54
1976	5.05	2.67	6.96	1.63	8.60	0.55	NA	0.55	3.08	19.95
1977	4.82	2.50	6.82	1.66	8.47	0.53	NA	0.53	3.19	19.52
1978	4.90	2.60	6.76	1.65	8.40	0.53	NA	0.53	3.19	19.63
1979	4.97	2.79	6.90	1.50	8.40	0.60	NA	0.60	3.49	20.24
1980	4.75	2.61	7.17	1.03	8.20	0.63	NA	0.63	3.68	19.88
1981	4.55	2.52	7.13	0.93	8.06	0.64	NA	0.64	3.64	19.40
1982	4.63	2.61	5.83	1.11	6.94	0.60	NA	0.60	3.23	18.00
1983	4.38	2.43	5.64	0.98	6.62	0.49	NA	0.49	2.91	16.83
1984	4.56	2.52	6.15	1.08	7.23	0.53	NA	0.53	3.11	17.95
1985	4.43	2.43	5.90	0.97	6.87	0.50	NA	0.50	3.04	17.28
1986	4.31	2.32	5.58	0.92	6.50	0.49	NA	0.49	2.60	16.22
1987	4.31	2.43	5.95	1.15	7.10	0.52	NA	0.52	2.84	17.21
1988	4.63	2.67	6.38	1.10	7.48	0.61	NA	0.61	2.64	18.03
1989	4.78	2.72	6.82	1.07	7.89	0.63	NA	0.63	2.79	18.80
1990	4.39	2.62	7.02	1.24	8.25	0.66	(s)	0.66	2.79	18.72
1991	4.56	2.73	7.23	1.13	8.36	0.60	(s)	0.60	2.79	19.04
1992	4.69	2.80	7.53	1.17	8.70	0.59	(s)	0.59	2.77	19.54
1993	4.96	2.86	7.98	1.17	9.15	0.62	(s)	0.63	2.68	20.28
1994	4.85	2.90	8.17	1.12	9.29	0.69	(s)	0.69	2.99	20.71
1995	4.85	3.03	8.58	1.22	9.80	0.70	(s)	0.70	3.20	21.58
1996	5.24	3.16	8.87	1.25	10.12	0.71	(s)	0.71	2.73	21.97
1997	4.98	R3.21	R8.83	1.20	R10.04	0.75	(s)	0.76	2.97	R21.96
1998	R4.52	R3.00	R8.69	R1.16	R9.84	R0.64	0.01	R0.64	3.26	R21.26
1999P	4.67	3.09	8.67	1.23	9.90	0.64	NA	0.64	3.13	21.43

[1] Most deliveries to nonutility power producers are included in the industrial sector. In instances where the nonutility is primarily a commercial establishment, deliveries are included in the commercial sector.

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

[3] Natural gas consumed in the operation of pipelines, primarily in compressors.

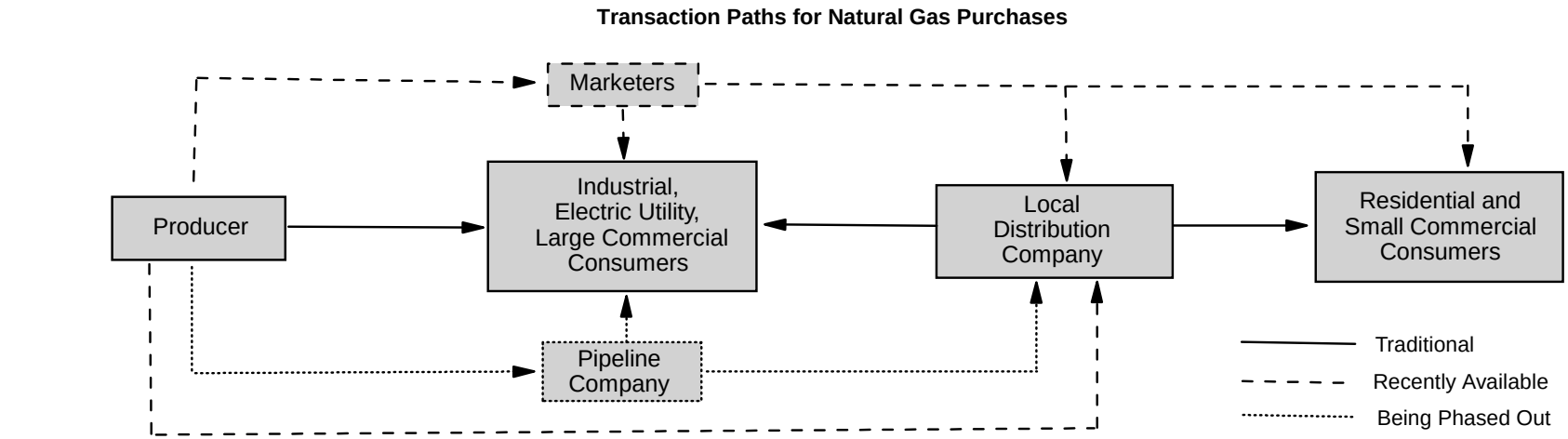
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.005 trillion cubic feet.

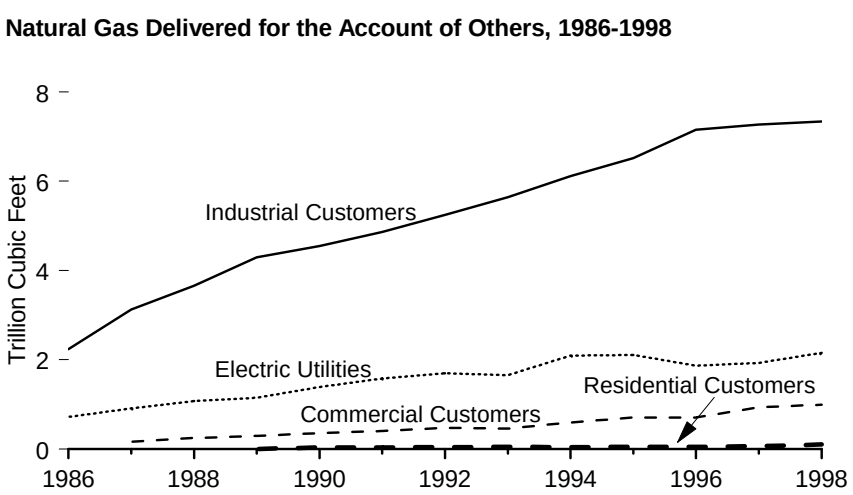
Notes: • For the definition of natural gas consumption, see Note at end of section. • Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F. • Totals may not equal sum of components due to independent rounding.

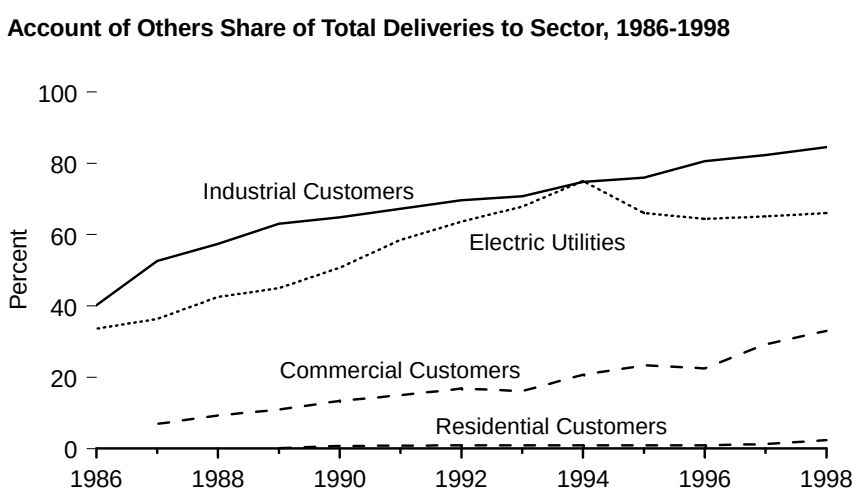
Web Page: http://www.eia.doe.gov/oil_gas_/natural_gas/nat_frame.html.

Sources: **Electric Utilities:** Table 8.8. **All Other Data:** • 1949-1993—Energy Information Administration (EIA), *Natural Gas Annual 1998* (October 1999), Table 100. • 1994 forward—EIA, *Natural Gas Monthly* (February 2000), Table 3.

Figure 6.6 Natural Gas Delivered for the Account of Others







Source: Table 6.6.

Table 6.6 Natural Gas Delivered for the Account of Others, 1986-1998

Year	Residential Customers			Commercial Customers			Industrial Customers			Electric Utilities [1]		
	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	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	Billion Cubic Feet		Percent
1986	NA	4,314	NA	NA	2,318	NA	2,240	5,579	40.2	721	2,602	33.6
1987	NA	4,315	NA	167	2,430	6.9	3,129	5,953	52.6	914	2,844	36.3
1988	NA	4,630	NA	247	2,670	9.3	3,663	6,383	57.4	1,076	2,636	42.5
1989	3	4,781	0.1	296	2,718	10.9	4,298	6,816	63.1	1,152	2,787	45.0
1990	31	4,391	0.7	353	2,623	13.4	4,545	7,018	64.8	1,390	2,787	50.7
1991	36	4,556	0.8	406	2,729	14.9	4,864	7,231	67.3	1,580	2,789	58.5
1992	41	4,690	0.9	471	2,803	16.8	5,249	7,527	69.7	1,697	2,766	63.7
1993	44	4,956	0.9	460	2,862	16.1	5,645	7,981	70.7	1,658	2,682	67.8
1994	42	4,848	0.9	599	2,895	20.7	6,113	8,167	74.8	2,092	2,987	75.0
1995	45	4,850	0.9	706	3,031	23.3	6,517	8,580	76.0	2,110	3,197	66.0
1996	49	5,241	0.9	707	3,158	22.4	7,152	8,870	80.6	1,871	2,732	64.4
1997	61	4,984	1.2	939	[R]3,215	29.2	[R]7,273	[R]8,832	82.3	1,932	2,968	65.1
1998	105	4,520	2.3	990	2,999	33.0	7,339	8,686	84.5	2,153	3,258	66.1

[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.

NA=Not available.

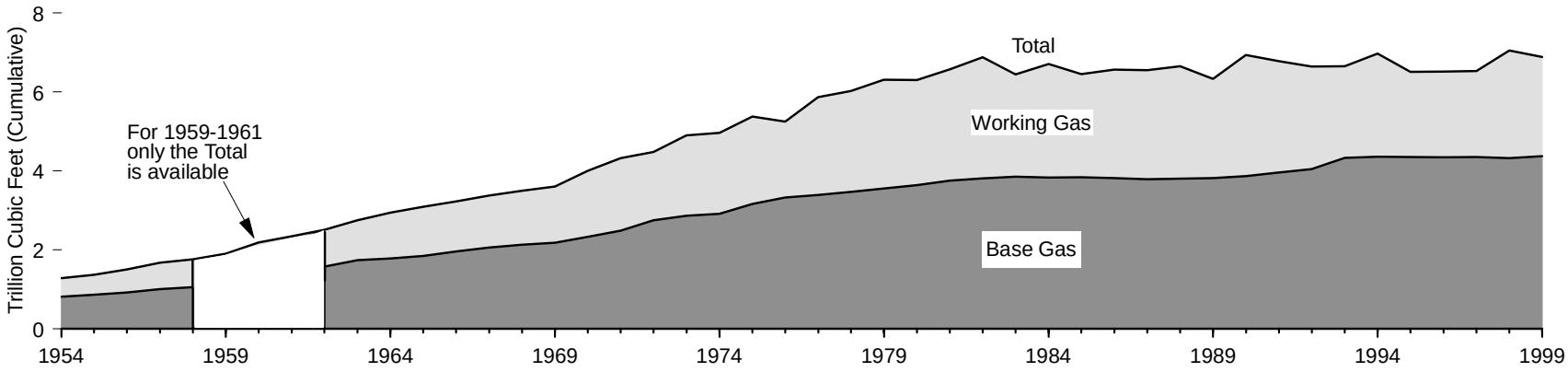
Notes: • Percentages are based on data prior to rounding. • Deliveries for the account of others are deliveries to customers by transporters that do not own the natural gas but provide transportation services. These quantities may include gas covered by long-term contracts and quantities involved in short-term or spot market sales.

Web Page: http://www.eia.doe.gov/oil_gas/natural_gas/nat_frame.html.

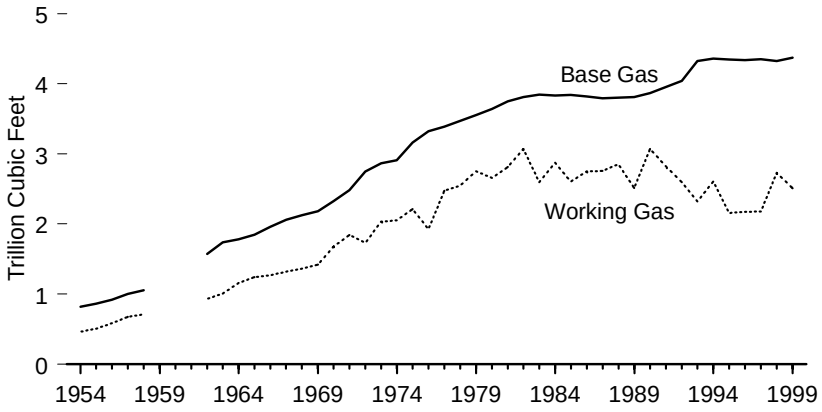
Sources: **Electric Utilities Total Deliveries:** EIA, Form EIA-759, "Monthly Power Plant Report." **All Other Data:** • 1986-1993—EIA, *Natural Gas Annual,* annual reports. • 1994 forward—EIA, *Natural Gas Annual 1998* (October 1999), Table 1.

Figure 6.7 Natural Gas in Underground Storage, 1954-1999

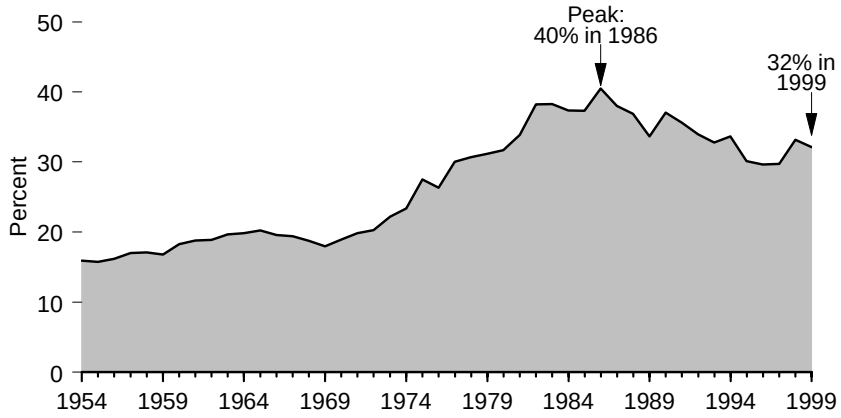
Total



Base Gas and Working Gas



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



Notes: • Storage is at end of year. • Because vertical scales differ, graphs should not be compared.

Sources: Tables 6.5 and 6.7.

Table 6.7 Natural Gas in Underground Storage, 1954-1999

(Billion Cubic Feet)

Year	Base Gas [1]			Working Gas			Total		
	Traditonal Storage	Salt Caverns	Total	Traditonal Storage	Salt Caverns	Total	Traditonal Storage	Salt Caverns	Total
1954	NA	NA	817	NA	NA	465	NA	NA	1,281
1955	NA	NA	863	NA	NA	505	NA	NA	1,368
1956	NA	NA	919	NA	NA	583	NA	NA	1,502
1957	NA	NA	1,001	NA	NA	673	NA	NA	1,674
1958	NA	NA	1,056	NA	NA	708	NA	NA	1,764
1959	NA	NA	NA	NA	NA	NA	NA	NA	1,901
1960	NA	NA	NA	NA	NA	NA	NA	NA	2,184
1961	NA	NA	NA	NA	NA	NA	NA	NA	2,344
1962	NA	NA	1,571	NA	NA	933	NA	NA	2,504
1963	NA	NA	1,738	NA	NA	1,007	NA	NA	2,745
1964	NA	NA	1,781	NA	NA	1,159	NA	NA	2,940
1965	NA	NA	1,848	NA	NA	1,242	NA	NA	3,090
1966	NA	NA	1,958	NA	NA	1,267	NA	NA	3,225
1967	NA	NA	2,058	NA	NA	1,318	NA	NA	3,376
1968	NA	NA	2,128	NA	NA	1,366	NA	NA	3,495
1969	NA	NA	2,181	NA	NA	1,421	NA	NA	3,602
1970	NA	NA	2,326	NA	NA	1,678	NA	NA	4,004
1971	NA	NA	2,485	NA	NA	1,840	NA	NA	4,325
1972	NA	NA	2,751	NA	NA	1,729	NA	NA	4,480
1973	NA	NA	2,864	NA	NA	2,034	NA	NA	4,898
1974	NA	NA	2,912	NA	NA	2,050	NA	NA	4,962
1975	NA	NA	3,162	NA	NA	2,212	NA	NA	5,374
1976	NA	NA	3,323	NA	NA	1,926	NA	NA	5,250
1977	NA	NA	3,391	NA	NA	2,475	NA	NA	5,866
1978	NA	NA	3,473	NA	NA	2,547	NA	NA	6,020
1979	NA	NA	3,553	NA	NA	2,753	NA	NA	6,306
1980	NA	NA	3,642	NA	NA	2,655	NA	NA	6,297
1981	NA	NA	3,752	NA	NA	2,817	NA	NA	6,569
1982	NA	NA	3,808	NA	NA	3,071	NA	NA	6,879
1983	NA	NA	3,847	NA	NA	2,595	NA	NA	6,442
1984	NA	NA	3,830	NA	NA	2,876	NA	NA	6,706
1985	NA	NA	3,842	NA	NA	2,607	NA	NA	6,448
1986	NA	NA	3,819	NA	NA	2,749	NA	NA	6,567
1987	NA	NA	3,792	NA	NA	2,756	NA	NA	6,548
1988	NA	NA	3,800	NA	NA	2,850	NA	NA	6,650
1989	NA	NA	3,812	NA	NA	2,513	NA	NA	6,325
1990	NA	NA	3,868	NA	NA	3,068	NA	NA	6,936
1991	NA	NA	3,954	NA	NA	2,824	NA	NA	6,778
1992	NA	NA	4,044	NA	NA	2,597	NA	NA	6,641
1993	NA	NA	4,327	NA	NA	2,322	NA	NA	6,649
1994	4,317	44	4,360	2,536	70	2,606	6,853	113	6,966
1995	4,290	60	4,349	2,082	72	2,153	6,371	131	6,503
1996	4,277	64	4,341	2,087	85	2,173	6,364	149	6,513
1997	4,283	67	4,350	2,092	83	2,175	6,375	150	6,525
1998[E]	4,259	67	4,326	[R]2,626	104	[R]2,730	[R]6,884	171	[R]7,056
1999[E]	4,306	67	4,373	2,409	100	2,509	6,715	167	6,881

[1] Includes native gas.

R=Revised. E=Estimated. NA=Not available.

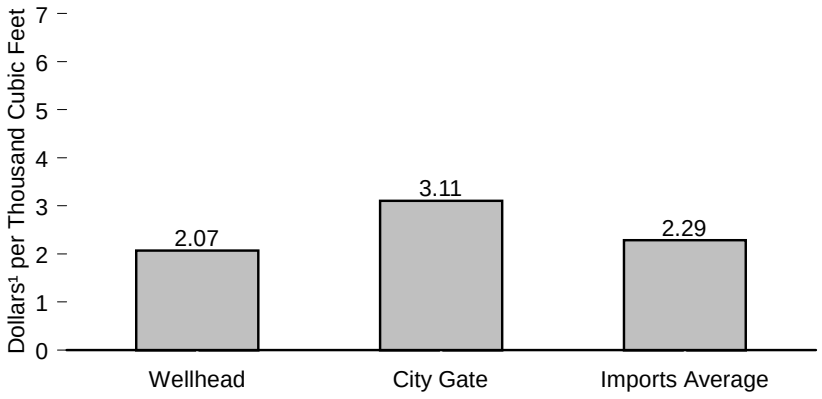
Notes: • Storage is at end of year. • Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60 degrees F. For prior years, the pressure base was 14.65 p.s.i.a. at 60 degrees F. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/oil_gas/natural_gas/nat_frame.html.

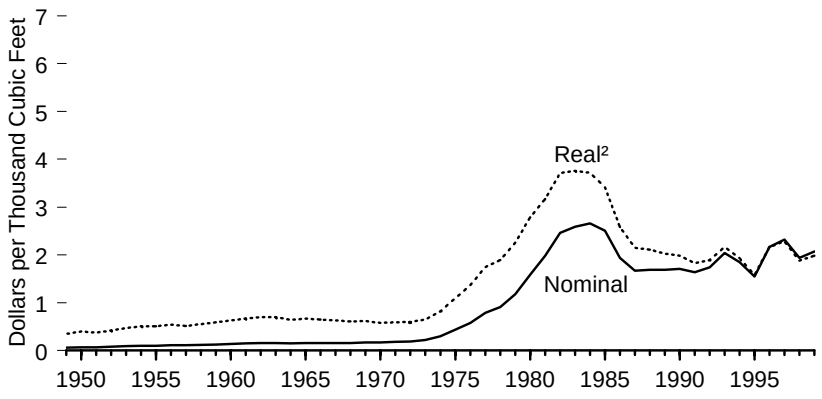
Sources: • 1954-1974—American Gas Association, *Gas Facts.* • 1975-1978—Federal Energy Administration, Form FEA-G318-M-O, "Underground Gas Storage Report," and Federal Power Commission, Form FPC-8, "Underground Gas Storage Report." • 1979-1984—EIA, Form EIA-191, "Underground Gas Storage Report" and Federal Energy Regulatory Commission, Form FERC-8, "Underground Gas Storage Report." • 1985-1993—EIA, *Natural Gas Monthly,* monthly reports. • 1994 forward—EIA, *Natural Gas Monthly,* (February 2000), Tables 9, 11, and 12.

Figure 6.8 Natural Gas Wellhead, City Gate, and Imports Prices

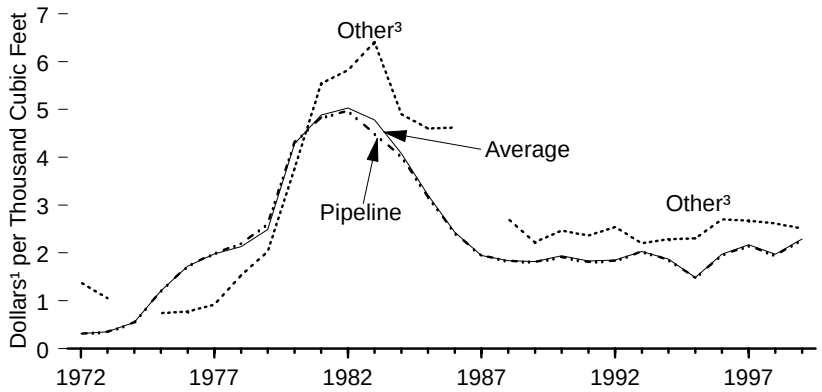
Wellhead, City Gate, and Imports Average, 1999



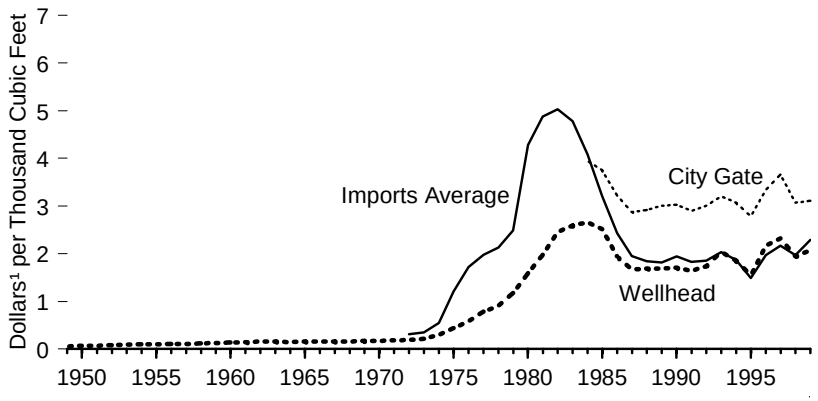
Wellhead, 1949-1999



Imports, 1972-1999



Wellhead, City Gate, and Imports Average, 1949-1999



[1] Nominal dollars.

[2] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

[3] There was no price in 1974 or 1987 because all imports were by pipeline in those years.

Source: Table 6.8.

Table 6.8 Natural Gas Wellhead, City Gate, and Imports Prices, 1949-1999

(Dollars per Thousand Cubic Feet)

Year	Wellhead [1]		City Gate		Imports		
	Nominal	Real [2]	Nominal	Real [2]	Pipeline (nominal)	Other [3] (nominal)	Average (nominal)
1949	0.06	[R]0.35	NA	NA	NA	NA	NA
1950	0.07	[R]0.40	NA	NA	NA	NA	NA
1951	0.07	[R]0.37	NA	NA	NA	NA	NA
1952	0.08	[R]0.42	NA	NA	NA	NA	NA
1953	0.09	[R]0.47	NA	NA	NA	NA	NA
1954	0.10	[R]0.51	NA	NA	NA	NA	NA
1955	0.10	[R]0.51	NA	NA	NA	NA	NA
1956	0.11	[R]0.54	NA	NA	NA	NA	NA
1957	0.11	[R]0.52	NA	NA	NA	NA	NA
1958	0.12	[R]0.55	NA	NA	NA	NA	NA
1959	0.13	[R]0.59	NA	NA	NA	NA	NA
1960	0.14	[R]0.63	NA	NA	NA	NA	NA
1961	0.15	[R]0.67	NA	NA	NA	NA	NA
1962	0.16	[R]0.70	NA	NA	NA	NA	NA
1963	0.16	[R]0.70	NA	NA	NA	NA	NA
1964	0.15	[R]0.64	NA	NA	NA	NA	NA
1965	0.16	[R]0.67	NA	NA	NA	NA	NA
1966	0.16	[R]0.65	NA	NA	NA	NA	NA
1967	0.16	[R]0.63	NA	NA	NA	NA	NA
1968	0.16	[R]0.61	NA	NA	NA	NA	NA
1969	0.17	[R]0.62	NA	NA	NA	NA	NA
1970	0.17	[R]0.58	NA	NA	NA	NA	NA
1971	0.18	[R]0.59	NA	NA	NA	NA	NA
1972	0.19	[R]0.60	NA	NA	0.31	1.38	0.31
1973	0.22	[R]0.65	NA	NA	0.35	1.05	0.35
1974	0.30	[R]0.82	NA	NA	0.55	([4])	0.55
1975	0.44	[R]1.10	NA	NA	1.21	0.74	1.21
1976	0.58	[R]1.37	NA	NA	1.73	0.77	1.72
1977	0.79	[R]1.75	NA	NA	1.99	0.92	1.98
1978	0.91	[R]1.89	NA	NA	2.19	1.53	2.13
1979	1.18	[R]2.26	NA	NA	2.61	2.03	2.49
1980	1.59	[R]2.79	NA	NA	4.32	3.77	4.28
1981	1.98	[R]3.17	NA	NA	4.83	5.54	4.88
1982	2.46	[R]3.71	NA	NA	4.97	5.82	5.03
1983	2.59	[R]3.76	NA	NA	4.49	6.41	4.78
1984	2.66	[R]3.72	3.95	[R]5.53	4.01	4.90	4.08
1985	2.51	[R]3.41	3.75	[R]5.09	3.17	4.60	3.21
1986	1.94	[R]2.58	3.22	[R]4.28	2.42	4.62	2.43
1987	1.67	[R]2.15	2.87	[R]3.70	1.95	([4])	1.95
1988	1.69	[R]2.11	2.92	[R]3.64	1.83	2.71	1.84
1989	1.69	[R]2.03	3.01	[R]3.61	1.81	2.22	1.82
1990	1.71	[R]1.98	3.03	[R]3.50	1.91	2.47	1.94
1991	1.64	[R]1.83	2.90	[R]3.23	1.81	2.36	1.83
1992	1.74	[R]1.89	3.01	[R]3.28	1.84	2.54	1.85
1993	2.04	[R]2.17	3.21	[R]3.41	2.03	2.20	2.03
1994	1.85	[R]1.93	3.07	[R]3.20	1.86	2.28	1.87
1995	1.55	[R]1.58	2.78	[R]2.83	[R]1.48	2.30	1.49
1996	2.17	[R]2.17	3.34	[R]3.34	1.96	2.70	1.97
1997	2.32	[R]2.28	[R]3.66	[R]3.59	2.15	2.67	2.17
1998	[R]1.94	[R]1.88	[R]3.07	[R]2.98	[R]1.95	[R]2.62	[R]1.97
1999	[E]2.07	[E]1.98	3.11	2.97	2.28	2.51	2.29

[1] See Glossary for definition of Natural Gas Wellhead Price.

[2] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Appendix Table E1.

[3] Primarily liquefied natural gas from Algeria.

[4] Not applicable. All imports were by pipeline.

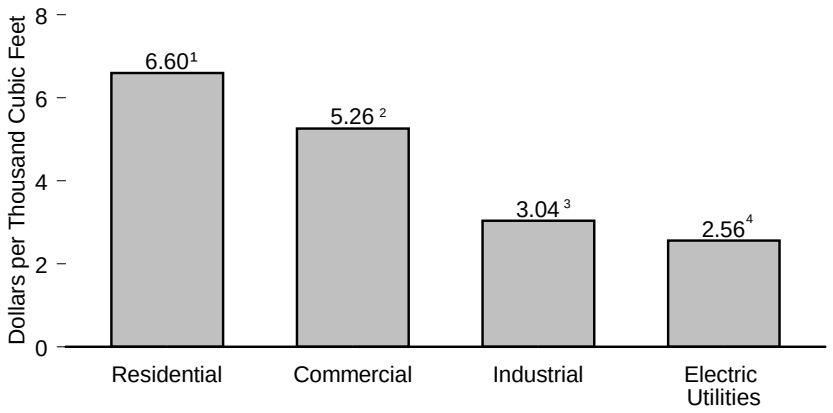
R=Revised. E=Estimated. NA=Not available.

Web Page: http://www.eia.doe.gov/oil_gas/natural_gas/nat_frame.html.

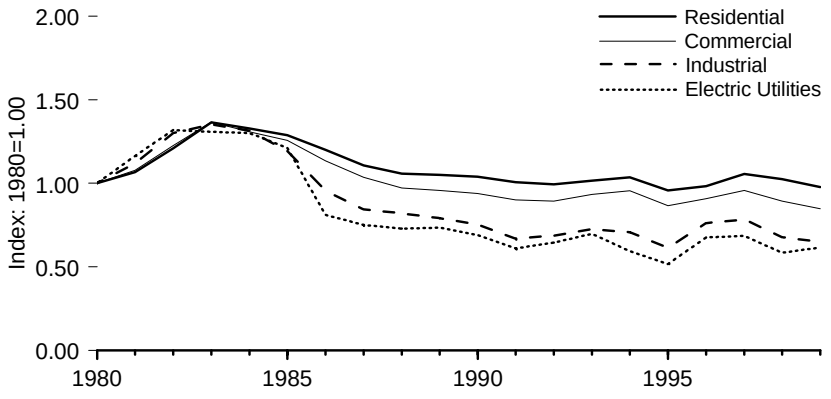
Sources: **Wellhead:** • 1949-1993—Energy Information Administration (EIA), *Natural Gas Annual 1998* (October 1999), Table 98. • 1994 forward—EIA, *Natural Gas Monthly* (March 2000), Table 4. **City Gate:** • 1984-1993—EIA, *Natural Gas Annual,* annual reports. • 1994 forward—EIA, *Natural Gas Monthly* (March 2000), Table 4. **Imports:** • 1972 and 1973—Federal Power Commission (FPC), *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG.* • 1974-1976—FPC, *United States Imports and Exports of Natural Gas,* annual reports. • 1977-1993—EIA, *Natural Gas Annual,* annual reports. • 1994 forward—EIA, *Natural Gas Monthly* (March 2000), Table 5.

Figure 6.9 Natural Gas Prices by Sector

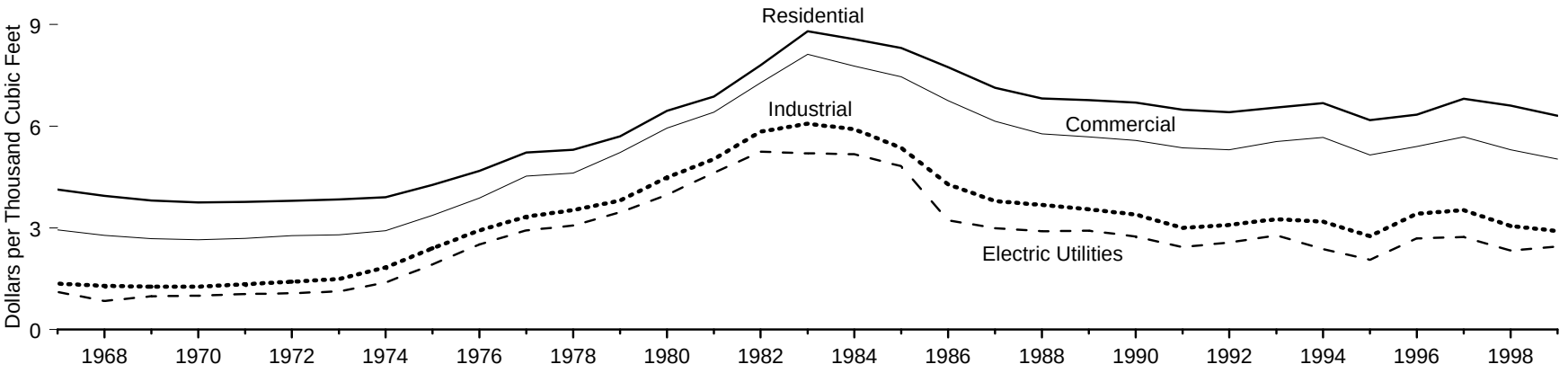
Nominal Prices, 1999



Real Prices,[5] Indexed, 1980-1999



Real Prices,[5] 1967-1999



[1] Based on 100 percent of volume delivered.
[2] Based on 65.1 percent of volume delivered.
[3] Based on 16.9 percent of volume delivered.
[4] Based on all steam-electric utility plants with a combined capacity of 50 megawatts or greater.
[5] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

Source: Table 6.9.

Table 6.9 Natural Gas Prices by Sector, 1967-1999

(Price: Dollars per Thousand Cubic Feet; Share of Total Volume Delivered: Percentage)

	Residential		Commercial [1]			Industrial [2]			Vehicle Fuel [3]			Electric Utilities	
	Prices [4]		Prices		Share of Total Volume Delivered	Prices		Share of Total Volume Delivered	Prices		Share of Total Volume Delivered	Prices [5]	
Year	Nominal	Real [6]	Nominal	Real [6]		Nominal	Real [6]		Nominal	Real [6]		Nominal	Real [6]
1967	1.04	R4.13	0.74	R2.94	NA	0.34	R1.35	NA	NA	NA	NA	0.28	R1.11
1968	1.04	R3.95	0.73	R2.78	NA	0.34	R1.29	NA	NA	NA	NA	0.22	R0.84
1969	1.05	R3.81	0.74	R2.68	NA	0.35	R1.27	NA	NA	NA	NA	0.27	R0.98
1970	1.09	R3.75	0.77	R2.65	NA	0.37	R1.27	NA	NA	NA	NA	0.29	R1.00
1971	1.15	R3.77	0.82	R2.69	NA	0.41	R1.34	NA	NA	NA	NA	0.32	R1.05
1972	1.21	R3.80	0.88	R2.77	NA	0.45	R1.41	NA	NA	NA	NA	0.34	R1.07
1973	1.29	R3.84	0.94	R2.80	NA	0.50	R1.49	NA	NA	NA	NA	0.38	R1.13
1974	1.43	R3.90	1.07	R2.92	NA	0.67	R1.83	NA	NA	NA	NA	0.51	R1.39
1975	1.71	R4.27	1.35	R3.37	NA	0.96	R2.40	NA	NA	NA	NA	0.77	R1.92
1976	1.98	R4.68	1.64	R3.88	NA	1.24	R2.93	NA	NA	NA	NA	1.06	R2.51
1977	2.35	R5.22	2.04	R4.53	NA	1.50	R3.33	NA	NA	NA	NA	1.32	R2.93
1978	2.56	R5.31	2.23	R4.62	NA	1.70	R3.52	NA	NA	NA	NA	1.48	R3.07
1979	2.98	R5.70	2.73	R5.22	NA	1.99	R3.81	NA	NA	NA	NA	1.81	R3.46
1980	3.68	R6.45	3.39	R5.94	NA	2.56	R4.49	NA	NA	NA	NA	2.27	R3.98
1981	4.29	R6.88	4.00	R6.41	NA	3.14	R5.03	NA	NA	NA	NA	2.89	R4.63
1982	5.17	R7.80	4.82	R7.28	NA	3.87	R5.84	85.1	NA	NA	NA	3.48	R5.25
1983	6.06	R8.80	5.59	R8.12	NA	4.18	R6.07	80.7	NA	NA	NA	3.58	R5.20
1984	6.12	R8.57	5.55	R7.77	NA	4.22	R5.91	74.7	NA	NA	NA	3.70	R5.18
1985	6.12	R8.31	5.50	R7.46	NA	3.95	R5.36	68.8	NA	NA	NA	3.55	R4.82
1986	5.83	R7.74	5.08	R6.75	NA	3.23	R4.29	59.8	NA	NA	NA	2.43	R3.23
1987	5.54	R7.14	4.77	R6.15	93.1	2.94	R3.79	47.4	NA	NA	NA	2.32	R2.99
1988	5.47	R6.82	4.63	R5.77	90.7	2.95	R3.68	42.6	NA	NA	NA	2.33	R2.90
1989	5.64	R6.77	4.74	R5.69	89.1	2.96	R3.55	36.9	NA	NA	NA	2.43	R2.92
1990	5.80	R6.70	4.83	R5.58	86.6	2.93	R3.39	35.2	3.39	R3.92	NA	2.38	R2.75
1991	5.82	R6.49	4.81	R5.36	85.1	2.69	R3.00	32.7	3.96	R4.42	NA	2.18	R2.43
1992	5.89	R6.41	4.88	R5.31	83.2	2.84	R3.09	30.3	4.05	R4.41	NA	2.36	R2.57
1993	6.16	R6.55	5.22	R5.55	83.9	3.07	R3.26	29.7	4.27	R4.54	87.8	2.61	R2.78
1994	6.41	R6.68	5.44	R5.67	79.3	3.05	R3.18	25.5	4.11	R4.28	86.9	2.28	R2.37
1995	6.06	R6.18	5.05	R5.15	76.7	2.71	R2.76	24.5	3.98	R4.06	86.6	2.02	R2.06
1996	6.34	R6.34	5.40	R5.40	77.6	3.42	R3.42	19.4	4.34	R4.34	94.0	2.69	R2.69
1997	6.94	R6.81	R5.80	R5.69	70.8	3.59	R3.52	R18.1	4.44	R4.36	89.7	R2.78	R2.73
1998	6.82	R6.61	R5.48	R5.31	R67.0	R3.14	R3.05	R16.1	R4.59	R4.45	R85.4	R2.40	R2.33
1999P	6.60	6.31	5.26	5.03	65.1	3.04	2.91	16.9	NA	NA	NA	2.56	2.45

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

[2] Most volumes and associated revenues for deliveries to nonutility power producers are included in the industrial sector. In instances where the nonutility is primarily a commercial establishment, volumes and associated revenues are included in the calculation of commercial prices.

[3] 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.

[4] Based on 100 percent of volume delivered.

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

[6] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

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

Notes: • Natural gas includes supplemental gaseous fuels. • Residential, commercial, and industrial price data represent prices of natural gas sold and delivered by local distribution companies to residential, commercial, and industrial consumers, respectively. The data do not reflect prices of natural gas transported for the account of others. • The average for each end-use sector is calculated by dividing the total value of the gas consumed by each sector by the total quantity consumed. See Note at end of section.

Web Page: http://www.eia.doe.gov/oil_gas/natural_gas/nat_frame.html.

Sources: **Vehicle Fuel:** 1990-1998—Energy Information Administration (EIA), *Natural Gas Annual 1998* (October 1999), Table 25. **All Other Data:** • 1967-1992—EIA, *Natural Gas Annual 1998* (October 1999), Table 101. • 1993 forward—EIA, *Natural Gas Monthly* (March 2000), Table 4.

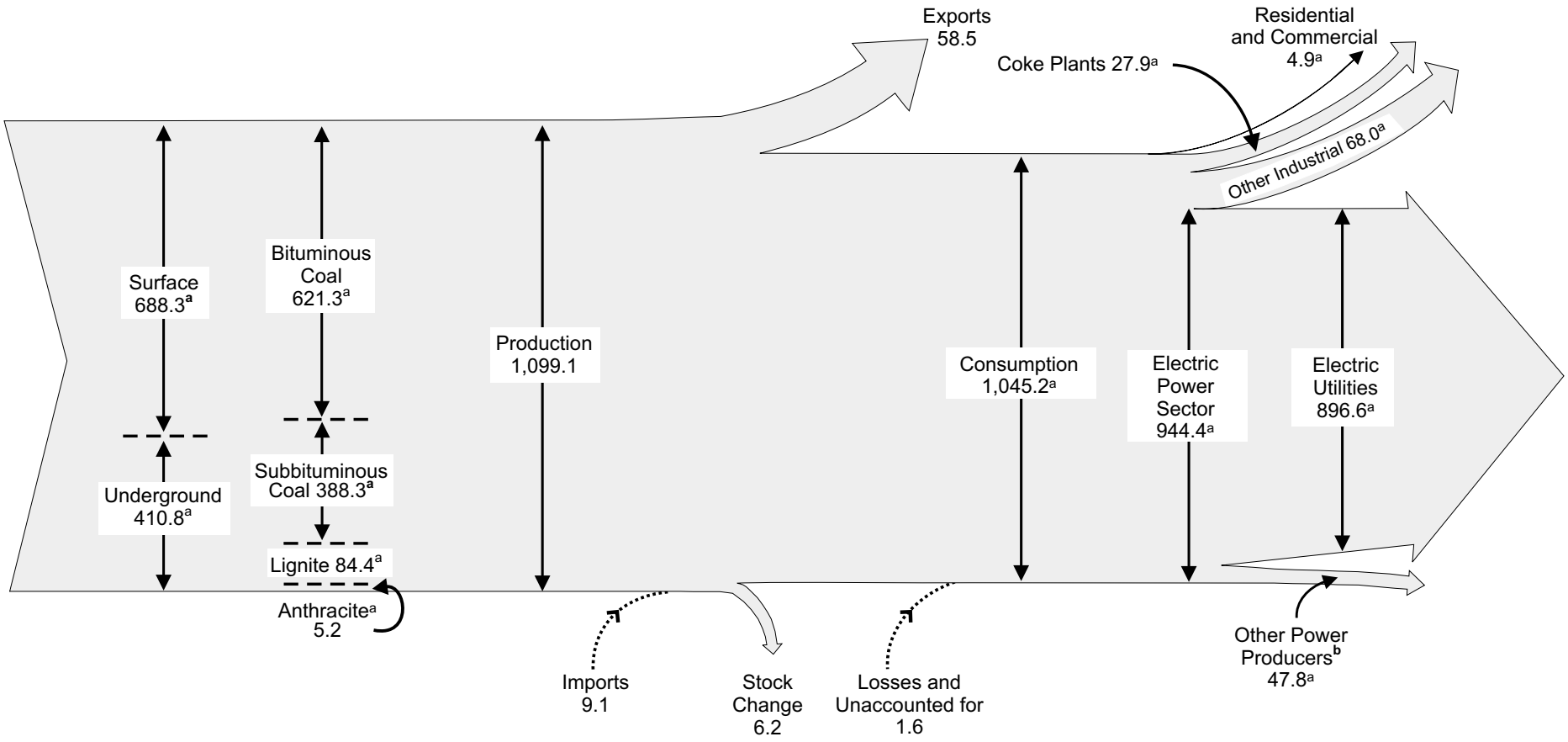
Natural Gas Note

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 (through 1995); 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 agriculture, forestry, and fishing (beginning in 1996), 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.

7 Coal

Coal yard, Curtis Bay, Maryland. Source: U.S. Department of Energy.

Diagram 4. Coal Flow, 1999
(Million Short Tons)

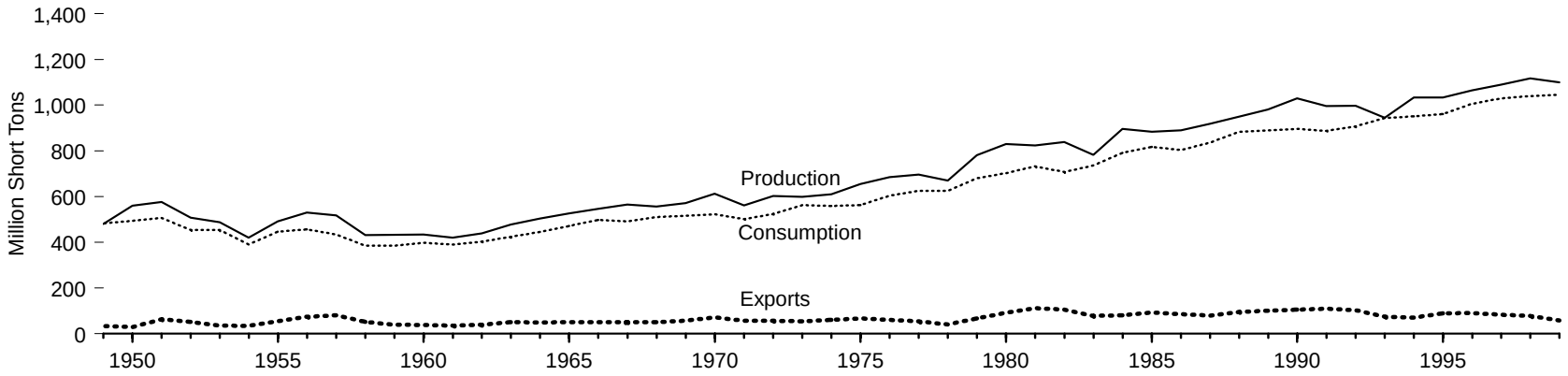


a Estimated.
b Nonutility wholesale producers of electricity, and nonutility congeneration plants that are not included in the end-use sectors.

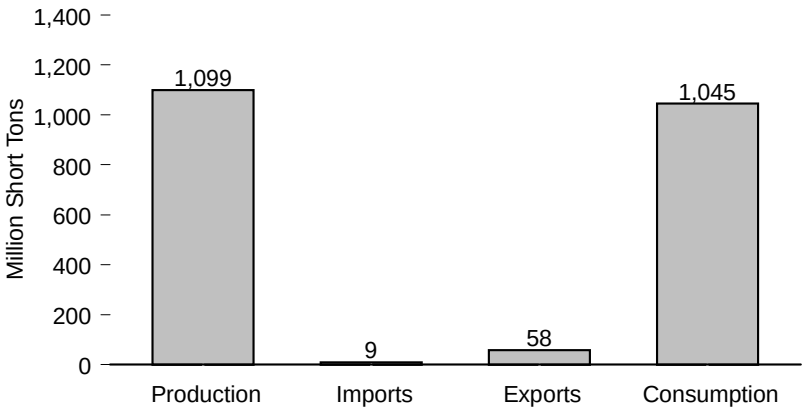
Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.
Sources: Tables 7.1, 7.2, and 7.3.

Figure 7.1 Coal Overview

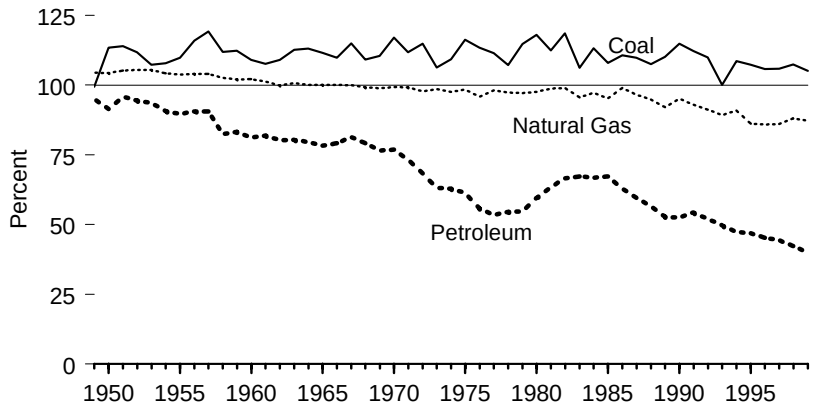
Overview, 1949-1999



Overview, 1999



Production as Share of Consumption by Type of Fossil Fuel, 1949-1999



Sources: Tables 5.1, 6.1, and 7.1.

Table 7.1 Coal Overview, 1949-1999

(Million Short Tons)

Year	Production	Imports	Exports	Stock Change [1]	Losses and Unaccounted for [2]	Consumption [3]
1949	480.6	0.3	32.8	[4]	[5]-35.1	483.2
1950	560.4	0.4	29.4	[4]	[5]9.5	494.1
1951	576.3	0.3	62.7	[4]	[5]3.5	505.9
1952	507.4	0.3	52.2	[4]	[5]0.8	454.1
1953	488.2	0.3	36.5	[4]	[5]-6.9	454.8
1954	420.8	0.2	33.9	[4]	[5]8.1	389.9
1955	490.8	0.3	54.4	[4]	[5]-6.3	447.0
1956	529.8	0.4	73.8	[4]	[5]-10.2	456.9
1957	518.0	0.4	80.8	[4]	[5]0.8	434.5
1958	431.6	0.3	52.6	[4]	[5]-1.3	385.7
1959	432.7	0.4	39.0	[4]	[5]9.2	385.1
1960	434.3	0.3	38.0	[4]	[5]1.7	398.1
1961	420.4	0.2	36.4	[4]	[5]-4.0	390.4
1962	439.0	0.2	40.2	[4]	[5]-1.5	402.3
1963	477.2	0.3	50.4	[4]	[5]3.3	423.5
1964	504.2	0.3	49.5	[4]	[5]4.0	445.7
1965	527.0	0.2	51.0	[4]	[5]2.2	472.0
1966	546.8	0.2	50.1	[4]	[5]2.2	497.7
1967	564.9	0.2	50.1	[4]	[5]4.6	491.4
1968	556.7	0.2	51.2	[4]	[5]3.5	509.8
1969	571.0	0.1	56.9	[4]	[5]2.9	516.4
1970	612.7	(s)	71.7	[4]	[5]6.6	523.2
1971	560.9	0.1	57.3	[4]	[5]4.2	501.6
1972	602.5	(s)	56.7	[4]	[5]-4.3	524.3
1973	598.6	0.1	53.6	[4]	[5]-17.9	562.6
1974	610.0	2.1	60.7	-8.9	2.0	558.4
1975	654.6	0.9	66.3	32.2	-5.5	562.6
1976	684.9	1.2	60.0	8.5	13.8	603.8
1977	697.2	1.6	54.3	22.6	-3.4	625.3
1978	670.2	3.0	40.7	-4.9	12.1	625.2
1979	781.1	2.1	66.0	36.2	0.4	680.5
1980	829.7	1.2	91.7	25.6	10.8	702.7
1981	823.8	1.0	112.5	-19.0	-1.4	732.6
1982	838.1	0.7	106.3	22.6	3.1	706.9
1983	782.1	1.3	77.8	-29.5	-1.6	736.7
1984	895.9	1.3	81.5	28.7	-4.3	791.3
1985	883.6	2.0	92.7	-27.9	2.8	818.0
1986	890.3	2.2	85.5	4.0	-1.2	804.2
1987	918.8	1.7	79.6	6.5	-2.5	836.9
1988	950.3	2.1	95.0	-24.9	-1.3	883.6
1989	980.7	2.9	100.8	-13.7	6.8	889.7
1990	1,029.1	2.7	105.8	26.5	3.9	895.5
1991	996.0	3.4	109.0	-0.9	3.7	887.6
1992	997.5	3.8	102.5	-3.0	-5.8	[3]907.7
1993	945.4	[R]8.2	74.5	-51.9	[R]-13.1	944.1
1994	1,033.5	[R]8.9	71.4	23.6	[R]-4.1	951.5
1995	1,033.0	[R]9.5	88.5	-0.3	[R]-7.9	962.0
1996	1,063.9	[R]8.1	90.5	-17.5	[R]-6.6	1,005.6
1997	1,089.9	7.5	83.5	-11.3	-4.1	1,029.2
1998	[R]1,117.5	8.7	[R]78.0	[R]24.2	[R]-16.1	[R]1,040.1
1999	[P]1,099.1	[P]9.1	[P]58.5	[P]6.2	[P]-1.6	[E]1,045.2

[1] Includes changes in stocks at electric utilities, coke plants, other industries, retail dealers, producers and distributors. A negative value indicates a net decrease in stocks; a positive value indicates a net increase in stocks.

[2] "Losses and Unaccounted for" is calculated as the sum of production and imports minus exports, stock change, and consumption.

[3] Independent power producers' use of coal (nonutility power producers in SIC 49, "Electric Gas, and Sanitary Services") are included beginning in 1992. See Table 7.3.

[4] Included in "Losses and Unaccounted for."

[5] Includes "Stock Change."

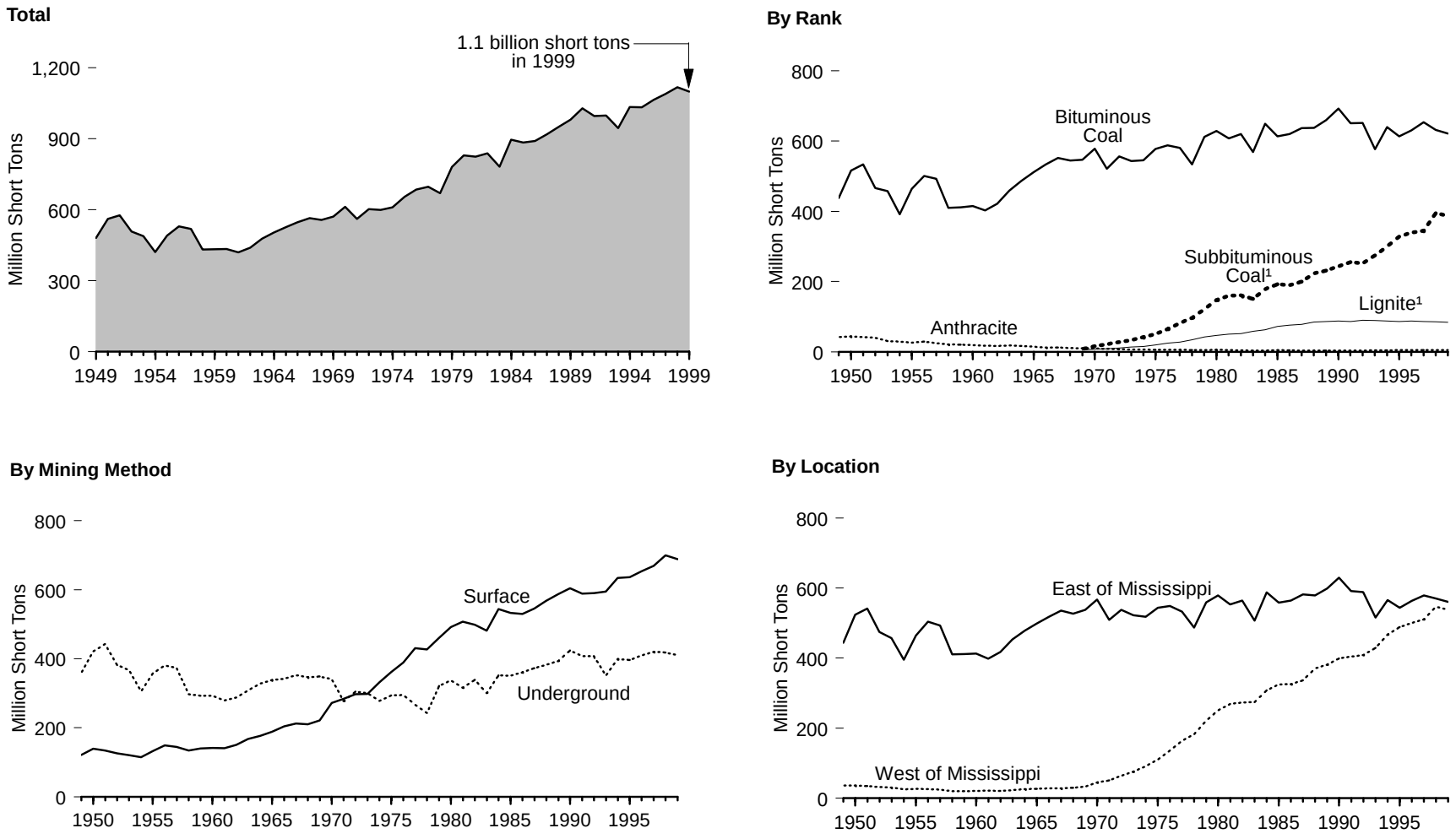
R=Revised. P=Preliminary. E=Estimate. (s)=Less than 0.05 million short tons.

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

Web Page: http://www.eia.doe.gov/fuelcoal.html.

Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook,* "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.* • 1981-1988—EIA, *Weekly Coal Production and Coal Production,* annual reports. • 1989-1998—EIA, *Coal Industry Annual,* annual reports. • 1999—Tables 7.2, 7.3, 7.4, 7.5, of this report, and EIA, *Quarterly Coal Report October-December 1999* (May 2000), Table 6.

Figure 7.2 Coal Production, 1949-1999



[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, 1949-1999

(Million Short Tons)

Year	Rank				Mining Method		Location		Total
	Bituminous Coal	Subbituminous Coal	Lignite	Anthracite	Underground	Surface	West of the Mississippi	East of the Mississippi	
1949	437.9	(1)	(1)	42.7	358.9	121.7	36.4	444.2	480.6
1950	516.3	(1)	(1)	44.1	421.0	139.4	36.0	524.4	560.4
1951	533.7	(1)	(1)	42.7	442.2	134.2	34.6	541.7	576.3
1952	466.8	(1)	(1)	40.6	381.2	126.3	32.7	474.8	507.4
1953	457.3	(1)	(1)	30.9	367.4	120.8	30.6	457.7	488.2
1954	391.7	(1)	(1)	29.1	306.0	114.8	25.4	395.4	420.8
1955	464.6	(1)	(1)	26.2	358.0	132.9	26.6	464.2	490.8
1956	500.9	(1)	(1)	28.9	380.8	148.9	25.8	504.0	529.8
1957	492.7	(1)	(1)	25.3	373.6	144.5	24.7	493.4	518.0
1958	410.4	(1)	(1)	21.2	297.6	134.0	20.3	411.3	431.6
1959	412.0	(1)	(1)	20.6	292.8	139.8	20.3	412.4	432.7
1960	415.5	(1)	(1)	18.8	292.6	141.7	21.3	413.0	434.3
1961	403.0	(1)	(1)	17.4	279.6	140.9	21.8	398.6	420.4
1962	422.1	(1)	(1)	16.9	287.9	151.1	21.4	417.6	439.0
1963	458.9	(1)	(1)	18.3	309.0	168.2	23.7	453.5	477.2
1964	487.0	(1)	(1)	17.2	327.7	176.5	25.7	478.5	504.2
1965	512.1	(1)	(1)	14.9	338.0	189.0	27.4	499.5	527.0
1966	533.9	(1)	(1)	12.9	342.6	204.2	28.0	518.8	546.8
1967	552.6	(1)	(1)	12.3	352.4	212.5	28.9	536.0	564.9
1968	545.2	(1)	(1)	11.5	346.6	210.1	29.7	527.0	556.7
1969	547.2	8.3	5.0	10.5	349.2	221.7	33.3	537.7	571.0
1970	578.5	16.4	8.0	9.7	340.5	272.1	44.9	567.8	612.7
1971	521.3	22.2	8.7	8.7	277.2	283.7	51.0	509.9	560.9
1972	556.8	27.5	11.0	7.1	305.0	297.4	64.3	538.2	602.5
1973	543.5	33.9	14.3	6.8	300.1	298.5	76.4	522.1	598.6
1974	545.7	42.2	15.5	6.6	278.0	332.1	91.9	518.1	610.0
1975	577.5	51.1	19.8	6.2	293.5	361.2	110.9	543.7	654.6
1976	588.4	64.8	25.5	6.2	295.5	389.4	136.1	548.8	684.9
1977	581.0	82.1	28.2	5.9	266.6	430.6	163.9	533.3	697.2
1978	534.0	96.8	34.4	5.0	242.8	427.4	183.0	487.2	670.2
1979	612.3	121.5	42.5	4.8	320.9	460.2	221.4	559.7	781.1
1980	628.8	147.7	47.2	6.1	337.5	492.2	251.0	578.7	829.7
1981	608.0	159.7	50.7	5.4	316.5	507.3	269.9	553.9	823.8
1982	620.2	160.9	52.4	4.6	339.2	499.0	273.9	564.3	838.1
1983	568.6	151.0	58.3	4.1	300.4	481.7	274.7	507.4	782.1
1984	649.5	179.2	63.1	4.2	352.1	543.9	308.3	587.6	895.9
1985	613.9	192.7	72.4	4.7	350.8	532.8	324.9	558.7	883.6
1986	620.1	189.6	76.4	4.3	360.4	529.9	325.9	564.4	890.3
1987	636.6	200.2	78.4	3.6	372.9	545.9	336.8	581.9	918.8
1988	638.1	223.5	85.1	3.6	382.2	568.1	370.7	579.6	950.3
1989	659.8	231.2	86.4	3.3	393.8	586.9	381.7	599.0	980.7
1990	693.2	244.3	88.1	3.5	424.5	604.5	398.9	630.2	1,029.1
1991	650.7	255.3	86.5	3.4	407.2	588.8	404.7	591.3	996.0
1992	651.8	252.2	90.1	3.5	407.2	590.3	409.0	588.6	997.5
1993	576.7	274.9	89.5	4.3	351.1	594.4	429.2	516.2	945.4
1994	640.3	300.5	88.1	4.6	399.1	634.4	467.2	566.3	1,033.5
1995	613.8	328.0	86.5	4.7	396.2	636.7	488.7	544.2	1,033.0
1996	630.7	340.3	88.1	4.8	409.8	654.0	500.2	563.7	1,063.9
1997	653.8	345.1	86.3	4.7	420.7	669.3	510.6	579.4	1,089.9
1998	R631.7	R394.8	R85.8	R5.3	R417.7	R699.8	R547.0	570.6	R1,117.5
1999	E621.3	E388.3	E84.4	E5.2	E410.8	E688.3	E537.9	E561.2	P1,099.1

[1] Included in bituminous coal.

R=Revised. P=Preliminary. E=Estimated.

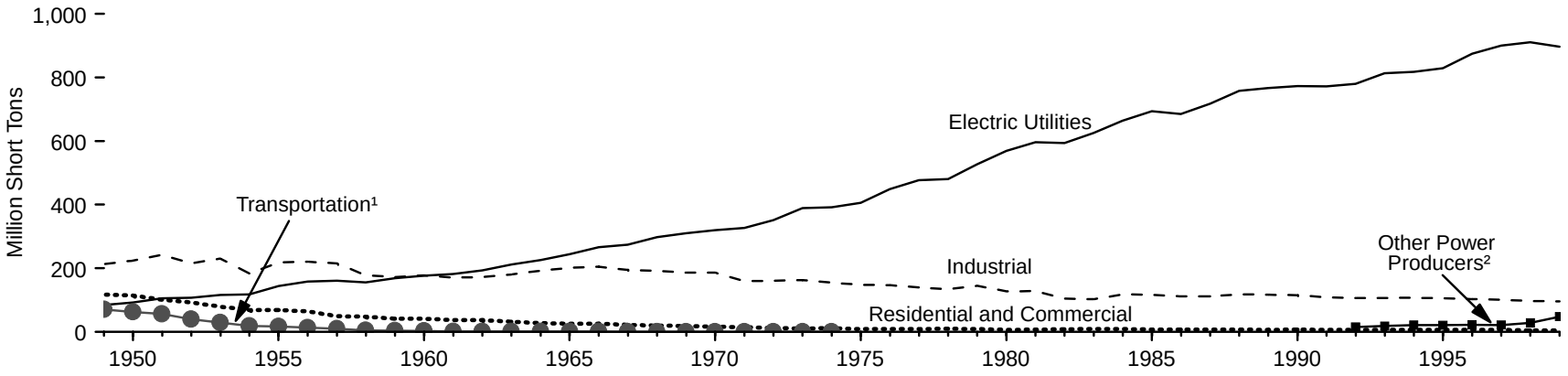
Note: Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelcoal.html.

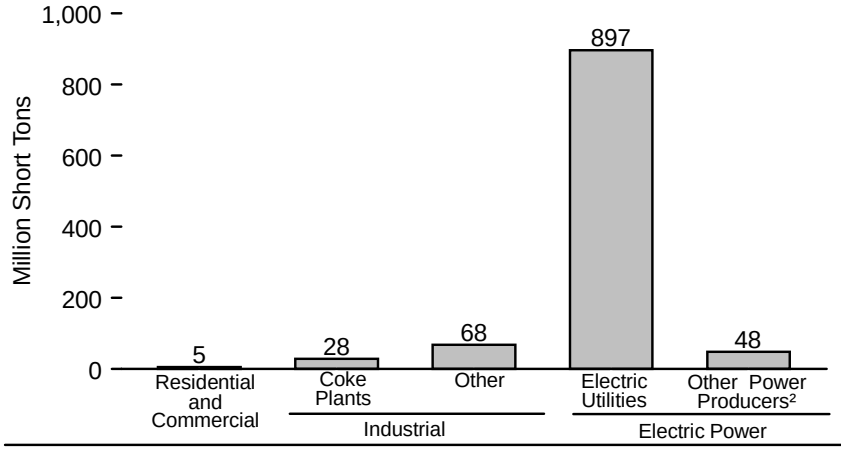
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook,* "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976.* • 1977 and 1978—EIA, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977; 1978, Coal-Pennsylvania Anthracite 1977; 1978,* and *Coal Production,* annual reports. • 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report* and *Coal Production,* annual reports. • 1981-1988—EIA, *Weekly Coal Production* and *Coal Production,* annual reports. • 1989-1997—EIA, *Coal Industry Annual,* annual reports. • 1998—EIA, Form EIA-7A, "Coal Production Report." • 1999—EIA estimates and *Quarterly Coal Report October-December 1999* (May 2000), Table 4.

Figure 7.3 Coal Consumption by Sector

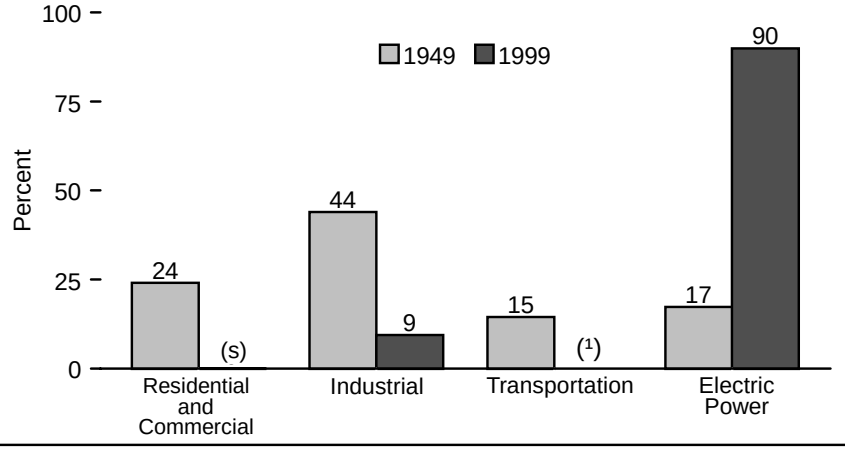
By Sector, 1949-1999



By Sector, 1999



Shares by Sector, 1949 and 1999



¹ Quantities for 1975, 1976, and 1977 are less than 0.5 million short tons. After 1977, small amounts of coal consumed by the transportation sector are included in "Industrial."

² Nonutility wholesale producers of electricity and cogeneration plants not included in the end-use sectors.

(s)=Less than 0.5 percent.

Source: Table 7.3.

Table 7.3 Coal Consumption by Sector, 1949-1999

(Million Short Tons)

Year	End-Use Sectors [1]					Electric Power Sector			Total
	Residential and Commercial	Industrial			Transportation	Electric Utilities	Other Power Producers [2]	Total	
		Coke Plants	Other	Total					
1949	116.5	91.4	121.2	212.6	70.2	84.0	NA	84.0	483.2
1950	114.6	104.0	120.6	224.6	63.0	91.9	NA	91.9	494.1
1951	101.5	113.7	128.7	242.4	56.2	105.8	NA	105.8	505.9
1952	92.3	97.8	117.1	214.9	39.8	107.1	NA	107.1	454.1
1953	79.2	113.1	117.0	230.1	29.6	115.9	NA	115.9	454.8
1954	69.1	85.6	98.2	183.9	18.6	118.4	NA	118.4	389.9
1955	68.4	107.7	110.1	217.8	17.0	143.8	NA	143.8	447.0
1956	64.2	106.3	114.3	220.6	13.8	158.3	NA	158.3	456.9
1957	49.0	108.4	106.5	214.9	9.8	160.8	NA	160.8	434.5
1958	47.9	76.8	100.5	177.4	4.7	155.7	NA	155.7	385.7
1959	40.8	79.6	92.7	172.3	3.6	168.4	NA	168.4	385.1
1960	40.9	81.4	96.0	177.4	3.0	176.7	NA	176.7	398.1
1961	37.3	74.2	95.9	170.1	0.8	182.2	NA	182.2	390.4
1962	36.5	74.7	97.1	171.7	0.7	193.3	NA	193.3	402.3
1963	31.5	78.1	101.9	180.0	0.7	211.3	NA	211.3	423.5
1964	27.2	89.2	103.1	192.4	0.7	225.4	NA	225.4	445.7
1965	25.7	95.3	105.6	200.8	0.7	244.8	NA	244.8	472.0
1966	25.6	96.4	108.7	205.1	0.6	266.5	NA	266.5	497.7
1967	22.1	92.8	101.8	194.6	0.5	274.2	NA	274.2	491.4
1968	20.0	91.3	100.4	191.6	0.4	297.8	NA	297.8	509.8
1969	18.9	93.4	93.1	186.6	0.3	310.6	NA	310.6	516.4
1970	16.1	96.5	90.2	186.6	0.3	320.2	NA	320.2	523.2
1971	15.2	83.2	75.6	158.9	0.2	327.3	NA	327.3	501.6
1972	11.7	87.7	72.9	160.6	0.2	351.8	NA	351.8	524.3
1973	11.1	94.1	68.0	162.1	0.1	389.2	NA	389.2	562.6
1974	11.4	90.2	64.9	155.1	0.1	391.8	NA	391.8	558.4
1975	9.4	83.6	63.6	147.2	(s)	406.0	NA	406.0	562.6
1976	8.9	84.7	61.8	146.5	(s)	448.4	NA	448.4	603.8
1977	9.0	77.7	61.5	139.2	(s)	477.1	NA	477.1	625.3
1978	9.5	71.4	63.1	134.5	(3)	481.2	NA	481.2	625.2
1979	8.4	77.4	67.7	145.1	(3)	527.1	NA	527.1	680.5
1980	6.5	66.7	60.3	127.0	(3)	569.3	NA	569.3	702.7
1981	7.4	61.0	67.4	128.4	(3)	596.8	NA	596.8	732.6
1982	8.2	40.9	64.1	105.0	(3)	593.7	NA	593.7	706.9
1983	8.4	37.0	66.0	103.0	(3)	625.2	NA	625.2	736.7
1984	9.1	44.0	73.7	117.8	(3)	664.4	NA	664.4	791.3
1985	7.8	41.1	75.4	116.4	(3)	693.8	NA	693.8	818.0
1986	7.7	35.9	75.6	111.5	(3)	685.1	NA	685.1	804.2
1987	6.9	37.0	75.2	112.1	(3)	717.9	NA	717.9	836.9
1988	7.1	41.9	76.3	118.1	(3)	758.4	NA	758.4	883.6
1989	6.2	40.5	76.1	116.6	(3)	766.9	NA	766.9	889.7
1990	6.7	38.9	76.3	115.2	(3)	773.5	NA	773.5	895.5
1991	6.1	33.9	75.4	109.3	(3)	772.3	NA	772.3	887.6
1992	6.2	32.4	74.0	106.4	(3)	779.9	15.2	[4]795.1	[4]907.7
1993	6.2	31.3	74.9	106.2	(3)	813.5	18.1	831.6	944.1
1994	6.0	31.7	75.2	106.9	(3)	817.3	21.3	838.5	951.5
1995	5.8	33.0	73.1	106.1	(3)	829.0	21.2	850.2	962.0
1996	6.0	31.7	70.9	102.6	(3)	874.7	22.2	896.9	1,005.6
1997	6.5	30.2	70.6	100.8	(3)	900.4	21.6	922.0	1,029.2
1998	[R]4.9	[R]28.2	[R]68.1	[R]96.3	(3)	910.9	[R]28.1	[R]938.9	[R]1,040.1
1999[E]	4.9	27.9	68.0	95.9	(3)	896.6	47.8	944.4	1,045.2

[1] Over half of the coal consumption at nonutility power producers is included in the end-use sectors.

[2] Nonutility wholesale producers of electricity, and nonutility cogeneration plants that are not included in the end-use sectors.

[3] After 1977, small amounts of coal consumed by the Transportation Sector are included in "Other" under the Industrial Sectors

[4] There is a discontinuity in this time series between 1991 and 1992 due to the addition of the coal consumed by independent power producers beginning in 1992.

R=Revised. E=Estimated. NA=Not available. (s)=Less than 0.05 million short tons.

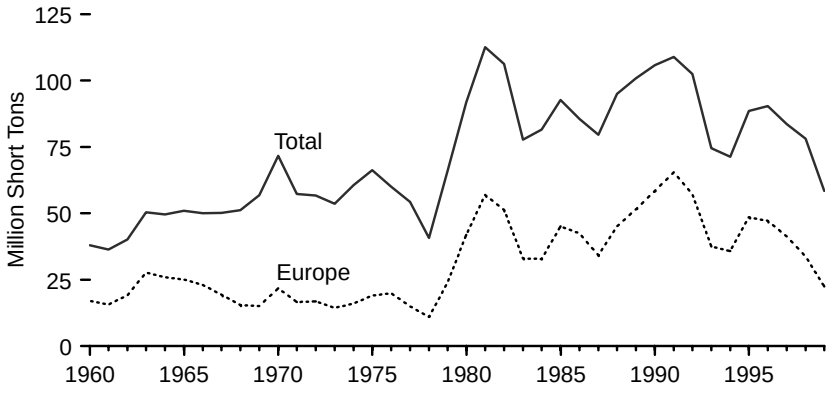
Notes: • See Note at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelcoal.html.

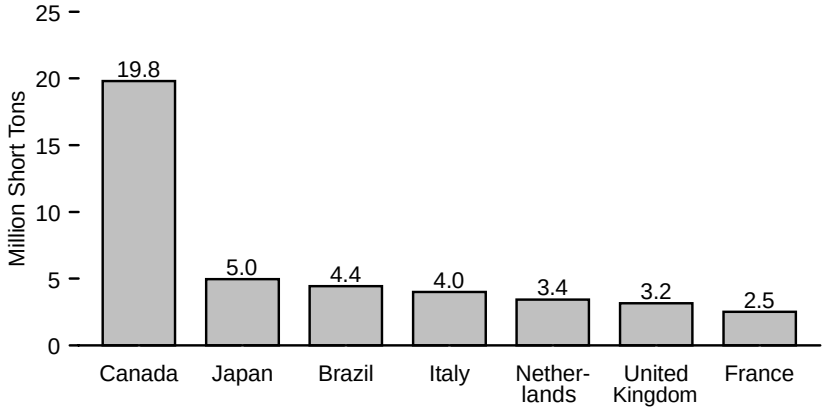
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook,* "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976.* • 1977 and 1978—EIA, Energy Data Report, *Coal-Pennsylvania Anthracite 1977; 1978,* and *Weekly Coal Report.* • 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report.* • 1981-1998—EIA, *Quarterly Coal Report October-December,* quarterly reports. • 1999—Table 8.8 of this report and EIA, *Monthly Energy Review* (March 2000), Table 6.2.

Figure 7.4 Coal Exports by Country of Destination

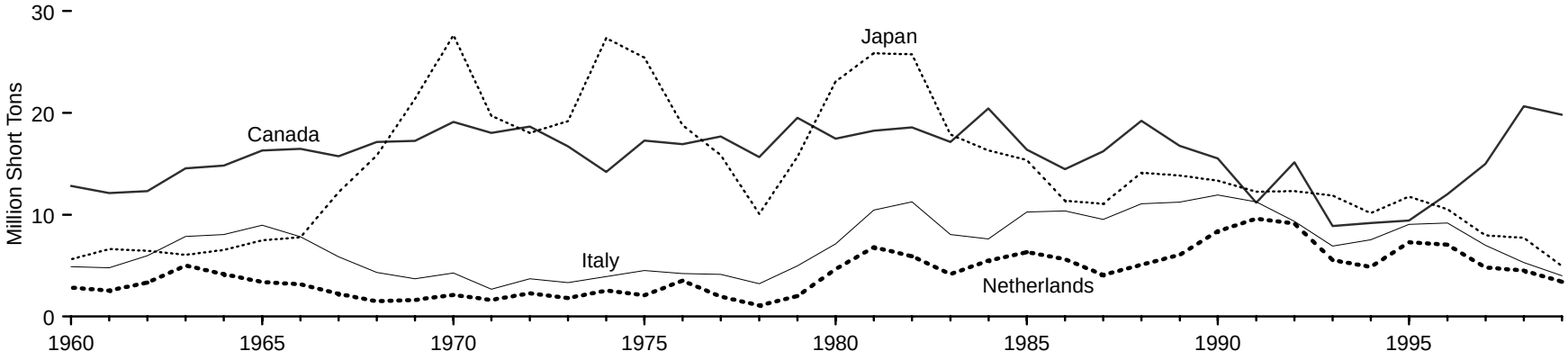
Total and Europe, 1960-1999



By Selected Country, 1999



By Selected Country, 1960-1999



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

Source: Table 7.4.

Table 7.4 Coal Exports by Country of Destination, 1960-1999

(Million Short Tons)

Year	Canada	Brazil	Europe										Japan	Other	Total
			Belgium and 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
1995	9.4	6.4	4.5	2.1	3.7	2.0	9.1	7.3	4.7	4.7	10.7	48.6	11.8	12.4	88.5
1996	12.0	6.5	4.6	1.3	3.9	1.1	9.2	7.1	4.1	6.2	9.8	47.2	10.5	14.2	90.5
1997	15.0	7.5	4.3	0.4	3.4	0.9	7.0	4.8	4.1	7.2	9.2	41.3	8.0	11.8	83.5
1998	[R]20.7	6.5	3.2	0.3	3.2	1.2	5.3	4.5	3.2	5.9	6.9	33.8	7.7	9.4	[R]78.0
1999	19.8	4.4	2.1	0.0	2.5	0.6	4.0	3.4	2.5	3.2	4.3	22.5	5.0	6.7	58.5

[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.

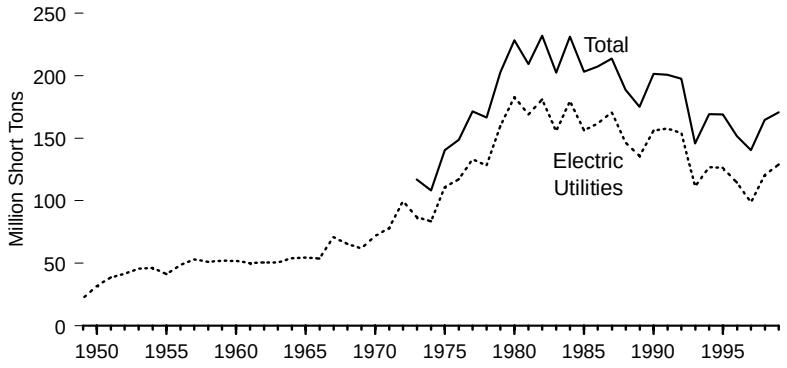
R=Revised. (s)=Less than 0.05 million short tons.

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

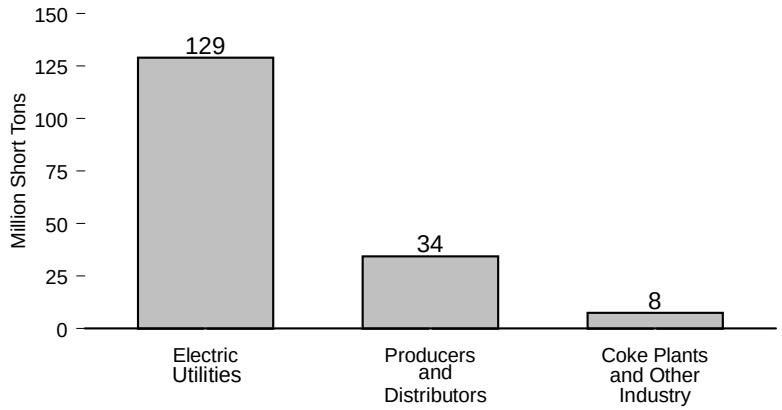
Sources: • 1960-1988—U.S. Department of Commerce, Bureau of the Census. *U.S. Exports by Schedule B Commodities, EM 522.* • 1989-1998—Energy Information Administration, *Coal Industry Annual,* annual reports. • 1999—U.S. Department of Commerce, Bureau of the Census, "Monthly Report EM 545."

Figure 7.5 Coal Stocks

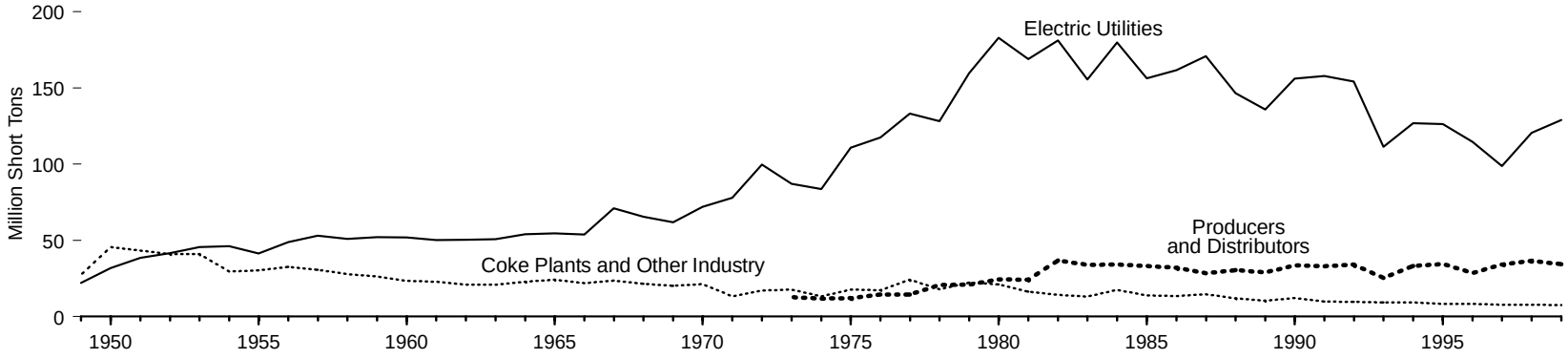
Total and Electric Utility Stocks, 1949-1999



By Holding Entity, 1999



By Holding Entity, 1949-1999



Notes: • Stocks are at end of year. • Because vertical scales differ, graphs should not be compared.

Source: Table 7.5.

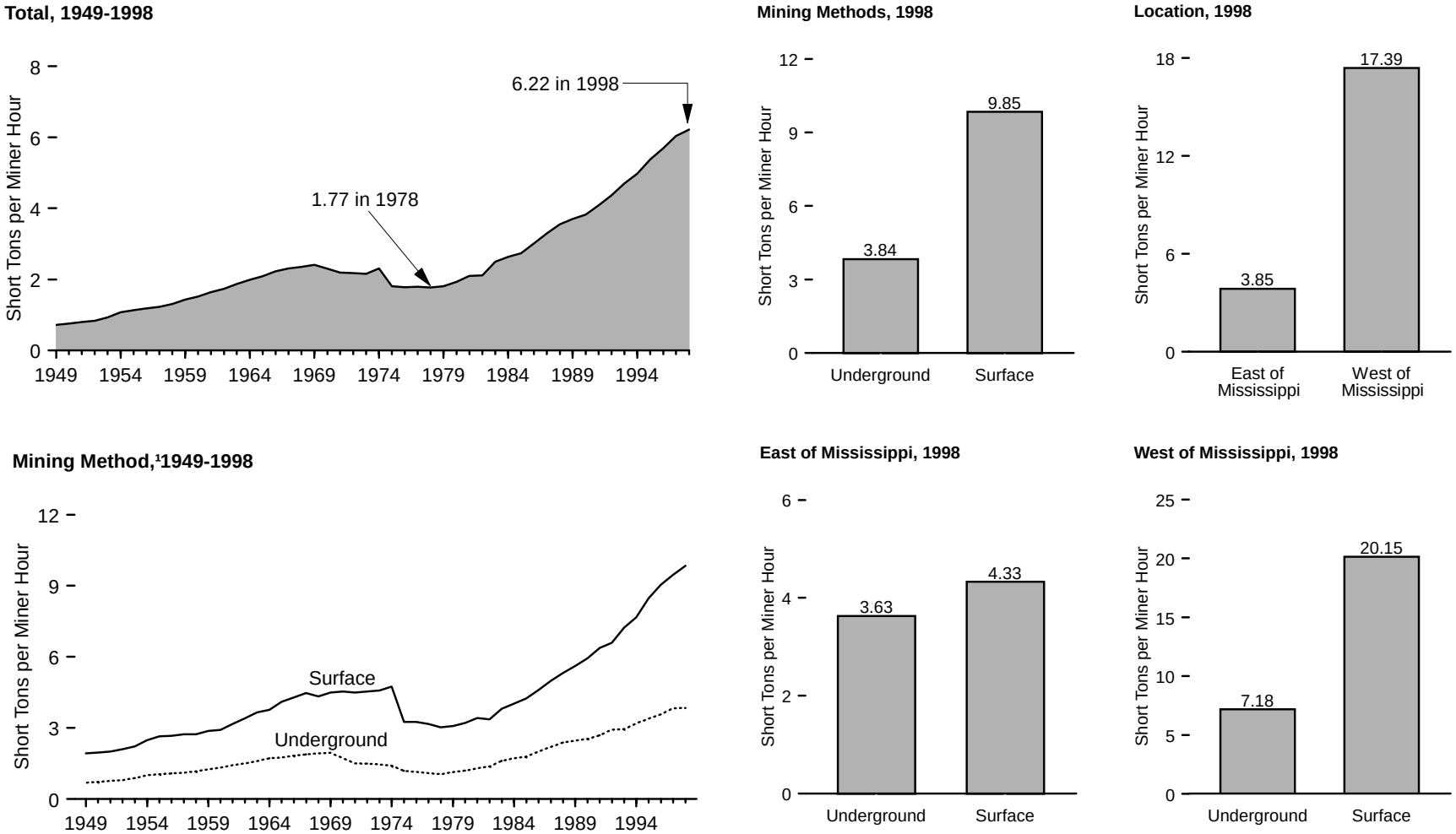
Table 7.5 Coal Stocks, 1949-1999

(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	2.4	6.7	111.3	120.5	25.3	145.7
1994	NA	2.7	6.6	126.9	136.1	33.2	169.4
1995	NA	2.6	5.7	126.3	134.6	34.4	169.1
1996	NA	2.7	5.7	114.6	123.0	28.6	151.6
1997	NA	2.0	5.6	98.8	106.4	34.0	140.4
1998	NA	2.0	R5.5	120.5	R128.1	R36.5	R164.6
1999	NA	E2.0	E5.5	P128.9	E136.4	E34.4	E170.8

[1] Stocks at retail dealers, excluding anthracite.
[2] Includes transportation sector.
R=Revised. P=Preliminary. E=Estimated. NA=Not available.
Notes: • Stocks are at end of year. • Totals may not equal sum of components due to independent rounding.
Web Page: http://www.eia.doe.gov/fuelcoal.html.
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook,* "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976.* • 1977 and 1978—EIA, Energy Data Report, *Coal-Pennsylvania Anthracite 1977; 1978,* and *Weekly Coal Report.* • 1979—EIA, Energy Data Report, *Weekly Coal Report.* • 1980-1998—EIA, *Quarterly Coal Report October-December,* quarterly reports. • 1999—Table 8.12 of this report and EIA, *Monthly Energy Review* (March 2000), Table 6.3.

