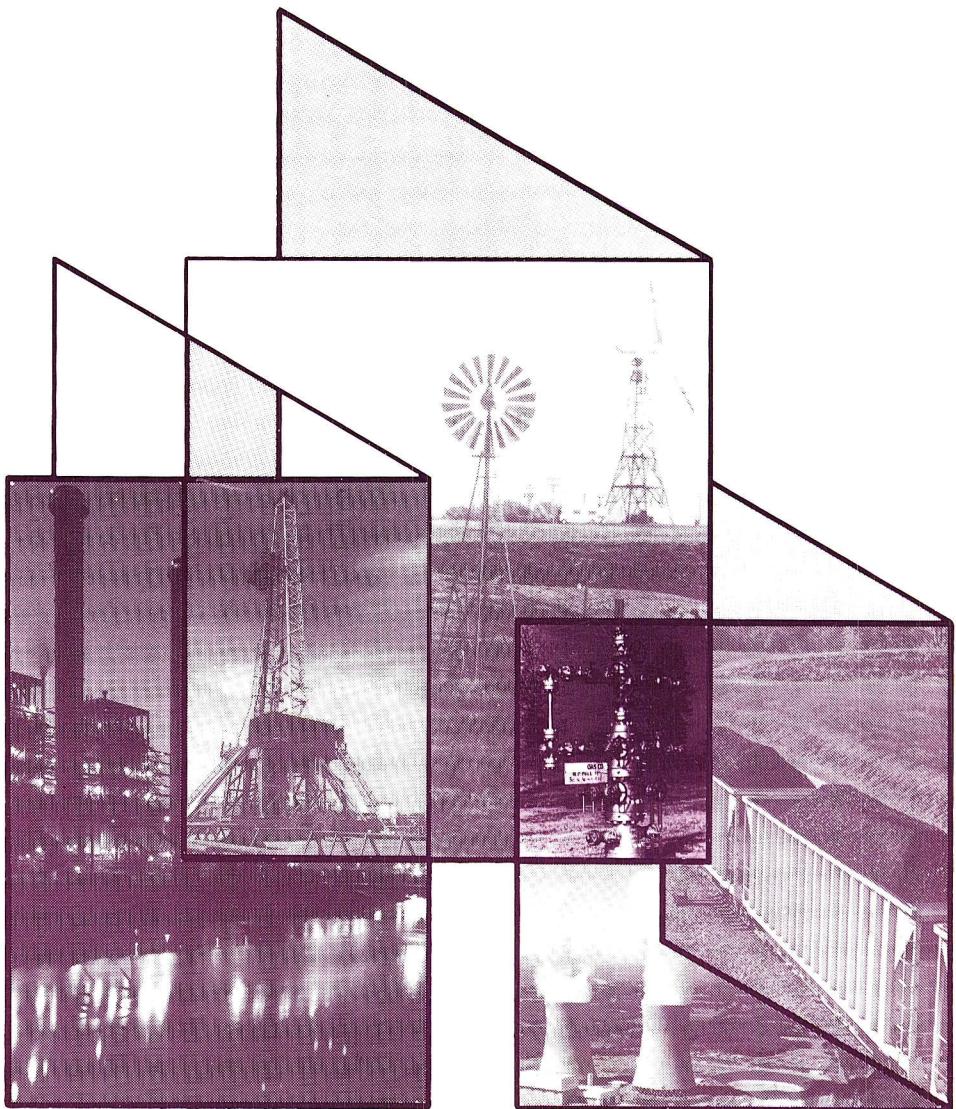


# Monthly Energy Review

May 1989



## **Monthly Energy Review**

The *Monthly Energy Review* presents current data on production, consumption, stocks, imports, exports, and prices of the principal energy commodities in the United States. Also included are data on international production of crude oil, consumption of petroleum products, petroleum stocks, and production of electricity from nuclear-powered facilities.

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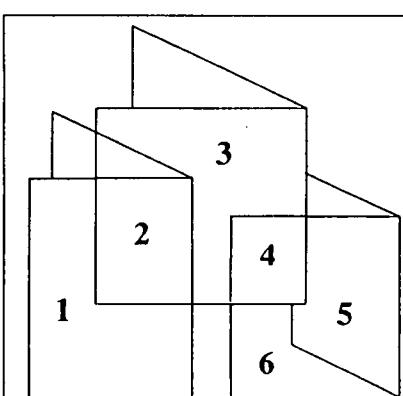
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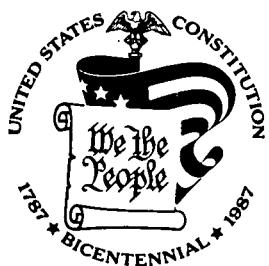
1. The Haynes Generating Station provides power in the Los Angeles area. Photograph courtesy of the Department of Water and Power, City of Los Angeles, California.
2. This is a drilling rig typical of those used by the oil industry.
3. An innovative wind turbine can be used to generate power more efficiently than the old-fashioned windmill.
4. A gas wellhead is referred to as a Christmas tree by the industry. Photograph courtesy of the Arkansas Louisiana Gas Company.
5. Unit trains are a primary transporter of coal. Photograph courtesy of the National Coal Association.
6. The cooling towers of the Susquehanna steam electric nuclear power plant. Photograph courtesy of Pennsylvania Power and Light Co./Allegheny Electric Cooperative, Inc.

The *Monthly Energy Review* (ISSN 0095-7356) is published monthly by the Energy Information Administration, 1000 Independence Avenue, SW, Washington, DC 20585, and sells for \$62.00 per year (price is subject to change without advance notice). Second-class postage rates paid at Washington, DC 20066-9998, and at additional mailing offices. POSTMASTER: Send address changes to *Monthly Energy Review*, Energy Information Administration, EI-231, 1000 Independence Avenue, SW, Washington, DC 20585.

# Monthly Energy Review

May 1989

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



This report was prepared by the Energy Information Administration, the independent statistical and analytical agency within the Department of Energy. The information contained herein should not be construed as advocating or necessarily reflecting any policy position of the Department of Energy or any other organization.

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- Released for printing: August 24, 1989

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Propane, A National Energy Resource .....	September 1975
Short-Term Energy Supply and Demand Forecasting at FEA .....	October 1975
Curtailments of Natural Gas Service .....	January 1976
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Impacts of Financial Constraints on the Electric Utility Industry .....	October 1982
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A Review of Valdez Oil Spill Market Impacts .....	March 1989
Monthly U.S. Crude Oil Production Estimates .....	March 1989

# Highlights

"Highlights"--special features that summarize the most important information presented in selected Energy Information Administration reports--are occasionally included in this publication. The following is a complete list of all the reports that have been summarized to date.

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<i>Energy Company Development Patterns in the Postembargo Era, Volume One</i> . . . . .	November 1982
<i>Residential Energy Consumption Survey: Consumption and Expenditures</i> . . . . .	January 1983
<i>Residential Energy Consumption Survey: Housing Characteristics</i> . . . . .	February 1983
<i>Energy Price and Expenditure Data Report, 1970-1980</i> . . . . .	July 1983
<i>Railroad Deregulation: Impact on Coal</i> . . . . .	August 1983
<i>Port Deepening and User Fees: Impact on U.S. Coal Exports</i> . . . . .	August 1983
<i>U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 1982 Annual Report</i> . . . . .	September 1983
<i>Annual Energy Review 1983</i> . . . . .	February 1984
<i>State Energy Data Report, Consumption Estimates, 1960-1982</i> . . . . .	March 1984
<i>Annual Energy Outlook 1983</i> . . . . .	March 1984
<i>State Energy Price and Expenditure Report, 1970-1981</i> . . . . .	May 1984
<i>Solar Collector Manufacturing Activity 1983</i> . . . . .	June 1984
<i>Estimates of U.S. Wood Energy Consumption, 1980-1983</i> . . . . .	September 1984
<i>International Energy Annual 1983</i> . . . . .	September 1984
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<i>Profiles of Foreign Direct Investment in U.S. Energy 1984</i> . . . . .	November 1985
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<i>International Energy Annual 1985</i> . . . . .	September 1986
<i>Consumption and Expenditures, April 1984 Through March 1985, Part 1: National Data</i> . . . . .	April 1987
<i>Consumption and Expenditures, April 1984 Through March 1985, Part 2: Regional Data</i> . . . . .	May 1987
<i>Uranium Industry Annual 1986</i> . . . . .	September 1987
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<i>Profiles of Foreign Direct Investment in U.S. Energy 1987</i> . . . . .	October 1988
<i>Manufacturing Energy Consumption Survey: Fuel Switching, 1985</i> . . . . .	November 1988

# Superconductivity and Energy Production and Consumption

**Abstract.** The recent discovery of ceramic high-temperature superconductors has implications for the U.S. energy industry, particularly the electric utility industry. This article reviews the potential applications of the new superconductors in the more efficient production and transmission of electric power.

## Introduction

Superconductivity is the ability of a material to conduct electricity with virtually no loss due to resistance. That property has applications in transportation (magnetic levitation trains), electronics and computers, medicine (magnetic resonance imaging), and the energy industry. Unlike conventional conductors (e.g., copper and aluminum) that operate at ambient temperatures, superconducting materials, until recently, have functioned only at temperatures near that of absolute zero (0 degrees Kelvin or -273 degrees Celsius). The record high temperature for superconductivity was only 23 degrees Kelvin just a few years ago. A relatively costly refrigerant, liquid helium, was needed to maintain the required temperatures.

In the past few years, ceramic materials have been discovered that conduct electricity with no resistance at much higher temperatures than had been seen before. Those high-temperature superconductors function at a critical temperature above the temperature of liquid nitrogen (77 degrees Kelvin). Since liquid nitrogen is an inexpensive refrigerant compared with liquid helium and requirements for containing the nitrogen refrigerant are far less complex, new and increasing opportunities are appearing for superconductors. Applications in the production, transmission, distribution, and consumption of electric power are among the most important.

## Requirements

Superconduction of electricity with virtually no loss due to resistance from the conductor depends on three variables: critical temperature, critical current density (a measure of how much electricity a material can carry), and critical magnetic field. The word "critical" in this context defines the limiting value above which superconductivity ceases to exist. Increases to a particular limit are possible in any one of the three areas as long as compensations are made in the other two. Failure to stay within the temperature/current/field boundaries quenches the superconductor.

For most applications, a critical current density between 10,000 and 1,000,000 amperes per square centimeter is necessary. Wires with this current density have not been developed. Current density is at present only 1,000 amperes per square centimeter at 1 tesla (20,000 times the strength of the earth's own magnetic field). At least one U.S. company has suggested that it is capable of meeting the density requirement for wire fabrication, though not the strength and flexibility requirements.

Any material that conducts electricity is subject to powerful magnetic fields. Superconductors must withstand field strengths of 2 tesla. Meeting this requirement does not appear to be a problem.

## Limitations

The new high-temperature superconductors have a number of important limitations compared with metals. First, metals are ductile, while ceramics are not. Forming a flexible, strong wire capable of carrying a sufficient current density is among the biggest technical obstacles to electric power superconductors. The next great discovery needs to be a superconducting ceramic that can be formed into wires and allows high current flow at high temperatures. Second, ceramic superconductors are susceptible to environmental degradation from such factors as oxygen, water, and carbon dioxide. Third, superconducting ceramics have a broad phase boundary, meaning that resistance first appears far be-

low the upper critical field value. Fourth, the flow of electricity through superconducting ceramics depends on the orientation of the ceramic crystals (anisotropy). That property poses severe problems, because the usual processing technologies for ceramics produce material in wire form with insufficient mutual alignment of the crystallites and hence with current carrying capabilities far lower than what is theoretically possible. Fifth, superconducting ceramics are not uniform conductors. They display intergranular conduction, meaning that the supercurrent must jump across the boundaries of small grains in the material. The combination of intergranular conduction and anisotropy poses problems devising reliable wires.<sup>1</sup>

## Applications

Assuming the various limitations surrounding the new high-temperature superconductors can be overcome, the applications for the technology are almost limitless. Suggested applications range from toys to nuclear fusion, from medical imaging to ship propulsion, from consumer electronics to medical equipment, from magnetic levitation trains to military communications. In the energy area, some of the largest potential applications are transmission lines, storage rings, generators, and motors. Those large-scale energy applications are summarized here.

### Transmission Lines

Transmission and distribution losses in the United States have been in the neighborhood of 7 percent in recent years. Superconducting transmission lines would increase system efficiency and conserve previously wasted energy. They would require less space, carry more power, and be concealed underground. From tests on low-temperature superconductors, Brookhaven National Laboratory reported that superconducting transmission lines can carry up to 3 billion watts of power and span up to 100 miles, making them comparable to the best conventional overhead lines.<sup>2</sup> In the early 1980's, a 138-kilovolt niobium alloy superconducting alternating current transmission line was successfully tested at Brookhaven. With a diameter of 406 millimeters and a power rating of 1,000 million volt-amperes, it had three times the capacity of a conventional transmission line with similar dimensions and voltage.<sup>3</sup> Remote siting of large, unpopular, baseload power plants like nuclear and coal would then be possible due to the efficient transmission of power via superconducting transmission lines.

On the other hand, the new superconductors would still require refrigeration and would require conventional conductors as shunts. The shunts would be necessary in the event of a power spike that could burn or permanently quench the superconductor. Thus, while superconducting transmission lines may save upwards of \$5 billion per year, the cost of installing them underground and with refrigeration would run into the hundreds of billions.<sup>4</sup>

### Storage Rings

Superconducting magnetic energy storage rings (SMES) can be used to store electricity without loss by circulating the electricity through a very large superconducting magnet. That application would allow electric utilities to generate electricity during periods of low demand for use during peak periods. Such a system could effectively increase generating capacity by 20 percent and replace intermediate and peaking capacity (natural gas, petroleum, pumped storage hydroelectric, and pond hydroelectric) with baseload capacity (nuclear, coal, and run-of-river hydroelectric). It would also benefit intermittent renewable energy technologies, such as photovoltaics and wind power.<sup>5</sup>

The Strategic Defense Initiative Office and the Defense Nuclear Agency are funding a program to develop SMES. When completed, public electric utilities would be able to access 10 to 25 megawatts electric for a period of 2 to 3 hours. The Electric Power Research Institute (EPRI) has developed plans for a low critical temperature SMES plant (5,500 megawatthours, 1,000 megawatts electric) using a liquid helium coolant.

Construction difficulties with SMES include the need for a solid rock containment area hundreds of meters across. The devices would also be costly. It has been estimated that SMES to supply New York City with power for 1 to 2 hours would be about \$1 billion.<sup>6</sup>

### Generators

Conventional generators operate at an efficiency of 95 to 97 percent. Superconducting generators could improve on that by 1 to 2 percent. That 1 to 2 percent improvement would offset the added cost of the superconducting units. Superconducting generators have several inherent advantages over conventional ones. Given adequate current carrying capacity wires, a superconducting generator would be from one-half to one-third the size of a conventional one.

<sup>1</sup>Simon Foner and Terry P. Orlando, "Superconductors: The Long Road Ahead," *Technology Review* (February/March 1988), p. 40.

<sup>2</sup>"Not-so-superconductors," *The Economist* (June 13, 1987), p. 93.

<sup>3</sup>John Douglas, "Pursuing the Promise of Superconductivity," *EPRI Journal* (September 1987), p. 11.

<sup>4</sup>Foner and Orlando, "Superconductors," p. 43.

<sup>5</sup>Alan M. Wolsky, Edward J. Daniels, and Robert F. Giese, "New Superconductors May Have Significant Economic Impact," *Logos* 5, 3, Argonne National Laboratory (Autumn 1987), p. 25.

<sup>6</sup>Foner and Orlando, "Superconductors," p. 44.

That size difference represents enormous savings in raw materials and transportation. It also enhances the stability of the electric utility system by increasing the machine's critical-fault clearing time.<sup>7</sup>

In the early 1980's, a project between Westinghouse and EPRI worked out many of the requirements and technical questions involved in the construction of a 300-million-volt-ampere (270-megawatts electric) superconducting generator using niobium alloys.<sup>8</sup> Such a generator would produce double the output of a conventional generator. Use of high-temperature superconductors would reduce the cost even more.

## Motors

Probably the largest potential impact on the electric field is through superconducting motors. The discovery of high-temperature superconductors has removed a major barrier to the practical application of superconductors to motors--the liquid helium cooling system. The millions of electrical motors in the country are a major source of electric demand and a major source of heat-generated energy losses. Superconducting motors will increase the efficiency of electric use<sup>9</sup> and thus expand the motor applications available to electricity, especially in the transportation sector. The relatively small size, power requirements, and current densities of motors (compared with nuclear power production, transmission, and storage) make them the logical first large-scale commercial application of superconductors.

Argonne National Laboratory's Materials and Components Technology Division has already developed a demonstration electric motor using high temperature superconductors. However, the motor does not produce enough power to be of practical use. Designs are being developed that would lead to practical motors using superconductors in the form of wires.

## *The Outlook for Commercial Applications*

Estimating the timing of the introduction of large-scale, commercial superconducting technology is difficult but not impossible. The following comments are relevant:

- Conventional low-temperature superconductors, e.g., niobium alloys, are not competitive with con-

ventional conductors for any bulk power applications and for only a very few specialized applications (e.g., medical diagnostic equipment). Little commercial potential exists for large-scale application in the electric industry for conventional low-temperature superconductors.

- High-temperature superconductors (i.e., superconductors above the temperature of liquid nitrogen) are not well understood. Despite much effort, their properties are theoretically difficult to explain. The existing ceramics have problems with permanent quenching at excessive temperature/current/field values. Ceramic superconductors capable of carrying electric utility-level currents in wire form have not been verified.
- There is currently no way to make flexible, high-current wires from the new ceramic superconductors and no theory on how it should be done. The process of demonstrating wire-making will take at least 5 years and possibly much longer. It took about two decades before wires at the electric utility power level were formed from low critical temperature metal superconductors.

In summary, early applications of high-temperature superconductors are likely in areas with less critical technical or economic requirements, e.g., toys, microwave devices, medical imaging, etc. In areas with high technical and economic requirements, e.g., high voltage transmission, high-temperature superconductors will take much longer to penetrate the market. According to the Electric Power Research Institute, it will be a decade before any of the electric utility-scale products are ready for the market. Superconducting generators will not be commercial until the next century. Nonetheless, the potential economic impact is so great that continued research in this area promises potentially large gains to the U.S. electrical economy.

## *For Further Information*

This article was prepared by the Nuclear and Alternate Fuels Division of the Energy Information Administration. Inquiries regarding the article should be addressed to Mark Gielecki on 202-586-4442.

<sup>7</sup>Jenny Hopkinson, "Electric Generation Near Absolute Zero," *EPRI Journal* (March 1981), p. 8.

<sup>8</sup>Douglas, "Superconductivity," p. 7.

<sup>9</sup>Wolsky, Daniels, and Giese, "New Superconductors," p. 22.

# Highlights: Commercial Buildings Consumption and Expenditures 1986

## Energy Consumption

U.S. commercial buildings rely on five major sources of energy: electricity, natural gas, fuel oil, district heat (steam or hot water from an outside source), and propane. In 1986, commercial buildings consumed 5.0 quadrillion Btu of those sources (Table FE1).

Electricity, the most ubiquitous source of energy in commercial buildings, accounted for 2.4 quadrillion Btu of the total. Natural gas, consumed in over half of the buildings, accounted for 1.7 quadrillion Btu. Fuel oil, district heat, and propane were consumed in fewer buildings and accounted for much smaller shares of total consumption. Commercial consumption of the three sources combined equaled about 1 quadrillion Btu.

## Energy Expenditures

Expenditures for the five major sources of commercial energy consumption totaled \$61 billion. Again, electricity accounted for the largest share of the total: \$47

billion, a 78-percent share. At \$20 per million Btu, it was by far the most expensive of the five sources.

Natural gas, one of the least expensive sources (\$5 per million Btu), accounted for \$8 billion of commercial energy expenditures in 1986. Fuel oil, district heat, and propane together accounted for \$5 billion. Of those three sources, propane was the most expensive (\$9 per million Btu).

## Energy Intensity

Energy intensity is a measure of the consumption rate of a given energy source. It is computed as the ratio of total consumption to total floorspace of the buildings using that source. In 1986, the energy intensities of electricity, natural gas, and fuel oil ranged between 40,100 and 46,200 Btu per square foot. In contrast, buildings with district heat registered a consumption rate for this energy source of 91,200 Btu per square foot. At the other extreme, propane was consumed at a rate of 19,700 Btu per square foot.

Table FE1. Energy Consumption and Expenditures at Commercial Buildings by Major Fuel, 1986

Major Fuel	Number of Buildings (thousand)	Total Energy Consumption (trillion Btu)	Energy Intensity (thousand Btu per square foot)	Total Energy Expenditures (million dollars)	Energy Expenditures per Million Btu (dollars)	RSE <sup>1</sup> Row Factor
Electricity	3,965	2,390	42.3	47,186	19.74	4.30
Natural Gas	2,214	1,723	46.2	8,355	4.85	4.39
Fuel Oil <sup>2</sup>	534	442	40.1	2,059	4.66	8.85
District Heat	77	422	91.2	2,620	6.21	16.37
Propane	344	63	19.7	543	8.59	13.30
All Major Fuels	3,992	5,040	88.7	60,762	12.06	3.98
<i>RSE Column Factor</i>	<i>1.008</i>	<i>1.330</i>	<i>1.085</i>	<i>1.229</i>	<i>0.480</i>	

<sup>1</sup>Relative Standard Error. To obtain the RSE percentage for a given table cell, multiply the cell's RSE column and row factors.

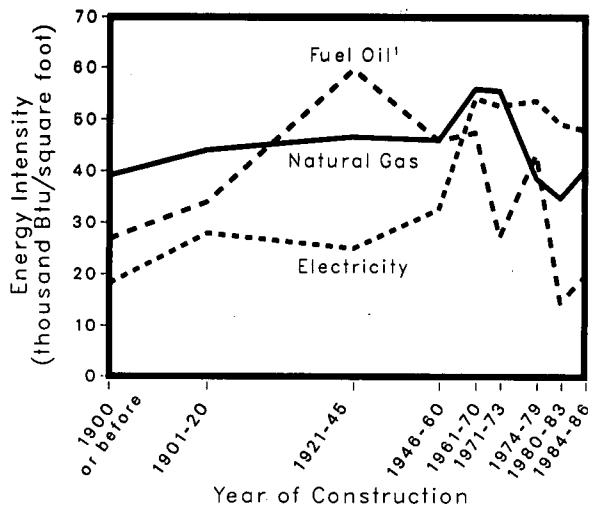
<sup>2</sup>Including kerosene.

Source: Energy Information Administration, *Nonresidential Buildings Energy Consumption Survey: Commercial Buildings Consumption and Expenditures 1986*, DOE/EIA-0318(86) (Washington, DC, May 1989), Table 1.

The energy intensity of a given energy source varies by year of building construction (Figure FE1). The intensity of natural gas consumption for newer buildings was lower than the average intensity for all buildings constructed prior to 1980. The fraction of commercial buildings using natural gas was also lower for newer buildings. If those trends were to continue, the result would be a decline in total natural gas consumption in commercial buildings. An even more dramatic difference was apparent for fuel oil. In contrast, the average intensity of electricity consumption in newer buildings was higher than the average for all buildings constructed prior to 1980. Consequently, a continuation of current building practices and energy use patterns would tend to promote growth in electricity consumption by the commercial sector.

The foregoing estimates are from *Commercial Buildings Consumption and Expenditures 1986*, which is based on the Energy Information Administration's Nonresidential Buildings Energy Consumption Survey (see box). In addition to the topics summarized above, the report examines the relationship between energy consumption rates and various building characteristics, including building use, location, and energy-using features. It also presents some consumption statistics, such as information on lighting and on peak electricity demand, that were not available from previous surveys.

**Figure FE1. Energy Intensities by Year of Building Construction, 1900-1986**



<sup>1</sup> Including kerosene.

Note: Energy sources measured by NBECS but not shown above are district sources (steam, hot water, chilled water) and liquefied petroleum gases (such as propane).

Source: Energy Information Administration, *Nonresidential Buildings Energy Consumption Survey: Commercial Buildings Consumption and Expenditures 1986*, DOE/EIA-0318(86) (Washington, DC, May 1989), Figure 1.

### About the Survey

EIA conducts the Nonresidential Buildings Energy Consumption Survey (NBECS) to collect data on the characteristics of and energy consumption in commercial buildings. Three NBECS have been conducted--in 1979, 1983, and 1986. In the 1986 NBECS, coverage of several topics was added or expanded. For example, information on lighting equipment was collected for the first time, and the energy sources for both space heating and water heating were categorized as primary or secondary. Several other areas of the survey, including electricity generation, heating and cooling equipment, and conservation features, also were added or enhanced.

The NBECS is conducted in two stages. In the first stage, information about the selected buildings is collected through voluntary personal interviews with the buildings' owners, managers, or tenants. In the second stage, data concerning the actual consumption of energy are obtained via a mandatory mail survey of energy suppliers to the building. *Commercial Buildings Consumption and Expenditures 1986* is based on the energy supplier data and is the first NBECS report to include peak electricity demand data. *Characteristics of Commercial Buildings 1986*, published in September 1988, was based on results from the first stage.

Buildings covered by the survey were defined by three criteria: (1) they were totally enclosed by walls extending from the foundation to the roof; (2) they were used primarily for some commercial purpose; and (3) they measured more than 1,000 square feet.

### To Order the Report

*Nonresidential Buildings Energy Consumption Survey: Commercial Buildings Consumption and Expenditures 1986* may be obtained by using the order form in the back of this publication.

# Section 1. Energy Summary

The United States production of energy during the first 5 months of 1989 was relatively unchanged from the same period in 1988, and U.S. consumption was up 1.0 percent. Net imports of all energy were 4.9 percent higher than during the first 5 months of 1988.

Energy production during May 1989 totaled 5.5 quadrillion Btu, a 2.8-percent increase compared with the level of production during May 1988. Coal production increased 11.4 percent. Petroleum production decreased 4.6 percent, and natural gas production was down 0.4 percent. All other forms of energy production combined were up 6.6 percent from the level of production during May 1988.

Energy consumption during May 1989 totaled 6.4 quadrillion Btu, 3.5 percent above the level of consumption during May 1988. Natural gas consumption increased 5.2 percent, coal consumption rose 3.4 percent, and petroleum consumption was up 1.8 percent. Consumption of all other forms of energy combined increased, up 6.7 percent compared with the level 1 year earlier.

Net imports of energy during May 1989 totaled 1.1 quadrillion Btu, 1.6 percent above the level of net imports 1 year earlier. Net imports of petroleum increased 3.9 percent, and net imports of natural gas were up 15.7 percent. Net exports of coal increased 22.0 percent compared with the level in May 1988.

**Table 1.1 Energy Summary for May 1989**  
(Quadrillion (10<sup>15</sup>) Btu)

	May			Cumulative January Through May			
	1989	1988	Percent Change <sup>a</sup>	1989	1988 Daily Rate	1988	1988 Daily Rate
<b>Total Production<sup>b</sup></b> .....	<b>5.529</b>	<b>5.380</b>	<b>2.8</b>	<b>27.291</b>	<b>0.181</b>	<b>27.462</b>	<b>0.181</b>
Petroleum <sup>c</sup> .....	1.595	1.672	-4.6	7.758	.051	8.254	.054
Natural Gas (Dry) .....	1.404	1.409	-4	7.257	.048	7.341	.048
Coal .....	1.807	1.622	11.4	8.889	.059	8.442	.056
Other <sup>d</sup> .....	.722	.678	6.6	3.386	.022	3.426	.023
<b>Total Consumption<sup>b</sup></b> .....	<b>6.380</b>	<b>6.166</b>	<b>3.5</b>	<b>34.318</b>	<b>.227</b>	<b>34.202</b>	<b>.225</b>
Petroleum <sup>e</sup> .....	2.764	2.715	1.8	14.029	.093	14.057	.092
Natural Gas <sup>f</sup> .....	1.407	1.337	5.2	9.156	.061	9.068	.060
Coal .....	1.464	1.415	3.4	7.646	.051	7.491	.049
Other <sup>g</sup> .....	.745	.698	6.7	3.486	.023	3.586	.024
<b>Net Imports</b> .....	<b>1.121</b>	<b>1.104</b>	<b>1.6</b>	<b>5.718</b>	<b>.038</b>	<b>5.485</b>	<b>.036</b>
Petroleum <sup>h</sup> .....	1.243	1.197	3.9	6.120	.041	5.643	.037
Natural Gas .....	.103	.089	15.7	.531	.004	.527	.003
Coal <sup>i</sup> .....	-.247	-.202	22.0	-1.033	-.007	-.844	-.006
Other <sup>j</sup> .....	.023	.021	8.5	.100	.001	.160	.001

<sup>a</sup>Based on daily rates prior to rounding.

<sup>b</sup>Production and consumption totals exclude wood, waste, geothermal, wind, photovoltaic, and solar thermal energy except for small amounts used by electric utilities to generate electricity for distribution.

<sup>c</sup>Includes crude oil, lease condensate, and natural gas plant liquids.

<sup>d</sup>Other is hydroelectric and nuclear electric power, and electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

<sup>e</sup>Includes petroleum products.

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

<sup>g</sup>Other is hydroelectric and nuclear electric power; electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy; and net imports of electricity and coal coke.

<sup>h</sup>Includes crude oil, lease condensate, petroleum products, pentanes plus, unfinished oils, gasoline blending components, and imports of crude oil for the Strategic Petroleum Reserve.

<sup>i</sup>Minus sign indicates exports are greater than imports.

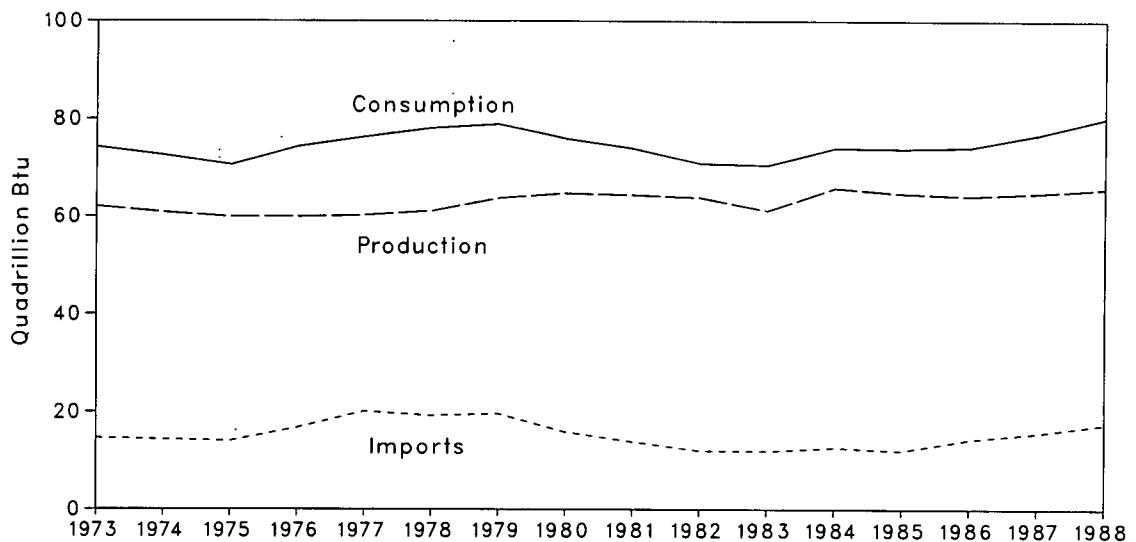
<sup>j</sup>Other is net imports of electricity and coal coke.

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

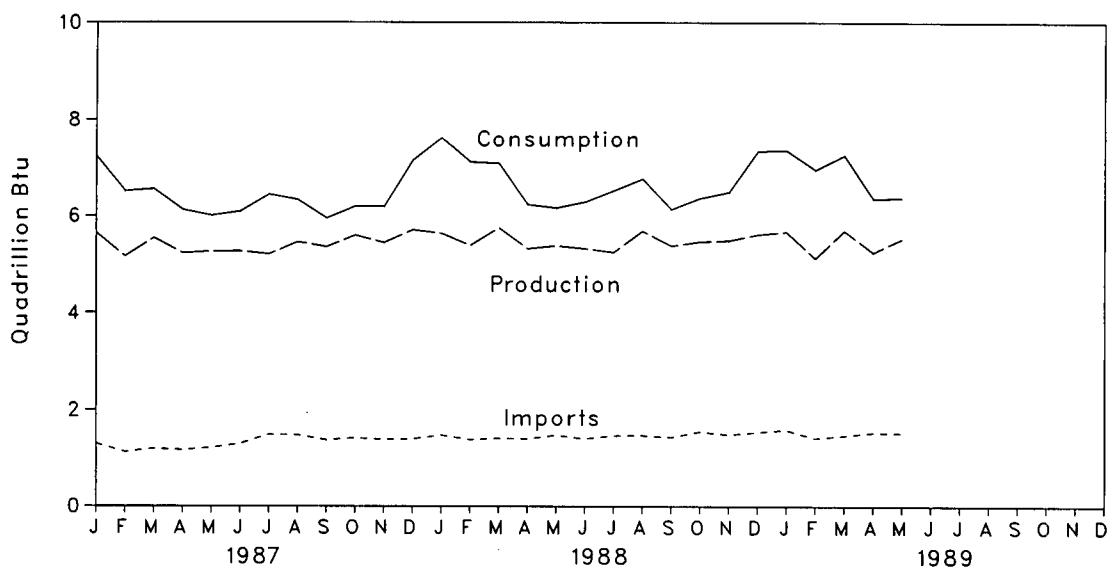
Sources: Energy Information Administration (EIA), *Monthly Energy Review* Section 1 and EIA calculations.

**Figure 1.1 Energy Overview**

Yearly



Monthly



**Table 1.2 Energy Overview<sup>a</sup>**  
**(Quadrillion (10<sup>15</sup>) Btu)**

	Production <sup>b</sup>	Consumption <sup>b c</sup>	Imports	Exports	Net Imports
1973 Total .....	62,060	74,282	14,731	2,051	12,680
1974 Total .....	60,835	72,543	14,413	2,223	12,190
1975 Total .....	59,860	70,546	14,111	2,359	11,752
1976 Total .....	59,892	74,362	16,837	2,188	14,648
1977 Total .....	60,219	76,288	20,090	2,071	18,019
1978 Total .....	61,103	78,089	19,254	1,931	17,323
1979 Total .....	63,801	78,898	19,616	2,870	16,746
1980 Total .....	64,761	75,955	15,971	3,723	12,247
1981 Total .....	64,421	73,990	13,975	4,329	9,646
1982 Total .....	63,898	70,848	12,092	4,633	7,460
1983 Total .....	61,215	70,524	12,028	3,717	8,311
1984 Total .....	65,847	74,101	12,763	3,804	8,959
1985 Total .....	64,765	73,945	12,098	4,232	7,886
1986 Total .....	64,225	74,237	14,430	4,055	10,375
1987 January .....	5,642	7,226	1,292	.281	1,010
February .....	5,157	6,511	1,111	.294	.817
March .....	5,535	6,554	1,182	.315	.867
April .....	5,223	6,123	1,156	.324	.831
May .....	5,257	6,003	1,200	.300	.900
June .....	5,264	6,090	1,290	.321	.970
July .....	5,204	6,442	1,488	.307	1.181
August .....	5,454	6,332	1,478	.336	1.142
September .....	5,354	5,951	1,371	.324	1.046
October .....	5,592	6,197	1,413	.304	1.109
November .....	5,440	6,194	1,384	.330	1.054
December .....	5,703	7,145	1,392	.417	.974
Total .....	64,823	76,768	15,755	3,852	11,903
1988 January .....	R 5,632	7,605	1,475	.290	1,185
February .....	R 5,383	7,112	1,381	.277	1,104
March .....	R 5,747	7,083	1,409	.350	1,059
April .....	R 5,319	6,235	1,397	.364	1,034
May .....	R 5,380	6,166	1,478	.374	1,104
June .....	R 5,321	6,292	1,401	.394	1,007
July .....	5,247	6,527	1,467	.382	1,085
August .....	R 5,684	6,768	1,476	.408	1,068
September .....	R 5,378	R 6,139	1,435	.396	1,039
October .....	5,465	R 6,372	1,554	.383	1,171
November .....	R 5,491	R 6,501	1,494	.362	1,132
December .....	R 5,614	R 7,337	1,547	.441	1,106
Total .....	R 65,662	R 80,135	17,513	4,420	13,094
1989 January .....	R 5,689	R 7,355	1,596	.318	1,278
February .....	R 5,128	R 6,960	1,421	.332	1,089
March .....	R 5,695	R 7,256	1,476	.392	1,084
April .....	R 5,249	R 6,367	1,540	.395	1,145
May .....	5,529	6,380	1,528	.407	1,121
5-Month Total .....	27,291	34,318	7,562	1,843	5,718
1988 5-Month Total .....	27,462	34,202	7,139	1,654	5,485
1987 5-Month Total .....	26,813	32,416	5,940	1,514	4,426

<sup>a</sup>For definitions, see Notes at end of section.

<sup>b</sup>Excludes wood, waste, geothermal, wind, photovoltaic, and solar thermal energy except for small amounts used by electric utilities to generate electricity for distribution.

<sup>c</sup>The sum of domestic energy production and net imports of energy does not equal domestic energy consumption. The difference is attributed to stock changes; losses and gains in conversion, transportation, and distribution; the addition of blending compounds; shipments of anthracite to U.S. Armed Forces in Europe; and adjustments to account for discrepancies between reporting systems.

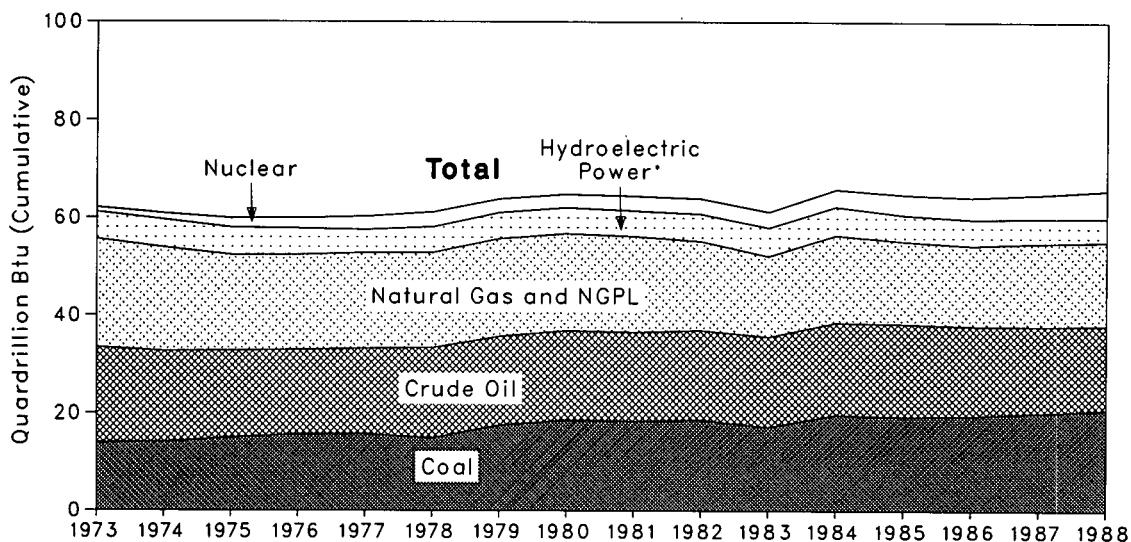
R=Revised data.

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

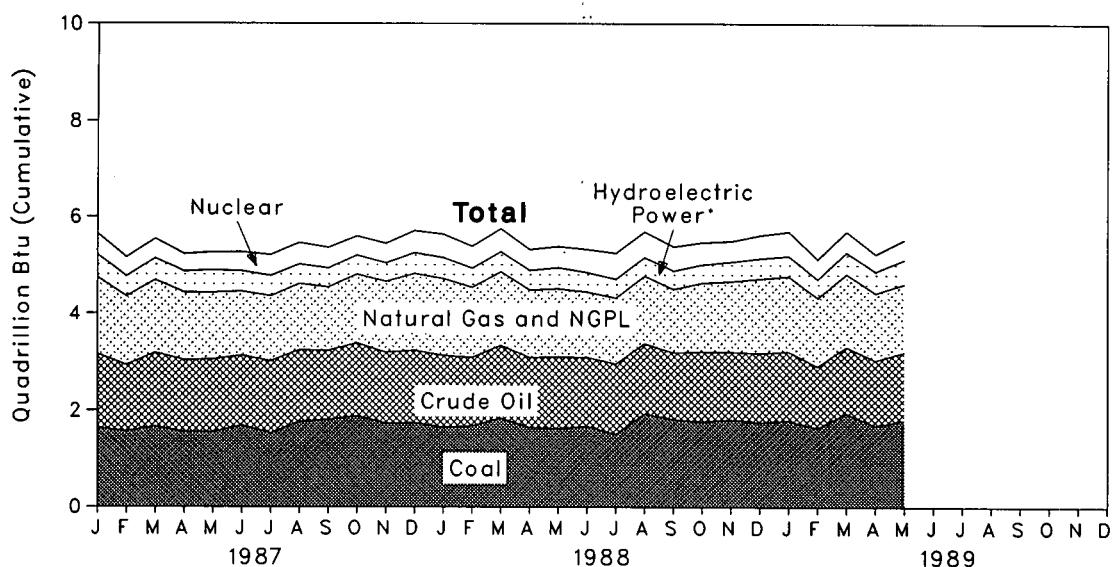
Source: Energy Information Administration calculations based on data appearing elsewhere in this publication.

**Figure 1.2 Production of Energy by Source**

Yearly



Monthly



\*Includes other.