Figure 7.6 Coal Mining Productivity



[1] For 1979 forward, includes all coal; prior to 1979, excludes anthracite.
Note: Because vertical scales differ, graphs should not be compared.

Source: Table 7.6.

Table 7.6 Coal Mining Productivity, 1949-1998

(Short Tons per Miner Hour [1])

Year	Mining Method		Location						
			East of the Mississippi			West of the Mississippi			
	Underground	Surface	Underground	Surface	Total	Underground	Surface	Total	Total
1949	[2]0.68	[2]1.92	NA	NA	NA	NA	NA	NA	0.72
1950	[2]0.72	[2]1.96	NA	NA	NA	NA	NA	NA	0.76
1951	[2]0.76	[2]2.00	NA	NA	NA	NA	NA	NA	0.80
1952	[2]0.80	[2]2.10	NA	NA	NA	NA	NA	NA	0.84
1953	[2]0.88	[2]2.22	NA	NA	NA	NA	NA	NA	0.93
1954	[2]1.00	[2]2.48	NA	NA	NA	NA	NA	NA	1.08
1955	[2]1.04	[2]2.65	NA	NA	NA	NA	NA	NA	1.14
1956	[2]1.08	[2]2.67	NA	NA	NA	NA	NA	NA	1.19
1957	[2]1.11	[2]2.73	NA	NA	NA	NA	NA	NA	1.23
1958	[2]1.17	[2]2.73	NA	NA	NA	NA	NA	NA	1.31
1959	[2]1.26	[2]2.87	NA	NA	NA	NA	NA	NA	1.43
1960	[2]1.33	[2]2.91	NA	NA	NA	NA	NA	NA	1.52
1961	[2]1.43	[2]3.16	NA	NA	NA	NA	NA	NA	1.64
1962	[2]1.50	[2]3.40	NA	NA	NA	NA	NA	NA	1.74
1963	[2]1.60	[2]3.66	NA	NA	NA	NA	NA	NA	1.87
1964	[2]1.72	[2]3.76	NA	NA	NA	NA	NA	NA	1.99
1965	[2]1.75	[2]4.10	NA	NA	NA	NA	NA	NA	2.09
1966	[2]1.83	[2]4.28	NA	NA	NA	NA	NA	NA	2.23
1967	[2]1.88	[2]4.48	NA	NA	NA	NA	NA	NA	2.31
1968	[2]1.93	[2]4.33	NA	NA	NA	NA	NA	NA	2.35
1969	[2]1.95	[2]4.50	NA	NA	NA	NA	NA	NA	2.41
1970	[2]1.72	[2]4.53	NA	NA	NA	NA	NA	NA	2.30
1971	[2]1.50	[2]4.49	NA	NA	NA	NA	NA	NA	2.19
1972	[2]1.49	[2]4.54	NA	NA	NA	NA	NA	NA	2.18
1973	[2]1.46	[2]4.58	NA	NA	NA	NA	NA	NA	2.16
1974	[2]1.41	[2]4.74	NA	NA	NA	NA	NA	NA	2.31
1975	[2]1.19	[2]3.26	NA	NA	NA	NA	NA	NA	1.81
1976	[2]1.14	[2]3.25	NA	NA	NA	NA	NA	NA	1.78
1977	[2]1.09	[2]3.16	NA	NA	NA	NA	NA	NA	1.80
1978	[2]1.04	[2]3.03	NA	NA	NA	NA	NA	NA	1.77
1979	1.13	3.08	NA	NA	NA	NA	NA	NA	1.81
1980	1.20	3.21	NA	NA	NA	NA	NA	NA	1.93
1981	1.29	3.42	NA	NA	NA	NA	NA	NA	2.10
1982	1.37	3.36	NA	NA	NA	NA	NA	NA	2.11
1983	1.61	3.81	NA	NA	NA	NA	NA	NA	2.50
1984	1.72	4.03	1.69	2.56	1.98	2.49	8.15	7.07	2.64
1985	1.78	4.24	1.75	2.52	2.00	2.45	8.61	7.40	2.74
1986	2.00	4.60	1.96	2.75	2.21	2.80	9.02	7.90	3.01
1987	2.20	4.98	2.16	2.97	2.42	3.39	9.86	8.73	3.30
1988	2.38	5.32	2.32	2.99	2.54	3.55	10.73	9.38	3.55
1989	2.46	5.61	2.39	3.13	2.63	3.92	11.86	10.21	3.70
1990	2.54	5.94	2.46	3.32	2.73	4.01	12.26	10.41	3.83
1991	2.69	6.38	2.59	3.49	2.86	4.53	12.36	10.79	4.09
1992	2.93	6.59	2.82	3.61	3.07	4.85	12.49	11.03	4.36
1993	2.95	7.23	2.81	3.74	3.11	5.18	13.94	12.14	4.70
1994	3.19	7.67	3.02	3.85	3.28	5.93	15.19	13.22	4.98
1995	3.39	8.48	3.19	4.03	3.45	6.32	16.23	14.18	5.38
1996	3.57	9.05	3.36	4.25	3.63	7.03	17.89	15.66	5.69
1997	3.83	9.46	3.63	4.49	3.89	6.82	18.63	16.04	6.04
1998	3.84	9.85	3.63	4.33	3.85	7.18	20.15	17.39	6.22

[1] Data for bituminous, subbituminous, and lignite mines 1949-1973 and anthracite mines 1949-1978 were originally reported in short tons per miner-day. The data were converted to short-tons per miner-hour by assuming an eight-hour day. All remaining data were calculated by dividing total production by total labor hours worked by all mine employees except office workers.

[2] Anthracite mining productivity is unavailable by underground and surface but is included in the Total.

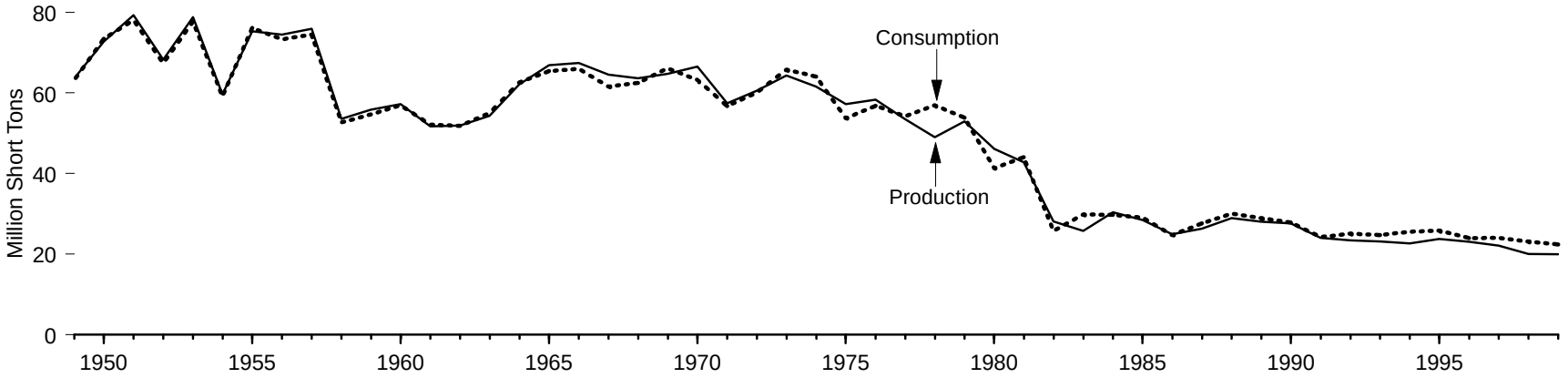
NA=Not available.

Web Page: http://www.eia.doe.gov/fuelcoal.html.

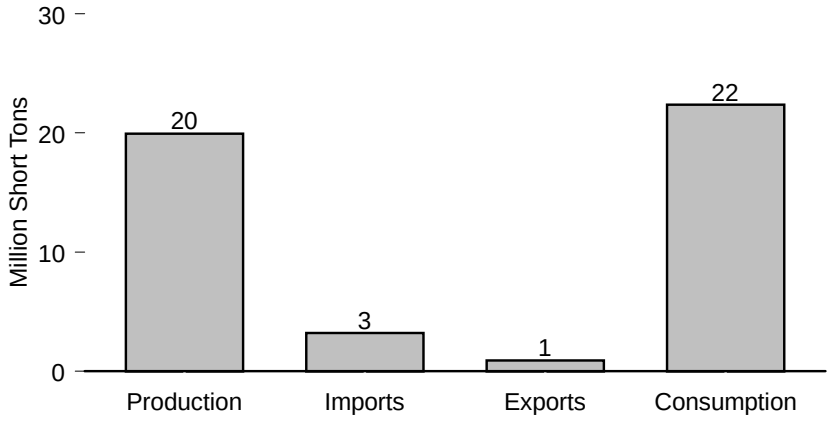
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook,* "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976.* • 1977 and 1978—EIA, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977; 1978* and *Coal-Pennsylvania Anthracite 1977; 1978.* • 1979—EIA, Energy Data Report, *Coal Production-1979.* • 1980-1988—EIA, *Coal Production,* annual reports. • 1989 forward—EIA, *Coal Industry Annual,* annual reports.

Figure 7.7 Coke Overview

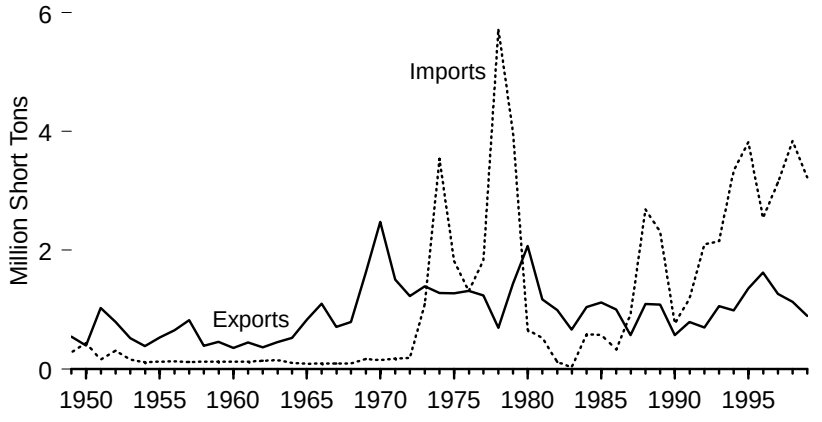
Production and Consumption, 1949-1999



Overview, 1999



Trade, 1949-1999



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

Source: Table 7.7.

Table 7.7 Coke Overview, 1949-1999

(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	[R]1.18	[R]0.79	0.19	[R]24.25
1992	23.41	[R]2.10	[R]0.70	-0.22	[R]25.03
1993	23.18	[R]2.16	[R]1.06	-0.42	[R]24.70
1994	22.69	[R]3.34	[R]0.99	-0.53	[R]25.56
1995	23.75	[R]3.82	[R]1.36	0.37	[R]25.85
1996	23.08	[R]2.54	[R]1.62	0.02	[R]23.97
1997	22.12	[R]3.14	[R]1.27	-0.03	[R]24.02
1998	[R]20.04	[R]3.83	[R]1.13	[R]-0.36	[R]23.11
1999[P]	19.95	3.22	0.90	-0.08	22.36

[1] Producer and distributor stocks at end of year. A negative value indicates a net decrease in stocks; a positive value indicates a net increase in stocks.

[2] "Consumption" is calculated as the sum of production and imports minus exports and stock change.

R=Revised. P=Preliminary. (s)=Less than 0.005 million short tons.

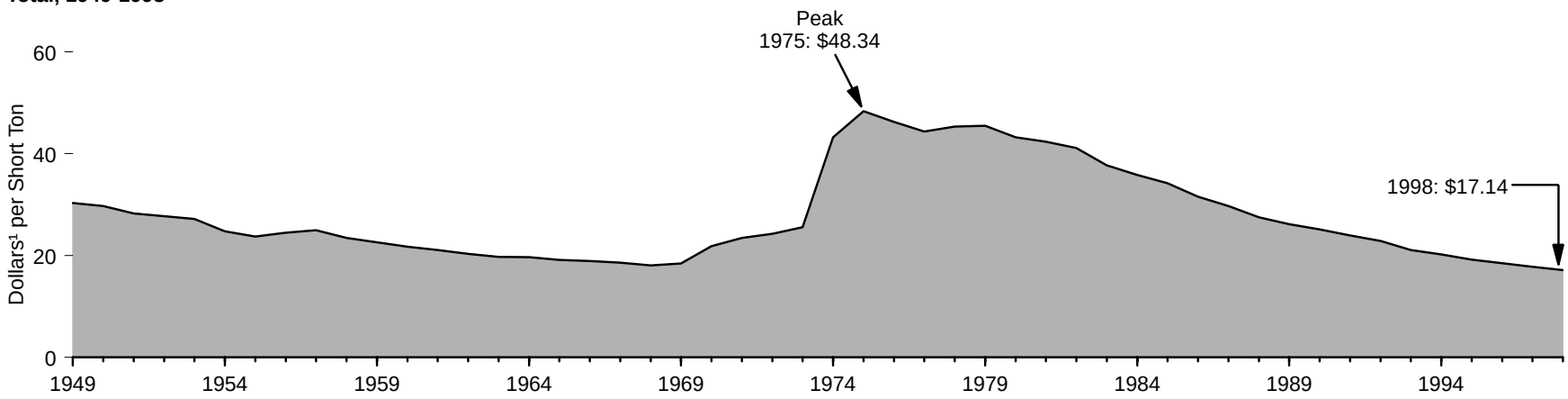
Note: Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelcoal.html.

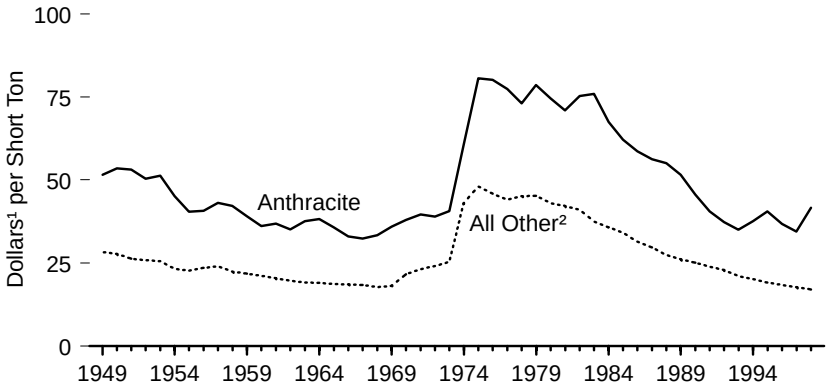
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook,* "Coke and Coal Chemicals" chapter. • 1976-1980—Energy Information Administration (EIA), Energy Data Report, *Coke and Coal Chemicals,* annual reports. • 1981-1998—EIA, *Quarterly Coal Report October-December,* quarterly reports. • 1999—EIA estimates.

Figure 7.8 Coal Prices

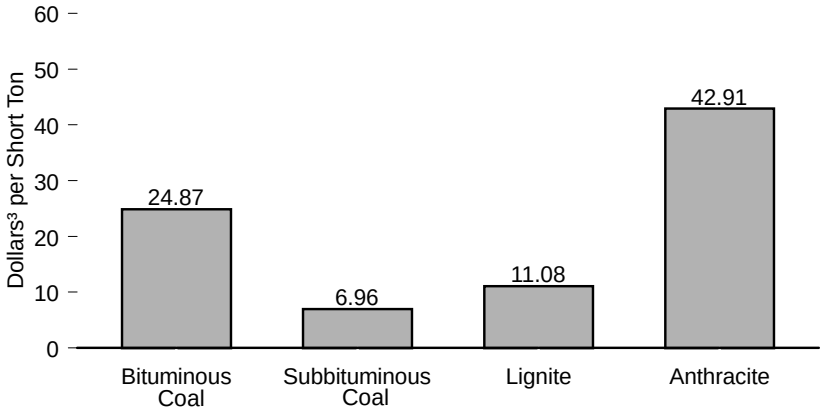
Total, 1949-1998



By Type, 1949-1998



By Type, 1998



[1] In chained (1996) dollars, calculated by using gross domestic implicit price deflators. See Table E1.

[2] Bituminous coal, subbituminous coal, and lignite.

[3] Nominal dollars.

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

Source: Table 7.8.

Table 7.8 Coal Prices, 1949-1998

(Dollars per Short Ton)

Year	Bituminous Coal		Subbituminous Coal		Lignite		Subtotal [1]		Anthracite		Total	
	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]	Nominal	Real [2]
1949	[3]4.90	[3]28.39	([4])	([4])	2.37	R13.73	4.88	R28.27	8.90	R51.56	5.24	R30.36
1950	[3]4.86	[3]27.85	([4])	([4])	2.41	R13.81	4.84	R27.74	9.34	R53.52	5.19	R29.74
1951	[3]4.94	[3]26.40	([4])	([4])	2.44	R13.04	4.92	R26.30	9.94	R53.13	5.29	R28.27
1952	[3]4.92	[3]25.89	([4])	([4])	2.39	R12.58	4.90	R25.79	9.58	R50.42	5.27	R27.74
1953	[3]4.94	[3]25.66	([4])	([4])	2.38	R12.36	4.92	R25.56	9.87	R51.27	5.23	R27.17
1954	[3]4.54	[3]23.35	([4])	([4])	2.43	R12.50	4.52	R23.25	8.76	R45.06	4.81	R24.74
1955	[3]4.51	[3]22.80	([4])	([4])	2.38	R12.03	4.50	R22.75	8.00	R40.44	4.69	R23.71
1956	[3]4.83	[3]23.62	([4])	([4])	2.39	R11.69	4.82	R23.57	8.33	R40.73	5.01	R24.50
1957	[3]5.09	[3]24.09	([4])	([4])	2.35	R11.12	5.08	R24.04	9.11	R43.11	5.28	R24.99
1958	[3]4.87	[3]22.50	([4])	([4])	2.35	R10.86	4.86	R22.46	9.14	R42.24	5.07	R23.43
1959	[3]4.79	[3]21.89	([4])	([4])	2.25	R10.28	4.77	R21.80	8.55	R39.08	4.95	R22.62
1960	[3]4.71	[3]21.23	([4])	([4])	2.29	R10.32	4.69	R21.14	8.01	R36.10	4.83	R21.77
1961	[3]4.60	[3]20.50	([4])	([4])	2.24	R9.98	4.58	R20.41	8.26	R36.81	4.73	R21.08
1962	[3]4.50	[3]19.79	([4])	([4])	2.23	R9.81	4.48	R19.70	7.99	R35.14	4.62	R20.32
1963	[3]4.40	[3]19.13	([4])	([4])	2.17	R9.43	4.39	R19.09	8.64	R37.57	4.55	R19.78
1964	[3]4.46	[3]19.11	([4])	([4])	2.14	R9.17	4.45	R19.07	8.93	R38.26	4.60	R19.71
1965	[3]4.45	[3]18.71	([4])	([4])	2.13	R8.96	4.44	R18.67	8.51	R35.79	4.55	R19.13
1966	[3]4.56	[3]18.64	([4])	([4])	1.98	R8.09	4.54	R18.56	8.08	R33.03	4.62	R18.89
1967	[3]4.64	[3]18.41	([4])	([4])	1.92	R7.62	4.62	R18.33	8.15	R32.33	4.69	R18.60
1968	[3]4.70	[3]17.87	([4])	([4])	1.79	R6.81	4.67	R17.76	8.78	R33.38	4.75	R18.06
1969	[3]5.02	[3]18.19	([4])	([4])	1.86	R6.74	4.99	R18.09	9.91	R35.92	5.08	R18.41
1970	[3]6.30	[3]21.68	([4])	([4])	1.86	R6.40	6.26	R21.54	11.03	R37.96	6.34	R21.82
1971	[3]7.13	[3]23.36	([4])	([4])	1.93	R6.32	7.07	R23.17	12.08	R39.58	7.15	R23.43
1972	[3]7.78	[3]24.45	([4])	([4])	2.04	R6.41	7.66	R24.07	12.40	R38.97	7.72	R24.26
1973	[3]8.71	[3]25.92	([4])	([4])	2.09	R6.22	8.53	R25.39	13.65	R40.63	8.59	R25.57
1974	[3]16.01	[3]43.72	([4])	([4])	2.19	R5.98	15.75	R43.01	22.19	R60.60	15.82	R43.20
1975	[3]19.79	[3]49.44	([4])	([4])	3.17	R7.92	19.23	R48.04	32.26	R80.59	19.35	R48.34
1976	[3]20.11	[3]47.54	([4])	([4])	3.74	R8.84	19.43	R45.93	33.92	R80.19	19.56	R46.24
1977	[3]20.59	[3]45.74	([4])	([4])	4.03	R8.95	19.82	R44.02	34.86	R77.43	19.95	R44.31
1978	[3]22.64	[3]46.94	([4])	([4])	5.68	R11.78	21.76	R45.12	35.25	R73.09	21.86	R45.32
1979	[3]27.31	[3]52.27	9.55	R18.28	6.48	R12.40	23.66	R45.28	41.06	R78.58	23.75	R45.45
1980	29.17	R51.14	11.08	R19.42	W	W	24.52	R42.99	42.51	R74.53	24.65	R43.22
1981	31.51	R50.52	12.18	R19.53	W	W	26.29	R42.15	44.28	R71.00	26.40	R42.33
1982	32.15	R48.53	13.37	R20.18	W	W	27.14	R40.97	49.85	R75.25	27.25	R41.13
1983	31.11	R45.17	13.03	R18.92	W	W	25.85	R37.53	52.29	R75.91	25.98	R37.72
1984	30.63	R42.88	12.41	R17.37	10.45	R14.63	25.51	R35.71	48.22	R67.50	25.61	R35.85
1985	30.78	R41.77	12.57	R17.06	10.68	R14.49	25.10	R34.06	45.80	R62.15	25.20	R34.20
1986	28.84	R38.30	12.26	R16.28	10.64	R14.13	23.70	R31.47	44.12	R58.58	23.79	R31.59
1987	28.19	R36.34	11.32	R14.59	10.85	R13.99	23.00	R29.65	43.65	R56.26	23.07	R29.74
1988	27.66	R34.48	10.45	R13.03	10.06	R12.54	22.00	R27.43	44.16	R55.06	22.07	R27.52
1989	27.40	R32.91	10.16	R12.20	9.91	R11.90	21.76	R26.13	42.93	R51.56	21.82	R26.20
1990	27.43	R31.71	9.70	R11.21	10.13	R11.71	21.71	R25.10	39.40	R45.54	21.76	R25.15
1991	27.49	R30.66	9.68	R10.80	10.89	R12.15	21.45	R23.92	36.34	R40.53	21.49	R23.97
1992	26.78	R29.16	9.68	R10.54	10.81	R11.77	20.99	R22.85	34.24	R37.28	21.03	R22.90
1993	26.15	R27.80	9.33	R9.92	11.11	R11.81	19.79	R21.04	32.94	R35.02	19.85	R21.11
1994	25.68	R26.75	8.37	R8.72	10.77	R11.22	19.34	R20.14	36.07	R37.57	19.41	R20.22
1995	25.56	R26.06	8.10	R8.26	10.83	R11.04	18.74	R19.10	39.78	R40.55	18.83	R19.19
1996	25.17	R25.17	7.87	R7.87	10.92	R10.92	18.42	R18.42	36.78	R36.78	18.50	R18.50
1997	24.64	R24.18	7.42	R7.28	10.91	R10.71	R18.07	R17.73	35.12	R34.46	18.14	R17.80
1998	R24.87	R24.12	R6.96	R6.75	R11.08	R10.75	R17.55	R17.02	R42.91	R41.62	R17.67	R17.14

[1] Subtotal of bituminous coal, subbituminous coal, and lignite.

[2] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

[3] Includes subbituminous coal.

[4] Included in bituminous coal.

R=Revised. W=Withheld to avoid disclosure of individual company data.

Note: Prices are free-on-board (f.o.b.) mine prices. See Glossary.

Web Page: http://www.eia.doe.gov/fuelcoal.html.

Sources: **Bituminous Coal, Subbituminous Coal, and Lignite:** • 1949-1975—Bureau of Mines, *Minerals Yearbook,* "Coal-Bituminous and Lignite" chapter. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976.* • 1977 and 1978—EIA, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977; 1978.* • 1979-1992—EIA, *Coal Production,* annual reports. • 1993-1998—EIA, *Coal Industry Annual,* annual reports. **Anthracite:** • 1949-1976—Bureau of Mines, *Minerals Yearbook,* "Coal-Pennsylvania Anthracite" chapter. • 1977 and 1978—EIA, Energy Data Report, *Coal-Pennsylvania Anthracite 1977; 1978.* • 1979—EIA, Energy Data Report, *Coal Production-1979.* • 1980-1992—EIA, *Coal Production,* annual reports. • 1993-1998—EIA, *Coal Industry Annual,* annual reports. **Total:** • 1949-1978—Calculated as a production weighted average of the rank prices shown. • 1979-1998—EIA, *Coal Industry Annual,* annual reports.

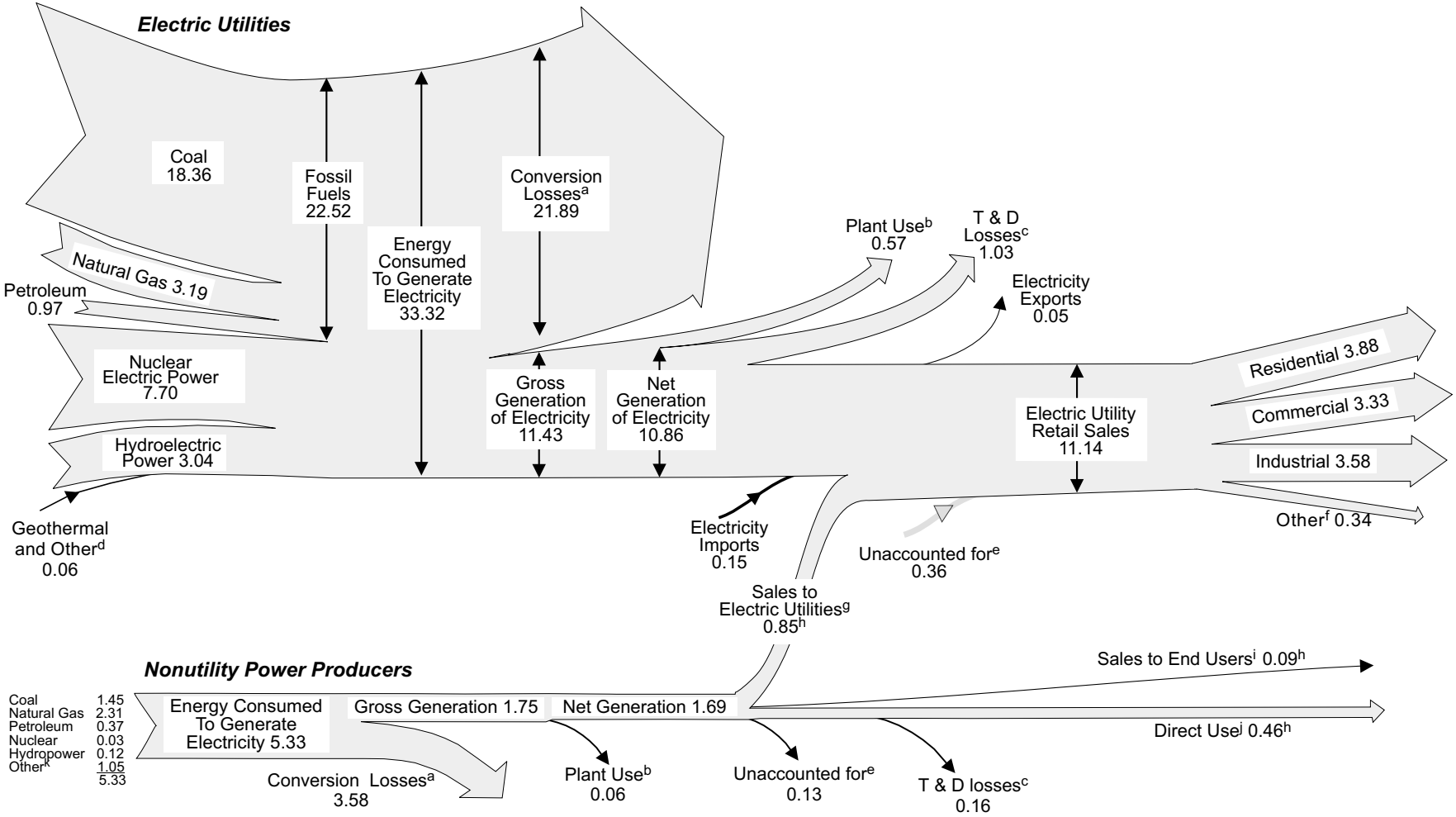
Coal Note

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 Power Industry–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 bunkers; Residential and Commercial Sector–retail dealer sales to households and small commercial establishments.

8 Electricity

High-tension power lines and towers. Source: U.S. Department of Energy.

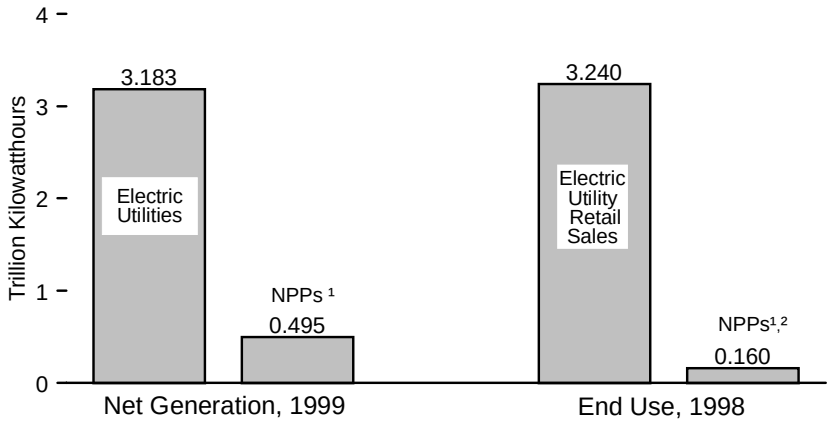
Diagram 5. Electricity Flow, 1999
(Quadrillion Btu)



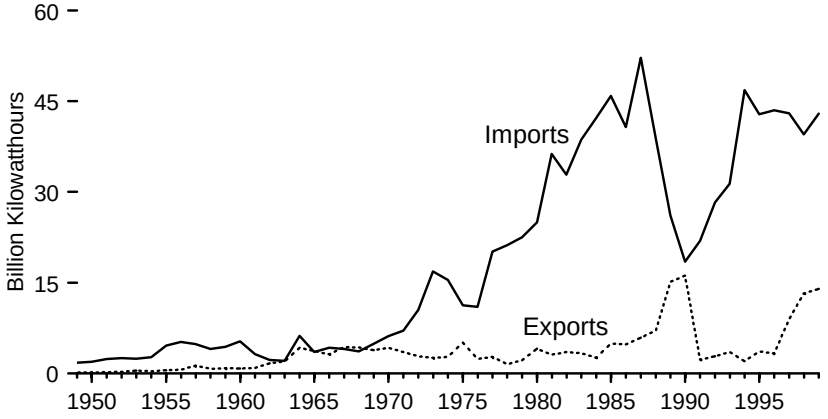
[a] Approximately two-thirds of all energy used to generate electricity. See Note 1 at end of section.
[b] The electric energy used in the operation of power plants. For utilities, plant use is estimated as 5 percent of gross generation. See Note 1 at end of section.
[c] Transmission and distribution losses are estimated as 9 percent of gross generation of electricity. See Note 1 at end of section.
[d] Wood, waste, wind, and solar energy used to generate electricity. See Table 8.3.
[e] Balancing item to adjust for 1998 data used to estimate 1999 values for some small series; data collection frame differences; and nonsampling error.
[f] Public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.
[g] Sales, interchanges, and exchanges of electric energy with utilities.
[h] 1999 data not available; this is the 1998 value.
[i] Includes sales, interchanges, and exchanges of electric energy with other nonutilities.
[j] Direct use is facility use of onsite net electricity generation.
[k] Geothermal, wood, waste, wind, and solar energy used to generate electricity.
See Table 8.4.
Note: Totals may not equal sum of components due to independent rounding.
Sources: Tables 8.1, 8.3, 8.8, 8.9, 8.14, and A6.

Figure 8.1 Electricity Overview

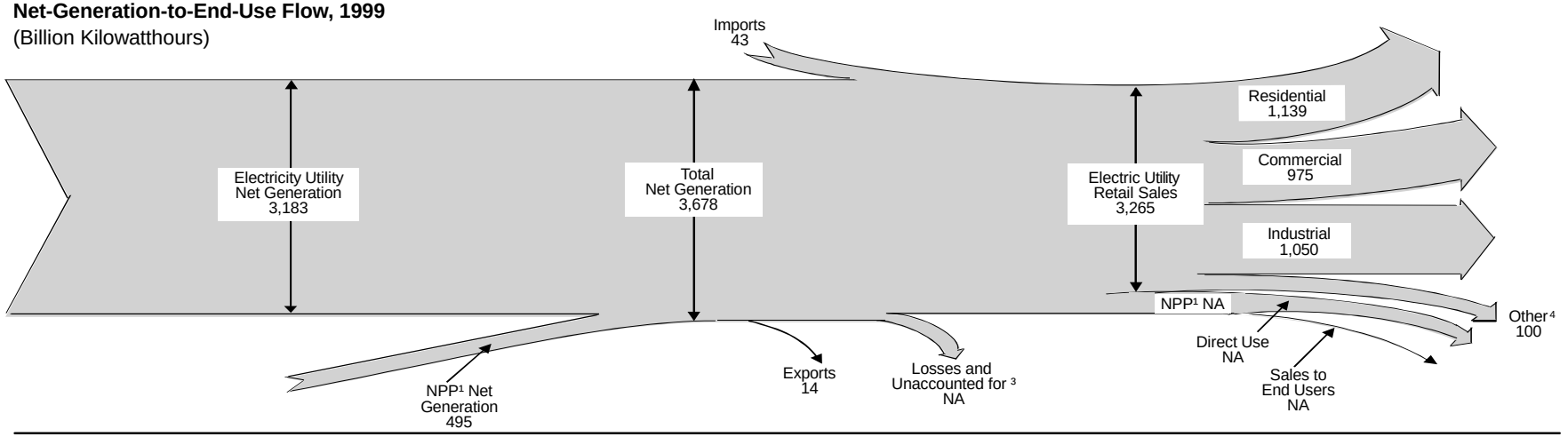
Net Generation and End Use



Electricity Trade, 1949-1999



Net-Generation-to-End-Use Flow, 1999
(Billion Kilowatthours)



[1] Nonutility power producers. See Glossary.

[2] Direct use and sales to end users.

[3] Energy losses that occur between the point of generation and delivery to the customer, and data collection frame differences and nonsampling error.

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

NA=Not available.

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

Sources: Tables 8.1 and 8.9.

Table 8.1 Electricity Overview, 1949-1999

(Billion Kilowatthours)

Year	Net Generation			Imports [1]	Exports [1]	Losses and Unaccounted for [2]	End Use			
	Electric Utilities	Nonutility Power Producers	Total				Electric Utility Retail Sales	Nonutility Power Producers		
								Direct Use [3]	Sales to End Users	Total
1949	291	NA	291	2	(s)	NA	255	NA	NA	NA
1950	329	NA	329	2	(s)	NA	291	NA	NA	NA
1951	371	NA	371	2	(s)	NA	330	NA	NA	NA
1952	399	NA	399	3	(s)	NA	356	NA	NA	NA
1953	443	NA	443	2	(s)	NA	396	NA	NA	NA
1954	472	NA	472	3	(s)	NA	424	NA	NA	NA
1955	547	NA	547	5	(s)	NA	497	NA	NA	NA
1956	601	NA	601	5	1	NA	546	NA	NA	NA
1957	632	NA	632	5	1	NA	576	NA	NA	NA
1958	645	NA	645	4	1	NA	588	NA	NA	NA
1959	710	NA	710	4	1	NA	647	NA	NA	NA
1960	756	NA	756	5	1	NA	688	NA	NA	NA
1961	794	NA	794	3	1	NA	722	NA	NA	NA
1962	855	NA	855	2	2	NA	778	NA	NA	NA
1963	917	NA	917	2	2	NA	833	NA	NA	NA
1964	984	NA	984	6	4	NA	896	NA	NA	NA
1965	1,055	NA	1,055	4	4	NA	954	NA	NA	NA
1966	1,144	NA	1,144	4	3	NA	1,035	NA	NA	NA
1967	1,214	NA	1,214	4	4	NA	1,099	NA	NA	NA
1968	1,329	NA	1,329	4	4	NA	1,203	NA	NA	NA
1969	1,442	NA	1,442	5	4	NA	1,314	NA	NA	NA
1970	1,532	NA	1,532	6	4	NA	1,392	NA	NA	NA
1971	1,613	NA	1,613	7	4	NA	1,470	NA	NA	NA
1972	1,750	NA	1,750	10	3	NA	1,595	NA	NA	NA
1973	1,861	NA	1,861	17	3	NA	1,713	NA	NA	NA
1974	1,867	NA	1,867	15	3	NA	1,706	NA	NA	NA
1975	1,918	NA	1,918	11	5	NA	1,747	NA	NA	NA
1976	2,038	NA	2,038	11	2	NA	1,855	NA	NA	NA
1977	2,124	NA	2,124	20	3	NA	1,948	NA	NA	NA
1978	2,206	NA	2,206	21	1	NA	2,018	NA	NA	NA
1979	2,247	NA	2,247	23	2	NA	2,071	NA	NA	NA
1980	2,286	NA	2,286	25	4	NA	2,094	NA	NA	NA
1981	2,295	NA	2,295	36	3	NA	2,147	NA	NA	NA
1982	2,241	NA	2,241	33	4	NA	2,086	NA	NA	NA
1983	2,310	NA	2,310	39	3	NA	2,151	NA	NA	NA
1984	2,416	NA	2,416	42	3	NA	2,286	NA	NA	NA
1985	2,470	NA	2,470	46	5	NA	2,324	NA	NA	NA
1986	2,487	NA	2,487	41	5	NA	2,369	NA	NA	NA
1987	2,572	NA	2,572	52	6	NA	2,457	NA	NA	NA
1988	2,704	NA	2,704	39	7	NA	2,578	NA	NA	NA
1989	2,784	[R,4]188	[R]2,972	26	15	[R]236	2,647	[4]83	[4]18	2,747
1990	2,808	[R,4]217	[R]3,025	[R]18	[R]16	[R]210	2,713	[4]84	[4]20	2,817
1991	2,825	[R,4]246	[R]3,071	[R]22	[R]2	218	2,762	[4]100	[4]11	2,873
1992	2,797	286	3,083	[R]28	[R]3	[R]224	2,763	111	11	2,885
1993	2,883	314	3,197	[R]31	[R]4	[R]236	2,861	111	16	2,988
1994	2,911	343	3,254	[R]47	[R]2	223	2,935	123	18	3,075
1995	2,995	363	3,358	[R]43	[R]4	[R]235	3,013	134	16	3,162
1996	3,077	370	3,447	[R]43	[R]3	[R]241	3,098	135	14	3,247
1997	3,123	372	3,494	[R]43	[R]9	[R]240	3,140	131	18	3,289
1998	3,212	[R]406	[R]3,618	[R]40	[R]13	[R]245	[R]3,240	[R]134	[R]26	[R]3,400
1999[P]	3,183	495	3,678	43	14	NA	3,265	NA	NA	NA

[1] Electricity transmitted across U.S. borders with Canada and Mexico.

[2] Energy losses that occur between the point of generation and delivery to the customer, and data collection frame differences and nonsampling error. See Note 1 at end of section.

[3] Facility use of onsite net electricity generation.

[4] Data for 1989-1991 were collected for facilities with capacities 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 1989-1991 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.

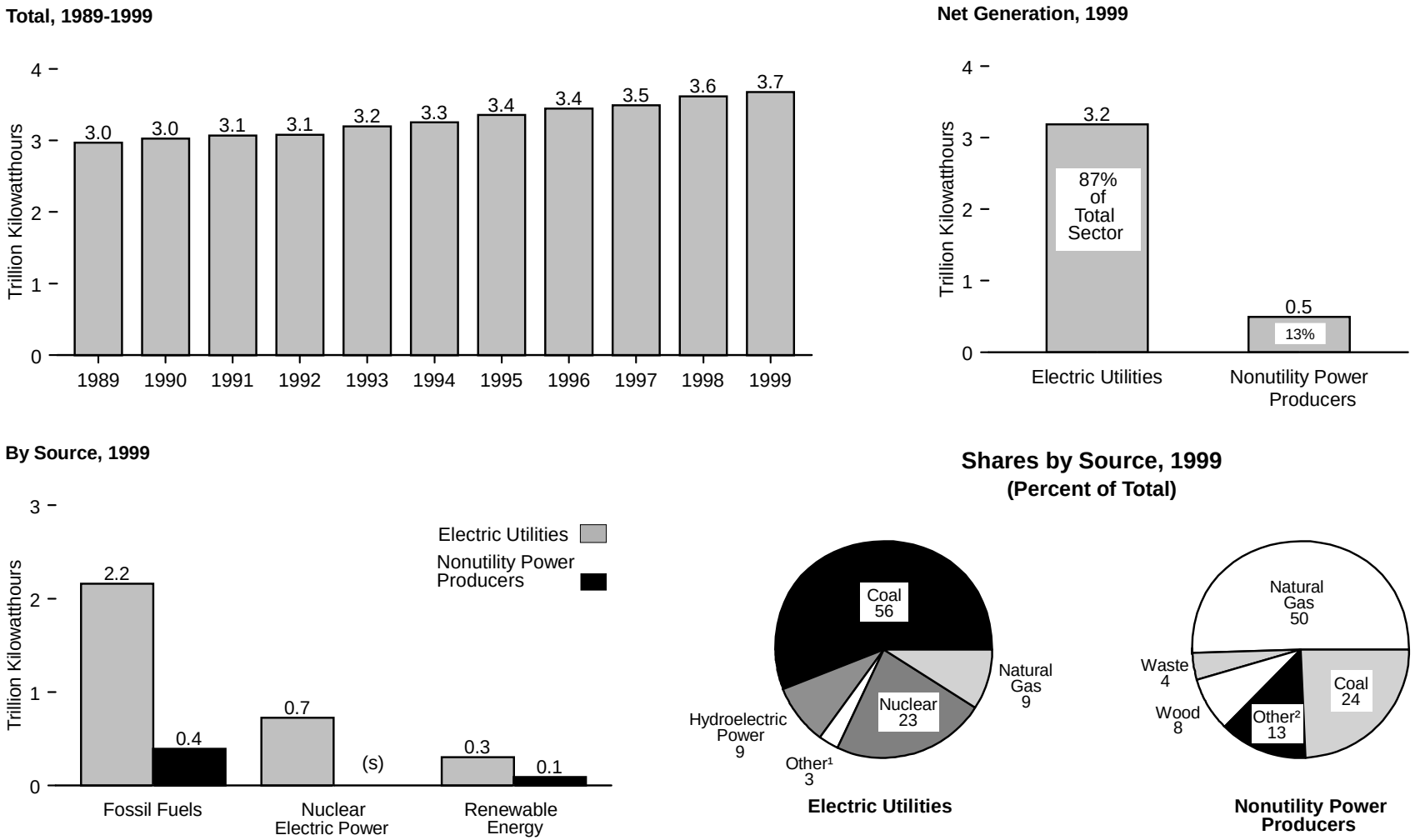
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 billion kilowatthours.

Notes: • See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

Sources: See end of section.

Figure 8.2 Electricity Net Generation



¹ Petroleum, geothermal, wood, waste, wind, and solar.
² Petroleum, other gas, nuclear electric power, hydroelectric power, geothermal, wind, and solar.

(s)=Less than 0.05 trillion kilowatthours.
Note: Because vertical scales differ, graphs should not be compared.
Sources: Tables 8.2, 8.3, and 8.4.

Table 8.2 Electricity Net Generation, 1989-1999

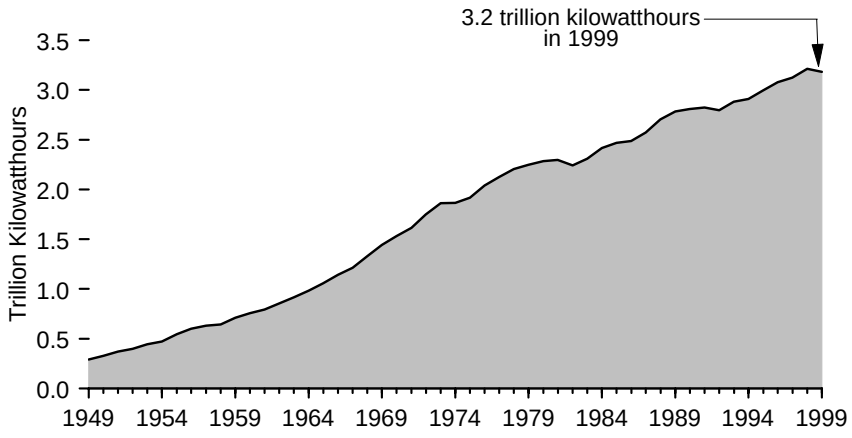
(Billion Kilowatthours)

Year	Fossil Fuels				Other Gas [4]	Nuclear Electric Power	Hydroelectric Pumped Storage [5]	Renewable Energy								Total [11]
											Waste					
	Coal [1]	Petroleum [2]	Natural Gas [3]	Total Fossil Fuels				Conventional Hydroelectric Power	Geo-thermal	Wood [6]	MSW [7] and LFG [8]	Other Waste [9]	Wind	Solar [10]	Total Renewable Energy	
1989	1,583.8	163.9	R363.9	R2,111.6	NA	529.4	(12)	R273.7	R14.9	27.7	R7.9	R2.0	R2.3	R0.6	R329.1	R2,971.9
1990	1,590.3	124.0	R378.3	R2,092.7	NA	577.0	-3.5	R293.0	R15.8	30.4	R10.8	R2.3	R3.0	0.6	R356.1	R3,024.9
1991	1,589.9	119.0	R392.6	R2,101.5	NA	612.6	-4.5	R289.5	R16.0	33.2	R12.4	R3.3	R3.0	0.8	R358.2	R3,071.3
1992	1,621.1	99.4	418.3	2,138.8	NA	618.8	-4.2	253.1	16.4	35.6	14.0	3.8	2.9	0.7	326.5	3,083.4
1993	1,690.0	112.4	428.4	2,230.8	NA	610.4	-4.0	280.5	17.0	36.8	14.5	4.1	3.0	0.9	356.7	3,196.9
1994	1,691.7	105.5	465.9	R2,263.1	12.1	640.5	-3.4	260.2	16.8	37.8	15.5	3.6	3.4	0.8	338.1	3,253.8
1995	1,710.2	75.3	498.5	R2,284.0	R13.5	673.4	-2.7	311.0	14.4	36.4	16.9	R3.4	3.2	0.8	R386.0	3,357.8
1996	1,795.7	81.7	455.8	R2,333.2	R14.2	674.7	-3.1	347.4	15.1	36.8	16.4	R4.3	3.4	0.9	R424.3	3,447.0
1997	R1,844.1	R93.0	R485.4	R2,422.6	R11.2	628.6	-4.0	358.9	R14.6	R34.2	R17.6	R3.0	R3.2	0.9	R432.4	R3,494.2
1998	R1,873.9	R126.9	R540.6	R2,541.5	R8.5	673.7	-4.4	R323.3	R14.7	R31.8	R18.1	R3.2	R3.0	0.9	R395.0	R3,617.9
1999P	1,890.7	115.6	E545.8	2,552.1	E9.1	727.9	-6.1	311.7	14.2	41.8	E19.6	E3.4	3.6	0.3	394.7	3,677.7

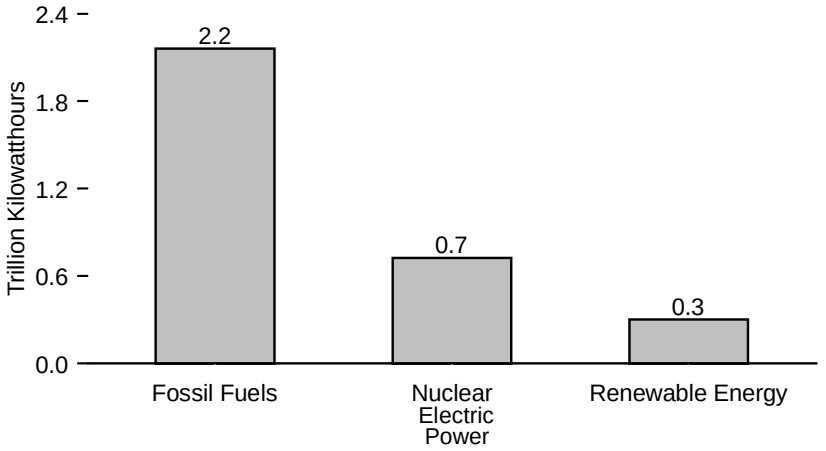
[1] Coal, fine coal, anthracite culm, bituminous gob, lignite waste, tar coal, waste coal, and coke breeze.
[2] Fuel oil nos. 1, 2, 4, 5, and 6, crude oil, petroleum coke, kerosene, liquid butane, liquid propane, methanol, liquid byproducts, oil waste, sludge oil, and tar oil.
[3] Includes supplemental gaseous fuels, waste heat, and waste gas.
[4] Butane, propane, blast furnace gas, coke oven gas, refinery gas, and process gas.
[5] Pumped storage facility production minus energy used for pumping.
[6] Wood, wood waste, black liquor, red liquor, spent sulfite liquor, pitch, wood sludge, peat, railroad ties, and utility poles.
[7] Municipal solid waste.
[8] Landfill gas.
[9] Methane, digester gas, liquid acetonitrile waste, tall oil, waste alcohol, medical waste, paper pellets, sludge waste, solid byproducts, tires, agricultural byproducts, closed looped biomass, fish oil, and straw.
[10] Solar thermal and photovoltaic energy.
[11] Data prior to 1999 include hydrogen, sulfur, batteries, chemicals, and purchased steam, which are not separately displayed on this table. Data for 1999 exclude these components.
[12] Included in conventional hydroelectric power.
R=Revised. P=Preliminary. E=Estimated. NA=Not available.
Notes: • See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding.
Web Page: http://www.eia.doe.gov/fuelelectric.html.
Sources: Tables 8.3 and 8.4.

Figure 8.3 Electricity Net Generation at Electric Utilities

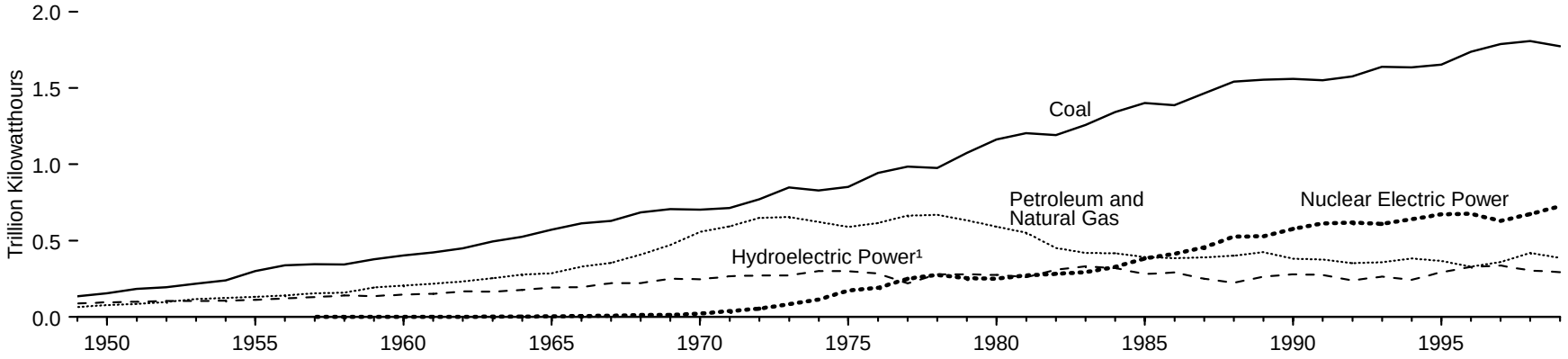
Total, 1949-1999



By Source, 1999



By Source, 1949-1999



¹ Conventional and pumped-storage hydroelectric power.

Source: Table 8.3.

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

Table 8.3 Electricity Net Generation at Electric Utilities, 1949-1999

(Billion Kilowatthours)

	Fossil Fuels						Renewable Energy								
										Waste					
Year	Coal	Petroleum [1]	Natural Gas [2]	Total Fossil Fuels	Nuclear Electric Power	Hydroelectric Pumped Storage [3]	Conventional Hydroelectric Power	Geo-thermal	Wood [4]	MSW [5] and LFG [6]	Other Waste [7]	Wind	Solar [8]	Total Renewable Energy	Total
1949	135.5	28.5	37.0	201.0	0	(9)	89.7	0	0.4	NA	NA	0	0	90.1	291.1
1950	154.5	33.7	44.6	232.8	0	(9)	95.9	0	0.4	NA	NA	0	0	96.3	329.1
1951	185.2	28.7	56.6	270.5	0	(9)	99.8	0	0.4	NA	NA	0	0	100.1	370.7
1952	195.4	29.7	68.5	293.6	0	(9)	105.1	0	0.5	NA	NA	0	0	105.6	399.2
1953	218.8	38.4	79.8	337.0	0	(9)	105.2	0	0.4	NA	NA	0	0	105.6	442.7
1954	239.1	31.5	93.7	364.4	0	(9)	107.1	0	0.3	NA	NA	0	0	107.3	471.7
1955	301.4	37.1	95.3	433.8	0	(9)	113.0	0	0.3	NA	NA	0	0	113.3	547.0
1956	338.5	35.9	104.0	478.5	0	(9)	122.0	0	0.2	NA	NA	0	0	122.2	600.7
1957	346.4	40.5	114.2	501.1	(s)	(9)	130.2	0	0.2	NA	NA	0	0	130.4	631.5
1958	344.4	40.4	119.8	504.5	0.2	(9)	140.3	0	0.2	NA	NA	0	0	140.4	645.1
1959	378.4	46.8	146.6	571.9	0.2	(9)	137.8	0	0.2	NA	NA	0	0	137.9	710.0
1960	403.1	48.0	158.0	609.0	0.5	(9)	145.8	(s)	0.1	NA	NA	NA	0	146.0	755.5
1961	421.9	48.5	169.3	639.7	1.7	(9)	152.2	0.1	0.1	NA	NA	NA	0	152.4	793.8
1962	450.2	48.9	184.3	683.4	2.3	(9)	168.6	0.1	0.1	NA	NA	NA	0	168.8	854.5
1963	493.9	52.0	201.6	747.5	3.2	(9)	165.8	0.2	0.1	NA	NA	NA	0	166.1	916.8
1964	526.2	57.0	220.0	803.2	3.3	(9)	177.1	0.2	0.1	NA	NA	NA	0	177.4	984.0
1965	570.9	64.8	221.6	857.3	3.7	(9)	193.9	0.2	0.3	NA	NA	NA	0	194.3	1,055.3
1966	613.5	78.9	251.2	943.6	5.5	(9)	194.8	0.2	0.3	NA	NA	NA	0	195.3	1,144.4
1967	630.5	89.3	264.8	984.6	7.7	(9)	221.5	0.3	0.3	NA	NA	NA	0	222.2	1,214.4
1968	684.9	104.3	304.4	1,093.6	12.5	(9)	222.5	0.4	0.4	NA	NA	NA	0	223.3	1,329.4
1969	706.0	137.8	333.3	1,177.1	13.9	(9)	250.2	0.6	0.3	NA	NA	NA	0	251.1	1,442.2
1970	704.4	184.2	372.9	1,261.5	21.8	(9)	247.7	0.5	0.1	0.2	(10)	NA	0	248.6	1,531.9
1971	713.1	220.2	374.0	1,307.4	38.1	(9)	266.3	0.5	0.1	0.2	(10)	NA	0	267.2	1,612.6
1972	771.1	274.3	375.7	1,421.2	54.1	(9)	272.6	1.5	0.1	0.2	(10)	NA	0	274.4	1,749.7
1973	847.7	314.3	340.9	1,502.9	83.5	(9)	272.1	2.0	0.1	0.2	(10)	NA	0	274.4	1,860.7
1974	828.4	300.9	320.1	1,449.4	114.0	(9)	301.0	2.5	0.1	0.2	(10)	NA	0	303.7	1,867.1
1975	852.8	289.1	299.8	1,441.7	172.5	(9)	300.0	3.2	(s)	0.2	(10)	NA	0	303.5	1,917.6
1976	944.4	320.0	294.6	1,559.0	191.1	(9)	283.7	3.6	0.1	0.2	(10)	NA	0	287.6	2,037.7
1977	985.2	358.2	305.5	1,648.9	250.9	(9)	220.5	3.6	0.3	0.2	(10)	NA	0	224.5	2,124.3
1978	975.7	365.1	305.4	1,646.2	276.4	(9)	280.4	3.0	0.2	0.1	(10)	NA	0	283.7	2,206.3
1979	1,075.0	303.5	329.5	1,708.0	255.2	(9)	279.8	3.9	0.3	0.2	(10)	NA	0	284.2	2,247.4
1980	1,161.6	246.0	346.2	1,753.8	251.1	(9)	276.0	5.1	0.3	0.2	(10)	NA	0	281.5	2,286.4
1981	1,203.2	206.4	345.8	1,755.4	272.7	(9)	260.7	5.7	0.2	0.1	(10)	NA	0	266.7	2,294.8
1982	1,192.0	146.8	305.3	1,644.1	282.8	(9)	309.2	4.8	0.2	0.1	(10)	NA	0	314.4	2,241.2
1983	1,259.4	144.5	274.1	1,678.0	293.7	(9)	332.1	6.1	0.2	0.2	(10)	(s)	0	338.6	2,310.3
1984	1,341.7	119.8	297.4	1,758.9	327.6	(9)	321.2	7.7	0.5	0.4	(10)	(s)	0	329.8	2,416.3
1985	1,402.1	100.2	291.9	1,794.3	383.7	(9)	281.1	9.3	0.7	0.6	(10)	(s)	0	291.9	2,469.8
1986	1,385.8	136.6	248.5	1,770.9	414.0	(9)	290.8	10.3	0.5	0.7	(10)	(s)	0	302.3	2,487.3
1987	1,463.8	118.5	272.6	1,854.9	455.3	(9)	249.7	10.8	0.8	0.7	(10)	(s)	0	262.0	2,572.1
1988	1,540.7	148.9	252.8	1,942.4	527.0	(9)	222.9	10.3	0.9	0.7	(10)	(s)	0	234.9	2,704.3
1989	1,553.7	158.3	266.6	1,978.6	529.4	(9)	265.1	9.3	1.0	0.5	0.5	(s)	(s)	276.4	2,784.3
1990	1,559.6	117.0	264.1	1,940.7	576.9	-3.5	283.4	8.6	0.8	0.7	0.6	(s)	(s)	294.1	2,808.2
1991	1,551.2	111.5	264.2	1,926.8	612.6	-4.5	280.1	8.1	0.7	0.7	0.6	(s)	(s)	290.2	2,825.0
1992	1,575.9	88.9	263.9	1,928.7	618.8	-4.2	243.7	8.1	0.8	0.7	0.6	(s)	(s)	253.9	2,797.2
1993	1,639.2	99.5	258.9	1,997.6	610.3	-4.0	269.1	7.6	0.9	0.7	0.4	(s)	(s)	278.7	2,882.5
1994	1,635.5	91.0	291.1	2,017.6	640.4	-3.4	247.1	6.9	0.8	0.9	0.4	(s)	(s)	256.0	2,910.7
1995	1,652.9	60.8	307.3	2,021.1	673.4	-2.7	296.4	4.7	0.6	0.9	0.2	(s)	(s)	302.8	2,994.5
1996	1,737.5	67.3	262.7	R2,067.5	674.7	-3.1	331.1	5.2	0.8	0.9	R0.3	(s)	(s)	R338.3	3,077.4
1997	1,787.8	77.8	283.6	R2,149.2	628.6	-4.0	341.3	5.5	0.7	1.0	R0.3	(s)	(s)	R348.7	3,122.5
1998	1,807.5	110.2	309.2	R2,226.9	673.7	-4.4	308.8	5.2	0.7	1.0	R0.3	(s)	(s)	R316.0	3,212.2
1999P	1,773.5	89.7	297.3	2,160.5	725.0	-6.0	299.7	1.7	0.7	E0.9	E0.3	(s)	(s)	303.4	3,182.9

[1] Fuel oil nos. 1, 2, 4, 5, and 6, crude oil, kerosene, and petroleum coke.
[2] Includes supplemental gaseous fuels.
[3] Pumped storage facility production minus energy used for pumping.
[4] Wood, wood waste, wood liquors, pitch, wood sludge, peat, railroad ties, and utility poles.
[5] Municipal solid waste.
[6] Landfill gas.
[7] Methane, digester gas, waste alcohol, sludge waste, solid byproducts, and tires.
[8] Solar thermal and photovoltaic energy.
[9] Included in conventional hydroelectric power.
[10] Included in MSW and LFG.

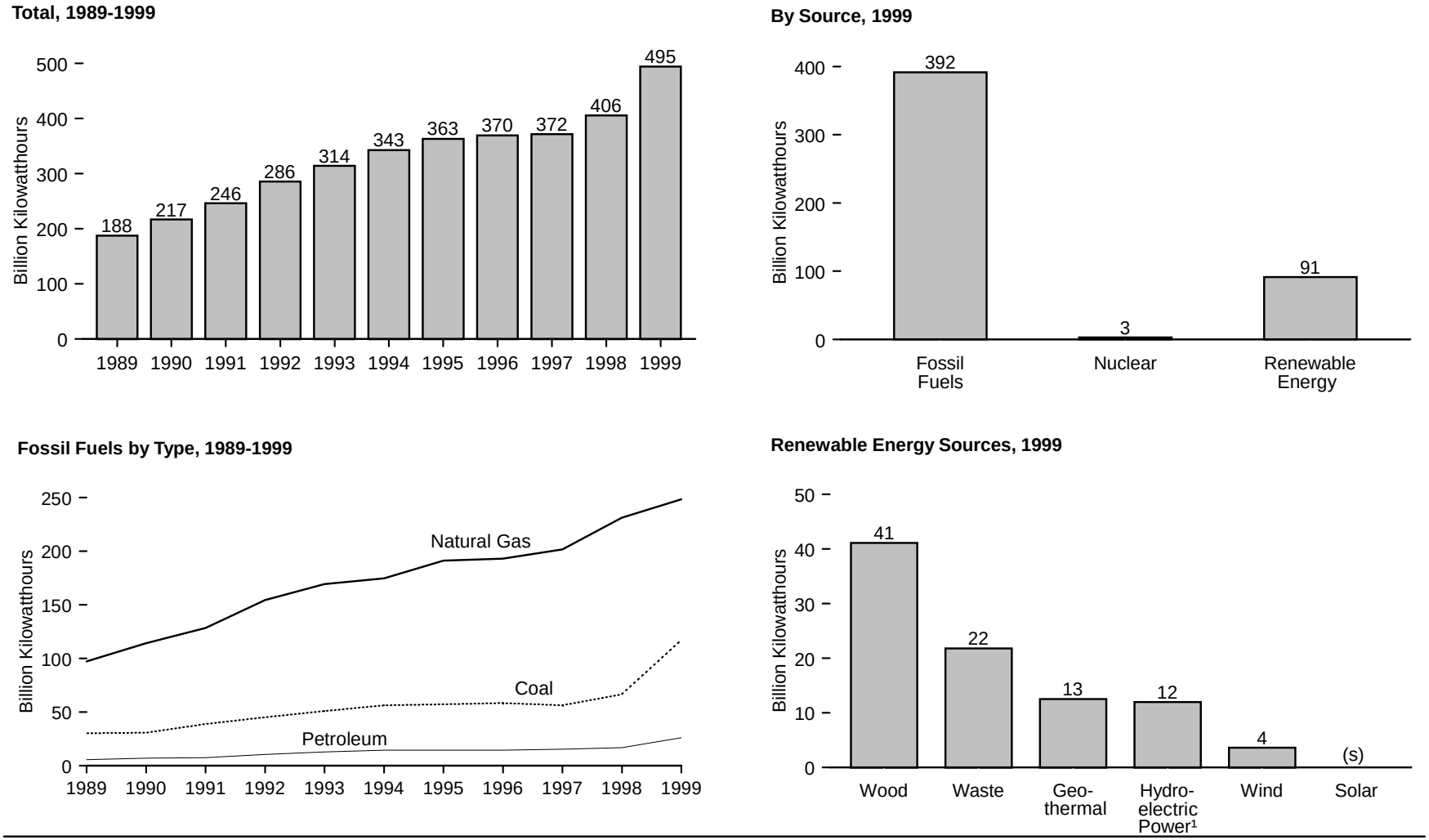
R=Revised. P=Preliminary. E=Estimated. NA=Not available. (s)=Less than 0.05 billion kilowatthours.

Notes: • See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

Sources: • 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." • 1982-1989—Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report." • 1990 forward—EIA, *Electric Power Monthly* (March 2000), Tables 4 and 5.

Figure 8.4 Electricity Net Generation at Nonutility Power Producers



[1] Conventional hydroelectric power only.
(s)=less than 0.5 billion kilowatthours.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 8.4.

Table 8.4 Electricity Net Generation at Nonutility Power Producers, 1989-1999

(Billion Kilowatthours)

Year	Fossil Fuels				Other Gas [4]	Nuclear Electric Power	Hydroelectric Pumped Storage [5]	Renewable Energy								Total [11]
											Waste					
	Coal [1]	Petroleum [2]	Natural Gas [3]	Total Fossil Fuels				Conventional Hydroelectric Power	Geo-thermal	Wood [6]	MSW [7] and LFG [8]	Other Waste [9]	Wind	Solar [10]	Total Renewable Energy	
1989[12]	30.2	5.5	R97.3	R133.0	(13)	(s)	0.0	R8.6	R5.5	26.8	R7.5	R1.5	R2.3	R0.6	R52.8	R187.6
1990[12]	30.7	7.0	R114.3	R152.0	(13)	0.1	0.0	R9.6	R7.2	29.6	R10.1	R1.8	R3.0	0.6	R62.0	R216.7
1991[12]	38.8	7.5	R128.4	R174.7	(13)	0.1	0.0	R9.4	R8.0	32.4	R11.7	R2.8	R3.0	0.8	R68.0	R246.3
1992	45.2	10.5	154.4	210.1	(13)	0.1	0.0	9.4	8.3	34.8	13.3	3.2	2.9	0.7	72.5	286.1
1993	50.9	12.8	169.5	233.2	(13)	0.1	0.0	11.4	9.5	35.9	13.8	3.7	3.0	0.9	78.1	314.4
1994	56.2	14.5	174.8	R245.5	12.1	0.1	0.0	13.1	9.8	37.0	14.6	3.2	3.4	0.8	82.1	343.1
1995	57.3	14.4	191.2	R262.9	R13.5	0.0	0.0	14.6	9.6	35.8	16.0	3.2	3.2	0.8	83.2	363.3
1996	58.3	14.3	193.1	R265.7	R14.2	0.0	0.0	16.4	9.9	36.0	15.5	R4.0	3.4	0.9	R86.0	369.6
1997	R56.3	R15.3	R201.8	R273.4	R11.2	0.0	0.0	17.7	R9.1	R33.5	R16.6	R2.7	R3.2	0.9	R83.7	R371.7
1998	R66.5	R16.8	R231.4	R314.7	R8.5	0.0	0.0	R14.5	R9.5	R31.1	R17.1	R2.9	R3.0	0.9	R78.9	R405.7
1999[P]	117.2	25.9	E248.4	391.5	E9.1	2.9	-0.1	12.0	12.5	41.1	E18.7	E3.1	3.6	0.3	91.4	494.8

[1] Coal, fine coal, anthracite culm, bituminous gob, lignite waste, tar coal, waste coal, and coke breeze.

[2] Fuel oil nos. 1, 2, 4, 5, and 6, crude oil, petroleum coke, kerosene, liquid butane, liquid propane, methanol, liquid byproducts, oil waste, sludge oil, and tar oil.

[3] Includes waste heat and waste gas.

[4] Butane, propane, blast furnace gas, coke oven gas, refinery gas, and process gas.

[5] Pumped storage facility production minus energy used for pumping.

[6] Wood, wood waste, black liquor, red liquor, spent sulfite liquor, pitch, wood sludge, peat, railroad ties, and utility poles.

[7] Municipal solid waste.

[8] Landfill gas.

[9] Methane, digester gas, liquid acetonitrile waste, tall oil, waste alcohol, medical waste, paper pellets, sludge waste, solid byproducts, tires, agricultural byproducts, closed loop biomass, fish oil, and straw.

[10] Solar thermal and photovoltaic energy.

[11] Data prior to 1999 include hydrogen, sulfur, batteries, chemicals, and purchased steam, which are not separately displayed on this table. Data for 1999 exclude these components.

[12] Data for 1989-1991 were collected for facilities with capacities 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 1989-1991 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.

[13] Included in natural gas.

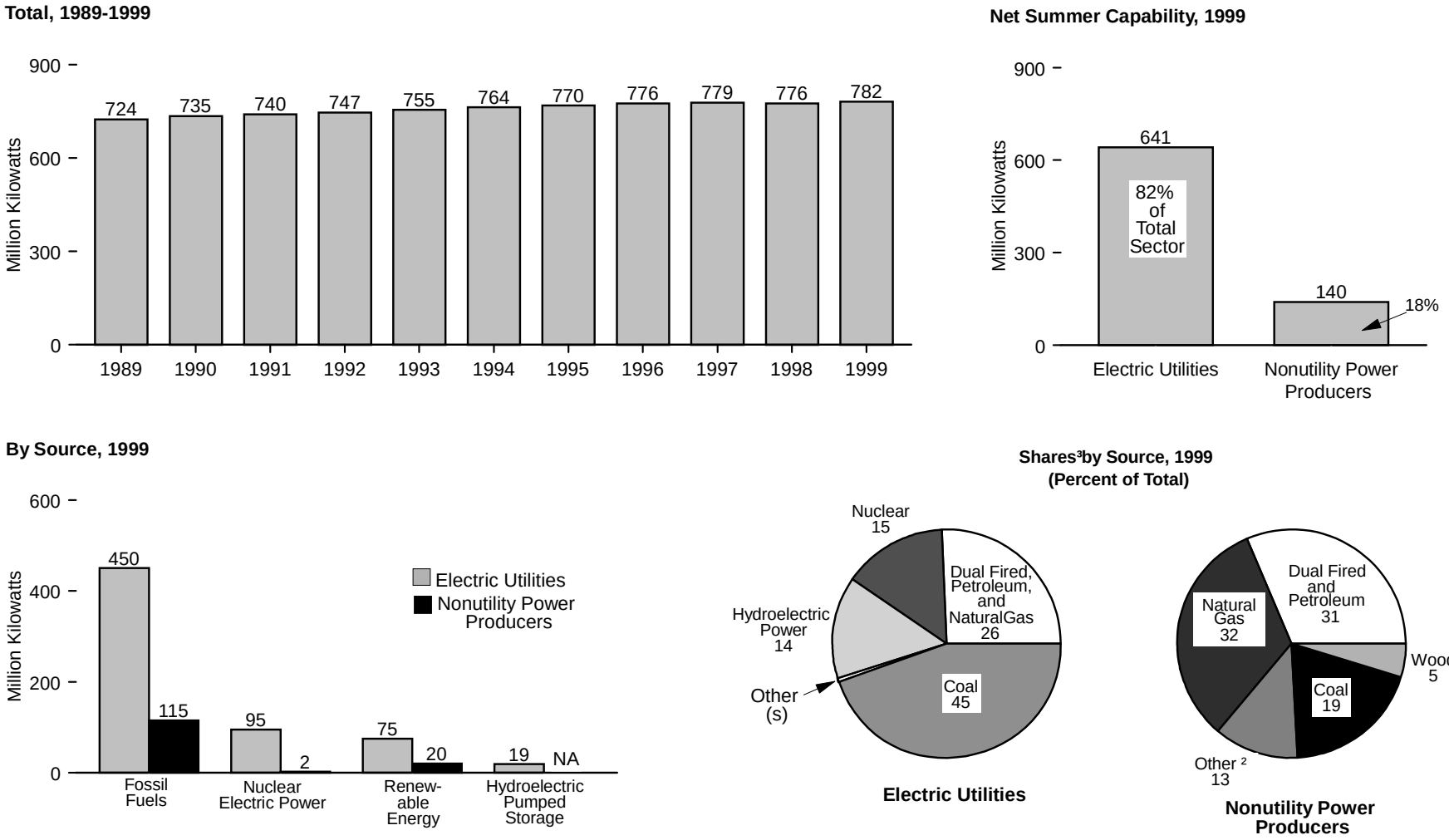
R=Revised. P=Preliminary. E=Estimated. (s)=Less than 0.05 billion kilowatthours.

Notes: • Due to restructuring of the electric power sector, the sale of generation assets is resulting in reclassification of plants from electric utility to nonutility plants. • See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

Sources: • 1989-1998—Energy Information Administration (EIA), estimated from Form EIA-860B, "Annual Electric Generator Report-Nonutility" and predecessor form. • 1999—EIA, *Electric Power Monthly* (March 2000), Tables 58-60.

Figure 8.5 Electric Power Sector Net Summer Capability



[1] Geothermal, wood, waste, wind, and solar.

[2] Other gas, conventional hydroelectric power, geothermal, waste, wind, solar, hydrogen, sulfur, batteries, chemicals, and purchased steam.

[3] Shares are based on data prior to rounding for publication and may not sum exactly to 100 percent.

NA= Not available.

(s)=Less than 0.5 percent.

Notes: • Data are at end of year. • Because vertical scales differ, graphs should not be compared.

Sources: Tables 8.5, 8.6, and 8.7.

Table 8.5 Electric Power Sector Net Summer Capability, 1989-1999

(Million Kilowatts)

Year	Fossil Fuels					Other Gas [5]	Nuclear Electric Power	Hydroelectric Pumped Storage	Renewable Energy							Total [9]
	Coal [1]	Petroleum [2]	Natural Gas [3]	Dual Fired [4]	Total Fossil Fuels				Conventional Hydroelectric Power	Geo-thermal	Wood [6]	Waste [7]	Wind	Solar [8]	Total Renewable Energy	
1989	R303.0	R56.9	R29.7	R131.2	R520.8	NA	98.2	18.1	R74.6	R2.6	R5.8	R2.1	R1.7	R0.3	R87.0	R724.3
1990	R306.7	R56.7	R31.0	R133.5	R527.9	NA	99.6	19.5	R74.0	R2.7	R6.2	R2.6	R1.9	0.3	R87.7	R734.9
1991	R306.7	R54.1	R35.1	R135.3	R531.3	NA	99.6	18.4	R76.2	2.6	R6.7	R3.0	R2.0	0.3	R90.7	R740.5
1992	308.5	51.5	35.1	141.2	536.3	NA	99.0	21.2	74.8	2.9	6.7	3.0	1.8	0.3	89.5	746.6
1993	309.9	49.7	37.4	144.7	541.6	NA	99.1	21.1	77.4	3.0	6.9	3.2	1.8	0.3	92.6	755.0
1994	310.8	47.6	43.1	147.0	R548.5	1.1	99.1	21.2	78.0	3.0	7.3	3.2	1.7	0.3	93.6	764.0
1995	310.8	48.0	41.9	152.4	R553.1	1.1	99.5	21.4	78.6	3.0	6.8	3.5	1.7	0.3	93.9	769.5
1996	313.0	47.8	48.8	151.6	R561.2	0.3	100.8	21.1	76.4	2.9	7.1	3.5	1.7	0.3	91.9	775.9
1997	R313.1	R46.3	R49.9	R153.6	R563.0	(s)	99.7	19.3	79.8	2.9	R7.1	R3.4	1.6	0.3	R95.1	778.5
1998	R312.6	R42.2	R59.1	R148.0	R561.9	R0.2	97.1	R18.9	R79.6	2.9	R6.8	R3.5	1.7	R0.4	R94.8	R775.9
1999E	312.5	42.3	57.1	153.1	565.1	0.2	97.2	18.9	79.7	2.9	6.8	3.5	1.7	0.4	95.0	781.6

[1] Coal, fine coal, anthracite culm, bituminous gob, lignite waste, tar coal, waste coal, and coke breeze.

[2] Fuel oil nos. 1, 2, 4, 5, and 6, crude oil, petroleum coke, kerosene, liquid butane, liquid propane, methanol, liquid byproducts, oil waste, sludge oil, and tar oil.

[3] Includes supplemental gaseous fuels, waste heat, and waste gas.

[4] Petroleum and natural gas.

[5] Butane, propane, blast furnace gas, coke oven gas, refinery gas, and process gas.

[6] Wood, wood waste, black liquor, red liquor, spent sulfite liquor, pitch, wood sludge, peat, railroad ties, and utility poles.

[7] Municipal solid waste, landfill gas, methane, digester gas, liquid acetonitrile waste, tall oil, waste alcohol, medical waste, paper pellets, sludge waste, solid byproducts, tires, agricultural byproducts, closed loop biomass, fish oil, and straw.

[8] Solar thermal and photovoltaic energy.

[9] Includes hydrogen, sulfur, batteries, chemicals, purchased steam, hot nitrogen, and multi-fueled capacity, which are not separately displayed on this table.

R=Revised. E=Estimated. NA=Not available. (s)=Less than 0.05 million kilowatts.

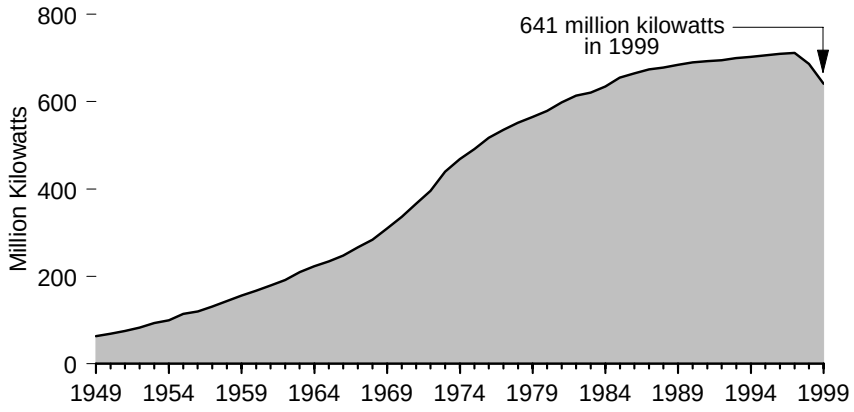
Notes: • Data are at end of year. • See Note 3 at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

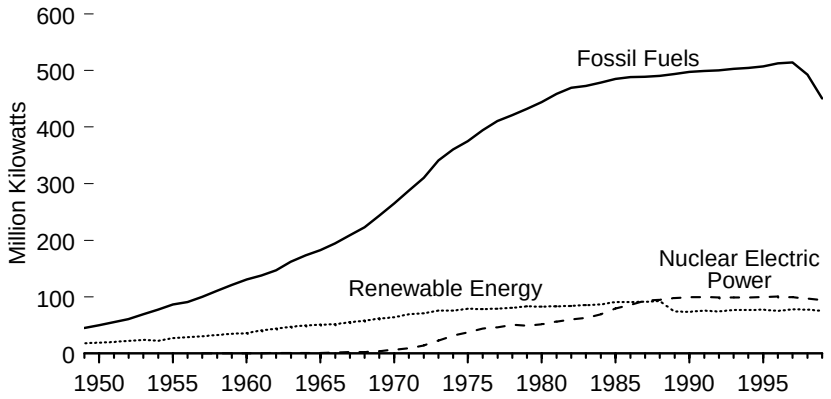
Sources: Tables 8.6 and 8.7.

Figure 8.6 Electric Utility Net Summer Capability

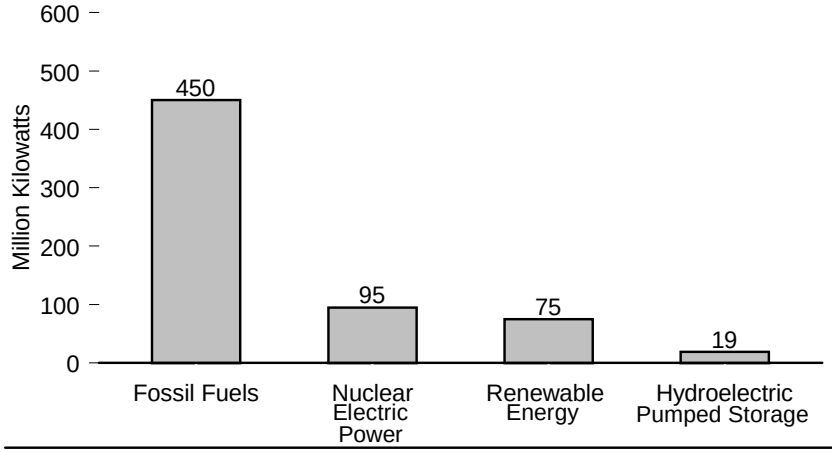
Total, 1949-1999



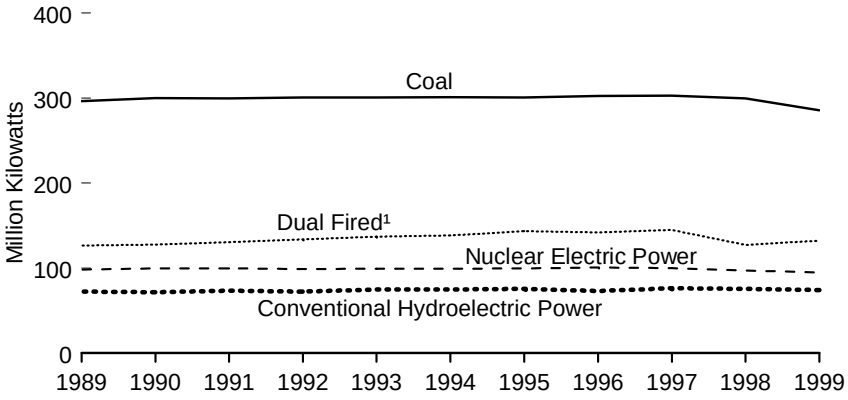
By Source, 1949-1999



By Source, 1999



By Selected Source, 1989-1999



¹ Petroleum and natural gas.

Notes: • Data are at end of year. • Because vertical scales differ, graphs should not be compared.

Source: Table 8.6.