**Table 1.3 Production of Energy by Source**  
 (Quadrillion (10<sup>15</sup>) Btu)

	Coal	Crude Oil <sup>a</sup>	NGPL <sup>b</sup>	Natural Gas (Dry)	Hydro-electric Power <sup>c</sup>	Nuclear Electric Power	Other <sup>d</sup>	Total <sup>e</sup>	Year to Date
1973 Total .....	13,993	19,493	2,569	22,187	2,861	0.910	0.046	62,060	
1974 Total .....	14,074	18,575	2,471	21,210	3,177	1.272	.056	60,835	
1975 Total .....	14,990	17,729	2,374	19,640	3,155	1.900	.072	59,860	
1976 Total .....	15,654	17,262	2,327	19,480	2,976	2.111	.081	59,892	
1977 Total .....	15,755	17,454	2,327	19,565	2,333	2,702	.082	60,219	
1978 Total .....	14,910	18,434	2,245	19,485	2,937	3,024	.068	61,103	
1979 Total .....	17,539	18,104	2,286	20,076	2,931	2,776	.089	63,801	
1980 Total .....	18,597	18,249	2,254	19,908	2,900	2,739	.114	64,761	
1981 Total .....	18,376	18,146	2,307	19,699	2,758	3,008	.127	64,421	
1982 Total .....	18,639	18,309	2,191	18,255	3,266	3,131	.108	63,898	
1983 Total .....	17,246	18,392	2,184	16,530	3,527	3,203	.133	61,215	
1984 Total .....	19,719	18,848	2,274	17,931	3,348	3,553	.174	65,847	
1985 Total .....	19,325	18,992	2,241	16,906	2,939	4,149	.213	64,765	
1986 Total .....	19,510	18,376	2,149	16,471	3,017	4,471	.231	64,225	
1987 January .....	1,637	1,525	.187	1,578	.264	.431	.020	5,642	5,642
February .....	1,571	1,362	.172	1,418	.220	.394	.019	5,157	10,798
March .....	1,663	1,522	.188	1,498	.241	.402	.021	5,535	16,333
April .....	1,557	1,479	.181	1,396	.229	.361	.019	5,223	21,556
May .....	1,550	1,499	.187	1,379	.252	.370	.020	5,257	26,813
June .....	1,690	1,440	.180	1,322	.217	.394	.021	5,264	32,077
July .....	1,530	1,484	.187	1,340	.210	.432	.022	5,204	37,281
August .....	1,769	1,476	.185	1,364	.192	.446	.022	5,454	42,734
September .....	1,808	1,428	.181	1,301	.189	.427	.020	5,354	48,088
October .....	1,885	1,504	.189	1,415	.186	.393	.020	5,592	53,680
November .....	1,737	1,461	.187	1,457	.175	.403	.020	5,440	59,120
December .....	1,744	1,495	.191	1,581	.219	.453	.020	5,703	64,823
Total .....	20,142	17,675	2,215	17,049	2,593	4,908	.244	64,823	
1988 January .....	1,649	1,483	.187	R 1,583	.229	.481	.021	R 5,632	R 5,632
February .....	1,682	1,409	.177	R 1,444	.198	.455	.018	R 5,383	11,016
March .....	1,839	1,506	.193	R 1,512	.203	.473	.021	R 5,747	R 16,763
April .....	1,650	1,442	.185	R 1,392	.199	.432	.019	R 5,319	R 22,081
May .....	1,622	1,480	.192	R 1,409	.221	.438	.018	R 5,380	R 27,462
June .....	1,675	1,422	.185	R 1,349	.196	.475	.020	R 5,321	R 32,783
July .....	1,516	1,446	.191	1,360	.176	.537	.021	5,247	R 38,030
August .....	1,933	1,453	.191	R 1,388	.171	.528	.021	R 5,684	R 43,714
September .....	1,823	1,374	.185	R 1,308	.169	.499	.020	R 5,378	R 49,092
October .....	1,772	1,442	.196	1,418	.157	.459	.020	5,465	R 54,556
November .....	1,817	1,396	.191	R 1,450	.192	.426	.020	R 5,491	R 60,047
December .....	1,758	1,428	.193	R 1,534	.207	.475	.019	R 5,614	R 65,661
Total .....	20,736	17,279	2,267	R 17,148	2,318	5,678	.236	R 65,662	
1989 January .....	R 1,796	1,423	.195	R 1,550	.208	.499	.019	R 5,689	R 5,689
February .....	R 1,644	1,272	.171	R 1,414	.193	.417	.017	R 5,128	R 10,818
March .....	R 1,950	1,368	.195	R 1,500	.235	.427	.020	R 5,695	R 16,513
April .....	1,692	1,348	.191	R 1,390	.250	.361	.017	R 5,249	R 21,761
May .....	1,807	1,404	.192	1,404	.291	.413	.018	5,529	27,291
5-Month Total ....	8,889	6,814	.944	7,257	1,177	2,118	.092	27,291	
1988 5-Month Total ....	8,442	7,319	.935	7,341	1,050	2,279	.096	27,462	
1987 5-Month Total ....	7,979	7,387	.916	7,270	1,205	1,958	.099	26,813	

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

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

<sup>c</sup>Includes industrial and utility production of hydroelectric power.

<sup>d</sup>Other is electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

<sup>e</sup>Excludes wood, waste, geothermal, wind, photovoltaic, and solar thermal energy except for small amounts used by electric utilities to generate electricity for distribution.

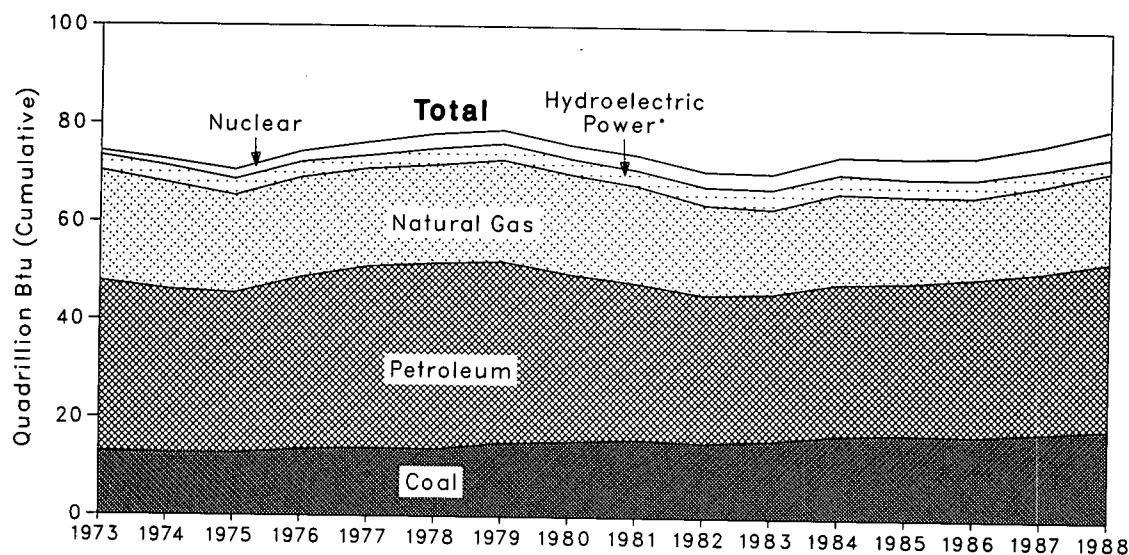
R=Revised data.

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

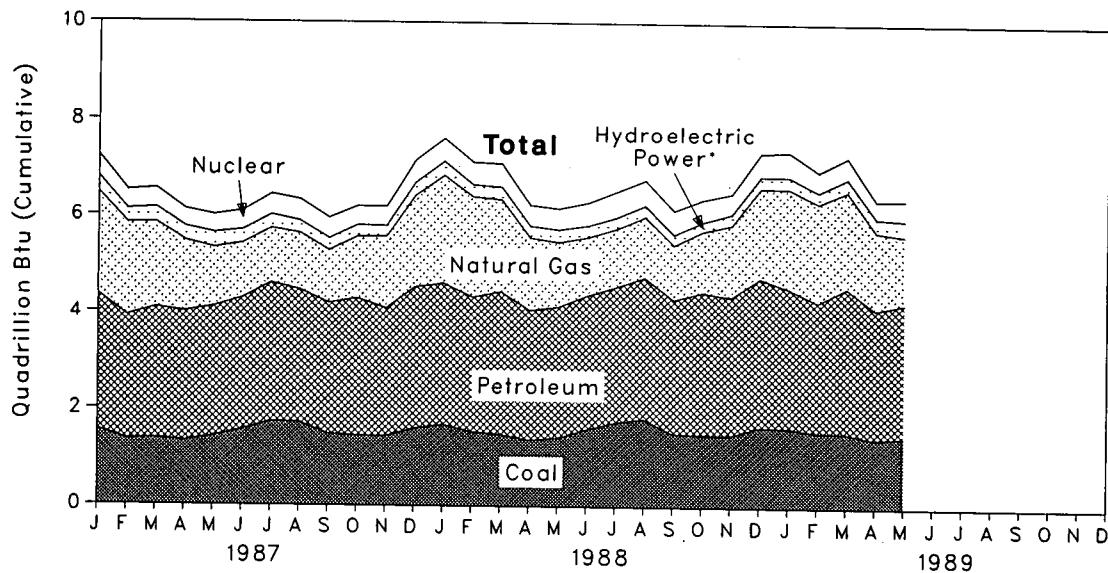
Source: Energy Information Administration calculations based on data appearing elsewhere in this publication.

**Figure 1.3 Consumption of Energy by Source**

Yearly



Monthly



\*Includes other.

**Table 1.4 Consumption of Energy by Source**  
 (Quadrillion (10<sup>15</sup>) Btu)

	Coal	Natural Gas <sup>a</sup>	Petro-leum	Hydro-electric Power <sup>b</sup>	Nuclear Electric Power	Other <sup>c</sup>	Total <sup>d</sup>	Year to Date
1973 Total .....	12,971	22,512	34,840	3,010	0.910	0.039	74,282	
1974 Total .....	12,663	21,732	33,455	3,309	1.272	.112	72,543	
1975 Total .....	12,663	19,948	32,731	3,219	1.900	.086	70,546	
1976 Total .....	13,584	20,345	35,175	3,066	2.111	.081	74,362	
1977 Total .....	13,922	19,931	37,122	2,515	2.702	.097	76,288	
1978 Total .....	13,765	20,000	37,965	3,141	3,024	.193	78,089	
1979 Total .....	15,039	20,666	37,123	3,141	2,776	.152	78,898	
1980 Total .....	15,423	20,394	34,202	3,118	2,739	.079	75,955	
1981 Total .....	15,907	19,928	31,931	3,105	3,008	.111	73,990	
1982 Total .....	15,322	18,505	30,231	3,572	3,131	.086	70,848	
1983 Total .....	15,894	17,357	30,054	3,899	3,203	.118	70,524	
1984 Total .....	17,070	18,507	31,051	3,757	3,553	.163	74,101	
1985 Total .....	17,478	17,834	30,922	3,363	4,149	.199	73,945	
1986 Total .....	17,262	16,708	32,196	3,385	4,471	.215	74,237	
1987 January .....	1,563	2,115	2,794	.303	.431	.019	7,226	7,226
February .....	1,358	1,917	2,558	.264	.394	.020	6,511	13,736
March .....	1,372	1,767	2,707	.286	.402	.019	6,554	20,290
April .....	1,323	1,466	2,678	.275	.361	.020	6,123	26,414
May .....	1,419	1,221	2,684	.288	.370	.021	6,003	32,416
June .....	1,554	1,133	2,728	.259	.394	.023	6,090	38,507
July .....	1,732	1,133	2,866	.258	.432	.022	6,442	44,949
August .....	1,720	1,169	2,738	.237	.446	.022	6,332	51,281
September .....	1,484	1,091	2,702	.222	.427	.024	5,951	57,232
October .....	1,448	1,276	2,838	.220	.393	.022	6,197	63,429
November .....	1,434	1,481	2,649	.205	.403	.022	6,194	69,623
December .....	1,602	1,900	2,922	.250	.453	.019	7,145	76,768
Total .....	18,008	17,668	32,865	3,068	4,906	.253	76,768	
1988 January .....	1,686	2,235	2,918	.261	.481	.024	7,605	7,605
February .....	1,537	2,084	2,785	.232	.455	.019	7,112	14,718
March .....	1,483	1,913	2,953	.235	.473	.026	7,083	21,801
April .....	1,370	1,499	2,687	.225	.432	.023	6,235	28,036
May .....	1,415	1,337	2,715	.244	.438	.017	6,166	34,202
June .....	1,598	1,203	2,768	.223	.475	.024	6,292	40,494
July .....	1,747	1,205	2,799	.211	.537	.028	6,527	47,021
August .....	1,821	1,256	2,931	.209	.528	.024	6,768	53,789
September .....	1,523	R 1,131	2,770	.194	.499	.023	R 6,139	R 59,928
October .....	1,499	R 1,263	2,947	.180	.459	.024	R 6,372	R 66,299
November .....	1,493	R 1,493	2,859	.209	.426	.021	R 6,501	R 72,800
December .....	1,667	R 1,872	3,079	.221	.475	.022	R 7,337	R 80,138
Total .....	18,840	R 18,489	34,209	2,644	5,678	.276	R 80,135	
1989 January .....	R 1,650	R 2,071	2,885	.222	.499	.026	R 7,355	R 7,355
February .....	R 1,563	R 2,058	2,690	.213	.417	.019	R 6,960	R 14,315
March .....	R 1,552	2,005	3,002	.246	.427	.023	R 7,256	R 21,570
April .....	1,417	R 1,615	2,687	.263	.361	.024	R 6,367	R 27,937
May .....	1,464	1,407	2,764	.308	.413	.024	6,380	34,318
5-Month Total ....	7,646	9,156	14,029	1,252	2,118	.117	34,318	
1988 5-Month Total ....	7,491	9,068	14,057	1,197	2,279	.109	34,202	
1987 5-Month Total ....	7,035	8,485	13,422	1,417	1,958	.098	32,416	

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

<sup>b</sup>Includes industrial and utility production and net imports of electricity.

<sup>c</sup>Other is net imports of coal coke and electricity generated for distribution from wood, waste, geothermal, wind; photovoltaic, and solar thermal energy.

<sup>d</sup>Excludes wood, waste, geothermal, wind, photovoltaic, and solar thermal energy except for small amounts used by electric utilities to generate electricity for distribution.

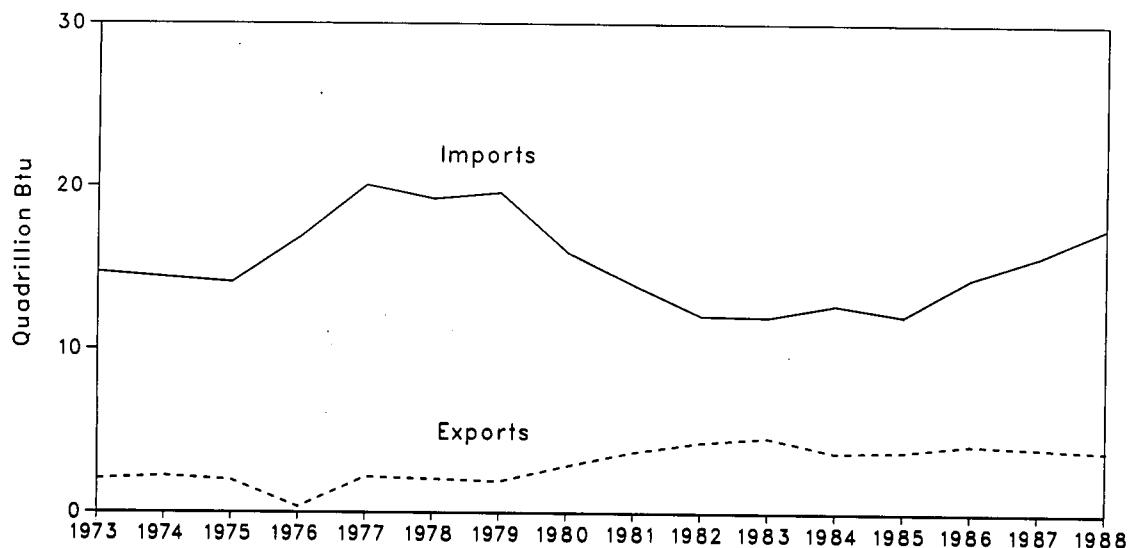
R=Revised data.

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

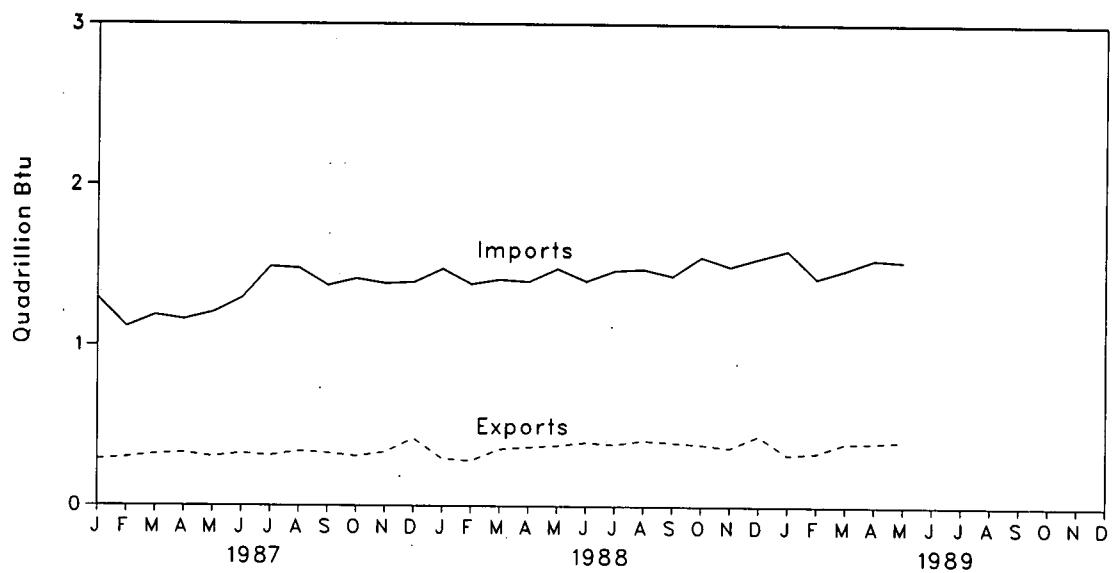
Source: Energy Information Administration calculations based on data appearing elsewhere in this publication.

**Figure 1.4 Energy Imports and Exports**

Yearly



Monthly



**Table 1.5 Net Imports<sup>a</sup> of Energy by Source  
(Quadrillion (10<sup>15</sup>) Btu)**

	Coal	Crude Oil <sup>b</sup>	Petro- leum Products <sup>c</sup>	Natural Gas	Electric- ity <sup>d</sup>	Coal Coke	Total	Year to Date
1973 Total .....	-1.422	6.883	6.097	0.981	0.148	-0.007	12.680	
1974 Total .....	-1.568	7.389	5.273	.907	.133	.056	12.190	
1975 Total .....	-1.738	8.708	3.800	.904	.064	.014	11.752	
1976 Total .....	-1.567	11.221	3.982	.922	.089	0	14.648	
1977 Total .....	-1.401	13.921	4.321	.981	.182	.015	18.019	
1978 Total .....	-1.004	13.125	3.932	.941	.204	.125	17.323	
1979 Total .....	-1.702	13.328	3.603	1.243	.211	.063	16.746	
1980 Total .....	-2.391	10.586	2.912	.957	.217	-.035	12.247	
1981 Total .....	-2.918	8.854	2.522	.857	.347	-.016	9.646	
1982 Total .....	-2.768	6.917	2.128	.898	.306	-.022	7.460	
1983 Total .....	-2.013	6.731	2.351	.887	.372	-.016	8.311	
1984 Total .....	-2.119	6.918	2.970	.792	.409	-.011	8.859	
1985 Total .....	-2.389	6.381	2.570	.894	.423	-.013	7.866	
1986 Total .....	-2.193	8.676	2.855	.886	.388	-.017	10.375	
1987 January .....	-141	.787	.229	.098	.040	-.001	1.010	1.010
February .....	-120	.593	.218	.081	.044	.001	.817	1.828
March .....	-167	.664	.246	.081	.045	-.002	.887	2.695
April .....	-158	.669	.189	.065	.046	0	.831	3.526
May .....	-169	.782	.192	.058	.037	0	.900	4.426
June .....	-190	.831	.232	.053	.042	.002	.970	5.396
July .....	-171	.942	.302	.061	.048	0	1.181	6.577
August .....	-199	.982	.242	.070	.046	.001	1.142	7.719
September .....	-171	.885	.228	.068	.033	.004	1.046	8.786
October .....	-172	.926	.232	.088	.034	.002	1.109	9.875
November .....	-183	.859	.244	.101	.030	.003	1.054	10.928
December .....	-209	.809	.229	.116	.031	-.001	.974	11.903
Total .....	-2.049	8.748	2.784	.936	.475	.009	11.903	
1988 January .....	-113	.811	.318	.133	.032	.003	1.185	1.185
February .....	-114	.767	.305	.111	.033	.002	1.104	2.288
March .....	-182	.847	.251	.106	.032	.008	1.058	3.348
April .....	-233	.890	.258	.089	.028	.004	1.034	4.382
May .....	-202	.946	.250	.089	.022	-.002	1.104	5.485
June .....	-205	.913	.184	.084	.027	.005	1.007	6.492
July .....	-213	.894	.288	.094	.035	.007	1.085	7.577
August .....	-240	.898	.282	.087	.038	.003	1.068	8.846
September .....	-284	.897	.291	.087	.025	.003	1.039	9.885
October .....	-231	.980	.296	.099	.023	.004	1.171	10.855
November .....	-214	.867	.348	.113	.017	.001	1.132	11.987
December .....	-234	.928	.278	.117	.015	.003	1.106	13.094
Total .....	-2.446	10.638	3.329	1.207	.326	.040	13.094	
1989 January .....	-164	.980	.328	.113	E .015	.007	1.278	1.278
February .....	-174	.831	.309	.102	E .019	.002	1.089	2.368
March .....	-212	.880	.292	.110	E .011	.003	1.084	3.452
April .....	-236	.987	.270	.104	E .013	.007	1.145	4.597
May .....	-247	1.007	.236	.103	E .017	.006	1.121	5.718
5-Month Total ....	-1.033	4.685	1.435	.531	E .075	.025	5.718	
1988 5-Month Total ....	-844	4.261	1.381	.527	.148	.013	5.485	
1987 5-Month Total ....	-755	3.515	1.075	.380	.212	-.001	4.426	

<sup>a</sup>Net imports equals imports minus exports. Minus sign indicates exports are greater than imports.

<sup>b</sup>Includes crude oil, lease condensate, and imports of crude oil for the Strategic Petroleum Reserve.

<sup>c</sup>Includes petroleum products, unfinished oils, pentanes plus, and gasoline blending components.

<sup>d</sup>Assumed to be hydroelectricity and estimated at the average input heat rate for fossil fuel steam-electric power plant generation, which has ranged from 10.3 to 10.5 thousand Btu per kilowatthour since 1973. Actual rates applied in converting kilowatthour to Btu are listed by year in the Appendix of this publication.

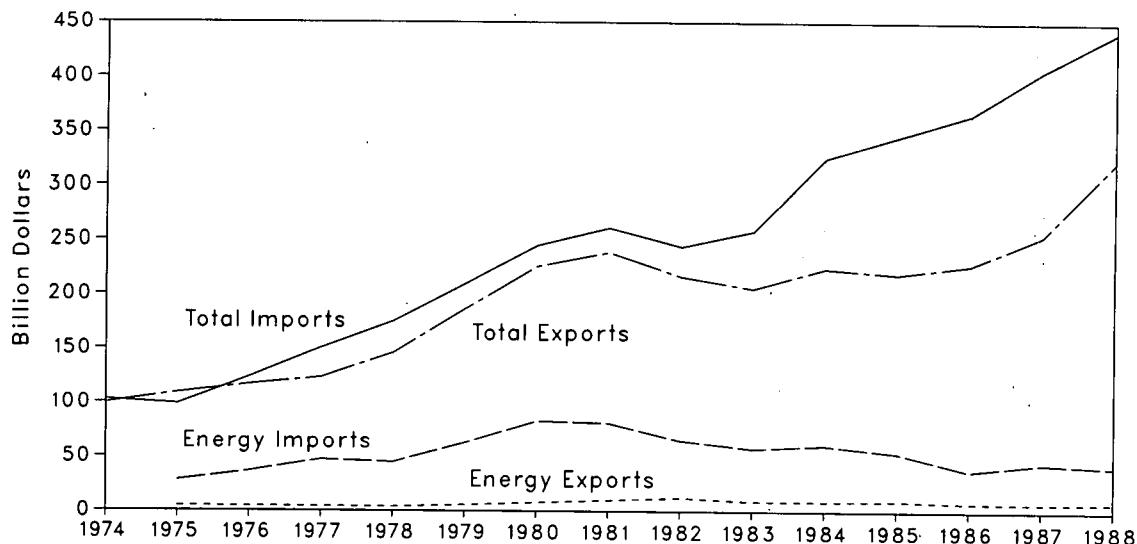
E=Estimate.

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

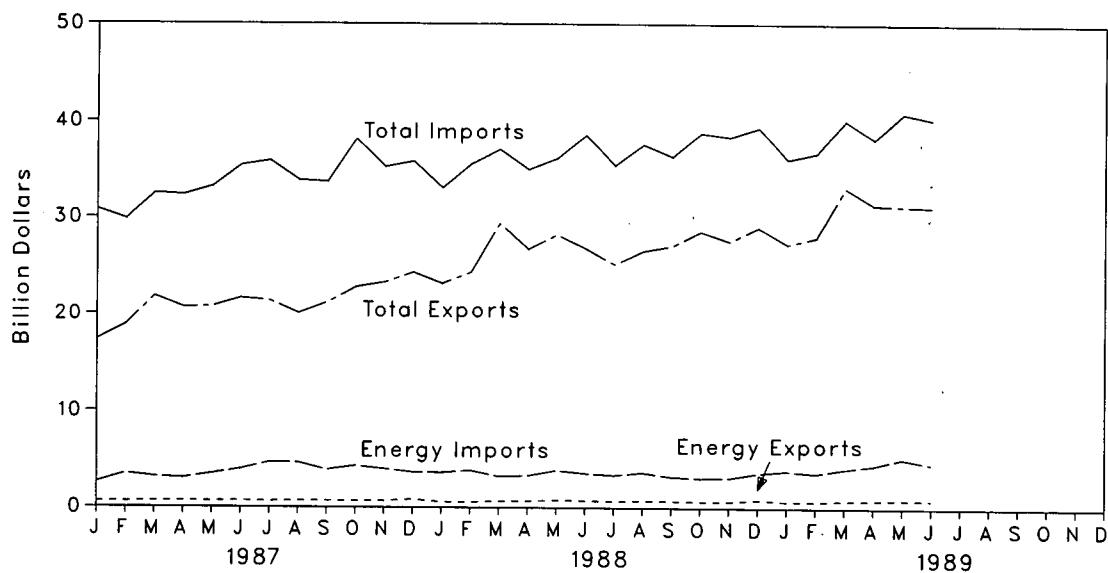
Source: Energy Information Administration calculations based on data appearing elsewhere in this publication.

**Figure 1.5 Merchandise Trade Value**

**Yearly**



**Monthly**



**Table 1.6 Merchandise Trade Value**  
(Million Dollars)

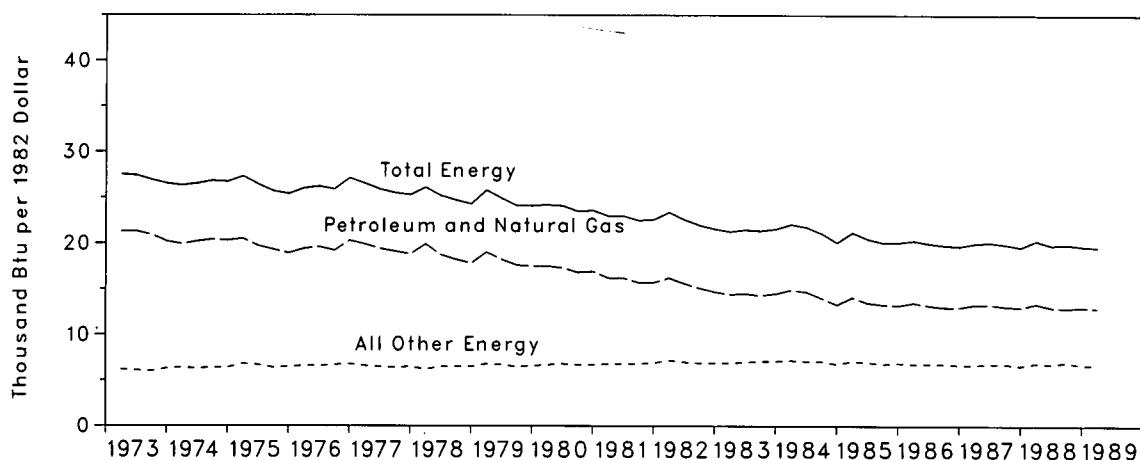
	Exports			Imports			Trade Balance		
	Energy	All Other	Total	Energy	All Other	Total	Energy	All Other	Total
1974 Total .....	NA	NA	99,437	NA	NA	102,559	NA	NA	-3,122
1975 Total .....	4,470	104,386	108,856	28,325	70,178	98,503	-23,855	34,208	10,353
1976 Total .....	4,226	112,568	116,794	36,384	87,093	123,477	-32,158	25,475	-6,683
1977 Total .....	4,184	118,998	123,182	47,153	103,237	150,390	-42,969	15,761	-27,208
1978 Total .....	3,882	141,965	145,847	44,763	129,994	174,757	-40,881	11,971	-28,910
1979 Total .....	5,875	180,688	186,363	63,077	146,381	209,458	-57,402	34,307	-23,095
1980 Total .....	7,982	217,584	225,566	82,924	161,947	244,871	-74,942	55,637	-19,305
1981 Total .....	10,279	228,436	238,715	81,380	179,622	260,982	-71,081	48,814	-22,267
1982 Total .....	12,729	203,713	216,442	65,409	178,543	243,952	-52,680	25,170	-27,510
1983 Total .....	9,500	196,139	205,639	57,952	200,096	258,048	-48,452	-3,957	-52,409
1984 Total .....	9,311	214,665	223,976	60,980	264,746	325,726	-51,669	-50,081	-101,750
1985 Total .....	9,971	208,844	218,815	53,917	291,359	345,276	-43,946	-82,515	-126,461
1986 Total .....	8,115	219,044	227,159	37,310	328,128	365,438	-29,195	-109,084	-138,279
1987 January .....	573	16,773	17,346	2,564	28,235	30,799	-1,991	-11,462	-13,453
February .....	564	18,290	18,854	3,440	26,370	29,810	-2,876	-8,080	-10,956
March .....	620	21,216	21,836	3,120	29,344	32,464	-2,500	-8,128	-10,628
April .....	633	20,045	20,678	2,979	29,312	32,291	-2,346	-9,267	-11,613
May .....	623	20,137	20,760	3,425	29,745	33,170	-2,802	-9,608	-12,410
June .....	654	20,983	21,637	3,895	31,463	35,358	-3,241	-10,480	-13,721
July .....	605	20,774	21,379	4,593	31,217	35,810	-3,988	-10,443	-14,431
August .....	675	19,404	20,079	4,582	29,244	33,826	-3,907	-9,840	-13,747
September .....	657	20,527	21,184	3,830	29,838	33,668	-3,173	-9,311	-12,484
October .....	630	22,148	22,778	4,240	33,836	38,076	-3,610	-11,688	-15,298
November .....	660	22,619	23,279	3,940	31,271	35,211	-3,280	-8,652	-11,932
December .....	817	23,497	24,314	3,612	32,147	35,759	-2,795	-8,650	-11,445
Total .....	7,713	246,409	254,122	44,220	362,021	406,241	-36,507	-115,612	-152,119
1988 January .....	560	22,602	23,162	3,576	29,459	33,035	-3,016	-6,858	-9,874
February .....	548	23,768	24,316	3,795	31,699	35,494	-3,247	-7,932	-11,179
March .....	645	28,698	29,343	R 3,190	R 33,809	36,999	R -2,545	R -5,111	-7,656
April .....	678	26,050	26,728	R 3,281	R 31,680	34,961	R -2,603	R -5,630	-8,233
May .....	R 763	R 27,430	28,193	R 3,800	R 32,308	36,108	R -3,037	R -4,878	-7,915
June .....	R 728	R 26,075	26,803	R 3,525	R 35,016	38,541	R -2,797	R -8,941	-11,738
July .....	660	24,526	25,186	3,339	32,058	35,397	-2,679	-7,532	-10,211
August .....	727	25,812	26,539	3,608	33,937	37,545	-2,881	-8,125	-11,006
September .....	711	26,356	27,067	3,204	33,100	36,304	-2,493	-6,744	-9,237
October .....	856	27,888	28,544	3,057	35,738	38,795	-2,401	-7,850	-10,251
November .....	654	26,911	27,565	3,101	35,288	38,389	-2,447	-8,377	-10,824
December .....	864	28,118	28,982	3,583	35,801	39,384	-2,719	-7,683	-10,402
Total .....	R 8,194	R 314,232	322,426	R 41,059	R 399,893	R 440,952	R -32,865	R -85,661	-118,526
1989 January .....	R 678	R 26,617	27,295	R 3,816	R 32,216	36,032	R -3,138	R -5,600	-8,738
February .....	R 673	R 27,291	27,964	R 3,567	R 33,120	36,687	R -2,894	R -5,830	-8,724
March .....	R 783	R 32,348	33,131	R 4,024	R 36,123	40,147	R -3,241	R -3,775	-7,016
April .....	R 814	R 30,553	31,367	R 4,392	R 33,793	38,185	R -3,578	R -3,240	-6,818
May .....	R 871	R 30,400	R 31,271	R 5,104	R 35,792	R 40,896	R -4,233	R -5,392	R -9,625
June .....	831	30,328	31,159	4,543	35,738	40,281	-3,712	-5,410	-9,122
6-Month Total ..	4,850	177,536	182,186	25,447	206,780	232,227	-20,797	-29,244	-50,041

R=Revised data. NA=Not available.

Notes: • Monthly data are not adjusted for seasonal variations. • The U.S. import statistics reflect both government and nongovernment imports of merchandise from foreign countries into the U.S. customs territory (which comprises the 50 States, the District of Columbia, and Puerto Rico) and the Virgin Islands.

Additional Notes and Sources: See end of section.

**Figure 1.6 Quarterly Energy Consumption per Dollar of Gross National Product (Seasonally Adjusted at Annual Rates)**



**Table 1.7 Energy Consumption per Dollar of Gross National Product (Seasonally Adjusted at Annual Rates)**

	Energy Consumption <sup>a</sup>	Gross National Product (GNP)	Energy Consumption per Dollar of GNP		
			Total Energy	Petroleum and Natural Gas	All Other Energy
	Quadrillion Btu	Trillion 1982 Dollars	Thousand Btu per 1982 Dollar		
1973 Year .....	74.282	2.744	27.1	20.9	6.2
1974 Year .....	72.543	2.729	26.6	20.2	6.4
1975 Year .....	70.546	2.695	26.2	19.5	6.7
1976 Year .....	74.362	2.827	26.3	19.6	6.7
1977 Year .....	76.288	2.959	25.8	19.3	6.5
1978 Year .....	78.089	3.115	25.1	18.6	6.5
1979 Year .....	78.898	3.192	24.7	18.1	6.6
1980 Year .....	75.955	3.187	23.8	17.1	6.7
1981 Year .....	73.990	3.249	22.8	16.0	6.8
1982 Year .....	70.848	3.166	22.4	15.4	7.0
1983 Year .....	70.524	3.279	21.5	14.5	7.0
1984 Year .....	74.101	3.501	21.2	14.2	7.0
1985 Year .....	73.945	3.619	20.4	13.5	6.9
1986 Year .....	74.237	R 3.718	R 20.0	13.2	6.8
1987 1 <sup>st</sup> Quarter <sup>b</sup> .....	75.806	R 3.783	R 20.0	13.3	R 6.7
2 <sup>nd</sup> Quarter <sup>b</sup> .....	76.967	R 3.824	20.1	13.3	6.8
3 <sup>rd</sup> Quarter <sup>b</sup> .....	77.229	R 3.873	R 19.9	13.1	R 6.8
4 <sup>th</sup> Quarter <sup>b</sup> .....	77.051	R 3.936	19.6	13.0	6.6
Year .....	76.768	R 3.854	R 19.9	13.1	R 6.8
1988 1 <sup>st</sup> Quarter <sup>b</sup> .....	R 80.777	R 3.975	R 20.3	R 13.4	6.9
2 <sup>nd</sup> Quarter <sup>b</sup> .....	79.313	R 4.011	R 19.8	R 13.0	6.8
3 <sup>rd</sup> Quarter <sup>b</sup> .....	R 80.369	R 4.043	R 19.9	R 12.9	R 7.0
4 <sup>th</sup> Quarter <sup>b</sup> .....	R 80.086	R 4.069	R 19.7	R 13.0	R 6.7
Year .....	R 80.135	R 4.024	R 19.9	R 13.1	R 6.8
1989 1 <sup>st</sup> Quarter <sup>b</sup> .....	R 80.657	R 4.107	R 19.6	R 12.9	R 6.7

<sup>a</sup>Excludes wood, waste, geothermal, wind, photovoltaic, and solar thermal energy except for small amounts used by electric utilities to generate electricity for distribution.

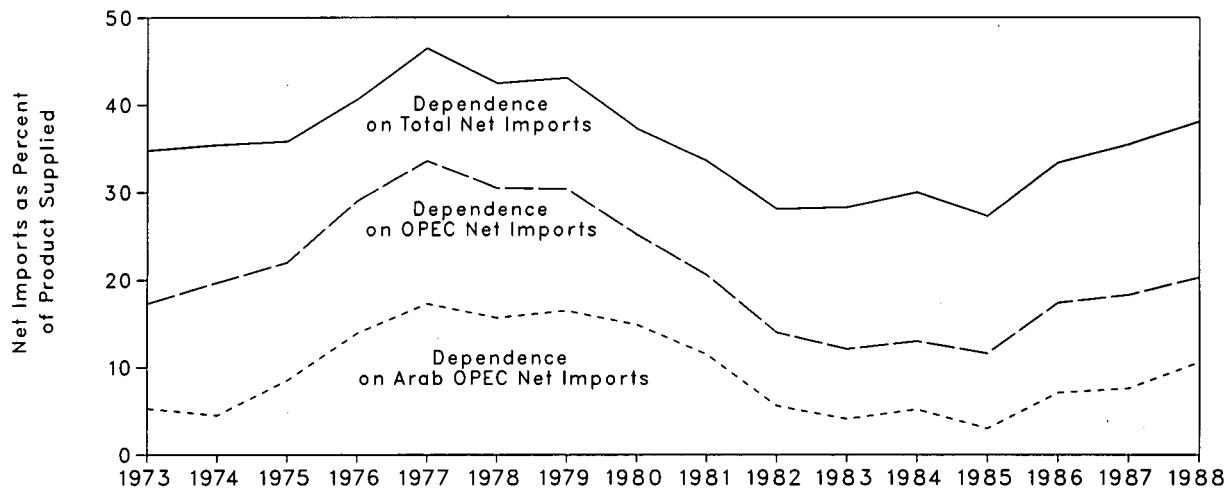
<sup>b</sup>Quarterly data are seasonally adjusted and shown at annual rates.

R=Revised data.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Yearly data may not equal average of quarters due to seasonality adjustments and independent rounding.

Sources: See end of section.

**Figure 1.7 U.S. Dependence on Petroleum Net Imports**



**Table 1.8 U.S. Dependence on Petroleum Net Imports<sup>a</sup>**

Annual Rate	Net Imports <sup>b</sup>			Petroleum Products Supplied	Net Imports as Percent of U.S. Petroleum Products Supplied		
	From Arab OPEC <sup>c</sup>	From OPEC <sup>d</sup>	From All Countries		From Arab OPEC <sup>c</sup>	From OPEC <sup>d</sup>	From All Countries
	Thousand Barrels per Day				Percent		
1973 Average .....	914	2,991	6,025	17,308	5.3	17.3	34.8
1974 Average .....	752	3,277	5,892	16,653	4.5	19.7	35.4
1975 Average .....	1,382	3,599	5,846	16,322	8.5	22.0	35.8
1976 Average .....	2,423	5,083	7,090	17,461	13.9	29.0	40.6
1977 Average .....	3,184	6,190	8,565	18,431	17.3	33.6	46.5
1978 Average .....	2,962	5,747	8,002	18,847	15.7	30.5	42.5
1979 Average .....	3,054	5,633	7,985	18,513	16.5	30.4	43.1
1980 Average .....	2,549	4,293	6,365	17,056	14.9	25.2	37.3
1981 Average .....	1,844	3,315	5,401	16,058	11.5	20.6	33.6
1982 Average .....	852	2,136	4,298	15,296	5.6	14.0	28.1
1983 Average .....	630	1,843	4,312	15,231	4.1	12.1	28.3
1984 Average .....	817	2,037	4,715	15,726	5.2	13.0	30.0
1985 Average .....	470	1,821	4,286	15,726	3.0	11.6	27.3
1986 Average .....	1,160	2,828	5,439	16,281	7.1	17.4	33.4
1987 1 <sup>st</sup> Quarter .....	1,077	2,608	5,252	16,575	6.5	15.7	31.7
2 <sup>nd</sup> Quarter .....	968	2,734	5,514	16,455	5.9	16.6	33.5
3 <sup>rd</sup> Quarter .....	1,501	3,607	6,697	16,710	9.0	21.6	40.1
4 <sup>th</sup> Quarter .....	1,534	3,251	6,175	16,916	9.1	19.2	36.5
Average .....	1,272	3,053	5,914	16,665	7.6	18.3	35.5
1988 1 <sup>st</sup> Quarter .....	1,676	3,210	6,263	17,588	9.5	18.3	35.6
2 <sup>nd</sup> Quarter .....	1,655	3,507	6,518	16,601	10.0	21.1	39.3
3 <sup>rd</sup> Quarter .....	1,995	3,655	6,623	17,083	11.7	21.4	38.8
4 <sup>th</sup> Quarter .....	2,020	3,675	6,937	17,857	11.3	20.6	38.8
Average .....	1,837	3,513	6,587	17,283	10.6	20.3	38.1
1989 1 <sup>st</sup> Quarter .....	2,034	3,866	6,946	17,623	11.5	21.9	39.4

<sup>a</sup>Beginning in October 1977, Strategic Petroleum Reserves are included.

<sup>b</sup>Net imports equals imports minus exports. Imports from members of the Organization of Petroleum Exporting Countries (OPEC) exclude indirect imports, which are petroleum products imported primarily from Caribbean and West European areas and refined from crude oil produced by OPEC.

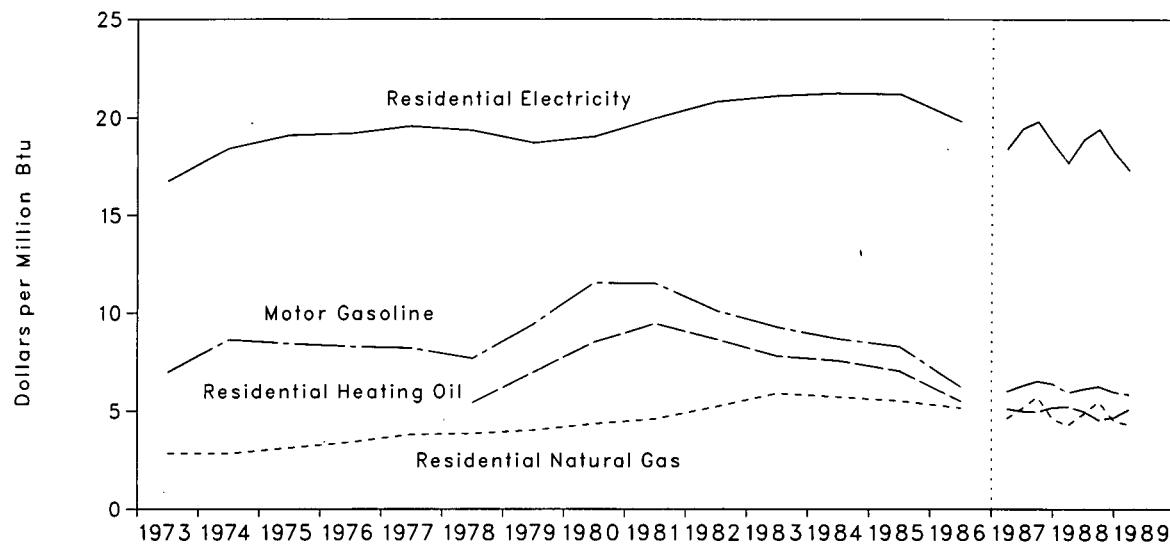
<sup>c</sup>The Arab members of OPEC are Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and the United Arab Emirates. Net imports from the Neutral Zone between Kuwait and Saudi Arabia are included in net imports from "Arab OPEC."