Table 8.6 Electric Utility Net Summer Capability, 1949-1999

(Million Kilowatts)

Year	Fossil Fuels					Nuclear Electric Power	Hydroelectric Pumped Storage	Renewable Energy							Total [7]
	Coal	Petroleum [1]	Natural Gas [2]	Dual Fired [3]	Total Fossil Fuels			Conventional Hydroelectric Power	Geo-thermal	Wood [4]	Waste [5]	Wind	Solar [6]	Total Renewable Energy	
1949	NA	NA	NA	NA	44.9	0	([8])	18.5	0	(s)	([9])	0	0	18.5	63.4
1950	NA	NA	NA	NA	50.0	0	([8])	19.2	0	(s)	([9])	0	0	19.2	69.2
1951	NA	NA	NA	NA	55.0	0	([8])	20.5	0	(s)	([9])	0	0	20.5	75.5
1952	NA	NA	NA	NA	60.8	0	([8])	22.4	0	(s)	([9])	0	0	22.4	83.2
1953	NA	NA	NA	NA	69.5	0	([8])	23.8	0	(s)	([9])	0	0	23.8	93.3
1954	NA	NA	NA	NA	77.5	0	([8])	22.5	0	(s)	([9])	0	0	22.5	100.0
1955	NA	NA	NA	NA	86.8	0	([8])	27.4	0	(s)	([9])	0	0	27.4	114.2
1956	NA	NA	NA	NA	91.2	0	([8])	28.5	0	(s)	([9])	0	0	28.5	119.7
1957	NA	NA	NA	NA	100.3	0.1	([8])	30.7	0	0.1	([9])	0	0	30.8	131.1
1958	NA	NA	NA	NA	110.7	0.1	([8])	32.5	0	0.1	([9])	0	0	32.6	143.3
1959	NA	NA	NA	NA	121.0	0.1	([8])	34.8	0	0.1	([9])	0	0	34.9	155.9
1960	NA	NA	NA	NA	130.8	0.4	([8])	35.8	(s)	0.1	([9])	NA	0	35.9	167.1
1961	NA	NA	NA	NA	137.8	0.4	([8])	40.7	(s)	0.1	([9])	NA	0	40.8	179.0
1962	NA	NA	NA	NA	147.3	0.7	([8])	44.0	(s)	0.1	([9])	NA	0	44.1	192.1
1963	NA	NA	NA	NA	161.8	0.8	([8])	47.0	(s)	0.1	([9])	NA	0	47.1	209.7
1964	NA	NA	NA	NA	173.4	0.8	([8])	49.4	(s)	0.1	([9])	NA	0	49.5	223.7
1965	NA	NA	NA	NA	182.9	0.8	([8])	51.0	(s)	0.1	([9])	NA	0	51.1	234.8
1966	NA	NA	NA	NA	194.5	1.7	([8])	51.2	(s)	0.1	([9])	NA	0	51.3	247.5
1967	NA	NA	NA	NA	208.9	2.7	([8])	55.0	0.1	0.1	([9])	NA	0	55.1	266.7
1968	NA	NA	NA	NA	223.2	2.7	([8])	57.9	0.1	0.1	([9])	NA	0	58.0	284.0
1969	NA	NA	NA	NA	243.6	4.4	([8])	61.6	0.1	0.1	([9])	NA	0	61.7	309.8
1970	NA	NA	NA	NA	265.4	7.0	([8])	63.8	0.1	0.1	([9])	NA	0	63.9	336.4
1971	NA	NA	NA	NA	288.0	9.0	([8])	69.1	0.2	0.1	([9])	NA	0	69.4	366.4
1972	NA	NA	NA	NA	310.7	14.5	([8])	70.5	0.3	0.1	([9])	NA	0	70.9	396.0
1973	NA	NA	NA	NA	341.2	22.7	([8])	75.4	0.4	0.1	([9])	NA	0	75.9	439.8
1974	NA	NA	NA	NA	360.7	31.9	([8])	75.5	0.4	0.1	([9])	NA	0	76.0	468.5
1975	NA	NA	NA	NA	375.1	37.3	([8])	78.4	0.5	0.1	([9])	NA	0	79.0	491.3
1976	NA	NA	NA	NA	394.8	43.8	([8])	78.0	0.5	0.1	([9])	NA	0	78.6	517.2
1977	NA	NA	NA	NA	410.4	46.3	([8])	78.6	0.5	0.1	([9])	NA	0	79.2	535.9
1978	NA	NA	NA	NA	420.8	50.8	([8])	79.9	0.5	0.1	([9])	NA	0	80.5	552.1
1979	NA	NA	NA	NA	432.1	49.7	([8])	82.9	0.7	0.1	([9])	NA	0	83.6	565.5
1980	NA	NA	NA	NA	444.1	51.8	([8])	81.7	0.9	0.1	([9])	NA	0	82.7	578.6
1981	NA	NA	NA	NA	458.9	56.0	([8])	82.4	0.9	0.1	([9])	(s)	0	83.4	598.3
1982	NA	NA	NA	NA	469.6	60.0	([8])	83.0	1.0	0.1	([9])	(s)	0	84.1	613.7
1983	NA	NA	NA	NA	472.8	63.0	([8])	83.9	1.2	0.2	([9])	(s)	0	85.3	621.1
1984	NA	NA	NA	NA	478.6	69.7	([8])	85.3	1.2	0.3	([9])	(s)	0	86.9	635.1
1985	NA	NA	NA	NA	485.0	79.4	([8])	88.9	1.6	0.2	0.2	(s)	0	90.8	655.2
1986	NA	NA	NA	NA	488.3	85.2	([8])	89.3	1.6	0.2	0.2	(s)	0	91.2	664.8
1987	NA	NA	NA	NA	488.8	93.6	([8])	89.7	1.5	0.2	0.2	(s)	0	91.7	674.1
1988	NA	NA	NA	NA	490.6	94.7	([8])	90.3	1.7	0.2	0.2	(s)	0	92.4	677.7
1989	296.6	55.6	15.4	126.3	493.9	98.2	18.1	72.4	1.6	0.2	0.2	(s)	(s)	74.4	684.6
1990	299.9	55.4	15.0	127.5	497.9	99.6	19.5	71.4	1.6	0.2	0.2	(s)	(s)	73.5	690.5
1991	299.6	52.6	16.7	130.5	499.4	99.6	R20.6	R71.5	1.6	0.2	0.2	(s)	(s)	75.6	693.0
1992	300.5	49.9	16.4	133.7	500.5	99.0	21.2	72.2	1.7	0.2	0.2	(s)	(s)	74.4	695.1
1993	300.8	47.8	17.0	137.2	502.8	99.0	21.1	74.8	1.7	0.2	0.2	(s)	(s)	77.0	700.0
1994	301.1	45.5	19.8	138.4	504.8	99.1	21.2	74.8	1.7	0.3	0.3	(s)	(s)	77.1	702.2
1995	300.6	46.1	17.7	143.2	507.6	99.5	21.4	75.3	1.7	0.3	0.3	(s)	(s)	77.6	706.1
1996	302.4	45.7	22.7	142.0	512.8	100.8	21.1	73.1	1.6	0.2	0.2	(s)	(s)	75.2	709.9
1997	302.9	43.7	22.9	144.9	514.3	99.7	19.3	76.2	1.6	0.2	0.2	(s)	(s)	78.3	711.9
1998	R299.7	R39.8	R26.2	R127.2	R492.9	97.1	R18.9	R75.5	R1.5	R0.3	0.2	(s)	(s)	R77.6	R686.7
1999P	285.8	19.9	12.4	132.3	450.3	94.8	18.9	74.1	0.3	0.3	0.2	(s)	(s)	74.9	641.5

[1] Fuel oil nos. 1, 2, 4, 5, and 6, crude oil, kerosene, and petroleum coke.
[2] Includes supplemental gaseous fuels.
[3] Petroleum and natural gas.
[4] Wood, wood waste, wood liquors, pitch, wood sludge, peat, railroad ties, and utility poles.
[5] Municipal solid waste, landfill gas, methane, digester gas, waste alcohol, sludge waste, solid byproducts, and tires.
[6] Solar thermal and photovoltaic energy.
[7] For 1997 forward, includes hot nitrogen and multi-fueled capacity, which are not separately displayed on this table.
[8] Included in "Conventional Hydroelectric Power."
[9] Included in "Wood."

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.05 million kilowatts.

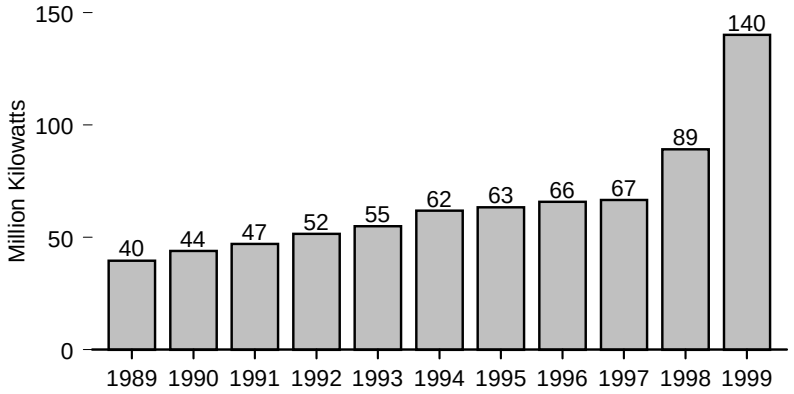
Notes: • Data are at end of year. • See Note 3 at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

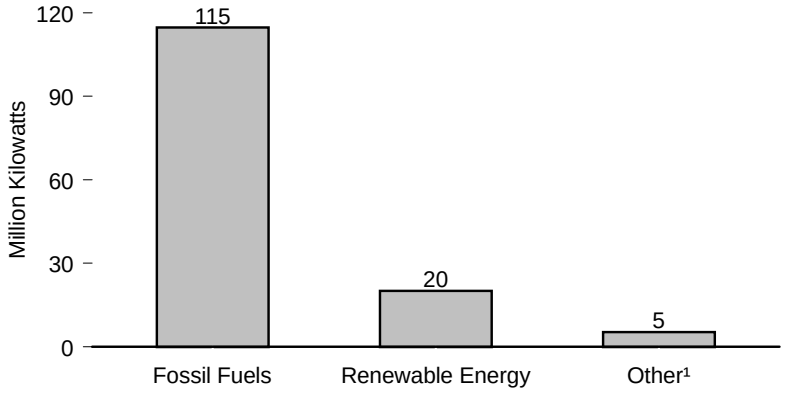
Sources: Energy Information Administration, Form EIA-860A, "Annual Electric Generator Report-Utility" and predecessor forms.

Figure 8.7 Nonutility Power Producer Net Summer Capability

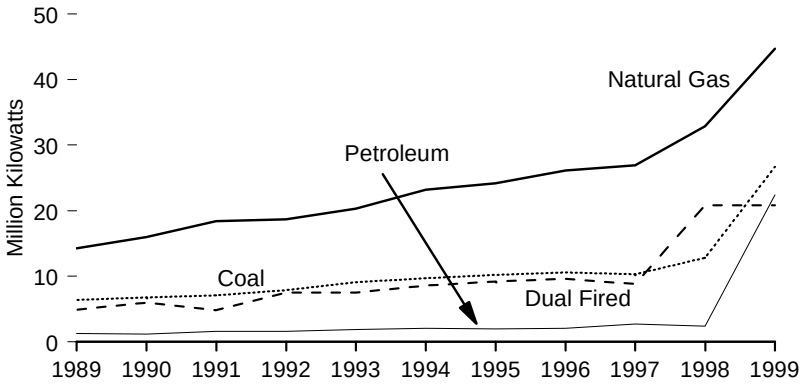
Total, 1989-1999



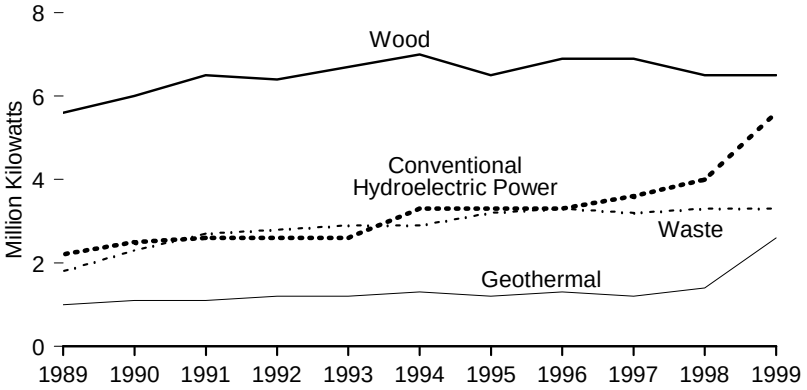
By Source, 1999



Fossil Fuels by Type, 1989-1999



Selected Renewable Energy Sources, 1989-1999



[1] Other gas, nuclear electric power, hydrogen, sulfur, batteries, and chemicals.

Notes: • Data are at end of year. • Due to restructuring of the electric power sector, the sale of generation assets is resulting in reclassificaion of plants from electric utility to nonutility plants.

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

Source: Table 8.7.

Table 8.7 Nonutility Power Producer Net Summer Capability 1989-1999

(Million Kilowatts)

Year	Fossil Fuels					Other Gas [5]	Nuclear Electric Power	Hydroelectric Pumped Storage	Renewable Energy								Total [11]
	Coal [1]	Petroleum [2]	Natural Gas [3]	Dual Fired [4]	Total Fossil Fuels				Conventional Hydroelectric Power	Geo-thermal	Wood [6]	Waste		Wind	Solar [10]	Total Renewable Energy	
												MSW [7] and LFG [8]	Other Waste [9]				
1989[12]	R6.4	R1.3	R14.3	R4.9	R26.9	NA	(s)	0	R2.2	R1.0	R5.6	R1.6	0.2	R1.7	R0.3	R12.5	R39.6
1990[12]	R6.8	R1.2	R16.0	R6.0	R30.1	NA	(s)	0	R2.5	R1.1	R6.0	R1.9	0.4	R1.9	0.3	R14.2	R44.5
1991[12]	R7.1	R1.6	R18.4	R4.8	R31.9	NA	(s)	0	R2.6	R1.1	R6.5	R2.2	0.5	R2.0	0.3	R15.1	R47.5
1992	7.9	1.6	18.7	7.5	35.8	NA	(s)	0	2.6	1.2	6.4	2.2	0.6	1.8	0.3	15.2	51.5
1993	9.1	1.9	20.3	7.5	38.8	NA	(s)	0	2.6	1.2	6.7	2.2	0.7	1.8	0.3	15.6	55.0
1994	9.7	2.1	23.2	8.6	R43.6	1.1	0	0	3.3	1.3	7.0	2.4	0.5	1.7	0.3	16.5	61.8
1995	10.2	2.0	24.2	9.2	R45.5	1.1	0	0	3.3	1.2	6.5	2.6	0.6	1.7	0.3	16.3	63.4
1996	10.6	2.1	26.1	9.6	R48.4	0.3	0	0	3.3	1.3	6.9	2.5	0.8	1.7	0.3	16.7	65.9
1997	R10.3	2.7	R26.9	R8.8	R48.7	(s)	0	0	3.6	1.2	R6.9	2.6	R0.6	1.6	0.3	R16.8	66.6
1998	R12.8	R2.4	R32.9	R20.8	R69.0	R0.2	0	0	R4.0	R1.4	R6.5	R2.7	R0.6	R1.7	R0.4	R17.2	R89.2
1999[E]	26.7	22.4	44.7	20.8	114.7	0.2	2.4	NA	5.6	2.6	6.5	2.7	0.6	1.7	0.4	20.1	140.1

[1] Coal, fine coal, anthracite culm, bituminous gob, lignite waste, tar coal, waste coal, and coke breeze.

[2] Fuel oil nos. 1, 2, 4, 5, and 6, crude oil, petroleum coke, kerosene, liquid butane, liquid propane, methanol, liquid byproducts, oil waste, sludge oil, and tar oil.

[3] Includes waste heat and waste gas.

[4] Petroleum and natural gas.

[5] Butane, propane, blast furnace gas, coke oven gas, refinery gas, and process gas.

[6] Wood, wood waste, black liquor, red liquor, spent sulfite liquor, pitch, wood sludge, peat, railroad ties, and utility poles.

[7] Municipal solid waste.

[8] Landfill gas.

[9] Methane, digester gas, liquid acetonitrile waste, tall oil, waste alcohol, medical waste, paper pellets, sludge waste, solid byproducts, tires, agricultural byproducts, closed loop biomass, fish oil, and straw.

[10] Solar thermal and photovoltaic energy.

[11] Includes hydrogen, sulfur, batteries, chemicals, and purchased steam, which are not separately displayed on this table.

[12] Data for 1989-1991 were collected for facilities with capacities 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 1989-1991 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.

R=Revised. E=Estimated. NA=Not available. (s)=Less than 0.05 million kilowatts.

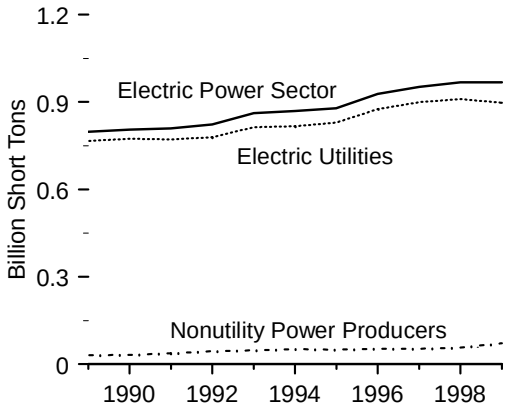
Notes: • Data are at end of year. • Due to restructuring of the electric power sector, the sale of generation assets is resulting in reclassification of plants from electric utility to nonutility plants. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

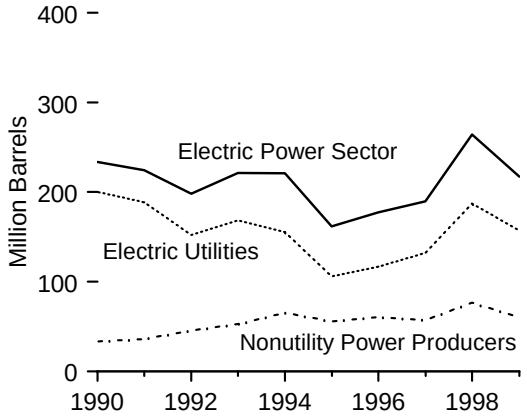
Sources: Energy Information Administration, estimated data using Form EIA-860B, "Annual Electric Generator Report-Nonutility" and predecessor form.

Figure 8.8 Consumption of Fossil Fuels To Generate Electricity

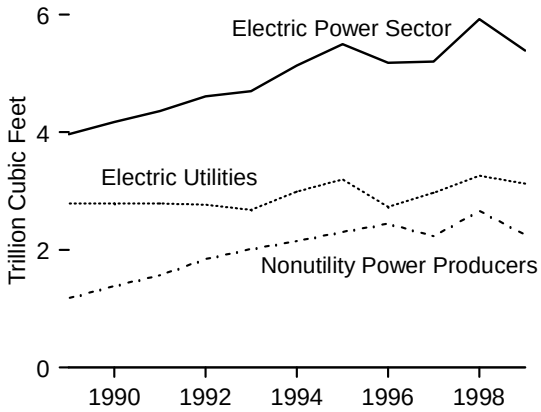
Coal Consumption, 1989-1999



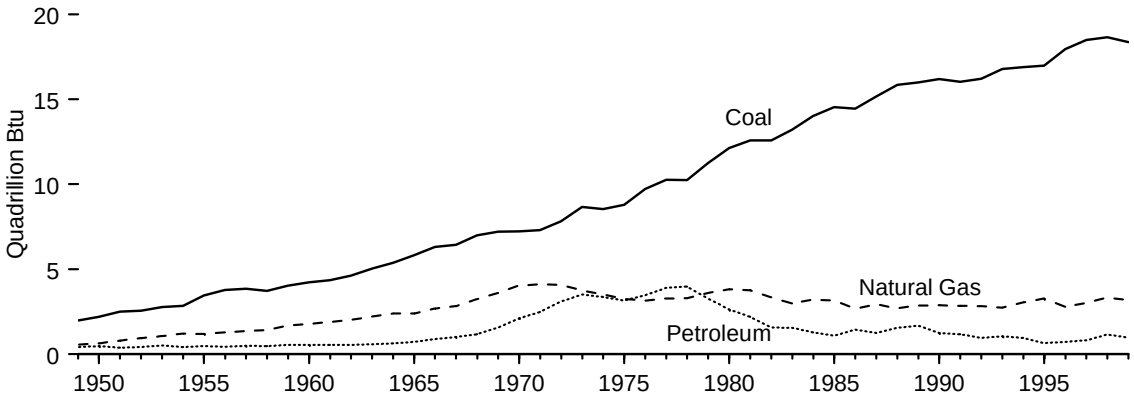
Petroleum Consumption, 1990-1999



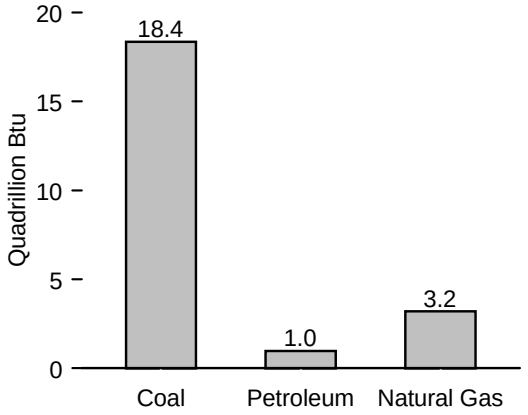
Natural Gas Consumption, 1989-1999



Consumption of Fossil Fuels by Electric Utilities, 1949-1999



Consumption of Fossil Fuels by Electric Utilities, 1999



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

Sources: Tables 8.8, A3, A4, and A5.

Table 8.8 Consumption of Fossil Fuels To Generate Electricity, 1949-1999

Year	Coal [1]			Petroleum									Natural Gas		
				Electric Utilities					Nonutility Power Producers			Total Electric Power Sector			
	Electric Utilities	Nonutility Power Producers	Total Electric Power Sector	Heavy Oil [2]	Light Oil [3]	Liquids	Petroleum Coke	Total [4]	Liquids [5]	Petroleum Coke	Total [4]		Electric Utilities [6]	Nonutility Power Producers [7]	Total Electric Power Sector
	Million Short Tons			Million Barrels			Million Short Tons	Million Barrels	Million Barrels	Million Short Tons	Million Barrels	Million Barrels	Billion Cubic Feet		
1949	84	NA	84	62	5	66	NA	66	NA	NA	NA	66	550	NA	550
1950	92	NA	92	70	5	75	NA	75	NA	NA	NA	75	629	NA	629
1951	106	NA	106	59	5	64	NA	64	NA	NA	NA	64	764	NA	764
1952	107	NA	107	62	5	67	NA	67	NA	NA	NA	67	910	NA	910
1953	116	NA	116	76	6	82	NA	82	NA	NA	NA	82	1,034	NA	1,034
1954	118	NA	118	62	5	67	NA	67	NA	NA	NA	67	1,165	NA	1,165
1955	144	NA	144	70	5	75	NA	75	NA	NA	NA	75	1,153	NA	1,153
1956	158	NA	158	67	5	73	NA	73	NA	NA	NA	73	1,239	NA	1,239
1957	161	NA	161	74	6	80	NA	80	NA	NA	NA	80	1,336	NA	1,336
1958	156	NA	156	72	6	78	NA	78	NA	NA	NA	78	1,373	NA	1,373
1959	168	NA	168	82	6	88	NA	88	NA	NA	NA	88	1,629	NA	1,629
1960	177	NA	177	84	4	88	NA	88	NA	NA	NA	88	1,725	NA	1,725
1961	182	NA	182	85	4	89	NA	89	NA	NA	NA	89	1,825	NA	1,825
1962	193	NA	193	85	4	89	NA	89	NA	NA	NA	89	1,966	NA	1,966
1963	211	NA	211	89	4	93	NA	93	NA	NA	NA	93	2,144	NA	2,144
1964	225	NA	225	97	4	101	NA	101	NA	NA	NA	101	2,323	NA	2,323
1965	245	NA	245	110	5	115	NA	115	NA	NA	NA	115	2,321	NA	2,321
1966	266	NA	266	135	6	141	NA	141	NA	NA	NA	141	2,610	NA	2,610
1967	274	NA	274	154	7	161	NA	161	NA	NA	NA	161	2,746	NA	2,746
1968	298	NA	298	179	10	189	NA	189	NA	NA	NA	189	3,148	NA	3,148
1969	311	NA	311	236	15	251	NA	251	NA	NA	NA	251	3,488	NA	3,488
1970	320	NA	320	311	24	336	1	339	NA	NA	NA	339	3,932	NA	3,932
1971	327	NA	327	362	34	396	1	399	NA	NA	NA	399	3,976	NA	3,976
1972	352	NA	352	440	53	494	1	497	NA	NA	NA	497	3,977	NA	3,977
1973	389	NA	389	513	47	560	1	563	NA	NA	NA	563	3,660	NA	3,660
1974	392	NA	392	483	53	536	1	539	NA	NA	NA	539	3,443	NA	3,443
1975	406	NA	406	467	39	506	(s)	506	NA	NA	NA	506	3,158	NA	3,158
1976	448	NA	448	514	42	556	(s)	556	NA	NA	NA	556	3,081	NA	3,081
1977	477	NA	477	575	49	624	(s)	624	NA	NA	NA	624	3,191	NA	3,191
1978	481	NA	481	588	48	636	(s)	638	NA	NA	NA	638	3,188	NA	3,188
1979	527	NA	527	493	31	523	(s)	525	NA	NA	NA	525	3,491	NA	3,491
1980	569	NA	569	391	29	420	(s)	421	NA	NA	NA	421	3,682	NA	3,682
1981	597	NA	597	330	21	351	(s)	352	NA	NA	NA	352	3,640	NA	3,640
1982	594	NA	594	234	15	250	(s)	251	NA	NA	NA	251	3,226	NA	3,226
1983	625	NA	625	229	17	245	(s)	247	NA	NA	NA	247	2,911	NA	2,911
1984	664	NA	664	189	15	204	(s)	206	NA	NA	NA	206	3,111	NA	3,111
1985	694	NA	694	159	15	173	(s)	175	NA	NA	NA	175	3,044	NA	3,044
1986	685	NA	685	216	14	230	(s)	232	NA	NA	NA	232	2,602	NA	2,602
1987	718	NA	718	184	15	199	(s)	201	NA	NA	NA	201	2,844	NA	2,844
1988	758	NA	758	229	19	248	(s)	250	NA	NA	NA	250	2,636	NA	2,636
1989[8]	767	31	798	242	25	267	1	270	28	NA	28	298	2,787	1,181	3,968
1990[8]	774	32	806	181	15	196	1	200	28	1	33	234	2,787	1,387	4,174
1991[8]	772	38	810	171	14	185	1	188	28	2	36	225	2,789	1,570	4,359
1992	780	45	824	136	12	147	1	152	32	3	46	198	2,766	1,845	4,610
1993	814	48	862	149	13	162	1	169	37	3	53	221	2,682	2,014	4,696
1994	817	52	870	135	16	151	1	155	42	5	66	221	2,987	2,149	5,136
1995	829	50	879	87	16	102	1	106	35	4	56	162	3,197	2,304	5,500
1996	875	53	928	96	17	113	1	117	38	4	61	178	2,732	2,448	5,180
1997	900	53	953	110	15	125	1	132	36	4	57	190	2,968	2,231	5,200
1998	911	57	968	157	22	179	2	187	54	4	77	264	3,258	2,666	5,924
1999[P]	897	72	968	126	23	149	2	157	50	2	60	217	3,125	[E]2,262	5,388

[1] Coal, fine coal, anthracite culm, bituminous gob, lignite waste, tar coal, waste coal, and coke breeze.
[2] For 1949 to 1979, steam plant consumption of petroleum; for 1980 forward, fuel oil nos. 4, 5, and 6, and residual fuel oils.
[3] For 1949 to 1979, gas turbine and internal combustion plant use of petroleum; for 1980 forward, fuel oil nos. 1 and 2, kerosene, and jet fuel.
[4] Petroleum coke is converted at 5 barrels per short ton.
[5] Fuel oil nos. 1, 2, 4, 5, and 6, crude oil, kerosene, liquid butane, liquid propane, methanol, liquid byproducts, oil waste, sludge oil, and tar oil.
[6] Includes supplemental gaseous fuels.
[7] Natural gas only.
[8] Nonutility data for 1989-1991 were collected for facilities with capacities 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 1989-1991 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.

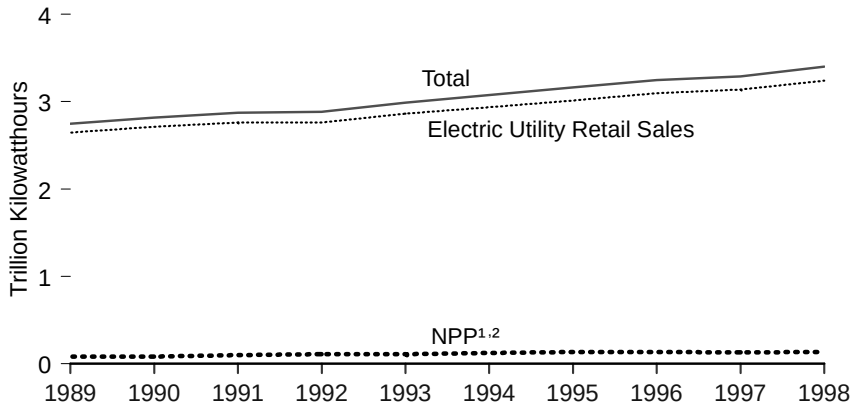
P=Preliminary. E=Estimated. NA=Not available. (s)=Less than 0.5 million short tons.

Notes: • Electric utility data are for fuels consumed to produce electricity only. Nonutility data prior to 1999 are for fuels consumed to produce both electricity and useful thermal output; nonutility data for 1999 are for fuels consumed to produce electricity only. • Due to restructuring of the electric power sector, the sale of generation assets is resulting in reclassification of plants from electric utility to nonutility plants. • See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding.

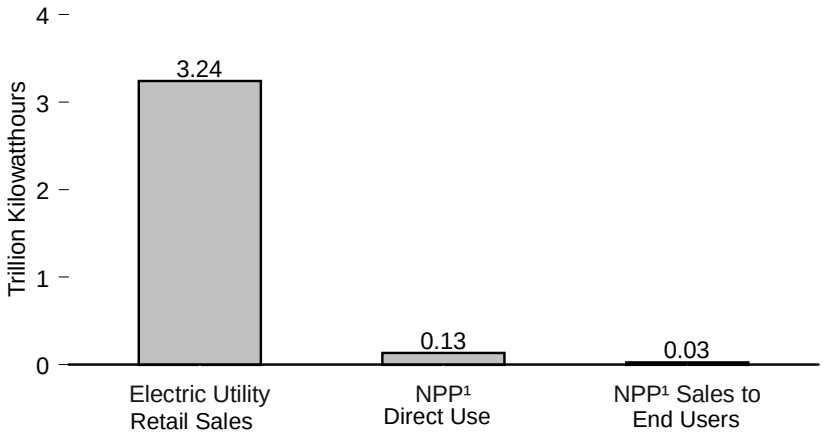
Sources: See end of section.

Figure 8.9 Electricity End Use

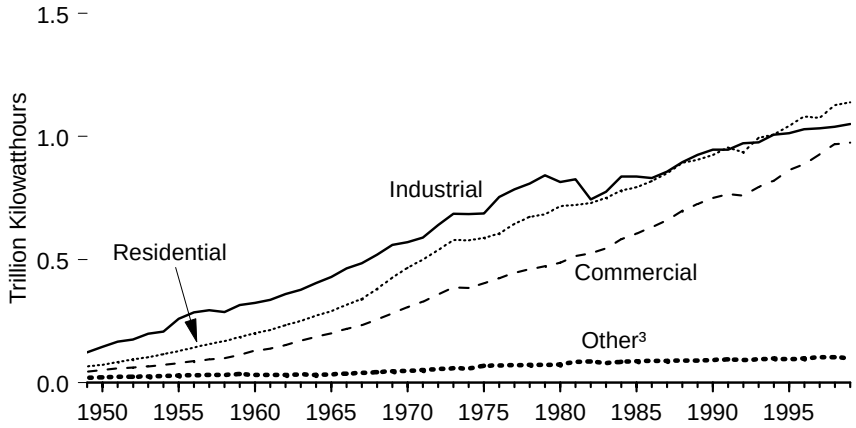
Overview, 1989-1998



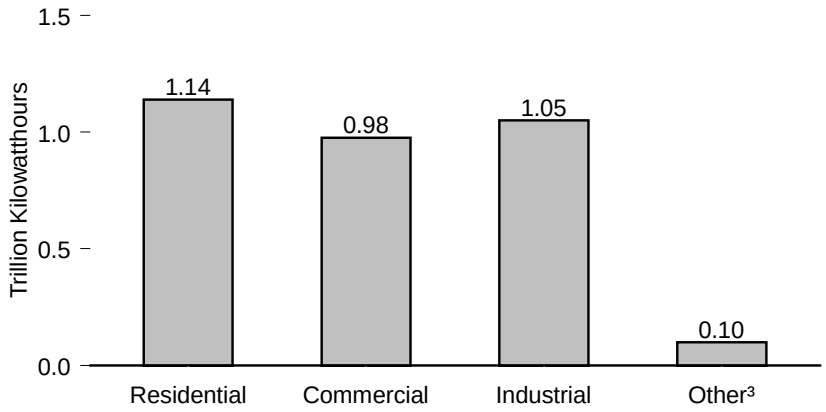
Overview, 1998



Electric Utility Retail Sales by Sector, 1949-1999



Electric Utility Retail Sales by Sector, 1999



[1] Nonutility power producer.

[2] Direct use and sales to end users.

[3] 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 8.9.

Table 8.9 Electricity End Use, 1949-1999

(Billion Kilowatthours)

Year	Electric Utility Retail Sales					Nonutility Power Producers		Total
	Residential	Commercial	Industrial	Other [1]	Total	Direct Use [2]	Sales to End Users	
1949	67	45	123	20	255	NA	NA	NA
1950	72	51	146	22	291	NA	NA	NA
1951	83	57	166	24	330	NA	NA	NA
1952	94	62	176	24	356	NA	NA	NA
1953	104	67	199	26	396	NA	NA	NA
1954	116	72	208	27	424	NA	NA	NA
1955	128	79	260	29	497	NA	NA	NA
1956	143	87	286	30	546	NA	NA	NA
1957	157	94	294	31	576	NA	NA	NA
1958	169	100	287	32	588	NA	NA	NA
1959	185	112	315	36	647	NA	NA	NA
1960	201	131	324	32	688	NA	NA	NA
1961	214	138	337	32	722	NA	NA	NA
1962	233	153	360	32	778	NA	NA	NA
1963	251	171	377	34	833	NA	NA	NA
1964	272	187	405	32	896	NA	NA	NA
1965	291	200	429	34	954	NA	NA	NA
1966	317	218	464	37	1,035	NA	NA	NA
1967	340	234	485	40	1,099	NA	NA	NA
1968	382	258	521	42	1,203	NA	NA	NA
1969	427	282	559	46	1,314	NA	NA	NA
1970	466	307	571	48	1,392	NA	NA	NA
1971	500	329	589	51	1,470	NA	NA	NA
1972	539	359	641	56	1,595	NA	NA	NA
1973	579	388	686	59	1,713	NA	NA	NA
1974	578	385	685	58	1,706	NA	NA	NA
1975	588	403	688	68	1,747	NA	NA	NA
1976	606	425	754	70	1,855	NA	NA	NA
1977	645	447	786	71	1,948	NA	NA	NA
1978	674	461	809	73	2,018	NA	NA	NA
1979	683	473	842	73	2,071	NA	NA	NA
1980	717	488	815	74	2,094	NA	NA	NA
1981	722	514	826	85	2,147	NA	NA	NA
1982	730	526	745	86	2,086	NA	NA	NA
1983	751	544	776	80	2,151	NA	NA	NA
1984	780	583	838	85	2,286	NA	NA	NA
1985	794	606	837	87	2,324	NA	NA	NA
1986	819	631	831	89	2,369	NA	NA	NA
1987	850	660	858	88	2,457	NA	NA	NA
1988	893	699	896	90	2,578	NA	NA	NA
1989	906	726	926	90	2,647	[3]83	[3]18	2,747
1990	924	751	946	92	2,713	[3]84	[3]20	2,817
1991	955	766	947	94	2,762	[3]100	[3]11	2,873
1992	936	761	973	93	2,763	111	11	2,885
1993	995	795	977	95	2,861	111	16	2,988
1994	1,008	820	1,008	98	2,935	123	18	3,075
1995	1,043	863	1,013	95	3,013	134	16	3,162
1996	1,082	887	1,030	98	3,098	135	14	3,247
1997	1,076	928	1,033	103	3,140	131	18	3,289
1998	[R]1,128	[R]969	[R]1,040	[R]104	[R]3,240	[R]134	[R]26	[R]3,400
1999[P]	1,139	975	1,050	100	3,265	NA	NA	NA

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

[2] Facility use of onsite net electricity generation.

[3] Data for 1989-1991 were collected for facilities with capacities 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 1989-1991 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.

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

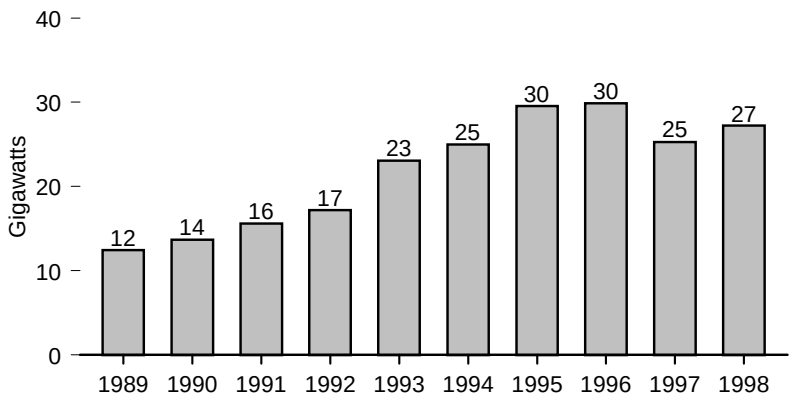
Notes: • See Note 4 at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

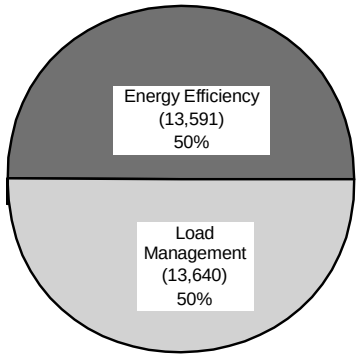
Sources: • 1949-September 1977—Federal Power Commission, Form FPC-5, "Monthly Statement of Electric Operating Revenue and Income." • October 1977-February 1980—Federal Energy Regulatory Commission (FERC), Form FPC-5, "Monthly Statement of Electric Operating Revenue and Income." • March 1980-1982—FERC, Form FPC-5, "Electric Utility Company Monthly Statement." • 1983—Energy Information Administration (EIA), Form EIA-826, "Electric Utility Company Monthly Statement." • 1984-1988—EIA, Form EIA-861, "Annual Electric Utility Report." • 1989 forward—EIA, *Electric Power Monthly* (March 2000), Table 44, and EIA, Form EIA-860B, "Annual Electric Generator Report-Nonutility" and predecessor form.

Figure 8.10 Electric Utility Demand-Side Management Programs: Peakload Reductions, Energy Savings, and Costs

Actual Peakload Reductions, Total of All Programs, 1989-1998

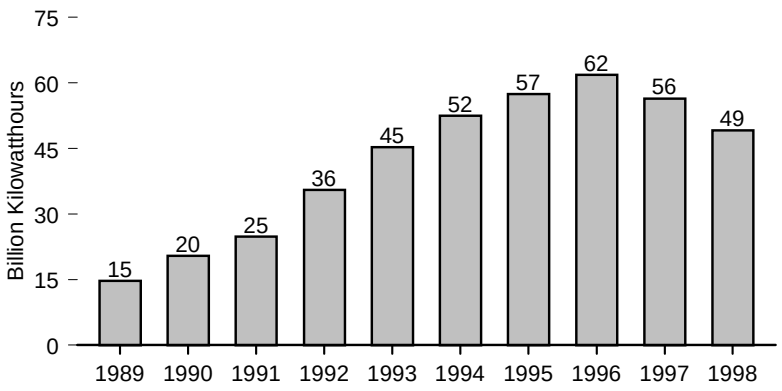


Actual Peakload Reductions by Program, 1998

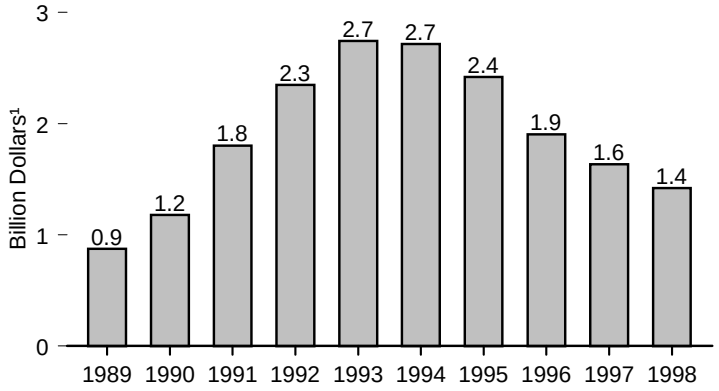


Total: 27,231 Megawatts

Energy Savings, 1989-1998



Costs, 1989-1998



[1] Nominal dollars.

Source: Table 8.10.

Table 8.10 Electric Utility Demand-Side Management Programs: Peakload Reductions, Energy Savings, and Costs, 1989-1998

Year	Actual Peakload Reductions [1] (megawatts)			Energy Savings (million kilowatthours)	Costs (thousand dollars [4])
	Load Management [2]	Energy Efficiency [3]	Total		
1989	NA	NA	12,463	14,672	872,935
1990	7,911	[5]5,793	13,704	20,458	1,177,457
1991	8,767	[5]6,852	15,619	24,848	1,803,773
1992	7,357	[5]9,847	17,204	35,563	2,348,094
1993	10,583	[5]12,486	23,069	45,294	2,743,533
1994	10,922	[5]14,079	25,001	52,483	2,715,657
1995	13,753	[5]15,807	29,561	57,421	2,421,261
1996	12,965	[5]16,928	29,893	61,842	1,902,197
1997	11,958	13,326	25,284	56,406	1,636,020
1998	13,640	13,591	27,231	49,167	1,420,920

[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] Load Management includes programs such as Direct Load Control and Interruptible Load Control, and beginning in 1997, "other types" of demand-side management programs. Direct load control refers to program activities that can interrupt consumer load at the time of annual peak load by direct control of the utility system operator by interrupting power supply to individual appliances or equipment on consumer premises. This type of control usually involves residential consumers. Interruptible load refers to program activities that, in accordance with contractual arrangements, can interrupt consumer load at times of seasonal peak load by direct control of the utility system operator or by action of the consumer at the direct request of the system operator. It usually involves commercial and industrial consumers. In some instances, the load reduction may be affected by direct action of the system operator (remote tripping) after notice to the consumer in accordance with contractual provisions. "Other types" are programs that limit or shift peak loads from on-peak to off-peak time periods, such as space heating and water heating storage systems.

[3] 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.

[4] Nominal dollars.

[5] From 1989 to 1996, Energy Efficiency includes "other types" of demand-side management programs. Beginning in 1997, these programs are included under Load Management.

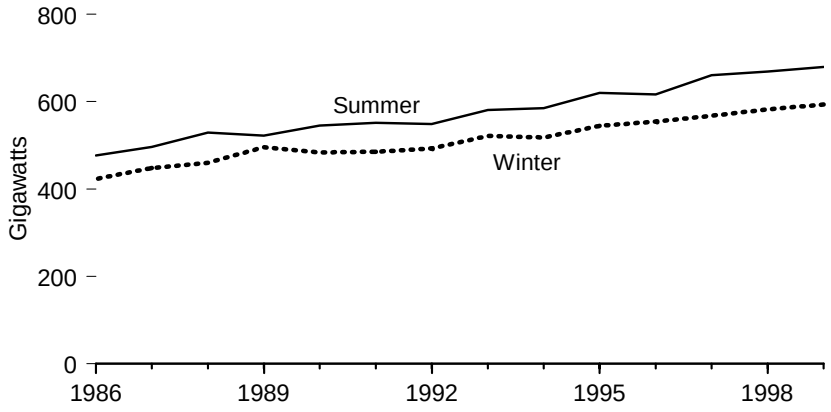
NA=Not available.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

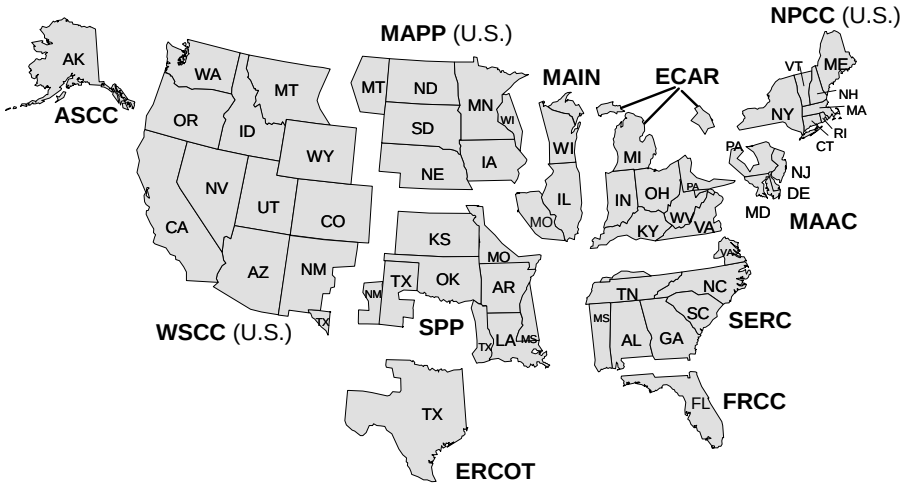
Sources: • 1989-1993—Energy Information Administration (EIA), *Electric Power Annual 1993* (December 1994). • 1994 forward—EIA, *Electric Power Annual 1998, Volume II* (October 1999), Tables 45, 48, and 49.

Figure 8.11 Electric Utility Noncoincidental Peak Load

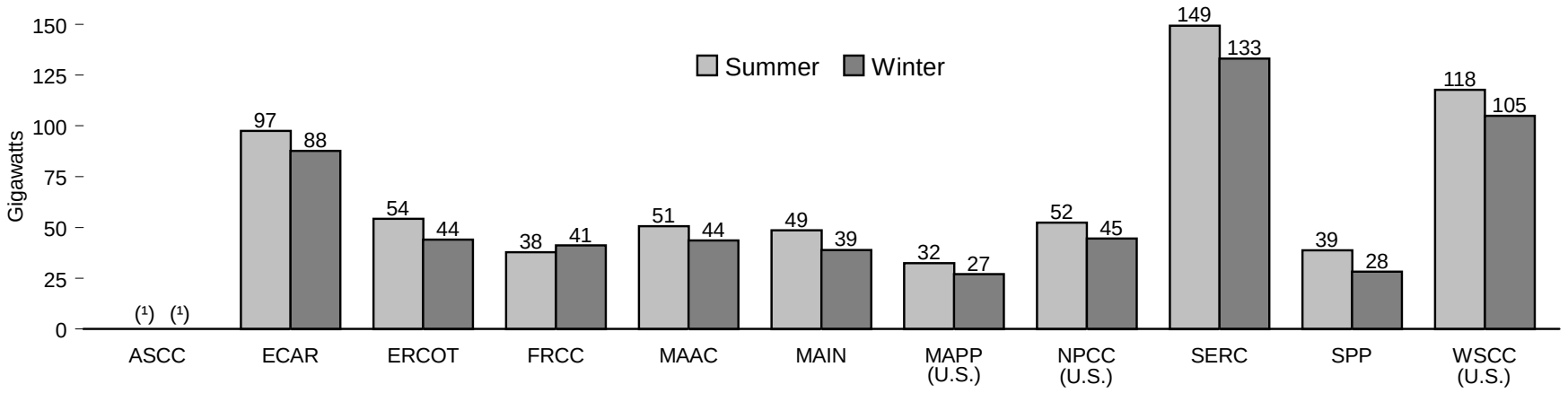
In the Contiguous United States, 1986-1999



North American Electric Reliability Council Map for the United States



By NERC Region, 1999



[1] Data for ASCC (Alaska) were not filed for 1999.

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 8.11.

Table 8.11 Electric Utility Noncoincidental Peak Load by Region, 1986-1999

(Megawatts)

Year	North American Electric Reliability Council Regions [1]										Contiguous United States	ASCC (Alaska)
	ECAR	ERCOT	FRCC	MAAC	MAIN	MAPP (U.S.)	NPCC (U.S.)	SERC	SPP	WSCC (U.S.)		
	Summer											
1986	69,606	39,335	—	37,564	35,943	21,029	39,026	105,570	47,123	81,787	476,983	([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
1994	87,165	44,162	—	46,019	42,562	27,000	47,581	132,584	56,035	102,212	585,320	524
1995	92,619	46,618	—	48,577	45,782	29,192	47,705	146,569	59,595	103,592	620,249	622
1996	90,798	47,480	—	44,302	46,402	28,253	45,094	145,650	60,072	108,739	616,790	([3])
1997	R93,784	R54,666	R38,730	R48,445	R47,509	R30,722	R49,566	R143,226	R37,724	R115,921	R660,293	([3])
1998	R95,675	R53,330	R37,327	R49,807	R47,875	R31,991	R51,760	R147,223	R38,180	R115,901	R669,069	([3])
1999F	97,475	54,199	37,864	50,576	48,542	32,406	52,415	149,380	38,795	117,874	679,526	([3])
	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
1994	75,638	36,180	—	40,653	33,999	23,033	42,547	132,661	42,505	91,037	518,253	641
1995	83,465	36,965	—	40,790	35,734	23,429	42,755	142,032	44,626	94,890	544,686	676
1996	84,534	38,868	—	40,468	37,162	24,251	41,208	143,060	49,095	95,435	554,081	([3])
1997	R84,401	R41,876	R39,975	R36,532	R37,410	R26,080	R44,199	R127,416	R27,847	R101,822	R567,558	([3])
1998	R86,020	R42,574	R40,165	R43,009	R38,170	R26,781	R44,160	R130,738	R27,986	R103,087	R582,690	([3])
1999F	87,748	44,061	41,176	43,628	38,945	26,980	44,550	133,116	28,311	104,936	593,451	([3])

[1] See Glossary for information on the North American Electric Reliablility 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 8.11 for an illustration of NERC regions.

[2] Data submission for ASCC (Alaska) began in 1989.

[3] Data for ASCC (Alaska) were not filed for 1996, 1997, 1998, or 1999.

R=Revised. F=Forecast. — = Not applicable.

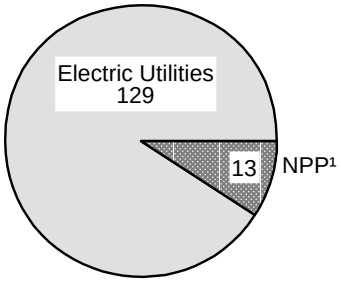
Note: Noncoincidental peak load is the sum of two or more peak loads on individual systems that do not occur at the same time interval.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

Sources: • 1986-1990—Energy Information Administration (EIA), *Electric Power Annual 1990* (January 1992), Table 53. • 1991-1993—EIA, *Electric Power Annual 1994, Volume II* (November 1995), Table 35. • 1994 forward—EIA, *Electric Power Annual 1998, Volume II* (December 1999), Table 35.

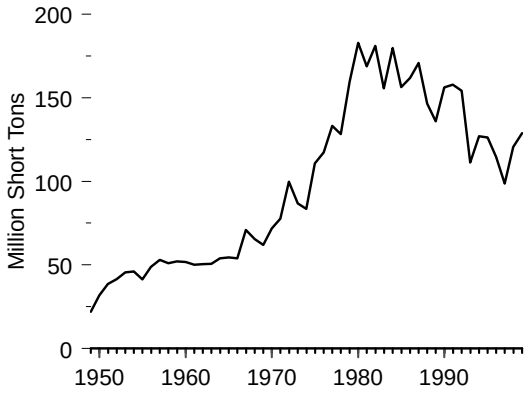
Figure 8.12 Electric Power Sector Stocks of Coal and Petroleum

Coal Stocks, 1999

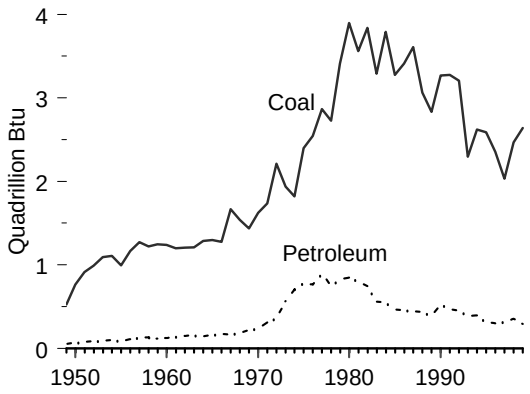


Total: 142 million short tons

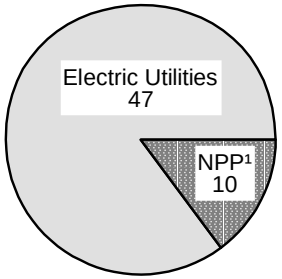
Coal Stocks at Electric Utilities, 1949-1999



Coal and Petroleum Stocks at Electric Utilities, 1949-1999

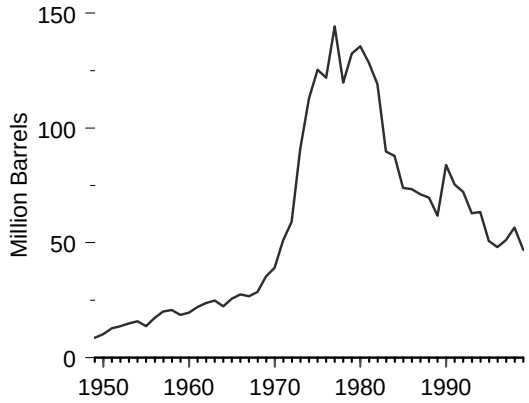


Petroleum Stocks, 1999

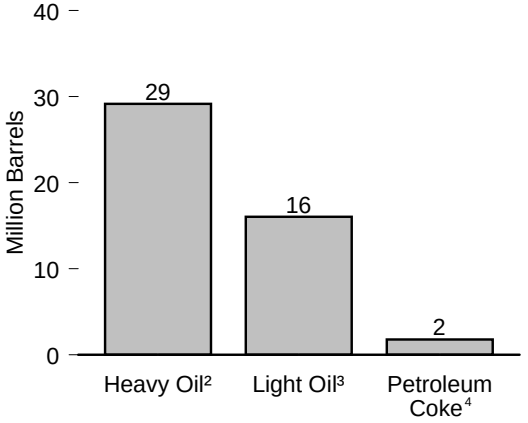


Total: 57 million barrels

Petroleum Stocks at Electric Utilities, 1949-1999



Petroleum Stocks at Electric Utilities by Type, 1999



[1] Nonutility power producers.
[2] Fuel oil nos. 4, 5, and 6, and residual fuel oils.
[3] Fuel oil nos. l and 2, heating oil, kerosene, and jet fuel.
[4] Petroleum coke, which is reported in short tons, is converted at a rate of 5 barrels per short ton.
Note: Because vertical scales differ, graphs should not be compared.
Source: Tables 8.12, A3, and A5.

Table 8.12 Electric Power Sector Stocks of Coal and Petroleum, 1949-1999

	Coal			Petroleum								
				Electric Utilities					Nonutility Power Producers			
Year	Electric Utilities	Nonutility Power Producers	Total Electric Power Sector	Heavy Oil [1]	Light Oil [2]	Liquids	Petroleum Coke	Total [3]	Liquids	Petroleum Coke	Total [3]	Total Electric Power Sector
	Million Short Tons			Million Barrels			Million Short Tons	Million Barrels	Million Barrels	Million Short Tons	Million Barrels	Million Barrels
1949	22.1	NA	22.1	NA	NA	8.6	NA	8.6	NA	NA	NA	8.6
1950	31.8	NA	31.8	NA	NA	10.2	NA	10.2	NA	NA	NA	10.2
1951	38.5	NA	38.5	NA	NA	12.8	NA	12.8	NA	NA	NA	12.8
1952	41.5	NA	41.5	NA	NA	13.7	NA	13.7	NA	NA	NA	13.7
1953	45.6	NA	45.6	NA	NA	15.0	NA	15.0	NA	NA	NA	15.0
1954	46.1	NA	46.1	NA	NA	15.9	NA	15.9	NA	NA	NA	15.9
1955	41.4	NA	41.4	NA	NA	13.7	NA	13.7	NA	NA	NA	13.7
1956	48.8	NA	48.8	NA	NA	17.3	NA	17.3	NA	NA	NA	17.3
1957	53.1	NA	53.1	NA	NA	20.1	NA	20.1	NA	NA	NA	20.1
1958	51.0	NA	51.0	NA	NA	20.8	NA	20.8	NA	NA	NA	20.8
1959	52.1	NA	52.1	NA	NA	18.5	NA	18.5	NA	NA	NA	18.5
1960	51.7	NA	51.7	NA	NA	19.6	NA	19.6	NA	NA	NA	19.6
1961	50.1	NA	50.1	NA	NA	22.0	NA	22.0	NA	NA	NA	22.0
1962	50.4	NA	50.4	NA	NA	23.8	NA	23.8	NA	NA	NA	23.8
1963	50.6	NA	50.6	NA	NA	24.9	NA	24.9	NA	NA	NA	24.9
1964	53.9	NA	53.9	NA	NA	22.4	NA	22.4	NA	NA	NA	22.4
1965	54.5	NA	54.5	NA	NA	25.6	NA	25.6	NA	NA	NA	25.6
1966	53.9	NA	53.9	NA	NA	27.4	NA	27.4	NA	NA	NA	27.4
1967	71.0	NA	71.0	NA	NA	26.7	NA	26.7	NA	NA	NA	26.7
1968	65.5	NA	65.5	NA	NA	28.7	NA	28.7	NA	NA	NA	28.7
1969	61.9	NA	61.9	NA	NA	35.3	NA	35.3	NA	NA	NA	35.3
1970	71.9	NA	71.9	NA	NA	38.0	0.2	39.2	NA	NA	NA	38.0
1971	77.8	NA	77.8	NA	NA	49.6	0.3	51.1	NA	NA	NA	49.6
1972	99.7	NA	99.7	NA	NA	57.7	0.3	59.1	NA	NA	NA	57.7
1973	87.0	NA	87.0	79.1	10.1	89.2	0.3	90.8	NA	NA	NA	90.8
1974	83.5	NA	83.5	97.7	15.2	112.9	(s)	113.1	NA	NA	NA	113.1
1975	110.7	NA	110.7	108.8	16.4	125.3	(s)	125.4	NA	NA	NA	125.4
1976	117.4	NA	117.4	107.0	14.7	121.7	(s)	121.9	NA	NA	NA	121.9
1977	133.2	NA	133.2	124.7	19.3	144.0	(s)	144.3	NA	NA	NA	144.3
1978	128.2	NA	128.2	102.4	16.4	118.8	0.2	119.8	NA	NA	NA	119.8
1979	159.7	NA	159.7	111.1	20.3	131.4	0.2	132.3	NA	NA	NA	132.3
1980	183.0	NA	183.0	105.4	30.0	135.4	0.1	135.6	NA	NA	NA	135.6
1981	168.9	NA	168.9	102.0	26.1	128.1	(s)	128.3	NA	NA	NA	128.3
1982	181.1	NA	181.1	95.5	23.4	118.9	(s)	119.1	NA	NA	NA	119.1
1983	155.6	NA	155.6	70.6	18.8	89.4	0.1	89.7	NA	NA	NA	89.7
1984	179.7	NA	179.7	68.5	19.1	87.6	0.1	87.9	NA	NA	NA	87.9
1985	156.4	NA	156.4	57.3	16.4	73.7	(s)	73.9	NA	NA	NA	73.9
1986	161.8	NA	161.8	56.8	16.3	73.1	(s)	73.3	NA	NA	NA	73.3
1987	170.8	NA	170.8	55.1	15.8	70.8	0.1	71.1	NA	NA	NA	71.1
1988	146.5	NA	146.5	54.2	15.1	69.3	0.1	69.7	NA	NA	NA	69.7
1989	135.9	NA	135.9	47.4	13.8	61.3	0.1	61.8	NA	NA	NA	61.8
1990	156.2	NA	156.2	67.0	16.5	83.5	0.1	84.0	NA	NA	NA	84.0
1991	157.9	NA	157.9	58.6	16.4	75.0	0.1	75.3	NA	NA	NA	75.3
1992	154.1	NA	154.1	56.1	15.7	71.8	0.1	72.2	NA	NA	NA	72.2
1993	111.3	NA	111.3	46.8	15.7	62.4	0.1	62.9	NA	NA	NA	62.9
1994	126.9	NA	126.9	46.3	16.6	63.0	0.1	63.3	NA	NA	NA	63.3
1995	126.3	NA	126.3	35.1	15.4	50.5	0.1	50.8	NA	NA	NA	50.8
1996	114.6	NA	114.6	32.5	15.2	47.7	0.1	48.1	NA	NA	NA	48.1
1997	98.8	NA	98.8	33.3	15.5	48.8	0.5	51.1	NA	NA	NA	51.1
1998	120.5	NA	120.5	37.4	16.3	53.8	0.6	56.6	NA	NA	NA	56.6
1999[P]	128.9	13.4	142.3	29.2	16.0	45.2	0.4	47.0	9.7	0.1	10.4	57.4

[1] For 1973 to 1979, steam plant stocks of petroleum; for 1980 forward, fuel oil nos. 4, 5, and 6, and residual fuel oils.

[2] For 1973 to 1979, gas turbine and internal combustion plant stocks of petroleum; for 1980 forward, fuel oil nos. 1 and 2, kerosene, and jet fuel.

[3] Petroleum coke is converted at 5 barrels per short ton.

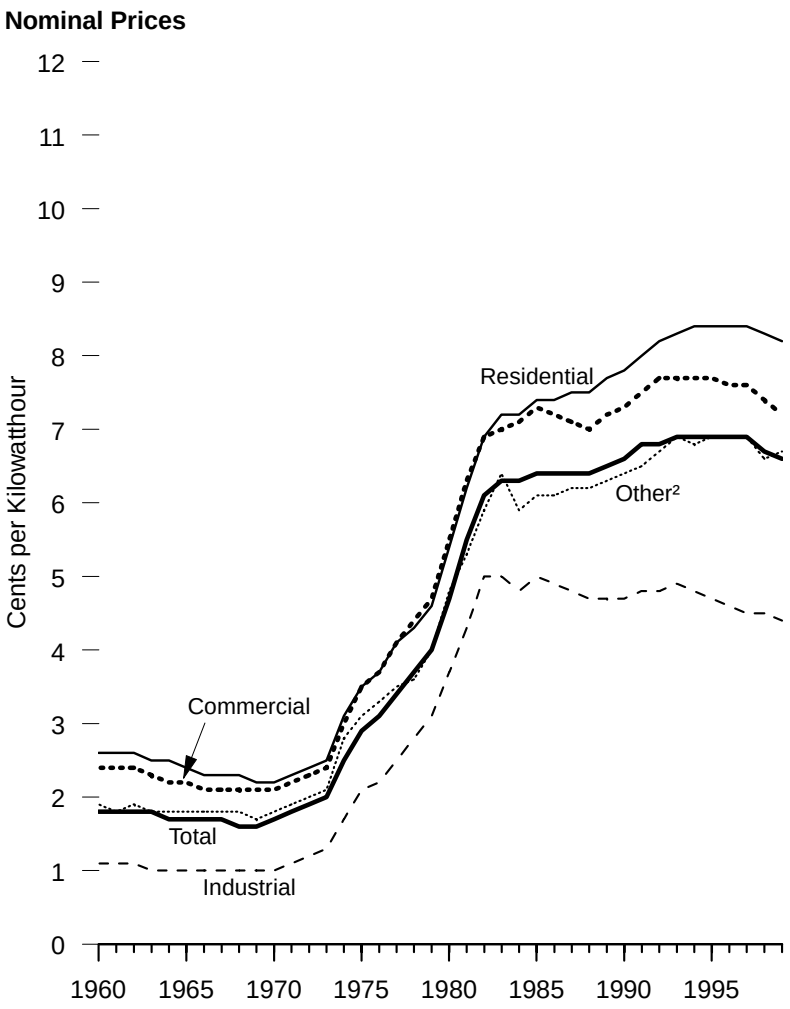
P=Preliminary. NA=Not available. (s)=Less than 0.05 million short tons.

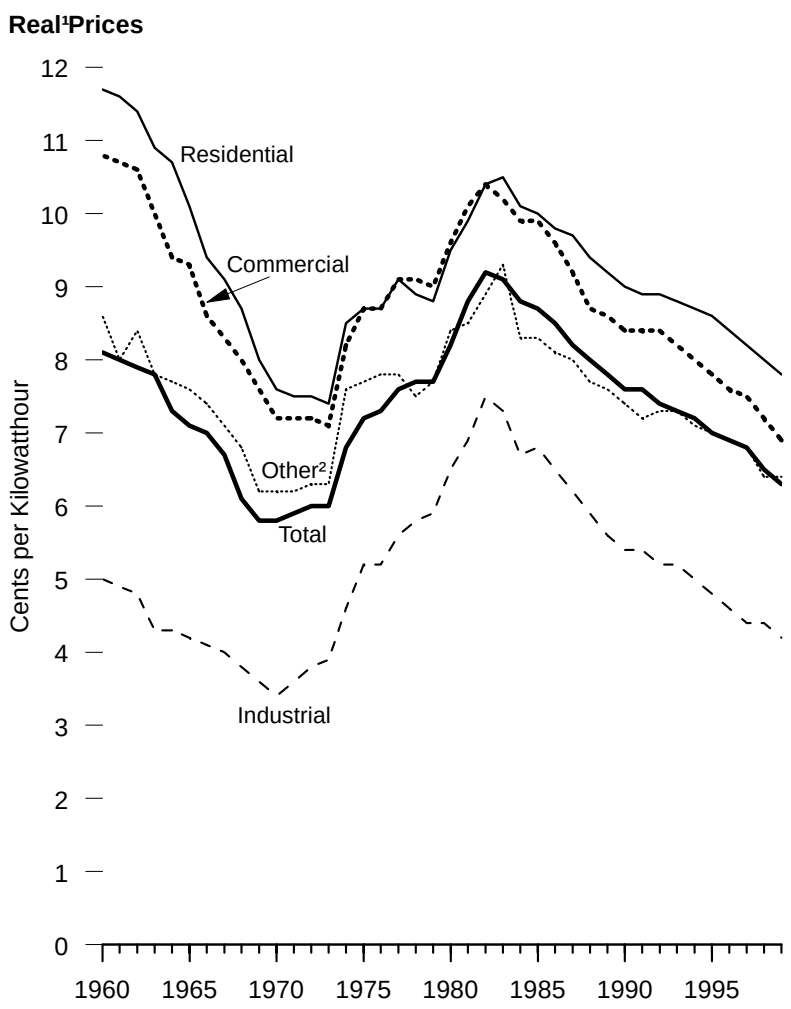
Notes: • Stocks are at end of year. • Data are for fuels available to produce electricity; they may include some fuels available to produce useful thermal output at cogeneration plants. • See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

Sources: • 1949-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982-1988—Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report." • 1989 forward—EIA, *Electric Power Monthly* (March 2000), Tables 21 and 71.

Figure 8.13 Retail Prices of Electricity Sold by Electric Utilities, 1960-1999





¹ In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. SeeTable E1.

² Public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Source: Table 8.13.

Table 8.13 Retail Prices of Electricity Sold by Electric Utilities, 1960-1999

(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	R11.7	2.4	R10.8	1.1	R5.0	1.9	R8.6	1.8	R8.1
1961	2.6	R11.6	2.4	R10.7	1.1	R4.9	1.8	R8.0	1.8	R8.0
1962	2.6	R11.4	2.4	R10.6	1.1	R4.8	1.9	R8.4	1.8	R7.9
1963	2.5	R10.9	2.3	R10.0	1.0	R4.3	1.8	R7.8	1.8	R7.8
1964	2.5	R10.7	2.2	R9.4	1.0	R4.3	1.8	R7.7	1.7	R7.3
1965	2.4	R10.1	2.2	R9.3	1.0	R4.2	1.8	R7.6	1.7	R7.1
1966	2.3	R9.4	2.1	R8.6	1.0	R4.1	1.8	R7.4	1.7	R7.0
1967	2.3	R9.1	2.1	R8.3	1.0	R4.0	1.8	R7.1	1.7	R6.7
1968	2.3	R8.7	2.1	R8.0	1.0	R3.8	1.8	R6.8	1.6	R6.1
1969	2.2	R8.0	2.1	R7.6	1.0	R3.6	1.7	R6.2	1.6	R5.8
1970	2.2	R7.6	2.1	R7.2	1.0	R3.4	1.8	R6.2	1.7	R5.8
1971	2.3	R7.5	2.2	R7.2	1.1	R3.6	1.9	R6.2	1.8	R5.9
1972	2.4	R7.5	2.3	R7.2	1.2	R3.8	2.0	R6.3	1.9	R6.0
1973	2.5	R7.4	2.4	R7.1	1.3	R3.9	2.1	R6.3	2.0	R6.0
1974	3.1	R8.5	3.0	R8.2	1.7	R4.6	2.8	R7.6	2.5	R6.8
1975	3.5	R8.7	3.5	R8.7	2.1	R5.2	3.1	R7.7	2.9	R7.2
1976	3.7	R8.7	3.7	R8.7	2.2	R5.2	3.3	R7.8	3.1	R7.3
1977	4.1	R9.1	4.1	R9.1	2.5	R5.6	3.5	R7.8	3.4	R7.6
1978	4.3	R8.9	4.4	R9.1	2.8	R5.8	3.6	R7.5	3.7	R7.7
1979	4.6	R8.8	4.7	R9.0	3.1	R5.9	4.0	R7.7	4.0	R7.7
1980	5.4	R9.5	5.5	R9.6	3.7	R6.5	4.8	R8.4	4.7	R8.2
1981	6.2	R9.9	6.3	R10.1	4.3	R6.9	5.3	R8.5	5.5	R8.8
1982	6.9	R10.4	6.9	R10.4	5.0	R7.5	5.9	R8.9	6.1	R9.2
1983	7.2	R10.5	7.0	R10.2	5.0	R7.3	6.4	R9.3	6.3	R9.1
1984	7.15	R10.01	7.13	R9.98	4.83	R6.76	5.90	R8.26	6.25	R8.75
1985	7.39	R10.03	7.27	R9.87	4.97	R6.74	6.09	R8.26	6.44	R8.74
1986	7.42	R9.85	7.20	R9.56	4.93	R6.55	6.11	R8.11	6.44	R8.55
1987	7.45	R9.60	7.08	R9.13	4.77	R6.15	6.21	R8.00	6.37	R8.21
1988	7.48	R9.33	7.04	R8.78	4.70	R5.86	6.20	R7.73	6.35	R7.92
1989	7.65	R9.19	7.20	R8.65	4.72	R5.67	6.25	R7.51	6.45	R7.75
1990	7.83	R9.05	7.34	R8.48	4.74	R5.48	6.40	R7.40	6.57	R7.59
1991	8.04	R8.97	7.53	R8.40	4.83	R5.39	6.51	R7.26	6.75	R7.53
1992	8.21	R8.94	7.66	R8.34	4.83	R5.26	6.74	R7.34	6.82	R7.43
1993	8.32	R8.85	7.74	R8.23	4.85	R5.16	6.88	R7.32	6.93	R7.37
1994	8.38	R8.73	7.73	R8.05	4.77	R4.97	6.84	R7.12	6.91	R7.20
1995	8.40	R8.56	7.69	R7.84	4.66	R4.75	6.88	R7.01	6.89	R7.02
1996	8.36	R8.36	7.64	R7.64	4.60	R4.60	6.91	R6.91	6.86	R6.86
1997	8.43	R8.27	7.59	R7.45	4.53	R4.45	6.91	R6.78	6.85	R6.72
1998	8.26	R8.01	7.41	R7.19	4.48	R4.34	6.63	R6.43	6.74	R6.54
1999P	8.17	7.81	7.20	6.88	4.42	4.23	6.74	6.44	6.63	6.34

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

[2] In chained (1996) dollars, calculated by using gross domestic product implicit price deflators. See Table E1.

R=Revised. P=Preliminary.

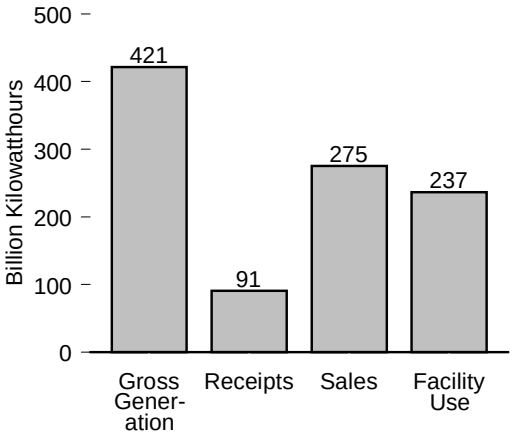
Note: Data for 1979 and earlier data are for Classes A and B privately owned electric utilities only. Data for 1980 forward are for selected Class A utilities whose electric operating revenues were $100 million or more during the previous year.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

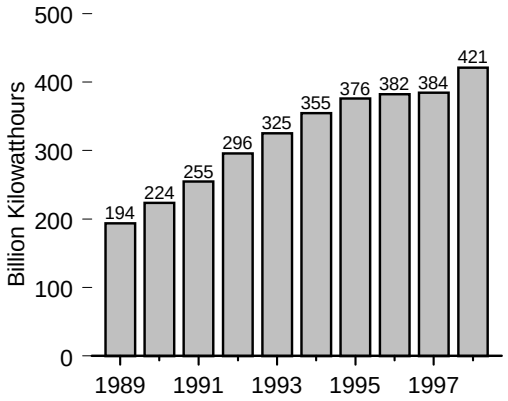
Sources: • 1960 through September 1977—Federal Power Commission, Form FPC-5, "Monthly Statement of Electric Operating Revenues and Income." • October 1977 through February 1980—Federal Energy Regulatory Commission (FERC), Form FPC-5, "Monthly Statement of Electric Operating Revenues and Income." • March 1980 through 1982—FERC, Form FERC-5, "Electric Utility Company Monthly Statement." • 1983—Energy Information Administration (EIA), Form EIA-826, "Electric Utility Company Monthly Statement." • 1984-1988—EIA, Form EIA-861, "Annual Electric Utility Report." • 1989 forward—EIA, *Electric Power Monthly* (March 2000), Table 52.

Figure 8.14 Nonutility Power Producer Overview

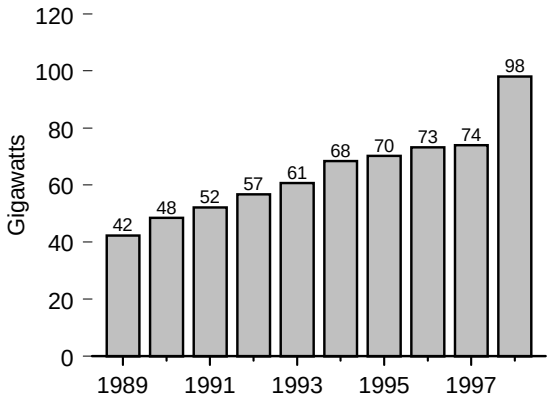
Supply and Disposition, 1998



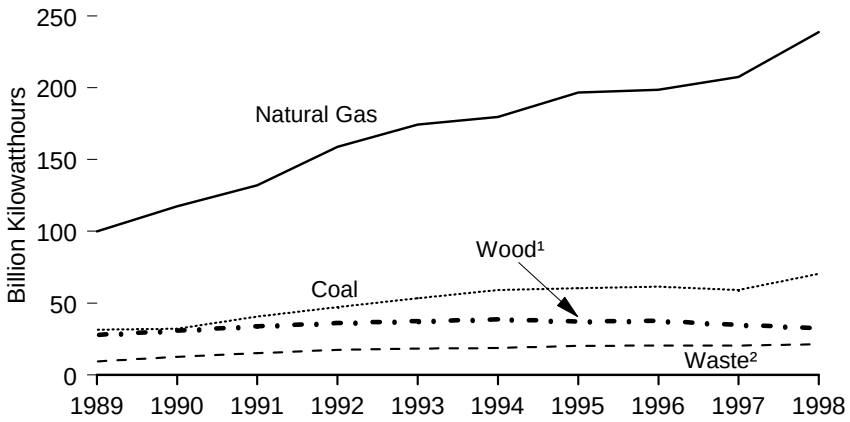
Gross Generation, 1989-1998



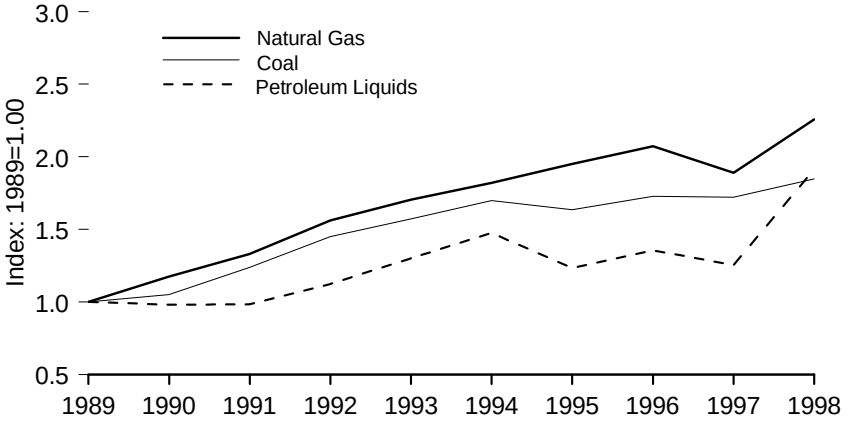
Installed Capacity, 1989-1998



Gross Generation by Selected Fuel Type, 1989-1998



Fossil Fuel Consumption by Selected Fuel Type, Indexed, 1989-1998



[1] See Table 8.14, footnote 14.
[2] See Table 8.14, footnotes 15, 16, and 17.
Notes: • Nonutility electric generating facilities with a total generator capacity of 1 megawatt or greater. See Table 8.14 for a description of fuels. • Due to restructuring of the electric power sector, the sale of generation assets is resulting in reclassification of plants from electric utility to nonutility plants. • Because vertical scales differ, graphs should not be compared.
Source: Table: 8.14.

Table 8.14 Nonutility Power Producer Overview, 1989-1998

Item	1989[1]	1990[1]	1991[1]	1992	1993	1994	1995	1996	1997	1998
Supply and Disposition										
(million kilowatthours)										
Gross Generation	R**193,578**	R**223,786**	R**254,594**	**296,001**	**325,226**	**354,925**	**375,901**	**382,423**	R**384,496**	R**421,364**
Receipts [2]	R61,479	R63,743	R68,264	83,421	85,323	94,166	89,919	103,219	R88,506	R90,675
Sales to Utilities [3]	81,229	106,224	129,118	164,374	187,466	204,688	217,906	224,646	R223,532	R249,483
Sales to End Users [4]	17,687	19,824	11,419	10,786	15,569	17,626	15,548	14,284	R18,147	R25,777
Facility Use [5]	R156,141	R161,482	R182,321	204,261	207,514	226,777	232,367	246,713	R231,323	R236,779
Fossil Fuel Consumption [6]										
Coal [7] (thousand short tons)	30,762	R32,311	R38,119	44,607	48,343	52,261	R50,329	53,199	R52,913	R56,849
Petroleum Liquids [8] (thousand barrels)	28,377	R27,878	R27,882	R31,876	R36,960	R41,889	R35,031	R38,444	R35,594	R54,275
Petroleum Coke (thousand short tons)	NA	1,108	1,629	2,750	3,182	4,740	4,188	4,484	4,364	4,470
Natural Gas [9] (million cubic feet)	1,181,015	1,386,741	1,569,850	1,844,857	2,013,788	2,149,246	2,303,944	2,447,720	R2,231,363	R2,666,430
Gross Generation										
(million kilowatthours)	R**193,578**	R**223,786**	R**254,594**	**296,001**	**325,226**	**354,925**	**375,901**	**382,423**	R**384,496**	R**421,364**
Coal [7]	31,511	32,131	40,587	47,363	53,367	59,035	60,234	61,375	R59,211	R70,369
Petroleum [10]	5,742	7,330	7,814	10,963	13,364	15,069	15,049	14,959	R15,930	R17,533
Natural Gas [11]	R100,003	R117,399	R132,014	158,798	174,282	179,735	196,633	198,555	R207,527	R238,747
Other Gas [12]	([13])	([13])	([13])	([13])	([13])	R12,478	R13,919	R14,604	R11,514	R8,802
Nuclear Electric Power	49	116	80	67	78	54	0	0	0	0
Conventional Hydroelectric Power	R8,689	R9,676	R9,541	9,446	11,511	13,227	14,774	16,555	R17,902	R14,633
Geothermal	R5,708	R7,430	R8,200	8,578	9,749	10,122	9,912	10,198	R9,382	R9,882
Wood [14]	27,835	30,812	33,785	36,255	37,421	38,595	37,283	37,525	R34,898	R32,596
MSW [15] and LFG [16]	R7,787	R10,613	R12,262	14,050	14,489	R15,404	R16,901	R16,348	R17,536	R18,101
Other Waste [17]	R1,562	R1,840	R2,875	3,303	3,835	3,394	R3,395	R4,210	R2,883	R3,050
Wind	R2,302	R3,066	R3,050	2,916	3,052	3,482	3,185	3,400	R3,248	R3,015
Solar [18]	R640	663	779	746	897	824	824	903	893	R887
Other [19]	1,750	2,710	3,609	3,516	3,181	3,507	3,792	3,793	R3,572	R3,750
Installed Capacity [20]										
(megawatts)	R**42,358**	R**48,473**	R**52,186**	**56,814**	**60,778**	**68,461**	**70,254**	**73,189**	R**74,004**	R**98,085**
Coal [7]	R6,911	R7,291	R7,659	8,503	9,772	10,372	10,877	11,370	R11,027	R13,712
Petroleum [10]	R1,376	R1,334	R1,686	1,730	2,043	2,262	2,116	2,251	R2,924	R2,629
Natural Gas [11]	R15,539	R18,008	R21,056	21,542	23,463	26,925	27,906	30,166	R31,092	R37,325
Petroleum and Natural Gas (dual fired)	R5,179	R6,757	R5,411	8,478	8,505	9,820	10,479	10,912	R10,029	R23,105
Other Gas [12]	([13])	([13])	([13])	([13])	([13])	1,130	R1,199	R298	R16	R198
Nuclear Electric Power	20	20	20	20	20	0	0	0	0	0
Conventional Hydroelectric Power	R2,290	R2,634	R2,656	2,684	2,741	3,364	3,399	3,419	R3,770	R4,136
Geothermal	R1,063	R1,123	R1,136	1,254	1,318	1,335	1,295	1,346	1,303	R1,449
Wood [14]	R5,856	R6,335	R6,824	6,805	7,046	7,416	6,885	7,263	R7,282	R6,887
MSW [15] and LFG [16]	R1,697	R2,063	R2,348	2,361	2,411	2,590	R2,832	2,661	R2,825	R2,868
Other Waste [17]	R255	R433	R556	645	720	561	R616	R830	R589	R626
Wind	R1,696	R1,911	R1,975	1,822	1,813	1,737	1,723	1,670	R1,566	R1,689
Solar [18]	R280	360	360	360	360	354	354	354	354	R385
Other [19]	R196	R207	R499	611	566	597	574	648	R1,229	R3,075

[1] Data for 1989-1991 were collected for facilities with capacities 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 1989-1991 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.

[2] Purchases, interchanges, and exchanges of electric energy with utilities and other nonutilities.

[3] Sales, interchanges, and exchanges of electric energy with utilities.

[4] Sales, interchanges, and exchanges of electric energy with entities other than utilities.

[5] Calculated as the sum of gross generation and receipts minus sales to utilities and end users.

[6] Data are for fuels consumed to produce both electricity and useful thermal output.

[7] Coal, fine coal, anthracite culm, bituminous gob, lignite waste, tar coal, waste coal, and coke breeze.

[8] Fuel oil nos. 1, 2, 4, 5, and 6, crude oil, kerosene, liquid butane, liquid propane, methanol, liquid byproducts, oil waste, sludge oil, and tar oil.

[9] Natural gas only.

[10] Fuel oil nos. 1, 2, 4, 5, and 6, crude oil, petroleum coke, kerosene, liquid butane, liquid propane, methanol, liquid byproducts, oil waste, sludge oil, and tar oil.

[11] Includes waste heat and waste gas.

[12] Butane, propane, blast furnace gas, coke oven gas, refinery gas, and process gas.

[13] Included in "Natural Gas."

[14] Wood, wood waste, black liquor, red liquor, spent sulfite liquor, pitch, wood sludge, peat, railroad ties, and utility poles.

[15] Municipal solid waste.

[16] Landfill gas.

[17] Methane, digester gas, liquid acetonitrile waste, tall oil, waste alcohol, medical waste, paper pellets, sludge waste, solid byproducts, tires, agricultural byproducts, closed loop biomass, fish oil, and straw.

[18] Solar thermal and photovoltaic energy.

[19] Hydrogen, sulfur, batteries, chemicals, and purchased steam.

[20] Installed capacity is the full-load continuous rating of a generator, prime mover, or other electrical equipment under specified conditions as designated by the manufacturer. It is usually indicated on a nameplate attached physically to the equipment. Installed station capacity does not include auxiliary or house units.

R=Revised. NA=Not available.