<sup>d</sup>OPEC consists of Ecuador, Gabon, Indonesia, Iran, Nigeria, and Venezuela, as well as the Arab members.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Annual averages may not equal average of quarters due to independent rounding.

Sources: See end of section.

**Figure 1.8 Cost of Fuels to End Users in Constant (1982-84) Dollars**



**Table 1.9 Cost of Fuels to End Users in Constant (1982-84) Dollars<sup>a</sup>**

	Leaded Regular Motor Gasoline		Residential Heating Oil		Residential Natural Gas		Residential Electricity <sup>b</sup>	
	Cent/Gal	\$/MMBtu	Cent/Gal	\$/MMBtu	Cent/Mcf	\$/MMBtu	Cent/kWh	\$/MMBtu
1973 Average .....	87.4	6.99	NA	NA	290.5	2.85	5.72	16.77
1974 Average .....	107.9	8.63	NA	NA	290.1	2.83	6.29	18.43
1975 Average .....	105.4	8.43	NA	NA	317.8	3.12	6.52	19.12
1976 Average .....	103.7	8.29	NA	NA	348.0	3.41	6.56	19.21
1977 Average .....	102.6	8.21	NA	NA	387.8	3.81	6.68	19.59
1978 Average .....	96.0	7.68	75.2	5.42	392.6	3.86	6.61	19.37
1979 Average .....	118.0	9.44	97.0	6.99	410.5	4.03	6.39	18.73
1980 Average .....	144.5	11.56	118.2	8.52	446.6	4.36	6.50	19.06
1981 Average .....	144.2	11.53	131.4	9.47	471.9	4.60	6.82	19.99
1982 Average .....	126.6	10.12	120.2	8.67	535.8	5.22	7.11	20.83
1983 Average .....	116.2	9.29	108.2	7.80	608.4	5.90	7.21	21.13
1984 Average .....	108.7	8.69	105.0	7.57	589.0	5.72	7.26	21.27
1985 Average .....	103.6	8.29	97.9	7.06	568.8	5.52	7.24	21.22
1986 Average .....	78.2	6.25	76.3	5.50	531.9	5.17	6.76	19.82
1987 1 <sup>st</sup> Quarter .....	75.0	6.00	71.0	5.12	477.6	4.63	6.28	18.41
2 <sup>nd</sup> Quarter .....	78.8	6.30	69.3	5.00	530.5	5.15	6.64	19.46
3 <sup>rd</sup> Quarter .....	81.8	6.54	68.9	4.97	580.0	5.72	6.77	19.83
4 <sup>th</sup> Quarter .....	80.1	6.40	71.8	5.18	474.0	4.60	6.39	18.72
Average .....	79.0	6.31	70.7	5.10	487.7	4.73	6.52	19.12
1988 1 <sup>st</sup> Quarter .....	74.3	5.94	72.4	5.22	441.9	4.29	6.04	17.70
2 <sup>nd</sup> Quarter .....	76.7	6.13	69.4	5.00	506.4	4.91	6.45	18.91
3 <sup>rd</sup> Quarter .....	78.4	6.27	63.3	4.56	574.3	5.57	6.63	19.44
4 <sup>th</sup> Quarter .....	74.8	5.98	64.9	4.68	469.7	4.56	6.23	18.25
Average .....	76.0	6.08	68.8	4.96	464.1	4.50	6.33	18.56
1989 1 <sup>st</sup> Quarter .....	73.1	5.85	70.6	5.09	445.4	4.32	5.91	17.32

<sup>a</sup>Fuel costs shown on this page are calculated using the Urban Consumer Price Index developed by the Bureau of Labor Statistics. See Note 6 at end of section.

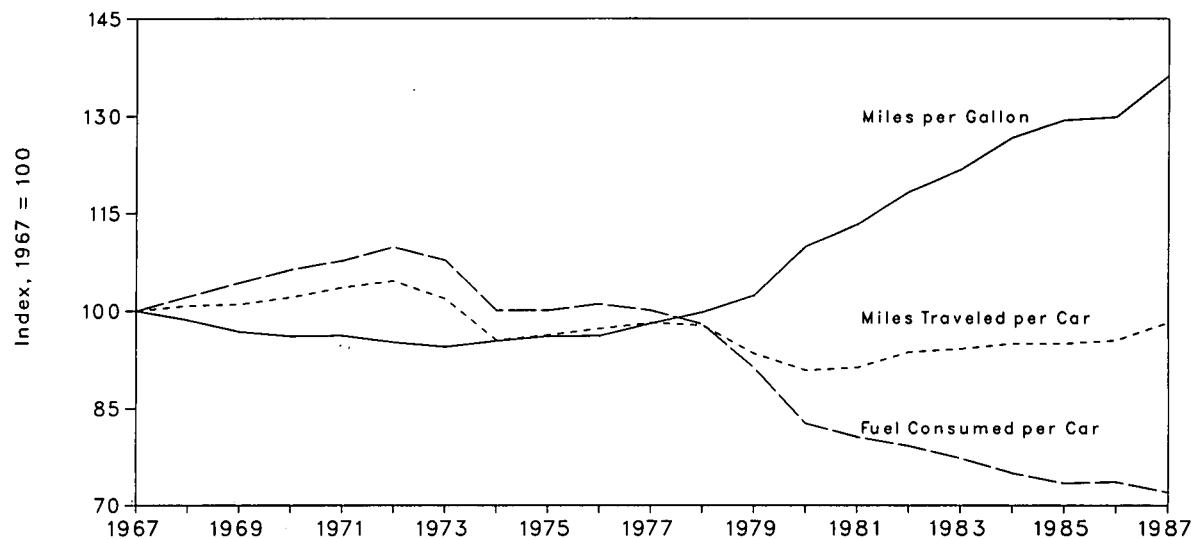
<sup>b</sup>Calculated from Table 9.9 "Old Series" for 1973 through 1985 and "New Series" for 1986 forward.

NA=Not available.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Annual averages may not equal average of quarters due to independent rounding.

Sources: See end of section.

**Figure 1.9 Passenger Car Efficiency**



**Table 1.10 Passenger Car Efficiency**

	Average Fuel Consumed per Car		Average Miles Traveled per Car		Average Miles Traveled per Gallon of Fuel Consumed	
	Gallons	Index	Miles	Index	Miles	Index
1967 .....	715	100.0	10,060	100.0	14.07	100.0
1968 .....	731	102.2	10,144	100.8	13.87	98.6
1969 .....	746	104.3	10,158	101.0	13.62	98.8
1970 .....	760	106.3	10,272	102.1	13.52	96.1
1971 .....	770	107.7	10,422	103.6	13.54	96.2
1972 .....	785	109.8	10,521	104.6	13.40	95.2
1973 .....	771	107.8	10,256	101.9	13.30	94.5
1974 .....	716	100.1	9,606	95.5	13.42	95.4
1975 .....	716	100.1	9,690	96.3	13.52	96.1
1976 .....	723	101.1	9,785	97.3	13.53	96.2
1977 .....	716	100.1	9,879	98.2	13.80	98.1
1978 .....	701	98.0	9,835	97.8	14.04	99.8
1979 .....	653	91.3	9,403	93.5	14.41	102.4
1980 .....	591	82.7	9,141	90.9	15.46	109.9
1981 .....	576	80.6	9,186	91.3	15.94	113.3
1982 .....	566	79.2	9,428	93.7	16.65	118.3
1983 .....	553	77.3	9,475	94.2	17.14	121.8
1984 .....	536	75.0	9,558	95.0	17.83	126.7
1985 .....	525	73.4	9,560	95.0	18.20	129.4
1986 .....	526	73.6	9,608	95.5	18.27	129.9
1987 <sup>a</sup> .....	515	72.0	9,883	98.2	19.17	136.2

<sup>a</sup>Preliminary data.

Note: Geographic coverage is the 50 States and the District of Columbia.

Sources: See end of section.

**Table 1.11 Population-Weighted Cooling Degree-Days<sup>a</sup>**

Census Divisions	July 1 through July 31					Cumulative January 1 through July 31				
	Normal <sup>b</sup>	1988	1989	Percent Change		Normal <sup>b</sup>	1988	1989	Percent Change	
				Normal to 1989	1988 to 1989				Normal to 1989	1988 to 1989
<b>New England</b> CT, ME, MA, NH, RI, VT .....	183	228	160	-12.6	-29.8	255	325	243	-4.7	-25.2
<b>Middle Atlantic</b> NJ, NY, PA .....	250	335	242	-3.2	-27.8	408	502	426	4.4	-15.1
<b>East North Central</b> IL, IN, MI, OH, WI .....	249	346	276	10.8	-20.2	456	589	452	-.9	-23.3
<b>West North Central</b> IA, KS, MN, MO, NE, ND, SD .....	319	367	330	3.4	-10.1	620	727	569	-8.2	-21.7
<b>South Atlantic</b> DE, FL, GA, MD and DC, NC, SC, VA, WV .....	404	439	411	1.7	-6.4	1,039	1,025	1,153	11.0	12.5
<b>East South Central</b> AL, KY, MS, TN .....	413	434	399	-3.4	-8.1	924	890	889	-3.8	-.1
<b>West South Central</b> AR, LA, OK, TX .....	561	543	514	-8.4	-5.3	1,405	1,307	1,438	2.3	10.0
<b>Mountain</b> AZ, CO, ID, MT, NV, NM, UT, WY .....	324	346	362	11.7	4.6	603	732	768	27.4	4.9
<b>Pacific</b> CA, OR, WA .....	195	212	166	-14.9	-21.7	277	292	281	1.4	-3.8
<b>U.S. Average<sup>c</sup></b> .....	317	363	313	-1.3	-13.8	659	705	686	4.1	-2.7

<sup>a</sup>See Note 7 at end of section.

<sup>b</sup>Normal is based on calculations of data from 1951 through 1980.

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

Source: See end of section.

# Notes and Sources for the Energy Summary Section

## Notes

**1. Energy Production:** Production of energy includes production of coal, crude oil and lease condensate, natural gas plant liquids, natural gas (dry), electric utility and industrial production of hydroelectric power, and electricity generated from nuclear power. Production also includes electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy but excludes other energy obtained from those sources because consistent historical data are not available. The volumetric data are converted to approximate heat contents (Btu values) of these energy sources using the conversion factors provided in the Appendix.

**2. Energy Consumption:** Consumption of energy includes consumption of coal, natural gas (including supplemental gaseous fuels), petroleum products supplied, electric utility and industrial production of hydroelectric power, net imports of electricity (assumed to be hydroelectricity), net imports of coal coke, and electricity generated from nuclear power. Consumption also includes electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy but excludes other energy obtained from those sources because consistent historical data are not available. Approximate heat contents (Btu values) are derived using the conversion factors provided in the Appendix.

**3. Energy Imports:** Energy imports include imports of coal, crude oil (including crude oil imported for the Strategic Petroleum Reserve), petroleum products, natural gas, electricity (assumed to be hydroelectricity), and coal coke. Approximate heat contents (Btu values) are derived using the conversion factors provided in the Appendix. For further information on electricity, see "Note for imports and exports of electricity" under Note 7 of the Notes and Sources for the Consumption Section.

**4. Energy Exports:** Energy exports include coal, crude oil, petroleum products, natural gas, electricity produced from hydroelectric power, and coal coke. Approximate heat contents (Btu values) are derived using the conversion factors provided in the Appendix. For more information on electricity, see "Note for imports and exports of electricity" under Note 7 of the Notes and Sources for the Consumption Section.

**5. Merchandise Trade Value:** Import data presented are based on the customs value. That value does not include insurance and freight and is consequently lower than the cost, insurance, and freight (CIF) value, which is also reported by the Bureau of the Census. All export

data, and import data prior to 1981, are on a free alongside ship (f.a.s.) basis.

"Trade Balance" is exports minus imports; a positive balance indicates a surplus trade value and a negative balance indicates a deficit trade value. The "Energy" columns include mineral fuels, lubricants, and related material. "All Other" and "Total" columns include foreign exports (i.e., reexports) and nonmonetary gold and Department of Defense Grant-aid shipments. The "All Other" columns are calculated by subtracting "Energy" from "Total."

"Imports" represent general imports (i.e., entries for immediate consumption, entries into customs bonded warehouses, and entries for the Strategic Petroleum Reserve). The statistics reflect both government and nongovernment imports of merchandise from foreign countries into the U.S. customs territory (which includes the 50 United States, the District of Columbia, and Puerto Rico) and the Virgin Islands. The statistics exclude imports into Guam, American Samoa, and other U.S. possessions, as well as shipments between the United States and Puerto Rico and the Virgin Islands, between the United States and other U.S. possessions, and between any two of those outlying areas.

**6. The Consumer Price Index:** The values for the Consumer Price Index, All Urban Consumers, All Items, 1982-84 = 100, are as follows:

1973	44.4	1987:	1st Quarter	111.6
1974	49.3		2nd Quarter	113.1
1975	53.8		3rd Quarter	114.4
1976	56.9		4th Quarter	115.4
1977	60.6		Year	112.4
1978	65.2	1988:	1st Quarter	116.1
1979	72.6		2nd Quarter	117.5
1980	82.4		3rd Quarter	119.1
1981	90.9		4th Quarter	120.3
1982	96.5		Year	118.3
1983	99.6	1989	1st Quarter	121.7
1984	103.9			
1985	107.6			
1986	109.1			

**7. Degree-Days:** Degree-days are relative measurements of outdoor air temperature. Cooling degree-days are defined as deviations of the mean daily temperature at a sampling station above a base temperature equal to 65 °F by convention. Heating degree-days are deviations of the mean daily temperature below 65 °F. For example, if a weather station recorded a mean daily temperature of 78 °F, cooling degree-days for that station would be 13 (and heating degree-days, 0). A weather station recording a mean daily temperature of 40 °F would report 25 heating degree-days (and 0 cooling degree-days).

There are several degree-day data bases maintained by the National Oceanic and Atmospheric Administra-

tion. The information published in the *Monthly Energy Review (MER)* is developed by the National Weather Service Climate Analysis Center, Camp Springs, MD. The data are available weekly with monthly summaries and are based on mean daily temperatures recorded at about 200 major weather stations around the country. The temperature information recorded at those weather stations is used to calculate statewide degree-day averages based on population. The State figures are then aggregated into Census Divisions and into the national average. The population weights currently used represent resident State population data estimated for 1980 by the U.S. Department of Commerce, Bureau of the Census. The data shown in the *MER* are available sooner than the Historical Climatology Series 5-1 and 5-2 developed by the National Climatic Center, Asheville, NC, which compiles data from some 8,000 weather stations.

## Sources

**Merchandise Trade Value:** 1974 through 1980: U.S. Department of Commerce, Bureau of the Census, "Highlights of U.S. Export and Import Trade," FT990 (January 1982), Appendix for total imports and exports. Energy imports and exports from U.S. Department of Commerce, Bureau of the Census, "Summary of U.S. Export and Import Merchandise Trade," December issues, plus Bureau of the Census reports EA691 "Exports from the Virgin Islands to Foreign Countries," and IA245V "U.S. Imports for Consumption and General Imports into the Virgin Islands." 1981 forward: U.S. Department of Commerce, Bureau of the Census, "Summary of U.S. Export and Import Merchandise Trade," most recent monthly issue.

**Gross National Product:** U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*.

**U.S. Dependence on Petroleum Net Imports:** Imports and Products Supplied--Section 3 of this publication. Exports--1973 through 1976: Bureau of Mines, *Mineral Industry Surveys*. 1977 through 1980: Energy Information Administration (EIA), *Energy Data Reports*, "Pe-

troleum Statement, Annual." 1981-1987: EIA, *Petroleum Supply Annual*. 1988 forward: EIA, *Petroleum Supply Monthly*.

## Cost of Fuels to End Users in Constant (1982-84) Dollars:

- Leaded Regular Motor Gasoline--Bureau of Labor Statistics (BLS), *Consumer Prices: Energy*, monthly.
- Residential Heating Oil--EIA, 1983 forward: EIA Form-782A, "Refiners/Gas Plant Operators' Monthly Petroleum Product Sales Report" and EIA Form-782B, "Resellers/Retailers' Monthly Petroleum Product Sales Report." Prices prior to 1983 are EIA estimates using data from FEA Form P112-M1/EIA-9, "No. 2 Heating Oil Supply/Price Monitoring Report" and EIA Form 9-A, "No. 2 Distillate Price Monitoring Report." See Note 6 in the Notes and Sources *Monthly Energy Review* Section 9, Price, for additional information.
- Residential Natural Gas--EIA, Annual data from Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition." Monthly data from Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers."
- Residential Electricity--Federal Energy Regulatory Commission (FERC), 1973 through February 1980: FPC Form 5, "Monthly Statement of Electric Operating Revenue and Income"; March 1980 forward: FERC Form 5, "Electric Utility Company Monthly Statement."
- Deflator (The Consumer Price Index, All Urban Consumers, All Items, 1982-84 = 100), Consumer Price Index-Detailed Report, *Monthly Labor Review*, BLS.

**Passenger Car Efficiency:** Indices are prepared from statistics published by the U.S. Department of Transportation, Federal Highway Administration, Federal Highway Statistics Division. 1967-1985: "Highway Statistics Summary to 1985," Table VM-201A; 1986 and 1987: *Highway Statistics*, Table VM-1.

## Section 2. Consumption

U.S. total energy consumption in May 1989 was 6.4 quadrillion Btu. Petroleum products accounted for 43 percent<sup>10</sup> of the energy consumed in May 1989, while coal accounted for 23 percent and natural gas accounted for 22 percent.

Residential and commercial sector consumption was 2.1 quadrillion Btu in May 1989, up 4 percent from the May 1988 level. The sector accounted for 32 percent of May 1989 total consumption, about the same share as in May 1988.

Industrial sector consumption was 2.4 quadrillion Btu in May 1989, up 4 percent from the May 1988 level. The industrial sector accounted for 38 percent of May 1989 total consumption, about the same share as in May 1988.

Transportation sector consumption of energy was 1.9 quadrillion Btu in May 1989, up 2 percent from the May 1988 level. The sector consumed 29 percent of May 1989 total consumption, down 1 percentage point from its 30-percent share in May 1988.

Electric utility consumption of energy totaled 2.3 quadrillion Btu in May 1989, up 6 percent from the May 1988 level. Coal contributed 53 percent of the energy consumed by electric utilities in May 1989, while nuclear electric power contributed 18 percent; hydroelectric power 13 percent; natural gas 11 percent; petroleum 5 percent; and wood, waste, geothermal, wind, photovoltaic, and solar thermal energy, about 1 percent.

**Table 2.1 Energy Consumption Summary for May 1989  
(Quadrillion (10<sup>15</sup>) Btu)**

Energy Source	Sector				Total
	Residential and Commercial	Industrial	Transportation	Electric Utilities	
Coal .....	0.011	0.235	(*)	1.221	1.464
Natural Gas <sup>b</sup> .....	.434	.671	0.045	.257	1.407
Petroleum Products .....	.191	.642	1.825	.106	2.764
Hydroelectric Power .....	-	.003	-	.304	.308
Nuclear Electric Power .....	-	-	-	.413	.413
Net Imports of Coal Coke .....	-	.006	-	-	.006
Other <sup>c</sup> .....	-	-	-	.018	.018
<b>Primary Consumption</b> .....	<b>.635</b>	<b>1.558</b>	<b>1.870</b>	<b>2.320</b>	<b>6.380</b>
Electricity .....	.423	.260	.001	-	-
<b>Net Energy Consumption</b> .....	<b>1.059</b>	<b>1.818</b>	<b>1.871</b>	-	<b>4.745</b>
Electrical System Energy Losses .....	1.011	.622	.003	-	1.636
<b>Total Energy Consumption<sup>d</sup></b> .....	<b>2.070</b>	<b>2.441</b>	<b>1.874</b>	-	<b>6.380</b>

<sup>a</sup>Small amounts of coal consumed for transportation are reported as industrial sector consumption.

<sup>b</sup>Includes supplemental gaseous fuels. Transportation sector is pipeline fuel only.

<sup>c</sup>Other is electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

<sup>d</sup>Excludes wood, waste, geothermal, wind, photovoltaic, and solar thermal energy except for small amounts used by electric utilities to generate electricity for distribution.

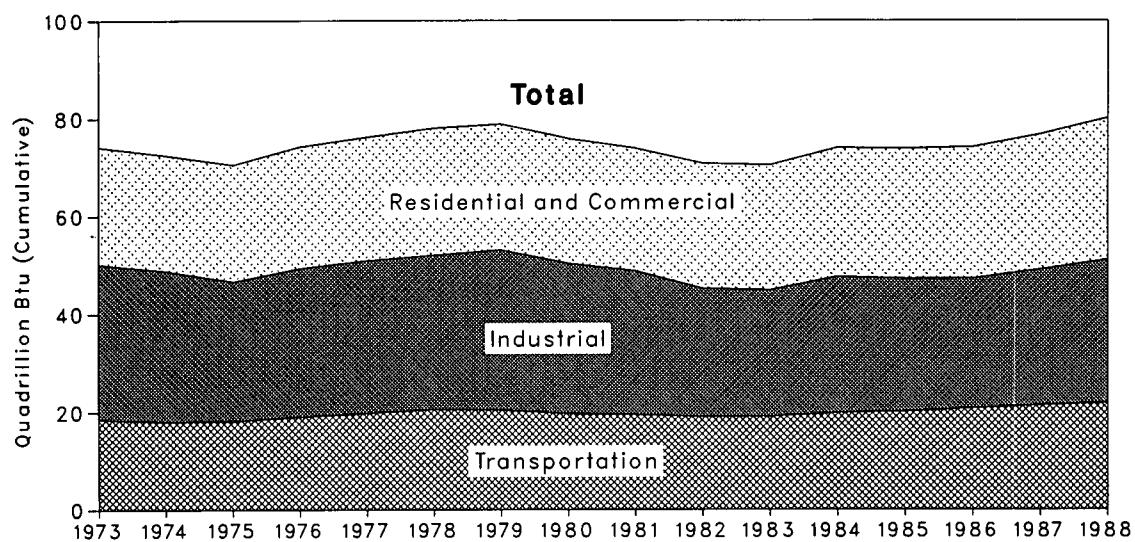
Note: Totals may not equal sum of components due to independent rounding and the use of sector-specific conversion factors.

Additional Notes and Sources: See end of section.

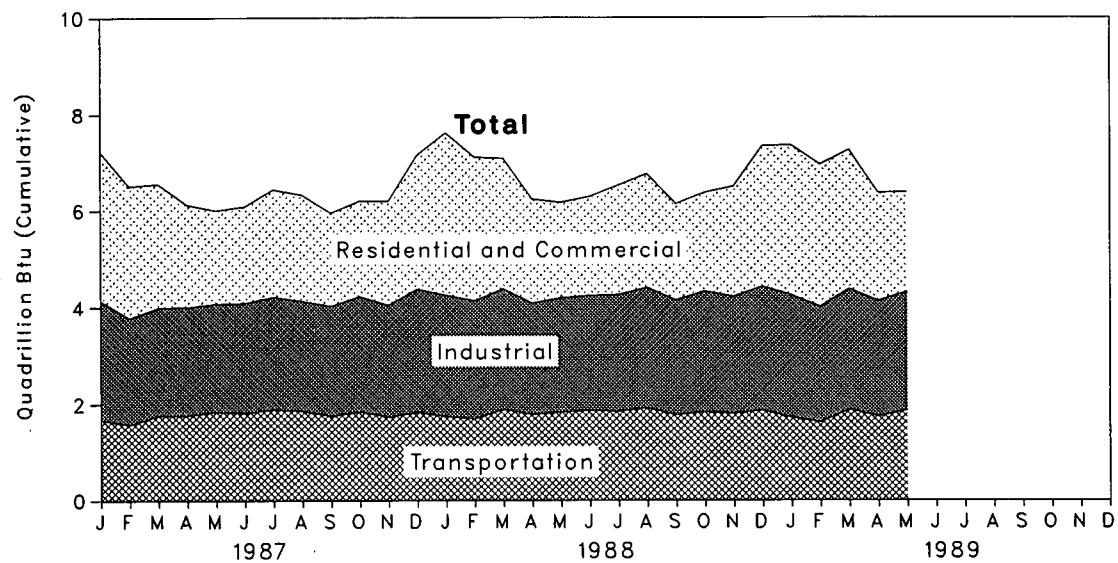
<sup>10</sup>Percentage changes are based on numbers in the following tables.

**Figure 2.1 Consumption of Energy by End-Use Sector**

Yearly



Monthly



**Table 2.2 Consumption of Energy by End-Use Sector**  
**(Quadrillion (10<sup>15</sup>) Btu)**

	Residential and Commercial		Industrial		Transportation		Total Net	Total Gross
	Net	Gross	Net	Gross	Net	Gross		
1973 Total .....	15.766	24.143	25.917	31.527	18.584	18.605	60.274	74.282
1974 Total .....	15.246	23.724	24.994	30.695	18.095	18.117	58.341	72.543
1975 Total .....	15.200	23.900	22.738	28.402	18.219	18.244	56.157	70.546
1976 Total .....	15.997	25.020	24.038	30.234	19.076	19.101	59.119	74.362
1977 Total .....	15.828	25.387	24.594	31.075	19.794	19.819	60.223	76.288
1978 Total .....	16.023	26.088	24.636	31.388	20.589	20.611	61.251	78.089
1979 Total .....	15.709	25.809	25.679	32.615	20.447	20.472	61.836	78.898
1980 Total .....	15.075	25.653	23.853	30.608	19.669	19.695	58.597	75.055
1981 Total .....	14.540	25.243	22.534	29.238	19.480	19.507	56.556	73.990
1982 Total .....	14.630	25.631	20.015	26.139	19.043	19.069	53.697	70.848
1983 Total .....	14.396	25.631	19.399	25.755	19.105	19.131	52.907	70.524
1984 Total .....	15.007	26.486	21.071	27.744	19.840	19.869	55.920	74.101
1985 Total .....	14.898	26.754	20.423	27.084	20.077	20.109	55.397	73.945
1986 Total .....	14.827	27.017	20.048	26.451	20.741	20.770	55.616	74.237
1987 January .....	1.946	3.094	1.926	2.450	1.677	1.679	5.551	7.226
February .....	1.790	2.732	1.740	2.204	1.571	1.573	5.101	6.511
March .....	1.592	2.567	1.692	2.220	1.765	1.767	5.049	6.554
April .....	1.241	2.127	1.714	2.232	1.766	1.768	4.716	6.123
May .....	.958	1.938	1.643	2.220	1.843	1.846	4.442	6.003
June .....	.892	2.003	1.669	2.264	1.816	1.819	4.382	6.090
July .....	.950	2.228	1.716	2.320	1.888	1.891	4.558	6.442
August .....	.941	2.203	1.680	2.265	1.859	1.861	4.482	6.332
September .....	.925	1.933	1.734	2.263	1.753	1.756	4.410	5.951
October .....	1.050	1.981	1.821	2.372	1.845	1.847	4.713	6.197
November .....	1.229	2.159	1.747	2.301	1.735	1.737	4.707	6.194
December .....	1.686	2.778	1.969	2.538	1.829	1.832	5.482	7.145
Total .....	15.199	27.742	21.052	27.652	21.349	21.378	57.595	76.768
1988 January .....	2.150	3.357	1.957	2.502	1.744	1.746	5.852	7.605
February .....	1.945	2.982	1.922	2.433	1.696	1.698	5.562	7.112
March .....	1.691	2.708	1.939	2.485	1.891	1.893	5.518	7.083
April .....	1.256	2.160	1.762	2.291	1.786	1.788	4.800	6.235
May .....	1.023	1.981	1.762	2.350	1.837	1.839	4.618	6.166
June .....	.921	2.051	1.752	2.371	1.865	1.868	4.541	6.292
July .....	.960	2.270	1.764	2.403	1.849	1.851	4.575	6.527
August .....	1.002	2.360	1.836	2.481	1.919	1.922	4.762	6.768
September .....	.954	1.995	R 1.839	R 2.369	1.774	1.776	R 4.566	R 6.139
October .....	1.082	2.048	R 1.926	R 2.487	1.837	1.839	R 4.842	R 6.372
November .....	1.322	2.285	R 1.849	R 2.408	1.808	1.810	R 4.977	R 6.501
December .....	1.782	2.910	R 1.975	R 2.556	1.869	1.871	R 5.625	R 7.337
Total .....	16.089	29.107	R 22.282	R 29.138	21.873	21.901	R 60.235	R 80.135
1989 January .....	1.975	3.106	R 1.988	R 2.525	1.721	1.724	R 5.684	R 7.355
February .....	R 1.894	R 2.951	R 1.858	R 2.384	1.623	1.625	R 5.374	R 6.960
March .....	R 1.780	R 2.879	R 1.940	R 2.489	1.888	1.890	R 5.615	R 7.256
April .....	1.308	2.242	R 1.832	R 2.381	1.746	1.748	R 4.882	R 6.367
May .....	1.059	2.070	1.818	2.441	1.871	1.874	4.745	6.380
5-Month Total .....	8.024	13.247	9.436	12.220	8.849	8.861	26.299	34.318
1988 5-Month Total ....	8.066	13.188	9.341	12.061	8.953	8.964	26.350	34.202
1987 5-Month Total ....	7.526	12.459	8.715	11.326	8.621	8.633	24.860	32.416

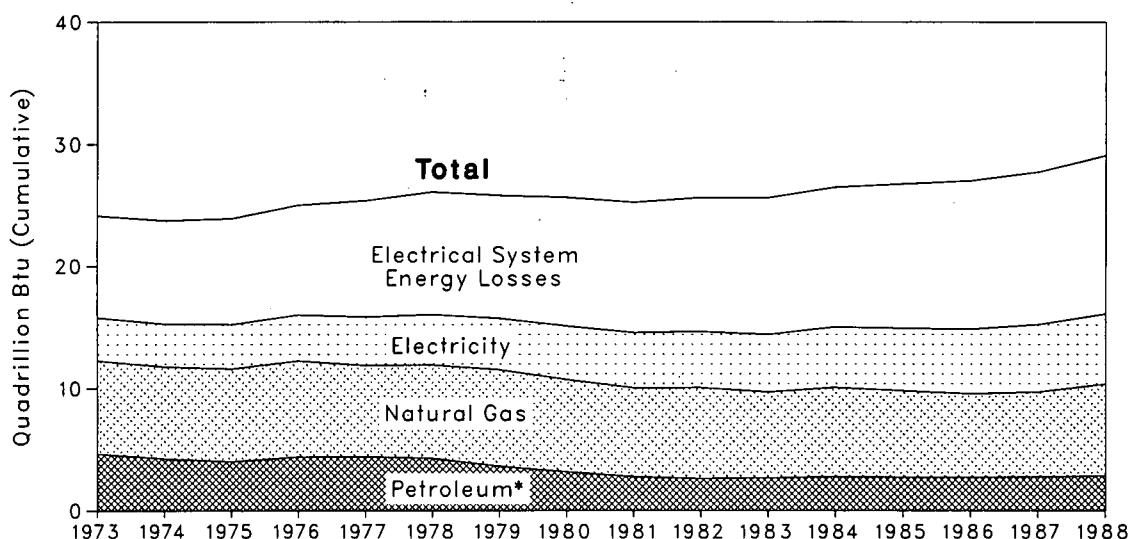
R=Revised data.

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

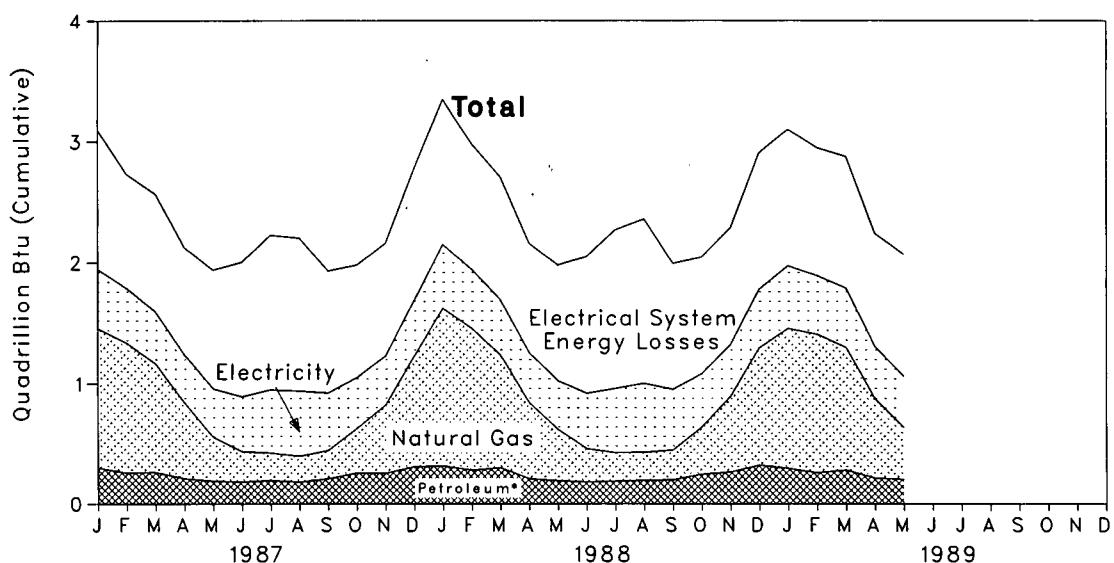
Additional Notes and Sources: See end of section.

**Figure 2.2 Consumption of Energy by the Residential and Commercial Sector**

Yearly



Monthly



\*Includes coal.

**Table 2.3 Consumption of Energy by the Residential and Commercial Sector**  
**(Quadrillion (10<sup>15</sup>) Btu)**

	Coal	Natural Gas <sup>a</sup>	Petroleum	Electricity	Net Energy	Electrical System Energy Losses	Total <sup>b</sup>	Year to Date
1973 Total .....	.254	7.626	4.391	3.495	15.766	8.377	24.143	
1974 Total .....	.257	7.518	3.996	3.475	15.246	8.478	23.724	
1975 Total .....	.209	7.581	3.805	3.604	15.200	8.700	23.900	
1976 Total .....	.203	7.866	4.181	3.747	15.997	9.023	25.020	
1977 Total .....	.205	7.461	4.206	3.955	15.828	9.559	25.387	
1978 Total .....	.214	7.624	4.070	4.116	16.023	10.065	26.088	
1979 Total .....	.187	7.891	3.448	4.184	15.709	10.101	25.809	
1980 Total .....	.145	7.540	3.035	4.355	15.075	10.578	25.653	
1981 Total .....	.167	7.243	2.634	4.497	14.540	10.703	25.243	
1982 Total .....	.187	7.427	2.449	4.566	14.630	11.001	25.631	
1983 Total .....	.192	7.025	2.498	4.680	14.396	11.235	25.631	
1984 Total .....	.209	7.291	2.585	4.922	15.007	11.478	26.486	
1985 Total .....	.176	7.078	2.573	5.072	14.898	11.855	26.754	
1986 Total .....	.176	6.824	2.576	5.251	14.827	12.190	27.017	
1987 January .....	.017	1.158	.281	.490	1.946	1.149	3.094	3.094
February .....	.015	1.083	.240	.452	1.790	.943	2.732	5.827
March .....	.011	.905	.249	.428	1.592	.975	2.567	8.394
April .....	.014	.634	.196	.397	1.241	.887	2.127	10.521
May .....	.009	.366	.179	.405	.958	.980	1.938	12.459
June .....	.007	.252	.173	.461	.892	1.111	2.003	14.463
July .....	.012	.226	.182	.530	.950	1.277	2.228	16.690
August .....	.011	.213	.169	.548	.941	1.262	2.203	18.893
September .....	.015	.233	.193	.483	.925	1.008	1.933	20.826
October .....	.015	.374	.239	.422	1.050	.931	1.981	22.807
November .....	.016	.572	.235	.406	1.229	.930	2.159	24.966
December .....	.021	.923	.284	.459	1.686	1.092	2.778	27.744
Total .....	.162	6.938	2.618	5.481	15.199	12.543	27.742	
1988 January .....	.019	1.310	.293	.528	2.150	1.206	3.357	3.357
February .....	.016	1.179	.261	.489	1.945	1.037	2.982	6.338
March .....	.012	.942	.284	.454	1.691	1.017	2.708	9.046
April .....	.014	.637	.192	.413	1.256	.904	2.160	11.207
May .....	.008	.429	.183	.403	1.023	.958	1.981	13.188
June .....	.010	.276	.170	.465	.921	1.130	2.051	15.239
July .....	.016	.236	.171	.537	.960	1.310	2.270	17.509
August .....	.015	.233	.178	.576	1.002	1.358	2.360	19.869
September .....	.009	.246	.189	.509	.954	1.041	1.995	21.864
October .....	.010	.397	.233	.441	1.082	.966	2.048	23.912
November .....	.014	.633	.248	.428	1.322	.963	2.285	26.197
December .....	.022	.978	.297	.484	1.782	1.128	2.910	29.107
Total .....	.165	7.499	2.698	5.727	16.089	13.017	29.107	
1989 January .....	.015	1.163	.278	.519	1.975	1.131	3.106	3.106
February .....	R .016	1.152	.240	.486	R 1.894	1.057	R 2.951	R 6.057
March .....	R .012	1.023	.267	.488	R 1.790	1.089	R 2.879	R 8.935
April .....	.012	.666	.199	.431	1.308	.934	2.242	R 11.177
May .....	.011	.434	.191	.423	1.059	1.011	2.070	13.247
5-Month Total ....	.066	4.437	1.174	2.347	8.024	5.222	13.247	
1988 5-Month Total ....	.069	4.498	1.212	2.287	8.066	5.122	13.188	
1987 5-Month Total ....	.065	4.146	1.144	2.172	7.526	4.933	12.459	

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

<sup>b</sup>Excludes wood, waste, geothermal, wind, photovoltaic, and solar thermal energy except for small amounts used by electric utilities to generate electricity for distribution.

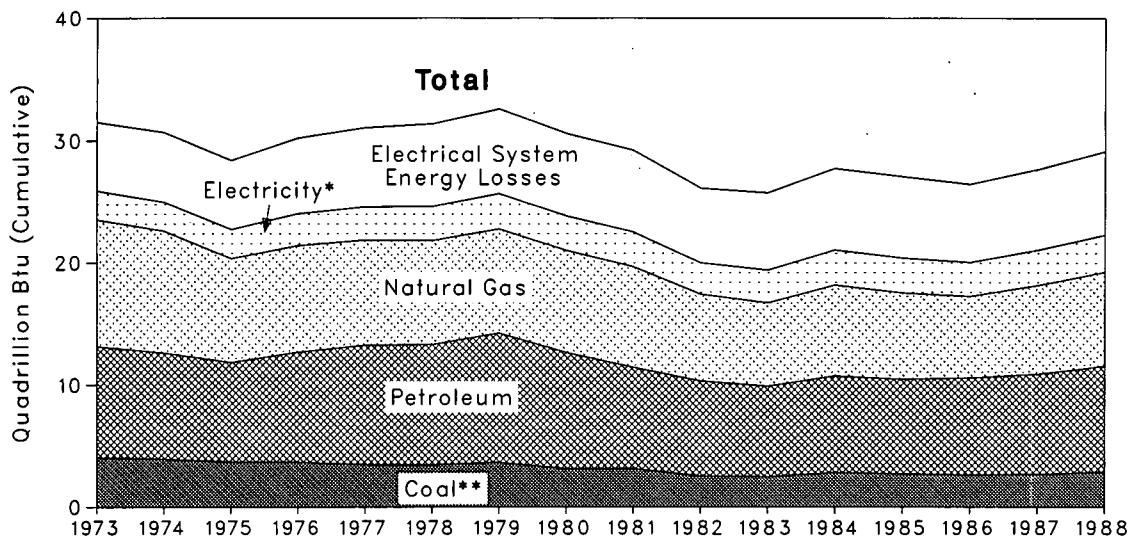
R=Revised data.

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

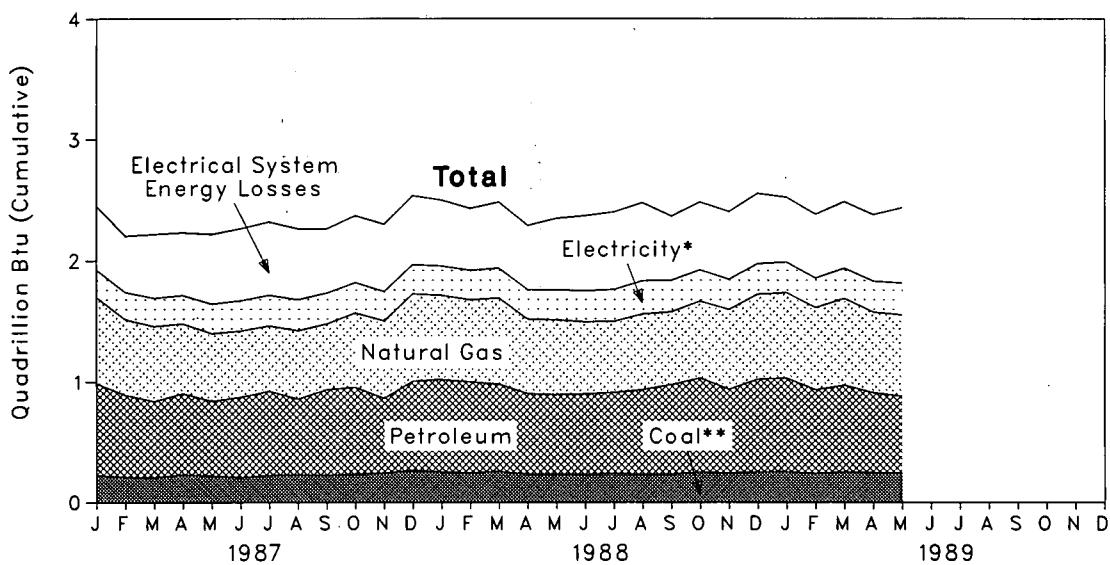
Additional Notes and Sources: See end of section.

**Figure 2.3 Consumption of Energy by the Industrial Sector**

Yearly



Monthly



\*Includes hydroelectric power.

\*\*Includes net imports of coal coke.

**Table 2.4 Consumption of Energy by the Industrial Sector**  
**(Quadrillion (10<sup>15</sup>) Btu)**

	Coal	Natural Gas <sup>a</sup>	Petro-leum	Hydro-electric Power	Net Imports of Coal Coke	Electricity	Net Energy	Electrical System Energy Losses	Total <sup>b</sup>	Year to Date
1973 Total .....	4.057	10.388	9.104	0.035	-0.007	2.341	25.917	5.811	31.527	
1974 Total .....	3.870	10.003	8.694	.033	.056	2.337	24.994	5.701	30.695	
1975 Total .....	3.667	8.532	8.147	.032	.014	2.346	22.738	5.664	28.402	
1976 Total .....	3.661	8.761	9.010	.033	0	2.573	24.038	6.196	30.234	
1977 Total .....	3.454	8.636	9.774	.033	.015	2.682	24.594	6.481	31.075	
1978 Total .....	3.314	8.539	9.867	.032	.125	2.761	24.636	6.751	31.388	
1979 Total .....	3.593	8.549	10.568	.034	.063	2.873	25.679	6.935	32.615	
1980 Total .....	3.155	8.394	9.525	.033	-.035	2.781	23.853	6.755	30.608	
1981 Total .....	3.157	8.257	8.285	.033	-.016	2.817	22.534	6.705	29.238	
1982 Total .....	2.552	7.116	7.794	.033	-.022	2.542	20.015	6.124	26.139	
1983 Total .....	2.490	6.821	7.423	.033	-.016	2.648	19.399	6.356	25.755	
1984 Total .....	2.842	7.449	7.897	.033	-.011	2.862	21.071	6.674	27.744	
1985 Total .....	2.760	7.080	7.715	.033	-.013	2.850	20.423	6.661	27.084	
1986 Total .....	2.643	6.693	7.939	.032	-.017	2.758	20.048	6.402	26.451	
1987 January .....	.225	.712	.764	.003	-.001	.224	1.926	.524	2.450	2.450
February .....	.207	.624	.683	.003	.001	.223	1.740	.464	2.204	4.654
March .....	.206	.620	.634	.003	-.002	.231	1.692	.527	2.220	6.874
April .....	.226	.576	.677	.003	0	.232	1.714	.518	2.232	9.106
May .....	.218	.561	.621	.003	0	.239	1.643	.577	2.220	11.326
June .....	.201	.548	.669	.003	.002	.247	1.669	.595	2.264	13.591
July .....	.221	.539	.702	.003	0	.251	1.716	.604	2.320	15.911
August .....	.224	.565	.633	.002	.001	.254	1.680	.585	2.265	18.176
September .....	.218	.542	.714	.002	.004	.254	1.734	.530	2.263	20.439
October .....	.228	.614	.725	.002	.002	.250	1.821	.551	2.372	22.811
November .....	.238	.640	.622	.002	.003	.242	1.747	.554	2.301	25.112
December .....	.262	.722	.745	.002	-.001	.239	1.969	.569	2.538	27.650
Total .....	2.673	7.264	8.189	.032	.009	2.884	21.052	6.600	27.652	
1988 January .....	.246	.695	.771	.003	.003	.239	1.957	.545	2.502	2.502
February .....	.240	.679	.757	.003	.002	.241	1.922	.511	2.433	4.935
March .....	.248	.711	.727	.003	.006	.244	1.939	.546	2.485	7.420
April .....	.226	.614	.673	.003	.004	.242	1.762	.529	2.291	9.711
May .....	.232	.617	.664	.003	-.002	.247	1.762	.588	2.350	12.061
June .....	.223	.595	.672	.003	.005	.255	1.752	.619	2.371	14.432
July .....	.230	.586	.676	.003	.007	.262	1.764	.639	2.403	16.835
August .....	.225	.624	.708	.002	.003	.273	1.836	.645	2.481	19.316
September .....	.227	R .601	.747	.002	.003	.259	R 1.839	.530	R 2.369	R 21.685
October .....	.245	R .634	.784	.002	.004	.256	R 1.926	.561	R 2.487	R 24.172
November .....	.241	R .658	.697	.002	.001	.249	R 1.849	.559	R 2.408	R 26.580
December .....	.246	R .701	.774	.002	.003	.249	R 1.975	.581	R 2.556	R 29.136
Total .....	2.828	R 7.715	8.650	.032	.040	3.016	R 22.282	6.856	R 29.138	
1989 January .....	R .245	R .706	.780	.003	.007	.247	R 1.988	.537	R 2.525	R 2.525
February .....	R .236	R .678	.697	.003	.002	.242	R 1.858	.527	R 2.384	R 4.909
March .....	R .247	.717	.723	.003	.003	.246	R 1.940	.550	R 2.489	R 7.399
April .....	.239	R .665	.666	.003	.007	.253	R 1.832	.549	R 2.381	R 9.780
May .....	.235	.671	.642	.003	.006	.260	1.818	.622	2.441	12.220
5-Month Total ....	1.202	3.437	3.508	.015	.025	1.249	9.436	2.785	12.220	
1988 5-Month Total ....	1.192	3.316	3.593	.015	.013	1.213	9.341	2.720	12.061	
1987 5-Month Total ....	1.081	3.093	3.379	.015	-.001	1.148	8.715	2.611	11.326	

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

<sup>b</sup>Excludes wood, waste, geothermal, wind, photovoltaic, and solar thermal energy except for small amounts used by electric utilities to generate electricity for distribution.

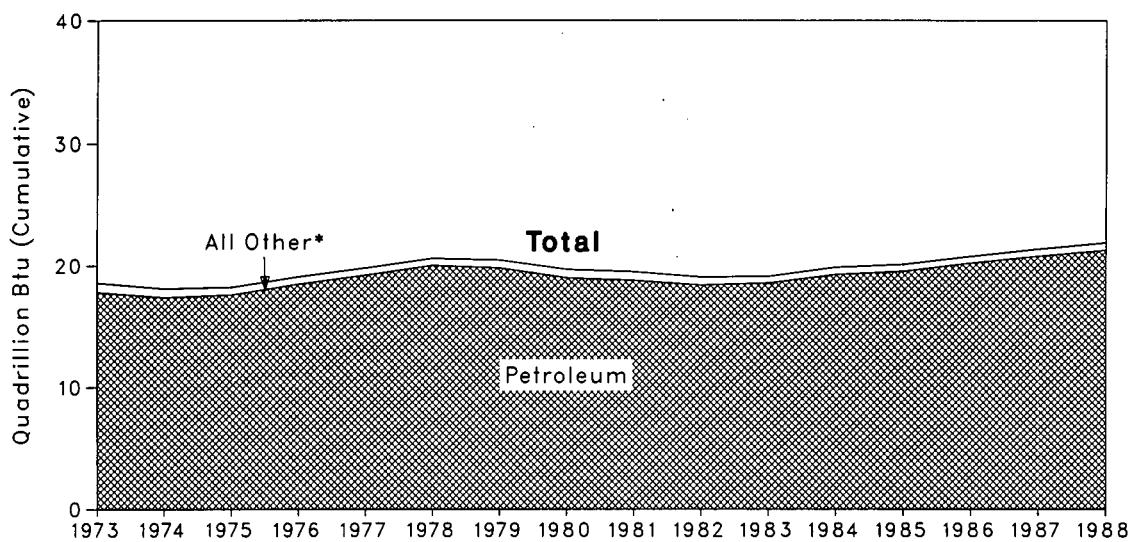
R=Revised data.

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

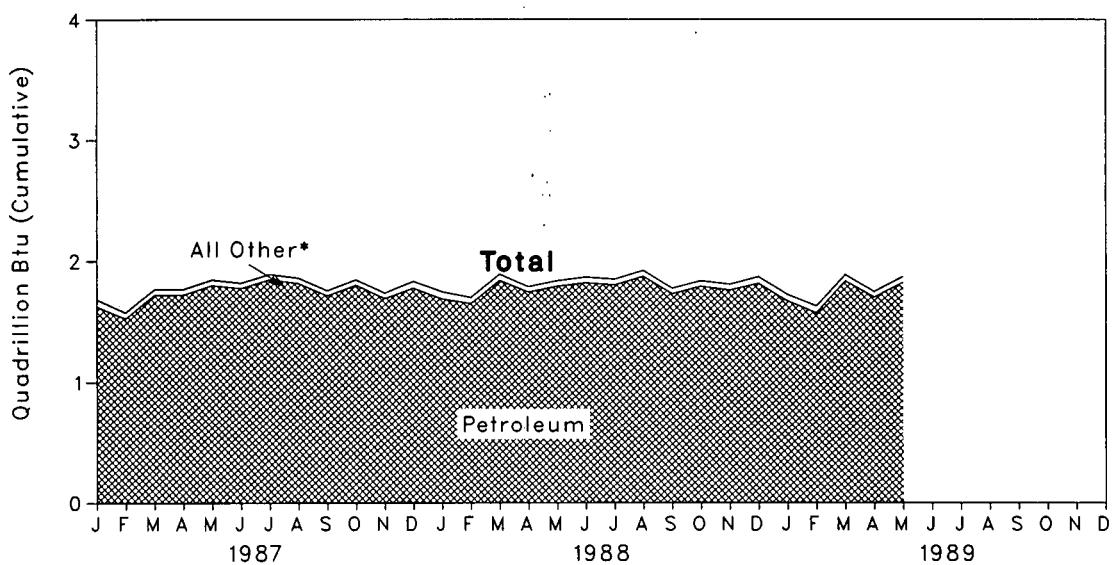
Additional Notes and Sources: See end of section.

**Figure 2.4 Consumption of Energy by the Transportation Sector**

Yearly



Monthly



\*Includes coal, natural gas, electricity, and electrical system energy losses.

**Table 2.5 Consumption of Energy by the Transportation Sector**  
 (Quadrillion (10<sup>15</sup>) Btu)

	Coal	Natural Gas <sup>a</sup>	Petroleum	Electricity	Net Energy	Electrical System Energy Losses	Total <sup>b</sup>	Year to Date
1973 Total .....	0.003	0.743	17.831	0.008	18.584	0.020	18.605	
1974 Total .....	.002	.685	17.399	.009	18.095	.022	18.117	
1975 Total .....	.001	.595	17.614	.010	18.219	.025	18.244	
1976 Total .....	(c)	.559	18.506	.010	19.076	.025	19.101	
1977 Total .....	(c)	.543	19.241	.010	19.794	.025	19.819	
1978 Total .....	(d)	.539	20.041	.009	20.589	.022	20.611	
1979 Total .....	(d)	.612	19.825	.010	20.447	.025	20.472	
1980 Total .....	(d)	.650	19.008	.011	19.669	.026	19.695	
1981 Total .....	(d)	.658	18.811	.011	19.480	.026	19.507	
1982 Total .....	(d)	.612	18.420	.011	19.043	.026	19.069	
1983 Total .....	(d)	.505	18.589	.011	19.105	.026	19.131	
1984 Total .....	(d)	.545	19.283	.013	19.840	.029	19.869	
1985 Total .....	(d)	.519	19.544	.014	20.077	.032	20.109	
1986 Total .....	(d)	.499	20.229	.012	20.741	.029	20.770	
1987 January .....	(d)	.055	1.621	.001	1.677	.003	1.679	1.679
February .....	(d)	.046	1.524	.001	1.571	.002	1.573	3.253
March .....	(d)	.045	1.718	.001	1.765	.002	1.767	5.020
April .....	(d)	.043	1.721	.001	1.766	.002	1.768	6.788
May .....	(d)	.043	1.799	.001	1.843	.003	1.846	8.633
June .....	(d)	.041	1.774	.001	1.816	.003	1.819	10.452
July .....	(d)	.039	1.848	.001	1.888	.003	1.891	12.343
August .....	(d)	.041	1.816	.001	1.859	.003	1.861	14.205
September .....	(d)	.039	1.713	.001	1.753	.002	1.756	15.960
October .....	(d)	.042	1.801	.001	1.845	.002	1.847	17.807
November .....	(d)	.044	1.669	.001	1.735	.002	1.737	19.544
December .....	(d)	.053	1.776	.001	1.829	.003	1.832	21.376
Total .....	(d)	.535	20.801	.013	21.349	.030	21.378	
1988 January .....	(d)	.058	1.685	.001	1.744	.002	1.746	1.746
February .....	(d)	.051	1.645	.001	1.696	.002	1.698	3.444
March .....	(d)	.048	1.841	.001	1.891	.002	1.893	5.337
April .....	(d)	.042	1.743	.001	1.786	.002	1.788	7.125
May .....	(d)	.044	1.791	.001	1.837	.002	1.839	8.964
June .....	(d)	.043	1.821	.001	1.865	.003	1.868	10.832
July .....	(d)	.044	1.803	.001	1.849	.003	1.851	12.683
August .....	(d)	.044	1.874	.001	1.919	.003	1.922	14.605
September .....	(d)	.043	1.729	.001	1.774	.002	1.776	16.381
October .....	(d)	.044	1.791	.001	1.837	.002	1.839	18.220
November .....	(d)	.046	1.760	.001	1.808	.002	1.810	20.030
December .....	(d)	.052	1.816	.001	1.869	.002	1.871	21.901
Total .....	(d)	.561	21.300	.012	21.873	.028	21.901	
1989 January .....	(d)	.053	1.668	.001	1.721	.002	1.724	1.724
February .....	(d)	.053	1.569	.001	1.623	.002	1.625	3.349
March .....	(d)	.049	1.837	.001	1.888	.002	1.890	5.239
April .....	(d)	.043	1.702	.001	1.746	.002	1.748	6.987
May .....	(d)	.045	1.825	.001	1.871	.003	1.874	8.861
5-Month Total ....	(d)	.243	8.600	.005	8.849	.012	8.861	
1988 5-Month Total ....	(d)	.243	8.705	.005	8.953	.011	8.964	
1987 5-Month Total ....	(d)	.233	8.383	.005	8.621	.012	8.633	

<sup>a</sup>Pipeline fuel only, including supplemental gaseous fuels.

<sup>b</sup>Excludes wood, waste, geothermal, wind, photovoltaic, and solar thermal energy except for small amounts used by electric utilities to generate electricity for distribution.

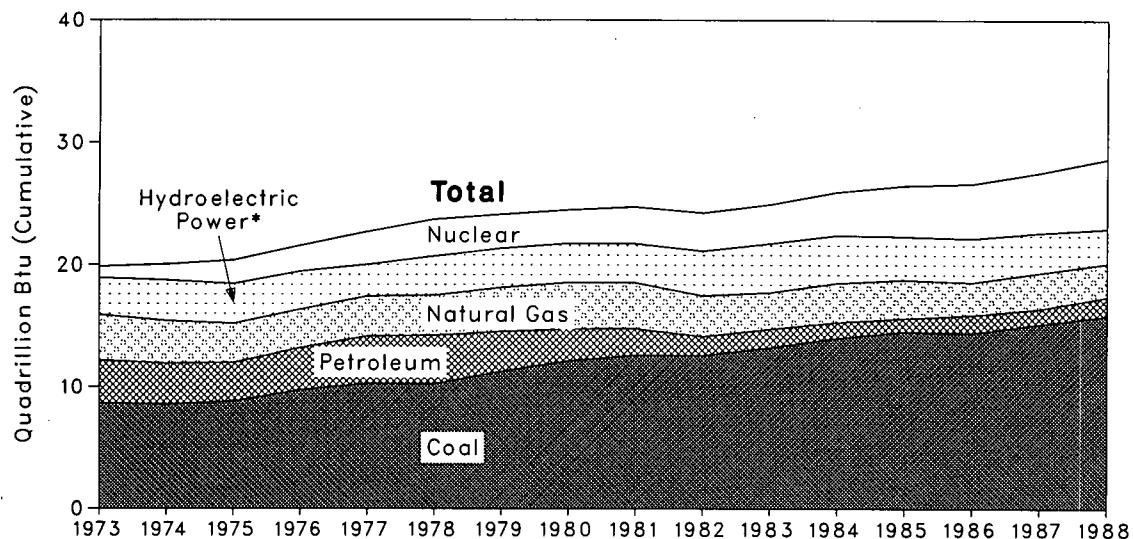
<sup>c</sup>Less than 0.5 trillion Btu.

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

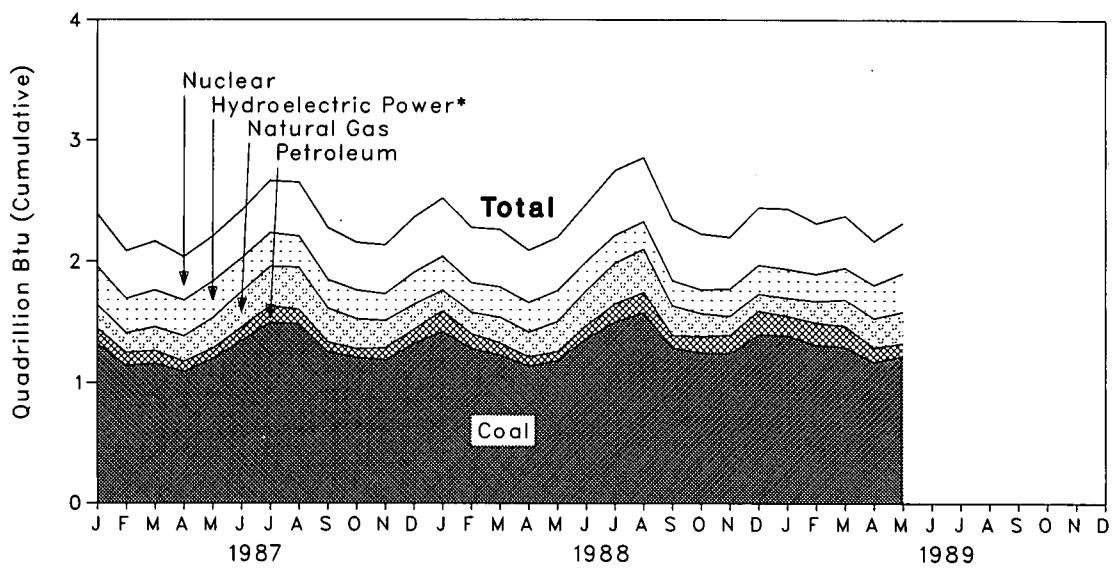
Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding. Additional Notes and Sources: See end of section.

**Figure 2.5 Energy Input at Electric Utilities**

Yearly



Monthly



\*Includes other.

**Table 2.6 Energy Input at Electric Utilities**  
 (Quadrillion (10<sup>15</sup>) Btu)

	Coal	Natural Gas <sup>a</sup>	Petro- leum <sup>b</sup>	Hydro- electric Power <sup>c</sup>	Nuclear Electric Power	Other <sup>d</sup>	Total	Year to Date
1973 Total .....	8.658	3.748	3.515	2.975	0.910	0.046	19.852	
1974 Total .....	8.534	3.519	3.365	3.276	1.272	.056	20.022	
1975 Total .....	8.786	3.240	3.166	3.187	1.900	.072	20.350	
1976 Total .....	9.720	3.152	3.477	3.032	2.111	.081	21.574	
1977 Total .....	10.262	3.284	3.901	2.482	2.702	.082	22.713	
1978 Total .....	10.238	3.287	3.987	3.110	3.024	.068	23.724	
1979 Total .....	11.260	3.613	3.283	3.107	2.776	.089	24.128	
1980 Total .....	12.123	3.810	2.634	3.085	2.739	.114	24.505	
1981 Total .....	12.583	3.768	2.202	3.072	3.008	.127	24.760	
1982 Total .....	12.582	3.342	1.568	3.539	3.131	.108	24.270	
1983 Total .....	13.213	2.998	1.544	3.866	3.203	.133	24.956	
1984 Total .....	14.020	3.220	1.286	3.725	3.553	.174	25.977	
1985 Total .....	14.542	3.160	1.090	3.330	4.149	.213	26.484	
1986 Total .....	14.444	2.691	1.452	3.353	4.471	.231	26.642	
1987 January .....	1.319	.191	.128	.300	.431	.020	2.390	2.390
February .....	1.135	.163	.111	.262	.394	.019	2.085	4.475
March .....	1.155	.197	.107	.283	.402	.021	2.165	6.640
April .....	1.087	.213	.084	.272	.361	.019	2.037	8.676
May .....	1.194	.250	.086	.285	.370	.020	2.205	10.881
June .....	1.342	.293	.112	.256	.394	.021	2.418	13.299
July .....	1.495	.329	.134	.255	.432	.022	2.666	15.965
August .....	1.481	.349	.120	.235	.446	.022	2.653	18.618
September .....	1.253	.277	.082	.220	.427	.020	2.279	20.897
October .....	1.207	.246	.073	.218	.393	.020	2.157	23.054
November .....	1.183	.224	.103	.203	.403	.020	2.135	25.189
December .....	1.322	.203	.117	.247	.453	.020	2.362	27.551
Total .....	15.173	2.935	1.257	3.035	4.906	.244	27.551	
1988 January .....	1.421	.172	.169	.258	.481	.021	2.522	2.522
February .....	1.281	.175	.123	.229	.455	.018	2.281	4.803
March .....	1.226	.211	.101	.232	.473	.021	2.264	7.067
April .....	1.133	.206	.079	.222	.432	.019	2.090	9.157
May .....	1.179	.247	.076	.240	.438	.018	2.199	11.357
June .....	1.364	.289	.105	.220	.475	.020	2.473	13.829
July .....	1.498	.339	.149	.208	.537	.021	2.752	16.581
August .....	1.575	.355	.171	.207	.528	.021	2.857	19.438
September .....	1.288	.240	.105	.192	.499	.020	2.343	21.781
October .....	1.246	.187	.138	.178	.459	.020	2.228	24.009
November .....	1.240	.155	.153	.207	.426	.020	2.201	26.210
December .....	1.399	.142	.192	.219	.475	.019	2.447	28.657
Total .....	15.850	2.719	1.561	2.612	5.678	.236	28.657	
1989 January .....	1.390	.150	.160	.219	.499	.019	2.438	2.438
February .....	1.310	.176	.185	.210	.417	.017	2.316	4.754
March .....	1.295	.216	.174	.243	.427	.020	2.376	7.129
April .....	1.170	.241	.121	.260	.361	.017	2.170	9.299
May .....	1.221	.257	.106	.304	.413	.018	2.320	11.620
5-Month Total .....	6.387	1.040	.746	1.237	2.118	.092	11.620	
1988 5-Month Total ....	6.241	1.011	.547	1.182	2.279	.096	11.357	
1987 5-Month Total ....	5.890	1.014	.517	1.403	1.958	.099	10.881	

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

<sup>b</sup>Includes petroleum products reported as "oil consumed in steam plants" through 1979 and "heavy oil" from 1980 forward, which are assumed to be residual fuel oil; petroleum products reported as "oil consumed in gas turbine and internal combustion engine plants" through 1979 and "light oil" from 1980 forward, which are assumed to be distillate fuel oil and kerosene; and petroleum coke.

<sup>c</sup>Includes net imports of electricity.

<sup>d</sup>Other is electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

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

## Notes and Sources for the Consumption Section

**1. Total Energy Consumed:** Total energy consumed includes coal, natural gas (including supplemental gaseous fuels), petroleum products supplied, electric utility and industrial generation of hydroelectric power, net imports of electricity generated from hydroelectric power, and electricity generated from nuclear power. Total energy consumed also includes electricity generated from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy but excludes other energy obtained from those sources because consistent historical data are not available.

**2. Economic Sectors:** Energy use is assigned to the major economic sectors according to the following guidelines as closely as possible:

- Residential and Commercial Sector-- private household establishments (which consume energy primarily for space heating, water heating, air conditioning, refrigeration, cooking, and clothes drying); nonmanufacturing business establishments, including hotels, motels, restaurants, wholesale businesses, retail stores, laundries, and other service enterprises; health, social, and educational institutions; and Federal, State, and local governments. Street lights, pumps, bridges, and public swimming pools are also included.
- Industrial sector--manufacturing, construction, mining, agriculture, fishing, and forestry establishments.
- 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.
- Electric utility sector--privately- and publicly-owned establishments that generate electricity primarily for use by the public.

**3. Conversion Factors:** See the conversion factors listed in the Appendix.

**4. Coal:** Coal is anthracite, bituminous coal, (including sub-bituminous coal), and lignite. Sources:

- 1973 through September 1977: U.S. Department of the Interior (DOI), Bureau of Mines (BOM), *Minerals Yearbook* and *Minerals Industry Surveys*.
- Electric Utilities--October 1977 forward: Energy Information Administration (EIA), EIA Form 759 (formerly FPC Form 4), "Monthly Power Plant Report."
- Other Industrial--October 1977 through December 1979: EIA, EIA Form 3, "Monthly Fuel Consumption Report - Manufacturing Plants"; January 1980 forward: EIA, EIA Form 3, "Quarterly

Fuel Consumption Report - Manufacturing Plants" and EIA Form 6, "Coal Distribution Report."

- Coke Plants--October 1977 through December 1980: EIA, EIA Form 5/5A, "Coke and Coal Chemicals - Monthly/Annual"; January 1981 through December 1984: EIA, EIA Form 5/5A, "Coke and Coal Chemicals - Quarterly/Annual Supplement"; January 1985 forward: EIA, EIA Form 5/5A, "Coke Plant Report," quarterly.
- Residential and Commercial--October 1977 through December 1979: EIA, EIA Form 2, "Monthly Coal Report, Retail Dealers and Upper Lake Docks"; January 1980 forward: EIA, EIA Form 6, "Coal Distribution Report."

**5. Natural Gas:** Natural gas consumption by end-use sector is based on data presented in Table 4.3 of this report. For Section 2 calculations, lease and plant fuel consumption are added to the industrial sector deliveries and pipeline fuel represents the transportation sector's use of natural gas. Values in Btu are derived using the conversion factors provided in the Appendix. Sources:

- 1973 through 1975: DOI, BOM, *Minerals Yearbook*, "Natural Gas" chapter.
- 1976 through 1978: EIA, *Energy Data Reports*, "Natural Gas, Annual."
- 1979: EIA, *Natural Gas Production and Consumption 1979*.
- 1980 through 1987: EIA, *Natural Gas Annual*.
- 1988 forward: EIA, EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers," and EIA computations.
- Electric utilities consumption--1973 through 1976: FPC Form 4, "Monthly Power Plant Report." 1977 through 1981: Federal Energy Regulatory Commission (FERC), FPC Form 4, "Monthly Power Plant Report." 1982 forward: EIA, EIA Form 759, "Monthly Power Plant Report."
- American Gas Association, "Monthly Gas Utility Statistical Report," residential sector and commercial sector monthly sales data for 1973 through 1979 used to estimate monthly consumption values from EIA annual consumption values.

**6. Petroleum:** Petroleum consumption by end-use is the sum of all individual petroleum products estimated to be consumed in each end-use sector. First, total consumption by product is determined. Petroleum consumption in this section of the *Monthly Energy Review (MER)* is the series called "petroleum products supplied" in Section 3. Sources for petroleum products supplied by individual products are:

- 1973 through 1975: DOI, BOM, *Mineral Industry Surveys*, "Petroleum Statement, Annual."

- 1976 through 1980: EIA, *Energy Data Reports*, "Petroleum Statement, Annual."
- 1981 through 1987: EIA, *Petroleum Supply Annual*.
- 1988 forward: EIA, *Petroleum Supply Monthly*.

Specific petroleum products' end-use allocation procedures follow:

- **Aviation Gasoline**--All product supplied is assigned to the transportation sector.
- **Asphalt**--All product supplied is assigned to the industrial sector.
- **Distillate Fuel**

#### *Electric Utility Sector, All Periods.*

Monthly and annual consumption in 1973 through 1979 is assumed to be the amount of oil (minus small amounts of kerosene and kerosene-type jet fuel deliveries) reported as consumed in internal combustion and gas turbine engine plants. From January 1980, electric utility consumption of distillate fuel is assumed to be the petroleum products reported as "light oil" (minus small amounts of kerosene deliveries through 1982) consumed at utilities.

Sources: 1973 through September 1977--FPC Form 4, "Monthly Power Plant Report;" October 1977 through 1981--FERC, FPC Form 4, "Monthly Power Plant Report;" 1982 forward--EIA, Form EIA-759, "Monthly Power Plant Report."

#### *Non-Electric Utility Sectors, Annual Estimates Through 1987.*

The aggregate non-electric utility use of distillate fuel is total distillate fuel supplied minus the electric utility consumption. The non-electric utility annual totals are allocated into the individual non-electric utility sectors in proportion to the amount of distillate fuel delivered to end users, grouped into sectors from EIA's "Deliveries of Fuel Oil and Kerosene" ("Deliveries") reports (based primarily on data collected by Form EIA-821 previously Form EIA-172) as follows:

- Residential sector deliveries are directly from the "Deliveries" reports for 1979 through 1987. Prior to 1979, each year's deliveries subtotal of the heating plus industrial category is split into residential, commercial, and industrial (including farm) in proportion to the 1979 shares;
- Commercial sector deliveries are directly from the "Deliveries" reports for 1979 through 1987. Prior to 1979, each year's deliveries subtotal of the heating plus industrial category is split into residential, commercial, and industrial (including farm) in proportion to the 1979 shares;
- Industrial sector deliveries for 1979 through 1987 are the sum of deliveries for industrial, farm,

oil company, off-highway, diesel, and all other uses. Prior to 1979, each year's deliveries subtotal of the heating plus industrial category is split into residential, commercial, and industrial (including farm) in proportion to the 1979 shares, and this estimated industrial portion is added to oil company, off-highway diesel, and all other uses; and

- Transportation sector deliveries are the sum of deliveries for railroad, vessel bunkering, and on-highway diesel, and military uses for all years.

#### *Non-Electric Utility Sectors, Monthly Estimates Through 1987.*

- Residential and commercial sector monthly consumption is estimated by allocating the annual sector estimates described above into months in proportion to each month's share of the year's sales of No. 2 heating oil as reported in the "Monthly Report of Heating Oil Sales" by the Ethyl Corporation from 1973 through 1980 and the American Petroleum Institute for 1981 and 1982, and the Energy Information Administration, Form EIA-782-A, "Refiners/Gas Plant Operators' Monthly Petroleum Product Sales Report," No. 2 Fuel Oil Sales to End Users and for Resale, for 1983 through 1987.

- The transportation sector highway use portion is allocated into the months in proportion to each month's share of the year's total sales for highway use as reported by the Federal Highway Administration's Table MF-25, "Private and Commercial Highway Use of Special Fuels by Months." The remaining transportation use of distillate fuel (i.e., for railroads, vessel bunkering, and military use) is evenly distributed over the months, adjusted for the number of days per month.

- Industrial sector monthly estimates are made by subtracting the residential and commercial, transportation, and electric utility sector estimates from each month's total distillate fuel supplied.

#### *Non-Electric Utility Sectors, 1988 Forward.*

Each month's non-electric utility consumption subtotal is disaggregated into the major end-use sectors in proportion to the shares each sector held of the non-electric utility subtotal in the same month in 1987.

- **Jet Fuel**--Through 1982, small amounts of kerosene-type jet fuel were consumed by the electric utility sector. Kerosene-type jet fuel deliveries to electric utilities as reported on the FERC-423 (formerly FPC-423) were used as estimates of this consumption. All remaining jet fuel (kerosene-type and naphtha-type) is consumed by the transportation sector.
- **Kerosene**--Total product supplied monthly is allocated to the major end-use sectors in proportion to annual deliveries grouped into end-use sectors

from EIA's "Deliveries of Fuel Oil and Kerosene" ("Deliveries") reports Form EIA-172) as follows:

- Residential sector deliveries are directly from the "Deliveries" reports for 1979 through 1987. Deliveries for 1987 are used as estimates for succeeding periods. Prior to 1979, each year's deliveries category called "heating" is split into residential, commercial, and industrial in proportion to the 1979 shares;
  - Commercial sector deliveries are directly from the "Deliveries" reports for 1979 through 1987. Deliveries for 1987 are used as estimates for succeeding periods. Prior to 1979, each year's deliveries category called "heating" is split into residential, commercial, and industrial in proportion to the 1979 shares; and
  - Industrial sector deliveries are directly from the "Deliveries" reports for 1979 through 1987. Deliveries for 1987 are used as estimates for succeeding periods. Prior to 1979, each year's deliveries category called "heating" is split into residential, commercial and industrial in proportion to the 1979 shares, and this estimated industrial (including farm) portion is added to "all other uses."
- **Liquefied Petroleum Gases (LPG)**--The annual shares of LPG's total consumption that are estimated to be consumed by each end-use sector are applied to each month's total LPG consumption (i.e., product supplied) to create monthly end-use consumption estimates. The annual end-use shares are calculated in the following manner:
    - Sales of LPG to the residential and commercial sector are converted from thousand gallons per year to thousand barrels per year and are assumed to be the annual consumption of LPG by the sector;
    - The quantity of LPG sold each year for consumption in internal combustion engines is allocated between the transportation and industrial sectors based on data for special fuels used on highways published by the U.S. Department of Transportation, Federal Highway Administration, in *Highway Statistics*. The allocations of LPG sold for internal combustion use range from 38 percent in the transportation sector and 62 percent in the industrial sector in 1973 to 66 percent transportation and 34 percent industrial in 1987.
    - LPG consumed annually by the industrial sector is estimated as the difference between LPG's total supplied and the estimated consumption by the sum of the residential and commercial sector and the transportation sector. The industrial sector includes LPG used by chemical plants as raw materials or solvents and for use in the production of synthetic rubber; refinery fuel use; use as synthetic natural gas feedstock and use in

secondary recovery projects; all farm use; LPG sold to gas utility companies for distribution through the mains; and a portion of the use of LPG as an internal combustion engine fuel.

The sources of the annual sales data for creating annual end-use shares are:

- 1973 through 1982: EIA's "Sales of Liquefied Petroleum Gases and Ethane" reports, based primarily on data collected by Form EIA-174.
  - 1983: End-use consumption estimates for 1983 are based on 1982 end-use consumption because the collection of data under Form EIA-174 was discontinued after data year 1982.
  - 1984 through 1987: American Petroleum Institute (API), "Sales of Natural Gas Liquids and Liquefied Refinery Gases" based on an LPG sales survey jointly sponsored by API, the Gas Processors Association, and the National Liquefied Petroleum Gas Association.
  - 1988 forward: The 1987 source is used to estimate succeeding periods.
- **Lubricants**--Total product supplied is allocated to the industrial and transportation sectors for all months according to proportions developed from annual sales of lubricants to those two sectors from U.S. Department of Commerce, Bureau of the Census, *Current Industrial Reports*, "Sales of Lubricating and Industrial Oils and Greases." The 1973 shares are applied to 1973 and 1974; the 1975 shares are applied to 1975 and 1976; and the 1977 shares are applied to 1977 forward.
  - **Motor Gasoline**--Total product supplied monthly is allocated to the major end-use sectors in proportion to aggregations of annual sales categories formed from the U.S. Department of Transportation, Federal Highway Administration *Highway Statistics*, Tables MF-21, MF-24, and MF-25, as follows:
    - Commercial sales are the sum of sales for public non-highway use and miscellaneous and unclassified uses;
    - Industrial sales are the sum of sales for agriculture, construction, and industrial and commercial use as classified in the *Highway Statistics*; and
    - Transportation sales are the sum of sales for highway use (minus the sales of special fuels, which are primarily diesel fuel and are accounted for in the transportation sector of distillate fuel) and sales for marine use.
  - **Petroleum Coke**--The portion consumed by the electric utility sector is from EIA Form 759, "Monthly Power Plant Report" (formerly FPC Form 4). The remaining petroleum coke is assigned to the industrial sector.

- **Residual Fuel**

*Electric Utility Sector, All Periods.*

Monthly and annual consumption 1973 through 1979 is assumed to be the amount of oil reported as consumed in steam-electric power plants. From January 1980, electric utility consumption of residual fuel is assumed to be the petroleum products reported as "heavy oil" consumed at utilities.

Sources: 1973 through September 1977--FPC Form 4, "Monthly Power Plant Report;" October 1977 through 1981--FERC, FPC Form 4, "Monthly Power Plant Report;" 1982 forward--EIA, Form EIA-759, "Monthly Power Plant Report."

*Non-Electric Utility Sectors, Annual Estimates Through 1987.*

The aggregate non-electric utility use of residual fuel is total residual fuel supplied minus the electric utility consumption. The non-electric utility annual totals are allocated into the individual non-electric utility sectors in proportion to the amount of residual fuel delivered to end users, grouped into sectors from EIA's "Deliveries of Fuel Oil and Kerosene" ("Deliveries") reports (based primarily on data collected by Form EIA-821, previously Form EIA-172) as follows:

- Commercial sector deliveries are directly from the "Deliveries" reports for 1979 through 1987. Prior to 1979, each year's deliveries subtotal of the heating plus industrial category is split into commercial and industrial in proportion to the 1979 shares;

- Industrial sector deliveries for 1979 through 1987 are the sum of deliveries for industrial, oil company, and all other uses. Prior to 1979, each year's deliveries subtotal of the heating plus industrial category is split into commercial and industrial in proportion to the 1979 shares; and this estimated industrial portion is added to oil company and all other uses; and

- Transportation sector deliveries are the sum of deliveries for railroad, vessel bunkering, and military uses for all years.

*Non-Electric Utility Sectors, Monthly Estimates Through 1987.*

- Commercial sector monthly consumption is estimated by allocating the annual commercial sector estimates described above into months in proportion to each month's share of the year's sales of No. 2 fuel oil as reported in the "Monthly Report of Heating Oil Sales" by the Ethyl Corporation for 1973 through 1980 and the American Petroleum Institute for 1981 and 1982, and the Energy Information Administration, Form

EIA-782-A, "Refiners/Gas Plant Operators' Monthly Petroleum Product Sales Report," No. 2 Fuel Oil Sales to End Users and for Resale, 1983 through 1987.

- Transportation sector monthly estimates are made by evenly distributing the annual sector estimate over the months, adjusted for the number of days per month.

- Industrial sector monthly estimates are made by subtracting the commercial, transportation, and electric utility sector estimates from each month's total residual fuel supplied.

*Non-Electric Utility Sectors, 1988 Forward.*

Each month's non-electric utility consumption subtotal is disaggregated into the major end-use sectors in proportion to the shares each sector held of the non-electric utility subtotal in the same month in 1987.

- **Road Oil**--All product supplied is assigned to the industrial sector.
- **All Other Petroleum Products**--The product supplied of all remaining petroleum products is assigned to the industrial sector.

**7. Hydroelectric Power:** Includes electricity generated by hydroelectric power at electric utilities, small amounts in the industrial sector, and net imports of electricity, which are assumed to be generated by hydroelectric power and are included in the electric utilities sector.

Sources for electric utilities sector:

- 1973 through 1976: FPC, Form 4, "Monthly Power Plant Report."
- 1977 through 1981: FERC, FPC Form 4, "Monthly Power Plant Report."
- 1982 forward: EIA, EIA Form 759, "Monthly Power Plant Report."

Sources for industrial sector:

- 1973 through 1978: FPC Form 4, *Monthly Power Plant Report* for plants with generating capacity exceeding 10 megawatts and FPC Form 12-C, *Industrial Electric Generating Capacity*, for all other plants.
- 1979: FPC Form 4, *Monthly Power Plant Report* for plants with generating capacity exceeding 10 megawatts and EIA estimates for all other plants.
- 1980 forward: Annual generation estimated by EIA as the average generation over the 6-year period of 1974 through 1979; monthly generation estimated to be in proportion to each month's hydroelectricity generation in the electric utility industry in 1980.

**Note for imports and exports of electricity:**

- Monthly electricity imports and exports estimates for 1982 forward were revised in the May 1984 *MER*. The revisions do not cause discontinuity in the annual data series: the data continue to come from the same source. The monthly data series, however, are discontinuous because monthly data from January 1982 forward are now available from the same source as the annual data. Estimates for monthly values prior to 1982, published in previous issues, were developed by converting the annual value to a daily rate and multiplying by the number of days in the month. Accordingly, month-to-month analyses are not comparable when taken across the transition date of January 1982. Monthly analyses on either side of that date will be comparable. There is no known bias in either the annual data or the monthly data since January 1982.

**Sources for imports and exports of electricity:**

- 1973 through 1980: DOE, Economic Regulatory Administration, "Report on Electric Energy Exchanges with Canada and Mexico."
- 1981: 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, Economic Regulatory Administration, *Electricity Exchanges Across International Borders*.
- 1984 through 1987: DOE, Economic Regulatory Administration, *Electricity Transactions Across International Borders*.
- 1988: DOE, Assistant Secretary for Fossil Energy, Office of Fuels Programs, *Electricity Transactions Across International Borders*.
- 1989 forward: EIA estimates.

**8. Nuclear Electric Power and Wood, Waste, Geothermal, Wind, Photovoltaic, and Solar Thermal Energy Sources Connected to Electric Utility Distribution Systems: Sources:**

- 1973 through 1976: FPC, Form 4, "Monthly Power Plant Report."
- 1977 through 1981: FERC, FPC Form 4, "Monthly Power Plant Report."
- 1982 forward: EIA, EIA Form 759, "Monthly Power Plant Report."

**9. Net Imports of Coal Coke:** Net imports means imports minus exports, and a minus sign indicates that exports are greater than imports. Sources:

- 1973 through 1975: DOI, BOM, *Minerals Yearbook*, "Coke and Coal Chemicals," chapter.

- 1976 through 1980: EIA, *Energy Data Report*, "Coke and Coal Chemicals," annual.
- 1981: EIA, *Energy Data Report*, "Coke Plant Report," quarterly.
- 1982 forward: EIA, *Quarterly Coal Report*.

**10. Electricity:** Sales of electricity represent consumption. From the sources cited below the following electricity sales categories are available: residential, commercial, industrial, and other. For the end-use estimates in this section, the "other" category (which is primarily sales for use in government buildings) is added to the commercial sector except for approximately 4 percent used by railroads and railways and accounted for in the transportation sector. Sales of electricity are converted into Btu at the rate of 3,412 Btu per kilowatthour. Sources of sales data:

- 1973 through 1976: FPC, Form 5, "Monthly Statement of Electric Operating Revenue and Income."
- 1977 through February 1980: EIA, FPC Form 5, "Monthly Statement of Electric Operating Revenue and Income."
- March 1980 through December 1982: EIA, FERC Form 5, "Electric Utility Company Monthly Statement."
- January 1983 forward: EIA, EIA Form 826, "Electric Utility Company Monthly Statement."

**11. Electrical System Energy Losses:** Electrical system energy losses are calculated as the difference between total energy input at electric utilities and the total energy content of electricity sold to end-use consumers. Most of those losses occur at steam-electric power plants (conventional and nuclear) in the conversion of heat energy into mechanical energy to turn electric generators. The 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 those 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 in transmission and distribution. Calculated electrical system energy 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.

## Section 3. Petroleum

Total petroleum imports<sup>11</sup> averaged 8.7 million barrels per day in July 1989, 11 percent<sup>12</sup> more than the June 1989 rate and 19 percent more than the July 1988 rate.

In July 1989, 16.9 million barrels per day of petroleum products were supplied for domestic use, 3 percent less than the previous month but 1 percent more than the previous July. Motor gasoline accounted for 45 percent of the total; distillate fuel oil, 16 percent; and residual fuel oil, 7 percent.

Motor gasoline supplied during July 1989 averaged 7.5 million barrels per day, 3 percent lower than the previous month but 1 percent higher than the July 1988 rate. Stocks of motor gasoline totaled 226 million barrels at the end of July 1989, 9 million barrels above the stock level at the end of June 1989 and 11 million barrels above the stock level 1 year earlier.