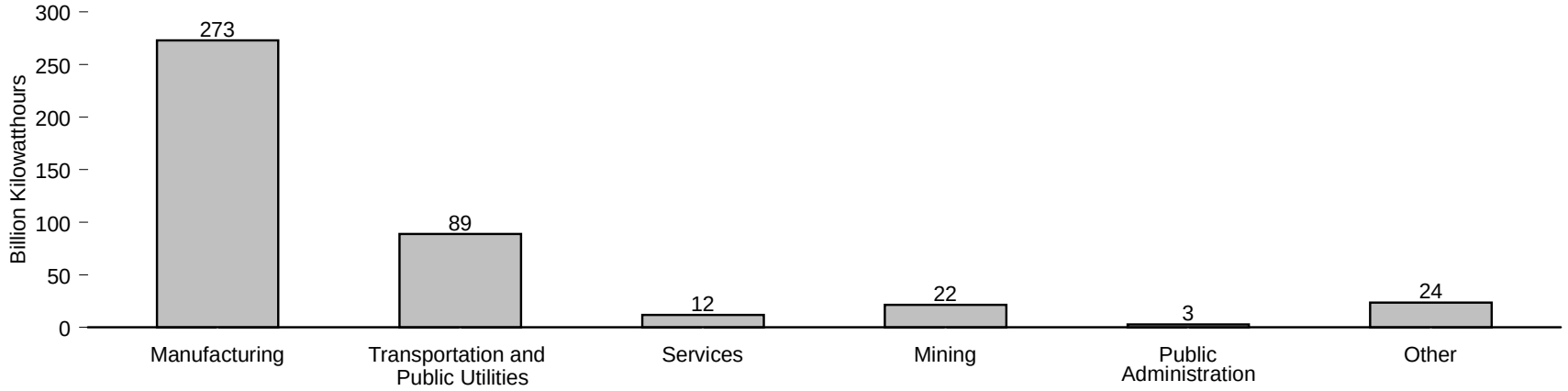
Notes: • Due to restructuring of the electric power sector, the sale of generation assets is resulting in reclassification of plants from electric utility to nonutility plants. • See Note 5 at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

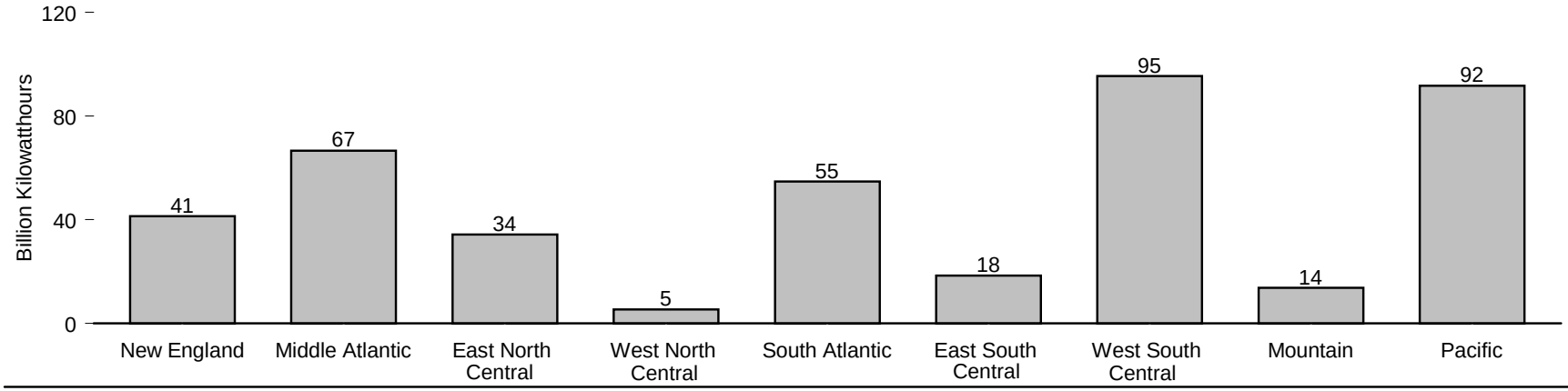
Sources: • 1989-1991—Estimated on the basis of data collected from Form EIA-867, "Annual Nonutility Power Producer Report." • 1992-1993—Energy Information Administration (EIA), *Electric Power Annual,* annual reports. • 1994-1998—EIA, *Electric Power Annual 1998, Volume II* (December 1999).

Figure 8.15 Nonutility Power Producer Gross Generation, 1998

By Producing Energy Group



By Census Division



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

Source: Table 8.15.

Table 8.15 Nonutility Power Producer Gross Generation, 1998

(Million Kilowatthours)

Census Divisions	Manufacturing	Transportation and Public Utilities	Services	Mining	Public Administration	Other Industry Groups	Total
New England	15,408	19,967	456	—	—	5,521	41,352
Middle Atlantic	46,083	13,024	3,596	1,517	883	1,476	66,579
East North Central	25,430	6,468	2,367	—	17	44	34,325
West North Central	3,143	669	427	1,146	—	21	5,405
South Atlantic	42,059	10,481	772	6	31	1,373	54,720
East South Central	12,955	5,155	92	114	56	—	18,372
West South Central	88,639	5,718	552	368	—	77	95,354
Mountain	5,607	4,287	856	488	—	2,451	13,689
Pacific	33,678	22,928	2,657	17,977	1,562	12,765	91,567
Total	**273,002**	**88,697**	**11,774**	**21,615**	**2,548**	**23,728**	**421,364**

— = Not applicable.

Notes: • Nonutility electric generating facilities with a total generator capacity of 1 megawatt or greater. • Data are based on facilities' consumption. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

Source: Energy Information Administration (EIA), *Electric Power Annual 1998, Volume II,* (October 1999), Table 60.

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. 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. Beginning in 1989, data for nonutility power producers (cogenerators, small power producers, and independent power producers) are provided.

3. Electric utility 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 the years 1949 through 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 non-nuclear generating units became operable between 1 and 4 months prior to their commercial operation dates, depending upon the prime mover and time period. The actual operable dates for nuclear units were used. It should be noted that nonutility net summer capabilities, which are not currently collected for nonutilities, are estimated based on installed nameplate capacity data in Table 8.14.

4. Data on electric utility retail sales of electricity represent gross output of electricity (measured at the generator terminals) minus power plant use and transmission and distribution losses. Included in each end-use sector are the following: Commercial Sector–sales of electricity to businesses that generally require less than 1,000 kilowatts of service; Industrial Sector–sales of electricity to businesses that generally require more than 1,000 kilowatts of service; Residential Sector–sales of electricity to residences for household purposes; "Other" Sector–sales of electricity for public street and highway lighting, to public authorities, railways, and railroads, and interdepartmental sales.

5. 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.

Electricity Sources

Table 8.1

Net Generation, Electric Utilities: Table 8.3. **Net Generation, Nonutility Power Producers:** Table 8.4. **Imports and Exports:** • 1949-September 1977—unpublished Federal Power Commission data. • October 1977-1980—unpublished Economic Regulatory Administration (ERA) data. • 1981—Department of Energy (DOE), Office of Energy Emergency Operations, "Report on Electric Energy Exchanges with Canada and Mexico for Calendar Year 1981," April 1982 (revised June 1982). • 1982 and 1983— DOE, ERA, *Electricity Exchanges Across International Borders*. • 1984-1986—DOE, ERA, *Electricity Transactions Across International Borders*. • 1987 and 1988—DOE, ERA, Form ERA-781R, "Annual Report of International Electrical Export/Import Data." • 1989–DOE Fossil Energy, Form FE-781R, "Annual Report of International Electrical Export/Import Data." • 1990-1998—Mexico's Data: DOE, Fossil Fuels, Office of Fuels Programs, Form FE-871R, "*Annual Report of International Electrical Export/Import Data*." Canada's Data: National Energy Board of Canada (metered energy, firm and interruptible). • 1999—EIA estimates based on preliminary data from DOE, Fossil Energy, and actual data from the National Energy Board of Canada. **Losses and Unaccounted For:** Calculated as the sum of total net generation and imports minus total end use and exports. **Electric Utility Retail Sales:** Table 8.9. **Nonutility Power Producers**: Table 8.14.

Table 8.8

• 1949-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982-1988—Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report." • 1989 forward–EIA, *Electric Power Monthly* (March 2000), Tables 14 and 67.

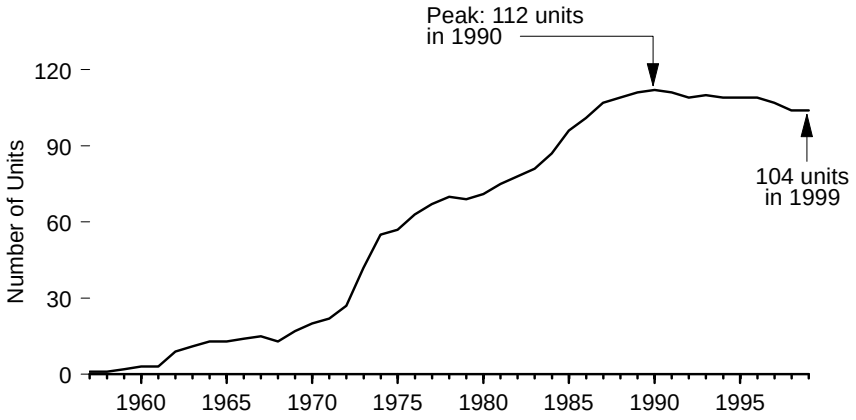
9 Nuclear Energy

Site of Shippingport atomic power station, the first commercial nuclear power plant in the United States (rectangular reactor building and foreground); background, Beaver Valley 1 and 2 nuclear power plants and Bruce Mansfield coal-fired power plant (southwestern Pennsylvania). Source: U.S. Department of Energy.

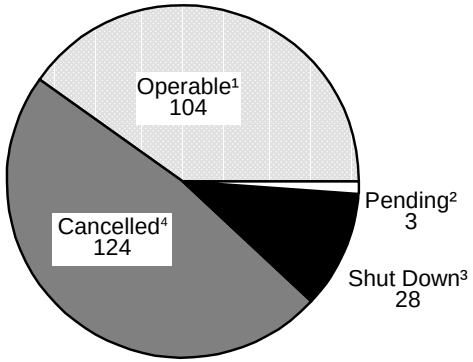
Figure 9.1 Nuclear Generating Units

Operable Units By Site, 1999

Operable Units,[1] 1957-1999

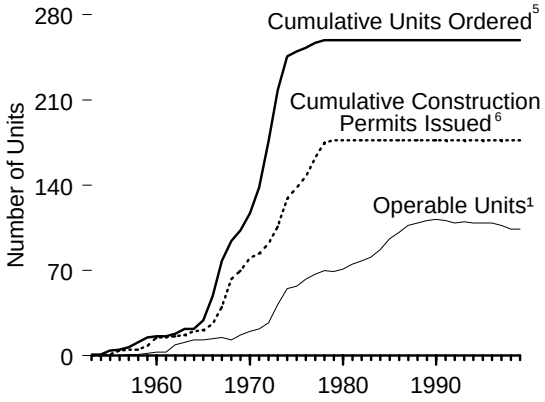


Status of All Ordered Units, 1953-1999

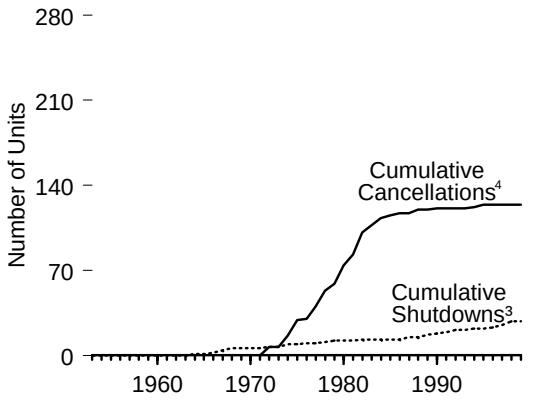


Total Units Ordered: 259

Orders, Permits, and Operable Units, 1953-1999



Cancellations and Shutdowns, 1953-1999



[1] Issuance by a regulatory authority of full-power operating license, or equivalent permission to operate.

[2] Ordered but not completed or cancelled.

[3] Ceased operation permanently.

[4] Cancellation of ordered units.

[5] Placement of an order by a utility for a nuclear steam supply system.

[6] Issuance by regulatory authority of a permit, or equivalent permission, to begin construction.

Note: Data are at end of year.

Sources: Map: Based on Energy Information Administration data. Other: Table 9.1.

Table 9.1 Nuclear Generating Units, 1953-1999

Year	Orders [1]	Construction Permits [2]	LPOL [3]	New Operable Units [4]	Shutdowns [5]	Total Operable Units [6]	Cancellations [7]	Cumulative Cancellations
1953	1	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0
1955	3	1	0	0	0	0	0	0
1956	1	3	0	0	0	0	0	0
1957	2	1	1	1	0	1	0	0
1958	4	0	0	0	0	1	0	0
1959	4	3	1	1	0	2	0	0
1960	1	7	1	1	0	3	0	0
1961	0	0	0	0	0	3	0	0
1962	2	1	7	6	0	9	0	0
1963	4	1	3	2	0	11	0	0
1964	0	3	2	3	1	13	0	0
1965	7	1	0	0	0	13	0	0
1966	20	5	1	2	1	14	0	0
1967	29	14	3	3	2	15	0	0
1968	16	23	0	0	2	13	0	0
1969	9	7	4	4	0	17	0	0
1970	14	10	4	3	0	20	0	0
1971	21	4	5	2	0	22	0	0
1972	38	8	6	6	1	27	7	7
1973	42	14	12	15	0	42	0	7
1974	28	23	14	15	2	55	9	16
1975	4	9	3	2	0	57	13	29
1976	3	9	7	7	1	63	1	30
1977	4	15	4	4	0	67	10	40
1978	2	13	3	4	1	70	13	53
1979	0	2	0	0	1	69	6	59
1980	0	0	5	2	0	71	15	74
1981	0	0	3	4	0	75	9	83
1982	0	0	6	4	1	78	18	101
1983	0	0	3	3	0	81	6	107
1984	0	0	7	6	0	87	6	113
1985	0	0	7	9	0	96	2	115
1986	0	0	7	5	0	101	2	117
1987	0	0	6	8	2	107	0	117
1988	0	0	1	2	0	109	3	120
1989	0	0	3	4	2	111	0	120
1990	0	0	1	2	1	112	1	121
1991	0	0	0	0	1	111	0	121
1992	0	0	0	0	2	109	0	121
1993	0	0	1	1	0	110	0	121
1994	0	0	0	0	1	109	1	122
1995	0	0	1	0	0	109	2	124
1996	0	0	0	1	1	109	0	124
1997	0	0	0	0	2	107	0	124
1998	0	0	0	0	3	104	0	124
1999	0	0	0	0	0	104	0	124

[1] Placement of an order by a utility or government agency for a nuclear steam supply system.
[2] Issuance by regulatory authority of a permit, or equivalent permission, to begin construction. Numbers reflect permits issued in a given year, not extant permits.
[3] Low-power operating license: Issuance by regulatory authority of license, or equivalent permission, to conduct testing but not to operate at full power.
[4] Issuance by regulatory authority of full-power operating license, or equivalent permission. Units generally did not begin immediate operation. See Note 1 at end of section.
[5] Ceased operation permanently.
[6] Total of units holding full-power licenses, or equivalent permission to operate, at the end of the year. See Note 1 at end of section.
[7] Cancellation by utilities of ordered units. Does not include three units (Bellefonte 1 and 2 and Watts Bar 2) where construction has been stopped indefinitely.

R=Revised.

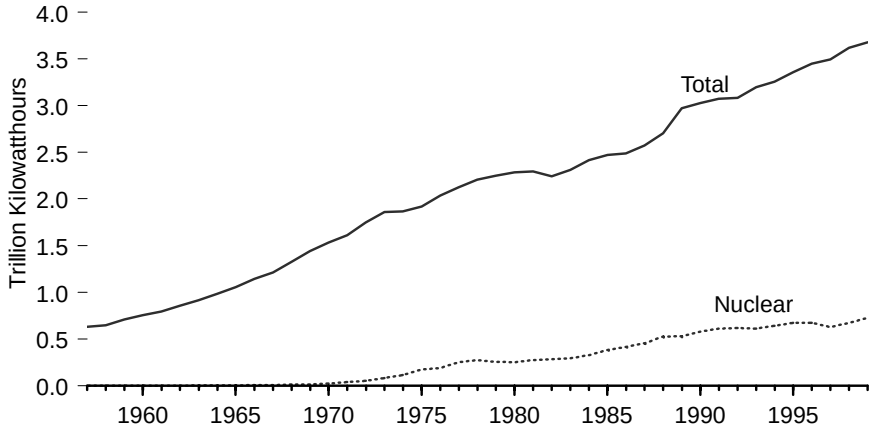
Note: Data are at end of year.

Web Page: http://www.eia.doe.gov/fuelnuclear.html.

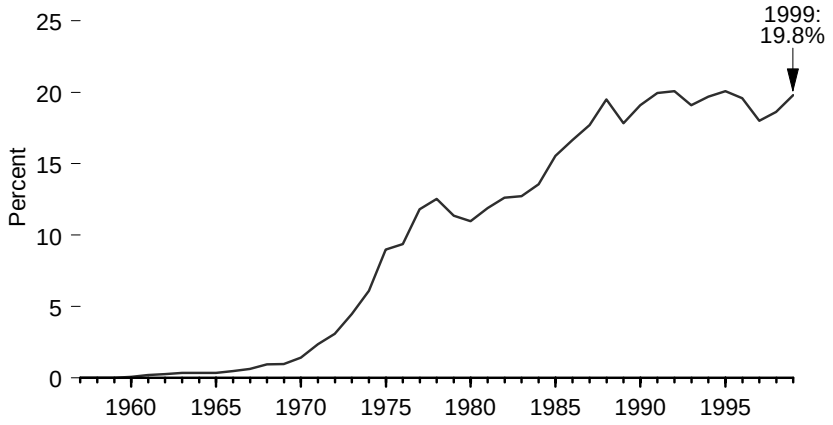
Sources: • 1953-1997: **Orders:** Energy Information Administration, *Commercial Nuclear Power 1991,* Appendix E, September 1991; Nuclear Energy Institute, *Historical Profile of U.S. Nuclear Power Development,* 1988 edition; U.S. Atomic Energy Commission, *1973 Annual Report to Congress, Volume 2, Regulatory Activities;* various utilities. **Construction Permits:** Nuclear Regulatory Commission, *Information Digest,* 1997 edition, Appendix A; Nuclear Energy Institute, *Historical Profile of U.S. Nuclear Power Development,* 1988 edition; various utility, Federal, and contractor officials. **Low-Power Operating Licenses:** Nuclear Energy Institute, *Historical Profile of U.S. Nuclear Power Development,* 1988 edition; U.S. Department of Energy, *Nuclear Reactors Built, Being Built, and Planned: 1995;* various utility, Federal, and contractor officials. **New Operable Units:** Nuclear Regulatory Commission, *Information Digest,* 1997 edition, Table 11 and Appendices A and B; various utility, Federal, and contractor officials. **Shutdowns:** Energy Information Administration, *Commercial Nuclear Power 1991,* Appendix E; Nuclear Regulatory Commission, *Information Digest,* 1998 edition; U.S. Department of Energy, *Nuclear Reactors Built, Being Built, and Planned: 1995;* Tennessee Valley Authority officials; Nuclear Regulatory Commission, "Plant Status Report." **Total Operable Units:** Running sum of new operable units minus permanent shutdowns. **Cancellations:** Energy Information Administration, *Commercial Nuclear Power 1991,* Appendix E, September 1991; Nuclear Regulatory Commission, *Information Digest,* 1997 editon, Appendix C; and Nuclear Energy Institute, *Historical Profile of U.S. Nuclear Power Development,* 1988 edition. • 1998 forward—http://www.nrc.gov/NRC/reactors.html.

Figure 9.2 Nuclear Power Plant Operations

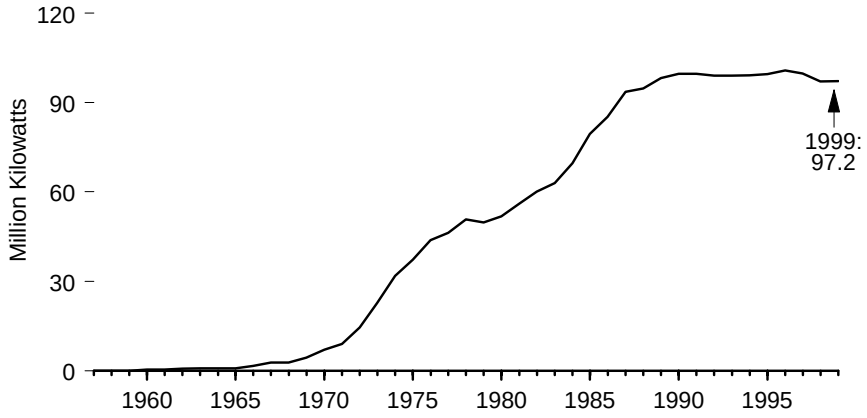
Total Electricity and Nuclear Electricity Net Generation, 1957-1999



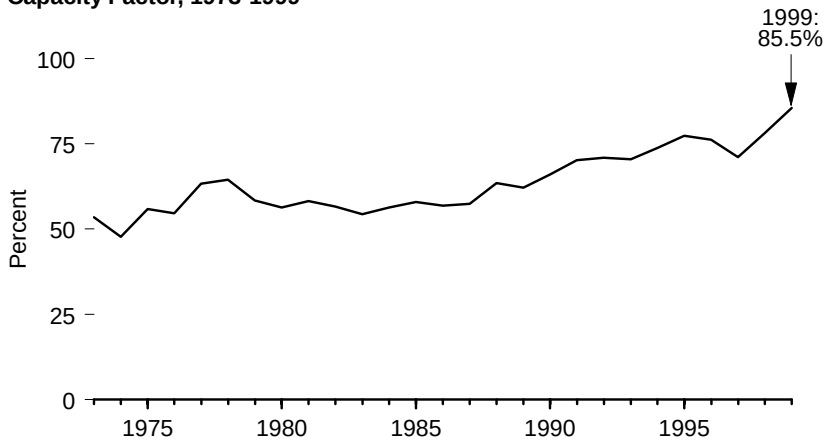
Nuclear Share of Electricity Net Generation, 1957-1999



Net Summer Capability of Operable Units, 1957-1999



Capacity Factor, 1973-1999



Sources: Tables 8.1 and 9.2.

Table 9.2 Nuclear Power Plant Operations, 1957-1999

Year	Nuclear Electricity Net Generation	Nuclear Share of Electricity Net Generation	Net Summer Capability of Operable Units [1,2]	Capacity Factor [2]
	Billion Kilowatthours	Percent	Million Kilowatts	Percent
1957	(s)	(s)	0.1	NA
1958	0.2	(s)	0.1	NA
1959	0.2	(s)	0.1	NA
1960	0.5	0.1	0.4	NA
1961	1.7	0.2	0.4	NA
1962	2.3	0.3	0.7	NA
1963	3.2	0.4	0.8	NA
1964	3.3	0.3	0.8	NA
1965	3.7	0.3	0.8	NA
1966	5.5	0.5	1.7	NA
1967	7.7	0.6	2.7	NA
1968	12.5	0.9	2.7	NA
1969	13.9	1.0	4.4	NA
1970	21.8	1.4	7.0	NA
1971	38.1	2.4	9.0	NA
1972	54.1	3.1	14.5	NA
1973	83.5	4.5	22.7	53.5
1974	114.0	6.1	31.9	47.8
1975	172.5	9.0	37.3	55.9
1976	191.1	9.4	43.8	54.7
1977	250.9	11.8	46.3	63.3
1978	276.4	12.5	50.8	64.5
1979	255.2	11.4	49.7	58.4
1980	251.1	11.0	51.8	56.3
1981	272.7	11.9	56.0	58.2
1982	282.8	12.6	60.0	56.6
1983	293.7	12.7	63.0	54.4
1984	327.6	13.6	69.7	56.3
1985	383.7	15.5	79.4	58.0
1986	414.0	16.6	85.2	56.9
1987	455.3	17.7	93.6	57.4
1988	527.0	19.5	94.7	63.5
1989	[3]529.4	[3]17.8	[3]98.2	[3]62.2
1990	577.0	19.1	99.6	66.0
1991	612.6	19.9	99.6	70.2
1992	618.8	20.1	99.0	70.9
1993	610.4	19.1	99.1	70.5
1994	640.5	19.7	99.1	73.8
1995	673.4	20.1	99.5	77.4
1996	674.7	19.6	100.8	76.2
1997	628.6	18.0	99.7	71.1
1998	673.7	18.6	97.1	78.2
1999[P]	727.9	19.8	97.2	85.5

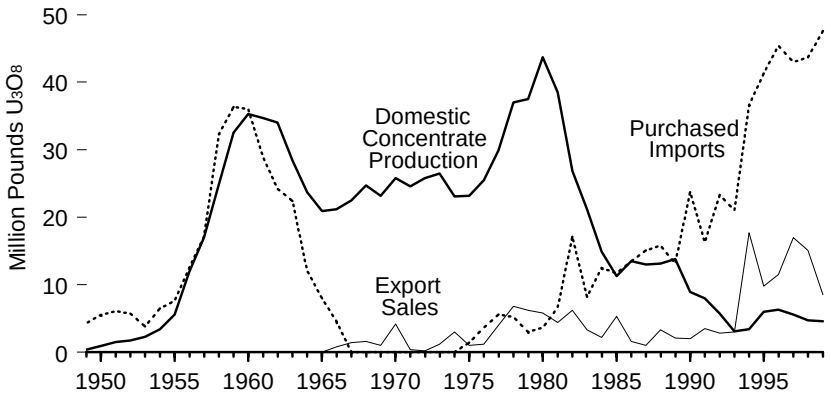
[1] At end of year.
[2] See Note 2 at end of section.
[3] Beginning in 1989, includes nonutility facilities.
P=Preliminary. NA=Not available. (s)=Less than 0.05 billion kilowatthours or less than 0.05 percent.

Note: The performance data shown in this table are based on a universe of reactor units that differs in some respects from the reactor universe used to profile the nuclear power industry in Table 9.1, especially in the years prior to 1973. See Note 1 at end of section for further discussion.

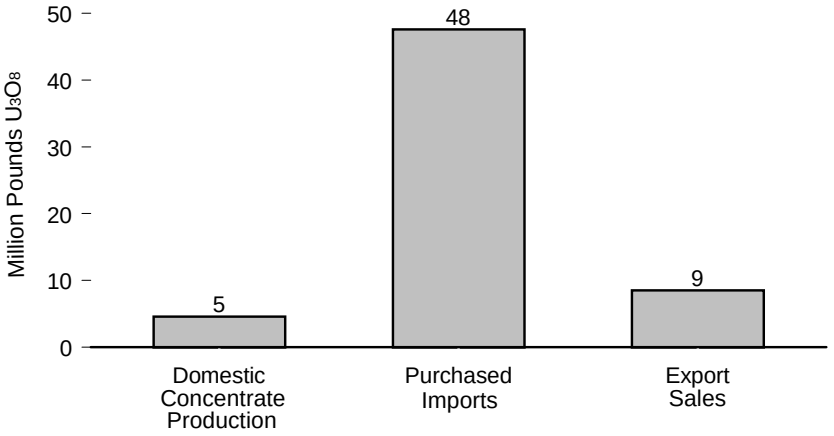
Sources: **Operable Units:** • 1957-1972—Federal Power Commission (FPC), Form FPC-4, "Monthly Power Plant Report." • 1973 forward—Nuclear Regulatory Commission, *Licensed Operating Reactors,* (NUREG-0020), monthly. **Electricity Generation:** • 1957-September 1977—FPC, Form FPC-4, "Monthly Power Plant 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-860A, "Annual Electric Generator Report-Utility."

Figure 9.3 Uranium Overview

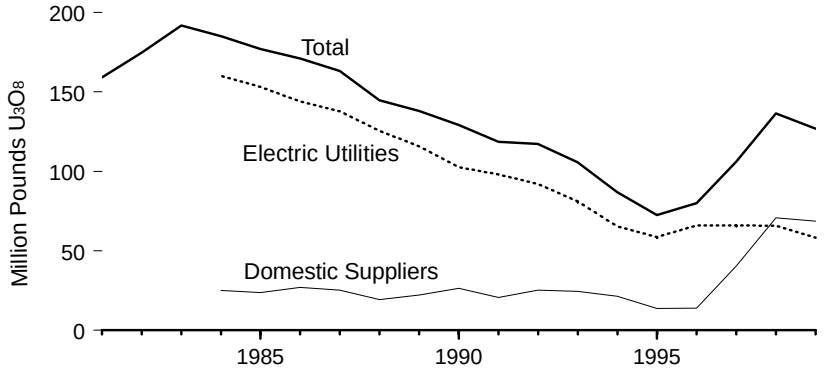
Production and Trade, 1949-1999



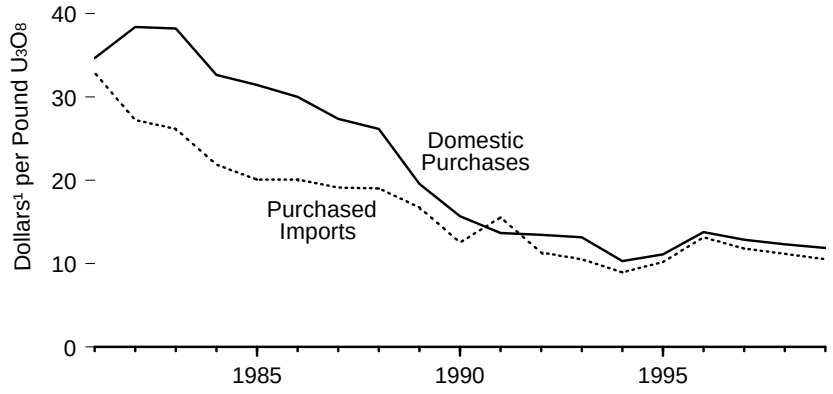
Production and Trade, 1999



Inventories, End of Year 1981-1999



Average Prices, 1981-1999



[1] Nominal dollars.

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

Source: Table 9.3.

Table 9.3 Uranium Overview, 1949-1999

Year	Domestic Concentrate Production	Purchased Imports [1]	Export [1] Sales	Utility Purchases From Domestic Suppliers	Loaded Into U.S. Nuclear Reactors [2]	Inventories			Average Price	
						Domestic Suppliers	Electric Utilities	Total	Purchased Imports	Domestic Purchases
	Million Pounds U_3O_8								U.S. Dollars[3] 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	153.2	176.9	20.08	31.43
1986	13.51	13.5	1.6	18.9	NA	27.0	144.1	171.1	20.07	30.01
1987	12.99	15.1	1.0	20.8	NA	25.4	137.8	163.2	19.14	27.37
1988	13.13	15.8	3.3	17.6	NA	19.3	125.5	144.8	19.03	26.15
1989	13.84	13.1	2.1	18.4	NA	22.2	115.8	138.1	16.75	19.56
1990	8.89	23.7	2.0	20.5	NA	26.4	102.7	129.1	12.55	15.70
1991	7.95	16.3	3.5	26.8	34.6	20.7	98.0	118.7	15.55	13.66
1992	5.65	23.3	2.8	23.4	43.0	25.2	92.1	117.3	11.34	13.45
1993	3.06	21.0	3.0	15.5	45.1	24.5	81.2	105.7	10.53	13.14
1994	3.35	36.6	17.7	22.7	40.4	21.5	65.4	86.9	8.95	10.30
1995	6.04	41.3	9.8	22.3	51.1	13.7	58.7	72.5	10.20	11.11
1996	6.32	45.4	11.5	22.9	46.2	13.9	66.1	80.0	13.15	13.81
1997	5.64	43.0	17.0	18.7	48.2	40.4	65.9	106.2	11.81	12.87
1998	4.71	43.7	15.1	20.3	R 38.2	70.7	R 65.8	R 136.5	11.19	12.31
1999P	4.61	47.6	8.5	19.2	58.8	68.8	58.2	127.0	10.55	11.88

[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 suppliers only. For 1982 forward, transactions by uranium buyers (consumers) have been included. Buyer imports and exports prior to 1982 are believed to be small.

[2] Does not include any fuel rods removed from reactors and later reloaded.

[3] Nominal dollars.

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

Web Page: http://www.eia.doe.gov/fuelnuclear.html.

Sources: • 1949-1966—U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry,* Report No. GJO-100, annual. • 1967-1998—Energy Information Administration (EIA), *Uranium Industry Annual,* annual reports. • 1999—EIA, *Uranium Industry Annual 1999* (May 2000), Tables H1, H2, H3, 5, 14, 27, 28, and 31.

Nuclear Energy Notes

1. In 1997 EIA undertook a major revision of Table 9.1 to more fully describe the history of the U.S. commercial nuclear power industry. The time frame was extended back to the birth of the industry in 1953, and the data categories were revised for greater relevance to current industry conditions and trends. To acquire the data for the revised categories it was necessary to develop a reactor unit database employing different sources than those used previously for Table 9.1 and still used for Table 9.2.

In Table 9.1 "commercial" means that the units contributed power to the commercial electricity grid, whether or not they were owned by an electric utility. A total of 259 units ever ordered was identified. Although most orders were placed by electric utilities, several units are or were ordered, owned, and operated wholly or in part by the Federal Government, including BONUS (Boiling Nuclear Superheater Power Station), Elk River, Experimental Breeder Reactor 2, Hallam, Hanford N, Piqua, and Shippingport.

A reactor is generally defined as operable in Table 9.1 while it possessed a full-power license from the Nuclear Regulatory Commission or its predecessor the Atomic Energy Commission, or equivalent permission to operate, at the end of the year. The definition is liberal in that it does not exclude units retaining full-power licenses during long, non-routine shutdowns. For example:

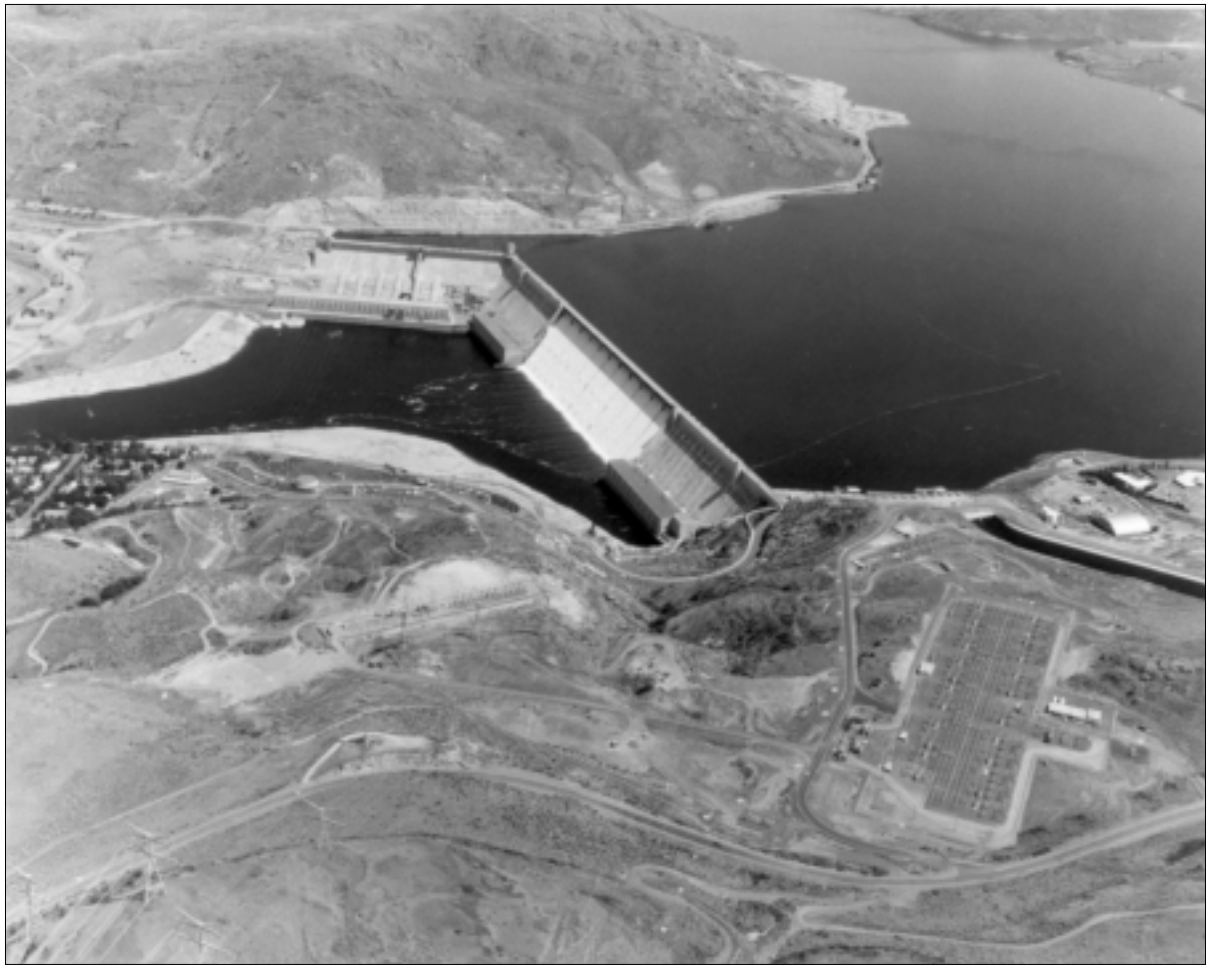
> In 1985 the five then-active Tennessee Valley Authority units (Browns Ferry 1, 2, and 3 and Sequoyah 1 and 2) were shut down under a regulatory forced outage. Browns Ferry 1 remains shut down and has been defueled, while the other units were idle for several years, restarting in 1991, 1995, 1988, and 1988, respectively. All five units are counted as operable during the shutdowns.
>
> Shippingport was shut down from 1974 through 1976 for conversion to a light-water breeder reactor, but is counted as operable until its retirement in 1982.
>
> Calvert Cliffs 2 was shut down in 1989 and 1990 for replacement of pressurizer heater sleeves but is counted as operable during those years.

Exceptions to the rule are Shoreham and Three Mile Island 2. Shoreham was granted a full-power license in April 1989, but was shut down two months later and never restarted. In 1991, the license was changed to Possession Only. Although not operable at the end of the year, Shoreham is treated as operable during 1989 and shut down in 1990, because counting it as operable and shut down in the same year would introduce a statistical discrepancy in the tallies. A major accident closed Three Mile Island 2 in 1979, and although the unit retained its full-power license for several years, it is considered permanently shut down since that year.

2. 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 use 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, by assuming that non-nuclear generating units became operable between 1 and 4 months prior to their commercial operation dates, depending upon the prime mover and time period. The actual operable dates for nuclear units were used.

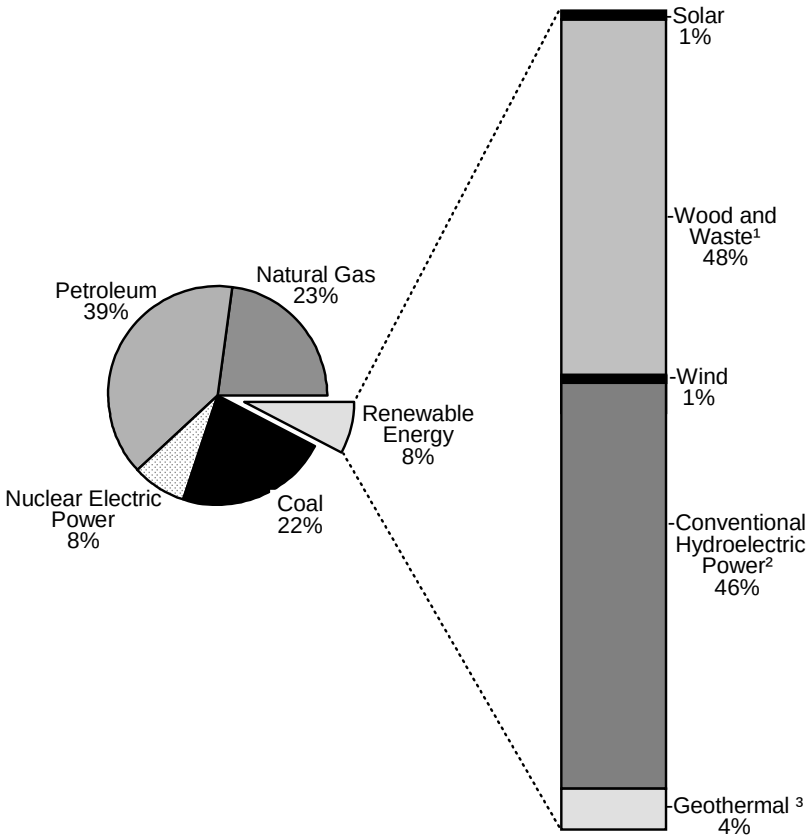
10 Renewable Energy



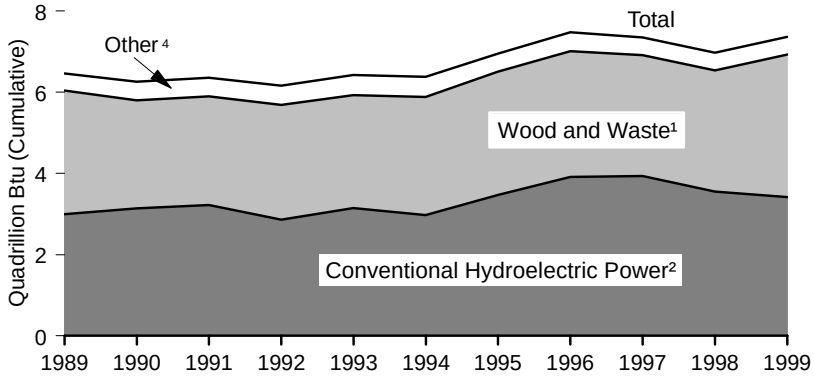
Grand Coulee Dam, Washington State. Source: U.S. Bureau of Reclamation.

Figure 10.1 Renewable Energy Consumption by Source

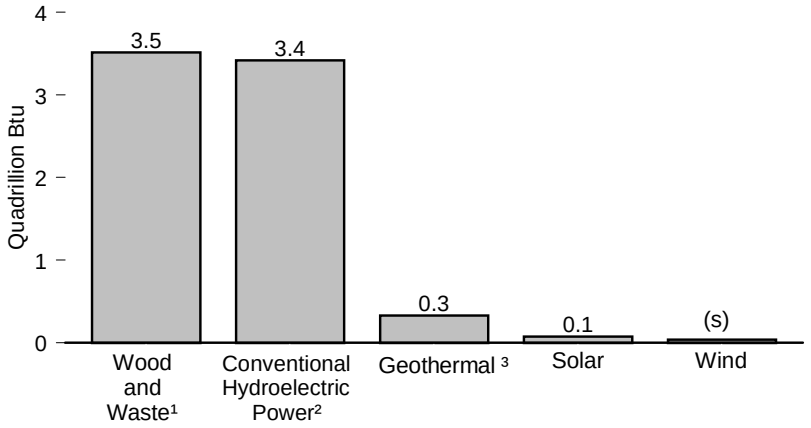
Renewable Energy as Share of Total Energy, 1999



Renewable Energy Consumption by Source, 1989-1999



Renewable Energy Consumption by Source, 1999



¹ Includes ethanol blended into motor gasoline.

² Includes electricity net imports from Canada that are derived from hydroelectric power.

³ Includes electricity imports from Mexico that are derived from geothermal energy.

⁴ Geothermal, solar, and wind.

(s) = Less than 0.05 quadrillion Btu.

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

Sources: Tables 1.3 and 10.1.

Table 10.1 Renewable Energy Consumption by Source, 1989-1999

(Quadrillion Btu)

Year	Wood and Waste [1]	Geothermal [2]	Conventional Hydroelectric Power [3,4]	Solar [5]	Wind [6]	Total
1989	R3.050	R0.338	R2.999	R0.059	R0.024	R6.470
1990	R2.665	R0.359	R3.140	0.063	R0.032	R6.260
1991	R2.679	R0.368	R3.222	0.066	R0.032	R6.367
1992	R2.826	0.379	2.863	0.068	0.030	R6.167
1993	R2.782	0.393	3.147	0.071	0.031	R6.424
1994	R2.914	0.395	2.971	0.072	0.036	R6.387
1995	R3.044	0.339	3.474	0.073	0.033	R6.963
1996	R3.104	0.352	R3.915	0.075	0.035	R7.482
1997	R2.982	R0.328	R3.940	0.074	R0.034	R7.358
1998	R2.991	R0.335	R3.552	0.074	R0.031	R6.984
1999E	3.514	0.327	3.417	0.076	0.038	7.373

[1] Wood, wood waste, black liquor, red liquor, spent sulfite liquor, pitch, wood sludge, peat, railroad ties, utility poles, municipal solid waste, landfill gas, methane, digester gas, liquid acetonitrile waste, tall oil, waste alcohol, medical waste, paper pellets, sludge waste, solid byproducts, tires, agricultural byproducts, closed looped biomass, fish oil, and straw.

[2] Includes electricity imports from Mexico that are derived from geothermal energy. Includes grid-connected electricity, and geothermal heat pump and direct use energy. Excludes shaft power and remote electrical power.

[3] Hydroelectricity generated by pumped storage is not included in renewable energy.

[4] Includes electricity net imports from Canada that are derived from hydroelectric power.

[5] Includes solar thermal and photovoltaic energy.

[6] Includes only grid-connected electricity.

R=Revised. E=Estimated.

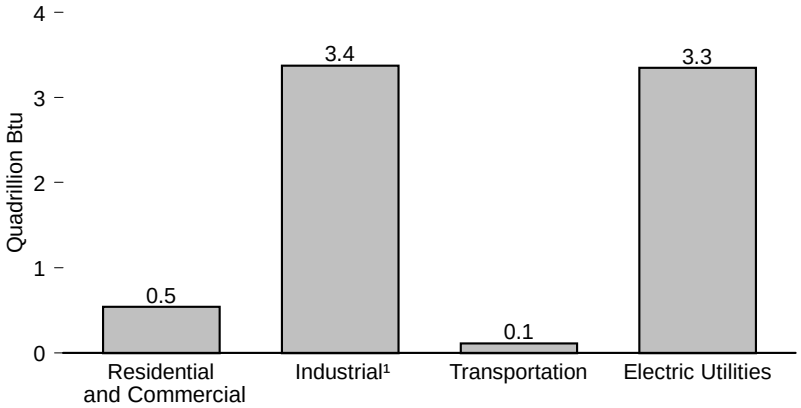
Note: Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelrenewable.html.

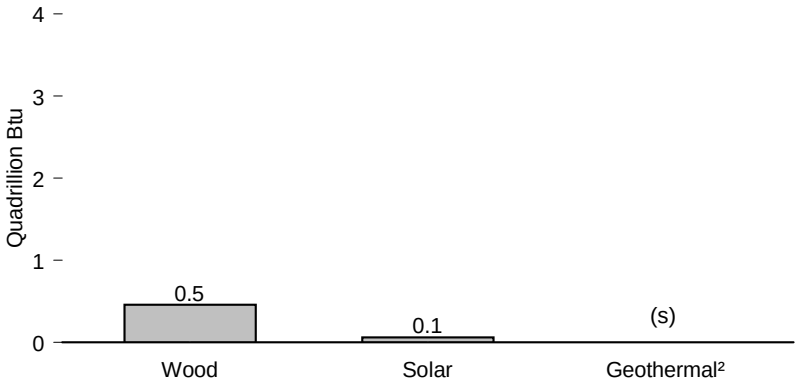
Sources: • 1989—Energy Information Administration (EIA) estimates. • 1990-1993—EIA, *Renewable Energy Annual,* annual reports. • 1994-1998—EIA, *Renewable Energy Annual 1999* (December 1999). • 1999—EIA estimates.

Figure 10.2 Renewable Energy Consumption by Sector, 1999

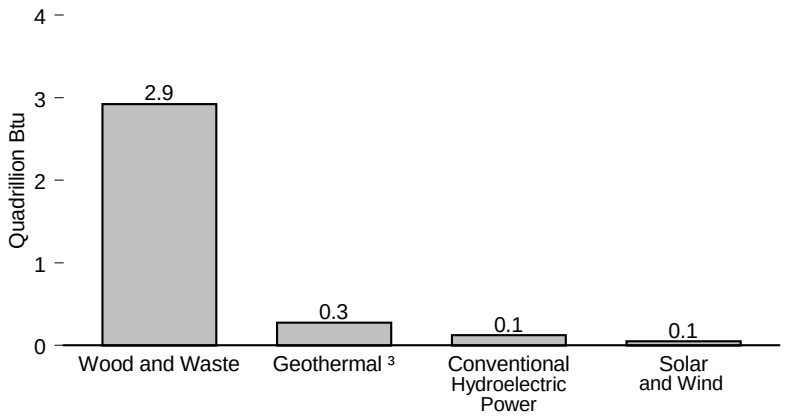
By Sector



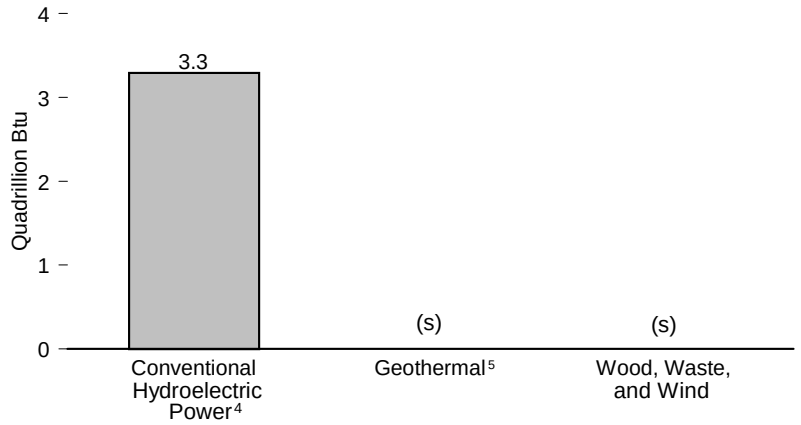
Residential and Commercial Sector



Industrial Sector



Electric Utilities



[1] Generation of electricity by nonutility power producers is included in the industrial sector, not the electric utility sector. Covers facilities of 1 megawatt or greater capacity.

[2] Geothermal heat pump and direct energy use.

[3] Geothermal electricity generation, heat pump, and direct energy use.

[4] Includes electricity net imports from Canada that are derived from hydroelectric power.

[5] Includes electricity imports from Mexico that are derived from geothermal energy.

(s) = Less than 0.05 quadrillion Btu.

Source: Table 10.2.

Table 10.2 Renewable Energy Consumption by Sector, 1989-1999

(Quadrillion Btu)

	Residential and Commercial				Industrial [1]						Trans-portation	Electric Utilities [2]					
Year	Wood [3]	Geo-thermal [4]	Solar [5]	Total	Wood and Waste [6]	Geo-thermal [7]	Conventional Hydroelectric Power [8]	Solar	Wind	Total	Alcohol Fuels [9]	Wood and Waste [6]	Geo-thermal [10]	Conventional Hydroelectric Power [8,11]	Solar and Wind	Total	Total
1989	R0.952	0.008	0.053	R1.012	R2.007	R0.122	R0.091	R0.007	R0.024	R2.250	0.071	0.020	0.208	2.908	(s)	3.137	R6.470
1990	R0.618	0.008	0.056	R0.682	R1.944	R0.159	R0.101	0.007	R0.032	R2.242	0.082	R0.022	0.192	3.039	(s)	3.253	R6.260
1991	R0.652	0.009	0.058	R0.719	R1.940	R0.174	R0.100	0.008	R0.032	R2.254	0.065	0.021	0.185	3.123	(s)	R3.330	R6.367
1992	R0.687	0.010	0.060	R0.756	R2.040	0.182	0.098	0.008	0.030	R2.357	R0.078	0.022	0.188	2.766	(s)	R2.976	R6.167
1993	0.592	0.010	0.062	0.664	R2.082	0.206	0.119	0.009	0.031	R2.447	0.088	R0.021	0.177	3.028	(s)	3.225	R6.424
1994	0.582	0.010	0.064	0.656	R2.214	0.214	0.136	0.009	0.036	R2.610	0.097	R0.021	0.170	2.834	(s)	3.024	R6.387
1995	0.641	0.011	0.065	0.717	R2.281	0.210	0.152	0.008	0.033	R2.685	0.104	0.017	0.118	3.322	(s)	3.457	R6.963
1996	0.644	0.012	0.066	0.722	R2.366	0.217	0.171	0.009	0.035	R2.798	0.074	0.020	0.123	R3.744	(s)	R3.888	R7.482
1997	R0.480	0.013	0.065	R0.558	R2.385	R0.200	0.185	0.009	R0.034	2.813	0.097	R0.021	0.115	R3.754	(s)	R3.890	R7.358
1998	R0.424	0.015	0.065	R0.503	R2.441	R0.211	R0.151	R0.009	R0.031	R2.844	0.105	R0.021	R0.110	R3.401	(s)	R3.532	R6.984
1999E	0.461	0.015	0.063	0.539	2.922	0.276	0.125	0.013	0.038	3.373	0.112	0.020	0.036	3.292	(s)	3.349	7.373

[1] Nonutility power producers' use of renewable energy to produce electricity and useful thermal output is included in the industrial sector, not the electric utility sector. Covers facilities of 1 megawatt or greater capacity.

[2] For Btu conversion rates, see Appendix Table A6.

[3] Wood.

[4] Geothermal heat pump and direct use energy.

[5] The solar thermal component 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 between 1980 and 1999. 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. Included also is a very small amount of photovoltaic solar energy.

[6] Wood, wood waste, black liquor, red liquor, spent sulfite liquor, pitch, wood sludge, peat, railroad ties, utility poles, municipal solid waste, landfill gas, methane, digester gas, liquid acetonitrile waste, tall oil, waste alcohol, medical waste, paper pellets, sludge waste, solid byproducts, tires, agricultural byproducts, closed looped biomass, fish oil, and straw.

[7] Geothermal electricity generation, heat pump, and direct use energy.

[8] Hydroelectricity generated by pumped storage is not included in renewable energy.

[9] Ethanol blended into motor gasoline.

[10] Includes electricity imports from Mexico that are derived from geothermal energy.

[11] Includes electricity net imports from Canada that are derived from hydroelectric power.

R=Revised. E=Estimated. (s)=Less than 0.0005 quadrillion Btu.

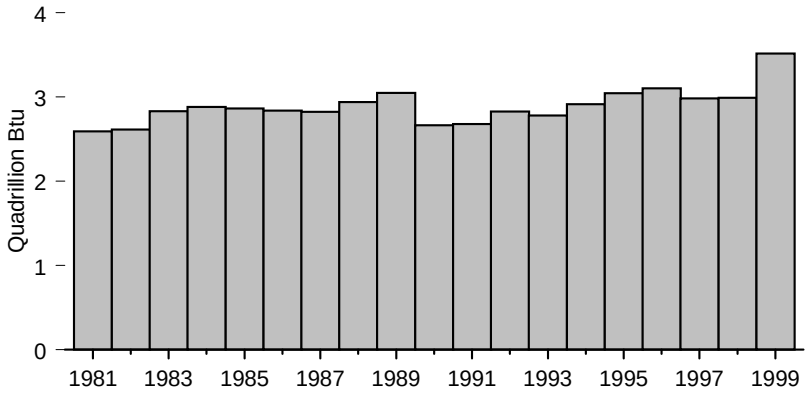
Note: Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelrenewable.html.

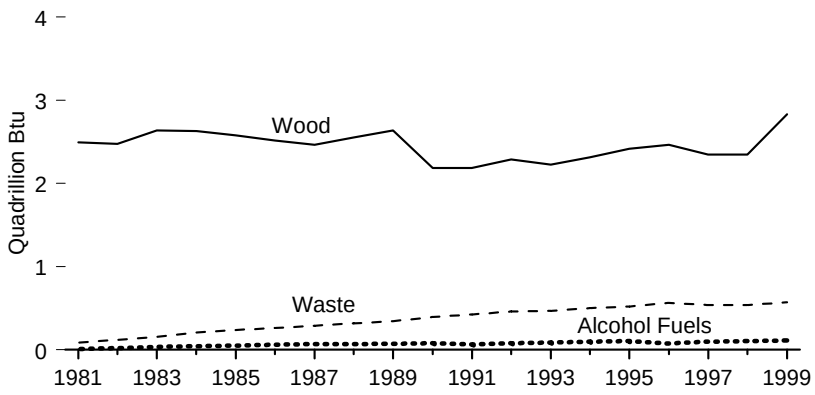
Sources: • 1989—Energy Information Administration (EIA) estimates. • 1990-1993—EIA, *Renewable Energy Annual,* annual reports. • 1994-1998—EIA, *Renewable Energy Annual 1999* (December 1999). • 1999—EIA estimates.

Figure 10.3 Wood and Waste Energy and Alcohol Fuels Consumption Estimates

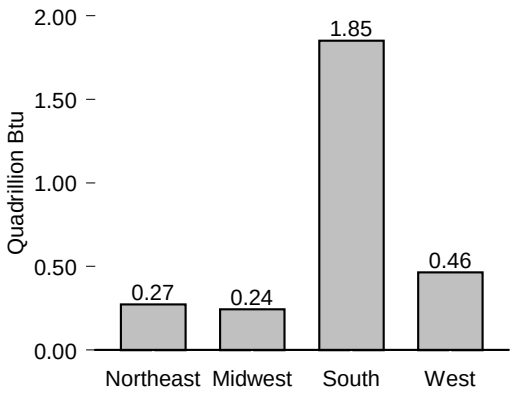
Total Wood and Waste Energy and Alcohol Fuels, 1981-1999



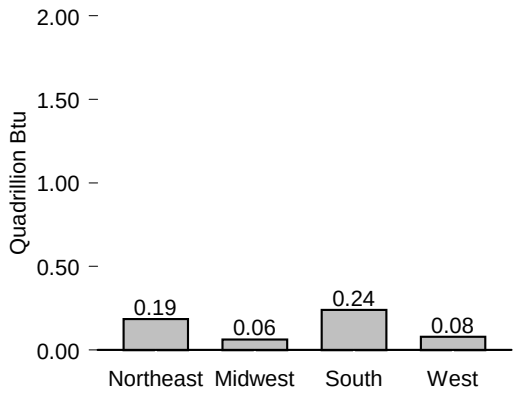
Wood and Waste Energy and Alcohol Fuels by Type, 1981-1999



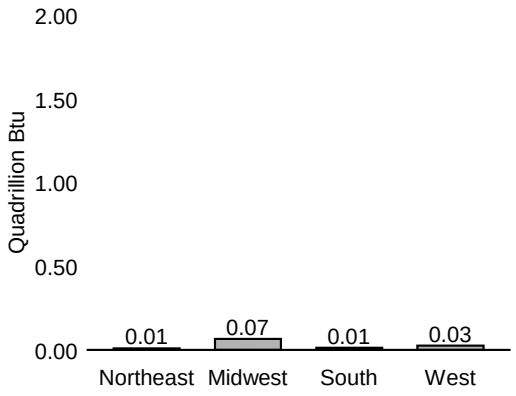
Wood Energy by Census Region, 1999



Waste Energy by Census Region, 1999



Alcohol Fuels[1] by Census Region, 1999



[1] Ethanol blended into motor gasoline.

Notes: • Not all data were available for 1985, 1986, and 1988; therefore, values were interpolated. • Beginning in 1989, includes expanded coverage of nonutility consumption. • See Appendix D for Census regions. • Because vertical scales differ, graphs should not be compared.

Source: Table 10.3.

Table 10.3 Wood and Waste Energy and Alcohol Fuels Consumption Estimates by Type and Census Region, 1981-1999

(Trillion Btu)

Year	Wood [1]					Waste [2]					Alcohol Fuels [3]					Total
	North-east	Mid-west	South	West	Total	North-east	Mid-west	South	West	Total	North-east	Mid-west	South	West	Total	
1981	395	335	1,349	416	2,495	16	5	37	30	88	(s)	4	1	2	7	2,590
1982	358	343	R1,391	385	R2,477	20	13	50	36	R119	(s)	11	4	4	19	R2,615
1983	380	323	1,526	411	R2,639	36	17	56	48	157	(s)	22	8	5	35	R2,831
1984	R348	R340	R1,480	R460	R2,629	39	21	57	91	208	(s)	25	13	5	43	R2,880
1985 [4]	350	386	1,374	464	2,576	46	30	74	85	235	(s)	29	17	5	51	2,862
1986 [4]	352	432	1,266	468	2,518	53	38	91	80	262	(s)	34	22	4	60	2,840
1987	R354	R479	R1,160	R472	R2,465	60	47	108	74	289	(s)	38	26	4	R68	R2,822
1988 [4]	396	519	1,168	469	2,552	72	56	127	63	318	(s)	38	26	6	70	2,940
1989	R437	R559	R1,175	R464	R2,635	84	64	145	51	344	(s)	38	26	7	71	R3,050
1990	R260	R335	R1,081	R513	R2,188	119	89	114	73	395	(s)	55	17	10	82	R2,665
1991	R228	R295	R1,187	R477	R2,188	R133	R98	R108	87	426	(s)	45	11	9	65	R2,679
1992	R269	R291	R1,255	R474	R2,288	148	84	128	100	460	(s)	55	13	10	R78	R2,826
1993	277	222	R1,404	324	R2,226	151	85	130	102	468	(s)	R62	R15	11	88	R2,782
1994	284	228	R1,468	335	R2,314	169	59	204	71	503	(s)	R69	16	12	97	R2,914
1995	R368	R289	R1,100	R660	R2,418	172	58	219	73	521	(s)	R73	R17	R13	104	R3,044
1996	R267	R254	1,523	R422	R2,465	187	63	235	80	565	7	43	8	16	74	R3,104
1997	R253	R213	R1,488	R394	R2,348	191	61	213	72	538	9	56	11	21	97	R2,982
1998	R237	R206	R1,513	R389	R2,346	R185	63	R217	R75	R540	R9	61	12	23	105	R2,991
1999	273	243	1,852	464	2,832	186	64	241	80	571	10	65	12	25	112	3,514

[1] Wood, wood waste, black liquor, red liquor, spent sulfite liquor, pitch, wood sludge, peat, railroad ties, and utility poles. Beginning in 1989, includes expanded coverage of nonutility consumption (see Table 8.4).

[2] Municipal solid waste, landfill gas, methane, digester gas, liquid acetonitrile waste, tall oil, waste alcohol, medical waste, paper pellets, sludge waste, solid byproducts, tires, agricultural byproducts, closed looped biomass, fish oil, and straw. Beginning in 1989, includes expanded coverage of nonutility consumption (see Table 8.4).

[3] Ethanol blended into motor gasoline.

[4] Not all data were available; therefore, values were interpolated.

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

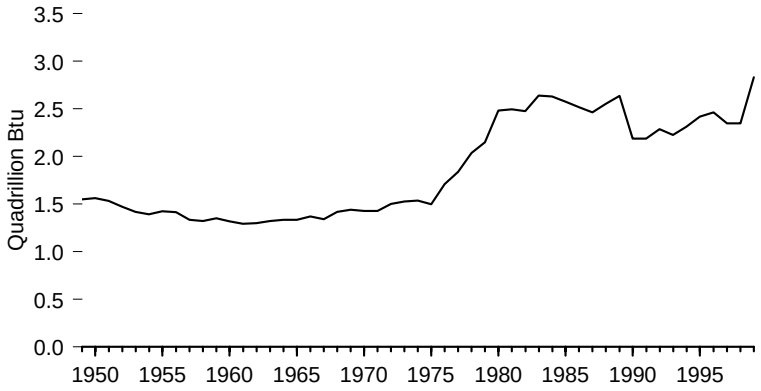
Notes: • See Appendix D for Census regions. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelrenewable.html.

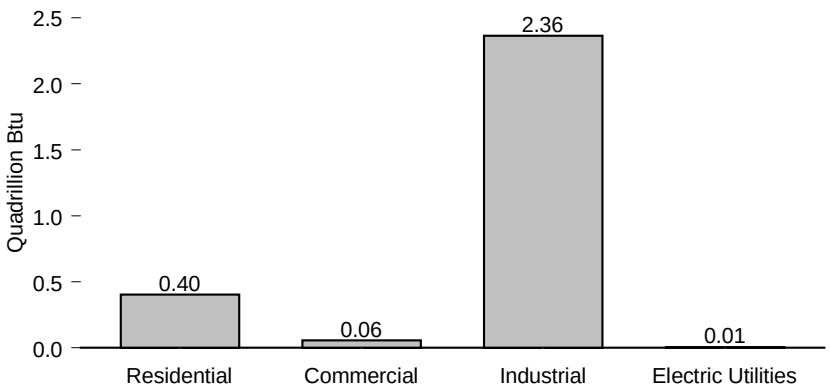
Sources: • **1981-1983, Wood—**EIA, *Estimates of U.S. Wood Energy Consumption, 1980-1983* (November 1984), Tables ES1 and ES2. • **1981-1983 Waste and Alcohol Fuels, and 1984 Data—**EIA, Office of Coal, Nuclear, Electric and Alternate Fuels, unpublished data. • **1987—**EIA, *Estimates of Biofuels Consumption in the United States During 1987,* Tables ES1 and ES2.• **1989Wood, 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. • **1990Wood, Industrial Sector:** American Paper Institute, *Fact Sheet on 1990 Energy Use in the U.S. Pulp and Paper Industry* (July 1991). **Wood, Residential Sector:** EIA, "1990 Residential Energy Consumption Survey." **Waste:** 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); U.S. Department of Treasury, Bureau of Alcohol, Tobacco, and Firearms, *Monthly Distilled Spirits Report,* Report Symbol 76 (June 1991), *Alcohol Fuels Report,* internal quarterly report (September 1991), and EIA, *Petroleum Supply Monthly,* various issues. • **1991 and 1992:** EIA, *Estimates of U.S. Biomass Energy Consumption 1992* (May 1994). • **1993-1999Wood, Residential Sector:** EIA, Form EIA-457, "1993 Residential Energy Consumption Survey," extrapolations from "1993 Residential Energy Consumption Survey" for 1994 through 1996 estimates, and "1997 Residential Energy Consumption Survey" for 1997, and extrapolations for 1998 and 1999. **Wood, Commercial Sector:** EIA, Office of Coal, Nuclear, Electric and Alternate Fuels (CNEAF), estimates. **Wood, Industrial Sector:** EIA, CNEAF, estimates derived from information from other government agencies, trade journals, industry association reports, Form EIA-846, "1991 Manufacturing Energy Consumption Survey," and Form EIA-846, "1994 Manufacturing Energy Consumption Survey." **Wood, Electric Utility:** EIA, Form EIA-861, "Annual Electric Utility Report," and Form EIA-759, "Monthly Power Plant Report." **Waste:** Government Advisory Associates, *Resource Recovery Yearbook,* and *Methane Recovery Yearbook,* and CNEAF estimates. **Alcohol Fuels:** EIA, Form EIA-819M, "Monthly Oxygenate Telephone Report."

Figure 10.4 Wood Energy Consumption Estimates

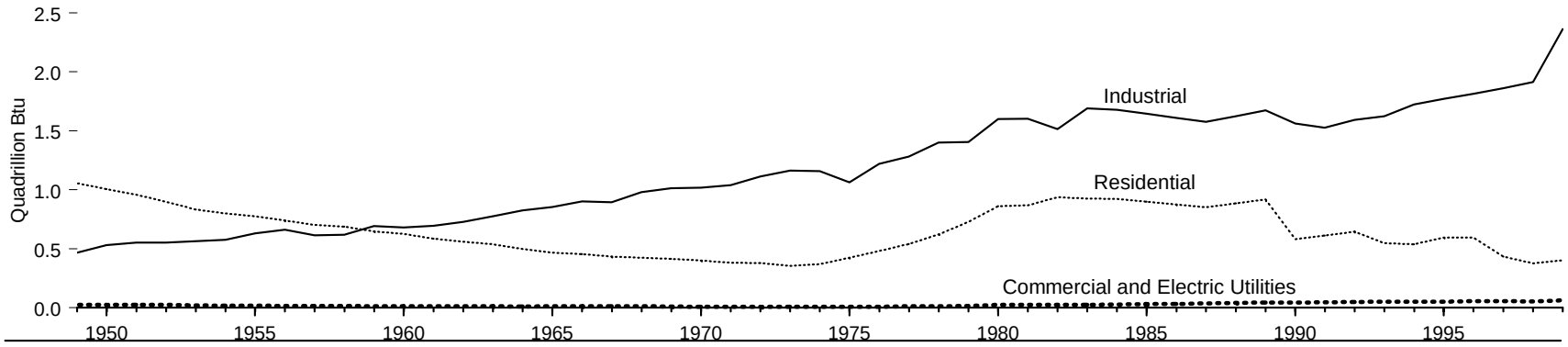
Total, 1949-1999



By Sector, 1999



By Sector, 1949-1999



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

Source: Table 10.4.

Table 10.4 Wood Energy Consumption Estimates by Sector, 1949-1999

(Trillion Btu)

Year	Residential	Commercial	Industrial	Electric Utilities	Total
1949	1,055	20	468	6	1,549
1950	1,006	19	532	5	1,562
1951	958	18	553	5	1,535
1952	899	17	552	6	1,474
1953	832	16	566	5	1,419
1954	800	15	576	3	1,394
1955	775	15	631	3	1,424
1956	739	14	661	2	1,416
1957	702	13	616	2	1,334
1958	688	13	620	2	1,323
1959	647	12	692	2	1,353
1960	627	12	680	2	1,320
1961	587	11	695	1	1,295
1962	560	11	728	1	1,300
1963	537	10	775	1	1,323
1964	499	9	827	2	1,337
1965	468	9	855	3	1,335
1966	455	9	902	3	1,369
1967	434	8	895	3	1,340
1968	426	8	982	4	1,419
1969	415	8	1,014	3	1,440
1970	401	8	1,019	1	1,429
1971	382	7	1,040	1	1,430
1972	380	7	1,113	1	1,501
1973	354	7	1,165	1	1,527
1974	371	7	1,159	1	1,538
1975	425	8	1,063	(s)	1,497
1976	482	9	1,220	1	1,711
1977	542	10	1,281	3	1,837
1978	622	12	1,400	2	2,036
1979	728	14	1,405	3	2,150
1980	860	21	1,600	3	2,483
1981	869	21	1,602	3	2,495
1982	937	22	1,516	2	R2,477
1983	925	22	1,690	R2	R2,639
1984	923	22	1,679	R5	R2,629
1985	1899	124	11,645	8	12,576
1986	1876	127	11,610	5	12,518
1987	852	129	1,576	R8	R,12,465
1988	1885	132	11,625	10	12,552
1989	918	134	1,673	R10	R,12,635
1990	581	137	1,562	R8	R,12,188
1991	613	139	1,528	R8	R,12,188
1992	645	142	1,593	R8	R,12,288
1993	548	44	1,625	R9	R2,226
1994	537	45	1,724	R8	R2,314
1995	596	45	1,771	R7	R2,418
1996	595	49	1,813	R8	R2,465
1997	433	R47	1,860	R8	R2,348
1998	R377	R47	1,914	R7	R2,346
1999	404	57	2,364	7	2,832

[1] No data were available, therefore, values were interpolated.

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

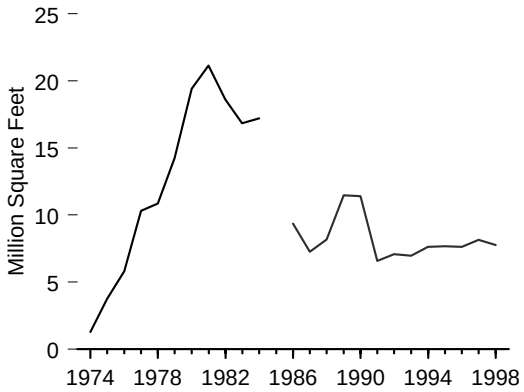
Note: Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelrenewable.html.

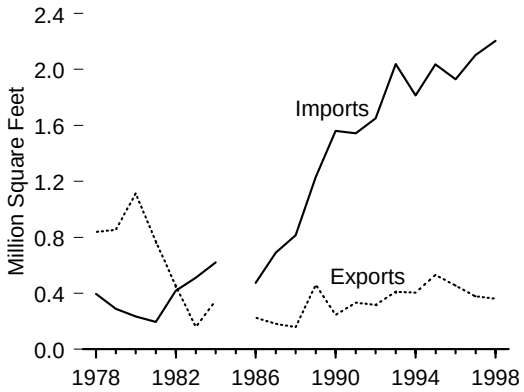
Sources: • **1949-1980** Calculated from Energy Information Administration (EIA), *Estimates of U.S. Wood Energy Consumption from 1949 to 1981,* Table A2, and EIA, *Annual Energy Review 1999,* Table 8.3. Plotted at yearly intervals. • **1980:** EIA, *Estimates of U.S. Wood Energy Consumption 1980-1983,* Table ES1, and calculation from *Annual Energy Review 1999,* Table 8.3. • **1981-1983:** EIA, *Estimates of U.S. Wood Energy Consumption, 1980-1983* (November 1984), Tables ES1 and ES2. • **1989~~In~~dustrial 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~~In~~dustrial Sector:** American Paper Institute, *Fact Sheet on 1990 Energy Use in the U.S. Pulp and Paper Industry* (July 1991). **Residential Sector:** EIA, "1990 Residential Energy Consumption Survey." • **1991 and 1992:** EIA, *Estimates of U.S. Biomass Energy Consumption 1992* (May 1994). • **1993-1998:** EIA, Form EIA-457, "1993 Residential Energy Consumption Survey," extrapolations from "1993 Residential Energy Consumption Survey" for 1994 through 1996 estimates, and "1997 Residential Energy Consumption Survey" for 1997, and extrapolations for 1998 and 1999. **Commercial Sector:** EIA, Office of Coal, Nuclear, Electric and Alternate Fuels (CNEAF), estimates. **Industrial Sector:** EIA, CNEAF, estimates derived from information from other government agencies, trade journals, industry association reports, Form EIA-846, "1991 Manufacturing Energy Consumption Survey," and Form EIA-846, "1994 Manufacturing Energy Consumption Survey." **Electric Utility:** EIA, Form EIA-861, "Annual Electric Utility Report," and Form EIA-759, "Monthly Power Plant Report."

Figure 10.5 Solar Thermal Collector Shipments by Type, Price, and Trade

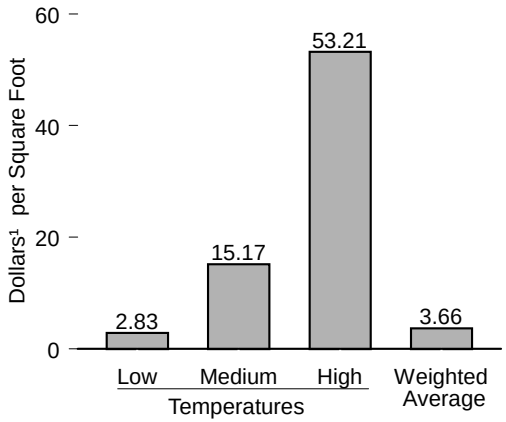
Total Shipments, 1974-1984 and 1986-1998



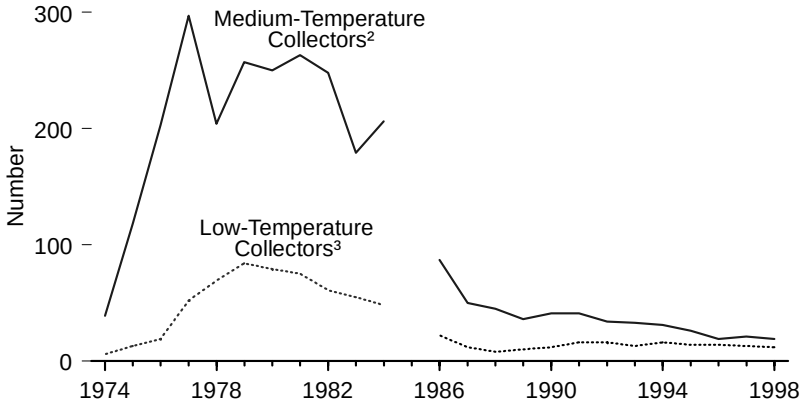
Trade, 1978-1984 and 1986-1998



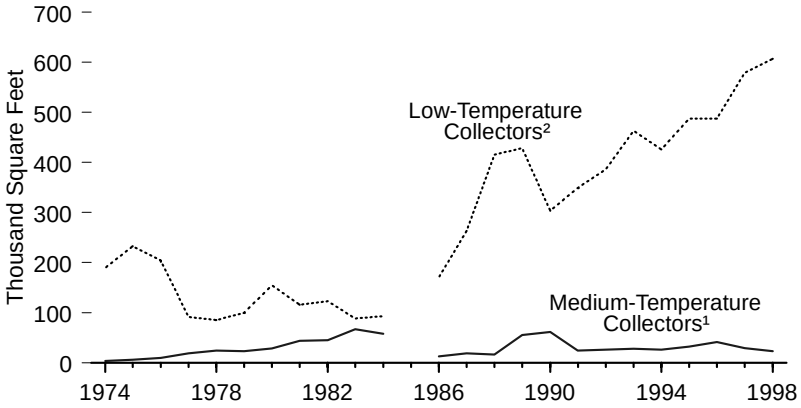
Prices, 1998



Number of U.S. Manufacturers, 1974-1984 and 1986-1998



Average Annual Shipments per Manufacturer, 1974-1984 and 1986-1998



[1] Nominal dollars.

[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.

[3] 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 10.5.

Table 10.5 Solar Thermal Collector Shipments by Type, Price, and Trade, 1974-1998

(Thousand Square Feet, Except as Noted)

Year	Low-Temperature Collectors [1]				Medium-Temperature Collectors [2]				High-Temperature Collectors [3]		Total Shipments [4]		Imports	Exports
	Number of U.S. Manu-facturers	Quantity Shipped	Shipments per Manu-facturer	Price [5] (dollars per square foot)	Number of U.S. Manu-facturers	Quantity Shipped	Shipments per Manu-facturer	Price [5] (dollars per square foot)	Quantity Shipped	Price [5] (dollars per square foot)	Quantity Shipped	Price [5] (dollars per square foot)		
1974	6	1,137	189.5	NA	39	137	3.5	NA	NA	NA	1,274	NA	NA	NA
1975	13	3,026	232.8	NA	118	717	6.1	NA	NA	NA	3,743	NA	NA	NA
1976	19	3,876	204.0	NA	203	1,925	9.5	NA	NA	NA	5,801	NA	NA	NA
1977	52	4,743	91.2	NA	297	5,569	18.8	NA	NA	NA	10,312	NA	NA	NA
1978	69	5,872	85.1	NA	204	4,988	24.5	NA	NA	NA	10,860	NA	396	840
1979	84	8,394	100.0	NA	257	5,856	22.8	NA	NA	NA	14,251	NA	290	855
1980	79	12,233	154.8	NA	250	7,165	28.7	NA	NA	NA	19,398	NA	235	1,115
1981	75	8,677	115.7	NA	263	11,456	43.6	NA	NA	NA	21,133	NA	196	771
1982	61	7,476	122.6	NA	248	11,145	44.9	NA	NA	NA	18,621	NA	418	455
1983	55	4,853	88.2	NA	179	11,975	66.9	NA	NA	NA	16,828	NA	511	159
1984	48	4,479	93.3	NA	206	11,939	58.0	NA	773	NA	17,191	NA	621	348
1985	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1986	22	3,751	170.5	R2.30	87	1,111	12.8	R18.30	4,498	NA	9,360	R6.14	473	224
1987	12	3,157	263.1	R2.18	50	957	19.1	R13.50	3,155	NA	7,269	R4.82	691	182
1988	8	3,326	415.8	2.24	45	732	16.2	R14.88	4,116	NA	8,174	R4.56	814	158
1989	10	4,283	428.3	2.60	36	1,989	55.3	R11.74	5,209	R17.76	11,482	R10.92	1,233	461
1990	12	3,645	303.8	2.90	41	2,527	61.6	7.68	5,237	15.74	11,409	R9.86	1,562	245
1991	16	5,585	349.0	2.90	41	989	24.1	11.94	1	31.94	6,574	4.26	1,543	332
1992	16	6,187	386.7	R2.50	34	897	26.4	10.96	2	75.66	7,086	3.58	1,650	316
1993	13	6,025	463.5	R2.80	33	931	28.2	R11.74	12	R22.12	6,968	3.96	2,039	411
1994	16	6,823	426.0	R2.54	31	803	26.0	R13.54	2	R177.00	7,627	R3.74	1,815	405
1995	14	6,813	487.0	R2.32	26	840	32.0	10.48	13	53.26	7,666	R3.30	2,037	530
1996	14	6,821	487.0	2.67	19	785	41.0	14.48	10	18.75	7,616	3.91	1,930	454
1997	13	7,524	579.0	2.60	21	606	29.0	15.17	7	25.00	8,138	3.56	2,102	379
1998	12	7,292	607.0	2.83	19	443	23.0	15.17	21	53.21	7,756	3.66	2,206	360

[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 as reported by respondents include all domestic and export shipments and may include imports that subsequently were shipped to domestic or to foreign customers.

[5] Prices, in nominal dollars, equal shipment value divided by quantity shipped. Value includes charges for advertising and warranties. Excluded are excise taxes and the cost of freight or transportation for the shipments.

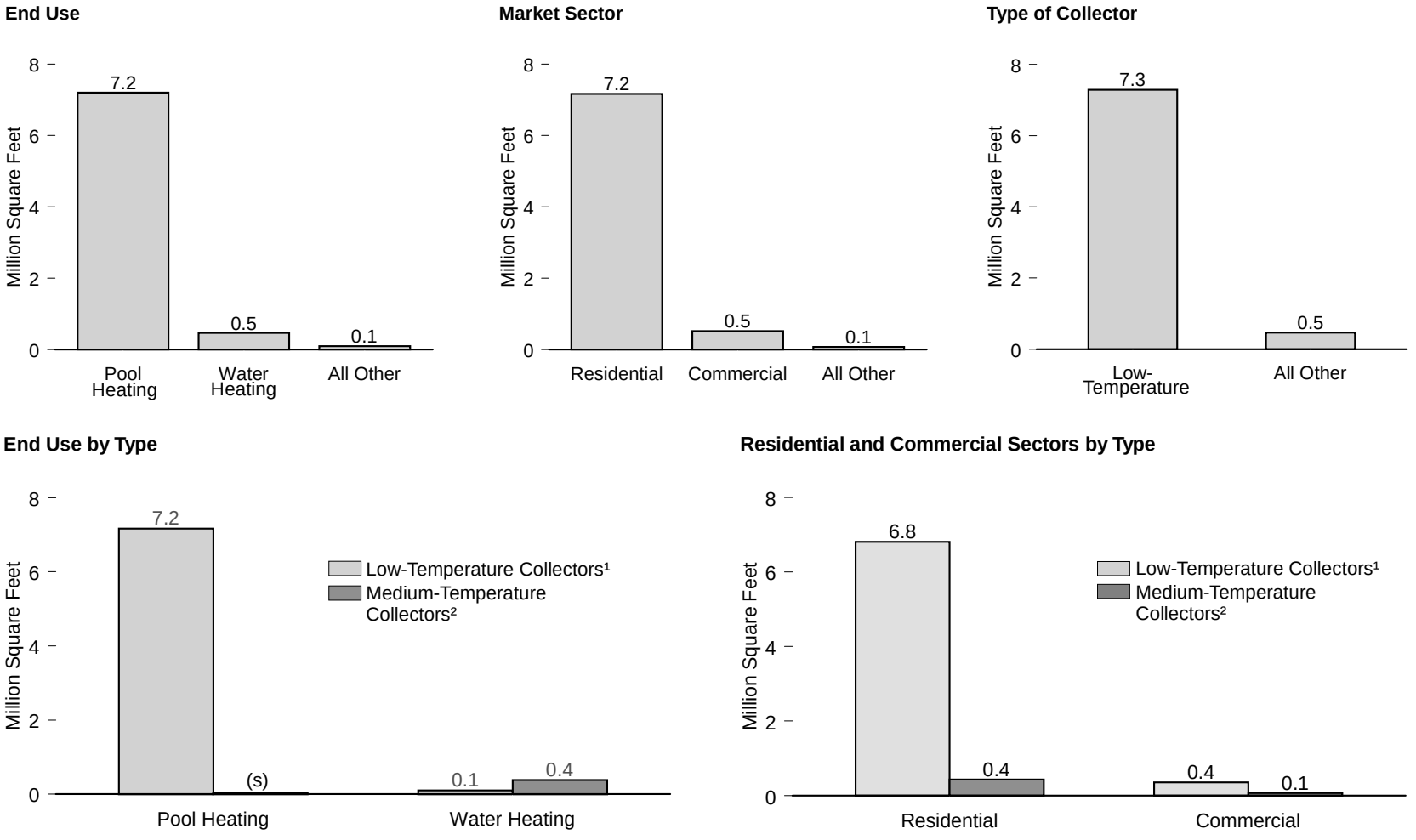
R=Revised. NA=Not available.

Notes: • Manufacturers producing more than one type of collector are accounted for in both groups. • No data are available for 1985. • High-temperature collector shipments were dominated by one manufacturer.

Web Page: http://www.eia.doe.gov/fuelrenewable.html.

Sources: • 1974-1992—Energy Information Administration (EIA), *Solar Collector Manufacturing Activity,* annual reports. • 1993 forward—EIA, *Renewable Energy Annual,* annual reports.

Figure 10.6 Solar Thermal Collector Shipments by End Use, Market Sector, and Type, 1998



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.

(s)=Less than 0.05 million square feet.

Source: Table 10.6.

Table 10.6 Solar Thermal Collector Shipments by End Use, Market Sector, and Type, 1998

(Thousand Square Feet)

End Use	Low-Temperature Collectors [1]	Medium-Temperature Collectors [2]	High-Temperature Collectors [3]	Total
End-Use Total	**7,285**	**443**	**21**	[4] **7,757**
Pool Heating	7,164	37	0	7,201
Water Heating	60	385	18	463
Space Heating	53	14	0	67
Space Cooling	0	0	0	0
Combined Space and Water Heating	8	7	(s)	15
Process Heating	0	0	0	0
Electricity Generation	0	0	2	[4] 10
Other [5]	(s)	0	1	1
Market Sector Total	**7,285**	**443**	**21**	[4] **7,757**
Residential	6,810	355	0	7,165
Commercial	429	70	18	517
Industrial	44	18	0	62
Electric Utility	0	0	2	[4] 10
Other [6]	2	0	1	3

[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. These are Parabolic dish/trough collectors used primarily by independent power producers to generate electricity for the electric grid.

[4] Totals include other types of collectors not shown.

[5] "Other" includes shipments of solar thermal collectors for other uses, such as cooking foods, water pumping, water purification, desalinization, distilling, etc.

[6] "Other" includes shipments of solar thermal collectors to other sectors, such as government, including the military but excluding space applications.

(s)=Less than 0.5 thousand square feet.

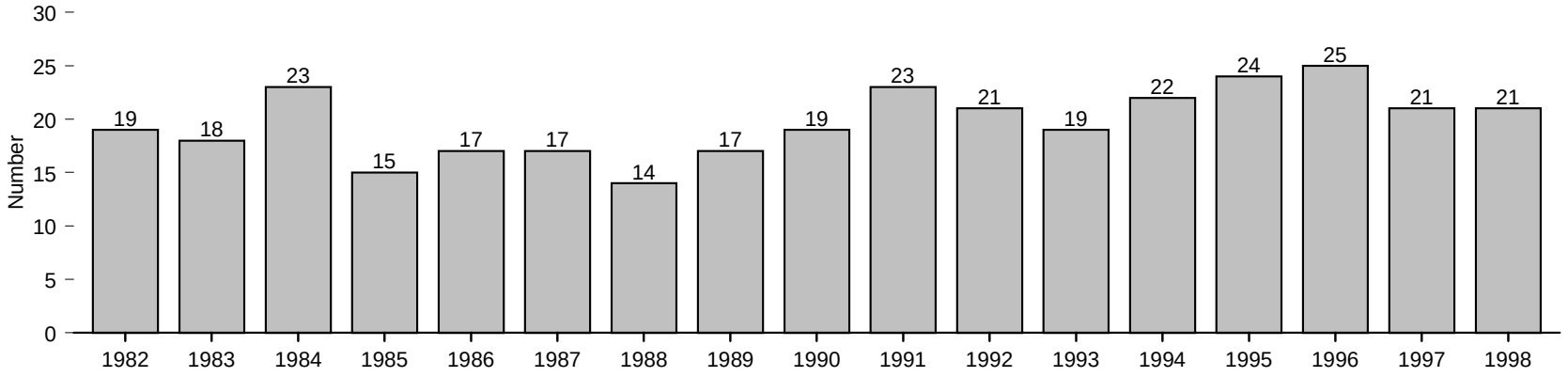
Notes: • Data represent shipments from U.S. manufacturers only. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelrenewable.html.