In July 1989, 2.7 million barrels of distillate fuel oil were supplied per day, 10 percent lower than the June 1989 rate but 3 percent higher than the July 1988 rate. Distillate fuel oil ending stocks for July 1989 were 115 million barrels, 16 million barrels above the stock level in the previous month but 5 million barrels lower than the stock level 1 year earlier.

Residual fuel oil supplied in July 1989 averaged 1.2 million barrels per day, 2 percent higher than the previous month but 1 percent lower than the July 1988 rate. Residual fuel oil stocks measured 41 million barrels at the end of July 1989, 4 million barrels lower than the previous month but the same as the stock level 1 year earlier.

Estimates (except of crude production) for the most current month are based on Energy Information Administration (EIA) weekly data and will be revised to conform with data from the EIA Petroleum Reporting System as available. For the most recent month, crude production is an EIA estimate based on historical and provisional data through April 1989.

<sup>11</sup>Total import data include imports into the Strategic Petroleum Reserve.

<sup>12</sup>Percentage changes are based on numbers shown in the following tables.

**Table 3.1a Crude Oil<sup>a</sup> and Petroleum Products Overview**

	Field Production			Stock Change <sup>b</sup>		Petroleum Products Supplied	Ending Stocks <sup>c</sup>
	Total Domestic <sup>d</sup>	Crude Oil	Natural Gas Plant Production	Crude Oil <sup>e</sup>	Petroleum Products		Crude Oil <sup>e</sup> and Petroleum Products
	Thousand Barrels per Day						Million Barrels
1973 Average .....	10,975	9,208	1,738	-11	146	17,308	1,008
1974 Average .....	10,498	8,774	1,688	62	117	16,653	1,074
1975 Average .....	10,045	8,375	1,633	17	15	16,322	1,133
1976 Average .....	9,774	8,132	1,604 <sup>h</sup>	39	-96	17,461	1,112
1977 Average .....	9,913	8,245	1,618	170	378	18,431	1,312
1978 Average .....	10,328	8,707	1,567	78	-172	18,847	1,278
1979 Average .....	10,179	8,552	1,584	148	25	18,513	1,341
1980 Average .....	10,214	8,597	1,573	97	42	17,056	1,392
1981 Average .....	10,230	8,572	1,609	290	-130	16,058	1,484
1982 Average .....	10,252	8,649	1,550	136	-283	15,296	1,430
1983 Average .....	10,299	8,688	1,559	214	-234	15,231	1,454
1984 Average .....	10,554	8,879	1,630	199	81	15,726	1,556
1985 Average .....	10,636	8,971	1,609	50	-153	15,726	1,519
1986 Average .....	10,289	8,680	1,551	78	124	16,281	1,593
1987 January .....	10,139	8,480	1,582	166	-376	16,684	1,586
February .....	10,073	8,389	1,618	22	-831	16,908	1,563
March .....	10,131	8,464	1,598	125	-340	16,165	1,557
April .....	10,139	8,498	1,590	-50	-532	16,524	1,539
May .....	9,977	8,336	1,585	-36	116	16,026	1,542
June .....	9,906	8,279	1,578	165	42	16,830	1,548
July .....	9,895	8,251	1,582	-33	372	17,113	1,558
August .....	9,843	8,210	1,571	345	737	16,346	1,592
September .....	9,851	8,205	1,582	220	236	16,670	1,606
October .....	10,037	8,364	1,602	661	-523	16,941	1,610
November .....	10,112	8,397	1,637	355	478	16,343	1,635
December .....	10,001	8,318	1,621	-405	-482	17,445	1,607
Average .....	10,008	8,349	1,595	128	-87	16,665	
1988 January .....	9,876	8,250	1,579	-43	-294	17,403	1,597
February .....	10,018	8,374	1,605	133	-868	17,760	1,576
March .....	10,071	8,374	1,636	219	-748	17,612	1,559
April .....	9,946	8,288	1,618	190	445	16,561	1,578
May .....	9,899	8,229	1,627	96	1,048	16,197	1,614
June .....	9,833	8,170	1,616	43	-109	17,059	1,612
July .....	9,713	8,040	1,618	-261	819	16,695	1,629
August .....	9,762	8,079	1,616	-488	307	17,482	1,624
September .....	9,575	7,895	1,621	-83	245	17,072	1,628
October .....	9,737	8,023	1,661	399	-333	17,580	1,630
November .....	9,751	8,023	1,666	3	25	17,620	1,631
December .....	9,641	7,942	1,634	-188	-911	18,365	1,597
Average .....	9,818	8,140	1,625	1	-29	17,283	
1989 January .....	E 9,638	E 7,913	1,653	130	512	17,211	1,620
February .....	E 9,469	E 7,830	1,601	63	-704	17,765	1,602
March .....	E 9,310	E 7,610	1,647	-131	-905	17,907	1,569
April .....	E 9,462	E 7,747	1,670	496	386	16,561	1,596
May .....	E 9,480	E 7,807	1,623	266	589	16,488	1,622
June .....	RE 9,213	RE 7,660	R 1,506	R -430	R -60	R 17,389	R 1,608
July .....	PE 9,323	PE 7,622	E 1,653	E 37	E 822	E 16,926	E 1,639
7-Month Average .....	PE 9,413	PE 7,740	E 1,623	E 62	E 102	E 17,172	
1988 7-Month Average .....	9,907	8,245	1,614	53	49	17,036	
1987 7-Month Average .....	10,037	8,385	1,590	52	-212	16,602	

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

<sup>b</sup>A negative number indicates a decrease in stocks and a positive number indicates an increase.

<sup>c</sup>Stocks are totals as of end of period.

<sup>d</sup>Includes crude oil, natural gas plant liquids, other hydrocarbons, and alcohol.

<sup>e</sup>Includes stocks located in the Strategic Petroleum Reserve.

<sup>f</sup>Includes crude oil for storage in the Strategic Petroleum Reserve.

<sup>g</sup>Net imports equals imports minus exports.

<sup>h</sup>Due to a rounding difference, this value is 1,603 in the *Petroleum Supply Annual* and *Petroleum Supply Monthly*.

<sup>i</sup>In January 1975, 1981, and 1983, numerous respondents were added to surveys affecting stocks reported and stock change calculations. See Note 4 at end of section.

Footnotes continued on following page.

**Table 3.1b Crude Oil<sup>a</sup> and Petroleum Products Overview (continued)**

	Imports			Exports			Net Imports <sup>a</sup>
	Total	Crude Oil <sup>f</sup>	Petroleum Products	Total	Crude Oil	Petroleum Products	
	Thousand Barrels per Day						
1973 Average .....	6,256	3,244	3,012	231	2	229	6,025
1974 Average .....	6,112	3,477	2,635	221	3	218	5,892
1975 Average .....	6,056	4,105	1,951	209	6	204	5,846
1976 Average .....	7,313	5,287	2,026	223	8	215	7,090
1977 Average .....	8,807	6,155	2,193	243	50	193	8,585
1978 Average .....	8,363	6,356	2,008	362	158	204	8,002
1979 Average .....	8,456	6,519	1,937	471	235	236	7,985
1980 Average .....	6,909	5,263	1,646	544	287	258	6,365
1981 Average .....	5,986	4,396	1,599	595	228	367	5,401
1982 Average .....	5,113	3,488	1,625	815	236	579	4,298
1983 Average .....	5,051	3,329	1,722	739	164	575	4,312
1984 Average .....	5,437	3,426	2,011	722	181	541	4,715
1985 Average .....	5,067	3,201	1,866	781	204	577	4,286
1986 Average .....	6,224	4,178	2,045	785	154	631	5,439
<b>1987 January .....</b>	<b>6,353</b>	<b>4,385</b>	<b>1,968</b>	<b>703</b>	<b>84</b>	<b>619</b>	<b>5,650</b>
February .....	5,984	3,866	2,118	977	284	694	5,007
March .....	5,794	3,779	2,015	720	150	570	5,074
April .....	5,911	4,132	1,779	870	247	624	5,041
May .....	6,073	4,340	1,732	666	69	597	5,407
June .....	6,769	4,807	1,962	669	116	554	6,099
July .....	7,588	5,295	2,293	680	149	531	6,908
August .....	7,454	5,510	1,944	664	141	523	6,790
September .....	7,178	5,110	2,068	795	116	680	6,382
October .....	7,068	5,142	1,926	646	84	562	6,422
November .....	7,068	5,013	2,055	737	164	573	6,331
December .....	6,833	4,640	2,194	1,057	220	838	5,776
<b>Average .....</b>	<b>6,678</b>	<b>4,674</b>	<b>2,004</b>	<b>764</b>	<b>151</b>	<b>613</b>	<b>5,914</b>
<b>1988 January .....</b>	<b>7,181</b>	<b>4,662</b>	<b>2,519</b>	<b>885</b>	<b>206</b>	<b>679</b>	<b>6,296</b>
February .....	7,256	4,650	2,605	864	146	718	6,392
March .....	6,944	4,868	2,076	834	213	622	6,110
April .....	7,270	5,167	2,103	676	114	562	6,594
May .....	7,469	5,339	2,130	814	138	676	6,655
June .....	7,239	5,322	1,917	938	138	800	6,301
July .....	7,297	5,100	2,197	826	186	640	6,471
August .....	7,386	5,089	2,296	814	152	661	6,572
September .....	7,506	5,212	2,294	673	119	554	6,833
October .....	7,830	5,551	2,279	732	166	566	7,098
November .....	7,714	5,070	2,644	717	148	569	6,997
December .....	7,727	5,230	2,497	1,008	129	879	6,719
<b>Average .....</b>	<b>7,402</b>	<b>5,107</b>	<b>2,295</b>	<b>815</b>	<b>155</b>	<b>661</b>	<b>6,587</b>
<b>1989 January .....</b>	<b>8,040</b>	<b>5,521</b>	<b>2,519</b>	<b>760</b>	<b>136</b>	<b>624</b>	<b>7,280</b>
February .....	7,909	5,263	2,646	875	208	666	7,034
March .....	7,392	4,993	2,400	860	156	704	6,532
April .....	8,034	5,745	2,289	810	139	670	7,224
May .....	7,697	5,665	2,032	792	131	661	6,905
June .....	R 7,869	R 5,915	R 1,954	R 975	R 243	R 732	R 6,895
July .....	E 8,706	E 6,560	E 2,147	E 803	E 136	E 667	E 7,903
<b>7-Month Average .....</b>	<b>E 7,950</b>	<b>E 5,670</b>	<b>E 2,280</b>	<b>E 838</b>	<b>E 164</b>	<b>E 675</b>	<b>E 7,112</b>
<b>1988 7-Month Average .....</b>	<b>7,236</b>	<b>5,017</b>	<b>2,219</b>	<b>834</b>	<b>164</b>	<b>670</b>	<b>6,402</b>
<b>1987 7-Month Average .....</b>	<b>6,358</b>	<b>4,378</b>	<b>1,980</b>	<b>752</b>	<b>155</b>	<b>597</b>	<b>5,607</b>

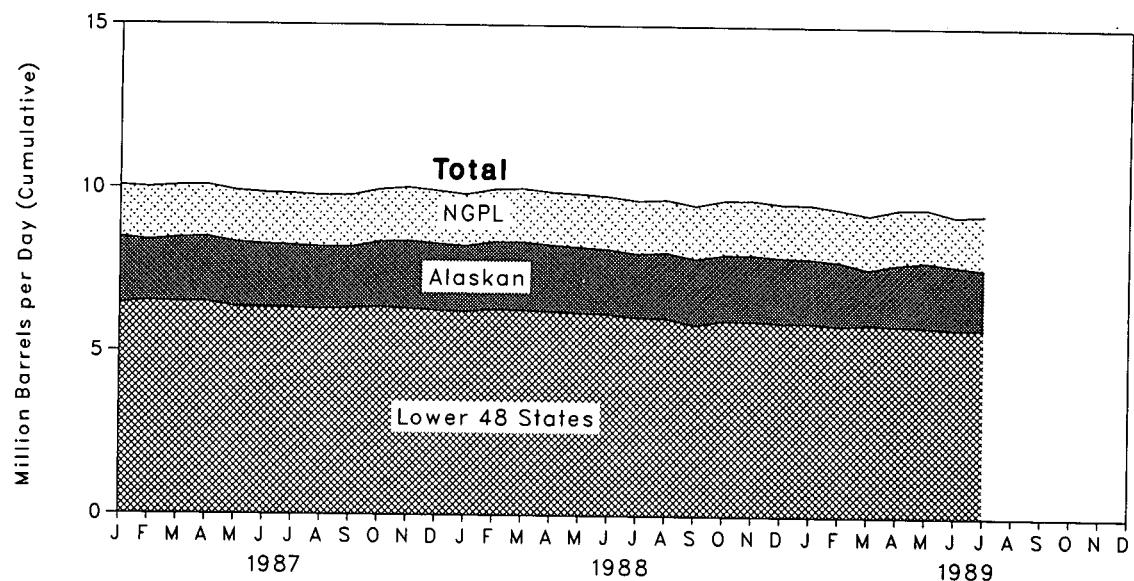
Footnotes continued.

PE=Preliminary estimate. R=Revised data. E=Estimate.

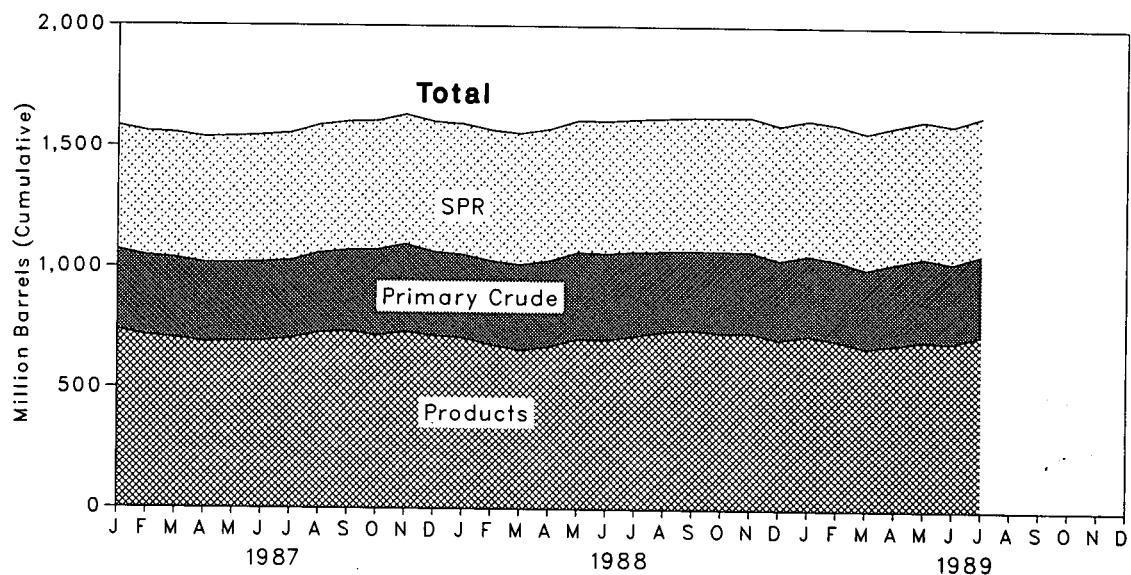
Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding.

Sources: See end of section.

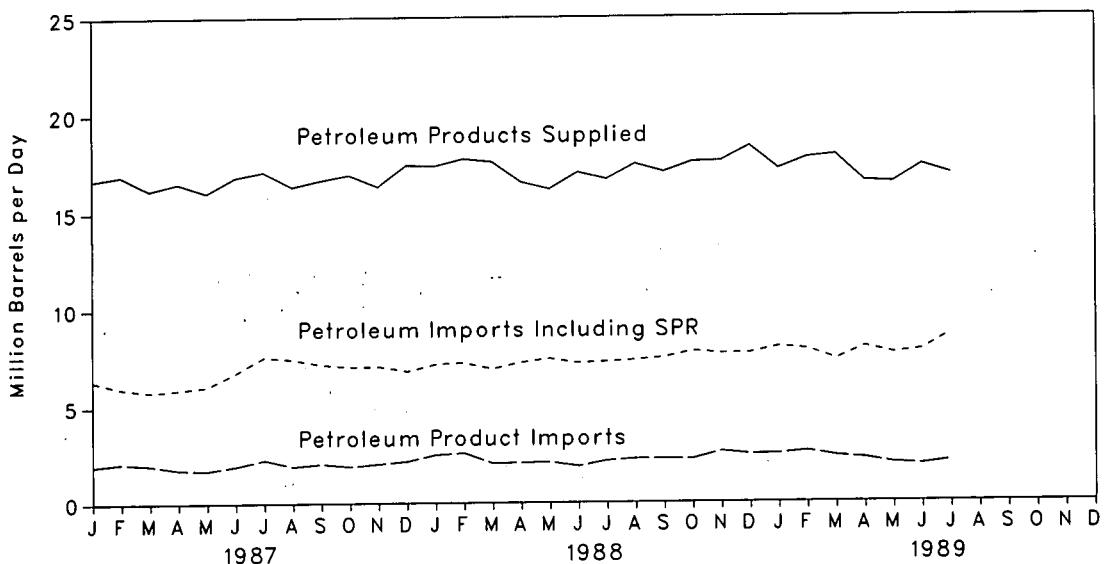
**Figure 3.1 Crude Oil and Natural Gas Liquids Production**



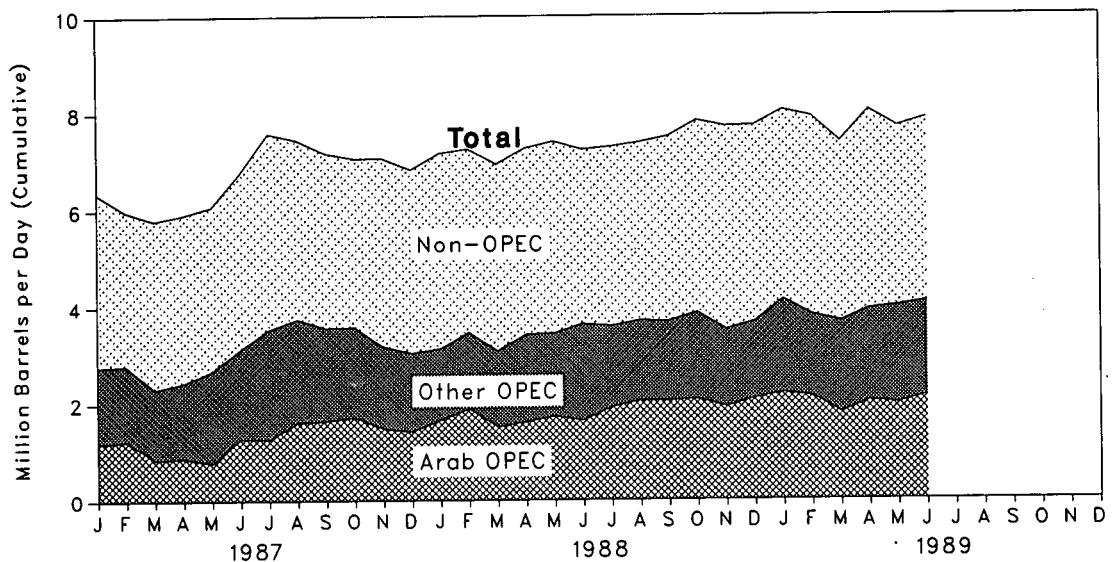
**Figure 3.2 Petroleum Stocks**



**Figure 3.3 Petroleum Products Supplied and Imports**



**Figure 3.4 Petroleum Imports by Source**



**Table 3.2a Crude Oil<sup>a</sup> Supply and Disposition**  
(Thousand Barrels per Day)

	Supply						
	Field Production		Imports			Unaccounted for Crude Oil <sup>b</sup>	Crude Used Directly <sup>c</sup>
	Total Domestic	Alaskan	Total	SPR <sup>d</sup>	Other		
1973 Average .....	9,208	198	3,244		3,244	3	-19
1974 Average .....	8,774	193	3,477		3,477	-25	-15
1975 Average .....	8,375	191	4,105		4,105	17	-17
1976 Average .....	8,132	173	5,287		5,287	77	-18
1977 Average .....	8,245	464	6,815	21	6,594	-6	-14
1978 Average .....	8,707	1,229	6,356	162	6,195	-57	-14
1979 Average .....	8,552	1,401	6,519	67	6,452	-11	-13
1980 Average .....	8,597	1,617	5,263	44	5,219	34	-13
1981 Average .....	8,572	1,609	4,396	256	4,141	83	-58
1982 Average .....	8,649	1,696	3,488	165	3,323	71	-59
1983 Average .....	8,688	1,714	3,329	234	3,096	114	NA
1984 Average .....	8,879	1,722	3,426	197	3,229	185	NA
1985 Average .....	8,971	1,825	3,201	118	3,083	145	NA
1986 Average .....	8,680	1,867	4,178	48	4,130	139	NA
1987 January .....	8,480	2,019	4,385	92	4,293	-5	NA
February .....	8,389	1,853	3,866	44	3,822	382	NA
March .....	8,464	1,968	3,779	95	3,684	151	NA
April .....	8,498	1,990	4,132	57	4,076	120	NA
May .....	8,336	1,979	4,340	92	4,248	51	NA
June .....	8,279	1,930	4,807	64	4,743	434	NA
July .....	8,251	1,910	5,295	76	5,218	32	NA
August .....	8,210	1,908	5,510	63	5,447	177	NA
September .....	8,205	1,874	5,110	64	5,047	217	NA
October .....	8,364	1,986	5,142	57	5,085	-3	NA
November .....	8,397	2,068	5,013	97	4,916	115	NA
December .....	8,318	2,043	4,640	68	4,572	101	NA
Average .....	8,349	1,962	4,674	73	4,601	145	NA
1988 January .....	8,250	1,999	4,662	67	4,595	216	NA
February .....	8,374	2,070	4,650	49	4,601	-50	NA
March .....	8,374	2,086	4,868	23	4,845	258	NA
April .....	8,288	2,029	5,167	78	5,090	27	NA
May .....	8,229	2,016	5,339	22	5,317	125	NA
June .....	8,170	1,984	5,322	70	5,252	208	NA
July .....	8,040	1,960	5,100	42	5,058	432	NA
August .....	8,079	2,009	5,089	26	5,064	278	NA
September .....	7,895	2,019	5,212	84	5,128	228	NA
October .....	8,023	2,010	5,551	43	5,508	160	NA
November .....	8,023	2,027	5,070	89	4,981	258	NA
December .....	7,942	1,996	5,230	27	5,203	196	NA
Average .....	8,140	2,017	5,107	51	5,055	196	NA
1989 January .....	E 7,913	E 1,958	5,521	65	5,456	209	NA
February .....	E 7,830	E 1,962	5,263	84	5,178	1	NA
March .....	E 7,610	E 1,686	4,993	75	4,917	431	NA
April .....	E 7,747	E 1,890	5,745	59	5,685	120	NA
May .....	E 7,807	E 1,973	5,665	77	5,588	338	NA
June .....	RE 7,660	RE 1,861	R 5,915	R 55	R 5,860	R 156	NA
July .....	PE 7,622	PE 1,824	E 6,560	E 80	E 6,480	E -119	NA
7-Month Average .....	PE 7,740	PE 1,878	E 5,670	E 71	E 5,599	E 165	NA
1988 7-Month Average .....	8,245	2,020	5,017	50	4,987	176	NA
1987 7-Month Average .....	8,385	1,951	4,378	75	4,303	162	NA

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

<sup>b</sup>Stocks are totals as of end of period.

<sup>c</sup>A negative number indicates a decrease in stocks and a positive number indicates an increase.

<sup>d</sup>Strategic Petroleum Reserve.

\*A balancing item.

<sup>e</sup>Beginning in January 1983, crude oil used directly as fuel is shown as product supplied.

<sup>f</sup>Stocks of Alaskan crude oil in transit were included beginning in January 1981. Stock changes are calculated using new basis stock levels. See Notes 4 and 5 at end of section.

Footnotes continued on following page.

**Table 3.2b Crude Oil<sup>a</sup> Supply and Disposition (continued)**

	Disposition					Ending Stocks <sup>b</sup>		
	Crude Losses	Stock Change <sup>c</sup>		Refinery Input	Exports	Product Supplied <sup>d</sup>	Total	SPR <sup>d</sup>
		SPR <sup>d</sup>	Other					
Thousand Barrels per Day					Million Barrels			
1973 Average .....	13		-11	12,431	2		242	242
1974 Average .....	13		62	12,133	3		265	265
1975 Average .....	13		17	12,442	6		271	271
1976 Average .....	15		39	13,418	8		285	285
1977 Average .....	16	20	150	14,602	50		348	340
1978 Average .....	16	163	-84	14,739	158		376	309
1979 Average .....	16	67	81	14,648	235		430	339
1980 Average .....	15	45	52	13,481	287	9 466	108	9 358
1981 Average .....	5	336	9 -46	12,470	228	594	230	363
1982 Average .....	3	174	-38	11,774	236	9 644	294	350
1983 Average .....	2	234	9 -20	11,685	164	723	379	344
1984 Average .....	2	195	4	12,044	181	64	796	451
1985 Average .....	1	117	-67	12,002	204	60	814	493
1986 Average .....	(s)	50	28	12,716	154	49	843	512
								331
1987 January .....	1	108	58	12,570	84	41	848	515
February .....	(s)	64	-42	12,290	284	41	849	517
March .....	1	106	19	12,081	150	39	852	520
April .....	(s)	67	-116	12,512	247	41	851	522
May .....	(s)	101	-137	12,653	69	42	850	525
June .....	(s)	69	97	13,202	116	36	855	527
July .....	(s)	91	-124	13,430	149	32	854	530
August .....	(s)	63	281	13,380	141	31	864	532
September .....	(s)	64	157	13,168	116	28	871	534
October .....	(s)	57	604	12,733	84	25	892	536
November .....	(s)	97	258	12,981	164	25	902	539
December .....	(s)	68	-472	13,212	220	31	890	541
Average .....	(s)	80	49	12,854	151	34		349
1988 January .....	(s)	67	-110	12,920	206	45	888	543
February .....	(s)	49	84	12,644	146	52	892	544
March .....	(s)	26	193	13,016	213	52	899	545
April .....	(s)	77	112	13,135	114	42	905	547
May .....	(s)	22	74	13,425	138	34	908	548
June .....	(s)	70	-27	13,487	138	32	909	550
July .....	1	42	-302	13,617	186	29	901	551
August .....	(s)	26	-514	13,752	152	30	886	552
September .....	(s)	84	-167	13,261	119	37	883	555
October .....	(s)	43	356	13,126	166	42	896	556
November .....	(s)	89	-86	13,156	148	44	896	559
December .....	(s)	27	-215	13,381	129	44	890	560
Average .....	(s)	52	-51	13,246	155	40		330
1989 January .....	(s)	65	66	13,330	136	47	895	562
February .....	(s)	85	-21	12,774	208	48	897	564
March .....	(s)	75	-206	12,963	156	45	893	566
April .....	(s)	60	437	12,953	139	23	907	568
May .....	(s)	77	189	13,395	131	19	916	570
June .....	(s)	R 44	R -474	R 13,896	R 243	R 20	R 903	R 572
July .....	E (s)	E 80	E -43	E 13,867	E 136	E 22	E 909	E 574
7-Month Average .....	E (s)	E 69	E -7	E 13,318	E 164	E 32		E 335
1988 7-Month Average .....	(s)	50	2	13,181	164	41		
1987 7-Month Average .....	(s)	87	-35	12,680	155	39		

Footnotes continued.

PE=Preliminary estimate. R=Revised data. NA=Not available. E=Estimate. (s)=Less than 500 barrels per day.

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

Sources: See end of section.

**Table 3.3a Crude Oil and Petroleum Product Imports**  
 (Thousand Barrels per Day)

	Imports from OPEC Sources <sup>a</sup>										
	Algeria	Libya	Saudi Arabia <sup>b</sup>	United Arab Emirates	Indonesia	Iran	Nigeria	Venezuela	Other OPEC <sup>b</sup>	Total OPEC <sup>c</sup>	Total Arab OPEC <sup>d</sup>
1973 Average .....	136	164	486	71	213	223	459	1,135	106	2,993	915
1974 Average .....	190	4	461	74	300	469	713	979	88	3,280	752
1975 Average .....	282	232	715	117	390	280	762	702	122	3,601	1,383
1976 Average .....	432	453	1,230	254	539	298	1,025	700	134	5,066	2,424
1977 Average .....	559	723	1,380	335	541	535	1,143	690	287	6,193	3,185
1978 Average .....	649	654	1,144	385	573	555	919	645	226	5,751	2,963
1979 Average .....	636	658	1,356	281	420	304	1,080	690	212	5,637	3,056
1980 Average .....	488	554	1,261	172	348	9	857	481	130	4,300	2,551
1981 Average .....	311	319	1,129	81	366	0	620	406	90	3,323	1,848
1982 Average .....	170	26	552	92	248	35	514	412	97	2,146	854
1983 Average .....	240	0	337	30	338	48	302	422	144	1,862	632
1984 Average .....	323	1	325	117	343	10	216	548	166	2,049	819
1985 Average .....	187	4	168	45	314	27	293	605	187	1,830	472
1986 Average .....	271	0	685	44	318	19	440	793	265	2,837	1,162
1987 January .....	156	0	875	15	254	0	346	899	218	2,764	1,184
February .....	307	0	776	54	418	30	256	791	155	2,785	1,222
March .....	334	0	430	0	317	73	312	702	135	2,305	843
April .....	323	0	463	62	236	47	512	710	77	2,430	866
May .....	196	0	499	26	297	75	550	913	119	2,675	775
June .....	247	0	782	45	261	165	546	808	268	3,122	1,275
July .....	347	0	756	42	349	237	792	854	157	3,533	1,264
August .....	250	0	961	103	312	208	732	831	351	3,748	1,611
September .....	378	0	902	146	242	193	615	821	263	3,560	1,640
October .....	274	0	1,051	111	305	86	518	829	401	3,576	1,713
November .....	395	0	637	97	219	41	607	771	402	3,169	1,477
December .....	339	0	876	31	216	23	613	717	220	3,033	1,415
Average .....	295	0	751	61	285	98	535	804	231	3,060	1,274
1988 January .....	333	0	849	61	179	* 1	406	766	540	3,134	1,652
February .....	358	0	1,265	79	194	0	506	846	214	3,461	1,883
March .....	259	0	937	6	127	0	589	803	352	3,073	1,509
April .....	342	0	929	48	166	0	711	833	385	3,413	1,610
May .....	320	0	1,041	41	298	0	601	841	360	3,501	1,724
June .....	262	0	923	11	184	0	875	850	527	3,632	1,635
July .....	225	0	1,076	43	216	0	715	724	590	3,589	1,911
August .....	257	0	1,169	0	153	0	623	830	669	3,703	2,036
September .....	289	0	1,066	22	242	0	546	824	697	3,685	2,042
October .....	326	0	1,244	16	265	0	686	772	552	3,861	2,069
November .....	322	0	986	0	240	0	489	779	694	3,510	1,914
December .....	312	0	1,289	19	194	0	667	669	524	3,674	2,080
Average .....	300	0	1,064	29	205	(s)	618	794	510	3,520	1,839
1989 January .....	315	0	1,450	59	211	0	746	916	429	4,126	2,200
February .....	310	0	1,290	17	292	0	542	767	593	3,812	2,126
March .....	272	0	1,108	64	167	0	702	911	454	3,678	1,789
April .....	235	0	1,226	14	128	0	750	830	743	3,926	2,030
May .....	272	0	1,155	61	264	0	754	853	630	3,990	1,977
June .....	205	0	1,240	17	138	0	864	777	841	4,082	2,140
6-Month Average ...	268	0	1,244	39	199	0	729	844	614	3,937	2,042
1988 6-Month Average ...	312	0	988	41	191	(s)	614	822	398	3,366	1,667
1987 6-Month Average ...	259	0	636	33	296	65	422	805	162	2,677	1,024

<sup>a</sup>Excludes petroleum imported into the United States indirectly from members of the Organization of Petroleum Exporting Countries (OPEC), primarily from Caribbean and West European areas, as petroleum products that were refined from crude oil produced by OPEC.

<sup>b</sup>"Other OPEC" consists of Ecuador, Gabon, Iraq, Kuwait, and Qatar. Prior to January 1988, imports from the Neutral Zone between Kuwait and Saudi Arabia are included in imports from Saudi Arabia. From January 1988 forward, those imports are included in imports from "Other OPEC."

<sup>c</sup>"Total OPEC" consists of Ecuador, Gabon, Indonesia, Iran, Nigeria, and Venezuela, as well as the Arab members.

<sup>d</sup>"Total Arab OPEC" consists of Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and the United Arab Emirates. Imports from the Neutral Zone are included in imports from "Total Arab OPEC."

\*A small amount of Iranian crude oil entered the United States (defined in this publication as the 50 States and the District of Columbia) in January 1988 from the Virgin Islands. The oil originated in Iran and was exported to the Virgin Islands prior to the signing of Executive Order 12613 on October 29, 1987.

Footnotes continued on following page.

**Table 3.3b Crude Oil and Petroleum Product Imports (continued)**  
 (Thousand Barrels per Day)

	Imports from Non-OPEC Sources <sup>1</sup>										Total Imports
	Bahamas	Canada	Mexico	Nether- lands Antilles	Trinidad and Tobago	United Kingdom	Puerto Rico	Virgin Islands	Other Non- OPEC	Total Non- OPEC	
1973 Average .....	174	1,325	16	585	255	15	99	329	465	3,263	6,256
1974 Average .....	164	1,070	8	511	251	8	90	391	340	2,832	6,112
1975 Average .....	152	846	71	332	242	14	90	406	300	2,454	6,056
1976 Average .....	118	599	87	275	274	31	88	422	353	2,247	7,313
1977 Average .....	171	517	179	211	289	126	105	466	550	2,614	8,807
1978 Average .....	160	467	318	229	253	180	94	429	484	2,613	8,363
1979 Average .....	147	538	439	231	190	202	92	431	548	2,819	8,456
1980 Average .....	78	455	533	225	176	176	88	388	491	2,609	6,909
1981 Average .....	74	447	522	197	133	375	62	327	534	2,672	5,996
1982 Average .....	65	482	685	175	112	456	50	316	627	2,968	5,113
1983 Average .....	125	547	826	189	96	382	40	282	701	3,189	5,051
1984 Average .....	88	630	748	188	94	402	42	294	902	3,388	5,437
1985 Average .....	40	770	816	40	113	310	28	247	873	3,237	5,067
1986 Average .....	37	807	699	25	125	350	21	244	1,080	3,387	6,224
1987 January .....	59	799	689	29	100	384	33	327	1,170	3,589	6,353
February .....	56	783	692	23	127	260	24	296	938	3,199	5,984
March .....	43	738	721	14	124	322	17	247	1,262	3,489	5,794
April .....	43	818	679	12	123	485	24	259	1,037	3,481	5,911
May .....	31	884	541	33	117	392	21	214	1,164	3,398	6,073
June .....	22	912	664	13	114	377	21	281	1,242	3,646	6,769
July .....	46	901	680	71	98	354	17	288	1,598	4,055	7,588
August .....	27	841	577	51	100	289	20	274	1,526	3,706	7,454
September .....	48	846	705	42	105	259	25	271	1,318	3,618	7,178
October .....	26	938	697	16	88	321	17	250	1,138	3,492	7,068
November .....	31	827	627	14	111	456	15	235	1,585	3,899	7,068
December .....	10	883	591	24	73	324	23	327	1,543	3,800	6,833
Average .....	37	848	655	29	106	352	21	272	1,296	3,617	6,678
1988 January .....	51	959	808	40	97	313	29	341	1,410	4,047	7,181
February .....	79	1,033	710	21	93	334	16	200	1,308	3,794	7,256
March .....	47	1,002	745	46	89	461	22	180	1,280	3,871	6,944
April .....	26	985	678	43	82	594	29	193	1,227	3,857	7,270
May .....	24	1,001	722	27	102	389	20	257	1,426	3,968	7,469
June .....	15	1,032	766	31	112	232	13	212	1,194	3,607	7,239
July .....	15	972	723	35	96	214	22	215	1,416	3,708	7,297
August .....	12	1,009	704	32	97	111	23	172	1,523	3,683	7,386
September .....	37	936	843	25	96	149	29	236	1,469	3,820	7,506
October .....	13	996	743	17	98	447	21	234	1,398	3,969	7,830
November .....	27	1,080	811	72	80	246	15	286	1,587	4,204	7,714
December .....	40	990	711	40	125	294	28	372	1,453	4,053	7,727
Average .....	32	999	747	36	97	315	22	242	1,392	3,882	7,402
1989 January .....	55	995	807	59	86	207	30	415	1,261	3,914	8,040
February .....	24	991	756	44	92	221	24	368	1,577	4,097	7,909
March .....	38	951	670	52	82	157	38	324	1,402	3,715	7,392
April .....	55	853	1,002	14	114	182	24	405	1,458	4,108	8,034
May .....	27	887	792	22	68	210	46	379	1,277	3,707	7,687
June .....	28	900	678	23	143	190	32	363	1,431	3,788	R 7,869
6-Month Average ...	38	929	784	36	97	194	32	376	1,398	3,884	7,821
1988 6-Month Average ...	40	1,002	739	35	96	388	22	231	1,308	3,859	7,226
1987 6-Month Average ...	42	823	664	21	117	371	23	270	1,139	3,471	6,148

Footnotes continued.

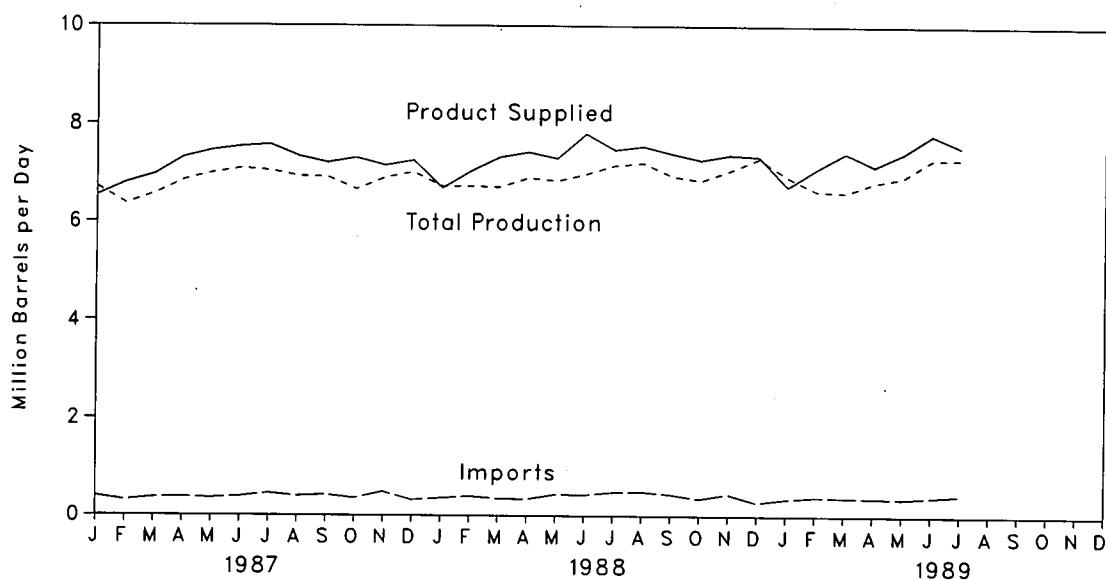
<sup>1</sup>Includes petroleum imported into the United States indirectly from members of OPEC, primarily from Caribbean and West European areas, as petroleum products that were refined from crude oil produced by OPEC.

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

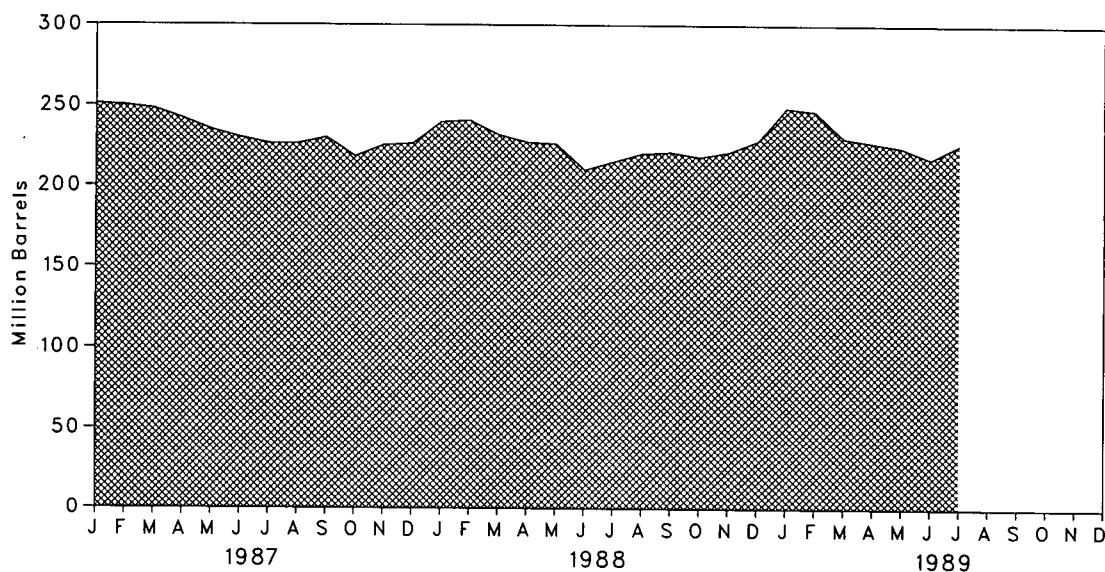
Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding. • Beginning in October 1977, Strategic Petroleum Reserve imports are included.

Sources: See end of section.