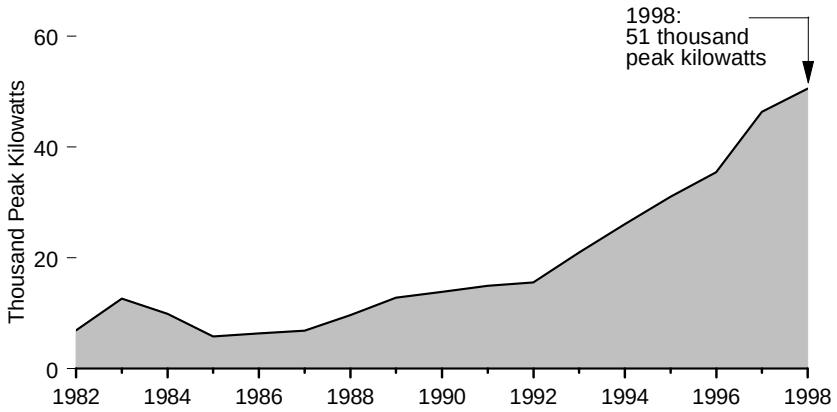
Source: Energy Information Administration, *Renewable Energy Annual 1999* (March 2000), Table 19.

Figure 10.7 Photovoltaic Cell and Module Shipments and Trade

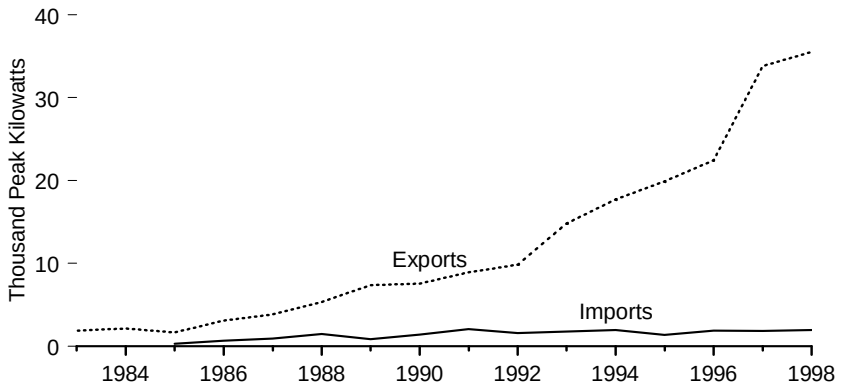
Number of U.S. Companies Reporting Shipments, 1982-1998



Total Shipments, 1982-1998



Trade, 1983-1998



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

Source: Table 10.7.

Table 10.7 Photovoltaic Cell and Module Shipments by Type, Price, and Trade, 1982-1998

Year	Number of U.S. Companies Reporting Shipments	Shipments			Imports	Exports	Prices [1]	
		Crystalline Silicon	Thin-Film Silicon	Total [2]			Modules	Cells
		Peak Kilowatts					Dollars per Peak Watt	
1982	19	NA	NA	6,897	NA	NA	NA	NA
1983	18	NA	NA	12,620	NA	1,903	NA	NA
1984	23	NA	NA	9,912	NA	2,153	NA	NA
1985	15	5,461	303	5,769	285	1,670	NA	NA
1986	17	5,806	516	6,333	678	3,109	NA	NA
1987	17	5,613	1,230	6,850	921	3,821	NA	NA
1988	14	7,364	1,895	9,676	1,453	5,358	NA	NA
1989	17	10,747	1,628	12,825	826	7,363	5.14	R3.08
1990	[3]19	12,492	1,321	[3]13,837	1,398	7,544	5.69	3.84
1991	23	14,205	723	14,939	2,059	8,905	6.12	4.08
1992	21	14,457	1,075	15,583	1,602	9,823	6.11	3.21
1993	19	20,146	782	20,951	1,767	14,814	5.24	5.23
1994	22	24,785	1,061	26,077	1,960	17,714	4.46	2.97
1995	24	29,740	1,266	31,059	1,337	19,871	4.56	2.53
1996	25	33,996	1,445	35,464	1,864	22,448	4.09	2.80
1997	21	44,314	1,886	46,354	1,853	33,793	4.16	2.78
1998	21	47,186	3,318	50,562	1,931	35,493	3.94	3.15

[1] Prices, in nominal dollars, equal shipment value divided by quantity shipped. Value includes charges for advertising and warranties. Excluded are excise taxes and the cost of freight or transportation for the shipments.

[2] Total shipments include all types of photovoltaic cells and modules (single-crystal silicon, cast silicon, ribbon silicon, thin-film silicon, and concentrator silicon) and internationally traded cells and modules. Shipments of cells and modules for space and satellite applications are not included.

[3] Data were imputed for one nonrespondent who exited the industry during 1990.

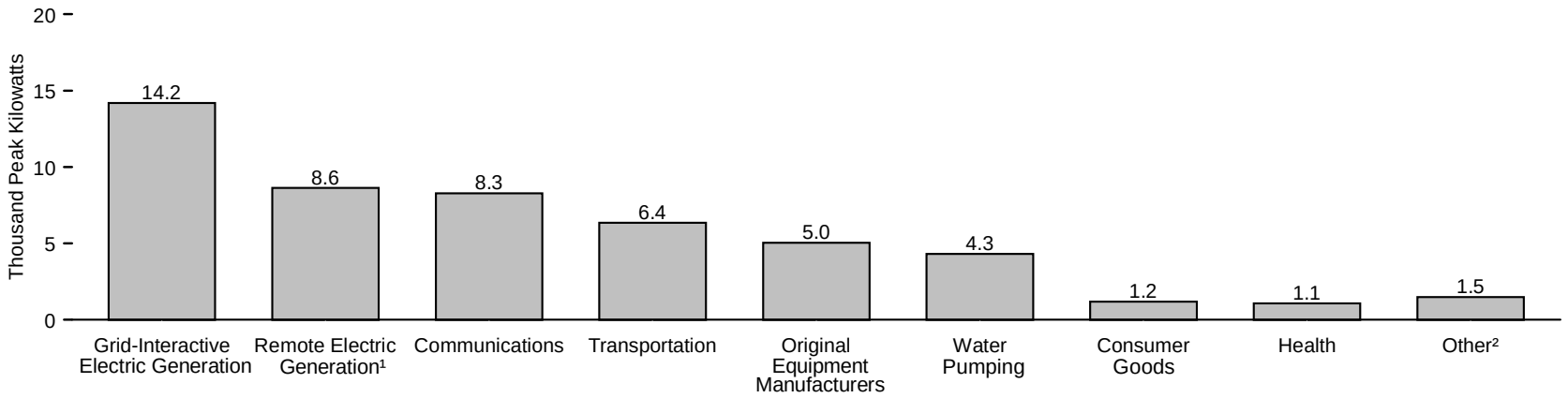
R=Revised data. NA=Not available.

Web Page: http://www.eia.doe.gov/fuelrenewable.html.

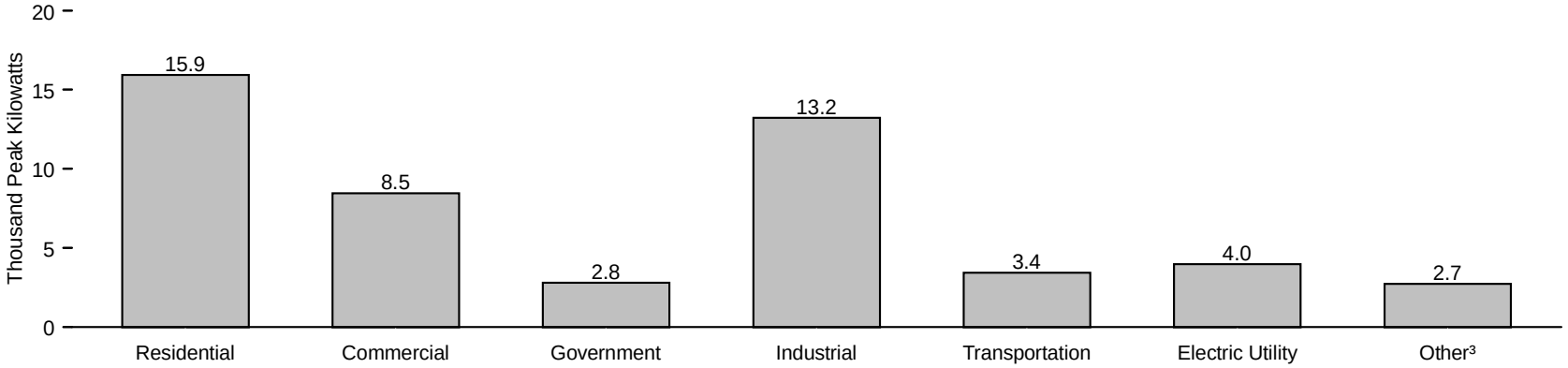
Sources: • 1982-1992—Energy Information Administration (EIA), *Solar Collector Manufacturing Activity,* annual reports. • 1993 forward—EIA, *Renewable Energy Annual,* annual reports.

Figure 10.8 Photovoltaic Cell and Module Shipments by End Use and Market Sector, 1998

By End Use



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 10.8.

Table 10.8 Photovoltaic Cell and Module Shipments by End Use and Market Sector, 1989-1998

Year	End Use									Market Sector							Total
			Electric Generation [1]														
	Communications	Consumer Goods	Grid-Interactive	Remote	Health	Original Equipment Manufacturers [2]	Transportation	Water Pumping	Other [3]	Residential	Commercial	Government	Industrial	Transportation	Electric Utility	Other [4]	
	Amount Shipped (peak kilowatts)																
1989	2,590	2,788	1,251	2,620	5	1,595	1,196	711	69	1,439	3,850	1,077	3,993	1,130	785	551	12,825
1990	4,340	2,484	469	3,097	5	1,119	1,069	1,014	240	1,701	6,086	1,002	2,817	974	826	432	13,837
1991	3,538	3,312	856	3,594	61	1,315	1,523	729	13	3,624	3,345	815	3,947	1,555	1,275	377	14,939
1992	3,717	2,566	1,227	4,238	67	828	1,602	809	530	4,154	2,386	1,063	4,279	1,673	1,553	477	15,583
1993	3,846	946	1,096	5,761	674	2,023	4,238	2,294	74	5,237	4,115	1,325	5,352	2,564	1,503	856	20,951
1994	5,570	3,239	2,296	9,253	79	1,849	2,128	1,410	254	6,632	5,429	2,114	6,855	2,174	2,364	510	26,077
1995	5,154	1,025	4,585	8,233	776	3,188	4,203	2,727	1,170	6,272	8,100	2,000	7,198	2,383	3,759	1,347	31,059
1996	6,041	1,063	4,844	10,884	977	2,410	5,196	3,261	789	8,475	5,176	3,126	8,300	3,995	4,753	1,639	35,464
1997	7,383	347	8,273	8,630	1,303	5,245	6,705	3,783	4,684	10,993	8,111	3,909	11,748	3,574	5,651	2,367	46,354
1998	8,280	1,198	14,193	8,634	1,061	5,044	6,356	4,306	1,491	15,936	8,460	2,808	13,232	3,440	3,965	2,720	50,562
	Percent of Total																
1989	20.2	21.7	9.8	20.4	(s)	12.4	9.3	5.5	0.5	11.2	30.0	8.4	31.1	8.8	6.1	4.3	100.0
1990	31.4	18.0	3.4	22.4	(s)	8.1	7.7	7.3	1.7	12.3	44.0	7.2	20.4	7.0	6.0	3.1	100.0
1991	23.7	22.2	5.7	24.1	0.4	8.8	10.2	4.9	0.1	24.3	22.4	5.5	26.4	10.4	8.5	2.5	100.0
1992	23.9	16.5	7.9	27.2	0.4	5.3	10.3	5.2	3.4	26.7	15.3	6.8	27.5	10.7	10.0	3.1	100.0
1993	18.4	4.5	5.2	27.5	3.2	9.7	20.2	10.9	0.4	25.0	19.6	6.3	25.5	12.2	7.2	4.1	100.0
1994	21.4	12.4	8.8	35.5	0.3	7.1	8.2	5.4	1.0	25.4	20.8	8.1	26.3	8.3	9.1	2.0	100.0
1995	16.6	3.3	14.8	26.5	2.5	10.3	13.5	8.8	3.8	20.2	26.1	6.4	23.2	7.7	12.1	4.3	100.0
1996	17.0	3.0	13.7	30.7	2.8	6.8	14.7	9.2	2.2	23.9	14.6	8.8	23.4	11.3	13.4	4.6	100.0
1997	15.9	0.7	17.8	18.6	2.8	11.3	14.5	8.2	10.1	23.7	17.5	8.4	25.3	7.7	12.2	5.1	100.0
1998	16.4	2.4	28.1	17.1	2.1	10.0	12.6	8.5	2.9	31.5	16.7	5.6	26.2	6.8	7.8	5.4	100.0

[1] Grid-interactive means connection to the electrical distribution system; remote means electricity, for general use, that does not interact with the electrical distribution system, such as at an isolated residential site or mobile home. The other end uses in this table also include electricity generation but only for the specific use cited.

[2] Original Equipment Manufacturers are non-photovoltaic manufacturers that combine photovoltaic technology into existing or newly developed product lines.

[3] Represents such applications as cooking food, desalinization, and distilling.

[4] Shipments to foreign governments and for specialty purposes.

(s)=Less than 0.05 percent.

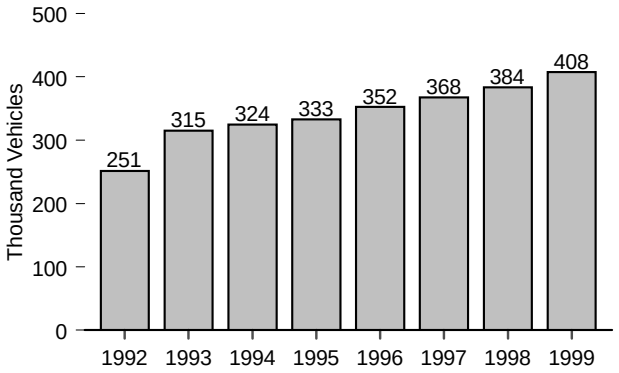
Note: Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/fuelrenewable.html.

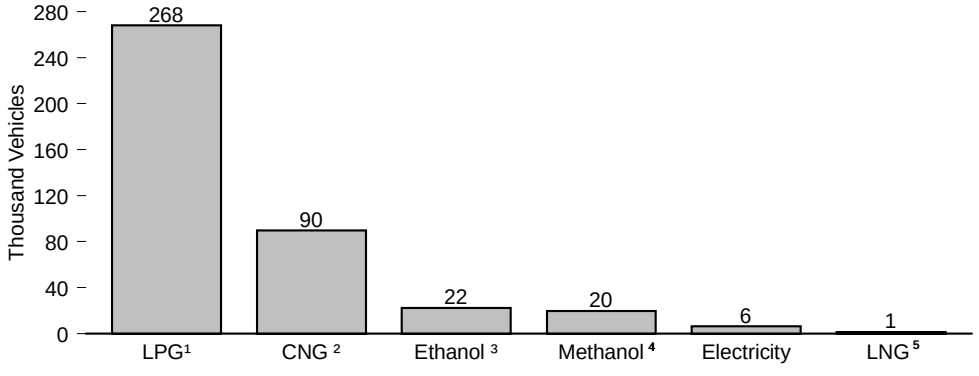
Sources: • 1989-1992—Energy Information Administration (EIA), *Solar Collector Manufacturing Activity*, annual reports. • 1993 forward—EIA, *Renewable Energy Annual,* annual reports.

Figure 10.9 Alternative-Fueled Vehicles and Fuel Consumption by Type

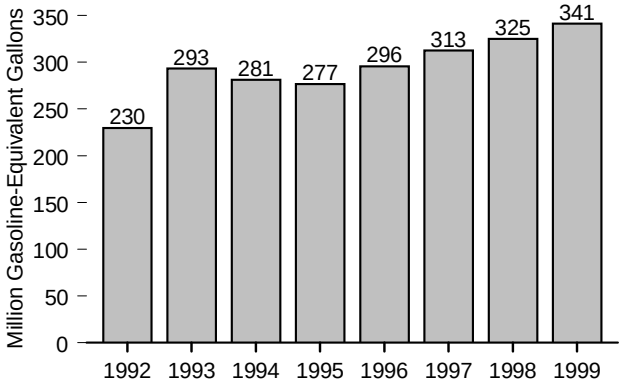
Vehicles in Use, 1992-1999



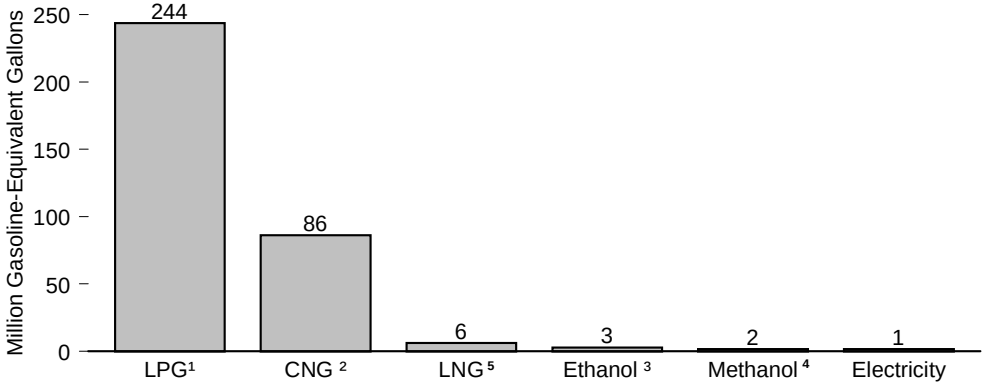
Vehicles in Use by Fuel Type, 1999



Fuel Consumption, 1992-1999



Fuel Consumption by Type, 1999



[1] Liquefied petroleum gases.
[2] Compressed natural gas.
[3] Ethanol, 85 percent and ethanol, 95 percent.
[4] Methanol, 85 percent, and methanol, neat.
[5] Liquefied natural gas.
Note: Because vertical scales differ, graphs should not be compared.
Source: Table 10.9.

Table 10.9 Alternative-Fueled Vehicles and Fuel Consumption by Type, 1992-1999

Year	Liquefied Petroleum Gases [1]	Compressed Natural Gas	Liquefied Natural Gas	Methanol, 85 Percent [2]	Methanol, Neat	Ethanol, 85 Percent [2]	Ethanol, 95 Percent [2]	Electricity	Total
	Estimated Number of Vehicles in Use								
1992	221,000	23,191	90	4,850	404	172	38	1,607	251,352
1993	269,000	32,714	299	10,263	414	441	27	1,690	314,848
1994	264,000	41,227	484	15,484	415	605	33	2,224	324,472
1995	259,000	50,218	603	18,319	386	1,527	136	2,860	333,049
1996	263,000	60,144	663	20,265	172	4,536	361	3,280	352,421
1997	263,000	R68,571	813	21,040	172	9,130	347	4,453	R367,526
1998	R266,000	R78,782	R1,172	R19,648	R200	R12,788	14	R5,243	R383,847
1999P	268,000	89,633	1,422	19,497	200	22,359	14	6,417	407,542
	Estimated Fuel Consumption (Thousand Gasoline-Equivalent Gallons)								
1992	208,142	16,823	585	1,069	2,547	21	85	359	229,631
1993	264,655	21,603	1,901	1,593	3,166	48	80	288	293,334
1994	248,467	24,160	2,345	2,340	3,190	80	140	430	281,152
1995	232,701	35,162	2,759	2,023	2,150	190	995	663	276,643
1996	239,158	46,923	3,247	1,775	347	694	2,699	773	295,616
1997	238,356	R65,192	3,714	1,554	347	1,280	1,136	1,010	R312,589
1998	R241,583	R73,251	R5,343	R1,212	R449	R1,727	59	R1,202	R324,826
1999P	243,648	86,073	6,062	1,108	449	2,489	59	1,458	341,346

[1] Vehicles in use represent lower bound estimates, rounded to the nearest thousand.
[2] Remaining portion is motor gasoline.
R=Revised data. P=Preliminary data.

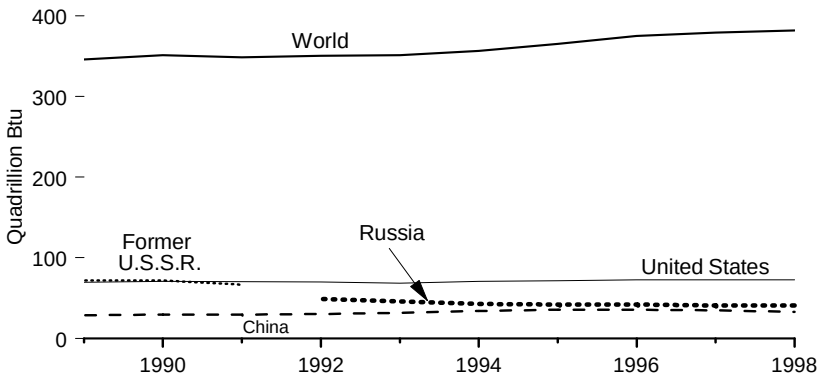
Note: Totals may not equal sum of components due to independent rounding.
Source: Web Page: http://www.eia.doe.gov/fuelrenewable.html.

11 International Energy

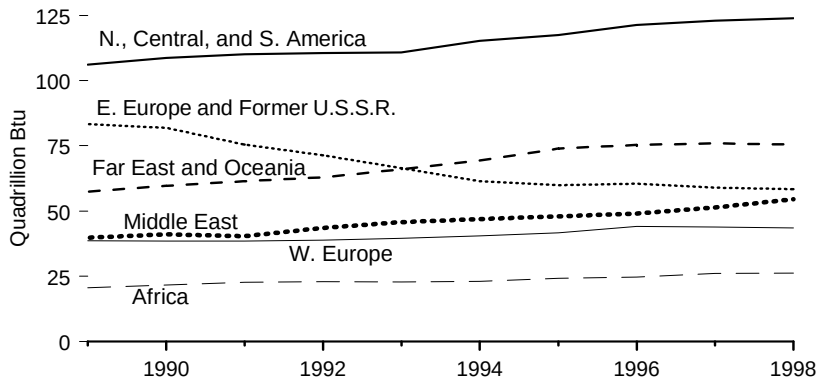
Drilling rig, Gansu Province, People's Republic of China. Source: U.S. Department of Energy.

Figure 11.1 World Primary Energy Production

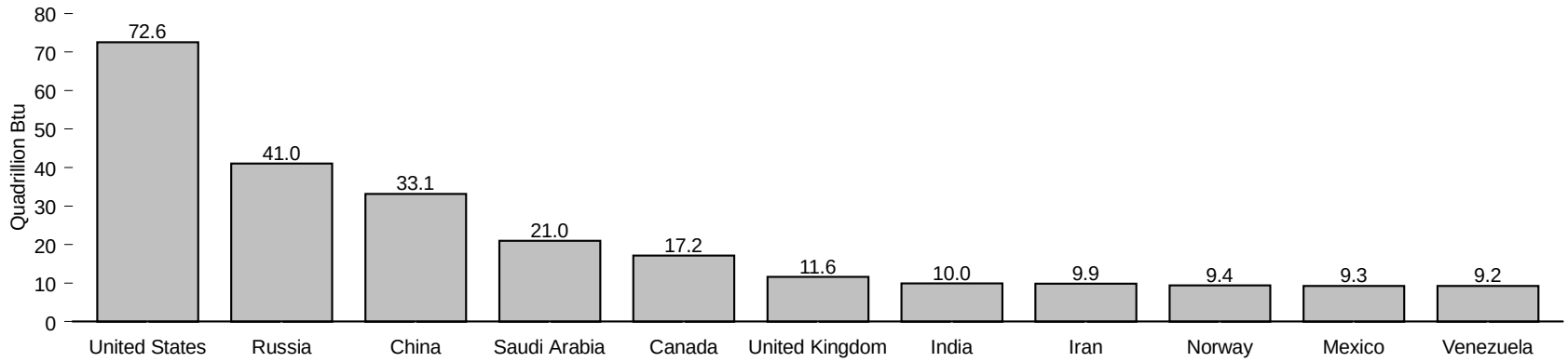
World and Leading Producers, 1989-1998



World Areas, 1989-1998



Top Producing Countries, 1998



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

Source: Table 11.1.

Table 11.1 World Primary Energy Production, 1989-1998

(Quadrillion Btu)

Region and Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998[P]
North, Central, and South America	[R]**106.13**	[R]**108.71**	[R]**110.19**	[R]**110.61**	[R]**110.85**	[R]**115.26**	[R]**117.50**	[R]**121.27**	[R]**123.02**	**123.88**
Brazil	3.75	3.79	3.94	4.01	4.17	4.33	4.53	4.89	5.17	5.59
Canada	[R]13.32	[R]13.39	[R]13.94	[R]14.48	[R]15.40	[R]16.35	16.85	[R]17.29	[R]17.23	17.18
Mexico	[R]7.46	[R]7.71	[R]8.01	[R]8.01	[R]8.11	[R]8.10	[R]8.04	[R]8.74	[R]9.04	9.29
United States	[R]69.46	[R]70.85	[R]70.51	[R]70.06	68.37	[R]70.83	71.29	[R]72.58	[R]72.53	72.55
Venezuela	5.77	6.31	[R]6.96	[R]6.96	7.27	[R]7.70	[R]8.08	[R]8.64	[R]9.49	9.24
Other	[R]6.38	[R]6.67	[R]6.83	[R]7.09	[R]7.53	[R]7.94	[R]8.71	[R]9.12	[R]9.57	10.03
Western Europe	[R]**38.57**	[R]**38.48**	[R]**38.50**	[R]**38.91**	[R]**39.52**	[R]**40.54**	[R]**41.63**	[R]**44.06**	[R]**43.83**	**43.55**
France	[R]4.06	[R]4.28	[R]4.47	[R]4.63	[R]4.85	[R]4.87	[R]4.93	[R]5.04	[R]4.90	4.75
Germany [1]	[R]7.94	[R]7.57	[R]6.35	[R]6.17	[R]5.84	[R]5.71	[R]5.60	[R]5.51	[R]5.45	5.02
Netherlands	[R]2.60	[R]2.63	[R]2.95	[R]2.93	[R]2.98	[R]2.91	[R]2.91	[R]3.25	[R]2.89	2.78
Norway	5.71	5.94	[R]6.23	[R]7.09	7.28	7.65	8.35	[R]9.29	[R]9.58	9.39
United Kingdom	[R]9.03	[R]8.96	[R]9.26	[R]9.07	[R]9.40	[R]10.18	[R]10.76	[R]11.58	[R]11.29	11.62
Other	[R]9.22	[R]9.10	[R]9.24	[R]9.02	[R]9.17	[R]9.22	[R]9.09	[R]9.39	[R]9.71	10.00
Eastern Europe and Former U.S.S.R.	**83.35**	[R]**81.92**	[R]**75.51**	[R]**71.33**	[R]**66.46**	[R]**61.40**	[R]**59.94**	[R]**60.51**	[R]**58.99**	**58.32**
Kazakhstan	—	—	—	3.76	3.38	[R]2.56	[R]2.27	2.35	2.48	2.42
Poland	[R]4.63	[R]3.88	[R]3.74	[R]3.68	[R]3.70	[R]3.75	[R]3.60	[R]3.84	[R]3.67	3.24
Former U.S.S.R.	71.89	72.11	66.43	—	—	—	—	—	—	—
Russia	—	—	—	[R]48.96	[R]45.51	[R]42.84	[R]41.85	[R]41.99	[R]40.82	41.04
Ukraine	—	—	—	[R]4.37	[R]4.01	[R]3.51	[R]3.56	[R]3.36	3.50	3.40
Other	[R]6.84	[R]5.93	[R]5.33	[R]10.55	[R]9.86	[R]8.73	[R]8.66	[R]8.97	[R]8.52	8.22
Middle East	**39.72**	**41.02**	**40.31**	**43.57**	[R]**45.76**	**46.94**	**47.97**	**49.03**	[R]**51.36**	**54.54**
Iran	7.02	7.67	8.27	8.53	8.83	9.16	9.35	[R]9.64	[R]9.84	9.89
Iraq	6.47	4.54	0.69	1.02	1.21	1.33	1.35	1.39	[R]2.60	4.71
Kuwait	4.32	2.83	0.43	2.44	4.28	4.73	4.81	4.94	[R]4.85	5.03
Saudi Arabia	12.81	15.92	19.75	20.39	20.11	20.00	20.25	20.39	[R]20.82	21.00
United Arab Emirates	4.99	5.51	6.24	6.11	5.78	5.84	6.14	6.34	[R]6.50	6.61
Other	4.12	4.55	4.94	5.08	[R]5.54	[R]5.88	6.06	6.32	[R]6.74	7.30
Africa	**20.59**	**21.63**	[R]**22.62**	**22.96**	[R]**22.81**	[R]**22.98**	[R]**24.18**	[R]**24.73**	[R]**26.03**	**26.24**
Algeria	4.48	4.73	5.04	5.06	4.87	4.79	5.13	5.28	[R]5.63	5.75
Libya	2.70	3.18	3.43	3.34	3.17	3.21	3.23	3.28	3.39	3.26
Nigeria	3.90	4.07	4.30	4.43	4.45	4.37	4.53	[R]4.57	[R]4.85	4.90
South Africa	4.12	4.05	4.12	4.26	4.41	4.61	4.85	4.86	[R]5.26	5.29
Other	5.39	5.60	[R]5.73	5.88	[R]5.91	[R]6.01	[R]6.44	6.74	[R]6.90	7.04
Far East and Oceania	[R]**57.45**	[R]**59.69**	[R]**61.41**	[R]**62.95**	[R]**65.92**	[R]**69.42**	[R]**73.96**	[R]**75.33**	[R]**76.01**	**75.41**
Australia	[R]5.59	6.14	[R]6.29	[R]6.59	[R]6.63	[R]6.94	[R]7.45	[R]7.58	[R]8.02	8.29
China	28.77	29.38	29.68	30.33	31.85	34.07	35.44	[R]35.48	[R]34.84	33.13
India	6.25	6.57	6.86	7.17	7.37	7.86	9.13	[R]9.30	[R]9.72	9.95
Indonesia	4.96	5.20	5.81	[R]5.96	[R]6.29	[R]6.63	[R]6.98	[R]7.43	[R]7.48	7.49
Japan	[R]3.36	[R]3.44	[R]3.61	[R]3.54	[R]3.90	[R]3.81	[R]4.19	[R]4.29	[R]4.55	4.67
Other	[R]8.52	[R]8.96	9.16	[R]9.37	[R]9.87	10.11	[R]10.77	11.26	[R]11.40	11.89
World	[R]**345.82**	[R]**351.46**	[R]**348.54**	[R]**350.33**	[R]**351.33**	[R]**356.54**	[R]**365.17**	[R]**374.93**	[R]**379.25**	**381.93**

[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

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

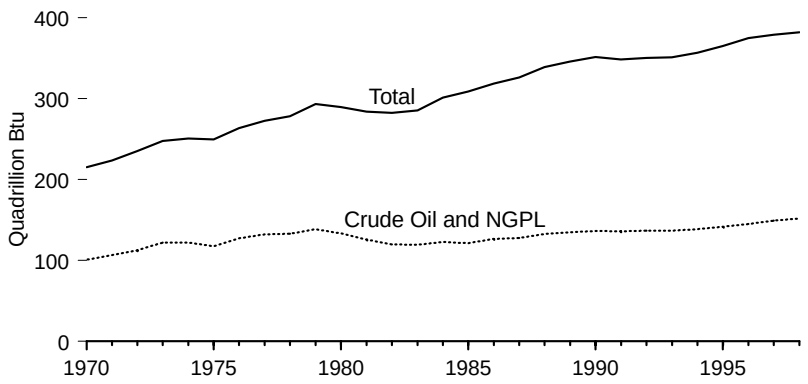
Notes: • See Note 1 at end of section. • World primary energy production includes crude oil and lease condensate, natural gas plant liquids, dry natural gas, coal, and net electricity generation from hydroelectric power, nuclear electric power, geothermal, wood, other biomass, waste, solar, and wind. Data for the United States also include renewable energy used for other than electricity generation. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

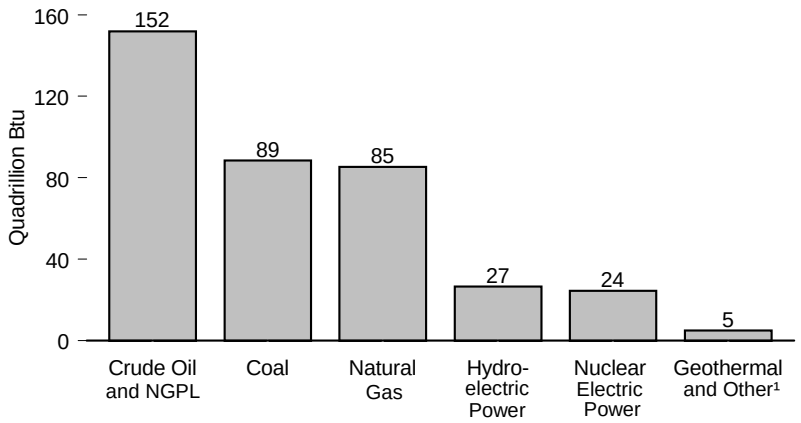
Sources: **United States:** Table 1.2. **All Other Data:** Energy Information Administration, *International Energy Annual 1998* (January 2000), Table F1, and the International Energy Database, April 2000.

Figure 11.2 World Primary Energy Production by Source

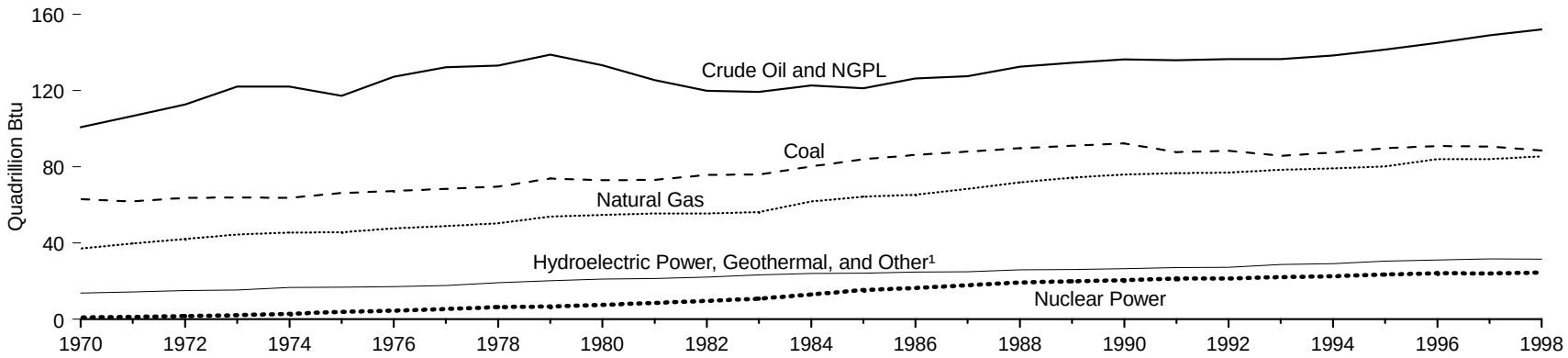
Total and Crude Oil and NGPL, 1970-1998



By Source, 1998



By Source, 1970-1998



[1]Net electricity generation from wood, other biomass, waste, solar, and wind. Data for the United States also include other renewable energy.

Notes: • Crude oil includes lease condensate. • NGPL is natural gas plant liquids. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.2.

Table 11.2 World Primary Energy Production by Source, 1970-1998

(Quadrillion Btu)

Year	Coal	Natural Gas [1]	Crude Oil [2]	Natural Gas Plant Liquids	Nuclear Electric Power [3]	Hydroelectric Power [3]	Geothermal [3] and Other [4]	Total
1970	62.96	37.09	97.09	3.61	0.90	12.15	1.59	215.39
1971	61.72	39.80	102.70	3.85	1.23	12.74	1.61	223.64
1972	63.65	42.08	108.52	4.09	1.66	13.31	1.68	234.99
1973	63.87	44.44	117.88	4.23	2.15	13.52	1.73	R247.82
1974	63.79	45.35	117.82	4.22	2.86	14.84	R1.75	250.64
1975	66.20	45.67	113.08	4.12	3.85	15.03	1.74	249.69
1976	67.32	47.62	122.92	4.24	4.52	15.08	1.97	263.67
1977	68.46	48.85	127.75	4.40	5.41	15.56	R2.10	272.54
1978	69.56	50.26	128.51	4.55	6.42	16.80	2.32	278.41
1979	73.83	53.93	133.87	4.87	6.69	17.69	2.48	293.36
1980	R72.94	R54.73	128.12	5.10	7.58	R18.06	R2.95	R289.49
1981	R73.06	R55.56	120.16	5.36	8.53	R18.35	R3.09	R284.12
1982	R75.67	R55.49	114.51	5.34	9.51	18.83	R3.24	R282.59
1983	R75.91	R56.13	113.97	5.34	10.72	19.73	R3.51	R285.31
1984	R80.12	R61.78	116.86	5.71	12.99	20.35	R3.64	R301.45
1985	R83.93	R64.22	115.40	5.82	15.37	20.57	R3.67	R308.98
1986	R86.07	R65.32	120.24	6.12	16.34	R21.03	R3.74	R318.86
1987	R87.89	R68.49	121.16	6.32	17.80	R21.10	R3.80	R326.55
1988	R89.61	R71.81	125.93	6.63	19.30	R21.90	R3.94	R339.12
1989	R91.05	R74.24	127.98	6.67	R19.82	21.76	R,5 4.29	R345.82
1990	R92.28	R75.91	129.50	6.85	20.37	R22.57	R3.97	R351.46
1991	R87.65	R76.68	128.77	7.13	21.29	R23.00	R4.02	R348.54
1992	R88.35	R76.84	129.13	7.38	21.36	R22.96	R4.32	R350.33
1993	R85.72	78.35	128.86	7.67	22.07	R24.31	R4.35	R351.33
1994	R87.53	R79.16	130.46	7.84	22.50	R24.49	R4.57	R356.54
1995	R89.67	R80.23	133.32	8.14	23.35	R25.73	R4.72	R365.17
1996	R90.78	R84.03	136.64	8.30	24.17	R26.12	R4.89	R374.93
1997	R90.64	R84.00	R140.52	R8.49	R23.95	R26.76	R4.89	R379.25
1998P	88.50	85.42	143.23	8.73	24.48	26.59	4.98	381.93

[1] Dry production.
[2] Includes lease condensate.
[3] Net generation, i.e., gross generation less plant use.
[4] Includes net electricity generation from wood, other biomass, waste, solar, and wind. Data for the United States also include other renewable energy.
[5] There is a discontinuity in the series between 1988 and 1989 due to the expanded coverage of U.S. renewable energy beginning in 1989. See Table 1.2.

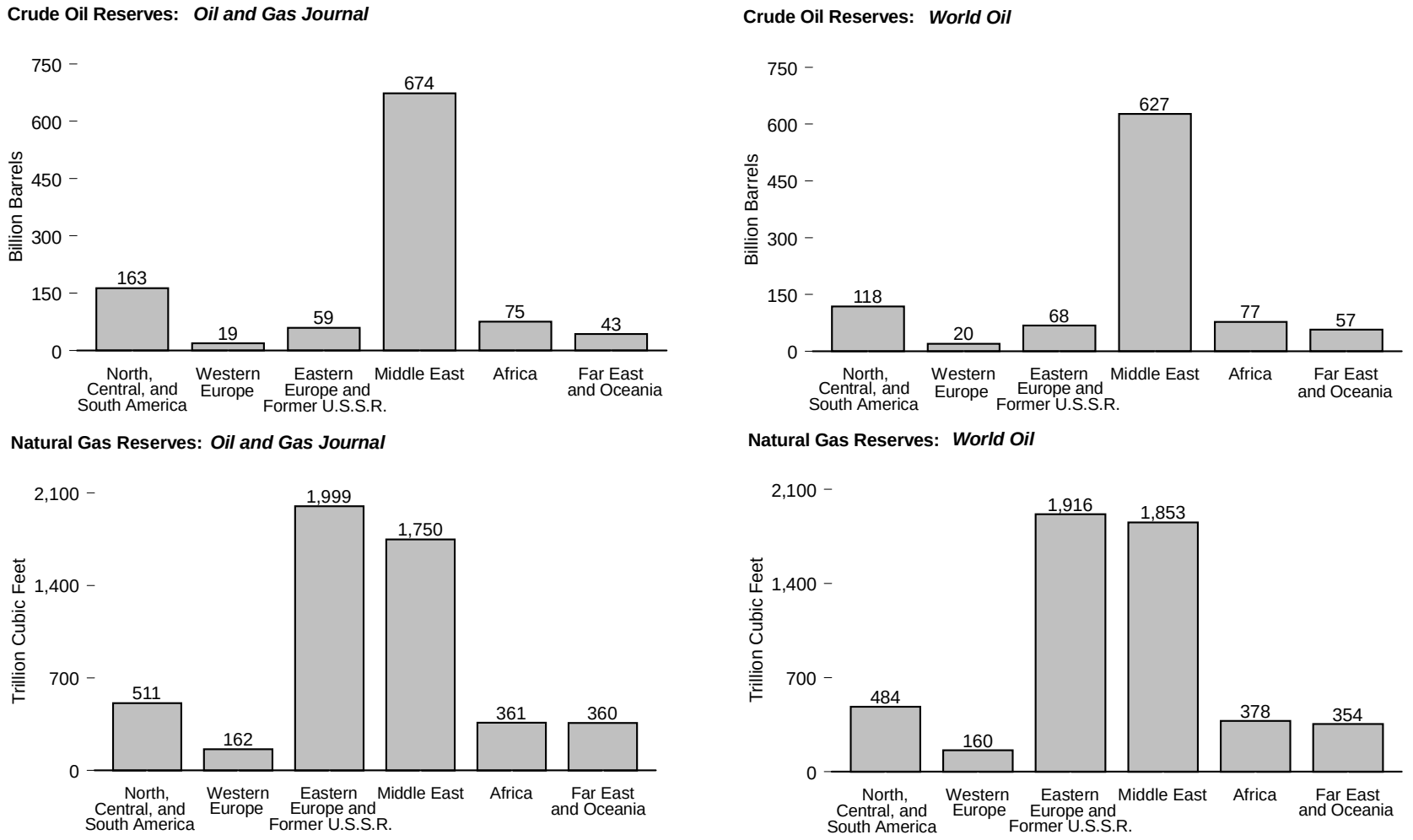
R=Revised. P=Preliminary.

Notes: • See Note 1 at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

Sources: • 1970-1988—Energy Information Administration (EIA), International Energy Database. • 1989 forward—EIA, *International Energy Annual 1998* (January 2000), Tables F1-F8, and the International Energy Database, April 2000.

Figure 11.3 World Crude Oil and Natural Gas Reserves, January 1, 1999



Source: Table 11.3.

Table 11.3 World Crude Oil and Natural Gas Reserves, January 1, 1999

Region and Country	Crude Oil (billion barrels)		Natural Gas (trillion cubic feet)	
	Oil & Gas Journal	*World Oil*	*Oil & Gas Journal*	*World Oil*
North America	**73.8**	**55.0**	**291.4**	**257.9**
Canada	4.9	5.6	63.9	63.6
Mexico	47.8	28.4	63.5	30.3
United States	21.0	21.0	164.0	164.0
Central and South America	**89.5**	**63.4**	**219.1**	**226.1**
Argentina	2.6	2.8	24.1	24.2
Bolivia	0.1	0.2	4.3	5.3
Brazil	7.1	7.5	8.0	8.7
Colombia	2.6	2.6	6.9	8.0
Ecuador	2.1	2.6	3.7	3.7
Peru	0.8	0.8	7.0	7.1
Trinidad and Tobago	0.5	0.6	18.3	19.8
Venezuela	72.6	45.5	142.5	146.6
Other	1.0	0.9	4.2	2.7
Western Europe	**18.9**	**19.8**	**161.5**	**159.8**
Denmark	0.9	0.9	3.9	3.2
Germany	0.4	0.4	12.3	12.0
Italy	0.6	0.6	8.1	7.8
Netherlands	0.1	0.1	63.1	62.5
Norway	10.9	11.9	41.4	43.6
United Kingdom	5.2	5.2	27.0	26.7
Other	0.7	0.8	5.7	4.0
Eastern Europe and Former U.S.S.R.	**58.9**	**67.9**	**1,999.4**	**1,916.2**
Hungary	0.1	(s)	3.1	1.4
Kazakhstan	5.4	7.0	65.0	70.6
Romania	1.4	0.9	13.2	4.1
Russia	48.6	55.1	1,700.0	1,705.0
Other [1]	3.3	4.9	218.1	135.1
Middle East	**673.6**	**627.1**	**1,749.5**	**1,853.2**
Bahrain	0.2	NA	4.2	NA
Iran	89.7	92.9	812.3	812.2
Iraq	112.5	99.0	109.8	112.6
Kuwait	96.5	94.7	52.7	56.4
Oman	5.3	5.6	28.4	29.1
Qatar	3.7	5.3	300.0	395.0
Saudi Arabia	261.5	261.4	204.5	208.0
Syria	2.5	2.3	8.5	8.4
United Arab Emirates	97.8	63.9	212.0	209.0
Yemen	4.0	1.9	16.9	17.0
Other	(s)	0.2	0.3	5.5
Africa	**75.4**	**77.2**	**361.1**	**377.9**
Algeria	9.2	13.0	130.3	137.5
Angola	5.4	4.0	1.6	1.7
Cameroon	0.4	0.7	3.9	3.9
Congo	1.5	1.7	3.2	4.3
Egypt	3.5	3.7	31.5	37.2
Libya	29.5	26.9	46.4	46.3
Nigeria	22.5	22.5	124.0	124.0
Tunisia	0.3	0.3	2.8	2.3
Other	3.1	4.4	17.4	20.8
Far East and Oceania	**43.0**	**57.1**	**359.6**	**354.0**
Australia	2.9	1.8	44.6	28.4
Brunei	1.4	1.0	13.8	9.6
China	24.0	33.5	48.3	42.4
India	4.0	3.0	19.0	12.9
Indonesia	5.0	8.6	72.3	77.1
Malaysia	3.9	4.6	81.7	85.8
New Zealand	0.1	0.1	2.5	2.2
Pakistan	0.2	0.2	21.6	21.6
Papua New Guinea	0.3	0.6	5.4	14.0
Thailand	0.3	0.4	12.5	14.8
Other	0.9	3.2	37.9	45.3
World	**1,033.2**	**967.5**	**5,141.6**	**5,145.2**

[1] Albania, Azerbaijan, Belarus, Bulgaria, Croatia, Czech Republic, Georgia, Kyrgyzstan, Lithuania, Poland, Serbia, Slovakia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

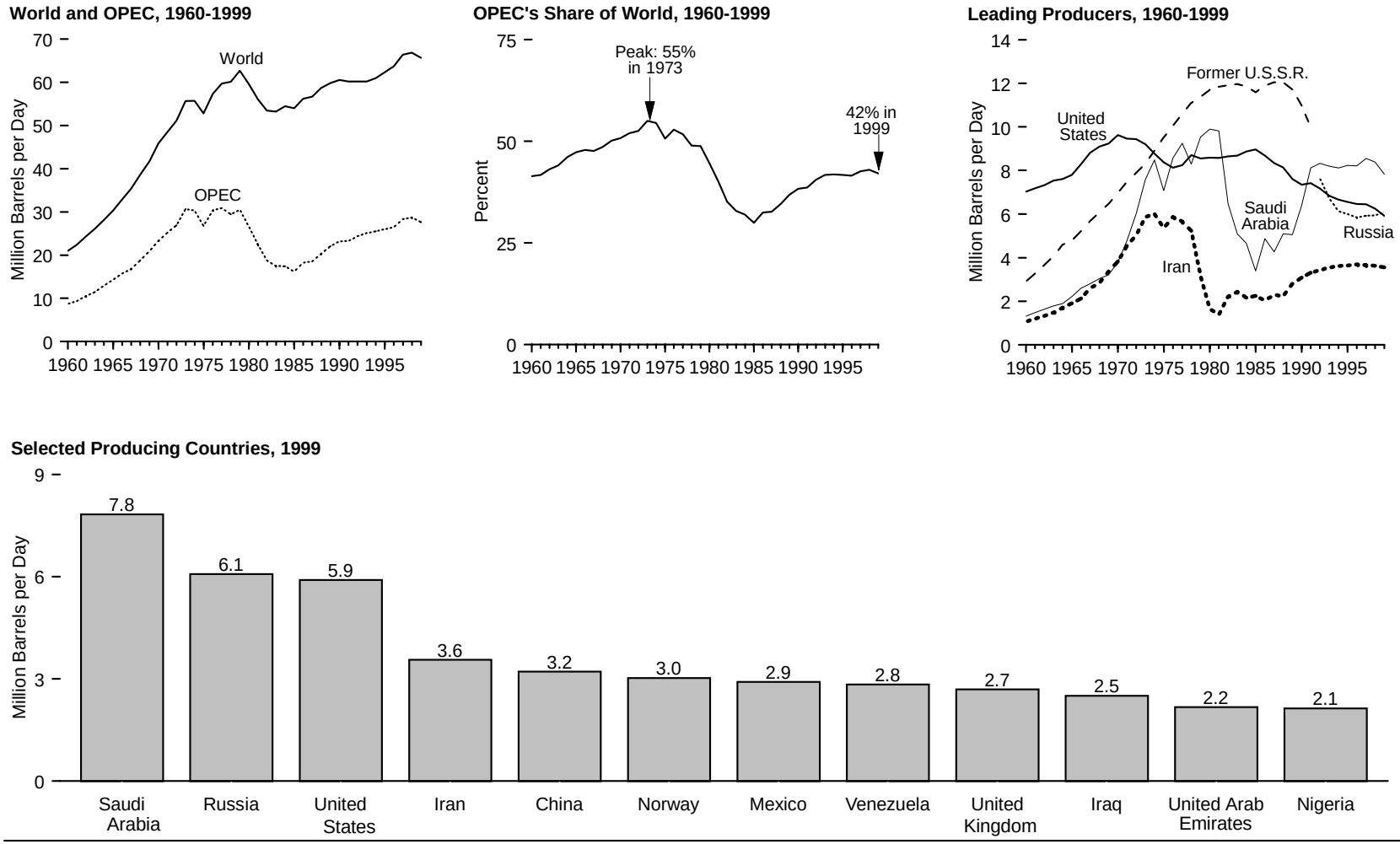
NA=Not available. (s)=Less than 50 million barrels.

Notes: • Data for Kuwait and Saudi Arabia include one-half of the reserves in the Neutral Zone between Kuwait and Saudi Arabia. • All reserve figures except those for the former U.S.S.R. and natural gas reserves in Canada are proved reserves recoverable with present technology and prices at the time of estimation. Former U.S.S.R. and Canadian natural gas figures include proved, and some probable reserves. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

Sources: **United States:** Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves* (December 1999). **All Other Data:** PennWell Publishing Company, *Oil & Gas Journal,* December 28, 1998. Gulf Publishing Company, *World Oil,* August 1999.

Figure 11.4 World Crude Oil Production



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

Source: Table 11.4.

Table 11.4 World Crude Oil Production, 1960-1999

(Million Barrels per Day)

Year	Persian Gulf Nations [2]	Selected OPEC [1] Producers								Selected Non-OPEC Producers									World
		Iran	Iraq	Kuwait [3]	Nigeria	Saudi Arabia [3]	United Arab Emirates	Venezuela	Total OPEC	Canada	China	Mexico	Norway	Former U.S.S.R.	Russia	United Kingdom	United States	Total Non-OPEC [4]	
1960	5.27	1.07	0.97	1.69	0.02	1.31	0.00	2.85	8.70	0.52	0.10	0.27	0.00	2.91	—	(s)	7.04	12.29	20.99
1961	5.65	1.20	1.01	1.74	0.05	1.48	0.00	2.92	9.36	0.61	0.11	0.29	0.00	3.28	—	(s)	7.18	13.09	22.45
1962	6.19	1.33	1.01	1.96	0.07	1.64	0.01	3.20	10.51	0.67	0.12	0.31	0.00	3.67	—	(s)	7.33	13.84	24.35
1963	6.82	1.49	1.16	2.10	0.08	1.79	0.05	3.25	11.51	0.71	0.13	0.31	0.00	4.07	—	(s)	7.54	14.62	26.13
1964	7.61	1.71	1.26	2.30	0.12	1.90	0.19	3.39	12.98	0.75	0.18	0.32	0.00	4.60	—	(s)	7.61	15.20	28.18
1965	8.37	1.91	1.32	2.36	0.27	2.21	0.28	3.47	14.35	0.81	0.23	0.32	0.00	4.79	—	(s)	7.80	15.98	30.33
1966	9.32	2.13	1.39	2.48	0.42	2.60	0.36	3.37	15.77	0.88	0.29	0.33	0.00	5.23	—	(s)	8.30	17.19	32.96
1967	9.91	2.60	1.23	2.50	0.32	2.81	0.38	3.54	16.85	0.96	0.28	0.36	0.00	5.68	—	(s)	8.81	18.54	35.39
1968	10.91	2.84	1.50	2.61	0.14	3.04	0.50	3.60	18.79	1.19	0.30	0.39	0.00	6.08	—	(s)	9.10	19.84	38.63
1969	11.95	3.38	1.52	2.77	0.54	3.22	0.63	3.59	20.91	1.13	0.48	0.46	0.00	6.48	—	(s)	9.24	20.79	41.70
1970	13.39	3.83	1.55	2.99	1.08	3.80	0.78	3.71	23.30	1.26	0.60	0.49	0.00	6.99	—	(s)	9.64	22.59	45.89
1971	15.77	4.54	1.69	3.20	1.53	4.77	1.06	3.55	25.21	1.35	0.78	0.49	0.01	7.48	—	(s)	9.46	23.31	48.52
1972	17.54	5.02	1.47	3.28	1.82	6.02	1.20	3.22	26.89	1.53	0.90	0.51	0.03	7.89	—	(s)	9.44	24.25	51.14
1973	20.67	5.86	2.02	3.02	2.05	7.60	1.53	3.37	30.63	1.80	1.09	0.47	0.03	8.32	—	(s)	9.21	25.05	55.68
1974	21.28	6.02	1.97	2.55	2.26	8.48	1.68	2.98	30.35	1.55	1.32	0.57	0.04	8.91	—	(s)	8.77	25.37	55.72
1975	18.93	5.35	2.26	2.08	1.78	7.08	1.66	2.35	26.77	1.43	1.49	0.71	0.19	9.52	—	0.01	8.37	26.06	52.83
1976	21.51	5.88	2.42	2.15	2.07	8.58	1.94	2.29	30.33	1.31	1.67	0.83	0.28	10.06	—	0.25	8.13	27.01	57.34
1977	21.73	5.66	2.35	1.97	2.09	9.25	2.00	2.24	30.89	1.32	1.87	0.98	0.28	10.60	—	0.77	8.24	28.82	59.71
1978	20.61	5.24	2.56	2.13	1.90	8.30	1.83	2.17	29.46	1.32	2.08	1.21	0.36	11.11	—	1.08	8.71	30.70	60.16
1979	21.07	3.17	3.48	2.50	2.30	9.53	1.83	2.36	30.58	1.50	2.12	1.46	0.40	11.38	—	1.57	8.55	32.09	62.67
1980	17.96	1.66	2.51	1.66	2.06	9.90	1.71	2.17	26.61	1.44	2.11	1.94	0.53	11.71	—	1.62	8.60	32.99	59.60
1981	15.25	1.38	1.00	1.13	1.43	9.82	1.47	2.10	22.48	1.29	2.01	2.31	0.50	11.85	—	1.81	8.57	33.60	56.08
1982	12.16	2.21	1.01	0.82	1.30	6.48	1.25	1.90	18.78	1.27	2.05	2.75	0.52	11.91	—	2.07	8.65	34.70	53.48
1983	11.08	2.44	1.01	1.06	1.24	5.09	1.15	1.80	17.50	1.36	2.12	2.69	0.61	11.97	—	2.29	8.69	35.76	53.26
1984	10.78	2.17	1.21	1.16	1.39	4.66	1.15	1.80	17.44	1.44	2.30	2.78	0.70	11.86	—	2.48	8.88	37.05	54.49
1985	9.63	2.25	1.43	1.02	1.50	3.39	1.19	1.68	16.18	1.47	2.51	2.75	0.79	11.59	—	2.53	8.97	37.80	53.98
1986	11.70	2.04	1.69	1.42	1.47	4.87	1.33	1.79	18.28	1.47	2.62	2.44	0.87	11.90	—	2.54	8.68	37.95	56.23
1987	12.10	2.30	2.08	1.59	1.34	4.27	1.54	1.75	18.52	1.54	2.69	2.55	1.02	12.05	—	2.41	8.35	38.15	56.67
1988	13.46	2.24	2.69	1.49	1.45	5.09	1.57	1.90	20.32	1.62	2.73	2.51	1.16	12.05	—	2.23	8.14	38.42	58.74
1989	14.84	2.81	2.90	1.78	1.72	5.06	1.86	1.91	22.07	1.56	2.76	2.52	1.55	11.72	—	1.80	7.61	37.79	59.86
1990	15.28	3.09	2.04	1.18	1.81	6.41	2.12	2.14	23.20	1.55	2.77	2.55	1.70	10.98	—	1.82	7.36	37.37	60.57
1991	14.74	3.31	0.31	0.19	1.89	8.12	2.39	2.38	23.27	1.55	2.84	2.68	1.89	9.99	—	1.80	7.42	36.94	60.21
1992	15.97	3.43	0.43	1.06	1.94	8.33	2.27	2.37	24.40	1.61	2.85	2.67	2.23	—	7.63	1.83	7.17	35.81	60.21
1993	16.71	3.54	0.51	1.85	1.96	8.20	2.16	2.45	25.12	1.68	2.89	2.67	2.35	—	6.73	1.92	6.85	35.12	60.24
1994	16.96	3.62	0.55	2.03	1.93	8.12	2.19	2.59	25.51	1.75	2.94	2.69	2.52	—	6.14	2.37	6.66	35.48	60.99
1995	17.21	3.64	0.56	2.06	1.99	8.23	2.23	2.75	26.00	1.81	2.99	2.62	2.77	—	6.00	2.49	6.56	36.33	62.33
1996	17.37	3.69	0.58	2.06	R2.00	8.22	2.28	R2.94	R26.46	1.84	3.13	2.86	3.10	—	5.85	2.57	6.46	R37.25	R63.71
1997	R18.47	3.66	R1.16	2.08	R2.33	8.56	2.32	R3.32	R28.32	R1.92	3.20	3.02	R3.14	—	R5.92	2.52	6.45	R38.10	R66.42
1998	19.33	3.63	2.15	2.09	2.15	8.39	2.35	3.17	28.76	R1.98	3.20	3.07	3.02	—	5.94	2.62	R6.25	38.11	66.87
1999P	18.69	3.56	2.51	1.90	2.13	7.83	2.17	2.83	27.64	1.91	3.21	2.91	3.02	—	6.07	2.69	5.93	38.02	65.66

[1] Organization of Petroleum Exporting Countries. See Glossary for membership.
[2] Persian Gulf Nations are Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and United Arab Emirates.
[3] Includes about one-half of the production in the Neutral Zone between Kuwait and Saudi Arabia.
[4] Ecuador, which withdrew from OPEC on December 31, 1992, and Gabon, which withdrew on December 31,1994, are included in "Non-OPEC" for all years.

R=Revised. P=Preliminary. — = Not applicable. (s)=Less than 0.005 million barrels per day.

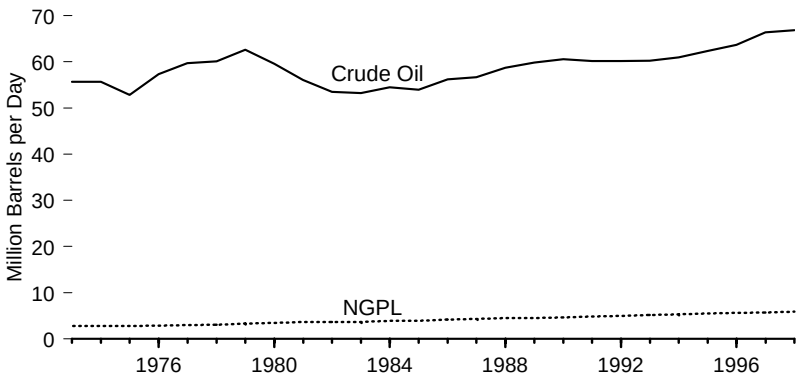
Notes: • Includes lease condensate, excludes natural gas plant liquids. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

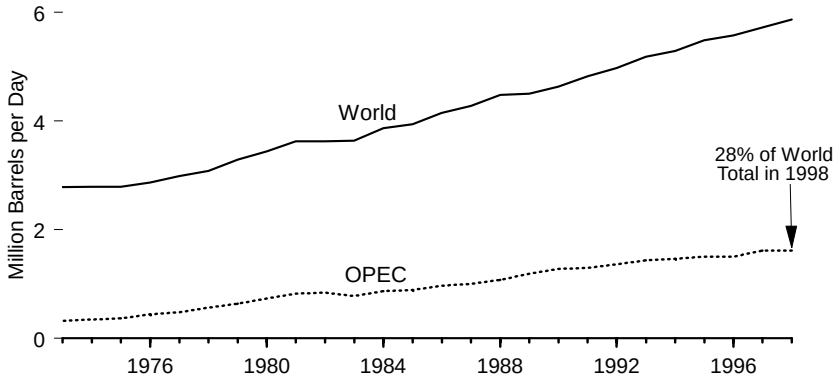
Sources: **China:** • 1960-1972—Central Intelligence Agency, unpublished data. • 1973-1998—Energy Information Administration (EIA), *International Energy Annual,* annual reports, and the International Energy Database, March 2000. • 1999—EIA, *Monthly Energy Review* (March 2000), Table 10.1b. **United States:** • 1960-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1998—EIA, *Petroleum Supply Annual.* • 1999—EIA, *Petroleum Supply Monthly* (February 2000). **Former U.S.S.R.:** • 1960-1969—U.S.S.R. Central Statistical Office, *Narodnoye Khozyaystvo SSSR* (National Economy USSR). • 1970-1991—EIA, *International Petroleum Monthly,* February 2000, Table 4.1c. **Russia:** • 1992-1998—EIA, *International Petroleum Monthly,* February 2000. • 1999—EIA, *Monthly Energy Review* (March 2000), Table 10.1b. **OPEC Nations:** • 1960-1972—Organization of Petroleum Exporting Countries, *Annual Statistical Bulletin 1979.* • 1973-1998—EIA, *International Energy Annual,* annual reports, and the International Energy Database, March 2000. • 1999—EIA, *Monthly Energy Review* (March 2000), Table 10.1a. **All Other Countries:** • 1960-1969—Bureau of Mines, *International Petroleum Annual, 1969.* • 1970-1972—EIA, *International Petroleum Annual, 1978.* • 1973-1998—EIA, *International Energy Annual,* annual reports, and the International Energy Database, March 2000. • 1999—EIA, *Monthly Energy Review* (March 2000), Table 10.1b.

Figure 11.5 World Natural Gas Plant Liquids Production

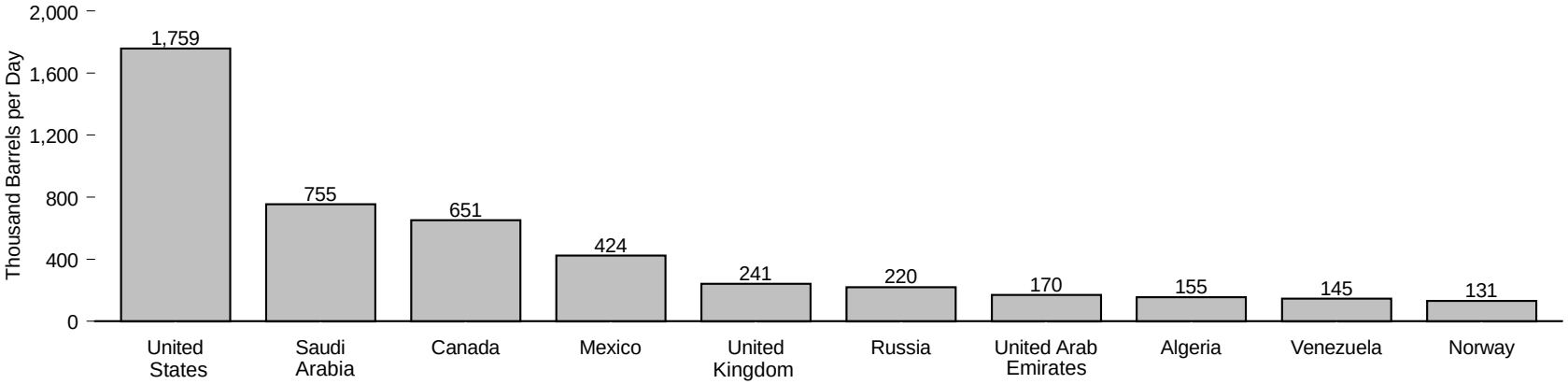
Crude Oil and NGPL Production, 1973-1998



World and OPEC NGPL Production, 1973-1998



Top NGPL Producing Countries, 1998



Notes: • Crude oil includes lease condensate. • NGPL is natural gas plant liquids.
• Because vertical scales differ, graphs should not be compared.

Sources: Tables 11.4 and 11.5.

Table 11.5 World Natural Gas Plant Liquids Production, 1973-1998

(Thousand Barrels per Day)

	Selected OPEC [1] Producers								Selected Non-OPEC Producers										
Year	Algeria	Indonesia	Kuwait [2]	Qatar	Saudi Arabia [2]	United Arab Emirates	Venezuela	Total OPEC	Australia	Canada	Kazakhstan	Mexico	Norway	Former U.S.S.R.	Russia	United Kingdom	United States	Total Non-OPEC [3]	World
1973	9	(s)	60	(s)	90	(s)	89	324	50	314	—	75	(s)	170	—	5	1,738	2,462	2,786
1974	12	(s)	50	5	130	(s)	84	347	50	314	—	80	(s)	190	—	5	1,688	2,443	2,790
1975	20	(s)	50	10	140	(s)	76	372	50	309	—	80	5	205	—	15	1,633	2,419	2,791
1976	24	10	50	10	185	(s)	77	442	50	289	—	95	20	220	—	15	1,604	2,425	2,867
1977	19	10	55	5	215	15	78	482	55	290	—	105	20	235	—	30	1,618	2,502	2,984
1978	25	30	75	5	250	30	61	566	60	281	—	115	35	255	—	40	1,567	2,514	3,080
1979	30	40	95	10	303	30	69	637	60	331	—	150	40	270	—	45	1,584	2,650	3,287
1980	36	70	95	10	369	35	60	732	60	331	—	193	40	285	—	45	1,573	2,712	3,444
1981	49	95	60	24	433	60	55	825	60	330	—	241	31	300	—	50	1,609	2,800	3,625
1982	58	80	40	30	430	90	60	842	52	318	—	255	33	315	—	78	1,550	2,784	3,626
1983	56	94	55	25	330	120	57	780	52	309	—	265	38	330	—	111	1,559	2,855	3,635
1984	105	75	67	28	355	130	57	869	54	336	—	257	36	340	—	136	1,630	3,000	3,869
1985	120	44	54	30	375	160	63	892	65	337	—	271	41	350	—	145	1,609	3,046	3,938
1986	120	30	75	22	385	185	97	969	60	328	—	352	53	440	—	152	1,551	3,181	4,150
1987	140	30	95	24	418	145	94	1,006	65	367	—	338	55	430	—	162	1,595	3,273	4,279
1988	120	30	100	30	499	130	98	1,077	67	381	—	370	75	450	—	159	1,625	3,404	4,481
1989	130	72	105	24	503	130	108	1,188	65	410	—	384	74	425	—	140	1,546	3,314	4,502
1990	130	77	65	40	620	135	114	1,281	63	426	—	428	78	425	—	108	1,559	3,351	4,632
1991	140	76	0	50	680	146	117	1,299	61	431	—	457	94	420	—	141	1,659	3,528	4,827
1992	140	75	34	55	713	144	113	1,364	56	460	86	454	95	—	230	160	1,697	3,610	4,974
1993	145	78	53	55	704	146	143	1,435	55	506	82	459	100	—	220	169	1,736	3,745	5,180
1994	140	80	85	50	698	150	146	1,465	56	529	63	461	103	—	200	218	1,727	3,827	5,292
1995	145	76	95	55	701	160	149	1,506	52	581	52	447	137	—	180	267	1,762	3,979	5,485
1996	150	80	85	50	697	160	150	1,501	62	596	54	423	138	—	185	259	1,830	R4,075	R5,576
1997	160	85	R109	70	712	160	R143	1,614	71	636	55	388	139	—	195	233	1,817	R4,107	R5,721
1998P	155	87	115	85	755	170	145	1,614	62	651	50	424	131	—	220	241	1,759	4,252	5,866

[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.

[3] Ecuador, which withdrew from OPEC on December 31, 1992, and Gabon, which withdrew on December 31,1994, are included in "Non-OPEC" for all years.

R=Revised. P=Preliminary. — = Not applicable. (s)=Less than 500 barrels per day.

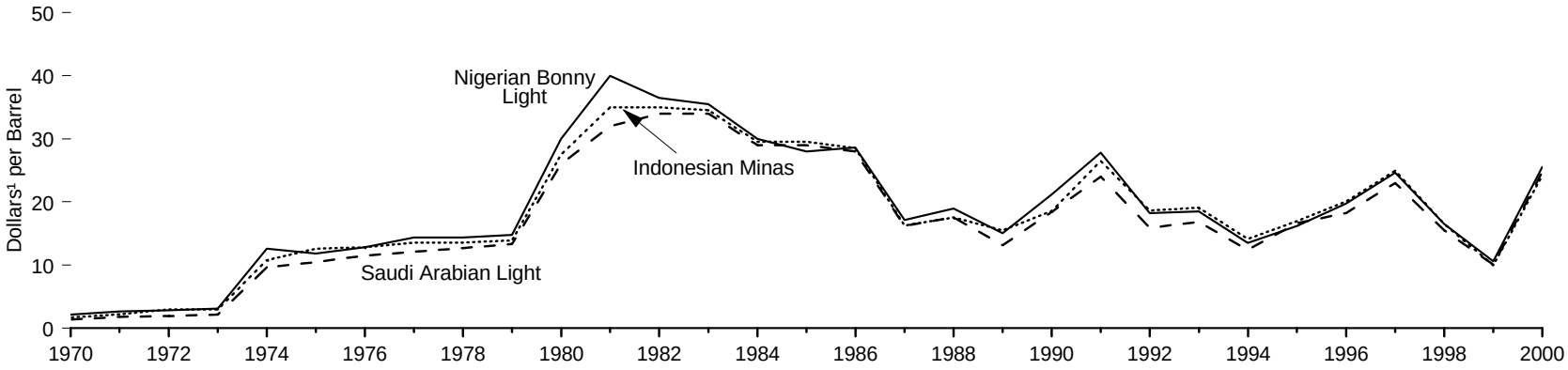
Note: Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

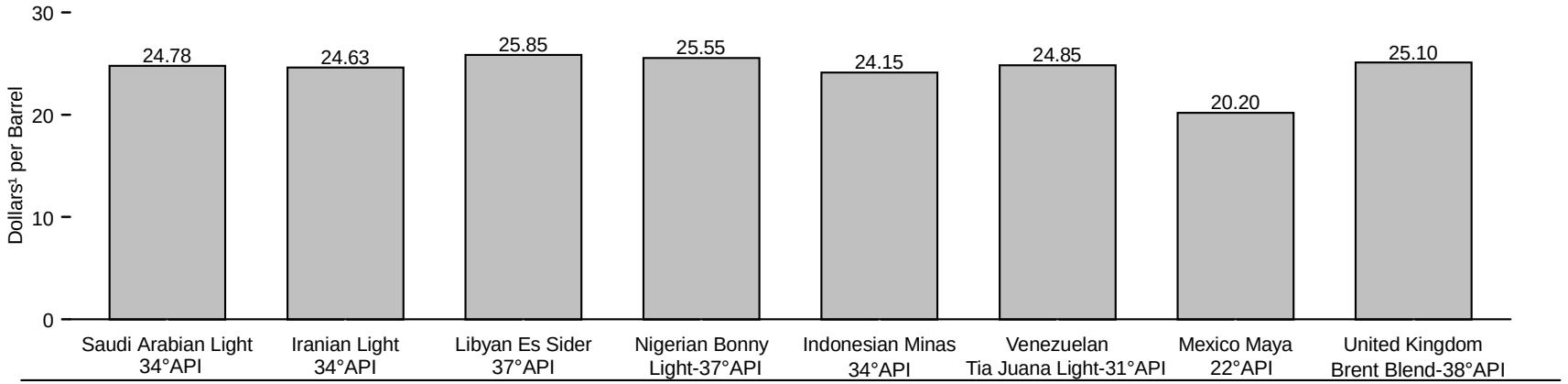
Sources: • 1973-1988—Energy Information Administration (EIA), *International Energy Annual,* annual reports, and the International Energy Database. • 1989 forward—EIA, *International Energy Annual 1998* (January 2000), Table 2.3, and the International Energy Database, March 2000.

Figure 11.6 Crude Oil Prices by Selected Type

Selected Types, 1970-2000



Selected Types, 2000



[1] Nominal dollars.
API=API gravity.

Notes: • Prices are as of the Friday that is closest to January 1, except in 1987, when prices are as of the first Friday in February. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.6.

Table 11.6 Crude Oil Prices by Selected Type, 1970-2000

(Dollars[1] per Barrel)

Year	Saudi Arabian Light-34° API	Iranian Light-34° API	Libyan [2] Es Sider-37° API	Nigerian [3] Bonny Light-37° API	Indonesian Minas-34° API	Venezuelan Tia Juana Light [4]	Mexico Maya-22° API	United Kingdom Brent Blend-38° API
1970	1.35	1.36	2.09	2.10	1.67	2.05	NA	NA
1971	1.75	1.76	2.80	2.65	2.18	2.45	NA	NA
1972	1.90	1.91	2.80	2.80	2.96	2.45	NA	NA
1973	2.10	2.11	3.10	3.10	2.96	2.60	NA	NA
1974	9.60	10.63	14.30	12.60	10.80	9.30	NA	NA
1975	10.46	10.67	11.98	11.80	12.60	11.00	NA	NA
1976	11.51	11.62	12.21	12.84	12.80	11.12	NA	NA
1977	12.09	12.81	13.74	14.33	13.55	12.72	NA	NA
1978	12.70	12.81	13.80	14.33	13.55	12.82	NA	NA
1979	13.34	13.45	14.52	14.80	13.90	13.36	15.45	15.70
1980	26.00	[5]30.37	34.50	29.97	27.50	25.20	28.00	26.02
1981	32.00	37.00	40.78	40.00	35.00	32.88	34.50	39.25
1982	34.00	34.20	36.50	36.50	35.00	32.88	26.50	36.60
1983	34.00	31.20	35.10	35.50	34.53	32.88	25.50	33.50
1984	29.00	28.00	30.15	30.00	29.53	27.88	25.00	30.00
1985	29.00	28.00	30.15	28.00	29.53	27.88	25.50	28.65
1986	28.00	28.05	30.15	28.65	28.53	28.05	21.93	26.00
1987	16.15	16.14	16.95	17.13	16.28	15.10	14.00	18.25
1988	17.52	15.55	18.52	18.92	17.56	17.62	11.10	18.00
1989	13.15	12.75	15.40	15.05	15.50	12.27	10.63	15.80
1990	18.40	18.20	20.40	21.20	18.55	24.69	17.05	21.00
1991	24.00	23.65	26.90	27.80	26.50	28.62	20.00	27.20
1992	15.90	15.50	17.20	18.20	18.65	19.67	10.75	17.75
1993	16.80	16.70	17.55	18.50	19.10	17.97	12.50	17.90
1994	12.40	12.40	12.55	13.50	14.15	12.97	9.01	13.15
1995	16.63	16.18	16.05	16.15	16.95	16.57	13.77	16.15
1996	18.20	17.73	19.20	19.70	20.05	18.52	15.79	19.37
1997	22.98	22.63	24.10	24.65	24.95	26.62	19.33	24.05
1998	15.50	14.93	16.72	16.50	16.50	15.93	10.81	15.89
1999	10.03	9.83	10.65	10.60	9.95	9.45	6.38	10.44
2000	24.78	24.63	25.85	25.55	24.15	24.85	20.20	25.10

[1] Nominal dollars.

[2] Prices for 1974 and 1975 are for crude oil with 40° API gravity. Prices for 1980 include $4.72 in retroactive charges and market premiums.

[3] Prices from 1977 forward include 2 cents per barrel harbor dues.

[4] 1970-1985—26° API; 1986 forward—31° API.

[5] Price for 1980 includes $1.87 market premiums and credit charges.

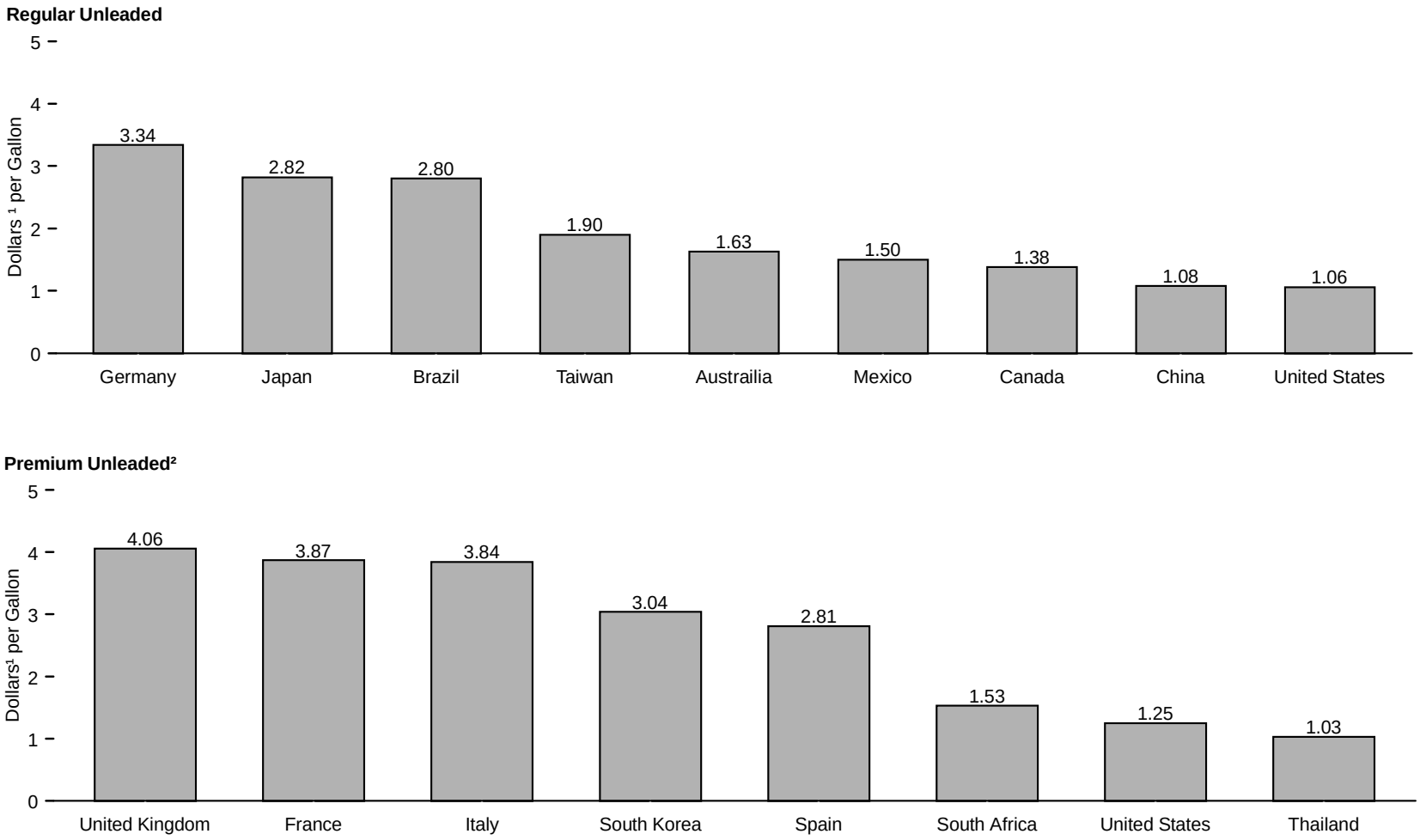
API=API gravity. NA=Not available.

Notes: • Based on official government-selling prices, netback values, or spot market quotations. • Prices are usually f.o.b. at the foreign port of lading. • Prices are as of the Friday that is closest to January 1, except in 1987, when prices are as of the first Friday in February. • See Tables 5.16, 5.17, and 5.19 for other types of crude oil prices for the United States, such as Domestic First Purchase Prices, Landed Costs of Crude Oil Imports, and Refiner Acquisition Costs.

Web Page: http://www.eia.doe.gov/international.

Sources: • 1970-1978—Petroleum and Energy Intelligence Weekly, Inc., *Petroleum Intelligence Weekly.* • 1979 forward—Energy Information Administration, *Weekly Petroleum Status Report.*

Figure 11.7 Retail Motor Gasoline Prices in Selected Countries, 1998



[1] Nominal dollars.
[2] Research Octane Number (RON) of 95.

Source: Table 11.7.

Table 11.7 Retail Motor Gasoline Prices in Selected Countries, 1990-1998

(Dollars[1] per Gallon)

	Regular Unleaded									Premium Unleaded [2]							
Year	Australia	Brazil	Canada	China	Germany	Japan	Mexico	Taiwan	United States	France	Italy	South Africa	South Korea	Spain	Thailand	United Kingdom	United States
1990	NA	3.82	1.87	NA	2.65	3.17	1.00	2.49	1.16	3.63	4.60	NA	2.03	NA	NA	2.82	1.35
1991	1.96	2.91	1.92	NA	2.90	3.46	1.29	2.39	1.14	3.45	4.50	NA	R2.49	NA	1.40	3.01	1.32
1992	1.89	2.92	1.73	NA	3.27	3.59	1.50	2.42	1.13	3.57	4.53	NA	R2.70	3.49	1.35	3.06	1.32
1993	1.73	2.40	1.57	NA	3.07	4.02	1.56	2.27	1.11	3.41	3.68	NA	R2.88	3.02	R1.26	2.84	1.30
1994	1.84	2.80	1.45	0.96	3.52	4.39	1.48	2.14	1.11	3.59	3.71	NA	R2.87	2.99	R1.21	2.99	1.31
1995	1.95	2.16	1.53	1.03	3.96	4.43	1.12	2.23	1.15	4.26	4.00	NA	2.93	3.24	R1.25	3.21	1.34
1996	2.12	2.31	1.61	1.03	3.94	3.65	1.26	2.15	1.23	4.41	4.39	1.74	R3.15	3.32	R1.31	3.34	1.41
1997	2.05	2.61	1.62	1.07	3.54	3.27	1.47	2.23	1.23	4.01	4.06	1.72	R3.34	3.01	R1.22	3.83	1.42
1998	1.63	2.80	1.38	1.08	3.34	2.82	1.50	1.90	1.06	3.87	3.84	1.53	3.04	2.81	1.03	4.06	1.25

[1] Nominal dollars.

[2] Research Octane Number (RON) of 95.

R=Revised. NA=Not available.

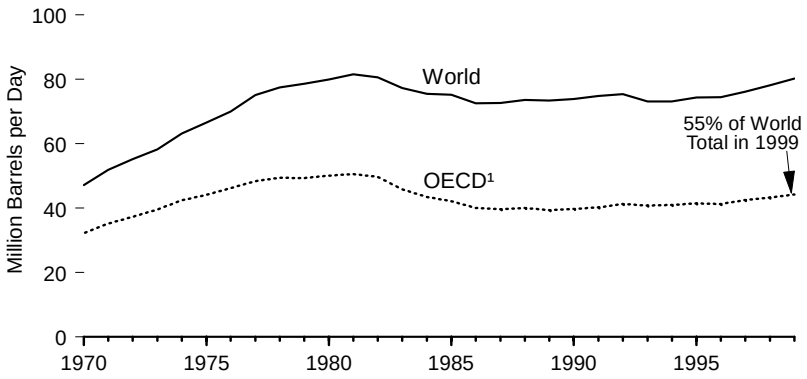
Notes: • Prices are those actually paid, i.e., net of rebates, and include transport costs and taxes which are not refundable. Prices in national currencies are converted to U.S. dollars using exchange rates published by the International Monetary Fund. • Prices for all countries, except the United States, have been converted from dollars per liter to dollars per gallon at 3.786 liters per gallon. Comparisons between prices and price trends in different countries require care. They are of limited validity because of fluctuations in exchange rates, differences in product quality, marketing practices, market structures, and the extent to which the standard categories of sales are representative of total national sales for a given period.

Web Page: http://www.eia.doe.gov/international.

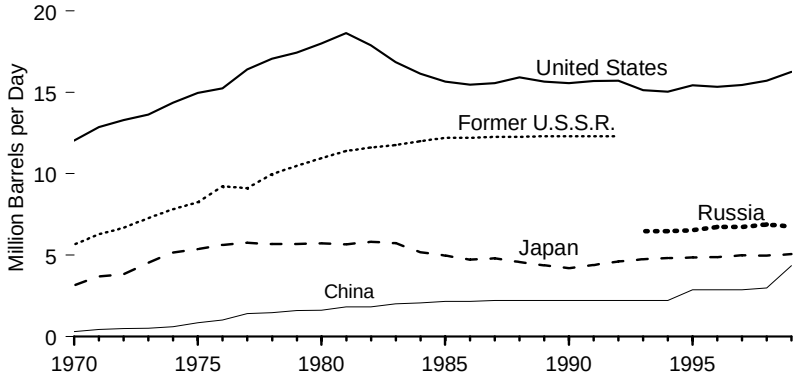
Sources: • **United States:** Table 5.22. • **All Other Data:** International Energy Agency, Organization for Economic Cooperation and Development, *Energy Prices and Taxes, Part II, Section D, and Part III, Section B,* quarterly reports.

Figure 11.8 World Crude Oil Refining Capacity

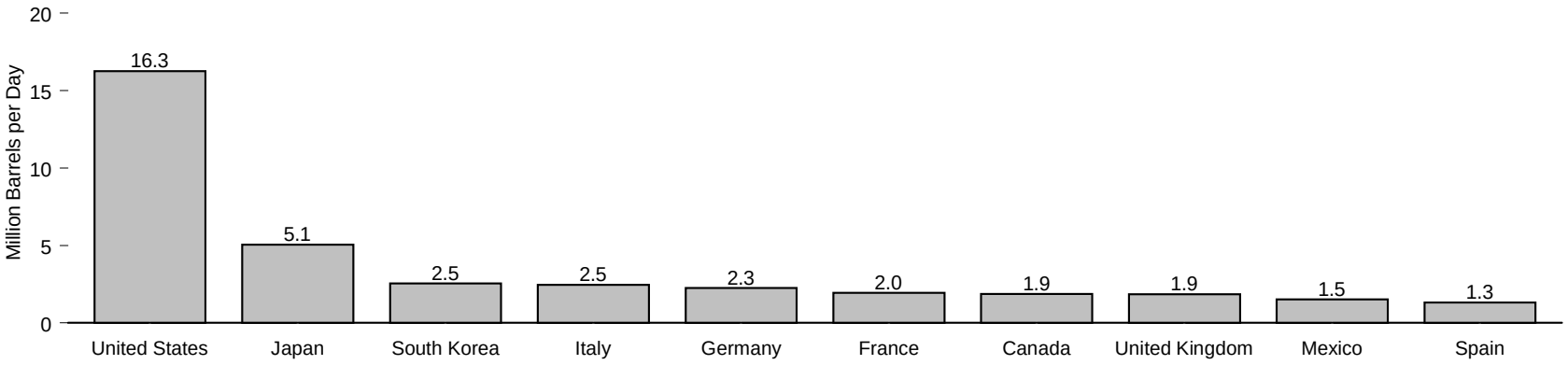
World and OECD,[1] 1970-1999



Leading Countries, 1970-1999



Selected OECD[1] Countries, 1999



[1] Organization for Economic Cooperation and Development. See Glossary for membership.

Notes: • Capacity is as of January 1. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.8.

Table 11.8 World Crude Oil Refining Capacity, 1970-1999

(Million Barrels per Day)

	Selected OECD [1] Countries											Selected Non-OECD Countries							
Year	Canada	France	Germany [2]	Italy	Japan	Mexico [3]	South Korea [3]	Spain	United Kingdom	United States	Total OECD [4]	Brazil	China	Former U.S.S.R.	Russia	Saudi Arabia	Ukraine	Total Non-OECD	World
1970	1.40	2.32	2.36	2.96	3.14	0.50	0.18	0.69	2.30	12.02	32.18	0.50	0.30	5.64	—	0.38	—	14.92	47.10
1971	1.45	2.53	2.54	3.24	3.70	0.57	0.25	0.85	2.39	12.86	35.18	0.51	0.42	6.27	—	0.91	—	16.73	51.91
1972	1.45	2.69	2.56	3.68	3.82	0.59	0.22	0.87	2.59	13.29	37.22	0.56	0.48	6.68	—	0.51	—	17.92	55.14
1973	1.73	2.95	2.70	3.59	4.53	0.63	0.43	1.03	2.47	13.64	39.48	0.72	0.50	7.26	—	0.43	—	18.72	58.20
1974	1.79	3.14	2.83	3.88	5.15	0.63	0.42	1.16	2.76	14.36	42.41	0.79	0.60	7.81	—	0.43	—	20.74	63.15
1975	1.88	3.34	2.99	3.95	5.35	0.76	0.43	1.17	2.78	14.96	44.07	0.96	0.85	8.24	—	0.61	—	22.45	66.52
1976	2.02	3.31	3.10	4.08	5.63	0.76	0.44	1.32	2.89	15.24	46.16	0.99	1.01	9.23	—	0.54	—	23.77	69.93
1977	2.10	3.52	3.08	4.26	5.76	0.94	0.42	1.28	3.01	16.40	48.34	1.12	1.40	9.10	—	0.60	—	26.77	75.11
1978	2.17	3.46	3.08	4.23	5.67	1.38	0.48	1.27	2.91	17.05	49.37	1.16	1.46	9.98	—	0.59	—	28.09	77.46
1979	2.23	3.47	3.10	4.20	5.68	1.24	0.54	1.43	2.53	17.44	49.31	1.21	1.58	10.48	—	0.49	—	29.27	78.58
1980	2.22	3.40	2.99	4.13	5.71	1.39	0.60	1.46	2.53	17.99	50.07	1.21	1.60	10.95	—	0.49	—	29.78	79.85
1981	2.17	3.34	3.02	4.09	5.66	1.39	0.61	1.46	2.63	18.62	50.57	1.40	1.81	11.40	—	0.49	—	30.99	81.56
1982	2.20	3.29	2.94	4.00	5.81	1.47	0.76	1.52	2.48	17.89	49.70	1.41	1.81	11.60	—	0.49	—	30.93	80.63
1983	2.02	2.87	2.47	3.28	5.73	1.29	0.76	1.52	2.26	16.86	45.79	1.22	2.00	11.75	—	0.71	—	31.42	77.21
1984	1.81	2.67	2.39	3.05	5.17	1.27	0.78	1.49	2.09	16.14	43.41	1.30	2.05	12.00	—	0.86	—	32.01	75.42
1985	1.87	2.39	2.17	3.10	4.97	1.27	0.78	1.49	2.01	15.66	42.10	1.31	2.15	12.20	—	0.84	—	33.02	75.12
1986	1.86	1.95	1.93	2.74	4.72	1.27	0.78	1.37	1.79	15.46	40.00	1.31	2.15	12.20	—	1.12	—	32.55	72.55
1987	1.76	1.83	1.72	2.68	4.79	1.35	0.86	1.31	1.78	15.57	39.64	1.32	2.20	12.26	—	1.13	—	32.93	72.57
1988	1.87	1.94	1.65	2.56	4.57	1.35	0.82	1.31	1.80	15.92	40.03	1.41	2.20	12.26	—	1.38	—	33.54	73.57
1989	1.86	1.88	1.52	2.45	4.36	1.35	0.88	1.29	1.80	15.65	39.35	1.41	2.20	12.30	—	1.38	—	33.99	73.34
1990	1.85	1.82	1.51	2.80	4.20	1.51	0.87	1.29	1.83	15.57	39.66	1.40	2.20	12.30	—	1.48	—	34.20	73.86
1991	1.88	1.82	2.07	2.39	4.38	1.68	0.87	1.32	1.87	15.68	40.16	1.41	2.20	12.30	—	1.86	—	34.60	74.76
1992	1.91	1.82	2.06	2.39	4.61	1.57	1.16	1.32	1.86	15.70	41.17	1.41	2.20	12.30	—	1.86	—	34.17	75.34
1993	1.87	1.85	2.23	2.42	4.74	1.52	1.15	1.30	1.84	15.12	40.81	1.40	2.20	—	6.46	1.86	1.24	32.29	73.10
1994	1.88	1.86	2.27	2.26	4.81	1.52	1.15	1.28	1.87	15.03	40.97	1.25	2.20	—	6.46	1.61	1.24	32.09	73.06
1995	1.91	1.77	2.32	2.26	4.85	1.52	1.17	1.28	1.87	15.43	41.42	1.25	2.87	—	6.53	1.66	1.26	32.83	74.25
1996	1.85	1.78	2.13	2.28	4.87	1.52	1.24	1.33	1.89	15.33	41.23	1.26	2.87	—	6.72	1.66	1.26	33.20	74.43
1997	1.85	1.79	2.11	2.26	4.99	1.52	2.21	1.30	1.94	15.45	42.46	1.26	2.87	—	6.73	1.66	1.25	33.63	76.09
1998	1.85	1.87	2.18	2.45	4.97	1.52	2.54	1.29	1.83	15.71	R43.22	1.66	2.97	—	6.87	1.65	1.25	34.91	R78.13
1999	1.87	1.95	2.25	2.45	5.06	1.53	2.54	1.32	1.85	16.26	44.14	1.77	4.35	—	6.75	1.69	1.09	36.01	80.15

[1] Organization for Economic Cooperation and Development. See Glossary for membership.

[2] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

[3] Mexico, which joined the OECD on May 18, 1994, and South Korea, which joined the OECD on December 12, 1996, are included in the OECD for all years shown in this table.

[4] Hungary and Poland, which joined the OECD on May 7, 1996, and November 22, 1996, respectively, are included in Total OECD beginning in 1992, the first year that data for these countries were available. The Czech Republic, which joined the OECD on December 21, 1995, is included in Total OECD beginning in 1994, the first year that data for the country were available.

R=Revised. — = Not applicable.

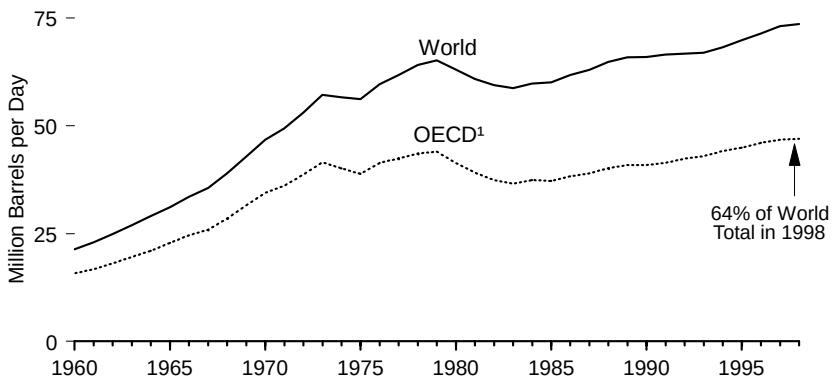
Notes: • Capacity data represent distillation capacity. • Capacity for all years is as of January 1. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

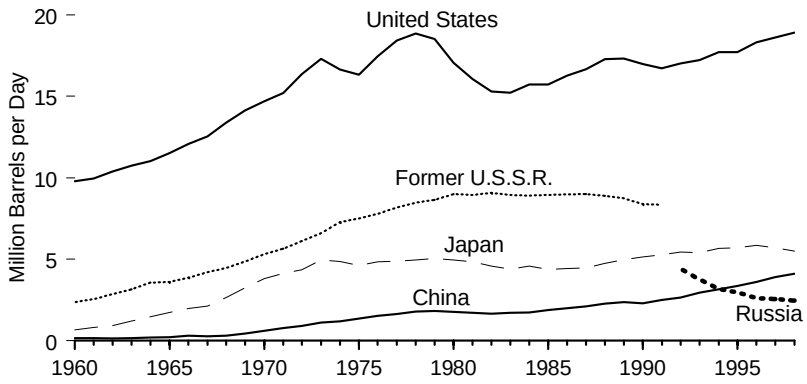
Sources: **United States:** • 1970-1977—Bureau of Mines, Mineral Industry Surveys, *Petroleum Refineries, Annual,* annual reports. • 1978-1981—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Refineries in the United States and U.S. Territories.* • 1982 forward—EIA, *Petroleum Supply Annual,* annual reports. **China and Former U.S.S.R.:** • 1970-1976—Ballinger Publishing Company, *The Energy Decade, 1970-1980, A Statistical and Graphic Chronicle.* • 1977 forward—PennWell Publishing Company, *Oil & Gas Journal.* **All Other Countries:** PennWell Publishing Company, *Oil & Gas Journal.*

Figure 11.9 World Petroleum Consumption

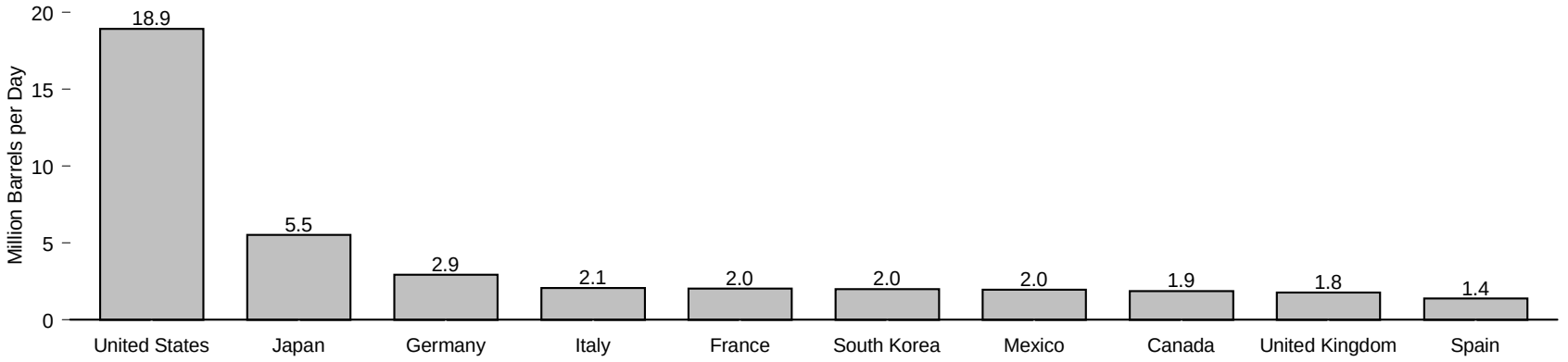
World and OECD,[1] 1960-1998



Leading Consumers, 1960-1998



Selected OECD[1] Consumers, 1998



[1] Organization for Economic Cooperation and Development. See Glossary for membership.

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

Source: Table 11.9.

Table 11.9 World Petroleum Consumption, 1960-1998

(Million Barrels per Day)

Year	Selected OECD [1] Consumers											Selected Non-OECD Consumers						World
	Canada	France	Germany [2]	Italy	Japan	Mexico [3]	South Korea [3]	Spain	United Kingdom	United States	Total OECD [4]	Brazil	China	India	Former U.S.S.R.	Russia	Total Non-OECD	
1960	0.84	0.56	0.63	0.44	0.66	0.30	0.01	0.10	0.94	9.80	15.78	0.27	0.17	0.16	2.38	—	5.56	21.34
1961	0.87	0.63	0.79	0.54	0.82	0.29	0.02	0.12	1.04	9.98	16.77	0.28	0.17	0.17	2.57	—	6.23	23.00
1962	0.92	0.73	1.00	0.67	0.93	0.30	0.02	0.12	1.12	10.40	18.06	0.31	0.14	0.18	2.87	—	6.83	24.89
1963	0.99	0.86	1.17	0.77	1.21	0.31	0.03	0.12	1.27	10.74	19.60	0.34	0.17	0.21	3.15	—	7.32	26.92
1964	1.05	0.98	1.36	0.90	1.48	0.33	0.02	0.20	1.36	11.02	21.05	0.35	0.20	0.22	3.58	—	8.03	29.08
1965	1.14	1.09	1.61	0.98	1.74	0.34	0.03	0.23	1.49	11.51	22.81	0.33	0.23	0.25	3.61	—	8.33	31.14
1966	1.21	1.19	1.80	1.08	1.98	0.36	0.04	0.31	1.58	12.08	24.60	0.38	0.30	0.28	3.87	—	8.96	33.56
1967	1.25	1.34	1.86	1.19	2.14	0.39	0.07	0.36	1.64	12.56	25.94	0.38	0.28	0.26	4.22	—	9.65	35.59
1968	1.34	1.46	1.99	1.40	2.66	0.41	0.10	0.46	1.82	13.39	28.56	0.46	0.31	0.31	4.48	—	10.40	38.96
1969	1.42	1.66	2.33	1.69	3.25	0.45	0.15	0.49	1.98	14.14	31.54	0.48	0.44	0.34	4.87	—	11.35	42.89
1970	1.52	1.94	2.83	1.71	3.82	0.50	0.20	0.58	2.10	14.70	34.49	0.53	0.62	0.40	5.31	—	12.32	46.81
1971	1.56	2.12	2.94	1.84	4.14	0.52	0.23	0.64	2.14	15.21	36.07	0.58	0.79	0.42	5.66	—	13.35	49.42
1972	1.66	2.32	3.13	1.95	4.36	0.59	0.23	0.68	2.28	16.37	38.74	0.66	0.91	0.46	6.12	—	14.35	53.09
1973	1.73	2.60	3.34	2.07	4.95	0.67	0.28	0.78	2.34	17.31	41.53	0.78	1.12	0.49	6.60	—	15.71	57.24
1974	1.78	2.45	3.06	2.00	4.86	0.71	0.29	0.86	2.21	16.65	40.12	0.86	1.19	0.47	7.28	—	16.56	56.68
1975	1.78	2.25	2.96	1.86	4.62	0.75	0.31	0.87	1.91	16.32	38.82	0.92	1.36	0.50	7.52	—	17.38	56.20
1976	1.82	2.42	3.21	1.97	4.84	0.83	0.36	0.97	1.89	17.46	41.39	1.00	1.53	0.51	7.78	—	18.28	59.67
1977	1.85	2.29	3.21	1.90	4.88	0.88	0.42	0.94	1.91	18.43	42.43	1.02	1.64	0.55	8.18	—	19.40	61.83
1978	1.90	2.41	3.29	1.95	4.95	0.99	0.48	0.98	1.94	18.85	43.62	1.11	1.79	0.62	8.48	—	20.54	64.16
1979	1.97	2.46	3.37	2.04	5.05	1.10	0.53	1.02	1.97	18.51	44.01	1.18	1.84	0.66	8.64	—	21.21	65.22
1980	1.87	2.26	3.08	1.93	4.96	1.27	0.54	0.99	1.73	17.06	41.41	1.15	1.77	0.64	9.00	—	21.66	63.07
1981	1.77	2.02	2.80	1.87	4.85	1.40	0.54	0.94	1.59	16.06	39.14	1.09	1.71	0.73	8.94	—	21.76	60.90
1982	1.58	1.88	2.74	1.78	4.58	1.48	0.53	1.00	1.59	15.30	37.45	1.06	1.66	0.74	9.08	—	22.05	59.50
1983	1.45	1.84	2.66	1.75	4.40	1.35	0.56	1.01	1.53	15.23	36.59	0.98	1.73	0.77	8.95	—	22.15	58.74
1984	1.47	1.75	2.66	1.65	4.58	1.45	0.59	0.91	1.85	15.73	37.43	1.03	1.74	0.82	8.91	—	22.41	59.84
1985	1.50	1.78	2.70	1.72	4.38	1.47	0.57	0.85	1.63	15.73	37.23	1.08	1.89	0.90	8.95	—	22.87	60.10
1986	1.51	1.77	2.86	1.74	4.44	1.49	0.61	0.88	1.65	16.28	38.28	1.24	2.00	0.95	8.98	—	23.48	61.76
1987	1.55	1.79	2.77	1.86	4.48	1.52	0.64	0.90	1.60	16.67	38.96	1.26	2.12	0.99	9.00	—	24.04	63.00
1988	1.69	1.80	2.74	1.84	4.75	1.55	0.73	0.98	1.70	17.28	40.24	1.30	2.28	1.08	8.89	—	24.58	64.82
1989	1.73	1.86	2.58	1.93	4.98	1.64	0.84	1.03	1.74	17.33	40.88	1.32	2.38	1.15	8.74	—	25.04	65.92
1990	1.69	1.82	2.66	1.87	5.14	1.68	1.03	1.01	1.75	16.99	40.92	1.34	2.30	1.17	8.39	—	25.06	65.98
1991	1.62	1.94	2.83	1.86	5.28	1.70	1.20	1.07	1.80	16.71	41.40	1.35	2.50	1.19	8.35	—	25.17	66.57
1992	1.64	1.93	2.84	1.94	5.45	1.72	1.46	1.11	1.80	17.03	R42.42	1.37	2.66	1.28	—	4.42	R24.34	R66.76
1993	1.69	1.88	2.90	1.85	5.40	1.71	1.69	1.06	1.82	17.24	42.98	1.43	2.96	1.31	—	3.75	R24.02	R67.00
1994	1.73	1.83	2.88	1.84	5.67	1.80	1.86	1.13	1.84	17.72	44.17	1.51	R3.16	1.41	—	3.18	R24.11	R68.28
1995	1.76	1.90	2.88	2.05	5.71	1.72	2.03	1.26	1.85	17.72	R44.96	1.60	R3.36	1.58	—	2.98	R24.91	R69.87
1996	1.80	1.94	2.91	2.06	5.87	1.76	2.18	1.18	1.85	18.31	46.07	1.72	R3.61	1.68	—	2.62	R25.33	R71.40
1997	1.86	1.96	2.90	2.05	5.71	R1.87	R2.39	1.30	1.80	18.62	R46.83	R1.82	R3.92	R1.77	—	R2.56	R26.30	R73.13
1998P	1.87	2.03	2.92	2.07	5.51	1.95	2.00	1.39	1.78	18.92	46.98	1.88	4.11	1.84	—	2.46	26.66	73.64

[1] Organization for Economic Cooperation and Development. See Glossary for membership.

[2] Through 1969, the data for Germany are for the former West Germany only. For 1970 through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

[3] Mexico, which joined the OECD on May 18, 1994, and South Korea, which joined the OECD on December 12, 1996, are included in the OECD for all years shown in this table.

[4] Hungary and Poland, which joined the OECD on May 7, 1996, and November 22, 1996, respectively, are included in Total OECD beginning in 1970, the first year that data for these countries were available. The Czech Republic, which joined the OECD on December 21, 1995, is included in Total OECD beginning in 1993, the year that it came into existence.

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

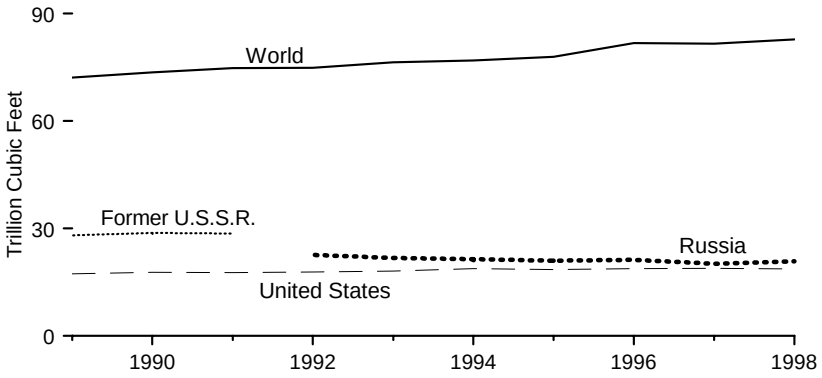
Note: Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

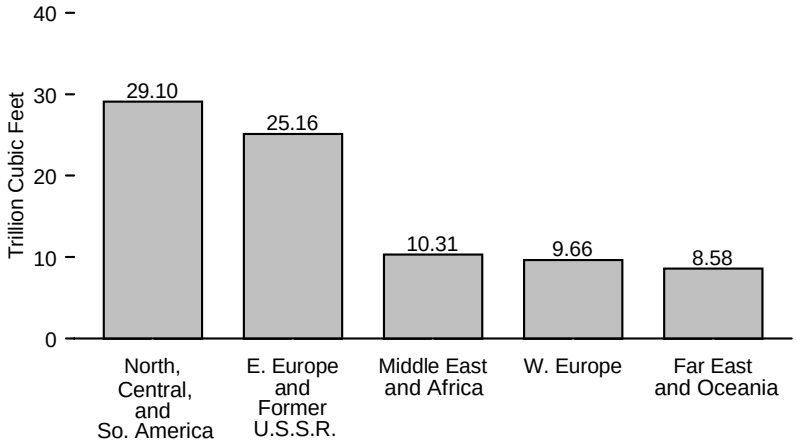
Sources:
- 1960-1979—Energy Information Administration (EIA), International Energy Database.
- 1980-1988—EIA, *International Energy Annual,* annual reports, and the International Energy Database.
- 1989 forward—EIA, *International Energy Annual 1998* (January 2000), Tables 1.1 and 1.2, and the International Energy Database, December 1999.

Figure 11.10 World Dry Natural Gas Production

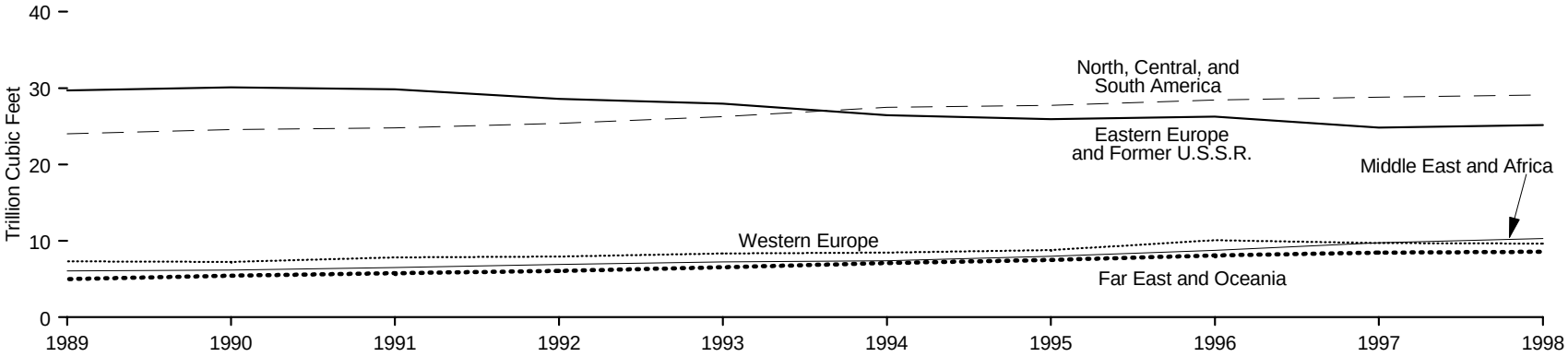
World and Leading Producers, 1989-1998



World Areas, 1998



World Areas, 1989-1998



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

Source: Table 11.10.

Table 11.10 World Dry Natural Gas Production, 1989-1998

(Trillion Cubic Feet)

Region and Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998 [P]
North, Central, and South America	[R]**24.03**	[R]**24.58**	[R]**24.81**	[R]**25.38**	[R]**26.26**	[R]**27.50**	[R]**27.74**	[R]**28.46**	[R]**28.83**	**29.10**
Argentina	0.72	0.63	0.70	0.71	0.76	0.79	0.88	0.94	0.97	1.05
Canada	[R]3.73	3.85	4.06	4.52	4.91	[R]5.27	[R]5.60	5.78	5.85	6.04
Mexico	[R]0.87	[R]0.90	[R]0.90	[R]0.88	[R]0.95	[R]0.97	[R]0.96	[R]1.06	[R]1.16	1.27
United States	17.31	17.81	17.70	17.84	18.10	18.82	18.60	[R]18.85	18.90	18.71
Venezuela	0.77	0.76	0.79	0.76	0.82	0.88	0.89	0.96	[R]0.99	0.99
Other	0.64	0.62	0.65	0.66	0.73	0.78	0.81	0.86	0.96	1.06
Western Europe	[R]**7.31**	**7.24**	**7.83**	[R]**7.92**	[R]**8.33**	[R]**8.44**	[R]**8.80**	[R]**10.09**	[R]**9.72**	**9.66**
Germany [1]	0.86	0.72	0.67	0.68	0.68	[R]0.70	[R]0.74	[R]0.80	[R]0.79	0.77
Italy	0.60	0.61	0.61	0.64	0.69	0.73	0.72	0.71	0.68	0.67
Netherlands	2.67	2.69	3.04	3.06	3.11	2.95	[R]2.98	3.37	2.99	2.84
Norway	1.09	0.98	0.97	1.04	0.97	1.04	1.08	1.45	[R]1.62	1.63
United Kingdom	1.58	1.75	2.01	[R]1.96	2.31	2.47	2.67	3.18	[R]3.03	3.17
Other	0.51	[R]0.49	0.53	0.54	[R]0.57	[R]0.55	0.61	0.59	[R]0.60	0.58
Eastern Europe and Former U.S.S.R.	[R]**29.71**	**30.13**	**29.85**	**28.58**	[R]**27.98**	**26.47**	**25.93**	**26.28**	[R]**24.85**	**25.16**
Romania	1.13	1.00	0.88	0.78	0.75	0.69	0.68	0.63	[R]0.61	0.52
Former U.S.S.R.	28.11	28.78	28.62	—	—	—	—	—	—	—
Russia	—	—	—	22.62	21.81	21.45	21.01	21.23	20.17	20.87
Turkmenistan	—	—	—	2.02	2.29	1.26	1.14	1.31	0.90	0.47
Ukraine	—	—	—	0.74	0.68	0.64	0.62	0.64	[R]0.64	0.64
Uzbekistan	—	—	—	1.51	1.59	1.67	1.70	1.70	1.74	1.94
Other	[R]0.47	0.35	0.35	0.91	[R]0.86	0.76	0.78	0.76	0.79	0.74
Middle East and Africa	**6.08**	**6.17**	**6.52**	**6.91**	**7.24**	**7.41**	**7.99**	**8.76**	[R]**9.74**	**10.31**
Algeria	1.71	1.79	1.93	1.97	1.90	1.81	2.05	2.19	[R]2.43	2.60
Egypt	0.27	0.29	0.32	0.35	0.40	0.42	0.44	0.47	0.48	0.49
Iran	0.78	0.84	0.92	0.88	0.96	1.12	1.25	1.42	[R]1.66	1.77
Qatar	0.22	0.28	0.33	0.40	0.48	0.48	0.48	0.48	[R]0.61	0.69
Saudi Arabia	1.05	1.08	1.13	1.20	1.27	1.33	1.34	1.46	[R]1.60	1.65
United Arab Emirates	0.81	0.78	0.92	1.02	0.94	0.91	1.11	1.19	[R]1.28	1.31
Other	1.24	1.13	0.98	1.08	1.30	1.34	1.33	1.53	[R]1.67	1.80
Far East and Oceania	**4.98**	**5.44**	**5.76**	[R]**6.06**	**6.55**	[R]**7.11**	[R]**7.50**	**8.11**	[R]**8.48**	**8.58**
Australia	0.57	0.72	0.75	[R]0.80	0.86	[R]0.93	1.03	1.05	[R]1.07	1.10
China	0.51	0.51	0.53	0.53	0.56	0.59	0.60	0.67	0.75	0.78
India	0.32	0.40	0.45	0.48	0.53	0.59	0.63	0.70	[R]0.72	0.76
Indonesia	1.42	1.53	1.72	1.79	1.97	2.21	2.24	2.35	2.37	2.24
Malaysia	0.61	0.65	0.75	0.80	0.88	0.92	1.02	1.23	1.36	1.44
Pakistan	0.47	0.48	0.53	0.55	0.58	0.63	0.65	0.70	0.70	0.71
Other	1.09	1.15	1.03	1.10	1.16	1.23	1.33	1.42	1.52	1.55
World	[R]**72.13**	[R]**73.57**	[R]**74.78**	[R]**74.84**	[R]**76.36**	[R]**76.93**	[R]**77.96**	[R]**81.70**	[R]**81.61**	**82.81**

[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

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

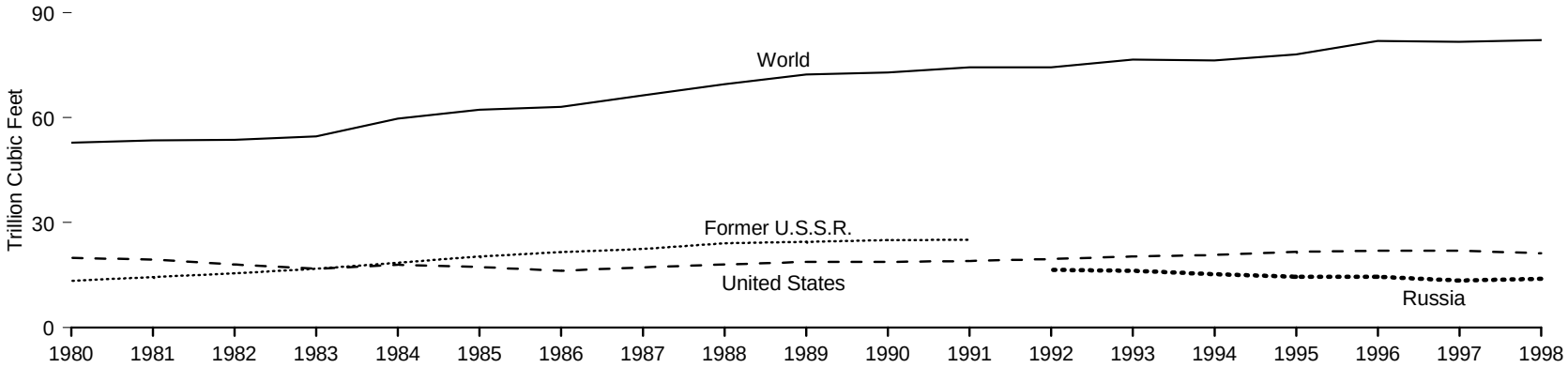
Note: Totals may not equal sum of components due to independent rounding and the inclusion of more recent U.S. data from an alternative source.

Web Page: http://www.eia.doe.gov/international.

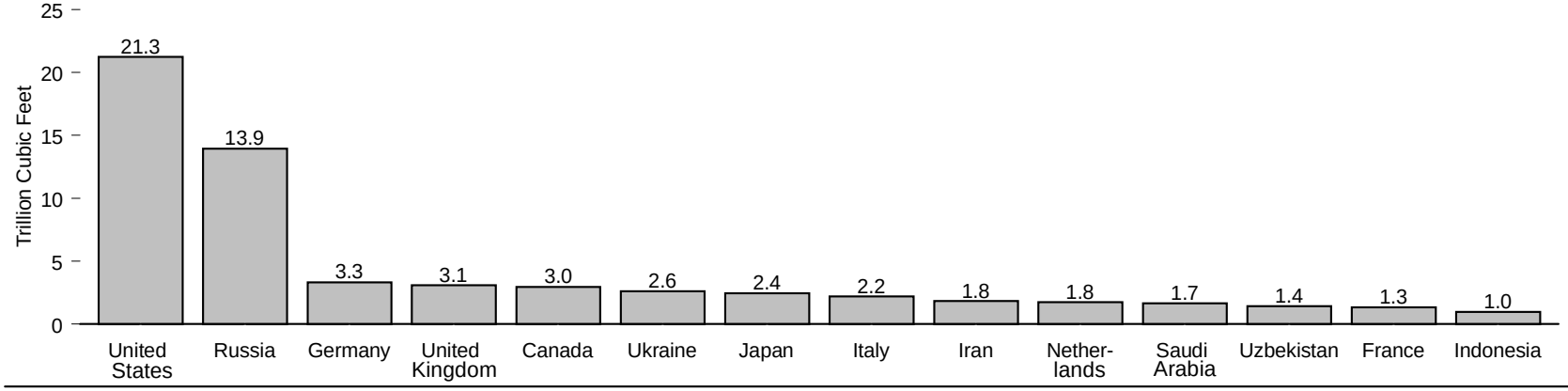
Sources: **United States:** Table 6.1. **All Other Data:** Energy Information Administration, *International Energy Annual 1998* (January 2000), Table 2.4, and the International Energy Database, March 2000.

Figure 11.11 World Dry Natural Gas Consumption

World and Leading Consumers, 1980-1998



Top Consuming Countries, 1998



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

Source: Table 11.11.

Table 11.11 World Dry Natural Gas Consumption, 1980-1998

(Billion Cubic Feet)

Year	Canada	France	Germany [1]	Indonesia	Iran	Italy	Japan	Nether-lands	Former U.S.S.R.	Russia	Saudi Arabia	Ukraine	United Kingdom	United States	Uzbek-istan	Other	World
1980	1,883	R981	2,621	195	232	R972	903	1,493	13,328	—	334	—	1,702	19,877	—	R8,369	R52,890
1981	R1,842	R1,003	2,513	232	155	R942	R925	1,421	14,440	—	564	—	R1,740	19,404	—	R8,333	R53,513
1982	R1,859	R979	2,334	218	200	R944	R956	1,511	15,522	—	430	—	R1,743	18,001	—	R8,931	R53,628
1983	R1,863	R999	2,397	302	310	R967	R1,020	R1,451	16,822	—	418	—	R1,815	16,835	—	R9,427	R54,626
1984	R2,017	R1,079	2,584	365	476	R1,135	R1,372	R1,540	18,512	—	620	—	R1,851	17,951	—	R10,189	R59,692
1985	2,165	R1,110	2,546	513	600	R1,151	1,468	R1,624	20,302	—	716	—	1,991	17,281	—	R10,777	R62,244
1986	R2,130	R1,129	2,595	441	536	R1,217	1,494	1,620	21,522	—	890	—	2,020	16,221	—	R11,303	R63,118
1987	2,112	R1,038	2,733	542	565	R1,346	1,543	1,672	22,462	—	946	—	2,079	17,211	—	R12,062	R66,312
1988	2,331	R963	2,716	492	706	1,460	1,618	1,513	24,092	—	1,028	—	1,972	18,030	—	R12,628	R69,548
1989	R2,427	R984	2,835	546	784	R1,581	1,731	1,550	24,529	—	1,052	—	1,951	18,801	—	R13,549	R72,320
1990	2,378	R997	2,669	547	837	R1,674	1,851	R1,535	24,961	—	1,077	—	2,059	18,716	—	R13,611	R72,912
1991	2,400	R1,131	R2,776	557	811	R1,775	1,976	1,715	25,014	—	1,130	—	2,218	19,035	—	R13,841	R74,380
1992	2,596	R1,146	R2,739	673	883	R1,760	2,023	1,669	—	16,482	1,201	3,503	R2,170	19,544	1,095	R16,868	R74,352
1993	R2,736	R1,158	R2,830	850	938	1,801	R2,034	R1,714	—	16,185	1,268	3,871	R2,412	20,279	1,541	R16,960	R76,576
1994	R2,824	R1,157	R2,965	965	1,123	1,748	2,180	R1,654	—	15,214	1,331	3,327	2,542	20,708	1,229	R17,397	76,365
1995	R2,791	1,183	R3,172	1,061	1,243	1,921	2,207	R1,701	—	14,507	1,343	2,970	2,690	21,581	1,349	R18,310	R78,029
1996	R3,000	1,314	R3,420	1,108	1,416	1,984	2,390	1,874	—	14,504	1,460	2,935	3,182	R21,966	1,434	R19,920	R81,907
1997	R3,035	R1,300	R3,278	R1,125	R1,663	R2,048	2,340	1,763	—	13,434	R1,601	R2,832	R3,013	R21,959	1,455	R20,806	R81,651
1998P	2,963	1,338	3,301	968	1,828	2,203	2,446	1,752	—	13,949	1,653	2,606	3,093	21,262	1,409	21,342	82,113

[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

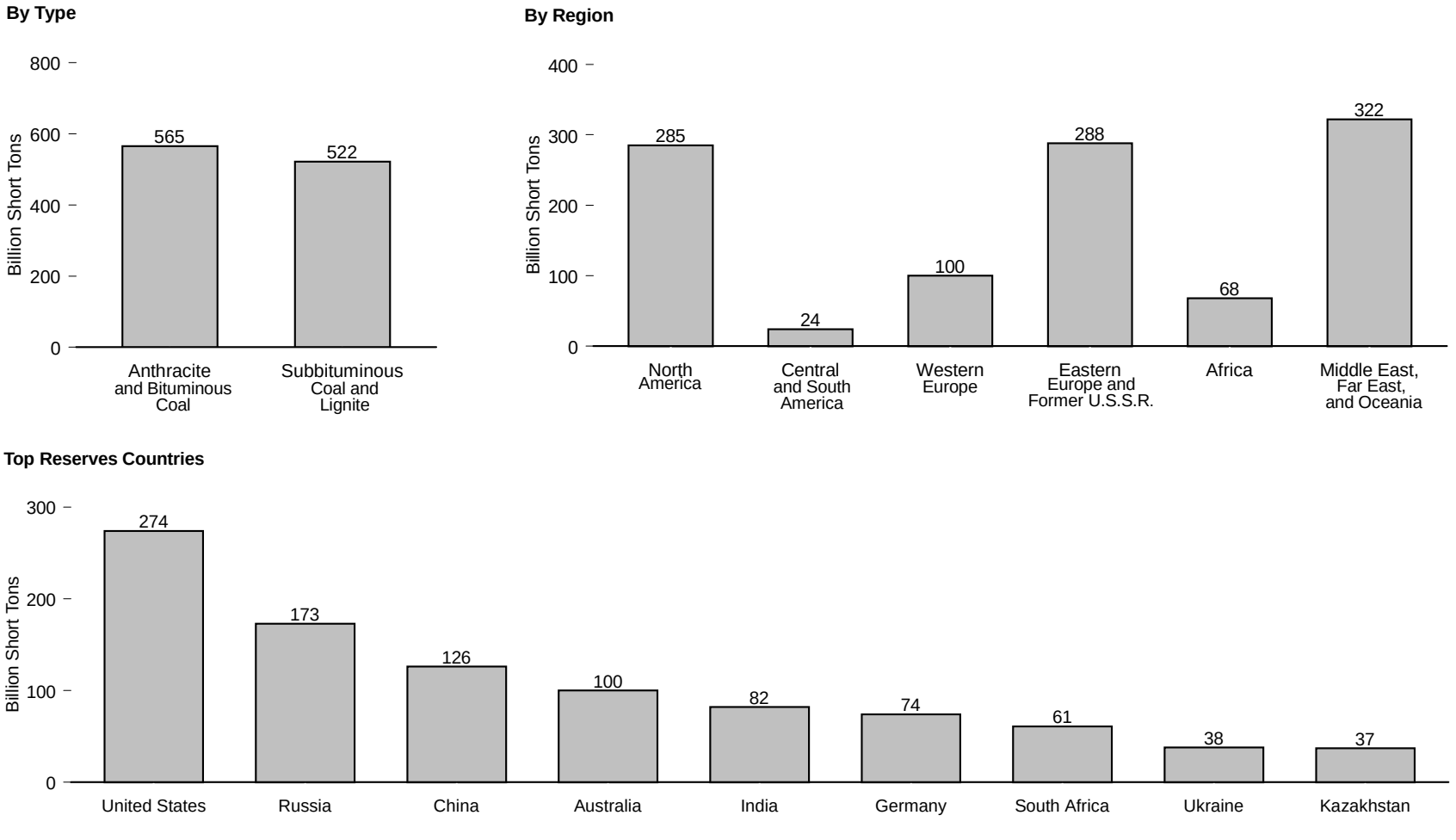
R=Revised. P=Preliminary. — = Not applicable.

Note: Totals may not equal sum of components due to independent rounding and the inclusion of more recent U.S. data from an alternative source.

Web Page: http://www.eia.doe.gov/international.

Sources: **United States:** Table 6.1. **All Other Data:** • 1980-1988—Energy Information Administration (EIA), *International Energy Annual,* annual reports, and the International Energy Database. • 1989 forward—EIA, *International Energy Annual 1998* (January 2000), Table 1.3, and the International Energy Database, March 2000.

Figure 11.12 World Recoverable Reserves of Coal



Notes: • Recoverable reserves are as of December 31, 1996, except for U.S. recoverable reserves, which are as of January 1, 1998. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.12.

Table 11.12 World Recoverable Reserves of Coal

(Million Short Tons)

Region and Country	Anthracite and Bituminous Coal	Subbituminous Coal and Lignite	Total
North America	R**131,807**	R**153,390**	R **285,197**
Canada	4,970	4,535	9,505
Greenland	0	202	202
Mexico	948	387	1,335
United States [1]	R125,889	R148,267	R 274,156
Central and South America	**8,641**	**15,140**	**23,781**
Brazil	0	13,173	13,173
Chile	34	1,268	1,302
Colombia	7,020	420	7,439
Peru	1,058	110	1,168
Other	529	170	699
Western Europe	**29,022**	**70,636**	**99,658**
Germany	26,455	47,399	73,855
Greece	0	3,168	3,168
Serbia and Montenegro	71	18,087	18,157
Turkey	495	690	1,185
United Kingdom	1,102	551	1,653
Other	898	741	1,639
Eastern Europe and Former U.S.S.R.	**124,354**	**164,032**	**288,386**
Bulgaria	14	2,974	2,988
Czech Republic	2,880	3,929	6,809
Hungary	657	4,260	4,917
Kazakhstan	34,172	3,307	37,479
Poland	13,352	2,421	15,773
Romania	1	3,979	3,980
Russia	54,110	118,964	173,074
Ukraine	18,065	19,806	37,871
Uzbekistan	1,102	3,307	4,409
Other	0	1,085	1,085
Africa	**67,420**	**276**	**67,695**
Botswana	4,754	0	4,754
South Africa	60,994	0	60,994
Zimbabwe	809	0	809
Other	862	276	1,138
Middle East, Far East, and Oceania	**203,534**	**118,934**	**322,468**
Australia	52,139	47,510	99,649
China	68,564	57,651	126,215
India	80,174	2,205	82,379
Indonesia	849	4,905	5,754
Japan	865	0	865
Pakistan	0	3,228	3,228
Thailand	(s)	2,205	2,205
Other	942	1,231	2,174
World	R**564,777**	R**522,408**	R**1,087,185**

[1] U.S. data are more current than other data on this table. They represent recoverable reserves as of January 1, 1999; data for the other countries are as of December 31, 1996, the most recent period for which they are available.

R=Revised. (s)=Less than 0.5 million short tons.

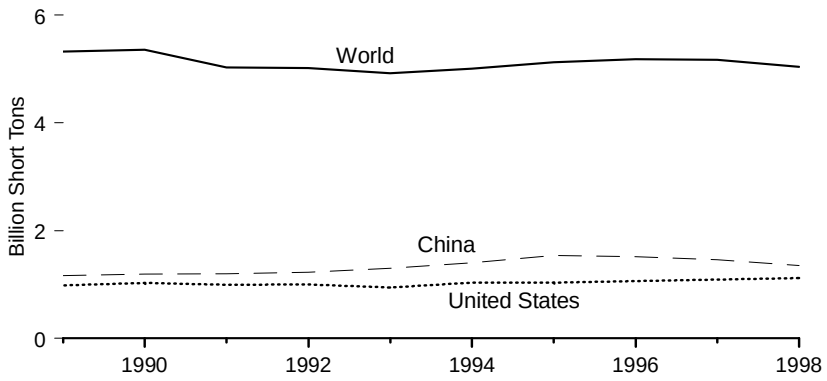
Notes: • World Energy Council data represent "Proved Recoverable Reserves," which are the tonnage within the Proved Amount in Place that can be recovered (extracted from the earth in raw form) under present and expected local economic conditions with existing, available technology. • The EIA does not certify the international reserves data but reproduces the information as a matter of convenience for the reader. • U. S. reserves represent estimated recoverable reserves from the Demonstrated Reserve Base which includes both measured and indicated tonnage. The U.S. term "measured" approximates the term "proved," used by the World Energy Council. The U.S. "measured and indicated" data have been combined and cannot be recaptured as "measured alone." • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

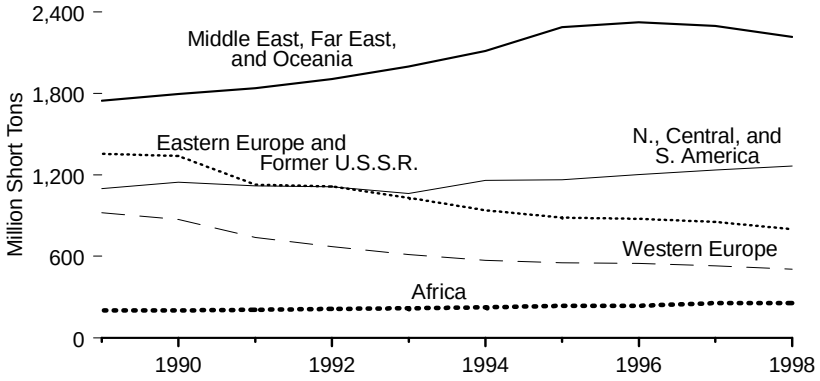
Sources: **United States:** Energy Information Administration, Coal Reserves Database (October 1999). **All Other Data:** World Energy Council, *1998 Survey of Energy Resources.*

Figure 11.13 World Coal Production

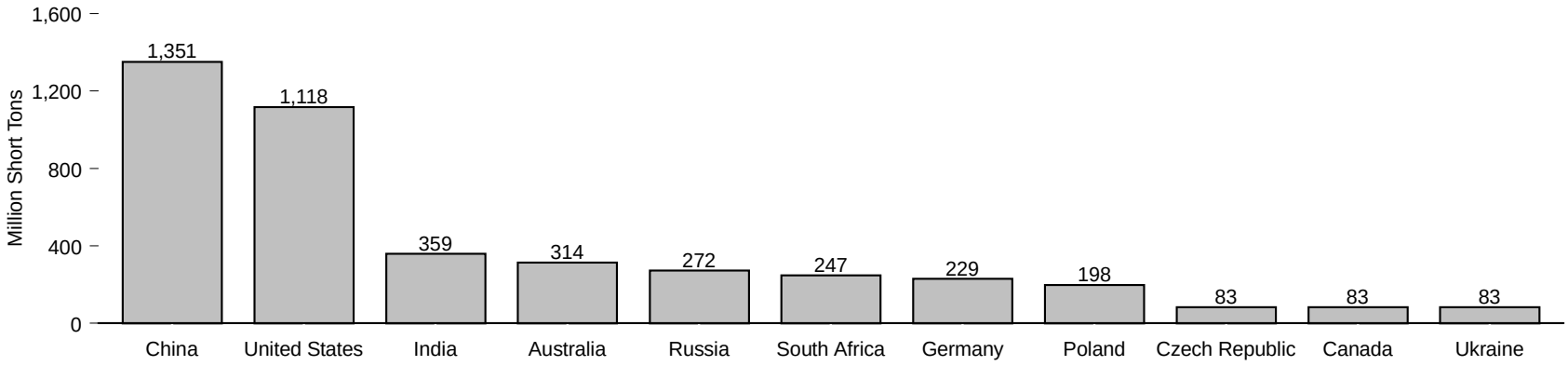
World and Leading Producers, 1989-1998



World Areas, 1989-1998



Top Producing Countries, 1998



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

Source: Table 11.13.

Table 11.13 World Coal Production, 1989-1998

(Million Short Tons)

Region and Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998[P]
North, Central, and South America	**1,100**	**1,146**	**[R]1,119**	**[R]1,113**	**1,064**	**[R]1,160**	**1,165**	**[R]1,202**	**1,236**	**1,266**
Canada	78	75	78	72	76	80	83	[R]83	87	83
Colombia	20	23	26	26	23	25	28	33	36	38
Mexico	8	9	8	7	8	10	10	[R]11	10	11
United States	981	1,029	996	998	945	1,034	1,033	1,064	1,090	1,118
Other	13	10	11	[R]10	11	[R]11	11	10	13	15
Western Europe	**921**	**873**	**738**	**[R]672**	**[R]612**	**571**	**[R]553**	**548**	**[R]531**	**506**
France	16	15	14	13	12	10	9	9	8	6
Germany[1]	541	514	388	346	315	292	273	265	252	229
Greece	57	57	58	61	60	63	64	66	[R]65	65
Macedonia	—	—	—	[R]8	8	8	8	8	7	7
Serbia and Montenegro	—	—	—	[R]44	41	[R]42	44	42	[R]45	48
Spain	48	40	37	37	35	33	31	[R]31	29	29
Turkey	58	52	51	57	54	60	61	62	62	67
United Kingdom	111	104	105	94	75	54	52	55	54	45
Former Yugoslavia	82	84	78	—	—	—	—	—	—	—
Other	7	7	6	[R]13	[R]12	[R]10	[R]10	10	[R]10	9
Eastern Europe and Former U.S.S.R.	**[R]1,356**	**[R]1,339**	**1,129**	**[R]1,115**	**[R]1,030**	**[R]939**	**[R]885**	**876**	**[R]853**	**800**
Bulgaria	[R]43	[R]39	31	33	32	32	[R]34	[R]34	[R]33	33
Czech Republic	—	—	—	—	[R]94	[R]85	[R]82	[R]84	[R]84	83
Hungary	22	19	19	17	16	16	15	[R]13	[R]14	16
Kazakhstan	—	—	—	139	123	[R]115	[R]92	84	80	77
Poland	275	237	231	[R]218	218	220	220	[R]222	[R]221	198
Romania	66	[R]42	36	42	[R]44	45	[R]45	[R]46	[R]37	29
Former U.S.S.R.	816	882	702	—	—	—	—	—	—	—
Russia	—	—	—	406	364	[R]313	[R]296	304	[R]290	272
Ukraine	—	—	—	147	128	105	[R]92	[R]79	[R]86	83
Other	134	120	110	[R]111	[R]11	[R]10	8	8	8	8
Africa	**202**	**202**	**205**	**212**	**216**	**[R]224**	**236**	**[R]235**	**[R]255**	**255**
South Africa	194	193	196	203	207	216	227	227	[R]246	247
Other	8	9	9	9	8	9	9	8	[R]8	8
Middle East, Far East, and Oceania	**1,746**	**1,796**	**[R]1,839**	**[R]1,907**	**[R]1,999**	**[R]2,113**	**[R]2,287**	**[R]2,324**	**[R]2,298**	**2,215**
Australia	216	226	236	249	248	248	267	272	293	314
China	1,162	1,190	1,199	1,229	1,304	1,404	1,537	[R]1,515	[R]1,461	1,351
India	221	233	253	270	281	291	301	340	[R]353	359
Indonesia	9	9	14	24	30	34	46	55	60	66
Japan	13	11	10	9	8	8	7	7	[R]4	4
North Korea	69	71	73	74	78	78	78	79	68	68
South Korea	23	19	17	13	10	8	6	5	5	5
Thailand	10	14	16	17	17	19	20	24	[R]26	22
Vietnam	4	5	5	5	7	6	9	11	[R]13	12
Other	19	17	[R]17	[R]17	[R]17	[R]16	[R]16	[R]16	15	15
World	**[R]5,325**	**[R]5,356**	**5,029**	**[R]5,019**	**[R]4,921**	**[R]5,008**	**[R]5,126**	**[R]5,185**	**[R]5,172**	**5,042**

[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

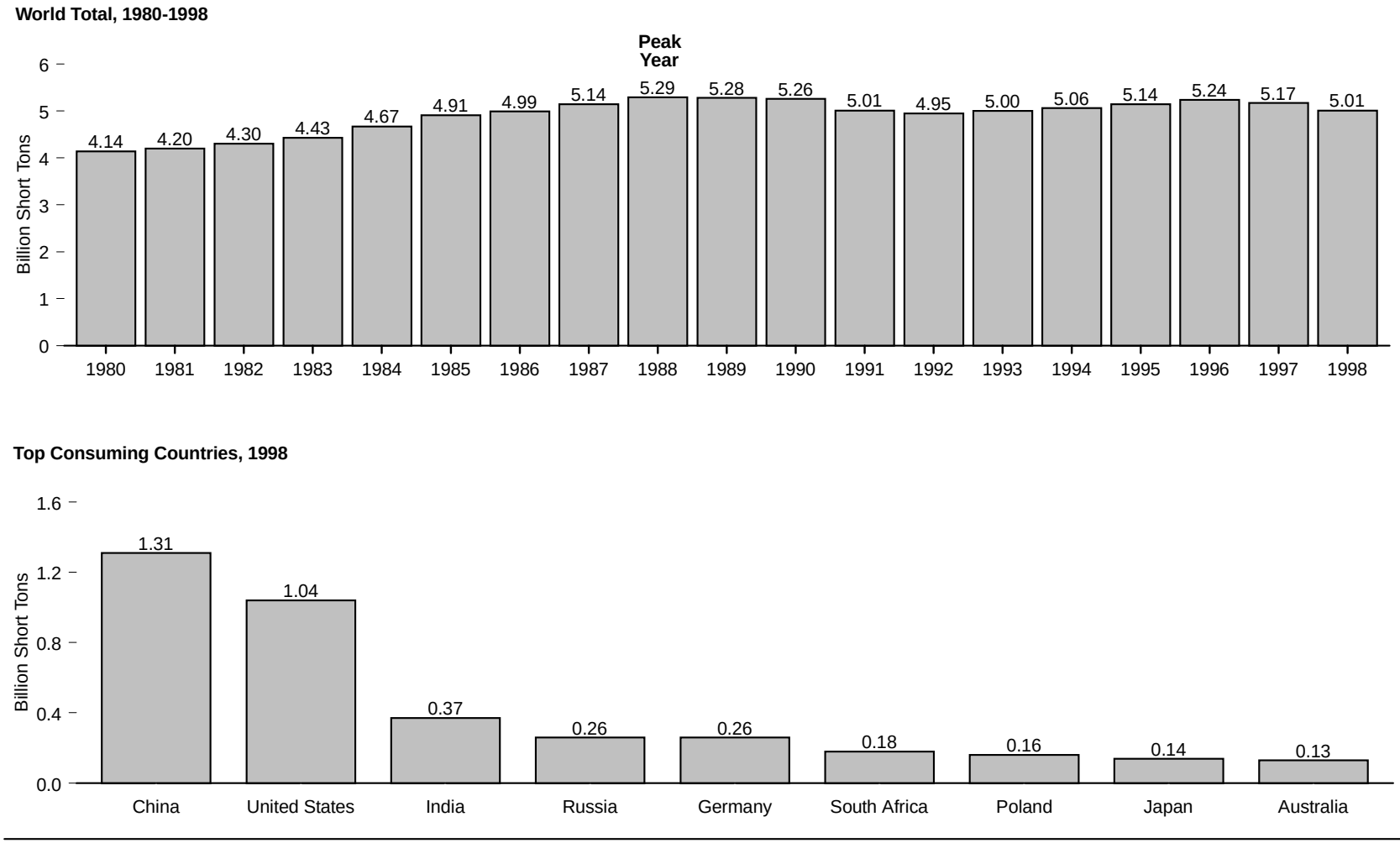
R=Revised. P=Preliminary. — = Not applicable.

Notes: • Coal includes anthracite, subanthracite, bituminous coal, subbituminous coal, lignite, and brown coal. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

Sources: **United States:** Table 7.1. **All Other Data:** Energy Information Administration, *International Energy Annual 1998* (January 2000), Table 2.5, and the International Energy Database, February 2000.

Figure 11.14 World Coal Consumption



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

Source: Table 11.14.

Table 11.14 World Coal Consumption, 1980-1998

(Million Short Tons)

Year	Australia	China	Germany [1]	Greece	India	Japan	North Korea	Poland	Former U.S.S.R.	Russia	South Africa	Turkey	Ukraine	United Kingdom	United States	Other	World
1980	74	679	535	26	130	98	51	221	751	—	105	20	—	134	703	R618	R4,145
1981	75	680	544	30	139	106	51	200	748	—	116	23	—	130	733	R622	R4,198
1982	R79	726	548	31	147	105	53	208	771	—	124	26	—	122	707	R655	R4,300
1983	78	768	549	36	R160	100	56	213	764	—	127	29	—	123	737	R689	R4,430
1984	81	845	573	36	R178	113	61	227	770	—	137	35	—	88	791	R734	R4,669
1985	86	921	579	42	R193	119	62	238	779	—	142	46	—	116	818	R772	R4,913
1986	84	962	576	44	R209	109	63	247	803	—	145	54	—	123	804	R770	R4,994
1987	93	1,027	565	49	R208	111	65	258	807	—	148	54	—	129	837	R788	R5,140
1988	96	1,098	562	56	215	123	69	253	821	—	151	51	—	123	884	R785	R5,286
1989	104	1,113	553	59	226	123	72	242	777	—	140	60	—	126	890	R796	R5,281
1990	R104	1,124	528	59	242	125	74	202	848	—	139	60	—	119	895	R739	R5,259
1991	108	1,165	406	59	252	128	75	202	672	—	144	64	—	118	888	R725	R5,005
1992	R111	1,199	359	62	274	126	76	192	—	R375	149	65	R151	111	908	R792	R4,950
1993	109	1,276	335	62	286	129	80	194	—	361	153	60	R135	96	944	R779	R5,000
1994	110	1,390	314	66	303	133	80	184	—	R316	160	66	R109	R91	951	R786	R5,060
1995	R112	R1,498	297	64	R311	140	80	R181	—	R295	162	67	R107	79	962	R788	R5,144
1996	118	R1,486	R296	R66	352	R144	81	R189	—	R313	165	R70	R90	R79	1,006	R790	R5,245
1997	R116	R1,435	R280	R66	R364	R145	70	R181	—	R285	R173	R74	R93	R70	1,029	R789	R5,169
1998P	130	1,313	260	66	370	140	70	161	—	263	177	78	90	63	1,040	793	5,014

[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

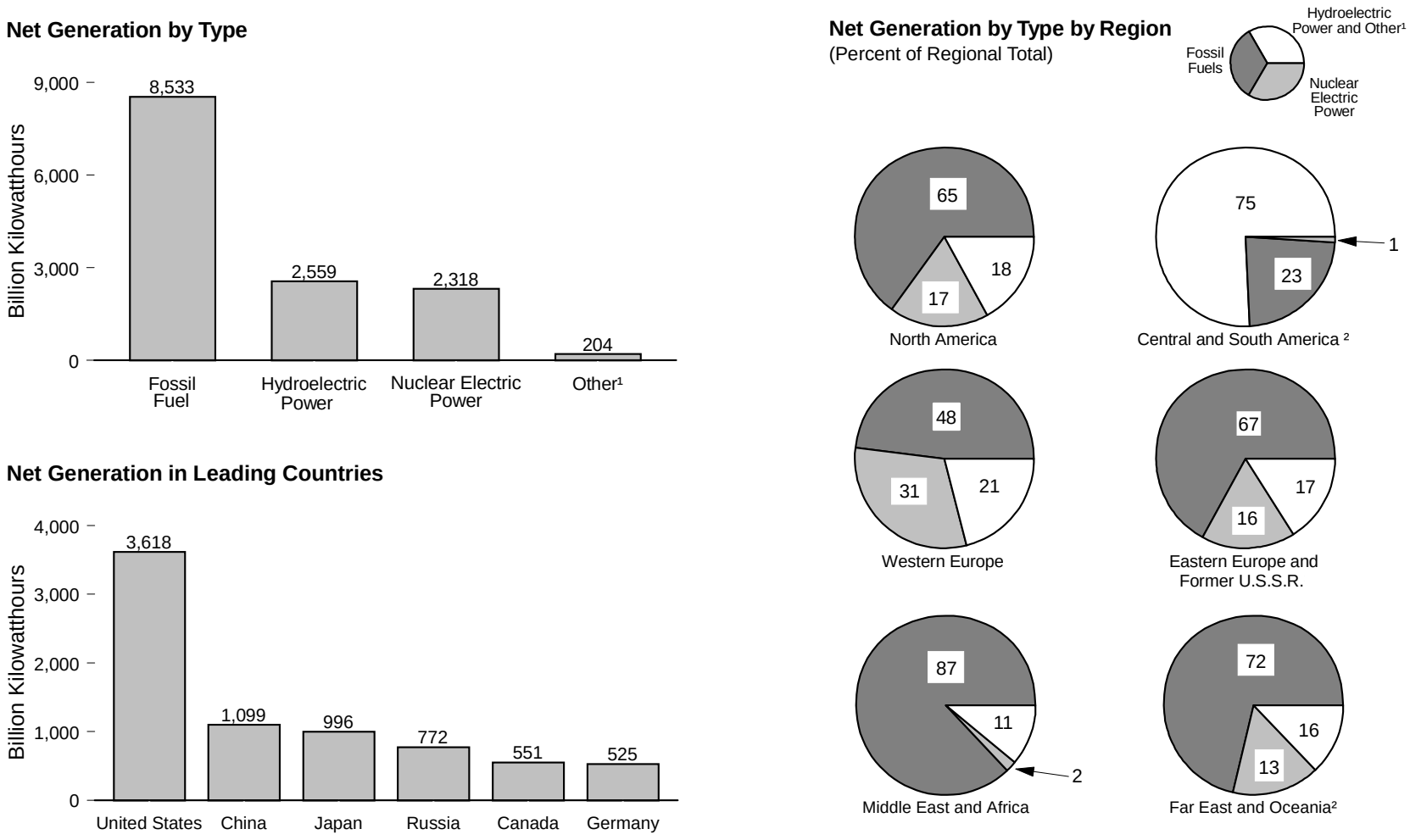
R=Revised. P=Preliminary. — = Not applicable.

Note: Totals may not equal sum of components due to independent rounding and the inclusion of more recent U.S. data from an alternative source.

Web Page: http://www.eia.doe.gov/international.

Sources: **United States:** Table 7.1. **All Other Data:** • 1980-1988—Energy Information Administration (EIA), *International Energy Annual,* annual reports, and the International Energy Database. • 1989 forward—EIA, *International Energy Annual 1998* (January 2000), Table 1.4, and the International Energy Database, February 2000.

Figure 11.15 World Net Generation of Electricity, 1998



¹ Geothermal, wood, other biomass, waste, solar, wind, hydrogen, sulfur, batteries, and chemicals.

² Sum of components does not equal 100 percent due to independent rounding.

Notes: • Data include both electric utility and non-electric utility sources. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.15.

Table 11.15 World Net Generation of Electricity by Type, 1980, 1997, and 1998

(Billion Kilowatthours)

Region and Country	Fossil Fuel			Nuclear Electric Power			Hydroelectric Power [1]			Total [2]		
	1980	1997	1998 P	1980	1997	1998 P	1980	1997	1998 P	1980	1997	1998 P
North America	**1,880.3**	R **2,680.9**	**2,829.5**	**287.0**	**716.4**	**750.0**	**546.9**	R **728.7**	**672.5**	R **2.721.8**	R **4,223.2**	**4,345.5**
Canada	79.8	R 132.8	149.7	35.9	77.9	67.5	251.0	R 347.6	329.3	R 367.9	R 562.2	550.9
Mexico	46.0	R 124.7	137.5	0.0	9.9	8.8	16.7	26.2	24.3	63.6	R 166.1	176.1
United States	1,754.0	R 2,422.6	2,541.5	251.1	628.6	673.7	279.2	354.9	318.9	2,289.8	R 3,494.2	3,617.9
Other	0.5	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.7
Central and South America	**99.8**	R **159.7**	**165.2**	**2.2**	**10.5**	**10.3**	**201.5**	R **512.4**	**523.1**	R **308.4**	R **696.4**	**712.8**
Argentina	22.2	R 33.5	32.1	2.2	7.5	7.1	17.3	R 34.8	35.8	R 42.0	R 76.0	75.2
Brazil	7.5	R 14.7	15.6	0.0	3.0	3.1	128.4	R 276.2	288.5	138.3	R 303.5	316.9
Colombia	5.1	R 12.2	13.6	0.0	0.0	0.0	14.3	30.9	31.2	R 19.5	R 43.4	45.0
Venezuela	17.6	R 16.7	17.9	0.0	0.0	0.0	14.4	R 56.6	52.5	32.0	R 73.2	70.4
Other	47.3	R 82.5	86.0	0.0	0.0	0.0	27.0	R 113.9	115.2	R 76.6	R 200.2	205.2
Western Europe	**1,180.1**	R **1,267.1**	**1,316.6**	**219.2**	**839.9**	**841.7**	**431.7**	R **502.1**	**519.6**	R **1,844.5**	R **2,659.3**	**2,731.9**
Austria	11.9	18.4	17.6	0.0	0.0	0.0	28.5	R 35.6	37.0	R 40.7	R 55.5	56.1
Finland	22.0	R 33.9	31.3	6.6	19.0	20.8	10.1	R 12.1	14.8	38.7	R 72.8	75.3
France	118.0	R 38.2	51.8	63.4	374.3	366.7	68.3	R 61.6	59.9	R 250.8	R 476.6	481.0
Germany	390.3	R 335.8	345.5	55.6	161.8	152.7	18.8	R 17.2	16.8	R 469.9	R 524.7	525.4
Italy	125.5	R 188.2	195.0	2.1	0.0	0.0	45.0	R 41.2	42.0	R 176.4	234.6	243.0
Netherlands	58.0	R 78.5	81.0	3.9	2.3	3.6	0.0	0.1	0.1	R 62.9	R 84.7	88.7
Norway	0.1	0.7	0.7	0.0	0.0	0.0	82.7	108.7	114.5	82.9	R 109.6	115.5
Spain	74.5	R 89.4	86.6	5.2	52.5	56.0	29.2	R 34.3	34.4	R 109.2	R 178.5	179.5
Sweden	10.1	R 9.6	9.6	25.3	66.7	70.8	58.1	R 68.3	72.9	R 94.3	R 148.2	156.8
Switzerland	0.9	R 2.0	2.3	12.9	24.0	24.5	32.5	R 33.7	33.2	R 46.4	R 60.8	61.1
Turkey	12.0	59.6	64.6	0.0	0.0	0.0	11.2	39.4	41.8	R 23.3	R 99.4	106.7
United Kingdom	228.9	R 226.5	234.1	32.3	89.3	97.7	3.9	4.1	5.1	265.1	R 325.9	343.1
Other	127.8	R 186.4	196.5	11.9	49.8	48.9	43.5	R 45.9	47.2	R 183.8	R 288.0	299.8
Eastern Europe and Former U.S.S.R.	**1,309.3**	R **1,019.4**	**1,003.7**	**83.2**	R **250.3**	**239.3**	**211.3**	R **249.1**	**245.8**	R **1,604.1**	R **1,520.2**	**1,490.2**
Czech Republic	—	R 46.6	46.4	—	12.5	12.5	—	R 1.7	1.6	—	R 61.7	61.5
Kazakhstan	—	R 42.8	43.2	—	R 0.3	0.1	—	R 6.4	6.0	—	49.5	49.3
Poland	111.1	R 130.6	130.1	0.0	0.0	0.0	3.2	R 3.8	4.3	R 114.7	R 134.8	134.9
Romania	51.4	R 32.2	31.0	0.0	5.1	4.9	12.5	R 17.3	16.6	63.9	R 54.6	52.5
Russia	—	R 527.0	523.1	—	104.5	98.3	—	R 152.5	150.5	—	R 784.0	771.9
Ukraine	—	R 83.2	76.0	—	75.4	70.6	—	R 9.9	11.3	—	R 168.6	157.9
Other	1,146.8	R 157.0	153.9	83.2	R **52.4**	52.8	195.5	R 57.5	55.5	1,425.6	R 267.0	262.2
Middle East	**82.8**	R **333.7**	**354.4**	**0.0**	**0.0**	**0.0**	**9.6**	R **18.8**	**18.9**	**92.4**	R **352.5**	**373.3**
Iran	15.7	R 83.1	88.0	0.0	0.0	0.0	5.6	R 7.3	7.3	R 21.3	R 90.4	95.3
Saudi Arabia	20.5	R 103.8	110.1	0.0	0.0	0.0	0.0	0.0	0.0	20.5	R 103.8	110.1
Other	46.6	R 146.8	156.3	0.0	0.0	0.0	4.1	R 11.5	11.6	R 50.7	R 158.3	167.9
Africa	**129.1**	R **304.3**	**305.3**	**0.0**	**12.6**	**13.6**	**60.6**	R **62.7**	**63.1**	**189.7**	R **380.0**	**382.4**
Egypt	8.6	R 42.9	45.5	0.0	0.0	0.0	9.7	R 11.9	12.3	18.3	54.8	57.8
South Africa	92.1	R 181.4	176.8	0.0	12.6	13.6	1.0	2.1	1.6	93.1	R 196.2	192.0
Other	28.4	R 79.9	82.9	0.0	0.0	0.0	49.9	R 48.7	49.2	78.4	R 129.0	132.6
Far East and Oceania	**907.7**	R **2,531.1**	**2,558.4**	**92.7**	**436.4**	**462.8**	R **275.2**	R **500.4**	**515.7**	R **1,280.5**	R **3,508.3**	**3,577.7**
Australia	74.5	R 155.8	167.5	0.0	0.0	0.0	12.8	R 16.6	15.6	R 87.7	R 175.5	186.4
China	227.9	850.0	882.5	0.0	11.4	13.5	57.6	R 193.1	202.9	285.5	R 1,054.5	1,098.8
India	69.7	R 355.8	358.4	3.0	10.5	10.6	46.5	R 74.0	76.2	119.3	R 441.1	446.1
Indonesia	10.6	R 62.3	64.5	0.0	0.0	0.0	3.0	R 5.9	6.1	13.5	R 70.7	73.1
Japan	381.6	R 579.9	564.5	78.6	306.1	318.1	87.8	R 88.9	89.5	549.1	R 999.3	996.0
South Korea	29.8	R 154.3	131.8	3.3	73.2	85.2	R 1.5	R 2.8	4.2	R 34.6	R 230.3	221.3
Taiwan	31.3	R 79.7	88.1	7.8	34.8	35.1	2.9	R 9.4	10.5	42.0	R 124.0	133.6
Thailand	12.3	R 78.9	75.7	0.0	0.0	0.0	1.3	R 7.1	7.1	R 13.6	R 86.0	82.8
Other	70.1	R 214.6	225.5	0.0	0.4	0.4	61.8	R 102.5	103.6	R 135.3	R 327.0	339.6
World	**5,589.0**	R **8,296.1**	**8,533.1**	**684.4**	R**2,266.1**	**2,317.7**	R**1,736.8**	R **2,574.2**	**2,558.7**	R **8,041.5**	R**13,339.9**	**13,613.9**

[1] Excludes pumped storage, except for the United States.

[2] Geothermal, wood, other biomass, waste, solar, wind, hydrogen, sulfur, batteries, and chemicals are included in total.

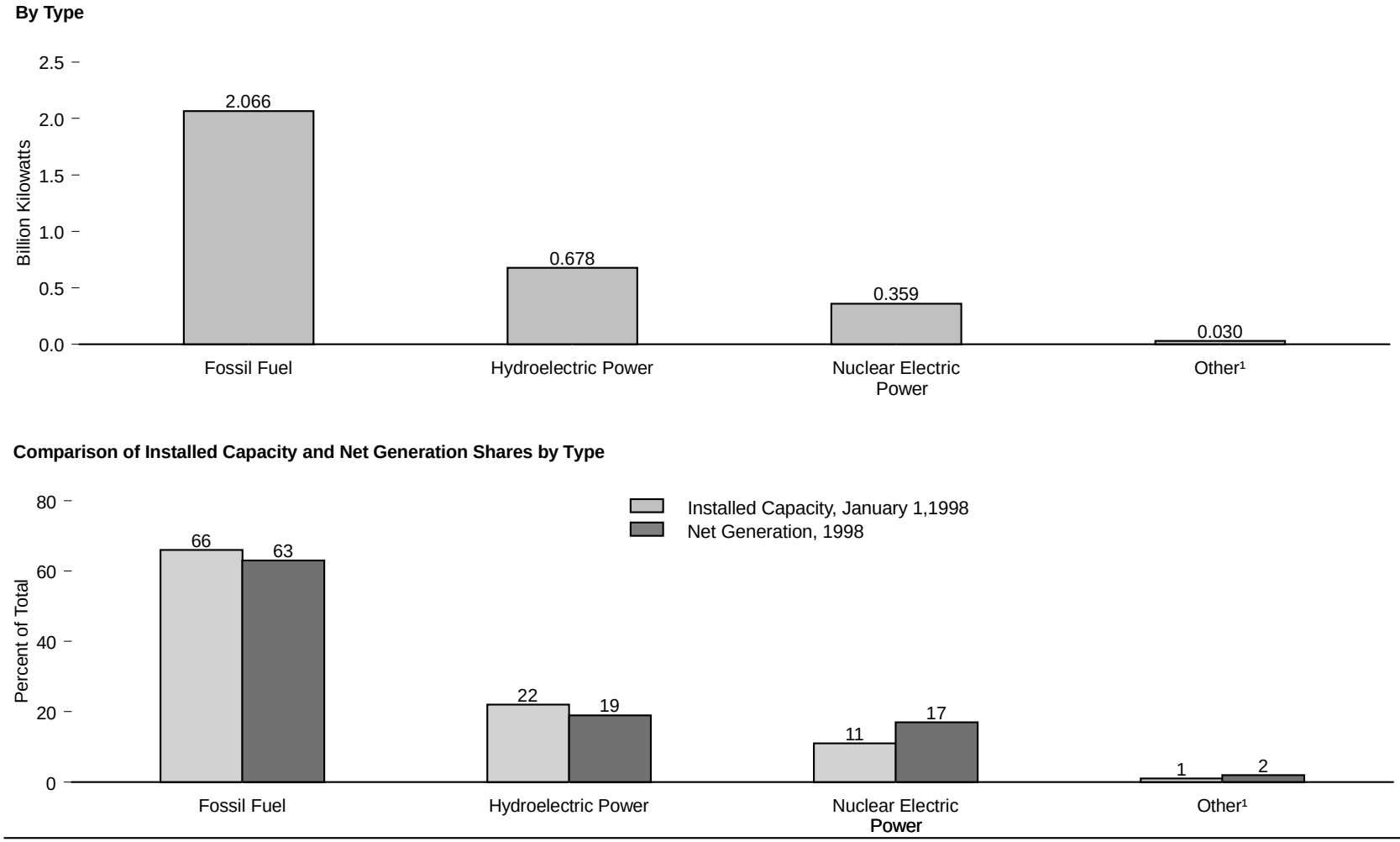
R=Revised. P=Preliminary. — = Not applicable.

Notes: • Data include both electric utility and non-electric utility sources. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

Sources: **United States:** Tables 1.2 and 8.2. **All Other Data:** • 1980—Energy Information Administration (EIA), International Energy Database. • 1997 and 1998—EIA, *International Energy Annual 1998* (January 2000), Table 6.3, and the International Energy Database, April 2000.

Figure 11.16 World Electrical Installed Capacity by Type, January 1, 1998



¹Geothermal, wood, other biomass, waste, solar, wind, hydrogen, sulfur, batteries, and chemicals.

Note: • Data include both electric utility and non-electric utility sources. • Shares are based on data prior to rounding for publication and may not sum exactly to 100 percent.

Sources: Tables 11.15 and 11.16.

Table 11.16 World Electrical Installed Capacity by Type, 1980, 1997, and 1998

(Million Kilowatts)

Region and Country	Fossil Fuel			Nuclear Electric Power			Hydroelectric Power [1]			Total [2]		
	1980	1997	1998 P	1980	1997	1998 P	1980	1997	1998 P	1980	1997	1998 P
North America	**470.6**	R **621.8**	**621.7**	**55.6**	**118.5**	**114.4**	**136.9**	**173.1**	**175.8**	**664.2**	**930.5**	**929.4**
Canada	27.4	34.8	32.4	5.9	16.4	13.9	47.9	65.5	66.6	81.1	116.8	112.5
Mexico	10.8	25.5	26.0	0.0	1.3	1.3	6.1	10.0	10.0	17.0	37.6	38.1
United States [3]	432.3	R 561.2	563.0	49.7	100.8	99.7	82.9	97.5	99.1	565.8	775.9	778.5
Other	(s)	(s)	(s)	0.0	0.0	0.0	0.0	0.0	0.0	(s)	(s)	(s)
Central and South America	**36.0**	R **54.7**	**58.2**	**(s)**	**1.7**	**1.7**	**43.0**	**102.9**	**106.3**	**81.2**	R **161.6**	**168.8**
Argentina	8.0	10.8	11.6	(s)	1.0	1.0	3.6	8.8	9.2	12.0	20.6	21.8
Brazil	4.1	4.9	5.2	0.0	0.7	0.7	27.5	53.1	54.1	33.4	60.8	62.3
Colombia	1.5	R 5.5	6.5	0.0	0.0	0.0	3.0	8.1	8.1	4.5	R 13.5	14.6
Venezuela	5.8	8.5	8.5	0.0	0.0	0.0	2.7	12.2	14.0	8.5	20.8	22.5
Other	16.6	R 25.0	26.4	0.0	0.0	0.0	6.2	20.7	20.9	22.9	R 46.0	47.5
Western Europe	**294.9**	R **334.7**	**337.9**	**44.7**	**125.2**	**127.9**	**126.7**	R **141.8**	**142.9**	**467.0**	R **605.8**	**614.4**
Austria	4.7	6.1	6.3	0.0	0.0	0.0	8.2	8.4	8.6	12.9	14.5	14.9
Finland	6.3	9.5	10.3	2.2	2.3	2.6	2.4	2.8	2.9	11.0	14.6	15.7
France	30.0	R 24.4	24.5	14.4	60.0	62.9	16.4	20.8	20.8	61.0	R 105.4	108.4
Germany	84.0	81.5	80.9	10.4	22.9	22.3	7.9	4.3	4.3	102.4	110.3	109.5
Italy	29.1	R 47.8	49.7	1.4	0.0	0.0	15.8	13.0	13.1	46.8	61.4	63.5
Netherlands	16.8	19.6	19.3	0.5	0.5	(s)	0.0	(s)	(s)	17.3	20.4	20.1
Norway	(s)	(s)	(s)	0.0	0.0	0.0	19.8	R 27.1	27.1	20.0	R 27.4	27.4
Spain	15.4	22.7	24.0	1.1	7.1	7.2	13.5	11.8	11.8	29.9	R 41.8	43.4
Sweden	7.9	R 7.8	7.6	4.6	10.1	10.1	14.9	15.8	16.2	27.4	R 33.7	34.0
Switzerland	0.7	1.0	1.1	1.9	3.1	3.1	11.5	10.3	10.3	14.1	14.4	14.5
Turkey	3.0	11.3	11.8	0.0	0.0	0.0	2.1	9.9	10.1	5.1	21.2	21.9
United Kingdom	64.7	56.0	55.1	6.5	12.9	12.9	2.5	1.5	1.5	73.6	70.5	69.7
Other	R 32.2	R 47.0	47.5	1.7	6.4	6.8	11.8	16.2	16.5	45.4	70.2	71.4
Eastern Europe and Former U.S.S.R.	**261.1**	R **304.3**	**303.3**	**14.2**	R **48.1**	**48.1**	**61.6**	R **80.7**	**80.4**	**336.9**	R **433.1**	**431.8**
Czech Republic	—	11.2	11.3	—	1.8	1.8	—	0.9	0.9	—	13.8	14.0
Kazakhstan	—	16.8	16.8	—	(s)	(s)	—	R 2.2	2.2	—	R 19.1	19.1
Poland	23.4	R 27.7	27.9	0.0	0.0	0.0	1.3	2.0	2.0	24.7	R 29.7	29.9
Romania	12.7	16.1	16.1	0.0	0.7	0.7	3.5	6.0	5.9	16.1	22.8	22.7
Russia	—	R 142.2	140.5	—	21.2	21.2	—	R 44.1	43.9	—	R 207.6	205.7
Ukraine	—	36.7	36.7	—	R 13.9	13.9	—	4.7	4.7	—	R 55.3	55.3
Other	225.0	53.7	54.0	14.2	R 10.6	10.6	56.9	R 20.7	20.7	296.1	R 84.9	85.2
Middle East	**27.9**	**82.7**	**82.8**	**0.0**	**0.0**	**0.0**	**2.6**	**4.6**	**4.6**	**30.4**	**87.3**	**87.4**
Iran	9.4	R 24.3	24.3	0.0	0.0	0.0	1.8	2.5	2.5	11.2	26.8	26.8
Saudi Arabia	5.9	21.1	21.2	0.0	0.0	0.0	0.0	0.0	0.0	5.9	21.1	21.2
Other	12.5	R 37.4	37.4	0.0	0.0	0.0	0.8	2.1	2.1	13.3	39.5	39.5
Africa	**30.5**	**71.0**	**72.3**	**0.0**	**1.8**	**1.8**	**13.9**	**20.8**	**20.8**	**44.5**	**93.8**	**95.0**
Egypt	2.4	13.9	13.9	0.0	0.0	0.0	2.4	2.7	2.7	4.9	16.6	16.6
South Africa	17.8	32.7	33.9	0.0	1.8	1.8	0.5	0.6	0.7	18.4	35.2	36.5
Other	10.3	24.4	24.4	0.0	0.0	0.0	10.9	17.5	17.5	21.2	42.0	42.0
Far East and Oceania	**223.1**	R **556.9**	**590.0**	**18.5**	**62.0**	**65.2**	R **74.4**	R **142.6**	**147.3**	R **316.7**	R **765.0**	**806.7**
Australia	18.1	33.9	31.5	0.0	0.0	0.0	6.2	7.0	7.0	24.2	R 40.9	38.5
China	45.6	178.8	192.0	0.0	2.2	2.2	20.3	55.6	59.7	65.9	236.5	253.9
India	20.7	73.4	75.2	0.9	2.2	2.2	11.8	21.1	21.9	33.3	R 97.7	100.3
Indonesia	3.9	R 13.4	16.1	0.0	0.0	0.0	1.0	3.4	3.4	4.9	R 17.1	19.9
Japan	98.1	146.1	152.2	15.7	42.7	45.2	19.6	21.2	21.3	133.4	210.6	219.3
South Korea	6.5	R 26.5	31.9	0.6	9.6	10.3	R 0.8	R 1.5	1.5	R 7.9	R 37.6	43.7
Taiwan	6.9	14.3	16.6	1.3	5.1	5.1	1.4	4.3	4.3	9.6	23.8	26.0
Thailand	2.6	R 13.2	14.3	0.0	0.0	0.0	1.3	2.9	2.9	3.8	R 16.1	17.3
Other	20.8	R 57.2	60.1	(s)	(s)	(s)	12.1	R 25.5	25.3	33.6	R 84.6	87.8
World	**1,344.1**	R**2,026.2**	**2,066.2**	**133.5**	R **357.3**	**359.2**	R **459.1**	R **666.4**	**678.1**	R**1,941.0**	R**3,077.2**	**3,133.4**

[1] Excludes pumped storage, except for the United States.

[2] Geothermal, wood, other biomass, waste, solar, wind, hydrogen, sulfur, batteries, and chemicals are included in total.

[3] Net summer capability at end of previous year. See Table 8.5.

R=Revised. P=Preliminary. (s)=Less than 0.05 million kilowatts. — = Not applicable.