**Figure 3.5 Finished Motor Gasoline Product Supplied, Production, and Imports**



**Figure 3.6 Motor Gasoline Ending Stocks**



**Table 3.4 Finished Motor Gasoline Supply and Disposition**

	Supply		Disposition				Ending Stocks <sup>a</sup>		
	Total Production	Imports <sup>b</sup>	Stock Change <sup>b,c</sup>	Exports	Product Supplied			Total Motor Gasoline <sup>e</sup>	Finished Motor Gasoline <sup>e</sup>
					Total	Unleaded <sup>d</sup>	Unleaded		
Thousand Barrels per Day									
1973 Average .....	6,535	134	-9	4	6,674			209	
1974 Average .....	6,360	204	24	2	6,537			218	
1975 Average .....	6,520	184	28	2	6,675			235	
1976 Average .....	6,841	131	-10	3	6,978			231	
1977 Average .....	7,033	217	72	2	7,177	1,976	27.5	258	
1978 Average .....	7,169	190	-54	1	7,412	2,521	34.0	238	
1979 Average .....	6,852	181	-2	(s)	7,034	2,798	39.8	237	
1980 Average .....	6,506	140	66	1	6,579	3,067	46.6	261	
1981 Average <sup>f</sup> .....	6,405	157	-28	2	6,588	3,264	49.5	253	
1982 Average .....	6,338	197	-25	20	6,539	3,409	52.1	235	
1983 Average .....	6,340	247	-45	10	6,622	3,647	55.1	222	186
1984 Average .....	6,453	299	54	6	6,693	3,987	59.6	243	205
1985 Average .....	6,419	381	-41	10	6,831	4,406	64.5	223	190
1986 Average .....	6,752	326	11	33	7,034	4,854	69.0	233	194
1987 January .....	6,714	393	528	44	6,535	4,822	73.8	251	211
February .....	6,365	309	-144	22	6,796	5,068	74.6	250	207
March .....	6,569	364	-51	20	6,964	5,193	74.6	248	205
April .....	6,850	374	-133	42	7,314	5,405	73.9	242	201
May .....	6,991	354	-164	48	7,460	5,569	74.7	235	196
June .....	7,089	385	-111	46	7,539	5,678	75.3	230	193
July .....	7,043	452	-119	33	7,581	5,740	75.7	226	189
August .....	6,933	396	-29	19	7,338	5,656	77.1	226	188
September .....	6,921	421	107	30	7,205	5,536	76.8	230	191
October .....	6,668	356	-302	21	7,305	5,636	77.1	218	182
November .....	6,907	484	208	32	7,151	5,589	78.2	225	188
December .....	7,015	320	24	59	7,251	5,715	78.8	226	189
Average .....	6,841	384	-15	35	7,206	5,470	75.9		
1988 January .....	6,730	357	387	8	6,693	5,395	80.6	240	201
February .....	6,736	397	75	18	7,039	5,607	79.7	241	203
March .....	6,715	349	-277	18	7,323	5,894	80.5	232	194
April .....	6,907	399	-142	18	7,430	5,991	80.6	227	190
May .....	6,851	437	-43	28	7,303	5,861	80.3	226	189
June .....	6,983	428	-465	59	7,817	6,336	81.1	210	175
July .....	7,159	482	148	12	7,482	6,144	82.1	215	179
August .....	7,209	494	131	15	7,556	6,232	82.5	220	184
September .....	6,948	443	-28	16	7,404	6,115	82.6	221	183
October .....	6,858	352	-75	13	7,271	5,988	82.4	218	180
November .....	7,060	451	118	15	7,379	6,157	83.4	221	184
December .....	7,303	277	192	45	7,344	6,220	84.7	228	190
Average .....	6,956	405	3	22	7,336	5,995	81.7		
1989 January .....	6,935	349	519	33	6,732	5,753	85.4	249	206
February .....	6,648	392	-79	24	7,095	6,119	86.3	247	204
March .....	6,615	381	-469	43	7,421	6,381	86.0	230	189
April .....	6,820	371	-5	46	7,150	6,298	87.2	227	189
May .....	6,931	356	-160	31	7,416	6,486	87.5	224	184
June .....	R 7,289	R 391	R -184	R 60	R 7,803	R 6,886	R 88.3	R 217	R 178
July .....	E 7,300	E 432	E 144	E 41	E 7,547	E 6,771	E 89.7	E 226	E 187
7-Month Average .....	E 6,937	E 382	E -32	E 40	E 7,311	E 6,378			
1988 7-Month Average .....	6,869	407	-44	23	7,297	5,890			
1987 7-Month Average .....	6,808	377	-25	37	7,173	5,356			

<sup>a</sup>Stocks are totals as of end of period.

<sup>b</sup>Beginning in 1981, excludes blending components.

<sup>c</sup>A negative number indicates a decrease in stocks and a positive number indicates an increase.

<sup>d</sup>Includes gasohol.

<sup>e</sup>Includes motor gasoline blending components.

<sup>f</sup>In January 1975, 1981, and 1983, numerous respondents were added to surveys affecting stocks reported and stock change calculations. See Note 4 at end of section.

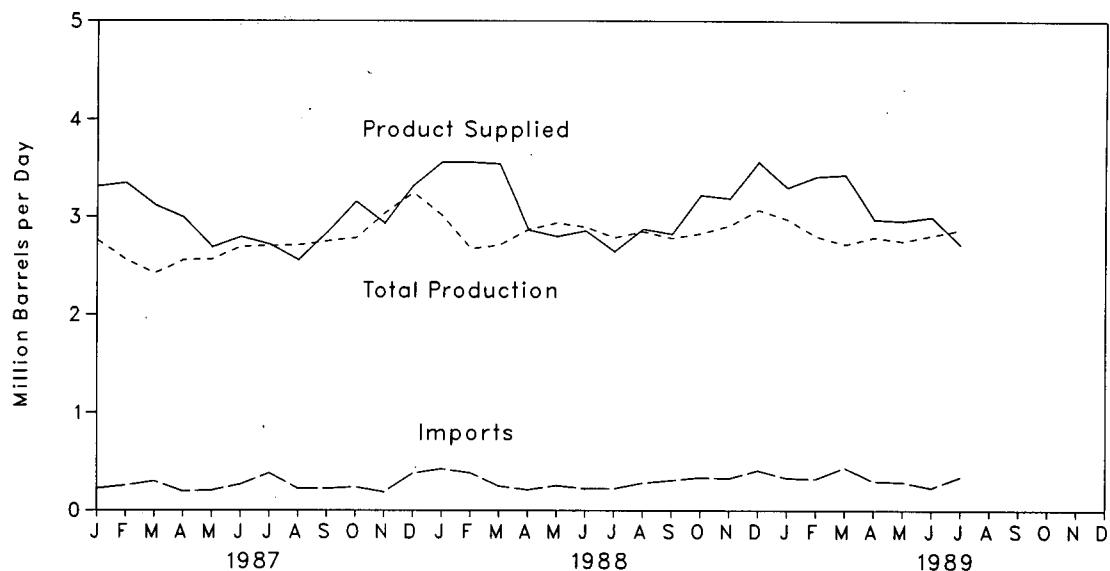
<sup>g</sup>Beginning in January 1981, survey forms were modified. See Note 1 at end of section.

R=Revised data. E=Estimate. (s)=Less than 500 barrels per day.

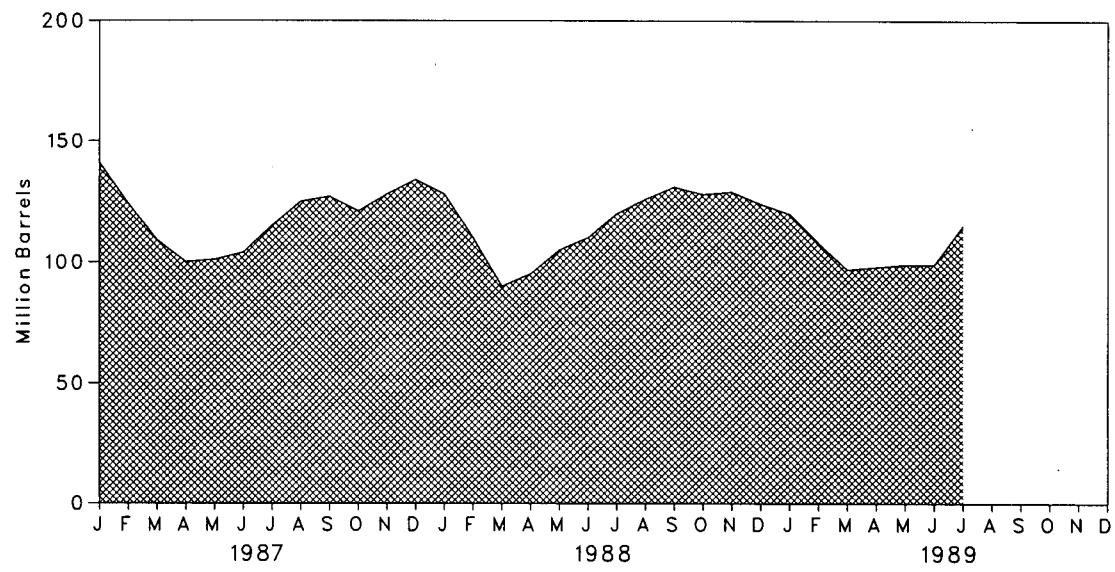
Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding.

Sources: See end of section.

**Figure 3.7 Distillate Fuel Oil Product Supplied, Production, and Imports**



**Figure 3.8 Distillate Fuel Oil Ending Stocks**



**Table 3.5 Distillate Fuel Oil Supply and Disposition**

	Supply			Disposition			Ending Stocks <sup>c</sup> Million Barrels
	Total Production	Imports	Crude Used Directly <sup>a</sup>	Stock Change <sup>b</sup>	Exports	Product Supplied <sup>a</sup>	
	Thousand Barrels per Day						
1973 Average .....	2,822	392	2	115	9	3,092	196
1974 Average .....	2,669	289	2	9	2	2,948	d 200
1975 Average .....	2,654	155	2	d -41	1	2,851	209
1976 Average .....	2,924	146	1	-62	1	3,133	186
1977 Average .....	3,278	250	1	176	1	3,352	250
1978 Average .....	3,167	173	1	-93	3	3,432	216
1979 Average .....	3,153	193	1	34	3	3,311	229
1980 Average .....	2,662	142	1	-64	3	2,866	d 205
1981 Average <sup>e</sup> .....	2,613	173	10	d -38	5	2,829	192
1982 Average .....	2,606	93	10	-35	74	2,671	d 179
1983 Average .....	2,456	174	NA	d -124	64	2,690	140
1984 Average .....	2,681	272	NA	57	51	2,845	161
1985 Average .....	2,687	200	NA	-48	67	2,868	144
1986 Average .....	2,798	247	NA	31	100	2,914	155
1987 January .....	2,759	222	NA	-444	115	3,310	141
February .....	2,556	253	NA	-629	93	3,345	124
March .....	2,421	297	NA	-464	67	3,116	109
April .....	2,553	192	NA	-300	53	2,991	100
May .....	2,563	203	NA	31	51	2,684	101
June .....	2,689	265	NA	104	61	2,790	104
July .....	2,700	381	NA	329	38	2,713	115
August .....	2,706	222	NA	327	47	2,553	125
September .....	2,748	222	NA	68	64	2,838	127
October .....	2,780	237	NA	-187	53	3,151	121
November .....	3,035	187	NA	234	56	2,932	128
December .....	3,242	378	NA	209	92	3,318	134
Average .....	2,731	255	NA	-56	66	2,976	
1988 January .....	3,010	424	NA	-206	82	3,558	128
February .....	2,667	383	NA	-614	107	3,557	110
March .....	2,706	247	NA	-660	74	3,539	90
April .....	2,867	210	NA	171	42	2,864	95
May .....	2,936	253	NA	320	74	2,795	105
June .....	2,893	222	NA	185	76	2,854	110
July .....	2,784	222	NA	308	58	2,640	120
August .....	2,848	279	NA	185	70	2,873	126
September .....	2,778	307	NA	192	72	2,821	131
October .....	2,827	336	NA	-103	48	3,218	128
November .....	2,909	327	NA	19	34	3,183	129
December .....	3,068	409	NA	-171	87	3,560	124
Average .....	2,859	302	NA	-30	69	3,122	
1989 January .....	2,973	331	NA	-103	110	3,296	120
February .....	2,798	322	NA	-455	164	3,411	108
March .....	2,714	439	NA	-352	76	3,429	97
April .....	2,788	299	NA	58	56	2,973	98
May .....	2,748	290	NA	30	51	2,957	99
June .....	R 2,808	R 233	NA	R 4	R 39	R 2,998	R 99
July .....	E 2,868	E 343	NA	E 449	E 54	E 2,707	E 115
7-Month Average .....	E 2,814	E 323	NA	E -48	E 78	E 3,107	
1988 7-Month Average .....	2,839	280	NA	-68	73	3,114	
1987 7-Month Average .....	2,607	259	NA	-191	68	2,989	

<sup>a</sup>Beginning in January 1983, product supplied for distillate fuel oil does not include crude oil used directly. See Note 3 at end of section.

<sup>b</sup>A negative number indicates a decrease in stocks and a positive number indicates an increase.

<sup>c</sup>Stocks are totals as of end of period.

<sup>d</sup>In January 1975, 1981, and 1983, numerous respondents were added to surveys affecting stocks reported and stock change calculations. See Note 4 at end of section. Due to a rounding difference, the 1975 stock change value is -40 in the *Petroleum Supply Annual* and the *Petroleum Supply Monthly*.

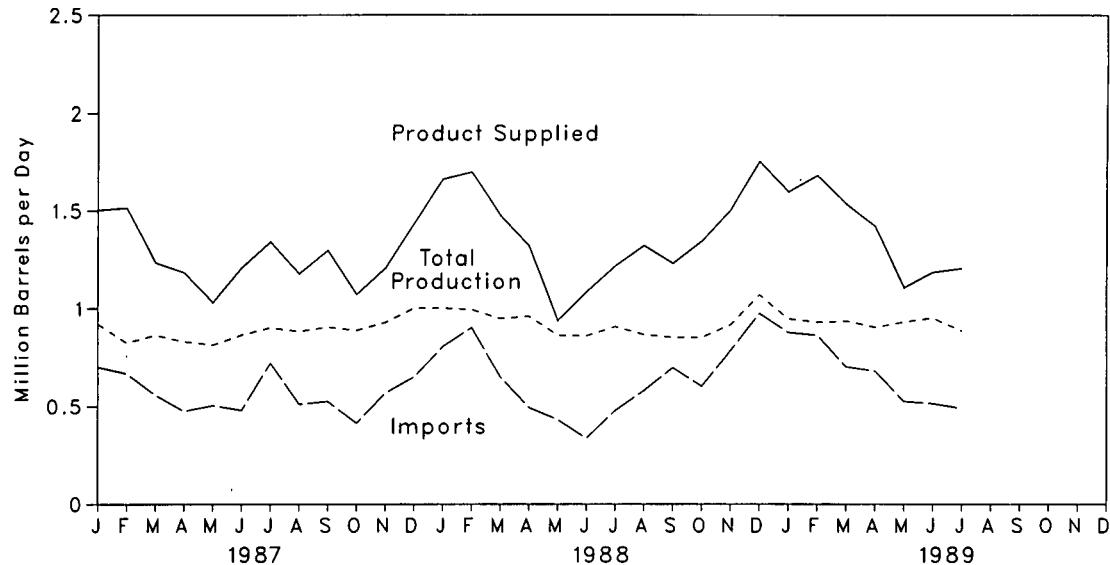
<sup>e</sup>Beginning in January 1981, survey forms were modified. See Note 1 at end of section.

R=Revised data. NA=Not available. E=Estimate.

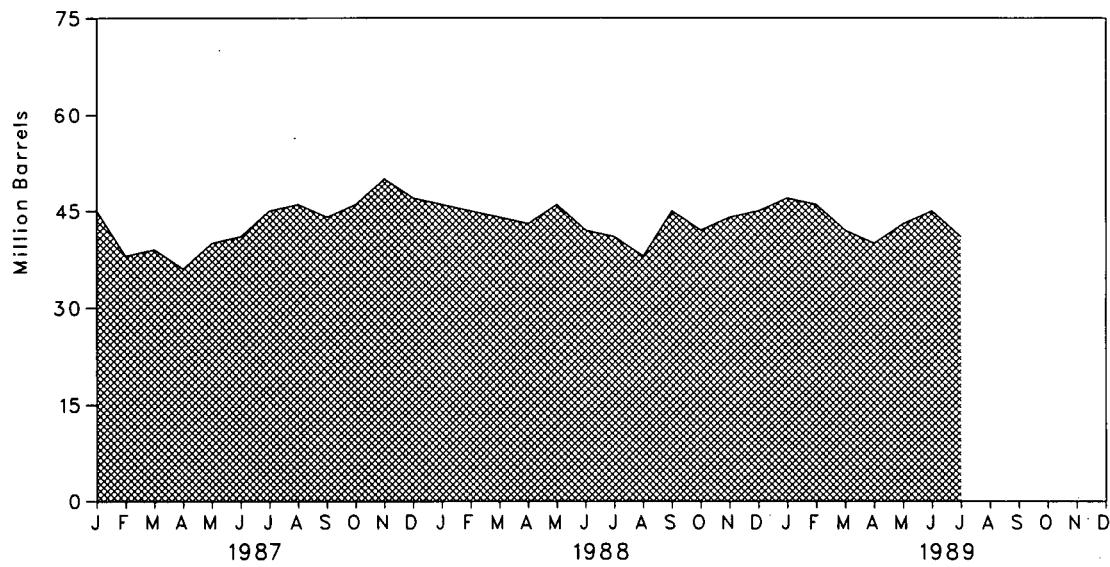
Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding.

Sources: See end of section.

**Figure 3.9 Residual Fuel Oil Product Supplied, Production, and Imports**



**Figure 3.10 Residual Fuel Oil Ending Stocks**



**Table 3.6 Residual Fuel Oil Supply and Disposition**

	Supply			Disposition			Ending Stocks <sup>c</sup> Million Barrels
	Total Production	Imports	Crude Used Directly <sup>a</sup>	Stock Change <sup>b</sup>	Exports	Product Supplied <sup>a</sup>	
	Thousand Barrels per Day						
1973 Average .....	971	1,853	17	-5	23	2,822	53
1974 Average .....	1,070	1,587	13	17	14	2,639	60
1975 Average .....	1,235	1,223	15	d -2	15	2,462	74
1976 Average .....	1,377	1,413	17	-5	12	2,801	72
1977 Average .....	1,754	1,359	13	48	6	3,071	90
1978 Average .....	1,667	1,355	13	1	13	3,023	90
1979 Average .....	1,687	1,151	12	15	9	2,826	96
1980 Average .....	1,580	939	12	-10	33	2,508	d 92
1981 Average* .....	1,321	800	48	d -37	118	2,088	78
1982 Average .....	1,070	776	48	-32	209	1,716	d 66
1983 Average .....	852	699	NA	d -55	185	1,421	49
1984 Average .....	891	681	NA	12	190	1,369	53
1985 Average .....	882	510	NA	-7	197	1,202	50
1986 Average .....	889	669	NA	-8	147	1,418	47
1987 January .....	920	701	NA	-81	198	1,504	45
February .....	825	668	NA	-243	221	1,515	38
March .....	863	559	NA	38	150	1,234	39
April .....	831	476	NA	-114	239	1,182	36
May .....	813	505	NA	145	144	1,029	40
June .....	864	481	NA	33	105	1,207	41
July .....	901	721	NA	108	175	1,339	45
August .....	882	512	NA	32	185	1,176	46
September .....	904	526	NA	-42	177	1,296	44
October .....	887	414	NA	39	194	1,069	46
November .....	928	568	NA	145	146	1,205	50
December .....	1,001	650	NA	-83	300	1,434	47
Average .....	885	565	NA	(s)	186	1,264	
1988 January .....	1,002	805	NA	-44	190	1,681	46
February .....	994	901	NA	-33	229	1,698	45
March .....	948	650	NA	-43	165	1,476	44
April .....	960	495	NA	-33	170	1,318	43
May .....	862	432	NA	94	263	938	46
June .....	880	336	NA	-117	249	1,083	42
July .....	906	479	NA	-37	206	1,217	41
August .....	866	581	NA	-97	225	1,320	38
September .....	852	698	NA	220	100	1,230	45
October .....	852	603	NA	-68	181	1,343	42
November .....	916	785	NA	51	146	1,504	44
December .....	1,069	975	NA	20	271	1,754	45
Average .....	926	644	NA	-8	200	1,378	
1989 January .....	948	877	NA	78	151	1,596	47
February .....	929	863	NA	-35	146	1,681	46
March .....	936	703	NA	-116	220	1,535	42
April .....	903	681	NA	-74	236	1,421	40
May .....	931	526	NA	77	276	1,105	43
June .....	R 951	R 515	NA	R 73	R 208	R 1,184	R 45
July .....	E 885	E 491	NA	E -79	E 250	E 1,204	E 41
7-Month Average .....	E 926	E 663	NA	E -11	E 213	E 1,386	
1988 7-Month Average .....	936	584	NA	-30	210	1,340	
1987 7-Month Average .....	860	587	NA	-13	175	1,285	

<sup>a</sup>Beginning in January 1983, product supplied for residual fuel oil does not include crude oil used directly. See Note 3 at end of section.

<sup>b</sup>A negative number indicates a decrease in stocks and a positive number indicates an increase.

<sup>c</sup>Stocks are totals as of end of period.

In January 1975, 1981, and 1983, numerous respondents were added to surveys affecting stocks reported and stock change calculations. See Note 4 at end of section.

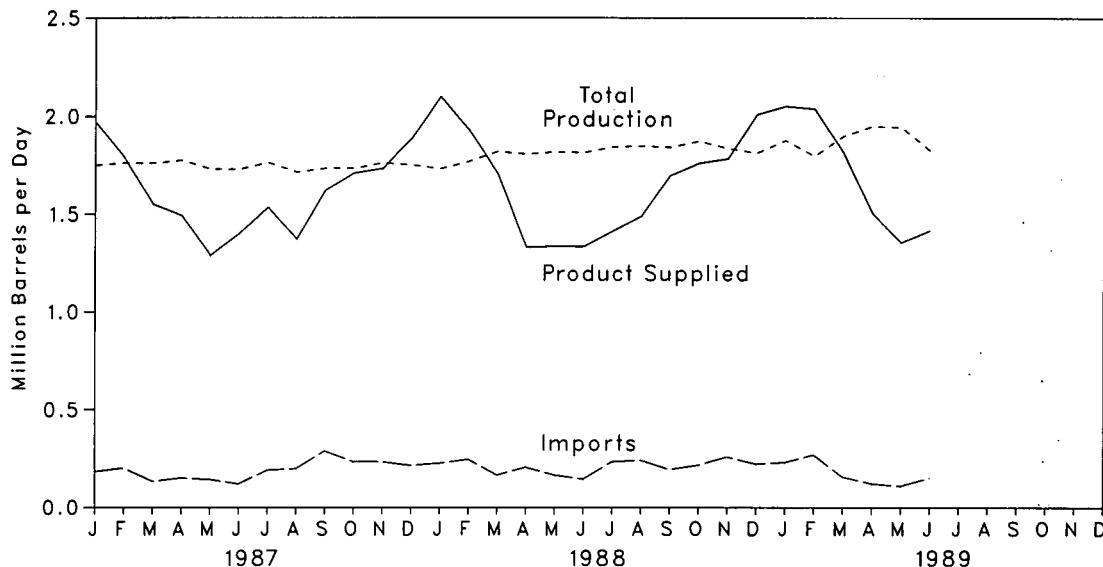
\*Beginning in January 1981, survey forms were modified. See Note 1 at end of section.

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

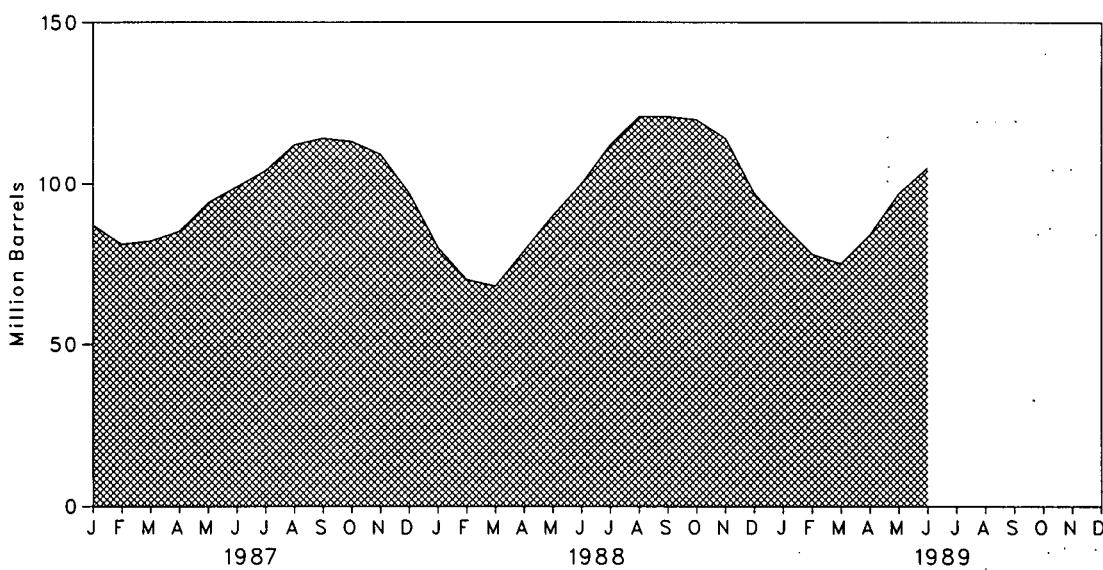
Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding.

Sources: See end of section.

**Figure 3.11 Liquefied Petroleum Gases Product Supplied, Production, and Imports**



**Figure 3.12 Liquefied Petroleum Gases Ending Stocks**



**Table 3.7 Liquefied Petroleum Gases<sup>a</sup> Supply and Disposition**

	Supply		Disposition				Ending Stocks <sup>c</sup> Million Barrels
	Total Production	Imports	Stock Change <sup>b</sup>	Refinery Inputs	Exports	Product Supplied	
	Thousand Barrels per Day						
1973 Average .....	1,600	132	35	220	27	1,449	99
1974 Average .....	1,565	123	38	220	25	1,406	d 113
1975 Average .....	1,527	112	d 35	246	26	1,333	125
1976 Average .....	1,535	130	-24	260	25	1,404	116
1977 Average .....	1,566	161	55	233	18	1,422	136
1978 Average .....	1,537	123	-12	239	20	1,413	132
1979 Average .....	1,556	217	-70	236	15	1,592	111
1980 Average .....	1,535	216	27	233	21	1,469	d 120
1981 Average .....	1,571	244	d 18	289	42	1,466	135
1982 Average .....	• 1,527	226	-111	300	65	1,499	d 94
1983 Average .....	1,642	190	-4	253	73	1,509	d 101
1984 Average .....	1,697	195	-19	291	48	1,572	101
1985 Average .....	1,704	187	-75	304	62	1,599	74
1986 Average .....	1,695	242	80	302	42	1,512	103
1987 January .....	1,751	183	-500	419	43	1,971	87
February .....	1,762	201	-205	341	38	1,789	81
March .....	1,761	132	10	282	52	1,550	82
April .....	1,775	149	121	274	36	1,493	85
May .....	1,732	142	283	269	34	1,288	94
June .....	1,732	119	175	255	22	1,400	99
July .....	1,764	190	145	244	30	1,534	104
August .....	1,717	198	259	252	33	1,372	112
September .....	1,736	288	81	266	56	1,622	114
October .....	1,736	233	-59	294	23	1,711	113
November .....	1,763	233	-129	356	35	1,735	109
December .....	1,753	214	-372	395	56	1,887	97
Average .....	1,748	190	-15	304	38	1,612	
1988 January .....	1,734	226	-566	383	44	2,099	80
February .....	1,770	245	-328	366	47	1,929	70
March .....	1,819	165	-50	292	36	1,707	68
April .....	1,806	205	361	277	43	1,329	79
May .....	1,817	165	343	277	37	1,324	90
June .....	1,814	144	331	256	38	1,333	100
July .....	1,842	233	380	248	35	1,412	112
August .....	1,847	241	287	262	50	1,490	121
September .....	1,841	194	20	274	43	1,698	121
October .....	1,872	216	-47	318	56	1,761	120
November .....	1,835	258	-206	445	71	1,782	114
December .....	1,811	222	-522	461	85	2,010	97
Average .....	1,817	209	1	321	49	1,656	
1989 January .....	1,876	230	-385	421	19	2,051	87
February .....	1,795	269	-337	331	31	2,038	78
March .....	1,899	155	-80	278	43	1,813	75
April .....	1,950	121	292	245	27	1,506	84
May .....	1,945	109	431	226	43	1,354	97
June .....	1,823	149	266	255	35	1,416	105
6-Month Average .....	1,883	171	35	293	33	1,694	
1988 6-Month Average .....	1,793	191	15	308	41	1,620	
1987 6-Month Average .....	1,752	154	-18	307	38	1,580	

<sup>a</sup>Includes ethane, propane, normal butane, and isobutane.

<sup>b</sup>A negative number indicates a decrease in stocks and a positive number indicates an increase.

<sup>c</sup>Stocks are totals as of end of period.

<sup>d</sup>In January 1975, 1981, 1983, and 1984, a new stock basis was established affecting stocks reported and stock change calculations. See Note 4 at end of section.

\*Due to a rounding difference, this value is 1,528 in the *Petroleum Supply Annual* and the *Petroleum Supply Monthly*.

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

Sources: See end of section.

**Table 3.8 Other Petroleum Products<sup>a</sup> Supply and Disposition**

	Supply		Disposition				Ending Stocks <sup>c</sup>
	Total Production	Imports	Stock Change <sup>b</sup>	Refinery Inputs	Exports	Products Supplied	
	Thousand Barrels per Day						
1973 Average .....	3,693	502	9	750	166	3,270	208
1974 Average .....	3,558	432	28	665	174	3,123	<sup>d</sup> 218
1975 Average .....	3,418	277	<sup>d</sup> -4	537	160	3,002	219
1976 Average .....	3,643	206	5	524	175	3,145	220
1977 Average .....	3,912	205	27	514	165	3,410	230
1978 Average .....	4,046	166	-14	492	167	3,568	225
1979 Average .....	4,153	195	37	352	209	3,749	238
1980 Average .....	3,956	210	23	311	198	3,634	<sup>d</sup> 247
1981 Average .....	3,739	226	<sup>d</sup> -46	723	199	3,088	282
1982 Average .....	3,453	334	-80	787	211	• 2,870	<sup>d</sup> 253
1983 Average .....	3,460	411	<sup>d</sup> -6	712	242	2,923	<sup>d</sup> 256
1984 Average .....	3,632	565	-23	791	245	3,183	240
1985 Average .....	3,721	588	17	886	240	3,166	246
1986 Average .....	3,997	561	10	888	308	3,353	250
<b>1987 January .....</b>	<b>3,852</b>	<b>469</b>	<b>121</b>	<b>659</b>	<b>219</b>	<b>3,323</b>	<b>254</b>
February .....	3,796	687	389	352	320	3,422	265
March .....	3,766	663	128	757	281	3,262	269
April .....	3,933	589	-107	872	254	3,502	266
May .....	4,049	529	-178	913	320	3,523	260
June .....	4,203	712	-158	896	320	3,857	255
July .....	4,363	550	-91	835	256	3,913	253
August .....	4,340	616	148	693	238	3,876	257
September .....	4,350	611	24	903	353	3,681	258
October .....	4,223	686	-14	971	272	3,680	258
November .....	4,010	583	20	975	305	3,294	258
December .....	4,050	633	-261	1,091	330	3,523	250
<b>Average .....</b>	<b>4,080</b>	<b>610</b>	<b>-1</b>	<b>829</b>	<b>289</b>	<b>3,572</b>	
<b>1988 January .....</b>	<b>3,942</b>	<b>706</b>	<b>136</b>	<b>812</b>	<b>354</b>	<b>3,347</b>	<b>254</b>
February .....	3,905	680	31	753	318	3,484	255
March .....	4,147	666	282	687	328	3,515	264
April .....	4,010	794	87	851	288	3,577	266
May .....	4,071	843	335	501	274	3,803	277
June .....	4,265	787	-43	777	379	3,939	276
July .....	4,315	781	21	831	329	3,915	276
August .....	4,413	701	-199	796	302	4,215	270
September .....	4,245	651	-159	850	323	3,882	265
October .....	4,163	771	-40	762	268	3,944	264
November .....	4,068	823	43	818	303	3,728	265
December .....	4,155	613	-429	1,153	392	3,653	252
<b>Average .....</b>	<b>4,143</b>	<b>735</b>	<b>6</b>	<b>799</b>	<b>321</b>	<b>3,751</b>	
<b>1989 January .....</b>	<b>4,185</b>	<b>732</b>	<b>402</b>	<b>714</b>	<b>311</b>	<b>3,489</b>	<b>265</b>
February .....	3,924	802	201	731	302	3,492	270
March .....	4,028	722	112	652	321	3,664	274
April .....	3,906	817	114	815	306	3,489	277
May .....	4,085	750	212	727	260	3,637	284
June .....	4,334	668	-220	866	389	3,967	277
<b>6-Month Average .....</b>	<b>4,079</b>	<b>748</b>	<b>138</b>	<b>750</b>	<b>314</b>	<b>3,624</b>	
<b>1988 6-Month Average .....</b>	<b>4,057</b>	<b>746</b>	<b>140</b>	<b>729</b>	<b>323</b>	<b>3,611</b>	
<b>1987 6-Month Average .....</b>	<b>3,934</b>	<b>606</b>	<b>29</b>	<b>747</b>	<b>285</b>	<b>3,480</b>	

<sup>a</sup>Includes pentanes plus, other hydrocarbons and alcohol, unfinished oil, gasoline blending components, and all finished petroleum products except finished motor gasoline, distillate fuel oil, residual fuel oil, and liquefied petroleum gases.

<sup>b</sup>A negative number indicates a decrease in stocks and a positive number indicates an increase.

<sup>c</sup>Stocks are totals as of end of period.

<sup>d</sup>In January 1975, 1981, 1983, and 1984, a new stock basis was established affecting stocks reported and stock change calculations. See Note 4 at end of this section.

\*Due to a rounding difference, this value is 2,869 in the *Petroleum Supply Annual* and the *Petroleum Supply Monthly*.

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

Sources: See end of section.

## Notes and Sources for the Petroleum Section

### Notes

**1.** The Energy Information Administration (EIA) uses a number of sources and methods to maintain the survey respondent lists. On a regular basis, survey managers review industry publications such as the *Oil and Gas Journal* and *Oil Daily* for information on facilities or companies starting up or closing down operations. Those sources are augmented by articles in newspapers, letters from respondents indicating changes in status, and information received from survey systems.

Every 3 years an extensive survey is conducted to update the frames completely. The updating involves consolidating information from every known source including State agencies, Federal agencies (e.g., Environmental Protection Agency, Corps of Engineers, Census Bureau, etc.), and private industry directories. The effort also includes the evaluation of the impact of potential frame changes on the historical time series of data published from these respondents. The results of this frame study are usually implemented in January to provide a full year under the same frame.

**2. Motor Gasoline:** Beginning in January 1981, the EIA expanded its universe to include non-refinery blenders; redefined motor gasoline into two categories (finished leaded and finished unleaded); and separated blending components from finished motor gasoline as a reporting category. Also, survey forms were modified to describe refinery operations more accurately. For further details, see the EIA, *Petroleum Supply Monthly*.

**3. Distillate and Residual Fuel Oils:** The requirement to report crude oil burned on leases and pipelines as either distillate or residual fuel oil has been eliminated. Prior to January 1981, the refinery input of unfinished oils number typically exceeded the number for available supply of unfinished oils. That discrepancy was assumed to be due to the redesignation of distillate and residual fuel oils received as such, but used as an unfinished oil input by the receiving refinery. The imbalance between supply and disposition of unfinished oils would then be subtracted from the production of distillate and residual fuel oils. Two-thirds of that difference was subtracted from distillate and one-third from residual. Beginning in January 1981, the EIA modified its survey forms to account for redesignated product

and discontinued the above-mentioned adjustment. For further details, see the EIA, *Petroleum Supply Monthly*.

**4. New Stock Basis:** In January 1975, 1981, and 1983, numerous respondents were added to bulk terminal and pipeline surveys affecting subsequent stocks reported and stock change calculations. Using the expanded coverage (new basis), the end-of-year stocks, in million barrels, would have been:

- Crude Oil: 1982--645 (Total) and 351 (Other Primary).
- Crude Oil and Petroleum Products: 1974--1,121; 1980--1,425; and 1982--1,462.
- Motor Gasoline: 1974--225; 1980--263; 1982--244 (Total) and 203 (Finished).
- Distillate Fuel Oil: 1974--224; 1980--205; and 1982--186.
- Residual Fuel Oil: 1974--75; 1980--91; and 1982--68.
- Liquefied Petroleum Gases: 1974--113; 1980--128; and 1982--103.
- Other Petroleum Products: 1974--220; 1980--249; and 1982--259.
- Stock change calculations beginning in 1975, 1981, and 1983, were made using new basis stock levels.

In January 1984, changes were made in the reporting of natural gas liquids. As a result, unfractionated stream, which was formerly included in "Other Petroleum Products Supply and Disposition" table, is now reported on a component basis (ethane, propane, normal butane, isobutane, and pentanes plus). Most of these stocks now appear in the "Liquefied Petroleum Gases Supply and Disposition" table. This change affects stocks reported and stock withdrawals in each table. Under the new basis, end-of-year 1983 stocks, in million barrels would have been:

- Liquefied Petroleum Gases: 1983--108.
- Other Petroleum Products: 1983--248.

**5. Stocks of Alaskan Crude Oil:** Stocks of Alaskan Crude oil in transit were included for the first time in January 1981. The major impact of this change is on the reporting of stock change calculations. Using the expanded coverage (new basis), 1980 end-of-year stocks, in million barrels, would have been 488 (Total) and 380 (Other Primary).

## **Sources**

- 1973 through 1976: U.S. Department of the Interior, Bureau of Mines, *Mineral Industry Surveys*, "Petroleum Statement, Annual" and "PAD Districts Supply/Demand, Annual."
- 1977 through 1980: Energy Information Administration (EIA), *Energy Data Reports*, "Petroleum Statement, Annual" and "PAD Districts Supply/Demand, Annual" and unleaded gasoline data from *Monthly Petroleum Statistics Report*.
- 1981 through 1988: EIA, *Petroleum Supply Annual*.
- January 1989 through June 1989: Detailed Statistics in appropriate issues of the *Petroleum Supply Monthly*.
- July 1989: Estimates based on EIA weekly data (except domestic crude oil production).
- January 1989 through July 1989: Domestic crude oil production estimate based on historical statistics from State conservation agencies and the Minerals Management Service of the U.S. Department of the Interior.

## Section 4. Natural Gas

Total dry natural-gas production in the United States during June 1989 was an estimated 1.3 trillion cubic feet, slightly higher than the previous June. Dry natural gas production during the first half of 1989 was 8.4 trillion cubic feet, 1 percent<sup>13</sup> lower than during the first half of 1988.

Consumption of natural and supplemental gas in June 1989 was 1.2 trillion cubic feet, 6 percent above the level in June 1988. Consumption of natural and supplemental gas during the first half of 1989 was 10.1 trillion cubic feet, 2 percent higher than the first half of 1988.

Deliveries to residential consumers in May 1989 (latest data available) were 260 billion cubic feet, slightly

higher than in the previous May. Total deliveries to industrial consumers during May were 557 billion cubic feet, 11 percent higher than in May 1988.

Imports of natural gas in June 1989 were 109 billion cubic feet, 18 percent higher than in the previous June. Imports of natural gas during the first half of 1989 were 668 billion cubic feet, 3 percent higher than imports during the first half of 1988.

Stocks of working gas<sup>14</sup> in underground natural gas storage reservoirs at the end of June 1989 totaled 2.4 trillion cubic feet, 3 percent above the level of stocks available 1 year earlier. Net injections into storage during June 1989 were 333 billion cubic feet, 26 percent more than during the previous June.

<sup>13</sup>Percentage changes are based on numbers shown in the following tables.

<sup>14</sup>Gas available for withdrawal.

**Table 4.1 Natural Gas Production**  
**(Billion Cubic Feet)**

	Gross Wet Gas Withdrawals <sup>a</sup>	Used for Repressing <sup>b</sup>	Nonhydrocarbon Gases Removed <sup>c</sup>	Vented and Flared <sup>d</sup>	Marketed Production (Wet) <sup>e</sup>	Extraction Loss	Total Dry Gas Production <sup>f</sup>
1973 Total .....	24,067	1,171	NA	248	22,648	917	21,731
1974 Total .....	22,850	1,080	NA	169	21,601	887	20,713
1975 Total .....	21,104	861	NA	134	20,109	872	19,236
1976 Total .....	20,944	859	NA	132	19,952	854	19,098
1977 Total .....	21,097	935	NA	137	20,025	863	19,163
1978 Total .....	21,309	1,181	NA	153	19,974	852	19,122
1979 Total .....	21,883	1,245	NA	167	20,471	808	19,663
1980 Total .....	21,870	1,365	199	125	20,180	777	19,403
1981 Total .....	21,587	1,312	222	98	19,956	775	19,181
1982 Total .....	20,210	1,388	208	93	18,520	762	17,758
1983 Total .....	18,597	1,458	222	95	16,822	790	16,033
1984 Total .....	20,192	1,630	224	108	18,230	838	17,392
1985 Total .....	19,534	1,915	326	95	17,198	816	16,382
1986 Total .....	19,063	1,838	337	98	16,791	800	15,991
1987 January .....	1,823	171	34	13	1,605	74	1,531
February .....	1,641	158	32	9	1,442	67	1,375
March .....	1,738	171	34	10	1,523	70	1,453
April .....	1,640	179	30	10	1,421	67	1,354
May .....	1,634	190	30	10	1,404	66	1,338
June .....	1,569	186	29	9	1,345	63	1,282
July .....	1,586	183	26	12	1,365	65	1,300
August .....	1,611	179	32	11	1,389	66	1,323
September .....	1,540	177	28	10	1,325	63	1,262
October .....	1,684	200	35	10	1,439	67	1,372
November .....	1,723	201	30	9	1,483	70	1,413
December .....	1,867	212	35	12	1,608	75	1,533
Total .....	20,056	2,208	376	124	17,349	812	16,536
1988 January .....	R 1,869	212	35	12	R 1,610	75	R 1,535
February .....	R 1,705	192	31	R 12	R 1,470	69	R 1,401
March .....	R 1,783	197	35	R 12	R 1,539	72	R 1,467
April .....	R 1,651	189	34	12	R 1,416	66	R 1,350
May .....	R 1,676	R 201	29	R 12	R 1,434	67	R 1,367
June .....	R 1,617	R 199	34	12	R 1,372	64	R 1,308
July .....	R 1,630	201	R 32	13	1,384	65	1,319
August .....	R 1,655	R 200	R 31	12	R 1,412	66	R 1,346
September .....	R 1,573	197	33	R 12	R 1,331	E 62	R 1,269
October .....	R 1,704	213	36	R 12	R 1,443	R 68	1,375
November .....	R 1,733	213	R 33	R 12	R 1,475	69	R 1,406
December .....	R 1,829	R 221	R 36	11	R 1,561	R 73	R 1,488
Total .....	R 20,425	R 2,435	R 399	R 144	R 17,449	R 817	R 16,632
1989 January .....	R 1,842	R 214	41	R 10	R 1,577	74	R 1,503
February .....	R 1,674	R 189	R 36	11	R 1,438	R 67	R 1,371
March .....	R 1,766	R 193	R 35	R 12	R 1,526	R 71	R 1,455
April .....	R 1,656	R 196	36	E 10	R 1,414	66	R 1,348
May .....	E 1,675	E 200	E 36	E 10	E 1,429	E 67	E 1,362
June .....	E 1,612	E 192	E 35	E 10	E 1,375	E 64	E 1,311
6-Month Total ....	E 10,225	E 1,184	E 219	E 63	E 8,759	E 409	E 8,350
1988 6-Month Total ....	10,301	1,190	198	72	8,841	413	8,428
1987 6-Month Total ....	10,045	1,055	189	61	8,740	407	8,333

<sup>a</sup>Gas withdrawn from gas and oil wells.