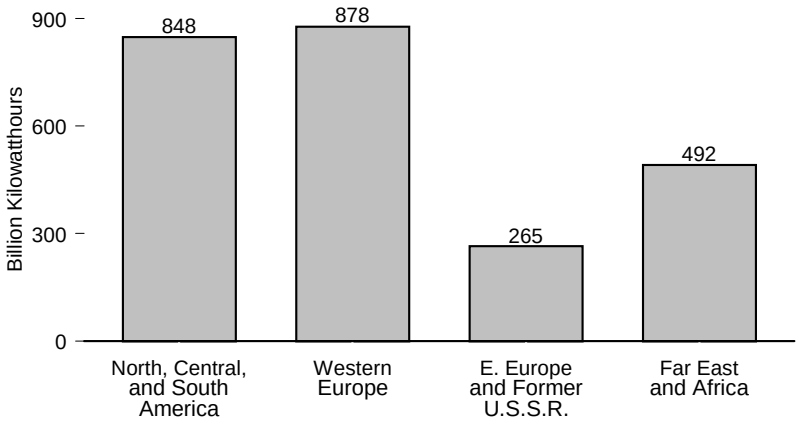
Notes: • Capacity for all years is as of January 1. • Data include both electric utility and nonutility sources. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

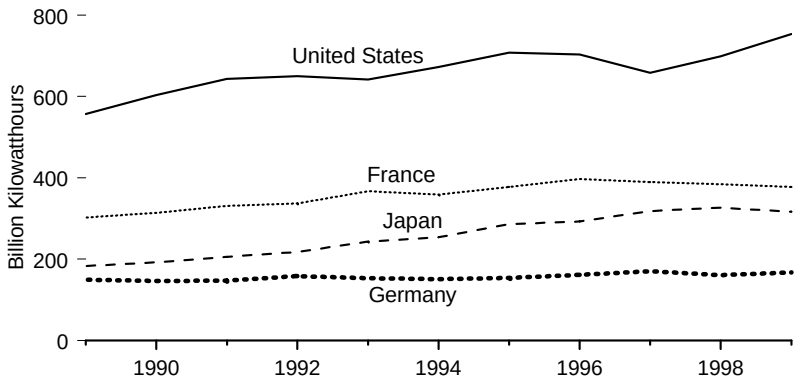
Sources: **United States:** Table 8.5. **All Other Data:** • 1980—Energy Information Administration (EIA), International Energy Database. • 1997 and 1998—EIA, *International Energy Annual 1998* (January 2000), Table 6.4, and the International Energy Database, April 2000.

Figure 11.17 World Nuclear Electricity Gross Generation

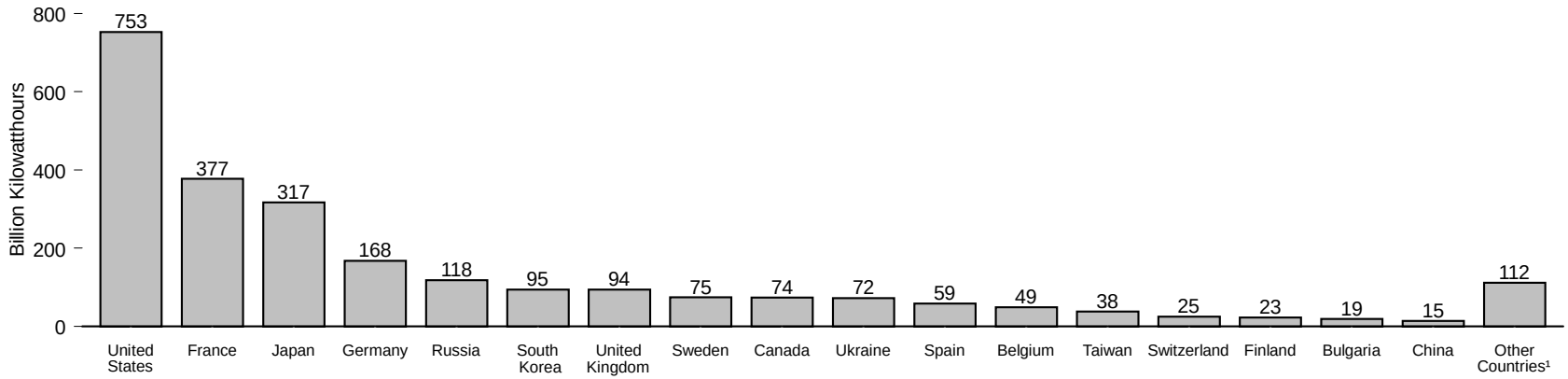
By Region, 1999



By Major Producer, 1989-1999



By Country, 1999



[1] Argentina, Armenia, Brazil, Czech Republic, Hungary, India, Lithuania, Mexico, Netherlands, Pakistan, Romania, South Africa, Slovakia, and Slovenia.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 11.17.

Table 11.17 World Nuclear Electricity Gross Generation, 1989-1999

(Billion Kilowatthours)

Region and Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
North America	**640.3**	**681.3**	**733.4**	**735.2**	**744.6**	**787.3**	**E816.1**	**E806.4**	**E752.8**	**E781.0**	**E837.3**
Canada	83.2	75.8	86.1	81.3	97.6	110.7	100.4	95.2	84.1	E72.7	E73.9
Mexico	—	2.1	4.2	3.9	4.9	4.2	7.9	7.9	10.4	9.5	10.0
United States [1]	557.0	603.4	643.0	650.0	642.0	672.4	E707.7	E703.3	E658.3	E698.7	E753.4
Central and South America	**6.6**	**9.4**	**9.2**	**8.8**	**8.1**	**8.2**	**9.6**	**9.8**	**11.1**	**E10.8**	**E11.1**
Argentina	5.0	7.4	7.7	7.1	7.7	8.2	7.1	7.4	8.0	E7.5	7.1
Brazil	1.6	2.0	1.4	1.8	0.4	0.0	2.5	2.4	3.2	3.3	E4.0
Western Europe	**732.2**	**738.6**	**769.7**	**E787.8**	**820.9**	**820.2**	**E835.7**	**E879.5**	**E886.5**	**E884.2**	**E878.1**
Belgium	41.2	42.7	42.9	43.5	41.9	40.6	41.4	43.3	47.4	46.1	49.0
Finland	18.8	18.9	19.2	19.0	19.6	19.1	18.9	19.5	20.9	21.9	23.0
France	302.5	314.1	331.4	337.6	366.7	359.1	377.6	397.0	E389.3	E384.4	E377.4
Germany [2]	149.6	147.2	147.3	158.8	153.5	151.1	154.3	161.7	170.4	161.0	E167.8
Netherlands	4.0	3.4	3.3	3.8	3.9	4.0	4.0	4.2	3.1	3.8	3.8
Slovenia	NA	NA	NA	E4.0	4.0	4.6	4.8	E4.6	5.4	E5.3	4.7
Spain	56.1	54.3	55.6	55.8	56.1	55.1	54.5	59.1	55.4	E58.6	58.9
Sweden	65.6	68.2	76.8	63.5	61.4	72.8	69.9	76.2	E70.6	E73.8	E74.5
Switzerland	22.8	23.6	22.9	23.4	23.3	24.2	24.8	25.0	25.3	25.7	24.8
United Kingdom	71.6	66.1	70.4	78.5	90.4	89.5	E85.5	E88.8	E98.8	E103.7	E94.1
Eastern Europe [3] and Former U.S.S.R.	NA	NA	NA	**E267.5**	**E259.0**	**E227.8**	**E234.9**	**E261.6**	**E247.1**	**E248.9**	**E264.7**
Armenia	—	—	—	—	—	—	NA	NA	1.4	1.6	E2.4
Bulgaria	NA	NA	NA	E12.2	14.0	14.9	17.2	18.7	E15.5	E19.2	E19.0
Czech Republic	NA	NA	NA	E12.9	E13.2	E12.7	E12.8	E13.5	NA	7.6	13.4
Hungary	NA	NA	NA	E13.8	13.8	14.0	14.0	14.2	14.0	13.9	E14.2
Kazakhstan	NA	NA	NA	E0.5	E0.4	E0.4	E0.4	E0.1	0.3	NA	0.0
Lithuania	NA	NA	NA	E16.4	E12.9	E7.0	E9.7	E13.6	12.1	13.5	9.9
Romania	—	—	—	—	—	—	—	E1.0	3.9	5.1	E5.2
Russia	NA	NA	NA	E125.6	120.4	97.7	98.3	108.8	108.1	103.7	E118.0
Slovakia	NA	NA	NA	E11.7	E11.6	E12.7	E12.0	E11.8	11.0	10.3	10.5
Ukraine	NA	NA	NA	E74.6	E72.7	68.4	70.4	80.0	80.8	E74.0	72.2
Africa	**11.7**	**8.9**	**9.7**	**9.9**	**7.7**	**10.3**	**11.9**	**E12.5**	**13.3**	**14.3**	**E13.5**
South Africa	11.7	8.9	9.7	9.9	7.7	10.3	11.9	E12.5	13.3	14.3	E13.5
Far East	**263.4**	**284.3**	**303.3**	**315.2**	**E345.2**	**E366.7**	**E407.0**	**E426.4**	**E456.2**	**E477.2**	**E478.0**
China	—	—	—	—	E2.6	E14.2	E13.0	E14.3	11.4	E14.5	E14.6
India	4.0	6.3	5.4	6.3	6.2	5.0	E8.0	8.3	E11.0	E11.2	E13.2
Japan	183.7	191.9	205.8	218.0	243.5	253.8	286.1	293.2	318.0	326.9	317.4
Pakistan	0.1	0.4	0.4	0.6	0.4	0.6	0.5	0.4	0.4	0.4	0.1
South Korea	47.2	52.8	56.3	56.4	58.1	58.3	64.0	72.5	E78.9	87.3	94.6
Taiwan	28.3	32.9	35.3	33.8	34.3	34.8	35.3	37.8	E36.6	36.9	E38.2
World	**1,654.2**	**1,722.5**	**1,825.2**	**E,[4]2,124.5**	**E2,185.6**	**E2,220.4**	**E2,315.1**	**E2,396.3**	**E2,367.0**	**E2,416.4**	**E2,482.6**

[1] See Note 2 at end of section.

[2] Through 1990, the data for Germany are for the former West Germany only. Beginning in 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 1997 for Eastern European countries are calculated as 5 percent more than the annual net nuclear generation reported by the International Atomic Energy Agency and published annually in *Nuclear Power Reactors in the World.*

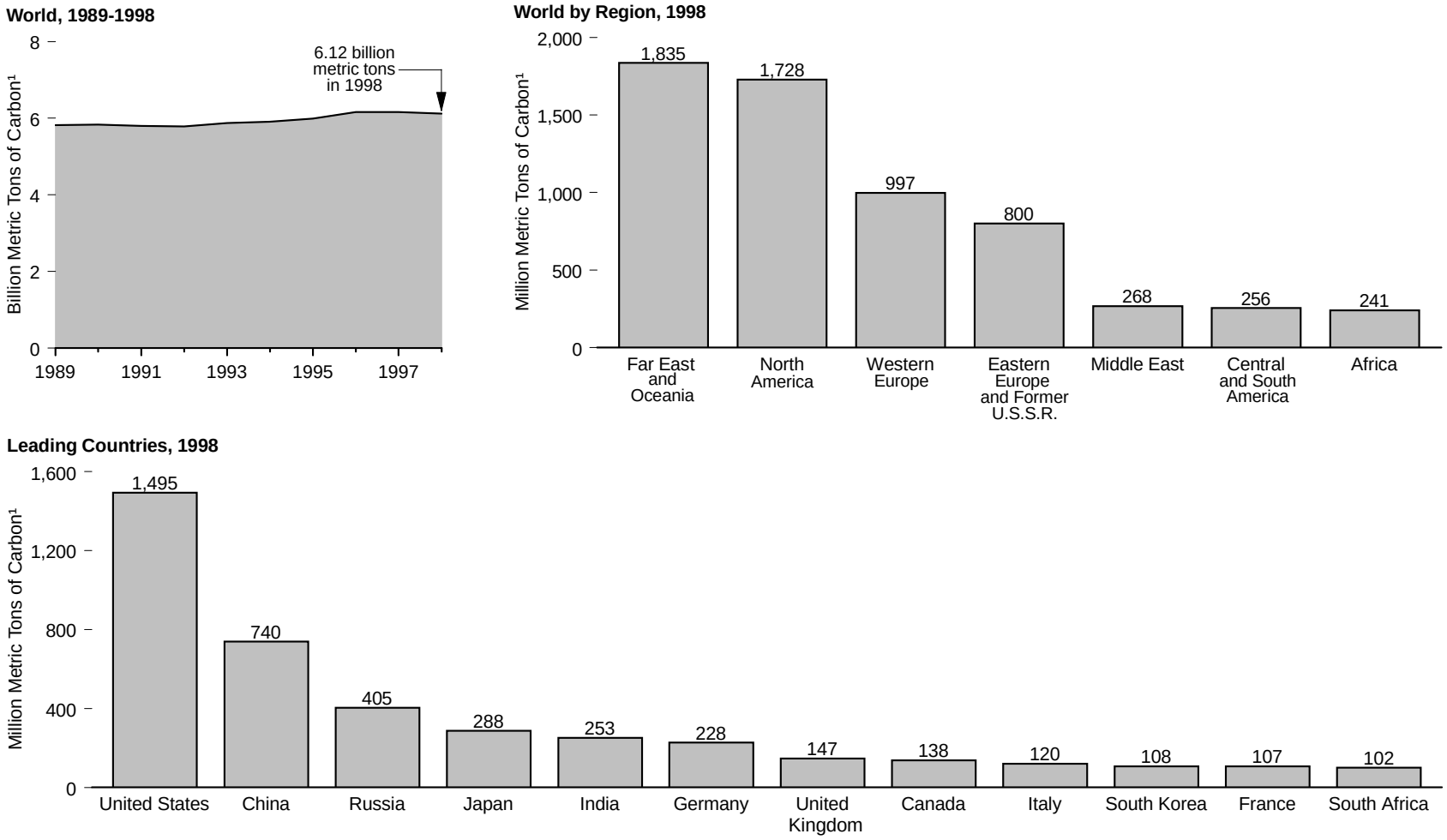
[4] There is a data discontinuity between 1991 and 1992; beginning with 1992, data for Eastern Europe and the Former U.S.S.R. are included for the first time.

R=Revised. E=Estimated. NA=Not available. — = Not applicable.

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

Source: Based on data from *Nucleonics Week,* a copyrighted publication of The McGraw-Hill Publishing Companies, Inc. Used with permission.

Figure 11.18 World Carbon Dioxide Emissions From Energy Consumption and Natural Gas Flaring



[1] Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 11.18.

Table 11.18 World Carbon Dioxide Emissions From Energy Consumption and Natural Gas Flaring, 1989-1998

(Million Metric Tons of Carbon [1])

Region and Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998[P]
North America	[R]**1,579**	**1,561**	**1,545**	[R]**1,570**	[R]**1,600**	**1,631**	[R]**1,643**	[R]**1,702**	[R]**1,720**	**1,728**
Canada	134	[R]129	[R]127	[R]126	[R]129	[R]134	[R]134	[R]139	[R]136	138
Mexico	[R]79	[R]80	[R]81	[R]86	[R]85	[R]90	[R]88	[R]93	94	95
United States [2]	1,366	[R]1,351	1,337	[R]1,358	[R]1,386	[R]1,407	1,421	1,470	[R]1,489	1,495
Other	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)	(s)
Central and South America	[R]**189**	[R]**184**	[R]**193**	[R]**196**	[R]**207**	[R]**216**	**226**	[R]**235**	[R]**244**	**256**
Argentina	[R]30	[R]27	[R]29	[R]30	[R]32	33	[R]34	36	35	36
Brazil	59	58	60	61	64	69	72	[R]75	[R]79	85
Venezuela	29	30	[R]30	30	31	33	34	36	37	37
Other	[R]70	[R]70	[R]74	[R]75	79	[R]81	[R]86	[R]89	93	98
Western Europe	[R]**993**	[R]**996**	[R]**994**	[R]**957**	[R]**949**	[R]**943**	[R]**957**	[R]**993**	[R]**991**	**997**
Belgium	[R]32	[R]33	[R]34	[R]33	33	34	35	37	37	39
France	[R]98	[R]101	[R]105	[R]101	98	95	97	[R]104	102	107
Germany [3]	[R]270	[R]269	[R]254	[R]244	[R]239	[R]234	[R]233	[R]240	[R]233	228
Italy	[R]111	[R]111	[R]111	[R]111	108	106	116	116	116	120
Netherlands	[R]52	[R]56	[R]57	[R]56	[R]60	[R]60	60	62	64	65
Spain	[R]65	[R]60	[R]63	[R]64	62	64	[R]66	[R]63	[R]71	75
Turkey	[R]33	[R]36	[R]38	[R]38	39	38	41	[R]44	[R]47	47
United Kingdom	[R]165	[R]163	[R]164	[R]156	157	155	152	[R]159	[R]150	147
Other	[R]167	[R]167	[R]166	[R]154	[R]153	[R]157	[R]156	[R]167	[R]170	169
Eastern Europe and Former U.S.S.R.	[R]**1,308**	[R]**1,292**	[R]**1,188**	[R]**1,113**	[R]**1,030**	[R]**913**	[R]**870**	[R]**865**	[R]**823**	**800**
Former Czechoslovakia	86	80	73	65	—	—	—	—	—	—
Czech Republic	—	—	—	—	[R]31	[R]30	[R]31	[R]31	[R]32	34
Poland	[R]109	[R]87	[R]88	[R]88	91	86	81	[R]92	[R]86	77
Romania	[R]52	[R]47	[R]36	[R]34	[R]34	[R]32	[R]33	[R]34	[R]33	28
Former U.S.S.R.	1,013	1,036	955	—	—	—	—	—	—	—
Russia	—	—	—	[R]570	[R]536	[R]477	443	[R]442	[R]411	405
Ukraine	—	—	—	[R]154	[R]145	[R]121	120	106	[R]105	100
Other	[R]48	[R]43	[R]36	[R]202	[R]193	[R]167	[R]162	[R]159	[R]157	157
Middle East	[R]**196**	[R]**199**	[R]**213**	[R]**219**	**233**	**242**	**248**	**255**	[R]**260**	**268**
Iran	[R]53	[R]55	62	64	65	68	71	71	[R]79	79
Saudi Arabia	[R]57	57	[R]62	63	65	67	68	71	[R]62	64
Other	[R]86	[R]87	[R]88	[R]92	102	107	109	113	[R]120	125
Africa	[R]**188**	[R]**195**	[R]**202**	[R]**206**	**215**	**222**	[R]**224**	**230**	[R]**237**	**241**
South Africa	80	[R]80	[R]83	[R]87	90	94	[R]94	96	[R]100	102
Other	[R]108	[R]116	[R]118	[R]119	125	128	130	134	137	139
Far East and Oceania	[R]**1,365**	[R]**1,405**	[R]**1,463**	[R]**1,524**	**1,638**	**1,739**	[R]**1,818**	[R]**1,878**	[R]**1,888**	**1,835**
Australia	[R]69	[R]71	[R]72	[R]74	[R]77	[R]77	[R]80	[R]80	[R]78	83
China	[R]610	[R]610	[R]639	[R]659	712	[R]768	[R]788	[R]794	[R]785	740
India	[R]144	[R]154	[R]160	[R]174	186	195	226	235	[R]245	253
Indonesia	[R]37	[R]39	[R]41	[R]46	54	56	[R]58	[R]65	[R]71	68
Japan	[R]257	[R]266	[R]272	[R]278	[R]280	295	292	304	[R]296	288
North Korea	45	47	[R]47	47	48	48	48	50	43	43
South Korea	[R]55	[R]60	[R]69	[R]72	84	93	101	109	[R]120	108
Taiwan	32	[R]33	34	[R]36	43	44	49	53	[R]58	59
Thailand	19	23	25	27	32	35	43	46	47	43
Other	[R]95	103	[R]104	[R]110	123	[R]129	[R]134	[R]141	[R]146	150
World	[R]**5,818**	[R]**5,832**	[R]**5,797**	[R]**5,784**	[R]**5,873**	[R]**5,907**	[R]**5,987**	[R]**6,158**	[R]**6,163**	**6,124**

[1] Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

[2] Data, when converted to million metric tons of carbon dioxide gas, may differ from the values shown for the United States in Table 12.1 because they exclude carbon dioxide emissions from geothermal, cement production, other industrial sources, and U.S. Territories, and include emissions from bunker fuels consumption.

[3] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

R=Revised. P=Preliminary. — = Not applicable. (s)=Less than 0.5 million metric tons.

Notes: • See Note 3 at end of section. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/international.

Source: Energy Information Administration, *International Energy Annual 1998* (January 2000), Table H1, and the International Energy Database, December 1999.

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 biomass, geothermal, solar and wind energy. Data for the United States also include biomass, geothermal, and solar energy not used for electricity generation. 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 biomass, geothermal, solar, and wind 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.

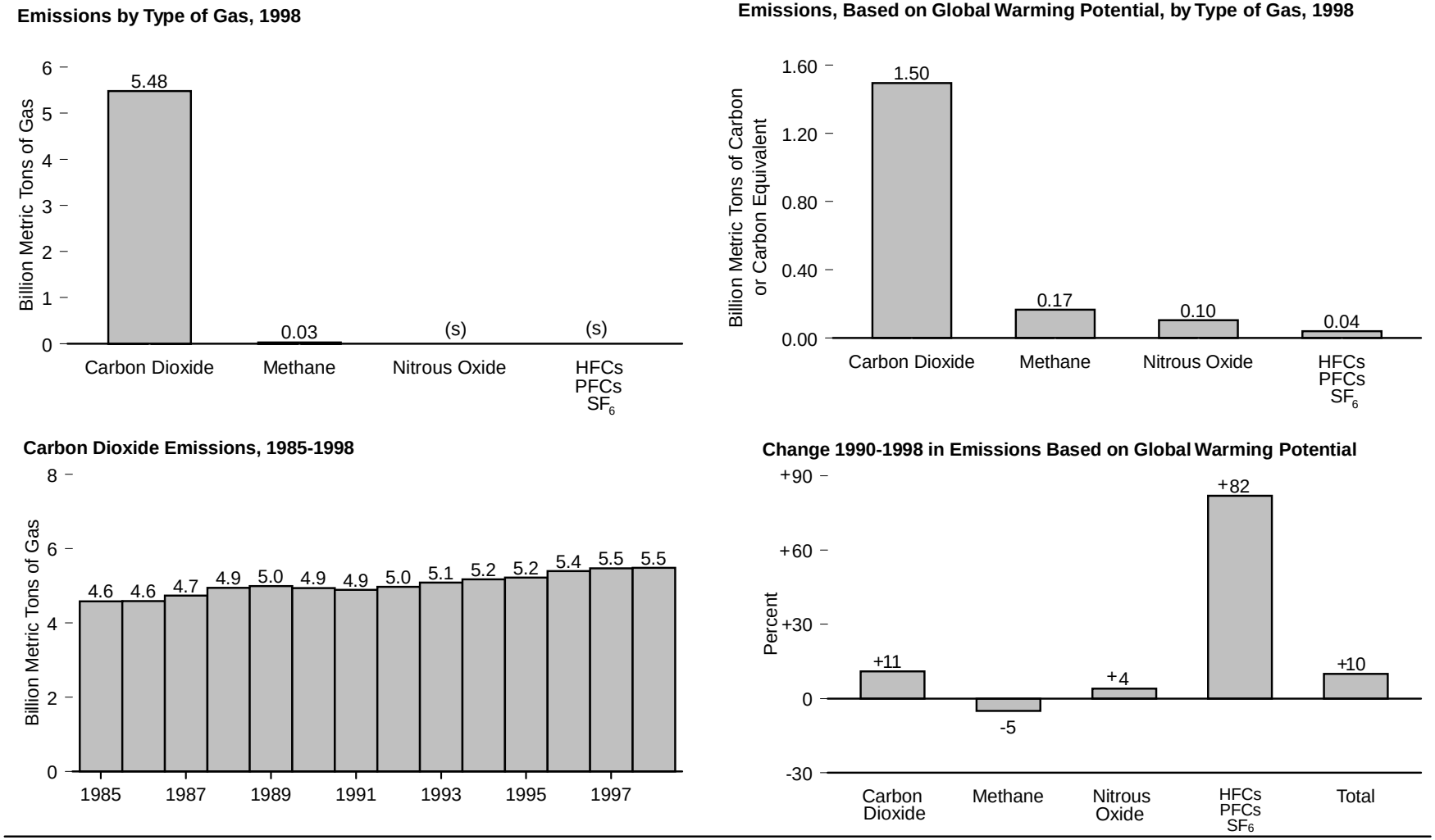
2. Nuclear electricity generation data in Table 11.17 are for gross output of electricity (measured at the generator terminals). Data on the gross generation of electricity in the United States are derived from data for net generation, which is gross output of electricity minus power plant use.

3. Data for carbon dioxide emissions include anthropogenic (human-caused) emissions from the consumption of petroleum, natural gas, and coal, and the flaring of natural gas. They do not include carbon dioxide emissions from cement production and other industrial sources. Hydrocarbon consumption and flaring statistics for each country have been reduced to account for the fraction of fuels not combusted and, in the case of petroleum, for the fraction of sequestration of non-fuel uses. Carbon dioxide emissions have been determined by applying carbon emission coefficients to the adjusted consumption and flaring data. Carbon emission coefficients for petroleum, natural gas, and flared gas are from Energy Information Administration, *Emissions of Greenhouse Gases in the United States 1998*, DOE/EIA-0573(98), October 1999, Table B1. Carbon emission coefficients for coal are from Energy Information Administration, *Emissions of Greenhouse Gases in the United States 1985-1990*, DOE/EIA-0573, October 1993, Table 11.

12 Environmental Indicators

"Harpers Ferry, Junction of the Rivers Shenandoah and Potomac." Engraving by W. Goodacre and James Archer, published in *The History and Topography of the United States of North America*, by John Howard Hinton, 1852. From the collection of the National Park Service, Harpers Ferry National Historical Park, Accession #1297.

Figure 12.1 Estimated Emissions of Greenhouse Gases



(s)=Less than 0.005 billion metric tons of gas.

Notes: • HFCs=hydrofluorocarbons; PFCs=perfluorocarbons; and SF_6=sulfur hexafluoride. • Because vertical scales differ, graphs should not be compared.

Source: Table 12.1.

Table 12.1 Estimated Emissions of Greenhouse Gases, 1985-1998

Year	Greenhouse Gases (million metric tons of gas)				Greenhouse Gases, Based on Global Warming Potential [1] (million metric tons of carbon or equivalent)				
	Carbon Dioxide	Methane	Nitrous Oxide	HFCs PFCs SF_6	Carbon Dioxide	Methane	Nitrous Oxide	HFCs PFCs SF_6	Total
1985	R4,584.2	R29.3	R1.1	(s)	1,250	168	96	20	1,533
1986	R4,585.6	R28.7	R1.1	(s)	1,251	165	93	21	1,530
1987	R4,735.0	R29.3	R1.1	(s)	1,291	168	93	22	1,575
1988	R4,949.4	R29.6	R1.1	(s)	1,350	170	91	26	1,636
1989	R4,996.6	R29.8	R1.1	(s)	1,363	171	96	26	1,656
1990	R4,939.0	30.2	R1.2	(s)	1,347	173	99	22	1,641
1991	R4,886.0	R30.5	R1.2	(s)	1,333	174	101	22	1,629
1992	R4,972.9	R30.6	R1.2	(s)	1,356	175	103	23	1,657
1993	R5,090.1	R29.9	R1.2	(s)	1,389	171	103	24	1,686
1994	R5,169.7	R30.0	R1.3	(s)	1,407	172	111	26	1,717
1995	R5,221.3	R30.2	R1.3	(s)	1,414	173	106	32	1,725
1996	R5,396.4	R29.3	R1.2	(s)	1,457	168	105	36	1,766
1997	R5,471.2	R29.3	R1.2	(s)	1,490	168	104	38	1,800
1998P	5,483.9	28.8	1.2	(s)	1,495	165	103	40	1,803

[1] Emissions of greenhouse gases were weighted based upon their relative global warming potential, with carbon dioxide gas equal to a weight of one, and were converted to carbon (for carbon dioxide) or to equivalent units of carbon (for other gases) by dividing by 3.667.

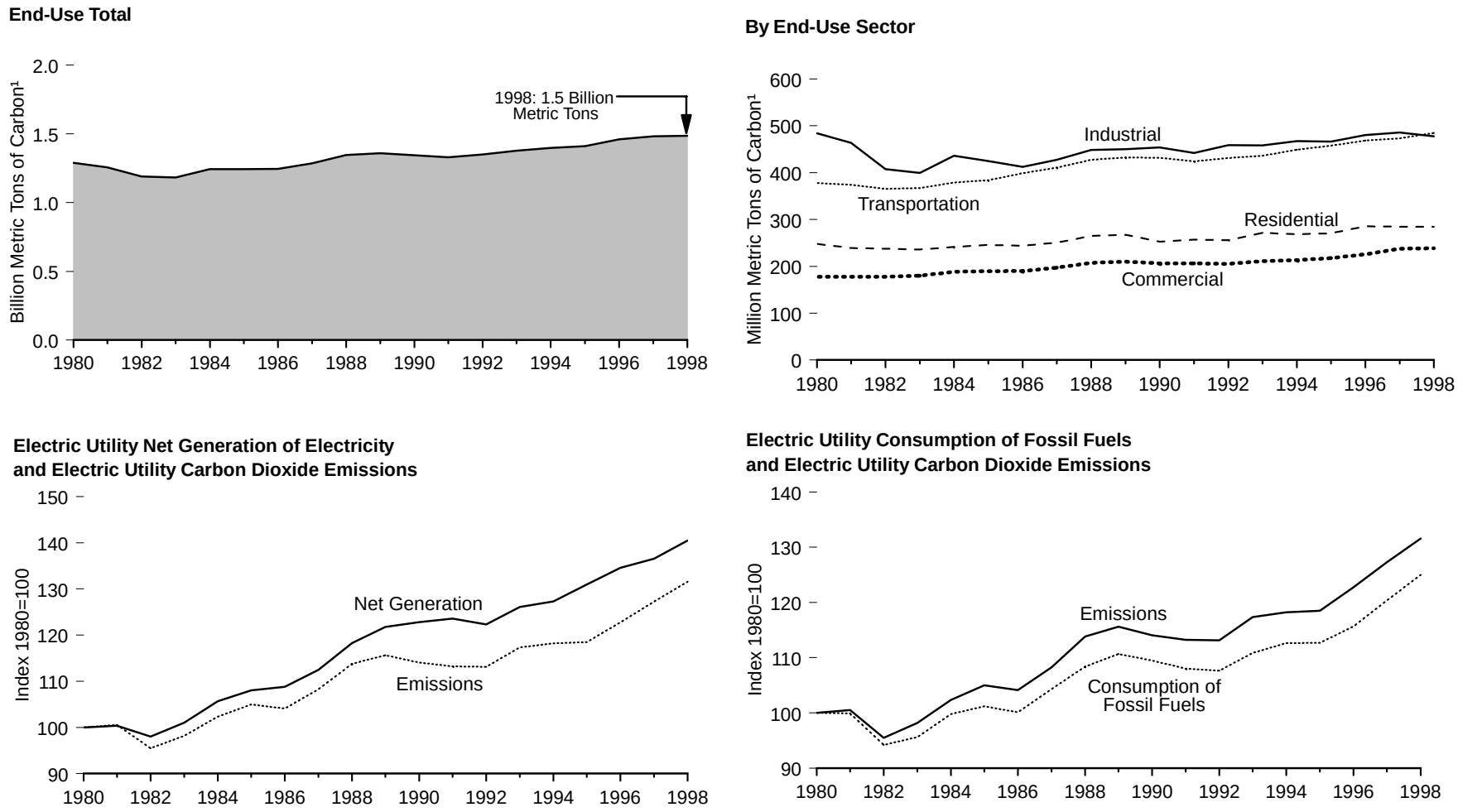
R=Revised. P=Preliminary. (s)=Less than 0.05 million metric tons.

Notes: • HFCs = hydrofluorocarbons; PFCs = perfluorocarbons; and SF_6 = sulfur hexafluoride. • Emissions are from anthropogenic sources. Anthropogenic means produced as the result of human activities, including emissions from agricultural activity and domestic livestock. Emissions from natural sources, such as wetlands and wild animals, are not included. • Because estimation methods for greenhouse gases are currently being developed, data are frequently revised on an annual basis in keeping with the latest findings of the international scientific community. For some of the gases, such as carbon dioxide, revisions are a small percentage of the total (on the order of 1 percent), but for other gases, such as nitrous oxide, they may be on the order of 100 percent.

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

Sources: • 1985-1989—Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States,* annual reports. • 1990 forward—EIA, *Emissions of Greenhouse Gases in the United States 1998* (October 1999).

Figure 12.2 Carbon Dioxide Emissions From Energy Consumption by Sector, 1980-1998



[1] Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

Sources: Tables 8.1, 8.8, and 12.2.

Table 12.2 Carbon Dioxide Emissions From Energy Consumption by Sector, 1980-1998

(Million Metric Tons of Carbon[1])

Year	Residential	Commercial	Industrial	Transportation	End-Use Total	Electric Utilities [2]
1980	R248.2	R178.2	484.6	378.1	R1,289.0	R417.9
1981	R239.7	R178.2	463.7	374.1	R1,255.7	R420.1
1982	R237.5	R178.1	R407.8	365.6	R1,189.0	R399.0
1983	R236.1	R179.9	R399.3	366.9	R1,182.2	R410.2
1984	R241.1	R188.7	R436.0	379.0	R1,244.8	R427.7
1985	245.8	R189.6	R424.5	R384.3	R1,244.2	R438.8
1986	R244.0	R190.4	R412.2	R399.0	R1,245.6	R435.2
1987	251.0	197.2	R427.3	R411.0	R1,286.5	R452.5
1988	R264.8	207.6	R448.2	R427.3	R1,347.9	R475.7
1989	R267.5	R209.9	R450.1	R432.6	R1,360.0	R483.2
1990	253.1	R206.7	R453.7	R431.8	R1,345.2	R476.7
1991	R257.1	206.4	R442.2	R424.3	R1,330.0	R473.3
1992	R255.9	R205.4	R458.8	R431.1	R1,351.3	R472.8
1993	R271.7	R211.3	R458.5	R436.4	R1,377.8	R490.5
1994	R268.3	R213.6	R467.1	R449.3	R1,398.3	R494.0
1995	270.3	R217.7	R466.2	R457.7	R1,411.9	R495.2
1996	R285.9	R225.8	R480.2	R468.8	R1,460.7	R513.0
1997	R284.6	R237.6	R485.8	R473.6	R1,481.7	R531.9
1998P	284.5	238.4	477.8	484.9	1,485.5	549.8

[1] Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

[2] Electric utility emissions are distributed across end-use sectors.

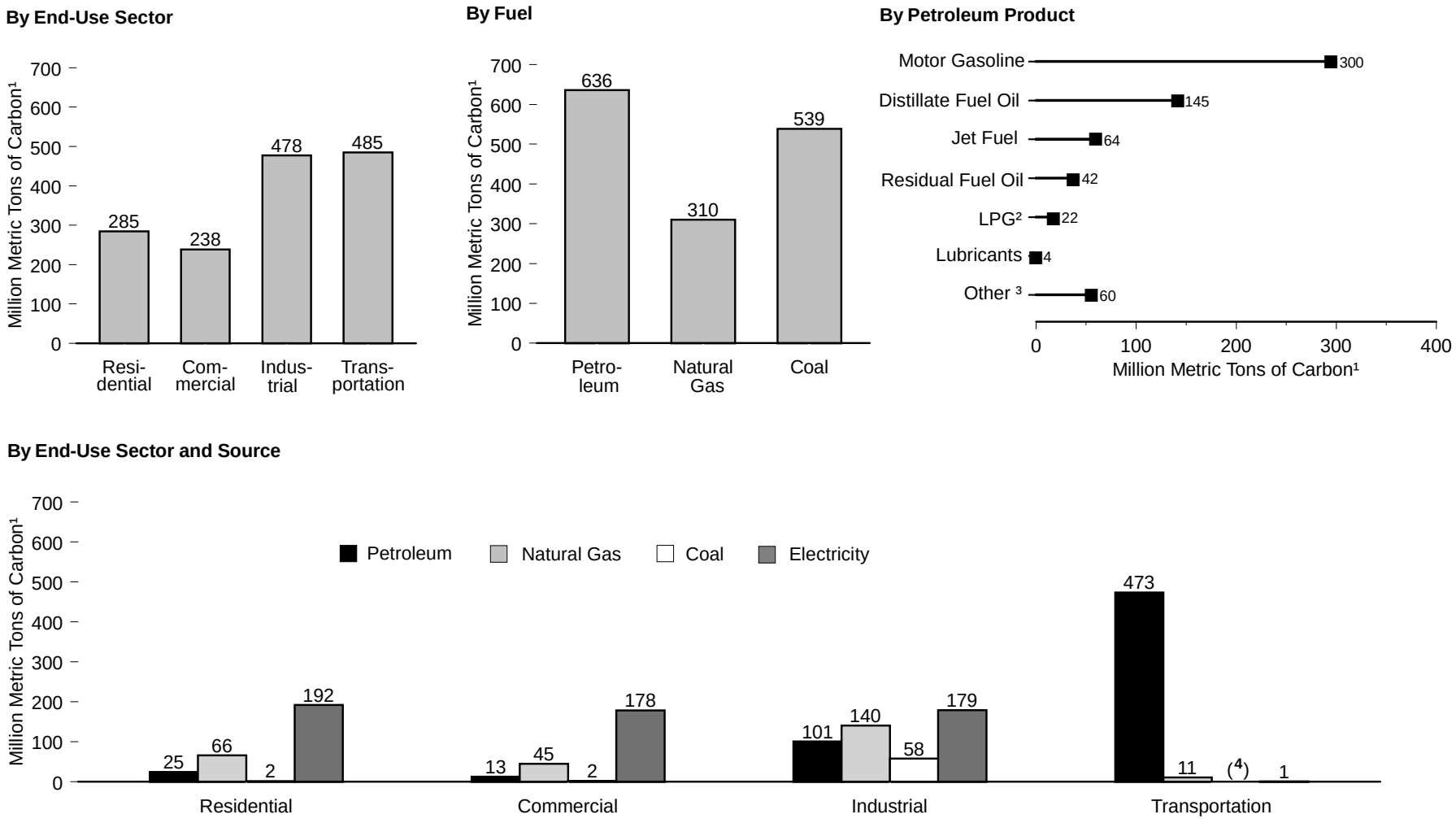
R=Revised. P=Preliminary.

Notes: • Includes energy from petroleum, natural gas, and coal. • Totals may not equal sum of components due to independent rounding.

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

Sources: • 1980-1989—Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States,* annual reports. • 1990 forward—EIA, *Emissions of Greenhouse Gases in the United States 1998* (October 1999), Table 5.

Figure 12.3 Carbon Dioxide Emissions From Energy Consumption by Sector by Energy Source, 1998



¹ Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

² Liquefied petroleum gases.

³ Aviation gasoline, kerosene, and other products.

⁴ Coal used in the transportation sector is included in the industrial sector.

Source: Table 12.3.

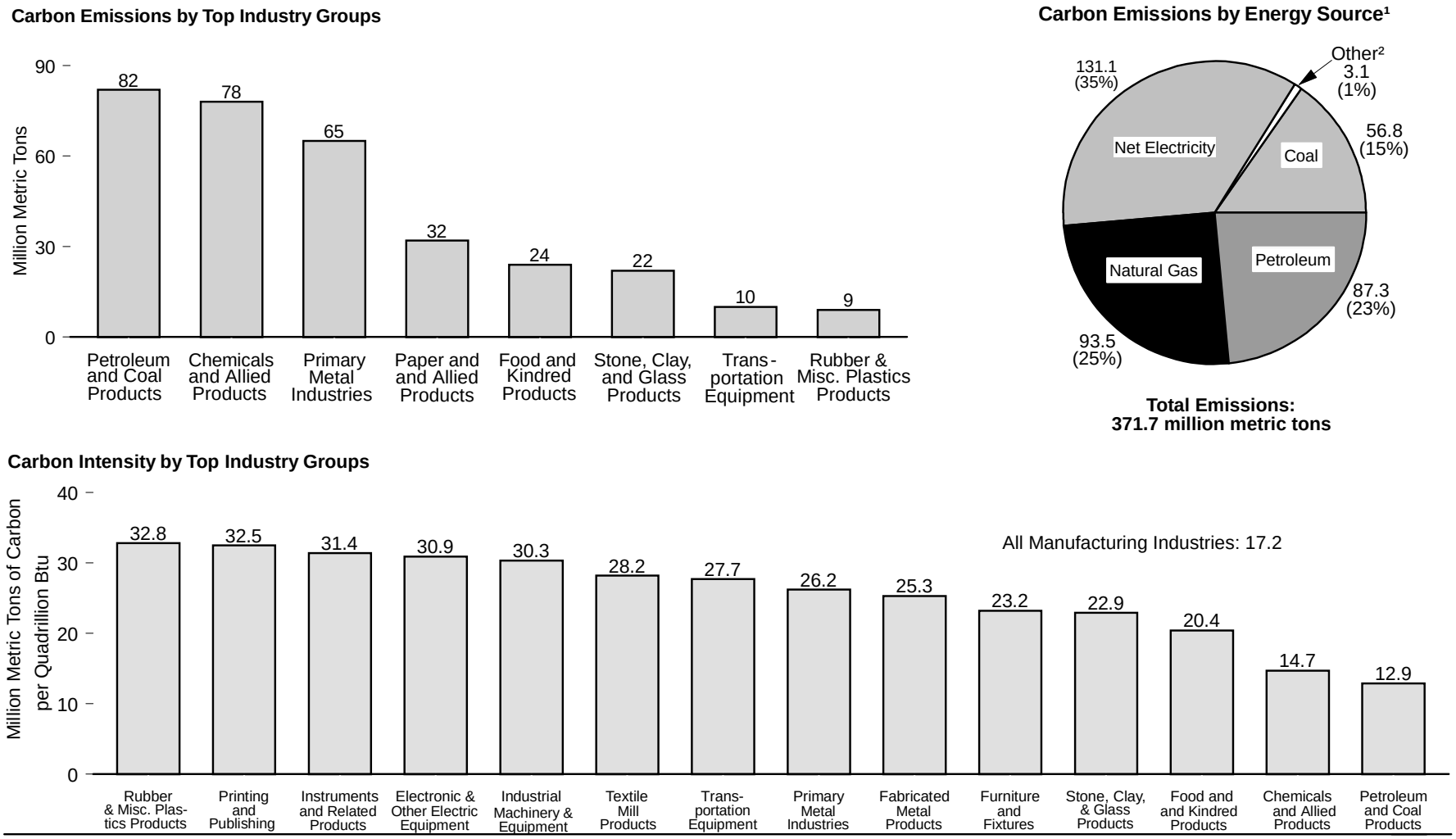
Table 12.3 Carbon Dioxide Emissions From Energy Consumption by Sector by Energy Source, 1998

(Million Metric Tons of Carbon[1])

Energy Source	Residential	Commercial	Industrial	Transportation	End-Use Total	Electric Utilities	Total
Petroleum	24.8	12.9	100.5	473.4	611.6	24.8	636.3
Aviation Gasoline	—	—	—	0.7	0.7	—	0.7
Distillate Fuel	15.4	8.3	21.9	96.9	142.6	[2] 2.5	145.1
Jet Fuel	—	—	—	64.2	64.2	—	64.2
Kerosene	2.1	0.6	0.4	—	3.2	—	3.2
Liquefied Petroleum Gases	7.2	1.3	13.3	0.2	22.1	—	22.1
Lubricants	—	—	1.9	1.8	3.7	—	3.7
Motor Gasoline	—	0.8	4.2	294.6	299.7	—	299.7
Residual Fuel	—	1.9	4.5	14.9	21.3	[3] 20.7	42.0
Other	—	—	54.2	—	54.2	[4] 1.5	55.7
Natural Gas	66.3	44.9	140.4	10.8	262.4	47.8	310.1
Coal	1.5	2.2	[5] 58.1	([6])	61.8	477.3	539.0
Electricity	191.9	178.4	178.8	0.7	549.8	—	—
Total	284.5	238.4	477.8	484.9	1,485.5	[7] 549.8	1,485.5

[1] Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.
[2] Light fuel oil.
[3] Heavy fuel oil.
[4] Petroleum coke.
[5] Industrial coal includes net imports of coke.
[6] Included in the industrial sector.
[7] Electric utility emissions are distributed across end-use sectors.
— = Not applicable.
Note: Totals may not equal sum of components due to independent rounding. All values are considered preliminary.
Web Page: http://www.eia.doe.gov/environment.html.
Source: Energy Information Administration, *Emissions of Greenhouse Gases in the United States 1998* (October 1999), Tables 7 and 9-13.

Figure 12.4 Carbon Dioxide Emissions From Energy Consumption for Manufacturing Industries, 1994



¹ Sum of shares does not equal 100 percent due to independent rounding.

² All other types of energy that respondents indicated were consumed.

Source: Table 12.4.

Table 12.4 Carbon Dioxide Emissions From Energy Consumption for Manufacturing Industries, 1994

SIC [2] Code	Major Group	Carbon[1] Emissions (million metric tons)						Carbon Intensity [5]
		Coal	Natural Gas	Petroleum	Net Electricity [3]	Other [4]	Total	
20	Food and Kindred Products	W	9.1	W	9.8	0.1	24.4	20.44
21	Tobacco Products	W	W	W	0.1	W	W	W
22	Textile Mill Products	1.0	1.7	0.6	5.5	0.0	8.7	28.21
23	Apparel and Other Textile Products	W	0.4	W	1.3	W	W	W
24	Lumber and Wood Products	W	0.7	W	3.4	0.2	4.9	9.98
25	Furniture and Fixtures	0.1	0.3	(s)	1.1	0.1	1.6	23.19
26	Paper and Allied Products	7.8	8.3	4.3	11.0	0.3	31.6	11.88
27	Printing and Publishing	0.0	0.7	W	2.9	0.0	3.6	32.52
28	Chemicals and Allied Products	7.8	32.1	12.4	25.7	0.4	78.3	14.70
29	Petroleum and Coal Products	W	11.7	64.2	6.0	(s)	81.8	12.91
30	Rubber and Miscellaneous Plastics Products	0.1	1.6	0.3	7.4	(s)	9.4	32.81
31	Leather and Leather Products	0.0	W	W	0.1	(s)	W	W
32	Stone, Clay, and Glass Products	7.2	6.2	2.0	6.1	0.1	21.6	22.85
33	Primary Metal Industries	26.2	11.7	1.3	24.3	0.9	64.5	26.20
34	Fabricated Metal Products	W	3.2	W	5.7	Q	9.3	25.33
35	Industrial Machinery and Equipment	W	1.6	W	5.4	0.0	7.5	30.32
36	Electronic and Other Electric Equipment	W	1.3	0.1	5.6	Q	7.5	30.91
37	Transportation Equipment	0.8	2.3	0.4	6.5	0.1	10.0	27.65
38	Instruments and Related Products	W	0.4	W	2.3	0.0	3.4	31.38
39	Miscellaneous Manufacturing Industries	(s)	0.3	0.1	0.9	W	W	W
—	Total	56.8	93.5	87.3	131.1	3.1	371.7	17.16

[1] Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon is equal to 3.667 tons of carbon dioxide gas.

[2] Based on 1987 Standard Industrial Classification system.

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

[4] All other types of energy that respondents indicated were consumed.

[5] Carbon intensity is million metric tons of carbon per quadrillion Btu. In the carbon intensity calculations electricity was evaluated as site electricity, the electricity delivered to the end user. Site electricity is equal to 3,412 Btu per kilowatthour.

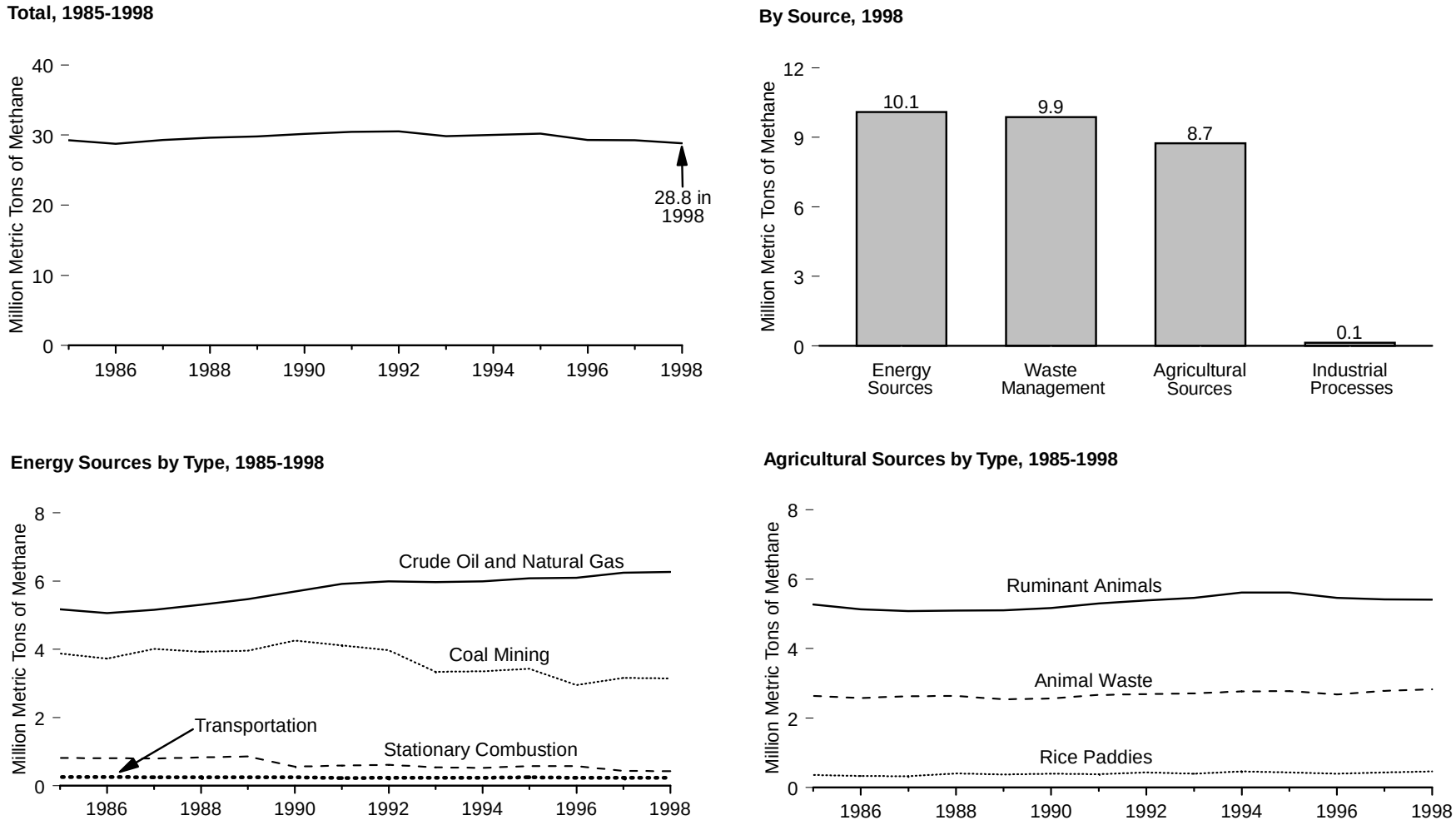
W=Withheld to avoid disclosure of data for individual establishments. Q=Data withheld because the relative standard error was greater than 50 percent.

Notes: • The estimates are for the first use of energy for heat and power and as feedstocks or raw material inputs. First use is defined as the consumption of the energy that was originally produced offsite or was produced onsite from input materials not classified as energy. • See Table 2.2 for manufacturing energy use. • Totals may not equal sum of components due to independent rounding.

Web Page: http://www.eia.doe.gov/emeu/consumption.

Sources: Energy Information Administration, Form EIA-846, "1994 Manufacturing Energy Consumption Survey" and Form EIA-810, "Monthly Refinery Report."

Figure 12.5 Methane Emissions



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

Source: Table 12.5.

Table 12.5 Methane Emissions, 1985-1998

(Million Metric Tons of Methane)

Year	Energy Sources					Waste Management			Agricultural Sources					Industrial Processes	Total
	Crude Oil and Natural Gas	Coal Mining	Transportation	Stationary Combustion	Total	Landfills	Wastewater Treatment	Total	Ruminant Animals	Animal Waste	Rice Paddies	Crop Residue Burning	Total		
1985	R5.17	3.88	0.26	R0.82	R10.13	R10.56	0.14	R10.70	5.27	2.64	0.36	0.04	8.31	0.11	R29.25
1986	R5.06	3.73	0.26	R0.81	R9.85	R10.56	0.15	R10.71	5.13	2.58	0.34	0.03	8.09	0.10	R28.74
1987	R5.16	4.01	R0.25	R0.80	R10.22	R10.78	0.15	R10.93	5.08	2.63	0.33	0.03	8.07	0.11	R29.32
1988	R5.31	3.93	0.25	R0.83	R10.31	R10.86	0.15	R11.01	5.10	2.64	0.41	0.03	8.18	0.12	R29.62
1989	R5.47	3.96	R0.25	R0.86	R10.54	R10.93	0.15	R11.08	5.11	2.54	0.38	0.04	8.08	0.12	R29.81
1990	5.70	4.26	0.25	R0.56	R10.77	R10.97	0.15	R11.12	5.17	2.57	0.40	0.04	8.18	0.12	R30.19
1991	5.92	4.12	R0.23	R0.59	R10.86	R10.94	0.15	R11.09	5.30	2.67	0.39	0.04	8.40	0.11	R30.47
1992	5.99	3.97	0.24	R0.62	R10.82	R10.90	0.15	R11.05	5.39	2.69	0.44	0.04	8.56	0.12	R30.55
1993	5.97	3.34	0.24	R0.54	R10.10	R10.86	0.16	R11.01	5.47	2.71	0.40	0.03	8.62	0.12	R29.85
1994	5.99	3.36	R0.24	R0.53	R10.11	R10.74	0.16	R10.90	5.62	2.77	0.47	0.04	R8.91	0.13	R30.05
1995	6.08	3.43	R0.25	R0.58	R10.34	R10.69	0.16	R10.85	5.62	R2.78	0.44	0.03	R8.87	0.13	R30.20
1996	6.10	2.95	R0.24	R0.58	R9.87	R10.54	0.16	R10.70	5.47	2.68	0.40	0.04	R8.60	0.13	R29.30
1997	R6.25	R3.16	0.24	R0.44	R10.09	R10.20	0.16	R10.36	R5.42	R2.79	R0.44	0.04	R8.69	0.13	R29.27
1998P	6.27	3.15	0.24	0.43	10.09	9.70	0.16	9.87	5.41	2.83	0.47	0.04	8.74	0.13	28.84

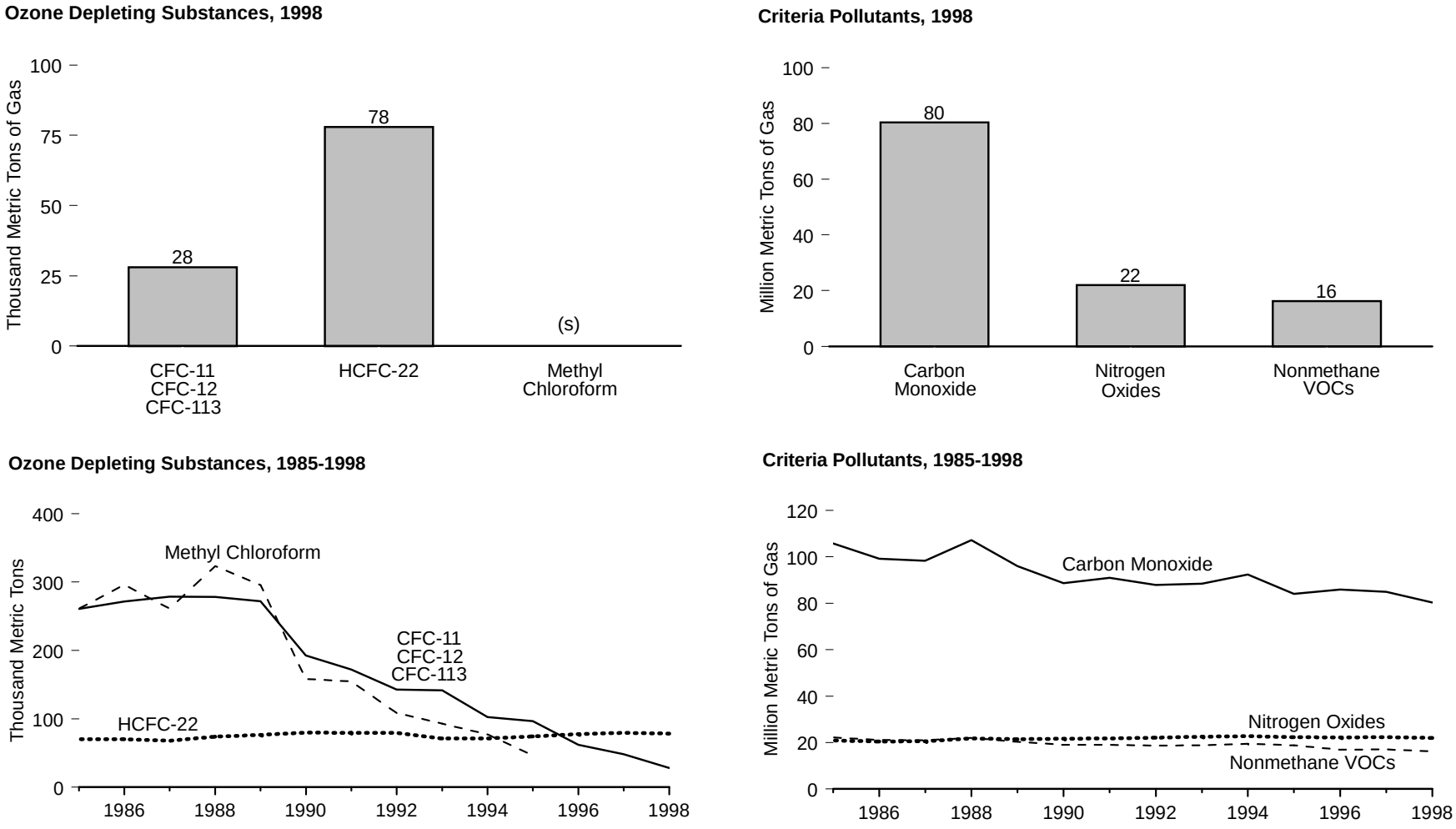
R=Revised. P=Preliminary.

Notes: • Emissions are from anthropogenic sources. Anthropogenic means produced as the result of human activities, including emissions from agricultural activity and domestic livestock. Emissions from natural sources, such as wetlands and wild animals, are not included. • Estimates of methane emissions are, in general, highly uncertain. The level of precision is probably on the order of 30 to 50 percent. For additional information, see "Appendix C, "Uncertainty in Emission Estimates" in the source report, page 110. • 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 via anaerobic decomposition of organic materials in landfills, animal wastes, and rice paddies. • Because inventory methods for greenhouse gases are currently being developed, data are frequently revised on an annual basis in keeping with the latest findings of the international scientific community. • Totals may not equal sum of components due to independent rounding.

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

Sources: • 1985-1989—Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States,* annual reports. • 1990 forward—EIA, *Emissions of Greenhouse Gases in the United States 1998* (October 1999), Table 15.

Figure 12.6 Ozone Depleting Substances and Criteria Pollutants



(s)=Less than 0.5 thousand metric tons of gas.

Notes: • CFC=chlorofluorocarbons; HCFC=chlorodifluoromethane; VOCs=volatile organic compounds. • Because vertical scales differ, graphs should not be compared.

Source: Table 12.6.

Table 12.6 Ozone Depleting Substances and Criteria Pollutants, 1985-1998

Year	Ozone Depleting Substances (thousand metric tons of gas)			Criteria Pollutants (million metric tons of gas)		
	CFC-11 CFC-12 CFC-113	HCFC-22	Methyl Chloroform	Carbon Monoxide	Nitrogen Oxides	Nonmethane VOCs
1985	260.7	70.3	261.1	R105.7	R20.9	R22.2
1986	271.4	70.3	296.1	R99.2	R20.5	R21.2
1987	278.5	68.1	261.1	R98.3	R20.6	21.0
1988	278.2	74.0	323.4	R107.2	R21.8	R22.0
1989	271.9	76.4	295.6	R96.0	R21.5	R20.4
1990	192.5	79.8	158.3	R88.7	R21.7	R19.0
1991	172.4	79.5	154.7	R90.9	R21.8	19.1
1992	142.7	79.5	108.3	R87.9	R22.1	18.7
1993	141.8	71.2	92.9	R88.4	R22.5	18.9
1994	102.8	71.4	77.4	R92.4	R22.8	19.5
1995	96.6	74.2	46.4	R84.0	R22.4	R18.9
1996	62.1	77.5	(s)	R85.9	R22.2	R16.9
1997	48.2	79.6	(s)	R85.0	R22.3	R17.1
1998P	28.3	78.4	(s)	80.4	22.0	16.2

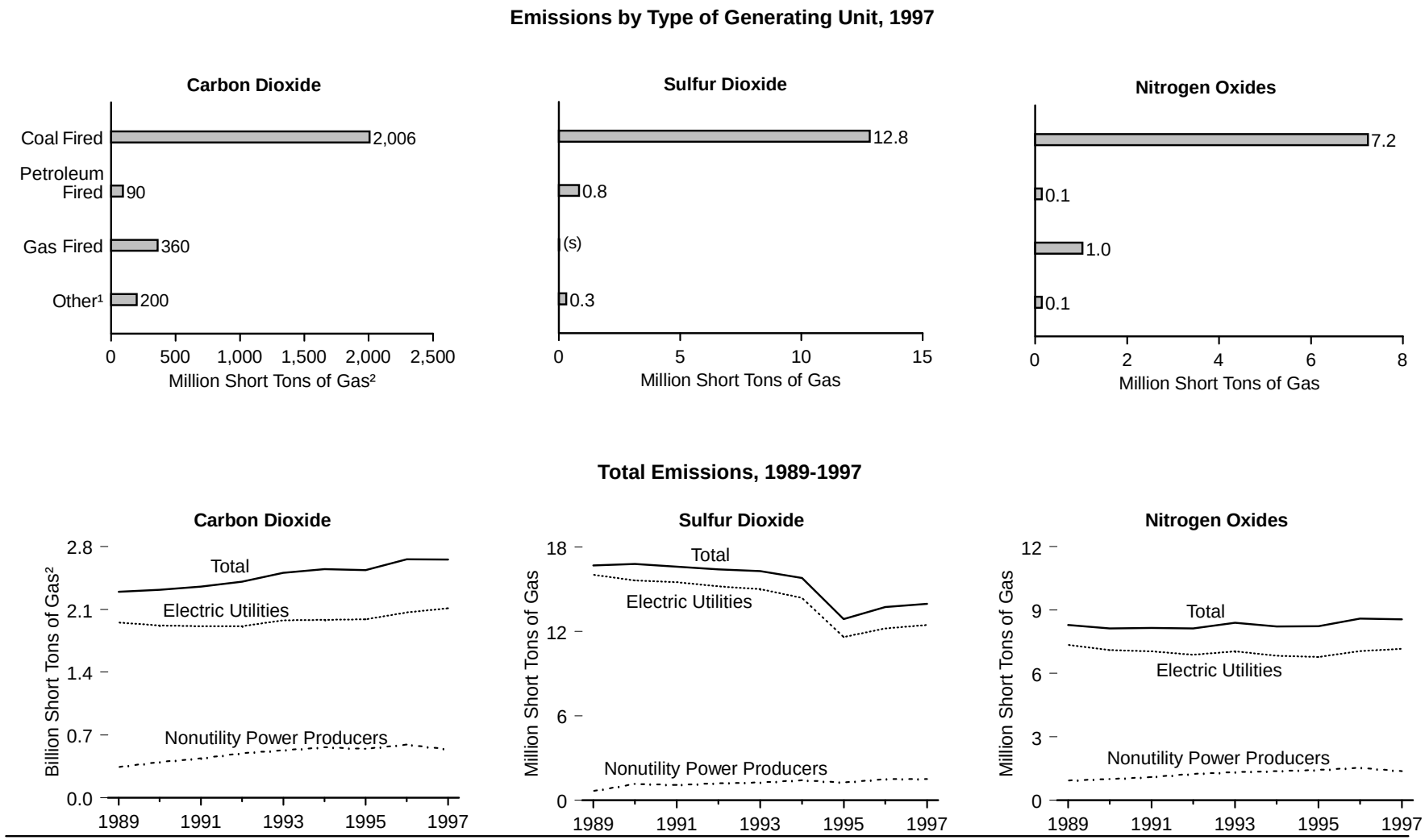
R=Revised. P=Preliminary. (s)=Less than 0.05 thousand metric tons.

Notes: • CFC = chlorofluorocarbons; HCFC = chlorodifluoromethane; and VOCs = volatile organic compounds. • Ozone depleting substances are gases containing chlorine that are being controlled because they deplete ozone. They are thought to have some indeterminate impact on greenhouse gases. • Criteria pollutants are regulated as urban air pollutants. They are thought to have indirect effects on climate because they promote the formation of ozone, itself a greenhouse gas. • Because estimation methods for greenhouse gases are currently being developed, data are frequently revised on an annual basis in keeping with the latest findings of the international scientific community.

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

Sources: **Ozone Depleting Substances:** • 1985-1989—Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States,* annual reports. • 1990 forward—EIA, *Emissions of Greenhouse Gases in the United States 1998* (October 1999). **Criteria Pollutants:** • 1985-1998—EIA, Office of Integrated Analysis and Forecasting estimates based upon Environmental Protection Agency, *National Air Pollutant Emission Trends Report 1900-1998* (March 2000).

Figure 12.7 Emissions From Electric Generating Units



[1] Plants fired by light oil, methane, coal-oil mixture, propane gas, blast furnace gas, wood, and refuse.

[2] Carbon dioxide gas can be converted to units of carbon by dividing by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas. Short tons can be converted to metric tons by dividing by 1.102.

(s)=Less than 0.05 million short tons.

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

Source: Table 12.7.

Table 12.7 Emissions From Electric Generating Units, 1989-1998

(Thousand Short Tons of Gas)

Year	Coal Fired			Petroleum Fired			Gas Fired			Other [1]			Total		
	Carbon Dioxide [2]	Sulfur Dioxide	Nitrogen Oxides	Carbon Dioxide [2]	Sulfur Dioxide	Nitrogen Oxides	Carbon Dioxide [2]	Sulfur Dioxide	Nitrogen Oxides	Carbon Dioxide [2]	Sulfur Dioxide	Nitrogen Oxides	Carbon Dioxide [2]	Sulfur Dioxide	Nitrogen Oxides
	Electric Utilities														
1989	1,651,813	15,196	6,764	135,734	819	221	161,051	1	359	4,092	4	8	1,952,691	16,020	7,352
1990	1,655,344	14,972	6,600	102,003	648	164	158,227	1	341	4,711	5	9	1,920,285	15,626	7,114
1991	1,653,114	14,838	6,548	97,246	662	156	159,816	1	335	3,756	4	8	1,913,932	15,505	7,047
1992	1,668,404	14,643	6,449	77,516	554	118	160,296	1	306	4,333	4	8	1,910,548	15,202	6,882
1993	1,738,068	14,378	6,625	82,459	625	126	154,141	1	297	3,362	3	6	1,978,029	15,007	7,054
1994	1,737,512	13,836	6,399	75,959	537	111	168,314	1	323	3,415	7	6	1,985,200	14,382	6,840
1995	1,753,974	11,254	6,340	52,702	334	78	179,631	1	363	3,322	10	6	1,989,628	11,599	6,787
1996	1,851,875	11,821	6,651	58,122	384	83	153,085	1	320	3,608	2	6	2,066,691	12,207	7,060
1997	1,903,460	12,014	6,834	60,758	435	81	145,433	1	252	4,003	2	7	2,113,654	12,452	7,174
1998[P]	1,911,627	11,671	6,701	100,895	759	137	195,868	1	377	897	1	7	2,209,287	12,432	7,222
	Nonutility Power Producers														
1989	72,360	548	282	14,884	90	36	142,974	1	531	114,944	27	89	345,162	665	938
1990	71,957	740	280	17,408	193	40	158,355	1	577	150,930	230	113	398,651	1,164	1,011
1991	83,461	661	323	18,704	160	44	174,315	1	617	164,794	281	116	441,274	1,102	1,100
1992	91,833	668	367	23,510	254	56	204,158	1	704	179,943	288	127	499,444	1,211	1,254
1993	97,281	709	395	27,304	266	62	219,859	1	749	185,343	296	132	529,787	1,272	1,337
1994	102,914	797	413	33,612	327	73	232,485	1	763	194,879	301	133	563,889	1,425	1,382
1995	99,500	689	404	29,287	305	65	232,808	1	839	185,514	283	136	547,110	1,278	1,444
1996	105,508	788	422	31,445	410	71	248,891	1	904	207,676	319	148	593,520	1,518	1,545
1997[P]	102,279	803	405	29,726	396	65	215,019	1	774	195,595	305	138	542,619	1,505	1,382
	Total														
1989	1,724,173	15,744	7,046	150,618	909	257	304,025	2	890	119,036	31	97	2,297,852	16,686	8,290
1990	1,727,301	15,711	6,881	119,411	842	204	316,583	2	918	155,641	235	122	2,318,936	16,790	8,125
1991	1,736,575	15,499	6,870	115,950	822	200	334,131	2	953	168,550	285	124	2,355,207	16,607	8,147
1992	1,760,237	15,311	6,816	101,027	808	174	364,454	2	1,010	184,275	292	135	2,409,992	16,413	8,136
1993	1,835,349	15,087	7,019	109,763	891	188	374,000	2	1,046	188,705	299	138	2,507,817	16,279	8,391
1994	1,840,426	14,633	6,812	109,571	864	185	400,799	2	1,086	198,294	308	139	2,549,089	15,807	8,221
1995	1,853,473	11,943	6,744	81,989	639	143	412,439	2	1,203	188,836	293	141	2,536,738	12,877	8,231
1996	1,957,384	12,609	7,072	89,567	793	155	401,976	2	1,224	211,283	322	154	2,660,210	13,726	8,604
1997[P]	2,005,739	12,818	7,239	90,484	831	146	360,453	2	1,026	199,598	307	145	2,656,274	13,957	8,556

[1] Plants fired by light oil, methane, coal-oil mixture, propane gas, blast furnace gas, wood, and refuse.

[2] Carbon dioxide gas can be converted to units of carbon by dividing by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas. Short tons can be converted to metric tons by dividing by 1.102.

P=Preliminary.

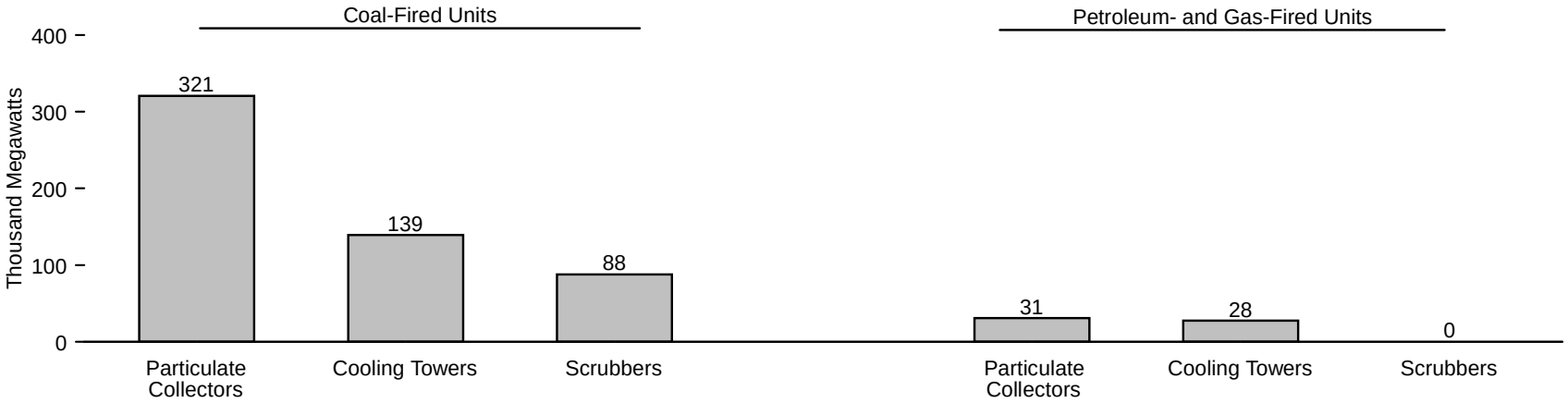
Note: See Technical Notes in the *Electric Power Annual* Volume II.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

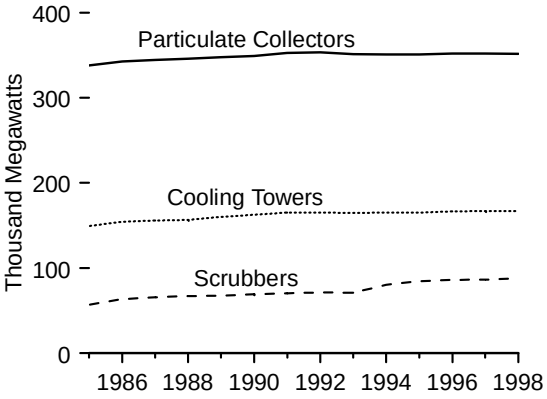
Sources: **Electric Utilities:** • 1989-1993—Energy Information Administration (EIA), *Electric Power Annual,* annual reports. • 1994 forward—EIA, *Electric Power Annual 1998, Volume II, annual reports.* **Nonutility Power Producers:** • 1989 forward—EIA, Form EIA-860B "Annual Electric Generator Report-Nonutility."

Figure 12.8 Installed Nameplate Capacity of Steam-Electric Generators for Electric Utility Plants With Environmental Equipment

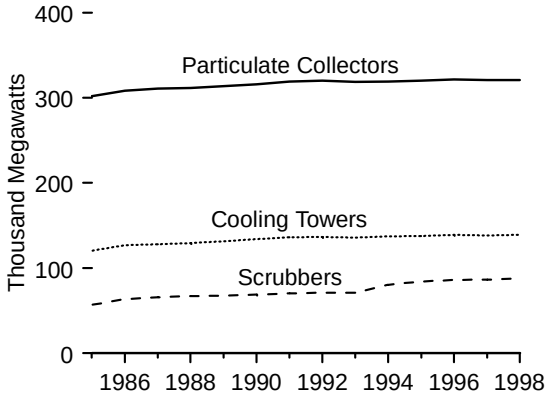
By Fuel and Equiment Type, 1998



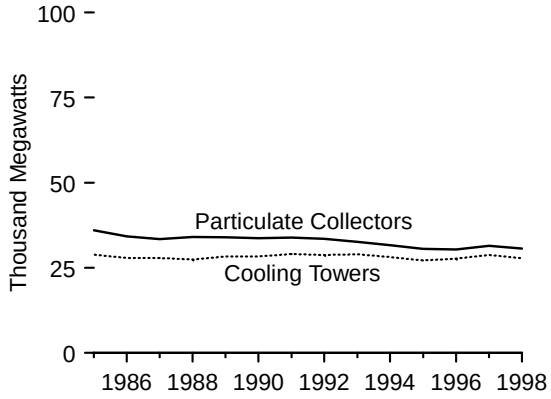
Total Units by Equipment Type, 1985-1998



Coal-Fired Units by Equipment Type, 1985-1998



Petroleum- and Gas-Fired Units by Equipment Type, 1985-1998



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

Source: Table 12.8.

Table 12.8 Installed Nameplate Capacity of Steam-Electric Generators for Electric Utility Plants With Environmental Equipment, 1985-1998

(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	347,655	160,087	67,534	375,257
1990	315,681	134,199	69,057	317,522	33,639	28,359	65	59,372	349,319	162,557	69,122	376,894
1991	319,127	136,270	70,294	319,189	33,864	29,067	260	59,773	352,990	165,337	70,554	378,963
1992	320,016	136,542	71,157	320,078	33,509	28,764	195	59,116	353,525	165,306	71,351	379,194
1993	318,830	136,028	70,890	318,893	32,620	28,922	0	58,580	351,451	164,951	70,890	377,473
1994	319,309	137,266	80,617	319,600	31,695	28,186	0	57,123	R351,180	165,452	80,617	R376,899
1995	320,268	137,825	84,260	320,467	30,513	27,187	0	54,942	R351,198	R165,295	R84,677	R375,691
1996	321,721	139,065	86,359	321,785	30,349	27,685	0	55,275	R352,254	166,749	86,359	R377,244
1997	320,832	138,120	86,605	320,896	31,422	28,766	0	56,485	352,254	166,886	86,605	377,381
1998P	321,082	139,082	87,783	321,353	30,708	27,814	0	55,764	351,790	166,896	87,783	377,117

[1] Components are not additive because some generators are included in more than one category.

R=Revised. P=Preliminary.

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. • Data cover only plants with fossil-fueled steam-electric capacity of 100 megawatts or greater.

Web Page: http://www.eia.doe.gov/fuelelectric.html.

Sources: • 1985-1987—Energy Information Administration (EIA), Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 1988-1993—EIA, *Electric Power Annual,* annual reports. • 1994 forward—EIA, *Electric Power Annual Volume II,* annual reports.

Appendix A

Thermal Conversion Factors

Using Thermal Conversion Factors

The thermal conversion factors presented in the following six tables can be used to estimate the heat content in British thermal units (Btu) of a given amount of energy measured in physical units, such as barrels or cubic feet. For example, 10 barrels of asphalt has a heat content of approximately 66.36 million Btu (10 barrels x 6.636 million Btu per barrel = 66.36 million Btu).

In general, the annual thermal conversion factors presented in Tables A2 through A6 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." Usually, the previous year's factor is used as the preliminary value until data become available to calculate the factor appropriate to the year. The source of each factor is described in the section entitled "Thermal Conversion Factor Source Documentation," which follows Table A6 in this appendix.

Thermal conversion factors for hydrocarbon mixes are weighted averages of the thermal conversion factors for each hydrocarbon included in the mix. For example, in calculating the thermal conversion factor for a 60-40 butane-propane mixture, the thermal conversion factor for butane is weighted 1.5 times the thermal conversion factor for propane.

More information about British thermal units (the standardized unit of measure for energy) can be found in the Glossary.

Table A1. Approximate Heat Content of Petroleum Products
(Million Btu per Barrel)

Energy Source	Heat Content
Asphalt	6.636
Aviation Gasoline	5.048
Butane	4.326
Butane-Propane Mixture (60 percent-40 percent)	4.130
Distillate Fuel Oil	5.825
Ethane	3.082
Ethane-Propane Mixture (70 percent-30 percent)	3.308
Isobutane	3.974
Jet Fuel, Kerosene-Type	5.670
Jet Fuel, Naphtha-Type	5.355
Kerosene	5.670
Lubricants	6.065
Motor Gasoline, Conventional	5.253
Motor Gasoline, Oxygenated	5.150
Motor Gasoline, Reformulated	5.150
Natural Gasoline	4.620
Pentanes Plus	4.620
Petrochemical Feedstocks	
Naphtha less than 401° F	5.248
Other Oils equal to or greater than 401° F	5.825
Still Gas	6.000
Petroleum Coke	6.024
Plant Condensate	5.418
Propane	3.836
Residual Fuel Oil	6.287
Road Oil	6.636
Special Naphthas	5.248
Still Gas	6.000
Unfinished Oils	5.825
Unfractionated Stream	5.418
Waxes	5.537
Miscellaneous	5.796

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A6.

Table A2. Approximate Heat Content of Crude Oil, Crude Oil and Products, and Natural Gas Plant Liquids, 1949-1999

(Million Btu per Barrel)

Year	Crude Oil Only			Crude Oil and Products		Natural Gas Plant Liquids Production
	Production	Imports	Exports	Imports	Exports	
1949	5.800	5.952	5.800	6.059	5.692	4.544
1950	5.800	5.943	5.800	6.080	5.766	4.522
1951	5.800	5.938	5.800	6.075	5.762	4.495
1952	5.800	5.938	5.800	6.067	5.774	4.464
1953	5.800	5.924	5.800	6.052	5.742	4.450
1954	5.800	5.931	5.800	6.052	5.745	4.415
1955	5.800	5.924	5.800	6.040	5.768	4.406
1956	5.800	5.916	5.800	6.024	5.754	4.382
1957	5.800	5.918	5.800	6.023	5.780	4.369
1958	5.800	5.916	5.800	5.993	5.779	4.366
1959	5.800	5.916	5.800	6.020	5.829	4.311
1960	5.800	5.911	5.800	6.021	5.834	4.295
1961	5.800	5.900	5.800	5.991	5.832	4.283
1962	5.800	5.890	5.800	6.004	5.841	4.273
1963	5.800	5.894	5.800	6.002	5.840	4.264
1964	5.800	5.882	5.800	5.998	5.844	4.268
1965	5.800	5.872	5.800	5.997	5.743	4.264
1966	5.800	5.863	5.800	5.993	5.729	4.259
1967	5.800	5.838	5.800	5.999	5.777	4.232
1968	5.800	5.836	5.800	5.977	5.763	4.218
1969	5.800	5.825	5.800	5.974	5.714	4.170
1970	5.800	5.822	5.800	5.985	5.810	4.146
1971	5.800	5.824	5.800	5.961	5.775	4.117
1972	5.800	5.809	5.800	5.935	5.741	4.070
1973	5.800	5.817	5.800	5.897	5.752	4.049
1974	5.800	5.827	5.800	5.884	5.774	4.011
1975	5.800	5.821	5.800	5.858	5.748	3.984
1976	5.800	5.808	5.800	5.856	5.745	3.964
1977	5.800	5.810	5.800	5.834	5.797	3.941
1978	5.800	5.802	5.800	5.839	5.808	3.925
1979	5.800	5.810	5.800	5.810	5.832	3.955
1980	5.800	5.812	5.800	5.796	5.820	3.914
1981	5.800	5.818	5.800	5.775	5.821	3.930
1982	5.800	5.826	5.800	5.775	5.820	3.872
1983	5.800	5.825	5.800	5.774	5.800	3.839
1984	5.800	5.823	5.800	5.745	5.850	3.812
1985	5.800	5.832	5.800	5.736	5.814	3.815
1986	5.800	5.903	5.800	5.808	5.832	3.797
1987	5.800	5.901	5.800	5.820	5.858	3.804
1988	5.800	5.900	5.800	5.820	5.840	3.800
1989	5.800	5.906	5.800	5.833	5.857	3.826
1990	5.800	5.934	5.800	5.849	5.833	3.822
1991	5.800	5.948	5.800	5.873	5.823	3.807
1992	5.800	5.953	5.800	5.877	5.777	3.804
1993	5.800	5.954	5.800	5.883	5.779	3.801
1994	5.800	5.950	5.800	5.861	[R]5.779	3.794
1995	5.800	5.924	5.800	[R]5.848	[R]5.747	3.796
1996	5.800	5.935	5.800	[R]5.842	[R]5.741	3.777
1997	5.800	5.954	5.800	[R]5.862	[R]5.729	3.762
1998	5.800	[R]5.953	5.800	5.862	[R]5.715	[R]3.769
1999[P]	5.800	5.941	5.800	5.850	5.715	3.745

R=Revised. P=Preliminary.
Note: Crude oil includes lease condensate.

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A6.

Table A3. Approximate Heat Content of Petroleum Product Weighted Averages, 1949-1999

(Million Btu per Barrel)

Year	Consumption					Imports	Exports	Liquefied Petroleum Gases Consumption	Motor Gasoline Consumption
	Residential and Commercial	Industrial	Transportation	Electric Utilities	Total				
1949	5.631	5.947	5.465	6.254	5.649	6.261	5.651	4.011	5.253
1950	5.626	5.940	5.461	6.254	5.649	6.263	5.751	4.011	5.253
1951	5.626	5.913	5.458	6.254	5.634	6.265	5.753	4.011	5.353
1952	5.621	5.905	5.442	6.254	5.621	6.261	5.768	4.011	5.253
1953	5.606	5.897	5.426	6.254	5.608	6.268	5.732	4.011	5.253
1954	5.603	5.883	5.412	6.254	5.595	6.252	5.738	4.011	5.253
1955	5.607	5.866	5.408	6.254	5.591	6.234	5.765	4.011	5.253
1956	5.601	5.856	5.406	6.254	5.585	6.225	5.744	4.011	5.253
1957	5.587	5.842	5.405	6.254	5.577	6.219	5.774	4.011	5.253
1958	5.582	5.832	5.393	6.254	5.567	6.091	5.778	4.011	5.253
1959	5.549	5.811	5.389	6.254	5.557	6.142	5.830	4.011	5.253
1960	5.570	5.800	5.388	6.267	5.555	6.161	5.835	4.011	5.253
1961	5.570	5.795	5.386	6.268	5.552	6.102	5.833	4.011	5.253
1962	5.555	5.784	5.386	6.267	5.545	6.138	5.842	4.011	5.253
1963	5.532	5.759	5.384	6.266	5.534	6.126	5.841	4.011	5.253
1964	5.517	5.728	5.388	6.267	5.528	6.129	5.845	4.011	5.253
1965	5.535	5.728	5.387	6.267	5.532	6.123	5.742	4.011	5.253
1966	5.523	5.722	5.388	6.266	5.532	6.112	5.728	4.011	5.253
1967	5.473	5.682	5.391	6.266	5.515	6.128	5.758	[1]3.838	5.253
1968	5.450	5.646	5.394	6.263	5.504	6.095	5.762	3.818	5.253
1969	5.399	5.603	5.394	6.259	5.492	6.093	5.713	3.805	5.253
1970	5.404	5.604	5.393	6.252	5.503	6.088	5.811	3.779	5.253
1971	5.392	5.600	5.389	6.245	5.504	6.062	5.775	3.772	5.253
1972	5.368	5.564	5.388	6.233	5.500	6.045	5.741	3.760	5.253
1973	5.387	5.568	5.395	6.245	5.515	5.983	5.752	3.746	5.253
1974	5.377	5.538	5.394	6.238	5.504	5.959	5.773	3.730	5.253
1975	5.358	5.528	5.392	6.250	5.494	5.935	5.747	3.715	5.253
1976	5.383	5.538	5.395	6.251	5.504	5.980	5.743	3.711	5.253
1977	5.389	5.555	5.400	6.249	5.518	5.908	5.796	3.677	5.253
1978	5.382	5.553	5.404	6.251	5.519	5.955	5.814	3.669	5.253
1979	5.471	5.418	5.428	6.258	5.494	5.811	5.864	3.680	5.253
1980	5.468	5.376	5.440	6.254	5.479	5.748	5.841	3.674	5.253
1981	5.409	5.313	5.432	6.258	5.448	5.659	5.837	3.643	5.253
1982	5.392	5.263	5.422	6.258	5.415	5.664	5.829	3.615	5.253
1983	5.286	5.273	5.415	6.255	5.406	5.677	5.800	3.614	5.253
1984	5.384	5.223	5.422	6.251	5.395	5.613	5.867	3.599	5.253
1985	5.326	5.221	5.423	6.247	5.387	5.572	5.819	3.603	5.253
1986	5.357	5.286	5.427	6.257	5.418	5.624	5.839	3.640	5.253
1987	5.316	5.253	5.430	6.249	5.403	5.599	5.860	3.659	5.253
1988	5.320	5.248	5.434	6.250	5.410	5.618	5.842	3.652	5.253
1989	5.257	5.233	5.440	6.241	5.410	5.641	5.869	3.683	5.253
1990	5.208	5.272	5.445	6.247	5.411	5.614	5.838	3.625	5.253
1991	5.163	5.192	5.442	6.248	5.384	5.636	5.827	3.614	5.253
1992	5.169	5.188	5.445	6.243	5.378	5.623	5.774	3.624	5.253
1993	5.148	5.200	5.438	6.241	5.379	5.620	5.777	3.606	5.253
1994	5.154	[R]5.170	[R]5.427	6.231	[R]5.361	[R]5.534	[R]5.777	3.635	[2]5.230
1995	5.126	[R]5.139	[R]5.419	6.210	[R]5.341	[R]5.504	[R]5.741	3.623	5.215
1996	[R]5.101	[R]5.125	[R]5.421	6.212	[R]5.336	[R]5.489	[R]5.733	3.613	5.216
1997	5.076	[R]5.134	[R]5.417	6.220	[R]5.336	[R]5.472	[R]5.720	3.616	5.213
1998	[R]5.045	[R]5.154	[R]5.415	[R]6.220	[R]5.349	[R]5.465	[R]5.704	[R]3.614	5.212
1999[P]	5.003	5.098	5.419	6.207	5.328	5.453	5.703	3.616	5.212

[1] There is a discontinuity in this time series between 1966 and 1967; beginning in 1967, the single constant factor is replaced by a quantity-weighted average of liquefied petroleum gases' major components.