<sup>b</sup>The injection of natural gas into oil and gas formations for pressure maintenance and cycling purposes.

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

<sup>d</sup>Vented: Natural gas released into the air on the base site or at processing plants. Flared: Natural gas burned in flares on the base site or at gas processing plants.

<sup>e</sup>Gross Wet Gas Withdrawals minus Used for Repressing, Nonhydrocarbon Gases Removed, and Vented and Flared. See Note 2 at end of section.

<sup>f</sup>Marketed Production (Wet) minus Extraction Loss.

<sup>g</sup>May include unknown quantities of nonhydrocarbon gases.

R=Revised data. NA=Not available. E=Estimate.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding. • Data through 1987 are final. Subsequent data are preliminary.

Sources: See end of section.

**Table 4.2 Natural Gas Supply and Disposition**  
(Billion Cubic Feet)

	Supply				Total Supply/ Disposition <sup>c</sup>	Disposition			
	Total Dry Gas Production	With- drawals from Storage <sup>a</sup>	Supple- mental Gaseous Fuels <sup>b</sup>	Imports <sup>b</sup>		Additions to Storage <sup>a</sup>	Exports <sup>b</sup>	Consump- tion <sup>b</sup>	Un- accounted for <sup>e</sup>
1973 Total .....	d 21,731	1,533	NA	1,033	24,297	1,974	77	22,049	196
1974 Total .....	d 20,713	1,701	NA	959	23,373	1,784	77	21,223	289
1975 Total .....	d 19,236	1,760	NA	953	21,949	2,104	73	19,538	235
1976 Total .....	d 19,098	1,921	NA	964	21,983	1,756	65	19,946	216
1977 Total .....	d 19,163	1,750	NA	1,011	21,924	2,307	56	19,521	41
1978 Total .....	d 19,122	2,158	NA	966	22,245	2,278	53	19,627	287
1979 Total .....	d 19,663	2,047	NA	1,253	22,964	2,295	56	20,241	372
1980 Total .....	19,403	1,972	155	985	22,515	1,949	49	19,877	640
1981 Total .....	19,181	1,930	176	904	22,191	2,228	59	19,404	501
1982 Total .....	17,758	2,164	145	933	21,000	2,472	52	18,001	475
1983 Total .....	16,033	2,270	132	920	19,354	1,822	55	16,835	• 642
1984 Total .....	17,392	2,088	110	843	20,443	2,295	55	17,951	• 143
1985 Total .....	16,382	2,397	126	949	19,855	2,163	57	17,281	354
1986 Total .....	15,991	1,837	113	750	18,692	1,984	61	16,221	427
1987 January .....	1,531	521	11	101	2,164	38	5	2,051	70
February .....	1,375	325	9	84	1,793	35	3	1,859	-104
March .....	1,453	213	9	86	1,761	105	5	1,714	-63
April .....	1,354	101	8	68	1,532	166	3	1,422	-59
May .....	1,338	28	7	61	1,434	298	3	1,184	-51
June .....	1,282	21	7	58	1,368	252	5	1,099	12
July .....	1,300	27	8	66	1,401	230	5	1,099	67
August .....	1,323	43	8	75	1,450	245	5	1,134	66
September .....	1,262	19	7	73	1,361	231	5	1,058	67
October .....	1,372	86	8	93	1,559	148	5	1,238	168
November .....	1,413	155	9	107	1,684	105	6	1,436	137
December .....	1,533	365	10	121	2,029	59	5	1,843	122
Total .....	16,536	1,905	101	992	19,534	1,911	54	17,137	432
1988 January .....	R 1,535	576	17	138	R 2,266	49	5	2,168	R 44
February .....	R 1,401	456	14	116	R 1,987	53	5	2,021	R -92
March .....	R 1,467	248	13	112	R 1,840	102	6	1,855	R -123
April .....	R 1,350	81	11	95	R 1,537	166	6	1,454	R -89
May .....	R 1,367	34	11	93	R 1,505	292	4	1,297	R -88
June .....	R 1,308	25	10	92	R 1,435	290	8	1,167	R -30
July .....	1,319	30	8	99	1,456	304	5	1,169	-22
August .....	R 1,346	30	10	93	R 1,479	296	6	1,218	R -41
September .....	R 1,269	31	10	94	R 1,404	317	7	R 1,097	R -17
October .....	1,375	88	11	105	1,579	212	6	R 1,225	R 136
November .....	R 1,406	173	12	120	R 1,711	148	7	R 1,448	R 108
December .....	R 1,488	368	R 14	126	R 1,996	35	9	R 1,816	R 136
Total .....	R 16,632	2,140	R 143	1,283	R 20,198	2,264	74	R 17,933	R -73
1989 January .....	R 1,503	397	16	119	R 2,035	45	6	R 2,009	-25
February .....	R 1,371	548	15	107	R 2,041	28	5	R 1,996	R 12
March .....	R 1,455	319	14	116	R 1,904	93	6	1,945	R -140
April .....	R 1,348	123	12	110	R 1,593	164	6	R 1,566	R -143
May .....	E 1,362	41	12	107	1,522	285	4	R 1,365	R -132
June .....	E 1,311	23	11	109	1,454	356	6	1,239	-147
6-Month Total .	E 8,350	1,451	80	668	10,549	971	33	10,120	-575
1988 6-Month Total .	8,428	1,420	76	646	10,570	952	34	9,962	-378
1987 6-Month Total .	8,333	1,209	51	458	10,052	894	24	9,329	-195

<sup>a</sup>Data for 1980 through 1987 include underground storage and liquefied natural gas storage. All other data include underground storage only. Computation procedures are discussed in Note 8 at end of section.

<sup>b</sup>See Notes at end of section.

<sup>c</sup>Data for 1978 forward do not include in-transit receipts and deliveries.

<sup>d</sup>May include unknown quantities of nonhydrocarbon gases.

<sup>e</sup>See Note 7 at end of section.

R=Revised data. NA=Not available. E=Estimate.

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

• Data through 1987 are final. Subsequent data are preliminary.

Sources: See end of section.

**Table 4.3 Natural Gas<sup>a</sup> Consumption by End-Use Sector  
(Billion Cubic Feet)**

	Lease and Plant Fuel	Pipeline Fuel <sup>b</sup>	Delivered to Consumers					Total Consumption
			Residential	Commercial	Industrial	Electric Utilities	Total	
1973 Total .....	1,496	728	4,879	2,597	8,689	3,660	19,825	22,049
1974 Total .....	1,477	669	4,786	2,556	8,292	3,443	19,077	21,223
1975 Total .....	1,396	583	4,924	2,508	6,968	3,158	17,558	19,538
1976 Total .....	1,634	548	5,051	2,668	6,964	3,081	17,764	19,946
1977 Total .....	1,659	533	4,821	2,501	6,815	3,191	17,329	19,521
1978 Total .....	1,648	530	4,903	2,601	6,757	3,188	17,449	19,627
1979 Total .....	1,499	601	4,965	2,786	6,899	3,491	18,141	20,241
1980 Total .....	1,026	635	4,752	2,611	7,172	3,682	18,216	19,877
1981 Total .....	928	642	4,546	2,520	7,128	3,640	17,834	19,404
1982 Total .....	1,109	596	4,633	2,606	5,831	3,226	16,295	18,001
1983 Total .....	978	490	4,381	2,433	5,643	2,911	15,367	16,835
1984 Total .....	1,077	529	4,555	2,524	6,154	3,111	16,345	17,951
1985 Total .....	966	504	4,433	2,432	5,901	3,044	15,811	17,281
1986 Total .....	923	485	4,314	2,318	5,579	2,602	14,814	16,221
1987 January .....	106	53	741	382	584	185	1,892	2,051
February .....	95	45	689	361	511	158	1,719	1,859
March .....	100	44	575	303	501	191	1,570	1,714
April .....	94	42	402	213	465	206	1,286	1,422
May .....	93	42	223	132	451	243	1,048	1,184
June .....	89	40	147	97	442	284	969	1,099
July .....	91	38	126	93	432	319	970	1,099
August .....	93	40	117	90	455	339	1,001	1,134
September .....	89	38	126	100	437	268	932	1,058
October .....	94	41	223	140	502	238	1,103	1,238
November .....	99	43	354	201	522	217	1,293	1,436
December .....	108	51	592	303	592	197	1,683	1,843
Total .....	1,149	519	4,315	2,414	5,895	2,844	15,468	17,137
1988 January .....	107	56	852	419	567	167	2,005	2,168
February .....	97	49	755	389	562	170	1,875	2,021
March .....	102	47	595	319	587	204	1,706	1,855
April .....	94	41	399	219	502	199	1,319	1,454
May .....	95	43	259	157	502	240	1,159	1,297
June .....	91	42	153	115	486	280	1,034	1,167
July .....	92	43	123	106	476	328	1,034	1,169
August .....	93	43	115	111	511	344	1,082	1,218
September .....	R 88	42	125	114	495	233	967	R 1,097
October .....	R 96	43	231	154	519	182	1,086	R 1,225
November .....	98	45	391	223	540	151	1,305	R 1,448
December .....	R 103	50	632	317	577	137	1,663	R 1,816
Total .....	R 1,155	544	4,630	2,644	6,325	2,635	16,234	R 17,933
1989 January .....	104	51	753	375	580	146	1,854	R 2,009
February .....	R 95	51	740	377	562	171	1,850	R 1,996
March .....	101	48	651	341	594	209	1,796	1,945
April .....	R 94	42	418	228	550	233	1,430	R 1,566
May .....	95	44	260	161	557	249	1,226	R 1,365
5-Month Total ....	489	236	2,822	1,482	2,843	1,008	8,156	8,881
1988 5-Month Total ....	495	236	2,860	1,503	2,720	980	8,064	8,795
1987 5-Month Total ....	488	226	2,630	1,391	2,512	983	7,515	8,230

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

<sup>b</sup>Natural gas consumed in the operation of pipelines, primarily in compressors.

R=Revised data.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding.  
• Data through 1987 are final. Subsequent data are preliminary.

Sources: See end of section.

**Table 4.4 Underground Storage of Natural Gas**  
(Volumes in Billion Cubic Feet)

	Natural Gas In Underground Storage, End of Period			Change in Working Gas from Same Period Previous Year		Storage Activity		
	Base Gas	Working Gas	Total <sup>a</sup>	Volume	Percent	Injections	Withdrawals	Net <sup>b</sup>
1973 Total .....	2,864	2,034	4,898	305	17.6	1,974	1,533	441
1974 Total .....	2,912	2,050	4,962	16	.8	1,784	1,701	83
1975 Total .....	3,162	2,212	5,374	162	7.9	2,104	1,760	344
1976 Total .....	3,323	1,926	5,250	-286	-12.9	1,756	1,921	-165
1977 Total .....	3,391	2,475	5,866	549	28.5	2,307	1,750	557
1978 Total .....	3,473	2,547	6,020	72	2.9	2,278	2,158	120
1979 Total .....	3,553	2,753	6,306	207	8.1	2,295	2,047	248
1980 Total .....	3,642	2,655	6,297	-99	-3.6	1,896	1,910	-14
1981 Total .....	3,752	2,817	6,569	162	6.1	2,180	1,887	293
1982 Total .....	3,808	3,071	6,879	255	9.0	2,399	2,094	306
1983 Total .....	3,847	2,595	6,442	-476	-15.5	1,700	2,142	-442
1984 Total .....	3,830	2,876	6,706	281	10.8	2,252	2,064	188
1985 Total .....	3,842	2,607	6,448	-270	-9.4	2,128	2,359	-231
1986 Total .....	3,819	2,749	6,567	142	5.5	1,952	1,812	140
<b>1987 January .....</b>	<b>3,818</b>	<b>2,280</b>	<b>6,098</b>	<b>67</b>	<b>3.0</b>	<b>38</b>	<b>513</b>	<b>-475</b>
February .....	3,815	1,988	5,803	116	6.2	35	320	-285
March .....	3,813	1,879	5,693	115	6.5	105	210	-105
April .....	3,812	1,938	5,750	97	5.3	163	101	62
May .....	3,811	2,206	6,017	130	6.3	293	28	265
June .....	3,810	2,437	6,247	113	4.9	248	21	227
July .....	3,813	2,636	6,449	65	2.5	226	27	199
August .....	3,813	2,836	6,648	-7	-2	241	43	198
September .....	3,813	3,049	6,862	-17	-6	227	19	209
October .....	3,813	3,106	6,919	-102	-3.2	146	86	60
November .....	3,792	3,059	6,851	-18	-6	105	153	-48
December .....	3,792	2,756	6,548	7	.3	59	359	-300
<b>Total .....</b>						<b>1,887</b>	<b>1,881</b>	<b>6</b>
<b>1988 January .....</b>	<b>3,792</b>	<b>2,229</b>	<b>6,021</b>	<b>-51</b>	<b>-2.3</b>	<b>49</b>	<b>576</b>	<b>-527</b>
February .....	3,791	1,827	5,618	-161	-8.1	53	456	-402
March .....	3,790	1,684	5,474	-196	-10.4	102	248	-146
April .....	3,790	1,770	5,560	-168	-8.7	166	81	86
May .....	3,790	2,028	5,818	-178	-8.1	292	34	258
June .....	3,792	2,293	6,085	-144	-5.9	290	25	265
July .....	3,793	2,567	6,359	-69	-2.6	304	30	274
August .....	3,791	2,834	6,625	-1	-1	296	30	266
September .....	3,791	3,121	6,912	72	2.4	317	31	286
October .....	3,792	3,243	7,035	137	4.4	212	88	123
November .....	3,803	3,197	6,999	138	4.5	148	173	-25
December .....	3,800	2,871	6,672	115	4.2	35	368	-333
<b>Total .....</b>						<b>2,264</b>	<b>2,140</b>	<b>125</b>
<b>1989 January .....</b>	<b>3,800</b>	<b>2,520</b>	<b>6,320</b>	<b>291</b>	<b>13.1</b>	<b>45</b>	<b>397</b>	<b>-352</b>
February .....	3,798	2,000	5,798	173	9.5	28	548	-520
March .....	3,798	1,774	5,572	90	5.4	93	319	-226
April .....	3,792	1,825	5,617	55	3.1	166	121	44
May .....	3,798	2,058	5,856	30	1.5	285	41	244
June .....	3,798	2,372	6,171	79	3.4	356	23	333

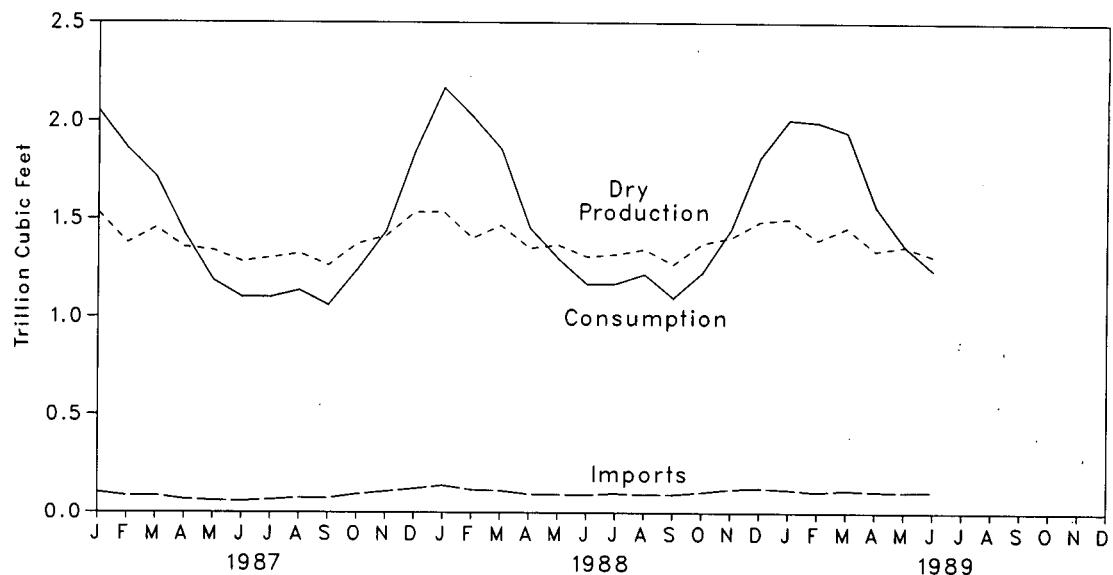
<sup>a</sup>Total underground storage capacity at the end of each calendar year (in billion cubic feet): 1978--6,890; 1979--6,929; 1980--7,434; 1981--7,805; 1982--7,915; 1983--7,985; 1984--8,043; 1985--8,087; 1986--8,145; 1987 and 1988--8,124. Current capacity is 8,124.

<sup>b</sup>Positive numbers indicate injections are greater than withdrawals. Negative numbers indicate withdrawals are greater than injections. Net injections or withdrawals may not equal the difference between applicable ending stocks. See Note 8 at end of section.

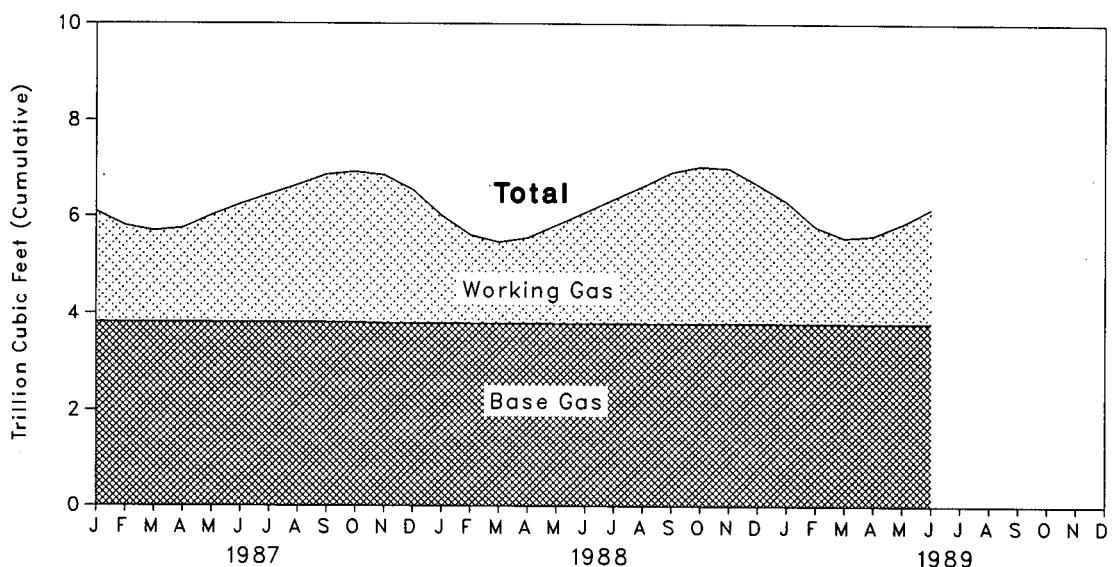
Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding. • Data through 1987 are final. Subsequent data are preliminary.

Sources: See end of section.

**Figure 4.1 Natural Gas Consumption, Production, and Imports**



**Figure 4.2 Natural Gas In Storage, End of Period**



## Notes and Sources for the Natural Gas Section

### Notes

**1. Nonhydrocarbon Gases Removed:** Annual data on nonhydrocarbon gases removed from marketed production--carbon dioxide, helium, hydrogen sulfide, and nitrogen--are from the Energy Information Administration (EIA) *Natural Gas Annual (NGA)* 1987. These data are not available for periods prior to 1980. For 1987, of the 32 producing States, 22 reported data on nonhydrocarbon gases removed. These 22 States accounted for 58 percent of total 1987 gross withdrawals. In addition, gross withdrawals data from four States, which together accounted for 38 percent of the 1987 total production, did not include all or most of the nonhydrocarbon gases removed on leases. Two States reported quantities unknown but considered insignificant. For further information see the EIA *Natural Gas Monthly (NGM)*.

Monthly data are reported by three States and computed for six States. All monthly data are considered preliminary until after publication of the EIA *NGA* for that year. For further information on methods of estimating preliminary monthly data, see the EIA *NGM*.

Monthly data are revised and considered final after publication of the EIA *NGA* by proportionally allocating the differences between annual data published in the EIA *NGA* and the sum of the preliminary monthly data (January-December).

**2. Production:** Annual data. Final annual data are from the EIA *NGA* 1987.

**Estimated Monthly Data.** All data for the two most recent months presented are estimated. Some of the data for earlier months are also estimated or computed. For a discussion of computation and estimation procedures, see the EIA *NGM*.

**Preliminary monthly data.** All monthly data are considered preliminary until after publication of the EIA *NGA* for that year. Preliminary monthly data are gathered from reports from the Interstate Oil Compact Commission and the U.S. Minerals Management Service. Volumetric data are converted, as necessary to a standard 14.73 psia pressure base. Unless there are major changes, data are not revised until after publication of the EIA *NGA*.

**Final monthly data.** The difference between annual production data published in the EIA *NGA* 1987 and the sum of preliminary monthly data (January-December) is allocated proportionally to the preliminary monthly data.

**3. Extraction Loss:** Extraction loss is the reduction in volume of natural gas resulting from the removal of natural gas liquid constituents at natural gas processing plants.

Annual data for extraction loss are from the EIA *NGA* for which they have been estimated based on the type and quantity of liquid products extracted from the gas stream and the calculated volume of such products at standard conditions. For a detailed explanation of the calculations used to derive estimated extraction losses, see the EIA *NGA*.

Preliminary monthly data are estimated based on extraction loss as an annual percentage of marketed production. This percentage is applied to each month's marketed production to estimate monthly extraction loss.

Monthly data are revised and considered final after the publication of the EIA *NGA*. Final monthly data are estimated by allocating annual extraction loss data to each month based on its total natural gas disposition.

**4. Supplemental Gaseous Fuels:** Supplemental gaseous fuels are mainly synthetic natural gas, propane-air, and refinery gas. Other gases may also be included such as, coke oven gas, biomass gas, manufactured gas, and air injected for Btu stabilization.

Annual data beginning with 1980 are from the EIA *NGA* 1987. Unknown quantities of supplemental gaseous fuels are included in consumption data for 1979 and earlier years.

All monthly data are considered preliminary until after the publication of the EIA *NGA* for that year. Monthly estimates are based on the annual ratio of supplemental gaseous fuels to the sum of dry gas production, net imports, and net withdrawals from storage. This ratio is applied to the monthly sum of these three elements to compute a monthly supplemental gaseous fuels figure.

**5. Imports and Exports:** The United States imports natural gas via pipeline from Mexico and Canada, and liquefied natural gas (LNG) (except in 1986) via tanker from Algeria. One shipment of LNG was received in December 1986 from Indonesia. The United States exports natural gas via pipeline to Mexico and Canada and liquefied natural gas via tanker to Japan.

Annual and final monthly data are published from the annual Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas," which requires data to be reported by month for the calendar year.

Preliminary monthly data are EIA estimates. For a discussion of estimation procedures, see the EIA *NGM*. Preliminary data are revised after the publication of the EIA *U.S. Imports and Exports of Natural Gas* for that year.

**6. Consumption:** Consumption includes pipeline fuel use, lease and plant fuel use, and deliveries to consuming sectors.

All final data are from the EIA *NGA*. All monthly data are considered preliminary until after publication of the EIA *NGA*. For more detailed information on the methods of estimating preliminary and final monthly data, see the EIA *NGM*.

**7. Unaccounted For:** Represents the difference between the sum of the components of natural gas supply and the sum of components of natural gas disposition. These differences may be due to quantities lost or to the effects of data reporting problems. Reporting problems include differences due to the net result of conversions of flow data metered at varying temperature and pressure bases and converted to a standard temperature and pressure base; the effect of variations in company accounting and billing practices; differences between billing cycle and calendar period time frames; and imbalances resulting from the merger of data reporting systems which vary in scope, format, definitions, and type of respondents.

The increase of 0.2 trillion cubic feet (Tcf) in the "Unaccounted for" category in 1983 followed by a decline of 0.5 trillion cubic feet in 1984 reflected unusually large differences resulting from the use of the annual billing cycle (essentially December 15, through the following December 14) consumption data in conjunction with calendar year supply data. Record cold temperatures during the last half of December 1983 resulted in a reported 0.3 Tcf increase in net withdrawals from underground storage for peak shaving as compared with the same period in 1982, but the effect of this cold weather was reflected primarily in 1984 consumption data. For underground storage data, see Table F2 in the May 1985 *NGM*, which was published in July 1985.

**8. Natural Gas Storage:** Gas in storage at the end of a reporting period may not equal the quantity derived by adding or subtracting net injections or withdrawals from the quantity in storage at the end of the previous period. This difference is due to changes in the quantity of native gas included in the base gas and/or losses in base gas due to migration from storage reservoirs.

All monthly data concerning underground storage are collected from the essentially identical Forms FPC-8 and EIA-191. Monthly data are revised after publication of the EIA *Underground Natural Gas Storage in the United States* for that heating year (April through March). In addition, injection and withdrawal data from the FPC-8/EIA-191 survey are adjusted to cor-

respond to data from Form EIA-176 following publication of the EIA *Natural Gas Annual*.

The final monthly and annual storage and withdrawal data for 1980 through 1987 include both underground and liquefied natural gas (LNG) storage. Underground storage data are taken from the FPC-8/EIA-191 surveys in the manner described earlier. Annual data on LNG additions and withdrawals are taken from Form EIA-176. Monthly data are estimated by computing the ratio of each month's underground storage additions and withdrawals to annual underground storage additions and withdrawals and applying it to annual LNG data.

## Sources

**Production:** 1973 through 1987: Energy Information Administration (EIA), *Natural Gas Annual 1987*; January 1988 forward: State reports to the Interstate Oil Compact Commission, data from the U.S. Minerals Management Service, and EIA estimates for States that do not report monthly data on a regular or timely basis.

**Extraction Loss, Consumption, and Unaccounted For:** 1973 through 1987: EIA, *Natural Gas Annual 1987*; January 1988 forward: EIA computations.

**Withdrawals from and Additions to Storage:** 1973 through 1987: EIA, *Natural Gas Annual 1987*; January 1988 forward: Form FPC-8 and Form EIA-191, "Underground Gas Storage Report."

**Supplemental Gaseous Fuels:** 1980 through 1987: EIA, *Natural Gas Annual 1987*; January 1988 forward: EIA computations.

**Imports and Exports:** 1973 through 1987: Form FPC-14, "Imports and Exports of Natural Gas"; January 1988 forward: EIA computations.

**End-Use Consumption:** All data except electric utility--1973 through 1987: EIA, *Natural Gas Annual, 1987*; January 1988 forward: Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers," and EIA computations. Electric utility data--EIA, Form 759, "Monthly Power Plant Report" (formerly Form FPC-4).

**Underground Storage:** 1973 and 1974: American Gas Association, *Gas Facts*; 1975 through 1979: EIA, Form FPC-8 and Form EIA-191, and the *Natural Gas Annual*; 1980 forward: EIA, Form FPC-8, Form EIA-191, and Form 176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

## Section 5. Oil and Gas Resource Development

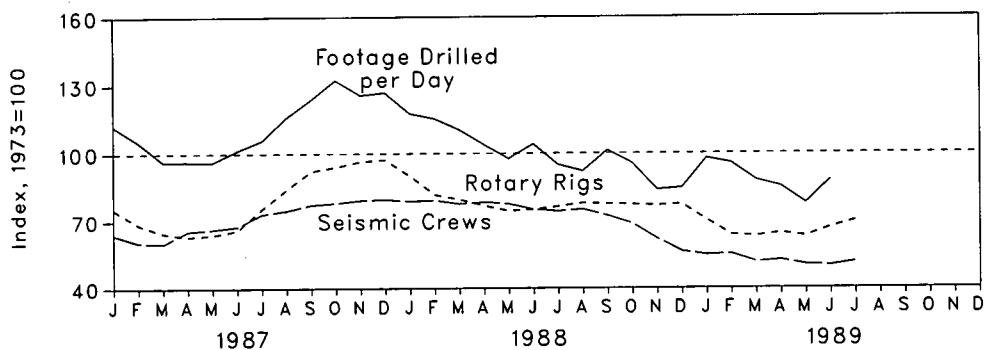
In July 1989, the number of crews engaged in seismic exploration increased by 5 from the previous month. The July 1989 total of 129 crews was 57 lower than in the previous July. Of the total, 107 were land crews and 22 were marine vessels. The number of land crews was down by 51 from July 1988 and the number of marine vessels was down by 6.

The July 1989 rotary rig count of 832 was 5 percent higher than in the previous month but 9 percent lower than in July 1988. Of the total number of rigs in operation, 718 were onshore and 114 were offshore. The number of onshore rigs was down 9 percent from the

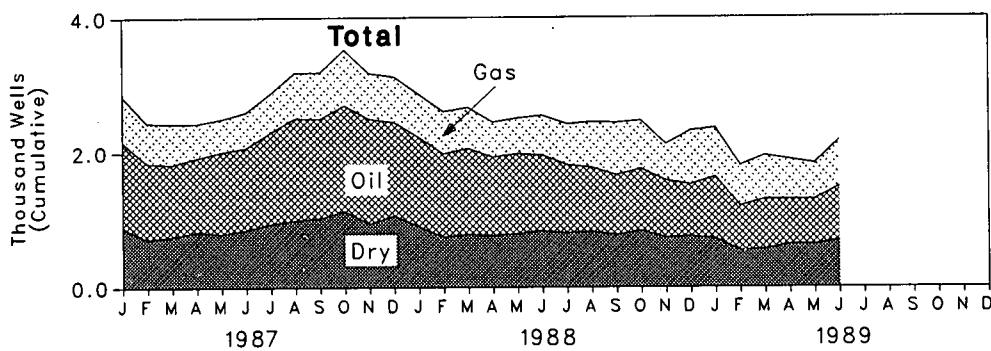
number in July 1988 and the number of offshore rigs was down 10 percent.

Exploratory and development well completions during June 1989 totaled an estimated 2,180, up 19 percent from the previous month but 15 percent lower than the June 1988 total. Oil well completions were 800, down 29 percent from the level in June 1988, and gas well completions totaled 690, up 13 percent from the June 1988 total. Total footage drilled in June 1989 was 10.10 million feet, up 10 percent from the total in May 1989 but down 15 percent from the total in June 1988.

**Figure 5.1 Seismic Crews, Rotary Rigs, and Footage Drilled**



**Figure 5.2 Total Oil and Gas Wells Completed**



**Table 5.1 Seismic Crews and Rotary Rigs**

	Crews Engaged in Seismic Exploration			Rotary Rigs In Operation <sup>a</sup>		
	Offshore	Onshore	Total	Offshore	Onshore	Total
	Monthly Average			Weekly Average		
1973 Average .....	23	227	250	84	1,110	1,194
1974 Average .....	31	274	305	94	1,378	1,472
1975 Average .....	30	254	284	106	1,554	1,660
1976 Average .....	25	237	262	129	1,529	1,658
1977 Average .....	27	281	308	167	1,834	2,001
1978 Average .....	25	327	352	185	2,074	2,259
1979 Average .....	30	370	400	207	1,970	2,177
1980 Average .....	37	493	530	231	2,678	2,909
1981 Average .....	44	637	681	256	3,714	3,970
1982 Average .....	57	531	588	243	2,862	3,105
1983 Average .....	47	426	473	199	2,033	2,232
1984 Average .....	49	445	494	213	2,215	2,428
1985 Average .....	45	333	378	206	1,774	1,980
1986 Average .....	24	176	201	99	865	964
1987 January .....	18	142	160	88	812	900
February .....	19	132	151	75	743	818
March .....	18	132	150	76	696	772
April .....	19	145	164	73	681	754
May .....	20	146	166	76	687	763
June .....	22	147	169	85	703	788
July .....	24	159	183	97	804	901
August .....	28	159	187	109	894	1,003
September .....	29	164	193	114	987	1,101
October .....	32	163	195	116	1,008	1,124
November .....	28	170	198	118	1,034	1,152
December .....	27	172	199	128	1,034	1,162
Average .....	24	153	176	95	841	936
1988 January .....	30	167	197	127	949	1,076
February .....	30	168	198	123	853	976
March .....	29	165	194	119	832	951
April .....	29	167	196	117	800	917
May .....	30	164	194	123	768	891
June .....	30	158	188	124	773	897
July .....	28	158	186	126	786	912
August .....	32	156	188	123	807	930
September .....	30	151	181	122	805	927
October .....	30	142	172	122	801	923
November .....	28	127	155	129	789	918
December .....	27	114	141	127	797	924
Average .....	29	153	182	123	813	936
1989 January .....	25	112	137	110	731	841
February .....	23	115	138	95	667	762
March .....	21	108	129	93	660	753
April .....	22	109	131	92	679	771
May .....	22	104	126	92	662	754
June .....	22	102	124	103	692	795
July .....	22	107	129	114	718	832
7-Month Average .....	22	108	130	100	689	789
1988 7-Month Average .....	29	164	193	123	822	945
1987 7-Month Average .....	20	143	163	81	731	812

<sup>a</sup>Monthly data are averages of 4- or 5-week reporting periods, not calendar months.

Note: Geographic coverage is the 50 States and the District of Columbia.

Sources: See end of section.

**Table 5.2 Total Oil and Gas Wells Completed and Footage Drilled**

	Wells Completed				Footage Drilled Million Feet
	Oil	Gas	Dry	Total	
	Thousand Wells				
1973 Total .....	10.25	6.98	10.47	27.69	139.42
1974 Total .....	13.66	7.17	12.21	33.04	153.79
1975 Total .....	16.98	8.17	13.74	38.89	181.05
1976 Total .....	17.70	9.44	13.81	40.94	187.29
1977 Total .....	18.70	12.12	15.04	45.86	215.70
1978 Total .....	19.07	14.41	16.59	50.06	238.39
1979 Total .....	20.70	15.17	16.04	51.91	243.69
1980 Total .....	32.28	17.22	20.34	69.84	312.30
1981 Total .....	42.84	19.91	27.28	90.03	408.84
1982 Total .....	38.75	18.73	25.96	83.43	374.85
1983 Total .....	36.77	14.28	23.85	74.90	314.73
1984 Total .....	42.20	16.79	25.36	84.35	367.33
1985 Total .....	34.57	14.10	20.51	69.18	306.98
1986 Total .....	18.37	7.89	12.17	38.43	173.11
1987 January .....	1.28	.68	.88	2.83	13.27
February .....	1.13	.61	.71	2.45	11.26
March .....	1.07	.61	.75	2.42	11.41
April .....	1.09	.51	.82	2.42	11.13
May .....	1.22	.49	.79	2.50	11.57
June .....	1.22	R .53	R .85	R 2.61	R 11.82
July .....	1.36	.58	.94	2.88	12.51
August .....	1.52	.68	R .99	R 3.20	R 13.77
September .....	1.45	R .69	1.02	R 3.16	R 14.18
October .....	1.57	.83	1.15	3.55	15.76
November .....	1.56	.68	.94	3.18	14.40
December .....	1.39	.68	1.06	3.13	15.02
Total .....	R 15.86	R 7.55	R 10.91	R 34.32	R 156.11
1988 January .....	1.33	.64	R .90	R 2.87	R 13.93
February .....	1.24	.63	.74	2.60	12.77
March .....	1.28	.61	.78	2.67	13.07
April .....	1.19	.52	.78	2.48	12.17
May .....	1.18	.55	.83	2.56	11.80
June .....	R 1.13	R .61	R .83	R 2.57	R 11.90
July .....	1.01	.59	.80	2.40	11.24
August .....	.95	.68	.82	2.44	10.90
September .....	.89	.78	.77	2.44	11.61
October .....	.90	.78	.94	2.62	12.19
November .....	.74	.70	.71	2.15	10.30
December .....	R .77	R .80	R .75	R 2.32	R 11.24
Total .....	R 12.60	R 7.68	R 9.64	R 30.12	R 143.12
1989 January .....	.92	R .73	.71	R 2.36	R 11.58
February .....	.66	.60	.54	1.80	10.07
March .....	.74	R .65	.56	R 1.95	R 10.30
April .....	.67	R .59	.63	R 1.88	R 9.77
May .....	.67	.53	.63	1.83	9.21
June .....	.80	.69	.69	2.18	10.10
6-Month Total .....	4.46	3.78	3.75	12.00	61.03
1988 6-Month Total .....	7.34	3.56	4.86	15.75	75.64
1987 6-Month Total .....	7.01	3.42	4.80	15.23	70.47

R=Revised data.

Notes: • Includes exploratory and development wells; excludes service wells, stratigraphic tests, and core tests. • Geographic coverage is the 50 States and the District of Columbia. • Totals and averages may not equal sum of components due to subsequent revisions and independent rounding.

• Due to the method of estimation, data shown on this page are frequently revised. See end of section.

Source: See end of section.

## **Notes and Sources for the Oil and Gas Resource Development Section**

### **Notes**

Beginning in the March 1985 *Monthly Energy Review (MER)*, the Energy Information Administration (EIA) revised the exploratory and development wells drilled data series. In order to present a consistent series, historical as well as current statistics were adjusted.

In previous issues, the *MER* published statistics based on data on well completions reported to the American Petroleum Institute during a given month, as opposed to data on wells actually completed during the month. Because of the time lag from date of well completion to date of reporting, data on well completions reported are not as accurate an indicator of drilling activity as are data on well completions. For example, during 1982 well completions reported continued to rise even though the number of wells actually completed fell. Starting in the March 1985 issue of the *MER*, published figures have been EIA estimates of the number of wells actually completed in a given month and are shown in thousands, rounded to two decimal places. The associated footage drilled is shown in millions, also rounded to two decimal places.

The EIA estimates are calculated using an adjustment process that imputes total well counts and footage by type and class based on partial counts of well completions available from the reported data. That is, based on statistical analysis of the incomplete reported data, the process imputes the missing portions to determine values for total well completions and footage. Estimates for a given month are first published in the *MER* for that month, that is estimates for June 1984 are first

published in the June 1984 *MER*. Revisions to the estimates are scheduled for the 6th, 12th, and 24th months following initial publication, as newly reported data refine the accuracy of the estimate. Unscheduled revisions to the published data will also be made when the latest estimate differs by more than 15 percent during the first 5 months, more than 10 percent during the next 6 months, more than 5 percent during the following 6 months, or more than 2 percent thereafter through 5 years. After 5 years, the actual reported data will be published.

The three well types considered are oil, gas, and dry. By convention, wells with both oil and gas zones are categorized as oil. Well classes are either development or exploratory; wells in any other class have been deleted. Exploratory well categories considered are new field wildcat, new pool wildcat, deeper pool test, or extension (American Association of Petroleum Geologists well classification codes 1 through 5).

Additional information may be obtained from "Estimating Well Completions," the feature article published in the March 1985 *MER*.

### **Sources**

- Crews Engaged: Society of Exploration Geophysicists, "Monthly Seismic Crew Count" and annual reports published in their bulletins, *Geophysics* and *Leading Edge*.
- Rotary Rigs: Hughes Tool Company, "Rotary Rigs Running--by State."
- Wells and Footage Drilled: EIA computations based on well reports submitted to the American Petroleum Institute by Petroleum Information Corporation.

## **Section 6. Coal**

Coal production in June 1989 totaled 79 million short tons, 3 percent<sup>15</sup> higher than in June 1988. Coal production for January through June 1989 totaled 486 million short tons, 5 percent higher than the 463 million short tons produced during the same period in 1988.

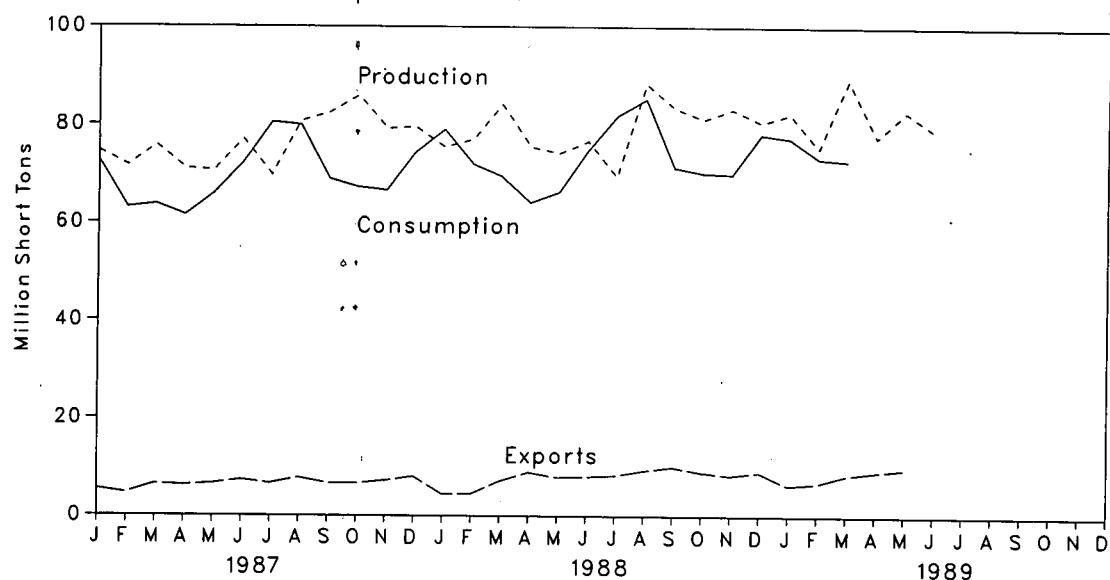
Electric utility coal consumption in May 1989 totaled 58 million short tons, 4 percent above the 56 million short tons consumed in May 1988.

Electric utility coal stocks were 151 million short tons at the end of May 1989, 9 percent less than at the end of May 1988.

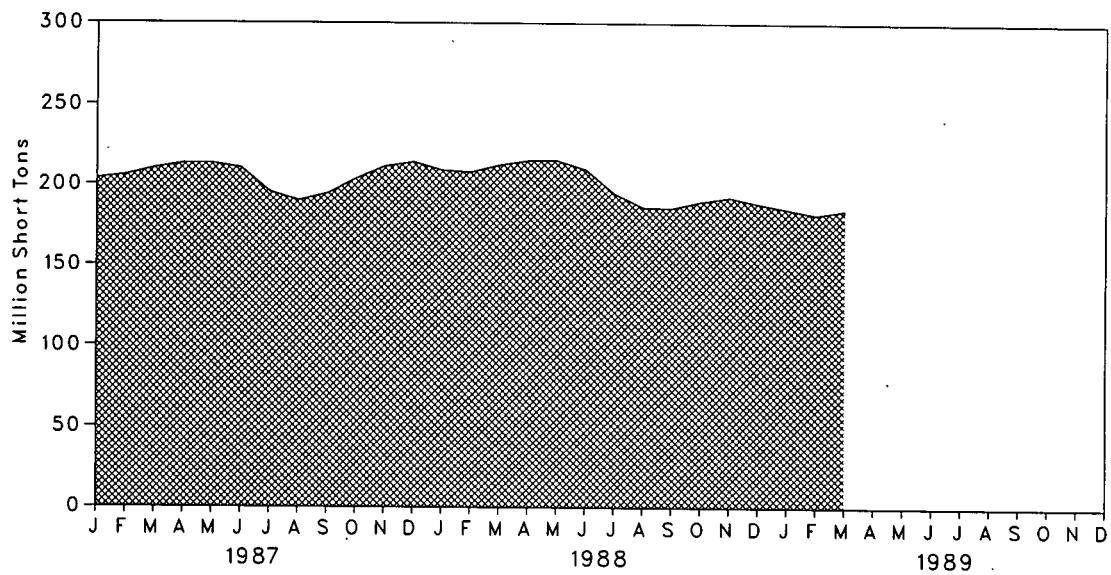
Exports of coal in May 1989 totaled 10 million short tons, 23 percent more than in May 1988. Imports of coal in May 1989 totaled 312 thousand short tons, 40 percent more than in May 1988.