[2] There is a discontinuity in this time series between 1993 and 1994; beginning in 1994, the single constant factor is replaced by a factor that is a quantity-weighted average of motor gasoline's major components. See Table A1.

R=Revised. P=Preliminary.

Note: Weighted averages of the products included in each category are calculated by using heat content values shown in Table A1.

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A6.

Table A4. Approximate Heat Content of Natural Gas, 1949-1999

(Btu per Cubic Foot)

Year	Production		Consumption			Imports	Exports
	Dry	Marketed	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	1,027	1,106	1,028	1,022	1,027	1,020	1,016
1994	1,028	1,105	1,029	1,022	1,028	1,022	1,011
1995	1,027	1,106	1,027	1,025	1,027	1,021	1,011
1996	1,027	1,109	1,027	1,024	1,027	1,022	1,011
1997	1,026	1,107	1,027	1,019	1,026	1,023	1,011
1998	R1,031	R1,110	R1,033	R1,022	R1,031	1,023	1,011
1999P	1,031	1,110	1,033	1,022	1,031	1,023	1,011

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

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A6.

Table A5. Approximate Heat Content of Coal and Coal Coke, 1949-1999

(Million Btu per Short Ton)

Year	Coal									Coal Coke
		Consumption								
		End-Use Sectors			Electric Power Sector					
			Industrial							
	Production	Residential and Commercial	Coke Plants	Other [1]	Electric Utilities	Other Power Producers [2]	Total	Imports	Exports	Imports and Exports
1949	24.916	24.263	26.797	24.612	23.761	NA	24.793	25.000	26.759	24.800
1950	25.090	24.461	26.798	24.820	23.937	NA	24.989	25.020	26.788	24.800
1951	25.019	24.281	26.796	24.521	23.701	NA	24.813	25.034	26.848	24.800
1952	25.096	24.371	26.796	24.724	23.885	NA	24.901	25.040	26.859	24.800
1953	25.147	24.383	26.796	24.785	23.964	NA	25.006	25.048	26.881	24.800
1954	25.054	24.362	26.795	24.788	23.996	NA	24.913	25.012	26.865	24.800
1955	25.201	24.373	26.794	24.821	24.056	NA	24.982	25.000	26.907	24.800
1956	25.117	24.195	26.792	24.664	23.943	NA	24.843	25.000	26.886	24.800
1957	25.213	24.238	26.792	24.707	23.980	NA	24.905	25.001	26.914	24.800
1958	24.983	24.287	26.794	24.606	23.897	NA	24.716	25.005	26.931	24.800
1959	24.910	24.224	26.790	24.609	23.924	NA	24.719	25.003	26.927	24.800
1960	24.906	24.226	26.791	24.609	23.927	NA	24.713	25.003	26.939	24.800
1961	24.849	24.248	26.792	24.580	23.904	NA	24.653	25.002	26.937	24.800
1962	24.828	24.173	26.788	24.562	23.911	NA	24.627	25.013	26.928	24.800
1963	24.831	24.033	26.784	24.509	23.897	NA	24.588	25.007	26.894	24.800
1964	24.840	24.037	26.785	24.477	23.864	NA	24.602	25.000	26.949	24.800
1965	24.775	24.028	26.787	24.385	23.780	NA	24.537	25.000	26.973	24.800
1966	24.629	23.915	26.786	24.226	23.648	NA	24.396	25.000	26.976	24.800
1967	24.475	23.685	26.781	24.040	23.506	NA	24.243	25.000	26.981	24.800
1968	24.445	23.621	26.780	24.014	23.486	NA	24.186	25.000	26.984	24.800
1969	24.280	23.474	26.779	23.724	23.240	NA	23.976	25.000	26.982	24.800
1970	23.842	23.203	26.784	22.983	22.573	NA	23.440	25.000	26.982	24.800
1971	23.507	23.090	26.784	22.670	22.301	NA	23.124	25.000	26.981	24.800
1972	23.389	22.998	26.782	22.550	22.204	NA	23.036	25.000	26.979	24.800
1973	23.376	22.831	26.780	22.586	22.246	NA	23.057	25.000	26.596	24.800
1974	23.072	22.479	26.778	22.419	21.781	NA	22.677	25.000	26.700	24.800
1975	22.897	22.261	26.782	22.436	21.642	NA	22.506	25.000	26.562	24.800
1976	22.855	22.774	26.781	22.530	21.679	NA	22.498	25.000	26.601	24.800
1977	22.597	22.919	26.787	22.322	21.508	NA	22.265	25.000	26.548	24.800
1978	22.248	22.466	26.789	22.207	21.275	NA	22.017	25.000	26.478	24.800
1979	22.454	22.242	26.788	22.452	21.364	NA	22.100	25.000	26.548	24.800
1980	22.415	22.543	26.790	22.690	21.295	NA	21.947	25.000	26.384	24.800
1981	22.308	22.474	26.794	22.585	21.085	NA	21.713	25.000	26.160	24.800
1982	22.239	22.695	26.797	22.712	21.194	NA	21.674	25.000	26.223	24.800
1983	22.052	22.775	26.798	22.691	21.133	NA	21.576	25.000	26.291	24.800
1984	22.010	22.844	26.799	22.543	21.101	NA	21.573	25.000	26.402	24.800
1985	21.870	22.646	26.798	22.020	20.959	NA	21.366	25.000	26.307	24.800
1986	21.913	22.947	26.798	22.198	21.084	NA	21.462	25.000	26.292	24.800
1987	21.922	23.404	26.799	22.381	21.136	NA	21.517	25.000	26.291	24.800
1988	21.823	23.571	26.799	22.360	20.900	NA	21.328	25.000	26.299	24.800
1989	21.765	23.650	26.800	22.347	20.848	NA	21.272	25.000	26.160	24.800
1990	21.822	23.137	26.799	22.457	20.929	NA	21.331	25.000	26.202	24.800
1991	21.681	23.114	26.799	22.460	20.755	NA	21.146	25.000	26.188	24.800
1992	21.682	23.105	26.799	22.250	20.787	18.928	21.107	25.000	26.161	24.800
1993	21.418	22.994	26.800	22.123	20.639	18.995	20.947	25.000	26.335	24.800
1994	21.394	23.112	26.800	22.068	20.673	19.450	20.978	25.000	26.329	24.800
1995	21.326	23.118	26.800	21.950	20.495	19.417	20.814	25.000	26.180	24.800
1996	21.322	23.011	26.800	22.105	20.525	19.391	20.824	25.000	26.174	24.800
1997	21.296	22.494	26.800	22.172	20.548	19.596	20.835	25.000	26.251	24.800
1998	R21.224	R22.783	26.800	R22.104	R20.479	R20.143	R20.760	25.000	R26.243	24.800
1999P	21.224	22.783	26.800	22.104	20.479	20.143	20.760	25.000	26.243	24.800

[1] Includes transportation.

[2] Nonutility wholesale producers of electricity, and nonutility cogeneration plants that are not included in the end-use sectors.

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

Source: Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels. See "Thermal Conversion Factor Source Documentation," which follows Table A6.

Table A6. Approximate Heat Rates for Electricity, 1949-1999

(Btu per Kilowatthour)

Year	Electricity Generation			Electricity Consumption
	Fossil-Fueled Steam-Electric Plants [1]	Nuclear Steam-Electric Plants	Geothermal Energy Plants [2]	
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	10,432	10,724	21,096	3,412
1990	10,402	10,680	21,096	3,412
1991	10,436	10,740	20,997	3,412
1992	10,342	10,678	20,914	3,412
1993	10,309	10,682	20,914	3,412
1994	10,316	10,676	20,914	3,412
1995	10,312	10,658	20,914	3,412
1996	R10,340	10,623	20,960	3,412
1997	R10,357	10,623	20,960	3,412
1998	R10,346	10,623	R21,017	3,412
1999P	10,346	10,623	21,017	3,412

[1] Used as the thermal conversion factor for hydroelectric power generation, and for wood and waste, wind, and solar energy consumed at electric utilities.

[2] Used as the thermal conversion factor for geothermal 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 **Crude Oil, Exports** and **Exports Petroleum Products**.

Crude Oil and Petroleum Products, Imports. Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product and each crude oil imported weighted by the quantity of each petroleum product and each type of crude oil imported. See **Crude Oil, Imports** and **Petroleum Products, Imports**.

Distillate Fuel Oil. EIA adopted the Bureau of Mines thermal conversion factor of 5.825 million Btu per barrel as reported in a Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950."

Ethane. EIA adopted the Bureau of Mines thermal conversion factor of 3.082 million Btu per barrel as published in the *California Oil World and Petroleum Industry,* First Issue, April 1942.

Ethane-Propane Mixture. EIA calculation of 3.308 million Btu per barrel based on an assumed mixture of 70 percent ethane and 30 percent propane. See **Ethane** and **Propane**.

Isobutane. EIA adopted the Bureau of Mines thermal conversion factor of 3.974 million Btu per barrel as published in the *California Oil World and Petroleum Industry,* First Issue, April 1942.

Jet Fuel, Kerosene Type. EIA adopted the Bureau of Mines thermal conversion factor of 5.670 million Btu per barrel for "Jet Fuel, Commercial" as published by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947-1985,* a 1968 release of historical and projected statistics.

Jet Fuel, Naphtha Type. EIA adopted the Bureau of Mines thermal conversion factor of 5.355 million Btu per barrel for "Jet Fuel, Military" as published by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947-1985,* a 1968 release of historical and projected statistics.

Kerosene. EIA adopted the Bureau of Mines thermal conversion factor of 5.670 million Btu per barrel as reported in a Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950."

Liquefied Petroleum Gases (LPG) Consumption. Ethane, ethylene, propane, propylene, normal butane, butylene, and isobutane produced at refineries or natural gas processing plants, including plants that fractionate new natural gas plants liquids.

Lubricants. EIA adopted the thermal conversion factor of 6.065 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

Miscellaneous Products. EIA adopted the thermal conversion factor of 5.796 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

Motor Gasoline. EIA adopted the Bureau of Mines thermal conversion factor of 5.253 million Btu per barrel for "Gasoline, Motor Fuel" as published by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947-1985,* a 1968 release of historical and projected statistics. Conversion factors for reformulated and oxygenated motor gasolines are calculated by EIA based on data published in the Environmental Protection Agency, Office of Mobile Sources, National Vehicle and Fuel Emissions Laboratory report EPA 420-F-95-003 *Fuel Economy Impact Analysis of Reformulated Gasoline*. Both of the factors are currently 5.150 million Btu per barrel.

Natural Gas Plant Liquids, Production. Calculated annually by EIA as the average of the thermal conversion factors of each natural gas plant liquid produced, weighted by the quantity of each natural gas plant liquid produced.

Natural Gasoline. EIA adopted the thermal conversion factor of 4.620 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

Pentanes Plus. EIA assumed the thermal conversion factor to be 4.620 million Btu or equal to that for natural gasoline. See **Natural Gasoline**.

Petrochemical Feedstocks, Naphtha less than 401° F. Assumed by EIA to be 5.248 million Btu per barrel, equal to the thermal conversion factor for special naphthas. See **Special Naphthas**.

Petrochemical Feedstocks, Other Oils equal to or greater than 401° F. Assumed by EIA to be 5.825 million Btu per barrel, equal to the thermal conversion factor for distillate fuel oil. See **Distillate Fuel Oil**.

Petrochemical Feedstocks, Still Gas. Assumed by EIA to be 6.000 million Btu per barrel, equal to the thermal conversion factor for still gas. See **Still Gas**.

Petroleum Coke. EIA adopted the thermal conversion factor of 6.024 million Btu per barrel as reported in Btu per short ton in the Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950." The Bureau of Mines calculated this factor by dividing 30.120 million Btu per short ton, as given in the referenced Bureau of Mines internal memorandum, by 5.0 barrels per short ton, as given in the Bureau of Mines Form 6-1300-M and successor EIA forms.

Petroleum Products, Total Consumption. Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed, weighted by the quantity of each petroleum product consumed.

Petroleum Products, Consumption by Electric Utilities. Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed at electric utilities, weighted by the quantity of each petroleum product consumed at electric utilities. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA's *State Energy Data Report*.

Petroleum Products, Consumption by Industrial Users. Calculated annually by EIA as the average of the thermal conversion factors for all

petroleum products consumed in the industrial sector, weighted by the estimated quantity of each petroleum product consumed in the industrial sector. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA's *State Energy Data Report*.

Petroleum Products, Consumption by Residential and Commercial Users. Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed by the residential and commercial sector, weighted by the estimated quantity of each petroleum product consumed in the residential and commercial sector. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA's *State Energy Data Report*.

Petroleum Products, Consumption by Transportation Users. Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed in the transportation sector, weighted by the estimated quantity of each petroleum product consumed in the transportation sector. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA's *State Energy Data Report*.

Petroleum Products, Exports. Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product, weighted by the quantity of each petroleum product exported.

Petroleum Products, Imports. Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product imported, weighted by the quantity of each petroleum product imported.

Plant Condensate. Estimated to be 5.418 million Btu per barrel by EIA from data provided by McClanahan Consultants, Inc., Houston, Texas.

Propane. EIA adopted the Bureau of Mines thermal conversion factor of 3.836 million Btu per barrel as published in the *California Oil World and Petroleum Industry,* First Issue, April 1942.

Residual Fuel Oil. EIA adopted the thermal conversion factor of 6.287 million Btu per barrel as reported in the Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950."

Road Oil. EIA adopted the Bureau of Mines thermal conversion factor of 6.636 million Btu per barrel, which was assumed to be equal to that of asphalt (see **Asphalt**) and was first published by the Bureau of Mines in the *Petroleum Statement, Annual, 1970*.

Special Naphthas. EIA adopted the Bureau of Mines thermal conversion factor of 5.248 million Btu per barrel, which was assumed to be equal to that of the total gasoline (aviation and motor) factor and was first published in the *Petroleum Statement, Annual, 1970*.

Still Gas. EIA adopted the Bureau of Mines estimated thermal conversion factor of 6.000 million Btu per barrel, first published in the *Petroleum Statement, Annual, 1970*

Unfinished Oils. EIA assumed the thermal conversion factor to be 5.825 million Btu per barrel or equal to that for distillate fuel (see **Distillate Fuel Oil**) and first published it in EIA's *Annual Report to Congress, Volume 3, 1977*.

Unfractionated Stream. EIA assumed the thermal conversion factor to be 5.418 million Btu per barrel or equal to that for plant condensate (see **Plant Condensate**) and first published it in EIA's *Annual Report to Congress, Volume 2, 1981*.

Waxes. EIA adopted the thermal conversion factor of 5.537 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

Approximate Heat Content of Natural Gas

Natural Gas, Total Consumption. • 1949-1962: EIA adopted the thermal conversion factor of 1,035 Btu per cubic foot as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*. • 1963-1979: EIA adopted the thermal conversion factor calculated annually by the American Gas Association (AGA) and published in *Gas Facts,* an AGA annual publication. • 1980 forward: Calculated annually by EIA by dividing the total heat content of natural gas consumed by the total quantity of natural gas consumed.

Natural Gas, Consumption by Electric Utilities. Calculated annually by EIA by dividing the total heat content of natural gas received at electric

utilities by the total quantity received at electric utilities. The heat contents and receipts are from Form FERC-423 and predecessor forms.

Natural Gas, Consumption by Sectors Other Than Electric Utilities. Calculated annually by EIA by dividing the heat content of all natural gas consumed less the heat content of natural gas consumed at electric utilities by the quantity of all natural gas consumed less the quantity of natural gas consumed at electric utilities. Data are from Forms EIA-176, FERC-423, EIA-759, and predecessor forms.

Natural Gas, Exports. • 1949-1972: Assumed by EIA to be equal to the thermal conversion factor for the consumption of dry natural gas. (See Natural Gas, Total Consumption). • 1973 forward: Calculated annually by EIA by dividing the heat content of exported natural gas by the quantity of natural gas exported, both reported on Form FPC-14.

Natural Gas Imports. • 1949-1972: Assumed by EIA to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Natural Gas, Total Consumption**. • 1973 forward: Calculated annually by EIA by dividing the heat content of imported natural gas by the quantity of natural gas imported, both reported on Form FPC-14.

Natural Gas, Production (Dry). Assumed by EIA to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Natural Gas, Total Consumption**.

Natural Gas, Production, Marketed (Wet). Calculated annually by EIA by adding the heat content of natural gas, dry production, and the total heat content of natural gas plant liquids production and dividing this sum by the total quantity of marketed (wet) natural gas production.

Approximate Heat Content of Coal and Coal Coke

Coal, Total Consumption. Calculated annually by EIA by dividing the sum of the heat content of coal (including anthracite culm and waste coal) consumption by the total tonnage.

Coal, Consumption by Electric Utilities. Calculated annually by EIA by dividing the sum of the heat content of coal (including anthracite culm and waste coal) received at electric utilities by the sum of the total tonnage received.

Coal, Consumption by Other Power Producers. Calculated annually by dividing the total heat content of coal (including anthracite culm and waste coal) consumed by other power producers by their total consumption tonnage.

Coal, Consumption by the Electric Power Sector. Calculated annually by dividing the total heat content of coal (including anthracite culm and waste coal) by total consumption tonnage of the electric power sector.

Coal, Consumption by End-Use Sectors. Calculated annually by EIA by dividing the sum of the heat content of coal (including anthracite culm and waste coal) consumed by the end-use sectors by the sum of the total tonnage.

Coal, Exports. Calculated annually by EIA by dividing the sum of the heat content of coal exported by the sum of the total tonnage.

Coal, Imports. Calculated annually by EIA by dividing the sum of the heat content of coal imported by the sum of the total tonnage.

Coal, Production. Calculated annually by EIA by dividing the sum of the total heat content of coal (including some anthracite culm) produced by the sum of the total tonnage.

Coal Coke, Imports and Exports. EIA adopted the Bureau of Mines estimate of 24.800 million Btu per short ton.

Approximate Heat Rates for Electricity

Fossil-Fueled Steam-Electric Plant Generation. There is no generally accepted practice for measuring the thermal conversion rates for power plants that generate electricity from hydroelectric, wood and waste, wind, photovoltaic, or solar thermal energy sources. Therefore, EIA used data from Form EIA-767, "Steam-Electric Plant Operation and Design Report," to calculate a rate factor that is equal to the prevailing annual average heat rate factor for fossil-fueled steam-electric power plants in the United States. By using that factor, it is possible to evaluate fossil fuel requirements for replacing those sources during periods of interruption, such as droughts. The heat content of a kilowatthour of electricity produced, regardless of the generation process, is 3,412 Btu. • 1949-1955: The weighted annual average heat rate for fossil-fueled steam-electric power

plants in the United States, as published by EIA in *Thermal-Electric Plant Construction Cost and Annual Production Expenses–1981* and *Steam-Electric Plant Construction Cost and Annual Production Expenses–1978.* • 1956-1988: The weighted annual average heat rate for fossil-fueled steam-electric power plants in the United States, as published in EIA, *Electric Plant Cost and Power Production Expenses 1991*, Table 9. • 1989 forward: Unpublished factors calculated on the basis of data from Form EIA-767, "Steam-Electric Plant Operation and Design Report."

Geothermal Energy Plant Generation. • 1960-1981: Calculated annually by EIA by weighting the annual average heat rates of operating geothermal units by the installed nameplate capacities as reported on Form FPC-12, "Power System Statement." • 1982 forward: Estimated annually by EIA on the basis of an informal survey of relevant plants.

Nuclear Steam-Electric Plant Generation. • 1957-1991: Calculated annually by dividing the total heat content consumed in nuclear generating units by the total (net) electricity generated by nuclear generating units. The heat content and electricity generation are reported on Form FERC-1, "Annual Report of Major Electric Utilities, Licensees, and Others"; Form EIA-412, "Annual Report of Public Electric Utilities"; and predecessor forms. The factors, 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.*

Appendix B

Metric and Other Physical Conversion Factors

Data presented in the *Annual Energy Review* and in other Energy Information Administration publications are expressed predominately in units that historically have been used in the United States, such as British thermal units, barrels, cubic feet, and short tons. However, because U.S. commerce involves other nations, most of which use metric units of measure, the U.S. Government is committed to the transition to the metric system, as stated in the Metric Conversion Act of 1975 (Public Law 94-168), amended by the Omnibus Trade and Competitiveness Act of 1988 (Public Law 100-418), and Executive Order 12770 of July 25, 1991.

The metric conversion factors presented in Table B1 can be used to calculate the metric-unit equivalents of values expressed in U.S. customary units. For example, 500 short tons is the equivalent of 453.6 metric tons (500 short tons 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 is 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	1,055.055 852 62[a,c]	=	joules (J)
calories (cal)	x	4.186 8[a]	=	joules (J)
kilowatthours (kWh)	x	3.6[a]	=	megajoules (MJ)

U.S. Unit	*multiplied by*	Conversion Factor	*equals*	Metric Unit
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 (^oF)	x	5/9 (after subtracting 32)[a,d]	=	degrees Celsius (^oC)

[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 (^oC) to degrees Fahrenheit (^oF) exactly, multiply by 9/5, then add 32.

Notes: • Spaces have been inserted after every third digit to the right of the decimal for ease of reading. • Most metric units shown belong to the International System of Units (SI), and the liter, hectare, and metric ton are accepted for use with the SI units. For more information about the SI units, contact Dr. Barry Taylor at Building 221, Room B610, National Institute of Standards and Technology, Gaithersburg, MD 20899, or on telephone number 301–975–4220.

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

Table B2. Metric Prefixes

Unit Multiple	Prefix	Symbol	Unit Multiple	Prefix	Symbol
10^{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	
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

Table C1 presents U.S. average carbon dioxide emission factors for coal by sector. The factors measure the emissions produced during the combustion of coal and were derived by the Energy Information Administration (EIA) from 5,426 sample analyses in EIA's Coal Analysis File. The factors are ratios of the carbon dioxide emitted to the heat content of the coal burned, assuming complete combustion. Factors vary according to the rank and geographic origin of the coal. Sectoral factors reflect the rank and origin of the coal consumed in the sector. Factors differ among sectors and within a sector over time for several reasons:

1. 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).

2. 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.

3. 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.

4. 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 Sector, 1980-1997
(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
1994	209.8	206.3	207.2	207.9	207.8
1995	210.2	206.4	207.2	208.1	207.9
1996	209.5	206.5	207.0	208.1	208.0
1997	210.2	206.6	207.2	208.2	208.0

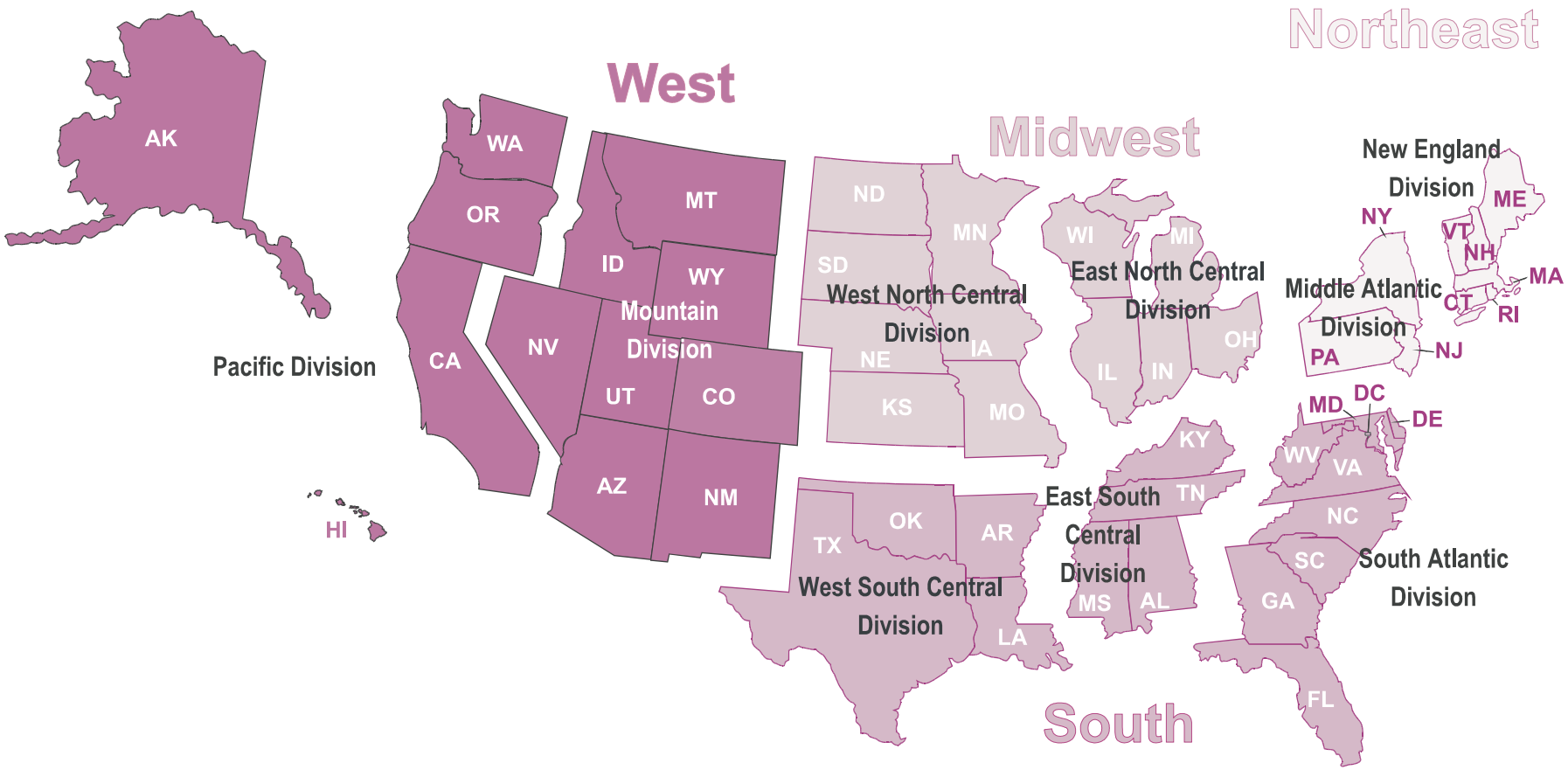
[a]No allowances have been made for carbon-related non-energy coal chemical by-products from the coal carbonization process.

[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

U.S. Census Regions and Divisions



Note: Map not to scale.
Source: Adapted from U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States, 1999* (Washington, DC, October 1999), Figure 1.

Appendix E

Table E1. U.S. Gross Domestic Product and Implicit Price Deflator; U.S. and World Population

Year	U.S. Gross Domestic Product (billion chained (1996) dollars)	U.S. Gross Domestic Product Implicit Price Deflator [1] (1996 = 1.0000)	U.S. Population [2] (million people)	World Population (million people)
1949	R1,550.9	R0.1726	148.7	NA
1950	R1,686.6	R0.1745	151.3	2,556.0
1951	R1,815.1	R0.1871	154.0	2,593.8
1952	R1,887.3	R0.1900	156.4	2,635.8
1953	R1,973.9	R0.1925	159.0	2,681.1
1954	R1,960.5	R0.1944	161.9	2,729.0
1955	R2,099.5	R0.1978	165.1	2,780.3
1956	R2,141.1	R0.2045	168.1	2,833.2
1957	R2,183.9	R0.2113	171.2	2,888.9
1958	R2,162.8	R0.2164	174.1	2,945.3
1959	R2,319.0	R0.2188	177.1	2,997.5
1960	R2,376.7	R0.2219	179.3	3,039.5
1961	R2,432.0	R0.2244	183.0	3,080.1
1962	R2,578.9	R0.2274	185.7	3,136.1
1963	R2,690.4	R0.2300	188.4	3,205.5
1964	R2,846.5	R0.2334	191.1	3,276.5
1965	R3,028.5	R0.2378	193.5	3,345.4
1966	R3,227.5	R0.2446	195.5	3,415.5
1967	R3,308.3	R0.2521	197.4	3,485.2
1968	R3,466.1	R0.2630	199.3	3,556.9
1969	R3,571.4	R0.2759	201.3	3,631.4
1970	R3,578.0	R0.2906	203.3	3,706.6
1971	R3,697.7	R0.3052	206.8	3,784.0
1972	R3,898.4	R0.3182	209.3	3,860.7
1973	R4,123.4	R0.3360	211.4	3,937.1
1974	R4,099.0	R0.3662	213.3	4,012.8
1975	R4,084.4	R0.4003	215.5	4,086.3
1976	R4,311.7	R0.4230	217.6	4,158.3
1977	R4,511.8	R0.4502	219.8	4,230.7
1978	R4,760.6	R0.4823	222.1	4,302.9
1979	R4,912.1	R0.5225	224.6	4,378.1
1980	R4,900.9	R0.5704	226.5	4,453.8
1981	R5,021.0	R0.6237	229.5	4,529.9
1982	R4,919.3	R0.6625	231.7	4,610.2
1983	R5,132.3	R0.6888	233.8	4,690.5
1984	R5,505.2	R0.7144	235.8	4,769.9
1985	R5,717.1	R0.7369	237.9	4,850.6
1986	R5,912.4	R0.7531	240.1	4,933.0
1987	R6,113.3	R0.7758	242.3	5,018.5
1988	R6,368.4	R0.8021	244.5	5,104.6
1989	R6,591.8	R0.8327	246.8	5,190.3
1990	R6,707.9	R0.8651	248.8	5,277.0
1991	R6,676.4	R0.8966	R252.2	5,359.4
1992	R6,880.0	R0.9184	255.0	5,441.8
1993	R7,062.6	R0.9405	R257.8	5,522.9
1994	R7,347.7	R0.9601	260.3	5,602.6
1995	R7,543.8	R0.9810	262.8	5,682.4
1996	R7,813.2	R1.0000	265.2	5,760.9
1997	R8,144.8	R1.0191	R267.8	R5,840.6
1998	R8,495.7	R1.0311	R270.2	R5,918.9
1999	8,848.2	1.0461	272.7	5,996.7

[1] 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.

R=Revised. NA=Not available.

Note: See "Chained Dollars" in the Glossary.

Web Pages: • http://www.bea.doc.gov/. • //www.census.gov/.

Sources: **U.S. Gross Domestic Product and U.S. Gross Domestic Product Implicit Price Deflator:** • 1949 forward—Department of Commerce (DOC), Bureau of Economic Analysis (BEA), *Survey of Current Business*. **U.S. Population:** • 1949-1989—DOC, U.S. Bureau of the Census, Current Population Reports Series P-25, November 1998. • 1990 forward—Bureau of the Census, State Population Estimates, December 29, 1999. **World Population:** • 1950 forward—DOC, Bureau of the Census, International Database, December 29, 1999.

Appendix F

Table F1a. Energy Consumption in the United States, Selected Years, 1635-1945

(Quadrillion Btu)

Year	Coal	Natural Gas	Petroleum	Nuclear Electric Power	Hydroelectric Power	Wood
1635	NA	—	—	—	—	(s)
1645	NA	—	—	—	—	0.001
1655	NA	—	—	—	—	0.002
1665	NA	—	—	—	—	0.005
1675	NA	—	—	—	—	0.007
1685	NA	—	—	—	—	0.009
1695	NA	—	—	—	—	0.014
1705	NA	—	—	—	—	0.022
1715	NA	—	—	—	—	0.037
1725	NA	—	—	—	—	0.056
1735	NA	—	—	—	—	0.080
1745	NA	—	—	—	—	0.112
1755	NA	—	—	—	—	0.155
1765	NA	—	—	—	—	0.200
1775	NA	—	—	—	—	0.249
1785	NA	—	—	—	—	0.310
1795	NA	—	—	—	—	0.402
1805	NA	—	—	—	—	0.537
1815	NA	—	—	—	—	0.714
1825	NA	—	—	—	—	0.960
1835	NA	—	—	—	—	1.305
1845	NA	—	—	—	—	1.757
1850	0.219	—	—	—	—	2.138
1855	0.421	—	—	—	—	2.389
1860	0.518	—	0.003	—	—	2.641
1865	0.632	—	0.010	—	—	2.767
1870	1.048	—	0.011	—	—	2.893
1875	1.440	—	0.011	—	—	2.872
1880	2.054	—	0.096	—	—	2.851
1885	2.840	0.082	0.040	—	—	2.683
1890	4.062	0.257	0.156	—	0.022	2.515
1895	4.950	0.147	0.168	—	0.090	2.306
1900	6.841	0.252	0.229	—	0.250	2.015
1905	10.001	0.372	0.610	—	0.386	1.843
1910	12.714	0.540	1.007	—	0.539	1.765
1915	13.294	0.673	1.418	—	0.691	1.688
1920	15.504	0.813	2.676	—	0.775	1.610
1925	14.706	1.191	4.280	—	0.701	1.533
1930	13.639	1.932	5.897	—	0.785	1.455
1935	10.634	1.919	5.675	—	0.831	1.397
1940	12.535	2.665	7.760	—	0.917	1.358
1945	15.972	3.871	10.110	—	1.486	1.261

NA=Not available. — = Not applicable. (s)=Less than 0.0005 quadrillion Btu.

Notes: • No data are available for years not shown. • See end of section for discussion of geographic coverage of data.

Sources: **Coal, Petroleum and Natural Gas, and Hydroelectric Power:** • 1850-1945: *Energy in the American Economy, 1850-1975,* Table VII. **Wood:** • 1635-1845: U.S. Department of Agriculture Circular No. 641, *Fuel Wood Used in the United States 1630-1930,* February 1942. This source estimates fuelwood consumption in cords per decade, which were converted to Btu using the conversion factor of 20 million Btu per cord. The annual average value for each decade was assigned to the fifth year of the decade on the assumption that annual use was likely to increase during any given decade and the average annual value was more likely to reflect mid-decade yearly consumption than use at either the beginning or end of the decade. Values thus begin at 1635 and are plotted at 10-year intervals. • 1850-1945: *Energy in the American Economy, 1850-1975,* Table VII (see Bibliography). Values are plotted at 5-year intervals. There is a discontinuity in the wood plot between 1945 and 1949 due to changes in definitions. Data through 1945 are for fuelwood only, while thereafter include wood-derived fuel and wood byproducts burned as fuel, such as cord wood, limb wood, spent pulping liquor, pulp waste, wood sludge, hogged fuel, peat, railroad ties, sawdust, wood chips, bark, forest residues, and charcoal.

Table F1b. Energy Consumption in the United States, 1949-1999

(Quadrillion Btu)

Year	Coal	Natural Gas [1]	Petroleum [2]	Nuclear Electric Power	Hydroelectric Power [3]	Wood
1949	11.981	5.145	11.883	0	1.449	1.549
1950	12.347	5.968	13.315	0	1.440	1.562
1951	12.553	7.049	14.428	0	1.454	1.535
1952	11.306	7.550	14.956	0	1.496	1.474
1953	11.373	7.907	15.556	0	1.439	1.419
1954	9.715	8.330	15.839	0	1.388	1.394
1955	11.167	8.998	17.255	0	1.407	1.424
1956	11.350	9.614	17.937	0	1.487	1.416
1957	10.821	10.191	17.932	(s)	1.557	1.334
1958	9.533	10.663	18.527	0.002	1.629	1.323
1959	9.518	11.717	19.323	0.002	1.587	1.353
1960	9.838	12.385	19.919	0.006	1.657	1.320
1961	9.623	12.926	20.216	0.020	1.680	1.295
1962	9.906	13.731	21.049	0.026	1.822	1.300
1963	10.413	14.403	21.701	0.038	1.772	1.323
1964	10.964	15.288	22.301	0.040	1.907	1.337
1965	11.581	15.769	23.246	0.043	2.058	1.335
1966	12.143	16.995	24.401	0.064	2.073	1.369
1967	11.914	17.945	25.284	0.088	2.344	1.340
1968	12.331	19.210	26.979	0.142	2.342	1.419
1969	12.382	20.678	28.338	0.154	2.659	1.440
1970	12.265	21.795	29.521	0.239	2.654	1.429
1971	11.598	22.469	30.561	0.413	2.861	1.430
1972	12.077	22.698	32.947	0.584	2.944	1.501
1973	12.971	22.512	34.840	0.910	3.010	1.527
1974	12.663	21.732	33.455	1.272	3.309	1.538
1975	12.663	19.948	32.731	1.900	3.219	1.497
1976	13.584	20.345	35.175	2.111	3.066	1.711
1977	13.922	19.931	37.122	2.702	2.515	1.837
1978	13.766	20.000	37.965	3.024	3.141	2.036
1979	15.040	20.666	37.123	2.776	3.141	2.150
1980	15.423	20.394	34.202	2.739	3.118	2.483
1981	15.908	19.928	31.931	3.008	3.105	2.495
1982	15.322	18.505	30.232	3.131	3.572	2.477
1983	15.894	17.357	30.054	3.203	3.899	2.639
1984	17.071	18.507	31.051	3.553	3.800	2.629
1985	17.478	17.834	30.922	4.149	3.398	[4]2.576
1986	17.260	16.708	32.196	4.471	3.446	[4]2.518
1987	18.008	17.744	32.865	4.906	3.117	2.465
1988	18.846	18.552	34.222	5.661	2.662	[4]2.552
1989	18.926	19.384	34.211	5.677	2.999	2.635
1990	19.101	19.296	33.553	6.162	3.104	2.188
1991	18.770	19.606	32.845	6.580	3.175	2.188
1992	19.158	20.131	33.527	6.608	2.820	2.288
1993	19.776	20.827	33.841	6.520	3.105	2.226
1994	19.960	21.288	34.670	6.838	2.936	2.314
1995	20.024	22.163	34.553	7.177	3.446	2.418
1996	20.940	22.559	35.757	7.168	3.883	2.465
1997	21.444	22.530	36.266	6.678	3.898	2.348
1998	21.593	21.921	36.934	7.157	3.506	2.346
1999	21.698	22.096	37.706	7.733	3.354	2.832

[1] Includes supplemental gaseous fuels.
[2] Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel.
[3] Conventional hydroelectric power and hydroelectric pumped storage (total pumped storage facility production minus energy used for pumping). Through 1988, includes all net imports of electricity. From 1989, includes only the portion of net imports of electricity that is derived from hydroelectric power.
[4] No data were available; therefore values were interpolated.
(s)=Less than 0.0005 quadrillion Btu.
Sources: **Wood:** Table 10.4. **All Other Data:** Table 1.3.

Geographic Coverage Note

Tables F1a and F1b present estimates of U.S. energy consumption by energy source for a period that begins a century and a half before the original 13 colonies formed a political union and continues through the decades during which the United States was still expanding territorially. The question thus arises, what exactly is meant by "U.S. consumption" of an energy source for those years when the United States did not formally exist or consisted of less territory than is now encompassed by the 50 States and the District of Columbia?

The documents used to assemble the estimates, and (as far as possible) the sources of those documents, were reviewed carefully for clues to geographic coverage. For most energy sources, the extent of coverage expanded more rapidly than the Nation, defined as all the official States and the District of Columbia. Estimates or measurements of consumption of each energy source generally appear to follow settlement patterns. That is, they were made for areas of the continent that were settled enough to have economically significant consumption even though those areas were not to become States for years. The wood data series, for example, begins in 1635 and includes 12 of the original colonies (excepting Georgia), as well as Maine, Vermont, and the area that would become the District of Columbia. By the time the series reaches 1810, the rest of the continental States are all included, though the last of the lower-48 States to achieve statehood did not do so until 1912. Likewise, the coal data series begins in 1850 but includes consumption in areas, such as Utah and Washington (State), which were significant coal-producing regions but had not yet attained statehood. (Note: No data were available on State-level historical coal consumption. The coal data shown in Table F1a through 1945 describe *apparent* consumption, i.e., production plus imports minus exports. The geographic coverage for coal was therefore based on a tally of coal-*producing* States listed in various historical issues of *Minerals Yearbook*. It is likely that coal was consumed in States where it was not mined in significant quantities.)

By energy source, the extent of coverage can be summarized as follows: • **Wood**—All 48 contiguous States and the District of Columbia by 1810; Alaska and Hawaii beginning in 1949. • **Coal**—35 coal-producing States by 1885. • **Petroleum and natural gas**—All 48 contiguous States, the District of Columbia, and Alaska by 1885; Hawaii beginning in 1949. • **Hydroelectric power**—Coverage for 1890 and 1895 is uncertain, but probably the 48 contiguous States and the District of Columbia. Coverage for 1900 through 1945 is the 48 contiguous States, and the District of Columbia; Alaska and Hawaii beginning in 1949. • **Nuclear electric power**—Coverage is all 50 States and the District of Columbia throughout.

Glossary

Account of Others (Natural Gas): Natural gas deliveries for the account of others. The transporters that make such deliveries do not own the gas but deliver it for others for a fee. Included are quantities covered by long-term contracts and quantities involved in short-term or spot market sales.

Alcohol: The family name of a group of organic chemical compounds composed of carbon, hydrogen, and oxygen. The series of molecules vary in chain length and are composed of a hydrocarbon plus a hydroxyl group: CH_3-$(CH_2)_n$-OH (e.g., methanol, ethanol, and tertiary butyl alcohol).

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

Anthracite Culm: Waste from Pennsylvania anthracite preparation plants, consisting of coarse rock fragments containing as much as 30 percent small-sized coal; sometimes defined as including very fine coal particles called silt. Its heat value ranges from 8 to 17 million Btu per short ton.

Anthropogenic: Made or generated by a human or caused by human activity. The term is used in the context of global climate change to refer to gaseous emissions that are produced as the result of human activities.

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.

Asphalt: A dark-brown to black cement-like material containing bitumens as the predominant constituents obtained by petroleum processing; used primarily for road construction. It includes crude asphalt as well as the following finished products: cements, fluxes, the asphalt content of emulsions (exclusive of water), and petroleum distillates blended with asphalt to make cutback asphalts. Note: The conversion factor for asphalt is 5.5 barrels per short ton.

Asphalt (refined): See Asphalt.

ASTM: The American Society for Testing and Materials, a trade association.

Aviation Gasoline Blending Components: Naphthas that are used for blending or compounding gasoline into finished aviation gasoline (e.g., straight-run gasoline, alkylate, and reformate). Excluded are oxygenates (alcohols, ethers), butane, and pentanes plus.

Aviation Gasoline, Finished: A complex mixture of relatively volatile hydrocarbons with or without small quantities of additives, blended to form a fuel suitable for use in aviation reciprocating engines. Fuel specifications are provided in ASTM Specification D910 and Military Specification MIL-G-5572. Note: Data on blending components are not counted in data on finished aviation gasoline. See **Jet Fuel, Finished; Jet Fuel, Kerosene-Type;** and **Jet Fuel, Naphtha-Type.**

Barrel (Petroleum): A unit of volume equal to 42 U.S. gallons.

Barrels per 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 (C) 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.

Biomass: Organic nonfossil material of biological origin constituting a renewable energy source.

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

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.**)

Bunker Fuels: Fuel supplied to ships and aircraft, both domestic and foreign, consisting primarily of residual and distillate fuel oil for ships and kerosene-based jet fuel for aircraft. The term "international bunker fuels" is used to denote the consumption of fuel for international transport activities. Note: For the purposes of greenhouse gas emissions inventories, emissions from combustion of international bunker fuels are subtracted from national emissions totals.

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.

Carbon Dioxide: A colorless, odorless, non-poisonous gas that is a normal part of the Earth's atmosphere. Carbon dioxide is a product of fossil-fuel combustion as well as other processes. It is considered a greenhouse gas as it traps the earth's heat and contributes to the potential for global warming. Other greenhouse gases are measured in relation to the global warming potential (GWP) of carbon dioxide, which, by international scientific convention, is assigned the value of 1. See Global Warming Potential (GWP).

Carbon Dioxide Equivalent: The amount of carbon dioxide by weight emitted into the atmosphere that would produce the same estimated radiative forcing as a given weight of another radiatively active gas. Carbon dioxide equivalents are computed by multiplying the weight of the gas being measured (for example, methane) by its estimated global warming potential (which is 21 for methane). "Carbon equivalent units" are defined as carbon dioxide equivalents multiplied by the carbon content of carbon dioxide (i.e., 12/44).

Chained Dollars: A measure used to express real prices. Real prices are those that have been adjusted to remove the effect of changes in the purchasing power of the dollar; they usually reflect buying power relative to a reference year. Prior to 1996, real prices were expressed in constant dollars, a measure based on the weights of goods and services in a single year, usually a recent year. In 1996, the U.S. Department of Commerce introduced the chained-dollar measure. The new measure is based on the average weights of goods and services in successive pairs of years. It is "chained" because the second year in each pair, with its weights, becomes the first year of the next pair. The advantage of using the chained-dollar

measure is that it is more closely related to any given period covered and is therefore subject to less distortion over time.

Chlorofluorocarbons (CFCs): A family of inert, non-toxic, easily liquefied chemicals used in refrigeration, air conditioning, packaging, and insulation, or as solvents or aerosol propellants.

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.

Climate Change: A term used to refer to all forms of climatic inconsistency, but especially to significant change from one prevailing climatic condition to another. In some cases, "climate change" has been used synonymously with the term "global warming"; scientists, however, tend to use the term in a wider sense to include natural changes in climate as well as climatic cooling.

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

Coal Coke: See **Coke, Coal.**

Coal Rank: The classification of coals according to their degree of progressive alteration from lignite to anthracite. In the United States, the standard ranks of coal include lignite, subbituminous coal, bituminous coal, and anthracite and are based on fixed carbon, volatile matter, heating value, and agglomerating (or caking) properties. See **Anthracite, Bituminous Coal, Lignite,** and **Subbituminous Coal.**

Coal Stocks: Coal quantities that are held in storage for future use and disposition. Note: When coal data are collected for a particular reporting period (month, quarter, or year), coal stocks are commonly measured as of the last day of this period.

Cogenerator: A generating facility that produces electricity and another form of useful energy (such as heat or steam) used for industrial, commercial, heating, or cooling purposes. See **Electric Utility** and **Nonutility Power Producer.**

Coke, Coal: A solid carbonaceous residue derived from low-ash, low-sulfur bituminous coal from which the volatile constituents are driven off by baking in an oven at temperatures as high as 2,000 F so that the fixed carbon and residual ash are fused together. Coke is used as a fuel and as a reducing agent in smelting iron ore in a blast furnace. Coke from coal is gray, hard, and porous and has a heating value of 24.8 million Btu per short ton.

Coke, Petroleum: A residue high in carbon content and low in hydrogen that is the final product of thermal decomposition in the condensation process in cracking. This product is reported as marketable coke or catalyst coke. The conversion is 5 barrels (of 42 U.S. gallons each) per short ton. Coke from petroleum has a heating value of 6.024 million Btu per barrel.

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: 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.

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.

Conversion Factor: A number that translates units of one system into corresponding values of another system. Conversion factors can be used to

translate physical units of measure for various fuels into Btu equivalents. See **British Thermal Unit.**

Cooling Tower: A common type of environmental equipment installed at power plants used to transfer heat, produced by burning fuel, to the atmosphere. Cooling towers are installed where there is insufficient cooling water available or where waste heat discharged into cooling water would affect marine life.

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.

Criteria Pollutant: A pollutant determined to be hazardous to human health and regulated under the Environmental Protection Agency's (EPA) National Ambient Air Quality Standards. The 1970 amendments to the Clean Air Act require EPA to describe the health and welfare impacts of a pollutant as the "criteria" for inclusion in the regulatory regime.

Crude Oil: A mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Crude oil may also include: 1. Small amounts of hydrocarbons that exist in the gaseous phase in natural underground reservoirs but are liquid at atmospheric pressure after being recovered from oil well (casinghead) gas in lease separators and that subsequently are commingled with the crude stream without being separately measured. 2. Small amounts of nonhydrocarbons produced with the oil, such as sulfur and other compounds. Note: In reporting crude oil data at various stages of the petroleum supply stream, Energy Information Administration survey programs have definitional variations due to whether associated products or materials are counted with crude oil. Some products and other materials are either mixed with the crude oil and cannot be separately measured or they are logically associated with crude oil for accounting purposes. Crude oil reserves data contain separate estimates for lease condensate, whereas crude oil supply data include lease condensate. Crude oil supply data include liquid hydrocarbons produced from tar sands, gilsonite, and oil shale. U.S. data on crude oil reserves do not include these sources unless it become economically viable to produce crude oil from them.

Crude Oil Landed Cost: The dollar-per-barrel price of crude oil at the port of discharge. Included are the charges associated with the purchase, transporting, and insuring of a cargo from the purchase point to the port of discharge. Not included are charges incurred at the discharge port (e.g., import tariffs or fees, wharfage charges, and demurrage charges).

Crude Oil Refinery Input: The total crude oil put into processing units at refineries.

Crude Oil Stocks: Stocks of crude oil and lease condensate held at refineries, in pipelines, at pipeline terminals, and on leases.

Crude Oil Used Directly: Crude oil consumed as fuel by crude oil pipelines and on crude oil leases.

Cubic Foot (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.

Culm: See **Anthracite Culm**.

Degree-Days, Cooling (CDD): The number of degrees per day that the daily average temperature is above 65° F. The daily average temperature is the mean of the maximum and minimum temperatures for a 24-hour period.

Degree-Days, Heating (HDD): The number of degrees per day that the daily average temperature is below 65° F. The daily average temperature is the mean of the maximum and minimum temperatures for a 24-hour period.

Degree-Days, Population-Weighted: Heating or cooling degree-days weighted by the population of the area in which the degree-days are recorded. To compute State population-weighted degree-days, each State is divided into from one to nine climatically homogeneous divisions, which are assigned weights based on the ratio of the population of the division to

the total population of the State. Degree-day readings for each division are multiplied by the corresponding population weight for each division and those products are then summed to arrive at the State population-weighted degree-day figure. To compute national population-weighted degree-days, the Nation is divided into nine Census regions, each comprising from three to eight States, which are assigned weights based on the ratio of the population of the region to the total population of the Nation. Degree-day readings for each region are multiplied by the corresponding population weight for each region and those products are then summed to arrive at the national population-weighted degree-day figure.

Demand-Side Management: The planning, implementation, and monitoring of utility activities designed to encourage consumers to modify patterns of electricity usage, including the timing and level of electricity demand.

Demonstrated Reserve Base (Coal): A collective term for the sum of coal in both measured and indicated resource categories of reliability, representing 100 percent of the in-place coal in those categories as of a certain date. Includes beds of bituminous coal and anthracite 28 or more inches thick and beds of subbituminous coal 60 or more inches thick that can occur at depths of 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 currently are being mined or for which there is evidence that they could be mined commercially at a given time. Represents that portion of the identified coal resource from which reserves are calculated.

Design Electrical Rating, 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. It includes diesel fuels and fuel oils. Products known as No. 1, No. 2, and No. 4 diesel fuel are used in on-highway diesel engines, such as those found in cars and trucks, as well as off-highway engines, such as those in railroad locomotives and agricultural machinery. Products known as No. 1, No. 2, and No. 4 fuel oils are used primarily for space heating and electric power generation.

Distillation Unit (Atmospheric): The primary distillation unit that processes crude oil (including mixtures of other hydrocarbons) at approximately atmospheric conditions. It includes a pipe still for vaporizing the crude oil and a fractionation tower for separating the vaporized hydrocarbon components in the crude oil into fractions with different boiling ranges. This is done by continuously vaporizing and condensing the components to separate higher boiling point material. The selected boiling ranges are set by the processing scheme, the properties of the crude oil, and the product specifications.

District Heat: Steam or hot water from an outside source used as an energy source in a building. The steam or hot water is produced in a central plant and is piped into the building. District heat may be purchased from a utility or provided by a physical plant in a separate building that is part of the same facility (for example, a hospital complex or university).

Dry Hole: An exploratory or development well found to be incapable of producing either oil or gas in sufficient quantities to justify completion as an oil or gas well.

Dry Natural Gas Production: The volume of natural gas withdrawn from reservoirs less: (1) the volume returned to such reservoirs in cycling, repressuring of oil reservoirs, and conservation operations; (2) gas vented and flared; (3) nonhydrocarbon gases removed from the gas stream; (4) gas converted to liquid form such as lease condensate and plant liquids, and removed from the produced gas stream. Volumes of dry gas withdrawn from gas storage reservoirs are not considered part of production. Data on dry natural gas production equals marketed production minus production of natural gas liquids. *Note:* The parameters for measurement are cubic feet at 60 degrees Fahrenheit and 14.73 pounds standard per square inch absolute.

Eastern Europe and Former U.S.S.R.: Includes Albania, Azerbaijan, Belarus, Bulgaria, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. See **U.S.S.R.**

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. The energy required for pumping at a pumped-storage hydroelectric plant is regarded as plant use and is deducted from the gross generation.

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

Electric Power Plant: A station containing prime movers, electric generators, and auxiliary equipment for converting mechanical, chemical, and/or fission energy into electric energy.

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: 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 of the energy industry. Consolidated company accounts do not include intersegment revenues and expenses. Therefore, A gaseous mixture of hydrocarbon compounds, primarily **methane**, delivered via pipeline for consumption. It is used as a fuel for electricity generation, a variety of uses in buildings, and as raw material input and fuel for industrial processes. *Note*: This product, also referred to as **Dry natural gas** or **Consumer-grade natural gas**, is the product that remains after **Wet natural gas** has been processed at lease facilities and/or natural gas processing plants. This processing removes nonhydrocarbon gases (e.g., water vapor, carbon dioxide, helium, hydrogen sulfide, and nitrogen) that would otherwise make the gas unmarketable and **natural gas liquids**. such intersegment transactions must be eliminated.

Emissions: Anthropogenic releases of gases to the atmosphere. In the context of global climate change, they consist of radiatively important greenhouse gases (e.g., the release of carbon dioxide during fuel combustion).

End-Use Sectors: The residential, commercial, industrial, and transportation sectors of the economy.

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

Energy Consumption: The use of energy as a source of heat or power or as an input in the manufacturing process.

Energy Expenditures: The money spent directly by consumers to purchase energy. Expenditures equal the amount of energy used by the consumer times the price per unit paid by the consumer.

Energy Source: A substance, such as petroleum, natural gas, or coal, that supplies heat or power. In Energy Information Administration reports, electricity and renewable forms of energy, such as wood, waste, geothermal, wind, and solar, are considered to be energy sources.

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: A colorless, flammable, gaseous, olefinic hydrocarbon recovered from natural gas and petroleum. Ethylene is used as a petrochemical feedstock for numerous chemical applications and the production of consumer goods.

Exploratory Well: A well drilled to find and produce oil or gas in an 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.

FAS: See **Free Alongside Ship.**

Federal Energy Administration: A predecessor of the Energy Information Administration.

Federal Energy Regulatory Commission (FERC): The Federal agency with jurisdiction over interstate electricity sales, wholesale electric rates, hydroelectric licensing, natural gas pricing, oil pipeline rates, and gas pipeline certification. FERC is an independent regulatory agency within the Department of Energy and is the successor to the Federal Power Commission.

Federal Power Commission (FPC): The predecessor agency of the Federal Energy Regulatory Commission. The Federal Power Commission was created by an Act of Congress under the Federal Water Power Act on June 10, 1920. It was charged originally with regulating the electric power and natural gas industries. It was abolished on September 30, 1977, when the Department of Energy was created. Its functions were divided between the Department of Energy and the Federal Energy Regulatory Commission, an independent regulatory agency.

Financial Reporting System (FRS): The Energy Information Administration's statutory requirement to identify major energy-producing companies and develop and implement a data-reporting program for energy financial and operating information from these companies. Companies are selected if they are within the top 50 publicly-owned U.S. crude oil producers that have at least 1 percent of either production or reserves of oil, gas, coal, or uranium in the United States, or 1 percent of either refining capacity or petroleum product sales in the United States.

First Use: Manufacturing establishments' consumption of the energy that was originally produced offsite or was produced onsite from input materials not classified as energy**.**

First Purchase Price: The marketed first sales price of domestic crude oil, consistent with the removal price defined by the provisions of the Windfall Profits Tax on Domestic Crude Oil (Public Law 96-223, Sec. 4998 [c]).

Fiscal Year: The U.S. Government's fiscal year runs from October 1 through September 30. The fiscal year is designated by the calendar year in which it ends; e.g., fiscal year 1999 began on October 1, 1998, and ends on September 30, 1999.

Flared Natural Gas: Natural gas burned in flares on the base site or at gas processing plants.

FOB: See **Free on Board.**

Footage Drilled: Total footage for wells in various categories, as reported for any specified period, includes (1) the deepest total depth (length of well bores) of all wells drilled from the surface, (2) the total of all bypassed footage drilled in connection with reported wells, and (3) all new footage drilled for directional sidetrack wells. Footage reported for directional sidetrack wells does not include footage in the common bore, which is reported as footage for the original well. In the case of old wells drilled deeper, the reported footage is that which was drilled below the total depth of the old well.

Former U.S.S.R.: See **U.S.S.R.**

Forward Costs: 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, for example, 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 formed in the Earth's crust, such as petroleum, coal, and natural gas.

Fossil Fueled Steam-Electric Power Plant: An electricity generation plant in which the prime mover is a turbine rotated by high-pressure steam produced in a boiler by heat from burning fossil fuels.

Fractionation: The process by which hydrocarbons recovered from natural gas and separated into distinct parts, or "fractions" such as propane, butane, and ethane.

Free Alongside Ship (FAS): 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 (FOB): 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.**

Fuelwood: See **Wood Energy.**

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 containing alcohol (generally ethanol but sometimes methanol) at a concentration of 10 percent or less by volume. Data on gasohol that has at least 2.7 percent oxygen, by weight, and is intended for sale inside carbon monoxide nonattainment areas are included in data on oxygenated gasoline. See **Oxygenates.**

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 and one or more combustion chambers where liquid or gaseous fuel is burned. 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 or pumping.

Global Warming: An increase in the near surface temperature of the Earth. Global warming has occurred in the distant past as the result of natural influences, but the term is most often used to refer to the warming predicted to occur as a result of increased anthropogenic emissions of greenhouse gases. See **Greenhouse Gases** and **Climate Change.**

Global Warming Potential (GWP): An index used to compare the relative radiative forcing of different gases without directly calculating the changes in atmospheric concentrations. GWPs are calculated as the ratio of the radiative forcing that would result from the emission of one kilogram of a greenhouse gas to that from the emission of one kilogram of carbon dioxide over a period of time, such as 100 years.

Greenhouse Gases: Those gases, such as water vapor, carbon dioxide, nitrous oxide, methane, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride, that are transparent to solar (short-wave) radiation but opaque to long-wave radiation, thus preventing long-wave radiant energy from leaving the atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.

Gross Domestic Product (GDP): The total value of goods and services produced by labor and property located in the United States. As long as the labor and property are located in the United States, the supplier (that is, the workers and, for property, the owners) may be either U.S. residents or residents of foreign countries.

Gross Domestic Product (GDP) Implicit Price Deflator: A measure used to convert nominal prices to real prices. See **Chained Dollars.**

Gross Electricity Generation: See **Electricity Generation, Gross.**

Gross Input to Atmospheric Crude Oil Distillation Units: Total input to atmospheric crude oil distillation units. Includes all crude oil, lease condensate, natural gas plant liquids, unfinished oils, liquefied refinery gases, slop oils, and other liquid hydrocarbons produced from tar sands, gilsonite, and oil shale.

Heat Content of a Quantity of Fuel, Gross: The total amount of heat released when a fuel is burned. Coal, crude oil, and natural gas all include chemical compounds of carbon and hydrogen. When those fuels are burned, the carbon and hydrogen combine with oxygen in the air to produce carbon dioxide and water. Some of the energy released in burning goes into transforming the water into steam and is usually lost. The amount of heat spent in transforming the water into steam is counted as part of gross heat content but is not counted as part of net content. Gross heat content is also referred to as the higher heating value. Btu conversion factors typically used by Energy Information Administration represent gross heat content.

Heat Content of a Quantity of Fuel, Net: The amount of usable heat energy released when a fuel is burned under conditions similar to those in which it is normally used. Net heat content is also referred to as the lower heating value. Btu conversion factors typically used by the Energy Information Administration represent gross heat content.

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

Hogged Fuel: Wood energy that is the result of chopping, shredding, and/or mincing wood and wood products.

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.

Hydroelectric Pumped Storage: Hydroelectricity that is generated during peak load periods by using water previously pumped into an elevated storage reservoir during off-peak periods when excess generating capacity is available to do so. When additional generating capacity is needed, the

water can be released from the reservoir through a conduit to turbine generators located in a power plant at a lower level.

Hydrofluorocarbons (HFCs): A group of anthropogenic chemicals composed of one or two carbon atoms and varying numbers of hydrogen and fluorine atoms. Most HFCs have 100-year Global Warming Potentials in the thousands.

Implicit Price Deflator: See **Chained Dollars.**

Imports: Receipts of goods into the 50 States and the District of Columbia from 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 ½ to 1½ miles apart. Indicated coal is projected to extend as a ½-mile-wide belt that lies more than ¼ mile from the outcrop or points of observation or measurement.

Industrial Sector: 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.

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: A refined petroleum product used in jet aircraft engines. It includes kerosene-type jet fuel and naphtha-type jet fuel.

Jet Fuel, Finished: A complex mixture of relatively volatile hydrocarbons with or without small quantities of additives, blended to form a fuel suitable for use in aviation reciprocating engines. Fuel specifications are provided in ASTM Specification D910 and Military Specification MIL-G-5572. Note: Data on blending components are not counted in data on finished aviation gasoline. See **Aviation Gasoline, Finished.**

Jet Fuel, Kerosene-Type: A kerosene-based product with a maximum distillation temperature of 400 F at the 10-percent recovery point and a final maximum boiling point of 572 F and meeting ASTM Specification 1655 and Military Specifications MIL-T-5624P and MIL-T-83133D (Grades JP-5 and JP-8). It is used for commercial and military turbojet and turboprop aircraft engines.

Jet Fuel, Naphtha-Type: A fuel in the heavy naphtha boiling range, with an average gravity of 52.8º API, 20 to 90 percent distillation temperature of 290 F to 470 F, and meeting Military Specification MIL-T-5624L (Grade JP-4). It is used primarily for military turbojet and turboprop aircraft engines because it has a lower freeze point than other aviation fuels and meets engine requirements at high altitudes and speeds.

Kerosene: A light petroleum distillate that is used in space heaters, cook stoves, and water heaters and is suitable for use as a light source when burned in wick-fed lamps. Kerosene has a maximum distillation temperature of 400° F at the 10-percent recovery point, a final boiling point of 572° F, and a minimum flash point of 100° F. Included are No. 1-K and No. 2-K, the two grades recognized by ASTM Specification D3699 as well as all other grades of kerosene called range or stove oil, which have properties similar to those of No. 1 fuel oil. See **Jet Fuel, Kerosene-Type.**

Kilowatthour: A measure of electricity defined as a unit of work or energy, measured as 1 kilowatt (1,000 watts) of power expended for 1 hour. One kilowatthour is equivalent to 3,412 Btu.

Landed Cost: See **Crude Oil Landed Cost.**

Lease and Plant Fuel: Natural gas used in well, field, and lease operations (such as gas used in drilling operations, heaters, dehydrators, and field compressors), and used as fuel in natural gas processing plants.

Lease Condensate: A mixture consisting primarily of pentanes and heavier hydrocarbons which is recovered as a liquid from natural gas in lease separation facilities. This category excludes natural gas plant liquids, such as butane and propane, which are recovered at downstream natural gas processing plants or facilities.

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

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

Liquefied Natural Gas (LNG): Natural gas (primarily methane) that has been liquefied by reducing its temperature to -260° F at atmospheric pressure.

Liquefied Petroleum Gases (LPG): A group of hydrocarbon-based gases derived from crude oil refining or natural gas fractionation. They include ethane, ethylene, propane, propylene, normal butane, butylene, isobutane, and isobutylene. For convenience of transportation, these gases are liquefied through pressurization.

Liquefied Refinery Gases (LRG): Liquefied petroleum gases fractionated from refinery or still gases. Through compression and/or refrigeration, they are retained in the liquid state. The reported categories are ethane/ethylene, propane/propylene, normal butane/butylene, and isobutane. Excludes still gas.

Losses: See **Electrical System Energy Losses.**

Low-Power Testing: The period of time between a nuclear generating unit's initial fuel loading date and the issuance of its operating (full-power) license. The maximum level of operation during that period is 5 percent of the unit's design thermal rating.

Lubricants: Substances used to reduce friction between bearing surfaces or incorporated into other materials used as processing aids in the manufacture of other products or used as carriers of other materials. Petroleum lubricants may be produced either from distillates or residues. Lubricants include all grades of lubricating oils, from spindle oil to cylinder oil, and those used in greases.

Major Energy Producers: The top publicly-owned crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System.

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. Standard Industrial Classification (SIC) codes used to classify an establishment as a manufacturer are 20 through 39.

Marketed Production, Natural Gas: Gross withdrawals less gas used for repressuring, quantities vented and flared, and nonhydrocarbon gases removed in treating or processing operations. Includes all quantities of gas used in field and processing operations.

Measured Resources, Coal: Coal resources for which estimates of the rank, quality, and quantity have been computed, within a margin of error of less than 20 percent, from sample analyses and measurements from closely spaced and geologically well known sample sites. Measured resources are computed from dimensions revealed in outcrops, trenches, mine workings, and drill holes. The points of observation and measurement are so closely spaced and the thickness and extent of coals are so well defined that the tonnage is judged to be accurate within 20 percent. Although the spacing of the point of observation necessary to demonstrate continuity of the coal differs from region to region, according to the character of the coalbeds, the points of observation are no greater than ½ mile apart. Measured coal is projected to extend as a belt ¼ mile wide from the outcrop or points of observation or measurement.

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.

Methane: Hydrocarbon gas (CH_4), which is the major component of natural gas. It is also an unimportant source of hydrogen in various industrial processing.

Methanol: A light, volatile alcohol (CH_3OH) eligible for motor gasoline blending. See **Oxygenates.**

Methyl Tertiary Butyl Ether (MTBE): An ether, $(CH_3)_3COCH_3$, intended for motor gasoline blending. See **Oxygenates.**

Miscellaneous Petroleum Products: All finished petroleum products not classified elsewhere—for example, petrolatum, lube refining byproducts (aromatic extracts and tars), absorption oils, ram-jet fuel, petroleum rocket fuels, synthetic natural gas feedstocks, and specialty oils.

Motor Gasoline Blending: Mechanical mixing of motor gasoline blending components, and oxygenates, when required, to produce finished motor gasoline. Finished motor gasoline may be further mixed with other motor gasoline blending components or oxygenates, resulting in increased volumes of finished motor gasoline and/or changes in the formulation of finished motor gasoline (e.g., conventional motor gasoline mixed with MTBE to produce oxygenated motor gasoline).

Motor Gasoline Blending Components: Naphthas (e.g., straight-run gasoline, alkylate, reformate, benzene, toluene, xylene) used for blending or compounding into finished motor gasoline. These components include reformulated gasoline blendstock for oxygenate blending (RBOB) but exclude oxygenates (alcohols, ethers), butane, and pentanes plus. Note: Oxygenates are reported as individual components and are included in the total for other hydrocarbons, hydrogens, and oxygenates.

Motor Gasoline, Conventional: Finished motor gasoline not included in the oxygenated or reformulated gasoline categories. Note: This category excludes reformulated gasoline blendstock for oxygenate blending (RBOB) as well as other blendstock. Conventional motor gasoline can be leaded or unleaded; regular, midgrade, or premium. See **Motor Gasoline Grades.**

Motor Gasoline, Finished: A complex mixture of relatively volatile hydrocarbons with or without small quantities of additives, blended to form a fuel suitable for use in spark-ignition engines. Motor gasoline, as defined in ASTM Specification D4814 or Federal Specification VV-G-1690C, is characterized as having a boiling range of 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 conventional gasoline; all types of oxygenated gasoline, including gasohol; reformulated gasoline; and all grades of leaded and unleaded gasoline; but it excludes aviation gasoline. *Note:* Data on blending components, as well as oxygenates, are not counted in data on finished motor gasoline.

Motor Gasoline, Finished Gasohol: A blend of finished motor gasoline containing 10 percent of alcohol by volume (generally ethanol but sometimes methanol) or less. See **Motor Gasoline, Oxygenated.**

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, midgrade, 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.

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, midgrade, 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 Grades: The classification of gasoline by octane ratings. Each type of gasoline (conventional, oxygenated, and reformulated; leaded or unleaded) is classified by three grades: regular, midgrade, and premium. Note: Gasoline sales are reported by grade in accordance with their classification at the time of sale. In general, automotive octane requirements are lower at high altitudes. Therefore, in some areas of the United States, such as the Rocky Mountain States, the octane ratings for the gasoline grades may be 2 or more octane points lower.

Regular Gasoline: Gasoline having an antiknock index, i.e., octane rating, greater than or equal to 85 and less than 88.

Midgrade Gasoline: Gasoline having an antiknock index, i.e., octane rating, greater than or equal to 88 and less than or equal to 90.

Premium Gasoline: Gasoline having an antiknock index, i.e., octane rating, greater than 90.

Motor Gasoline, Oxygenated: Finished motor gasoline other than reformulated gasoline, having an oxygen content of 1.8 percent or higher by weight and required by the U.S. Environmental Protection Agency (EPA) to be sold in areas designated by EPA as carbon monoxide (CO) nonattainment areas. Note: Oxygenated gasoline excludes reformulated gasoline, oxygenated fuels program reformulated gasoline (OPRG), and reformulated gasoline blendstock for oxygenated blending (RBOB). It can be formulated for regular, midgrade, or premium grade. See **Motor Gasoline Grades.**

Motor Gasoline, Reformulated: Finished motor gasoline formulated for use in motor vehicles, the composition and properties of which meet the requirements of the reformulated gasoline regulations promulgated by the U.S. Environmental Protection Agency under Section 211(k) of the Clean Air Act. Note: This category includes oxygenated fuels program reformulated gasoline (OPRG) but excludes reformulated gasoline blendstock for oxygenate blending (RBOB). It can be formulated for regular, midgrade, and premium grades. See **Motor Gasoline Grades.**

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). These 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: For stock-level data, a sum including finished motor gasoline stocks plus stocks of motor gasoline blending components but excluding stocks of oxygenates.

MTBE: See **Methyl Tertiary Butyl Ether.**

Naphtha: A generic term applied to a petroleum fraction with an approximate boiling range between 122°F and 400° F.

Natural Gas: A gaseous mixture of hydrocarbon compounds, primarily methane, delivered via pipeline for consumption. It is used as a fuel for electricity generation, a variety of uses in buildings, and as raw material input and fuel for industrial processes. *Note*: This product, also referred to as Dry natural gas or Consumer-grade natural gas, is the product that remains after Wet natural gas has been processed at lease facilities and/or natural gas processing plants. This processing removes nonhydrocarbon gases (e.g., water vapor, carbon dioxide, helium, hydrogen sulfide, and nitrogen) that would otherwise make the gas unmarketable and natural gas liquids.

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: See **Marketed Production, Natural Gas.**

Natural Gas Plant Liquids (NGPL): Those hydrocarbons in natural gas that are separated as liquids at downstream gas processing plants; fractionating and cycling plants; and, in some instances, at field facilities. Lease condensate is excluded. Products obtained include liquefied petroleum gases and pentanes plus.

Natural Gas Processing Plants: A facility designed to recover natural gas liquids from a stream of natural gas that may or may not have passed through lease separators and/or field separation facilities. These facilities also control the quality of the natural gas to be marketed. Cycling plants are classified as natural gas processing plants.

Natural Gas Wellhead Price: Price of natural gas calculated by dividing the total reported value at the wellhead by the total quantity produced as reported by the appropriate agencies of individual producing States and the U.S. Mineral Management Service. The price includes all costs prior to shipment from the lease, including gathering and compression costs, in addition to State production, severance and similar charges.

Natural Gas, Wet: A mixture of hydrocarbon compounds and small quantities of various nonhydrocarbons existing in the gaseous phase or in solution with crude oil in porous rock formations at reservoir conditions. The principal hydrocarbons normally contained in the mixture are methane, ethane, propane, butane, and pentanes. Typical nonhydrocarbon gases that may be present in reservoir natural gas are water vapor, carbon dioxide, helium, hydrogen sulfide, and nitrogen. Under reservoir conditions, natural gas and the liquefiable portions occur either in a single gaseous phase in the reservoir or in solution with crude oil and are not distinguishable at the time as separate substances.

Natural Gasoline: A term used in the gas processing industry to refer to a mixture of hydrocarbons (mostly pentanes and heavier hydrocarbons containing 5 or more carbon molecules) extracted from natural gas. It includes **Isopentane**.

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 Investment in Place: Net property, plant, and equipment plus investments and advances to unconsolidated affiliates.

Net Ownership Interest: Net working interest plus own royalty interest.

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.

Neutral Zone: A 6,200 square-mile area shared equally between Kuwait and Saudi Arabia under a 1992 agreement.

Nitrogen Oxides (NO_x): Compounds of nitrogen and oxygen produced by the burning of fossil fuels.

Nominal Dollars: A measure used to express nominal prices.

Nominal Price: The price paid for goods or services at the time of the transaction. Nominal prices are those that have not been adjusted to remove the effect of changes in the purchasing power of the dollar; they reflect buying power in the year in which the transaction occurred.

Nonhydrocarbon Gases: Typical nonhydrocarbon gases that may be present in reservoir natural gas are carbon dioxide, helium, hydrogen sulfide, and nitrogen.

Nontraceables: Energy companies' revenues, costs, assays, and liabilities that cannot be directly attributed to a type of business by use of a

reasonable allocation method developed on the basis of operating-level utilities.

Nonutility Power Producer: A corporation, person, agency, authority, or other legal entity or instrumentality that owns 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 ten 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) Florida Reliability Coordinating Council (FRCC); (4) Mid-America Interpol Network (MAIN); (5) Mid-Atlantic Area Council (MAAC); (6) Mid-Continent Area Power Pool (MAPP); (7) Northeast Power Coordinating Council (NPCC); (8) Southeastern Electric Reliability Council (SERC); (9) Southwest Power Pool (SPP); and (10) Western Systems Coordinating Council (WSCC); and Alaska Systems Coordinating Council (ASCC), which is an affiliate NERC member..

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.

Octane Rating: A number used to indicate motor gasoline's antiknock performance in motor vehicle engines. The two recognized laboratory engine test methods for determining the antiknock rating, i.e., octane rating, of gasoline are the Research method and the Motor method. To provide a single number as guidance to the consumer, the antiknock index ® + M)/2, which is the average of the Research and Motor octane numbers, was developed. See **Motor Gasoline Grades.**

OECD: See **Organization for Economic Cooperation and Development.**

OECD Europe: See **Organization for Economic Cooperation and Development, Europe.**

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 .**

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 Unit (Nuclear): In the United States, a nuclear generating unit that has completed low-power testing and has been issued a full-power operating license by the Nuclear Regulatory Commission, or equivalent permission to operate.

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, Czech Republic, Denmark and its territories (Faroe Islands and Greenland), Finland, France, Germany, Greece, Greenland, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, South Korea, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States and its territories (Guam, Puerto Rico, and Virgin Islands).

Organization for Economic Cooperation and Development, Europe: Includes Austria, Belgium, Czech Republic, Denmark, Faroe Islands, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

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, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, 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, Oxygenated.**

Oxygenates: Substances which, when added to motor gasoline, increase the amount of oxygen in that gasoline blend. Ethanol, methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), and methanol are common oxygenates. See **Motor Gasoline, Oxygenated**.

Ozone: A molecule made up of three atoms of oxygen. It occurs naturally in the stratosphere and provides a protective layer shielding the Earth from harmful ultraviolet radiation. In the troposphere, it is a chemical oxidant, a greenhouse gas, and a major component of photochemical smog.

Ozone-Depleting Substance: Gases containing chlorine that are being controlled because they deplete ozone. They are thought to have some indeterminate impact on greenhouse gases.

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

Pentanes Plus: A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas. Includes isopentane, natural gasoline, and plant condensate.

Perfluorocarbons (PFCs): A group of anthropogenic chemicals composed of one or two carbon atoms and four to six flourine atoms, containing no chlorine. PFCs have no commercial uses and are emitted as a byproduct of aluminum smelting and semiconductor manufacturing. PFCs have very high 100-year Global Warming Potentials and are very long-lived in the atmosphere.

Petrochemical Feedstocks: Chemical feedstocks derived from petroleum principally for the manufacture of chemicals, synthetic rubber, and a variety of plastics. Categories reported are naphthas with less than 401° F endpoint and other oils equal to or greater than 401° F endpoint.

Petroleum: A broadly defined class of liquid hydrocarbon mixtures. Included are crude oil, lease condensate, unfinished oils, refined products obtained from the processing of crude oil, and natural gas plant liquids. Nonhydrocarbon compounds blended into finished petroleum products, such as additives and detergents, are included after blending has been completed.

Petroleum Coke: See **Coke, Petroleum.**

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 may be 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: An approximate measure of consumption. It measures the disappearance of the products from primary sources, i.e., refineries, blending plants, and bulk terminals. In general, products supplied in any given period are computed as follows: field production, plus imports, plus unaccounted-for crude oil (plus net receipts when calculated on a PAD District basis) minus stock change, minus crude oil losses, minus refinery inputs, and minus exports. See also **Petroleum Consumption.**

Petroleum Sludge: See **Sludge.**

Petroleum Stocks, Primary: For individual products, quantities that are held at refineries, in pipelines, and at bulk terminals that have a capacity of 50,000 barrels or more, or that are in transit thereto. Stocks held by product retailers and resellers, as well as tertiary stocks held at the point of consumption, are excluded. Stocks of individual products held at gas processing plants are excluded from individual product estimates but are included in other oil estimates and total.

Photovoltaic Energy: Direct-current electricity generated from sunlight through solid-state semiconductor devices that have no moving parts.

Photovoltaic Module: 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 Fuel: Natural gas consumed in the operation of pipelines, primarily in compressors.

Pipeline, Natural Gas: A continuous pipe conduit, complete with such equipment as valves, compressor stations, communications systems, and meters, for transporting natural gas and/or supplemental gaseous fuels from one point to another, usually from a point in or beyond the producing field or processing plant to another pipeline or to points of utilization. Also refers to a company operating such facilities.

Pipeline, Petroleum: Crude oil and product pipelines (including interstate, intrastate, and intracompany pipelines) used to transport crude oil and petroleum products, respectively, within the 50 States and the District of Columbia.

Plant Condensate: One of the natural gas liquids, mostly pentanes and heavier hydrocarbons, recovered and separated as liquids at gas inlet separators or scrubbers in processing plants.

Prime Mover: The engine, turbine, water wheel, or similar machine that drives an electric generator; or, for reporting purposes, a device that converts energy to electricity directly.

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 output 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 demonstrates with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

Proved Reserves, Natural Gas Liquids: Those volumes of natural gas liquids (including lease condensate) demonstrated with reasonable certainty to be separable in the future from proved natural gas reserves, under existing economic and operating conditions.

Pumped Storage: See **Hydroelectric Pumped Storage.**

Real Price: A price that has been adjusted to remove the effect of changes in the purchasing power of the dollar. Real prices, which are expressed in chained dollars in this report, reflect buying power relative to a reference year. See **Chained Dollars.**

Refiner Acquisition Cost of Crude Oil: The cost of crude oil to the refiner, including transportation and other fees. The composite cost is the weighted average of domestic and imported crude oil costs.

Refinery Input: The raw materials and intermediate materials processed at refineries to produce finished petroleum products. They include crude oil, products of natural gas processing plants, unfinished oils, other hydrocarbons and alcohol, motor gasoline and aviation gasoline blending components, and finished petroleum products.

Refinery Output: The total amount of petroleum products produced at a refinery. Includes petroleum consumed by the refinery.

Refinery (Petroleum): An installation that manufactures finished petroleum products from crude oil, unfinished oils, natural gas liquids, other hydrocarbons, and alcohol.

Renewable Energy: Energy obtained from sources that are essentially inexhaustible (unlike, for example, fossil fuels, of which there is a finite supply). Renewable sources of energy include conventional hydroelectric power, wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

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 Sector: 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.

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, known as No. 5 and No. 6 fuel oils, that remain after the distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations. It conforms to ASTM Specifications D396 and D975 and Federal Specification VV-F-815C. No. 5, a residual fuel oil of medium viscosity, is also known as Navy Special and is defined in Military Specification MIL-F-859E, including Amendment 2 (NATO Symbol F-770). It is used in steam-powered vessels in government service and inshore powerplants. No. 6 fuel oil includes Bunker C fuel oil and is used for the production of electric power, space heating, vessel bunkering, and various industrial purposes.

Road Oil: Any heavy petroleum oil, including residual asphaltic oil, used as a dust palliative and surface treatment on roads and highways. It is generally produced in six grades, from 0, the most liquid, to 5, the most viscous.

Rotary Rig: A machine used for drilling wells that employs a rotating tube attached to a bit for boring holes through rock.

Royalty Interest: An interest in a mineral property provided through a royalty contract.

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

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

SIC: See **Standard Industrial Classification.**

Sludge: A dense, slushy, liquid- to semifluid-product that accumulates as an end result of an industrial or technological process designed to purify a substance. Industrial sludges are produced from the processing of energy-related raw materials, chemical products, water, mined ores, sewage, and other natural and man-made products. Sludges can also form from natural processes, such as the runoff produced by rainfall, and accumulate on the bottom of bogs, streams, lakes, and tidelands

Small Power Producer: Under the Public Utility Regulatory Policies Act, a small power producer generates electricity by using renewable energy (wood, waste, 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 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).

Solar Thermal Energy: The radiant energy of the sun that can be converted into other forms of energy, such as heat or electricity. Electricity produced from solar energy heats a medium that powers an electricity-generating device.

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.

Spent Liquor: The liquid residue left after an industrial process; can be a component of waste materials used as fuel.

Spot Market Price: See Spot Price.

Spot Price: The price for a one-time open market transaction for immediate deliver of the specific quantity of product at a specific location where the commodity is purchased "on the spot" at current market rates.

Standard Industrial Classification (SIC): A set of codes developed by the Office of Management and Budget that categorizes industries according to groups with similar economic activities.

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 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.

Stocks: Supplies of fuel or other energy source(s) stored for future use. Stocks are reported as of the end of the reporting period.

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

Sulfur Dioxide (SO_2): A toxic, irritating, colorless gas soluble in water, alcohol, and ether. Used as a chemical intermediate, in paper pulping and ore refining, and as a solvent.

Sulfur Hexafluoride (SF_6): A colorless gas soluble in alcohol and ether, and slightly less soluble in water. It is used as a dielectric in electronics.

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.

Tall Oil: The oily mixture of rosin acids, fatty acids, and other materials obtained by acid treatment of the alkaline liquors from the digesting (pulping) of pine wood.

Transportation Sector: 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.

Unaccounted-for Crude Oil: Represents the arithmetic difference between the calculated supply and the calculated disposition of crude oil. The calculated supply is the sum of crude oil production 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 locations other than those 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. In most cases, these are produced by partial refining or are purchased in an unfinished state for conversion to finish products by further refining.

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. See **Yellowcake**.

Uranium Resources: Three separate categories reflecting different levels of confidence in the quantities estimated: reasonable assured resources, estimated additional resources, and speculative resources. Reasonably assured resources refer 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 refer to uranium in addition to reasonably assured resources that are 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 refer to uranium in addition to estimated additional resources that are thought to exist, mostly on the basis of indirect evidence and geological extrapolations.

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

U.S.S.R.: The Union of Soviet Socialist Republics consisted of 15 constituent republics: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. As a political entity, the U.S.S.R. ceased to exist as of December 31, 1991.

Vented Natural Gas: Gas released into the air on the 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).

Vessel Bunkering: Includes sales for the fueling of commercial or private boats, such as pleasure craft, fishing boats, tugboats, and ocean-going vessels, including vessels operated by oil companies. Excluded are volumes sold to the U.S. Armed Forces.

Waste Energy: Garbage, bagasse, sewerage gas, and other industrial, agricultural, and urban refuse used to generate electricity.

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.

Western Europe: Includes Austria, Belgium, Bosnia and Herzegovina, Croatia, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Macedonia (The Former Yugoslav Republic of), Malta, Netherlands, Norway, Portugal, Serbia and Montenegro, Slovenia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

Wind Energy: The kinetic energy of wind converted into mechanical energy by wind turbines (i.e., blades rotating from a hub) that drive generators to produce electricity.

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.

Wood Sludge: See **Sludge.**

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.