<sup>15</sup>Percent changes are based on unrounded numbers not shown in the following tables.

**Figure 6.1 Coal Production, Consumption, and Exports**



**Figure 6.2 Coal Stocks, End of Period**



**Table 6.1 Coal Overview**  
(Thousand Short Tons)

	Production	Consumption	Imports <sup>a</sup>	Exports	Stocks <sup>b</sup>
1973 Total .....	598,568	562,584	127	53,587	NA
1974 Total .....	610,023	558,402	2,080	60,661	NA
1975 Total .....	654,641	562,640	940	66,309	NA
1976 Total .....	684,913	603,790	1,203	60,021	NA
1977 Total .....	697,205	625,291	1,647	54,312	NA
1978 Total .....	670,164	625,225	2,953	40,714	NA
1979 Total .....	781,134	680,524	2,059	66,042	202,472
1980 Total .....	828,700	702,729	1,194	91,742	228,407
1981 Total .....	823,775	732,628	1,043	112,541	209,423
1982 Total .....	838,111	706,910	742	106,277	232,037
1983 Total .....	782,091	736,671	1,271	77,772	202,585
1984 Total .....	895,921	791,291	1,286	81,483	231,300
1985 Total .....	883,638	818,049	1,952	92,680	203,367
1986 Total .....	890,315	804,312	2,212	85,518	207,319
1987 January .....	74,681	72,648	134	5,471	203,432
February .....	71,662	63,091	85	4,643	205,551
March .....	75,857	63,784	111	6,462	209,733
April .....	71,044	61,472	229	6,229	212,699
May .....	70,707	65,950	135	6,557	212,788
June .....	77,072	72,204	118	7,328	209,976
July .....	69,774	80,479	120	6,611	195,431
August .....	80,707	79,935	191	7,758	189,919
September .....	82,477	68,984	164	6,665	194,373
October .....	85,992	67,299	86	6,633	203,544
November .....	79,242	66,634	263	7,210	211,067
December .....	79,549	74,462	109	8,042	213,780
Total .....	918,762	836,841	1,747	79,607	
1988 January .....	75,540	79,019	159	4,434	208,717
February .....	77,025	72,009	162	4,482	207,712
March .....	84,222	69,502	221	7,145	212,044
April .....	75,589	64,179	107	8,943	214,768
May .....	74,277	66,327	224	7,905	214,923
June .....	76,725	74,904	257	8,053	209,386
July .....	69,422	81,845	203	8,303	194,636
August .....	88,535	85,320	205	9,322	186,020
September .....	83,511	71,383	29	10,066	185,691
October .....	81,176	70,219	229	9,010	189,629
November .....	83,227	69,978	207	8,338	192,288
December .....	80,513	78,130	131	9,023	188,468
Total .....	949,761	882,815	2,134	95,023	
1989 January .....	R 82,250	77,325	66	6,306	185,086
February .....	R 75,322	73,220	131	6,748	181,621
March .....	R 89,318	72,741	334	8,375	184,485
April .....	77,483	NA	158	9,104	NA
May .....	82,779	NA	312	8,685	NA
June .....	78,804	NA	NA	NA	NA
6-Month Total ....	485,955	NA	NA	NA	
1988 6-Month Total ....	463,377	425,940	1,130	40,961	
1987 6-Month Total ....	441,022	399,150	813	36,689	

<sup>a</sup>Includes Puerto Rico.

<sup>b</sup>Stocks held by electric utilities, coke plants, general industry, and coal producers and distributors at end of period. Excludes stocks held at retail dealers for consumption by the residential and commercial sector.

R=Revised data. NA=Not available.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Data through 1987 are final. Subsequent data are preliminary.

• Totals may not equal sum of components due to independent rounding. • See Note at end of section for methodology used to calculate production, consumption, and stocks.

Sources: See end of section.

**Table 6.2 Coal Consumption by End-Use Sector<sup>a</sup>**  
 (Thousand Short Tons)

	Electric Utilities	Industrial		Residential and Commercial	Total
		Coke Plants	Other Industrial Including Transportation		
1973 Total .....	389,212	94,101	68,154	11,117	562,584
1974 Total .....	391,811	90,191	64,983	11,417	558,402
1975 Total .....	405,962	83,598	63,670	9,410	562,640
1976 Total .....	448,371	84,704	61,799	8,916	603,790
1977 Total .....	477,126	77,739	61,472	8,954	625,291
1978 Total .....	481,235	71,394	63,085	9,511	625,225
1979 Total .....	527,051	77,368	67,717	8,388	680,524
1980 Total .....	569,274	68,657	60,347	6,452	702,729
1981 Total .....	596,797	61,015	67,395	7,422	732,628
1982 Total .....	593,666	40,908	64,096	8,240	706,910
1983 Total .....	625,211	37,033	65,979	8,448	736,671
1984 Total .....	664,399	44,022	73,744	9,128	791,291
1985 Total .....	693,841	41,056	75,372	7,779	818,049
1986 Total .....	685,056	36,006	75,583	7,667	804,312
1987 January .....	62,414	2,645	6,865	724	72,648
February .....	53,715	2,506	6,236	634	63,091
March .....	54,647	2,681	6,005	452	63,784
April .....	51,435	3,298	6,137	603	61,472
May .....	56,484	3,235	5,868	364	65,950
June .....	63,500	2,812	5,605	288	72,204
July .....	70,736	3,265	5,973	504	80,479
August .....	70,075	3,249	6,135	476	79,935
September .....	59,259	3,193	5,899	633	68,984
October .....	57,117	3,297	6,228	656	67,299
November .....	55,961	3,326	6,653	694	66,634
December .....	62,551	3,452	7,572	888	74,462
Total .....	717,894	36,957	75,175	6,914	836,941
1988 January .....	67,901	3,465	6,826	826	79,019
February .....	61,244	3,297	6,789	678	72,009
March .....	58,606	3,595	6,801	500	69,502
April .....	54,158	3,508	5,904	608	64,179
May .....	56,346	3,686	5,937	358	66,327
June .....	65,167	3,353	5,944	440	74,904
July .....	71,599	3,605	5,962	679	81,845
August .....	75,271	3,418	5,972	658	85,320
September .....	61,546	3,461	5,989	388	71,383
October .....	59,529	3,550	6,694	446	70,219
November .....	59,271	3,403	6,710	594	69,978
December .....	66,884	3,568	6,724	955	78,130
Total .....	757,522	41,910	76,252	7,130	882,815
1989 January .....	66,454	3,568	6,671	633	77,325
February .....	62,613	3,295	6,618	693	73,220
March .....	61,912	3,722	6,595	512	72,741
April .....	55,932	NA	NA	NA	NA
May .....	58,360	NA	NA	NA	NA
5-Month Total .....	305,271	NA	NA	NA	NA
1988 5-Month Total .....	298,256	17,551	32,258	2,971	351,036
1987 5-Month Total .....	278,695	14,364	31,111	2,775	326,945

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

NA=Not available.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Data through 1987 are final. Subsequent data are preliminary. • Totals may not equal sum of components due to independent rounding.

Sources: See end of section.

**Table 6.3 Coal Stocks, End of Period**  
(Thousand Short Tons)

	Consumer				Producers and Distributors	Total <sup>a</sup>
	Electric Utilities	Coke Plants	Other Industrial	Total <sup>a</sup>		
1973 Year .....	86,967	6,998	10,370	104,335	NA	NA
1974 Year .....	83,509	6,209	6,605	96,323	NA	NA
1975 Year .....	110,724	8,797	8,529	128,050	NA	NA
1976 Year .....	117,436	9,902	7,100	134,438	NA	NA
1977 Year .....	133,219	12,816	11,063	157,098	NA	NA
1978 Year .....	128,225	8,278	9,048	145,551	NA	NA
1979 Year .....	159,714	10,155	11,777	181,646	20,826	202,472
1980 Year .....	183,010	9,067	11,951	204,028	24,379	228,407
1981 Year .....	168,893	6,475	9,906	185,274	24,149	209,423
1982 Year .....	181,132	4,642	9,479	195,253	36,784	232,037
1983 Year .....	155,598	4,346	8,710	168,654	33,931	202,585
1984 Year .....	179,727	6,166	11,317	187,210	34,090	231,300
1985 Year .....	156,376	3,420	10,438	170,234	33,133	203,367
1986 Year .....	161,806	2,992	10,429	175,226	32,093	207,319
<b>1987 January .....</b>	<b>157,061</b>	<b>2,886</b>	<b>9,903</b>	<b>169,850</b>	<b>33,582</b>	<b>203,432</b>
February .....	158,322	2,780	9,377	170,479	35,071	205,551
March .....	161,648	2,675	8,850	173,173	36,560	209,733
April .....	165,103	3,028	8,881	177,012	35,686	212,699
May .....	165,683	3,382	8,911	177,976	34,813	212,788
June .....	163,361	3,735	8,941	176,037	33,939	209,976
July .....	150,217	3,603	9,393	163,213	32,217	195,431
August .....	146,106	3,472	9,845	159,422	30,496	189,919
September .....	151,961	3,340	10,297	165,598	28,775	194,373
October .....	160,942	3,521	10,457	174,920	28,624	203,544
November .....	168,274	3,703	10,617	182,594	28,472	211,067
December .....	170,797	3,884	10,777	185,459	28,321	213,780
<b>1988 January .....</b>	<b>163,581</b>	<b>3,942</b>	<b>10,058</b>	<b>177,582</b>	<b>31,135</b>	<b>208,717</b>
February .....	160,424	4,000	9,399	173,762	33,950	207,712
March .....	162,603	4,057	8,619	175,279	36,764	212,044
April .....	165,750	3,959	8,523	178,232	36,536	214,768
May .....	166,328	3,861	8,427	178,616	36,307	214,923
June .....	161,215	3,763	8,331	173,308	36,079	209,386
July .....	148,234	3,467	8,428	160,130	34,506	194,636
August .....	141,389	3,172	8,526	153,087	32,933	186,020
September .....	142,830	2,877	8,624	154,331	31,360	185,691
October .....	146,947	2,964	8,672	158,583	31,046	189,629
November .....	149,785	3,051	8,720	161,556	30,732	192,288
December .....	146,145	3,137	8,768	158,051	30,418	188,468
<b>1989 January .....</b>	<b>141,682</b>	<b>3,264</b>	<b>8,073</b>	<b>153,019</b>	<b>32,067</b>	<b>185,086</b>
February .....	137,136	3,391	7,378	147,905	33,716	181,621
March .....	138,919	3,518	6,683	149,120	35,365	184,485
April .....	144,577	NA	NA	NA	NA	NA
May .....	150,833	NA	NA	NA	NA	NA

<sup>a</sup>Excludes stocks held at retail dealers for consumption by the residential and commercial sector.

NA=Not available.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Data through 1987 are final. Subsequent data are preliminary.

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

Sources: See end of section.

## Notes and Sources for the Coal Section

### Notes

**1. Production:** Preliminary monthly estimates of national coal production are the sum of weekly estimates developed by the Energy Information Administration (EIA) and published in the *Weekly Coal Production* report. When a week extends into a new month, production is allocated on a daily basis and added to the appropriate month. Weekly estimates are based on Association of American Railroads data showing the number of railcars loaded with coal during the week by Class I and certain other railroads. This number is converted into tons of coal by EIA using the average number of tons of coal per railcar loaded reported in the most recent Quarterly Freight Commodity Statistics from the Interstate Commerce Commission. If an average coal tonnage per railcar loaded is not available for a specific railroad, the national average is used. To derive the estimate of total weekly production, the total rail tonnage for the week is divided by the ratio of quarterly production shipped by rail and total quarterly production. Data for the corresponding quarter of previous years are used to derive this ratio. This method insures that the seasonal variations are preserved in the production estimates.

When preliminary quarterly data become available, the monthly and weekly estimates are adjusted to conform to the quarterly figure. The adjustment procedure uses State-level production data and is explained in the *Quarterly Coal Report*. Initial estimates of annual production published in January of the following year are based on preliminary production data covering the first 9 months (three quarters) and weekly/monthly estimates for the fourth quarter. The fourth quarter estimates may or may not be revised when preliminary data become available in March of the following year, depending on the magnitude of the difference between the estimates and the preliminary data. In any event, all quarterly, monthly, and weekly production figures are adjusted to conform to the final annual production data published in the *Monthly Energy Review* in the fall of the following year.

**2. Consumption:** Coal consumption data are reported by major end-use sector.

- **Electric Utilities**--Both monthly and quarterly consumption data for electric utility plants are directly from reported data.
- **Coke Plants**--Prior to 1980, monthly coke plant consumption data were directly from reported data. From 1980 through 1987, coke plant consumption estimates were derived by proportioning reported quarterly data using the ratios of monthly-to-quarterly consumption data in 1979, the last year in which monthly data were reported.

Beginning in January 1988, monthly coke plant consumption estimates are derived from the reported quarterly data using monthly ratios of raw steel production data from the American Iron and Steel Institute. The ratios are the monthly raw steel production from open hearth and basic oxygen process furnaces as a proportion of the quarterly production from those kinds of furnaces.

- **Other Industrial**--Prior to 1978, monthly consumption data for the other industrial sector (i.e., all industrial users minus coke plants) were derived by using reported data to modify baseline consumption figures from the most recent Bureau of the Census Annual Survey of Manufactures or Census of Manufactures. For 1978 and 1979, monthly estimates were derived from data reported on Forms EIA-3 and EIA-6. From 1980 through 1987, monthly figures were estimated by proportioning quarterly data using the ratios of monthly-to-quarterly consumption data in 1979, the last year in which monthly data were reported on Form EIA-3. Quarterly consumption data were derived by adding beginning stocks at manufacturing plants to current receipts and subtracting ending stocks at manufacturing plants. In this calculation, current receipts were taken as the greater of either reported receipts from manufacturing plants (Form EIA-3) or reported shipments to the other industrial sector (Form EIA-6), thereby ensuring that agriculture, forestry, fishing, mining, and construction consumption were included where appropriate. Starting in January 1988, monthly consumption for the other industrial sector is estimated from reported quarterly data using ratios derived from industrial production indices published by the Board of Governors of the Federal Reserve System. Indices for six major industry groups are used as the basis for calculating the ratios: foods (SIC 20); paper and products (SIC 26); chemicals and products (SIC 28); petroleum products (SIC 29); clay, glass, and stone products (SIC 32); and primary metals (SIC 33). The monthly ratios are computed as the monthly sum of the weighted indices as a proportion of the quarterly sum of the weighted indices, using the 1977 proportion as the weights.
- **Residential and Commercial**--Prior to 1980, monthly consumption estimates for the residential and commercial sector were derived by using reported data to modify baseline figures developed by the Bureau of Mines. From 1980 through 1987, monthly estimates were derived by proportioning reported quarterly data using the ratios of monthly-to-quarterly consumption data in 1979, the last year in which monthly data were reported on Form EIA-2. During 1981 and 1982, the estimates were also modified to reflect air temperature degree-days. Quarterly consumption data were directly from reported data and were defined as distribution to the residential and commercial sector as reported by coal producers and distrib-

utors on Form EIA-6. Beginning in January 1988, monthly residential and commercial consumption estimates are derived from reported quarterly data using monthly national average population weighted heating/cooling degree-days obtained from the National Oceanic and Atmospheric Administration. The monthly ratios are the monthly national sum of heating and cooling degree-days as a proportion of the quarterly national sum. Quarterly consumption data are directly from reported data.

**3. Stocks:** Coal stocks data are reported by major end-use sector.

- Electric Utilities--Both monthly and quarterly stocks at electric utility plants are directly from reported data.
- Coke Plants--Prior to 1980, monthly stocks at coke plants were directly from reported data. From 1980 forward, coke plant stocks are estimated by using one-third of the current quarterly change to indicate the monthly change in stocks. Quarterly stocks are directly from data reported on Form EIA-5.
- Other Industrial--Prior to 1978, stocks for the other industrial sector were derived by using reported data to modify baseline figures from a one-time Bureau of Mines survey of consumers. For 1978 through 1982, monthly estimates were derived by judgmentally proportioning reported quarterly data based on representative seasonal patterns of supply and demand. From 1983 forward, other industrial coal stocks are estimated as indicated above for coke plants. Quarterly stocks are directly from data reported on Form EIA-3 and therefore include only manufacturing industries; data for agriculture, forestry, fishing, mining, and construction stocks are not available.
- Residential and Commercial--Prior to 1980, monthly and quarterly stock data for the residential and commercial sector were directly from reported data. Monthly and quarterly stock data are not available for the residential and commercial sector after December 1979.
- Producers and Distributors--Quarterly stocks at producers and distributors are directly from reported data. Monthly data are estimated by using one-third of the current quarterly change to indicate the monthly change in stocks.

**4. Imports and Exports:** All coal import and export figures are directly from data reported monthly by the Bureau of the Census.

**5. Additional Information:** More information concerning coal production, consumption, and stocks data and estimation procedures may be obtained in EIA's *Quarterly Coal Report*, DOE/EIA-0121.

## Sources

**Production:** 1973 through September 1977: Bureau of Mines, *Minerals Yearbook* and *Mineral Industry Surveys*; October 1977 forward: Energy Information Administration (EIA), *Weekly Coal Production*.

**Consumption and Stocks:** 1973 through September 1977: Bureau of Mines, *Minerals Yearbook* and *Mineral Industry Surveys* (except Residential and Commercial Consumption and Stocks and Producers and Distributors Stocks).

- Electric Utilities--October 1977 forward: EIA, Form EIA-759 (formerly FPC Form 4), "Monthly Power Plant Report."
- Coke Plants--October 1977 through December 1980: EIA, Form EIA-5/5A, "Coke and Coal Chemicals-Monthly/Annual"; January 1981 through December 1984: EIA, Form EIA-5/5A, "Coke Plant Report-Quarterly/Annual Supplement"; January 1985 forward: EIA, Form EIA-5, "Coke Plant Report," quarterly.
- Other Industrial--October 1977 through December 1979: EIA, Form EIA-3, "Monthly Fuel Consumption Report-Manufacturing Plants"; January 1980 forward: EIA, Form EIA-3, "Quarterly Fuel Consumption Report-Manufacturing Plants" and Form EIA-6, "Coal Distribution Report."
- Residential and Commercial Consumption and Stocks--1973 through 1976: Bureau of Mines, *Minerals Yearbook*; January 1977 through September 1977: Bureau of Mines, Form 6-1400-M, "Monthly Coal Report, Retail Dealers-Upper Lake Docks"; October 1977 through December 1979: EIA, Form EIA-2, "Monthly Coal Report, Retail Dealers-Upper Lake Docks"; January 1980 forward: EIA, Form EIA-6, "Coal Distribution Report," (stock data are not collected).
- Producers and Distributors Stocks--January 1980 forward: EIA, Form EIA-6, "Coal Distribution Report."

**Imports and Exports:** Bureau of the Census, U.S. Department of Commerce, Monthly Reports IM-145 (Imports) and EM-522 (Exports).

## Section 7. Electric Utilities

During May 1989, electric utilities generated 220 billion kilowatthours of electricity, 6 percent<sup>16</sup> above the May 1988 generation level. Coal-fired generation totaled 119 billion kilowatthours, 3 percent higher than the May 1988 level. Nuclear generation totaled 38 billion kilowatthours, 6 percent below the level 1 year earlier. Hydroelectric generation was 28 billion kilowatthours in May 1989, 32 percent above the May 1988 level. Natural gas-fired generation was 24 billion kilowatthours in May 1989, 2 percent higher than the May 1988 level. Petroleum-fired generation totaled 10 billion kilowatthours, 38 percent above the level 1 year earlier.

Sales of electricity to all ultimate consumers in the United States in May 1989 were 201 billion kilowatthours, 5 percent above May 1988 sales. Sales to industrial consumers totaled 76 billion kilowatthours in May 1989, 5 percent above the level in May 1988. Sales to residential consumers during May 1989 were 61 billion kilowatthours, 6 percent above the level of

sales during the previous May. Commercial sales were 56 billion kilowatthours, 3 percent higher than the amount sold to commercial consumers 1 year earlier. In May 1989, other sales totaled 7 billion kilowatthours, 13 percent above the May 1988 level.

Electric utility consumption of petroleum (excluding petroleum coke) during May 1989 was 17 million barrels, 40 percent above the May 1988 level. Coal consumption during May 1989 was 58 million short tons, 4 percent higher than consumption in May 1988. During May 1989, electric utilities consumed 249 billion cubic feet of natural gas, 4 percent above the May 1988 consumption level.

On May 31, 1989, electric utility stocks of all types of coal totaled 151 million short tons, 9 percent lower than the level on May 31, 1988. Stocks of petroleum (excluding petroleum coke) on May 31, 1989, totaled 66 million barrels, 4 percent below the level on May 31, 1988.

<sup>16</sup>Percentage changes are based on numbers shown in the following tables.

**Table 7.1 Net Generation of Electricity by Electric Utilities**  
 (Million Kilowatthours)

	Coal	Petroleum <sup>a</sup>	Natural Gas <sup>b</sup>	Nuclear Electric Power	Hydro-electric Power	Other <sup>c</sup>	Total
1973 Total .....	847,651	314,343	340,858	83,479	272,083	2,294	1,860,710
1974 Total .....	828,433	300,931	320,065	113,976	301,032	2,703	1,867,140
1975 Total .....	852,786	289,095	299,778	172,505	300,047	3,437	1,917,649
1976 Total .....	944,391	319,988	294,624	191,104	283,707	3,883	2,037,696
1977 Total .....	985,219	358,179	305,505	250,883	220,475	4,063	2,124,323
1978 Total .....	975,742	365,060	305,391	276,403	280,419	3,315	2,206,331
1979 Total .....	1,075,037	303,525	329,485	255,155	279,783	4,387	2,247,372
1980 Total .....	1,161,562	245,994	346,240	251,116	276,021	5,506	2,286,439
1981 Total .....	1,203,203	206,421	345,777	272,674	260,684	6,054	2,294,812
1982 Total .....	1,192,004	146,797	305,260	282,773	309,213	5,164	2,241,211
1983 Total .....	1,259,424	144,499	274,098	293,677	332,130	6,456	2,310,285
1984 Total .....	1,341,681	119,808	297,394	327,634	321,150	8,638	2,416,304
1985 Total .....	1,402,128	100,202	291,946	383,691	281,149	10,724	2,469,841
1986 Total .....	1,385,831	136,585	248,508	414,038	290,844	11,503	2,487,310
1987 January .....	126,631	11,927	17,788	39,975	25,412	1,017	222,749
February .....	109,648	10,502	15,120	36,598	21,226	940	194,034
March .....	111,920	10,007	18,349	37,290	23,248	1,034	201,849
April .....	105,474	7,912	19,602	33,518	22,025	965	189,496
May .....	115,155	8,146	23,239	34,320	24,202	1,012	206,074
June .....	129,351	10,655	27,090	36,560	20,863	1,071	225,589
July .....	143,503	12,547	30,512	40,056	20,195	1,103	247,915
August .....	143,194	11,289	32,262	41,352	18,446	1,101	247,645
September .....	120,777	7,696	25,678	39,666	18,180	1,011	213,008
October .....	117,743	6,819	22,985	36,492	17,955	1,015	203,009
November .....	114,172	9,803	21,005	37,438	16,857	983	200,258
December .....	126,213	11,189	18,992	42,006	21,087	1,013	220,500
Total .....	1,463,781	118,493	272,621	455,270	249,695	12,267	2,572,127
1988 January .....	137,626	15,976	16,276	44,658	22,031	1,033	237,600
February .....	126,080	11,894	16,480	42,246	19,105	898	216,702
March .....	119,858	9,770	19,743	43,912	19,514	1,041	213,838
April .....	108,946	7,496	19,238	40,067	19,104	959	195,809
May .....	115,006	7,215	23,149	40,650	21,238	922	208,180
June .....	132,029	9,757	26,804	44,079	18,833	1,004	232,507
July .....	144,084	14,051	31,284	49,828	16,904	1,084	257,235
August .....	152,141	16,070	32,702	48,985	16,447	1,064	267,408
September .....	124,249	10,018	22,213	46,270	16,270	1,001	220,023
October .....	121,114	13,240	17,316	42,581	15,112	1,013	210,377
November .....	120,841	14,977	14,547	39,578	18,466	985	209,394
December .....	136,228	18,355	13,027	44,046	19,913	980	232,550
Total .....	1,538,203	148,819	252,779	526,901	222,938	11,983	2,701,624
1989 January .....	134,876	15,328	13,886	46,328	19,965	959	231,343
February .....	126,936	17,381	16,531	38,725	18,620	874	219,066
March .....	126,564	16,674	19,920	39,636	22,642	1,000	226,436
April .....	115,273	11,569	22,451	33,495	24,075	886	207,749
May .....	118,958	9,939	23,595	38,339	28,033	940	219,803
5-Month Total ....	622,607	70,891	96,383	196,523	113,335	4,660	1,104,398
1988 5-Month Total ....	607,516	52,350	94,886	211,533	100,993	4,852	1,072,130
1987 5-Month Total ....	568,828	48,493	94,098	181,701	116,113	4,969	1,014,203

<sup>a</sup>Includes fuel oil Nos. 2, 4, 5, and 6, crude oil, kerosene, and petroleum coke.

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

<sup>c</sup>Other is electricity produced from geothermal, wood, waste, wind, photovoltaic, and solar thermal energy sources connected to electric utility distribution systems.

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

Sources: • 1973 through September 1977: Federal Power Commission, Form 4, "Monthly Power Plant Report," • October 1977 through 1981: Federal Energy Regulatory Commission, FPC Form 4, "Monthly Power Plant Report," • 1982 forward: Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

**Table 7.2 Electricity Sales<sup>a</sup> by End-Use Sector  
(Million Kilowatthours)**

	Residential		Commercial		Industrial		Other <sup>b</sup>		Total	
	Old	New	Old	New	Old	New	Old	New	Old	New
1973 Total .....	579,231	388,266		686,085		59,326		1,712,909		
1974 Total .....	578,184	384,826		684,875		58,039		1,705,924		
1975 Total .....	588,140	403,049		687,680		68,222		1,747,091		
1976 Total .....	606,452	425,094		754,069		69,631		1,855,246		
1977 Total .....	645,239	446,514		786,037		70,571		1,948,361		
1978 Total .....	674,466	461,163		809,078		73,215		2,017,922		
1979 Total .....	682,819	473,307		841,903		73,070		2,071,099		
1980 Total .....	717,495	486,155		815,067		73,732		2,094,449		
1981 Total .....	722,265	514,338		825,743		84,756		2,147,103		
1982 Total .....	729,520	526,397		744,949		85,575		2,086,441		
1983 Total .....	750,948	543,788		775,999		80,219		2,150,955		
1984 Total .....	777,654	780,092	578,281	577,275	840,588	838,718	81,849	88,887	2,278,372	2,284,972
1985 Total .....	790,977	793,828	608,968	604,679	824,523	835,207	85,075	91,988	2,309,543	2,325,702
1986 Total <sup>c</sup> .....		817,663		641,469		808,292		83,409		2,350,835
1987 January .....		82,132		54,503		65,528		7,435		209,598
February .....		73,435		52,216		65,259		7,157		198,066
March .....		67,370		51,259		67,803		7,021		193,453
April .....		60,014		49,706		67,962		6,854		184,536
May .....		58,499		53,465		69,910		7,050		188,924
June .....		68,859		59,265		72,365		7,308		207,798
July .....		83,751		64,427		73,485		7,586		229,249
August .....		88,160		65,103		74,520		7,669		235,451
September .....		73,439		61,269		74,419		7,280		216,407
October .....		60,848		55,915		73,147		7,136		197,046
November .....		60,008		52,118		70,870		7,104		190,100
December .....		73,099		54,462		69,999		7,254		204,814
Total .....		849,613		673,707		845,266		86,854		2,455,440
1988 January .....		89,529		58,723		69,984		6,873		225,109
February .....		80,248		56,682		70,701		6,767		214,398
March .....		71,560		55,127		71,435		6,560		204,682
April .....		61,395		53,456		70,782		6,365		191,998
May .....		57,566		54,379		72,471		6,410		190,826
June .....		68,218		61,567		74,690		6,917		211,392
July .....		85,362		65,189		76,827		7,208		234,585
August .....		93,870		67,809		80,153		7,348		249,180
September .....		77,532		64,936		75,976		7,148		225,592
October .....		63,767		58,914		75,076		6,967		204,724
November .....		63,630		55,348		72,834		6,635		198,446
December .....		77,184		58,073		73,098		6,910		215,265
Total .....		889,860		710,204		884,026		82,108		2,566,198
1989 January .....		85,616		59,397		72,315		7,553		224,881
February .....		78,189		57,508		71,003		7,141		213,841
March .....		77,290		58,461		72,105		7,446		215,301
April .....		64,685		54,786		74,168		7,074		200,713
May .....		61,065		55,997		76,330		7,258		200,651
5-Month Total .....		366,845		286,149		365,921		36,472		1,055,387
1988 5-Month Total .....		360,297		278,368		355,372		32,976		1,027,013
1987 5-Month Total .....		341,449		261,148		336,462		35,517		974,577

<sup>a</sup>Electricity sales to all ultimate consumers.

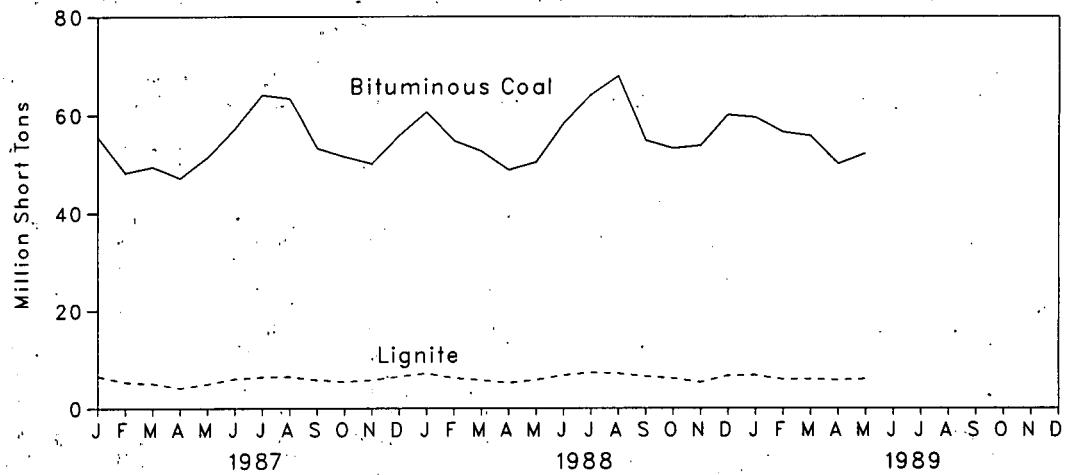
<sup>b</sup>Includes sales of electricity to Government, railways, street lighting authorities, and sales not included elsewhere.

<sup>c</sup>Beginning in January 1986, monthly Form EIA-826 electricity sales estimates, which are preliminary Form EIA-861 values, are based on a new sample and new expansion factors from data reported on Form EIA-861.

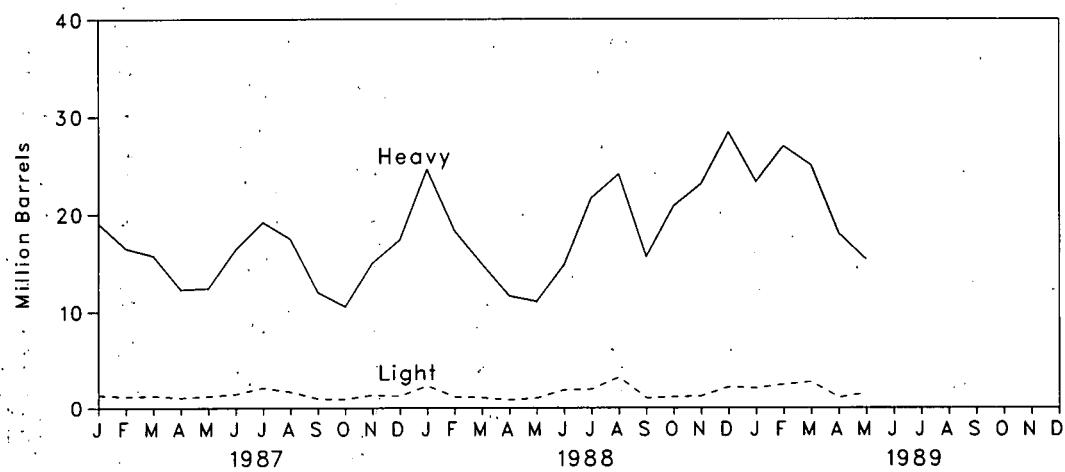
Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding.

Sources: Old Series: • 1973 through February 1980: Federal Power Commission, FPC Form 5, "Monthly Statement of Electric Operating Revenue and Income," • March 1980 through 1982: Federal Energy Regulatory Commission, FERC Form 5, "Electric Utility Company Monthly Statement," • 1983 through 1985, Energy Information Administration, Form EIA-826, "Electric Utility Company Monthly Statement." New Series: • 1984 and 1985 annual data: Energy Information Administration, Form EIA-861, "Annual Electric Utility Report." • 1986 annual data and 1987 monthly and annual data: Energy Information Administration, Form EIA-826, "Electric Utility Company Monthly Statement." • 1988 forward: Energy Information Administration, Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions."

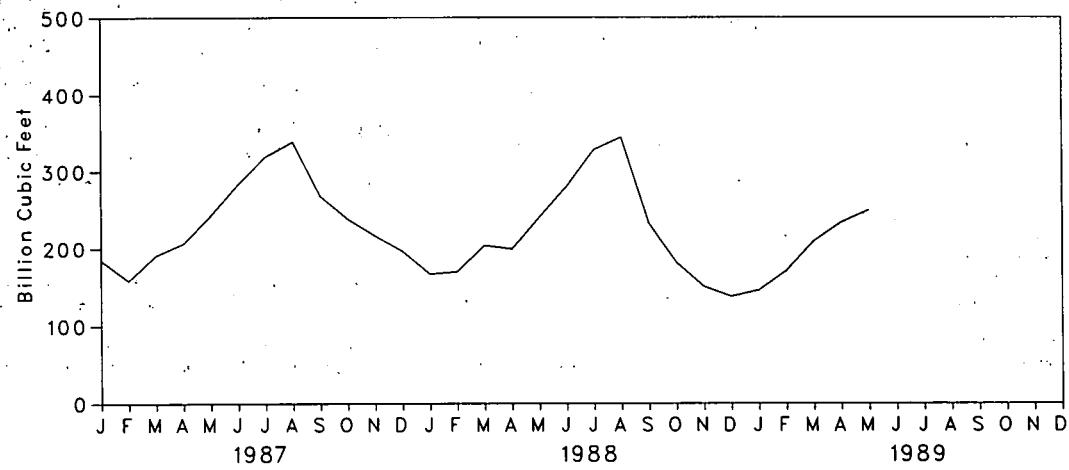
**Figure 7.1 Coal Consumed to Produce Electricity**



**Figure 7.2 Petroleum Consumed to Produce Electricity**



**Figure 7.3 Natural Gas Consumed to Produce Electricity**



**Table 7.3 Fossil Fuels Consumed by Electric Utilities To Generate Electricity**

	Coal				Petroleum				Natural Gas <sup>c</sup>
	Anthracite	Bituminous Coal	Lignite	Total	Heavy <sup>a</sup>	Light <sup>b</sup>	Total Liquids	Petroleum Coke	
	Thousand Short Tons				Thousand Barrels			Thousand Short Tons	Million Cubic Feet
1973 Total .....	1,443	376,975	10,794	389,212	(d)	(d)	560,248	507	3,660,172
1974 Total .....	1,498	378,643	11,870	391,811	(d)	(d)	536,274	625	3,443,428
1975 Total .....	1,480	388,523	15,960	405,982	(d)	(d)	506,128	70	3,157,669
1976 Total .....	1,350	425,205	21,817	448,371	(d)	(d)	555,920	68	3,080,868
1977 Total .....	1,425	451,051	24,650	477,126	(d)	(d)	623,705	98	3,191,200
1978 Total .....	1,064	448,763	31,407	481,235	(d)	(d)	635,839	398	3,188,363
1979 Total .....	1,046	488,129	37,876	527,051	(d)	(d)	523,297	268	3,490,523
1980 Total .....	951	526,680	41,842	569,274	391,163	29,051	420,214	179	3,681,595
1981 Total .....	1,221	550,784	44,792	596,797	329,798	21,313	351,111	139	3,840,154
1982 Total .....	1,075	543,346	49,245	593,666	234,434	15,337	249,771	149	3,225,518
1983 Total .....	1,036	570,108	54,067	625,211	228,984	16,512	245,497	261	2,910,767
1984 Total .....	1,070	606,339	56,990	664,399	189,289	15,190	204,479	252	3,111,342
1985 Total .....	1,033	631,885	60,923	693,841	158,779	14,635	173,414	231	3,044,083
1986 Total .....	829	616,134	68,093	685,056	216,156	14,326	230,482	313	2,802,370
1987 January .....	68	55,682	6,664	62,414	19,069	1,317	20,386	28	184,722
February .....	75	48,243	5,397	53,715	16,510	1,149	17,658	29	158,341
March .....	79	49,428	5,140	54,647	15,741	1,227	16,968	28	190,893
April .....	75	47,153	4,207	51,435	12,297	1,033	13,330	23	206,438
May .....	91	51,415	4,977	56,484	12,420	1,183	13,603	31	242,615
June .....	100	57,307	6,093	63,500	16,384	1,407	17,790	26	283,554
July .....	105	64,203	6,428	70,736	19,193	2,075	21,268	28	319,239
August .....	95	63,456	6,524	70,075	17,470	1,648	19,118	31	338,646
September .....	72	53,338	5,850	59,259	12,015	924	12,939	31	268,080
October .....	66	51,572	5,479	57,117	10,538	891	11,429	35	238,185
November .....	60	50,095	5,805	55,981	14,995	1,307	16,302	27	216,781
December .....	85	55,930	6,535	62,551	17,380	1,207	18,587	30	196,556
Total .....	972	647,824	69,098	717,894	184,011	15,367	199,378	348	2,844,051
1988 January .....	77	60,665	7,159	67,901	24,593	2,297	26,890	24	166,840
February .....	85	54,897	6,263	61,244	18,320	1,136	19,456	27	169,688
March .....	92	52,739	5,775	58,606	14,906	1,044	15,951	36	204,042
April .....	87	48,814	5,258	54,158	11,636	805	12,441	33	199,322
May .....	88	50,411	5,847	56,346	11,069	998	12,067	33	239,799
June .....	74	58,319	6,774	65,167	14,806	1,856	16,662	42	280,303
July .....	99	64,191	7,309	71,599	21,643	1,928	23,571	47	328,287
August .....	106	68,009	7,156	75,271	24,106	3,207	27,313	41	344,232
September .....	86	54,941	6,519	61,546	15,638	1,004	16,642	31	232,665
October .....	83	53,283	6,162	59,529	20,809	1,100	21,909	30	181,673
November .....	80	53,846	5,346	59,271	23,092	1,200	24,293	31	150,506
December .....	108	60,094	6,681	66,884	28,401	2,173	30,574	36	137,449
Total .....	1,063	680,211	76,249	757,522	229,019	18,748	247,768	409	2,634,804
1989 January .....	98	59,571	6,784	66,454	23,313	2,057	25,370	47	145,632
February .....	75	56,593	5,945	62,613	26,957	2,425	29,382	33	170,603
March .....	82	55,845	5,986	61,912	25,032	2,718	27,749	35	209,384
April .....	96	50,048	5,789	55,932	18,058	1,044	19,101	38	233,268
May .....	98	52,253	6,009	58,360	15,358	1,520	16,878	36	248,901
5-Month Total ....	450	274,310	30,512	305,271	108,717	9,784	118,482	188	1,007,789
1988 5-Month Total ....	427	267,527	30,302	298,256	80,524	6,280	86,804	152	979,690
1987 5-Month Total ....	389	251,922	26,385	278,695	76,036	5,908	81,944	138	983,010

<sup>a</sup>Heavy oil includes Grade Nos. 4, 5, and 6, and residual fuel oils.

<sup>b</sup>Light oil includes Grade No. 2 heating oil, kerosene, and jet fuel.

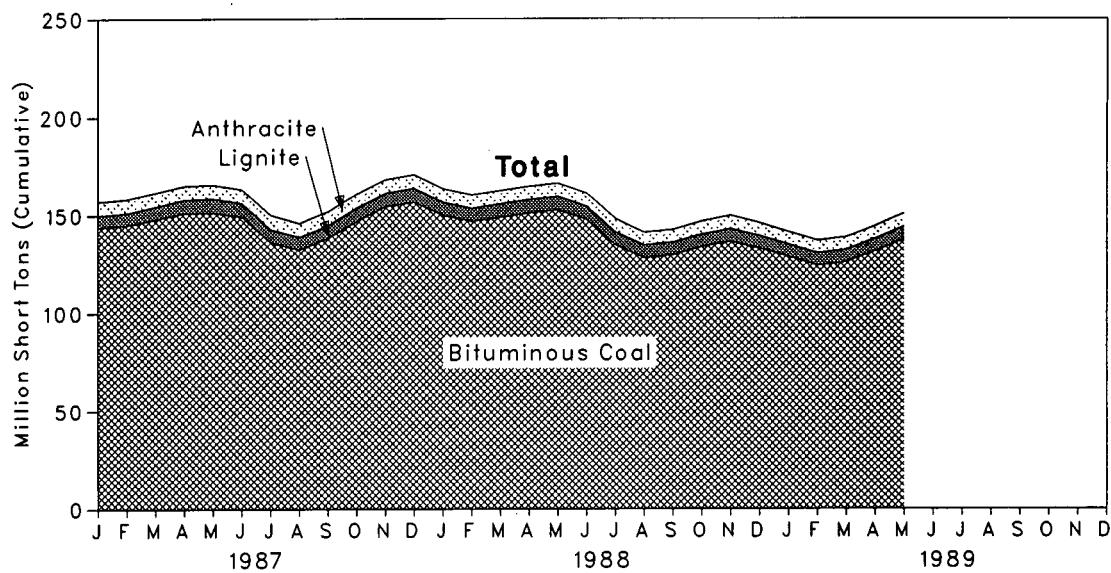
<sup>c</sup>Includes supplemental gaseous fuels.

<sup>d</sup>Prior to 1980, petroleum consumption data were not disaggregated by type of fuel. Disaggregation by prime mover type is provided in Table 7.5.

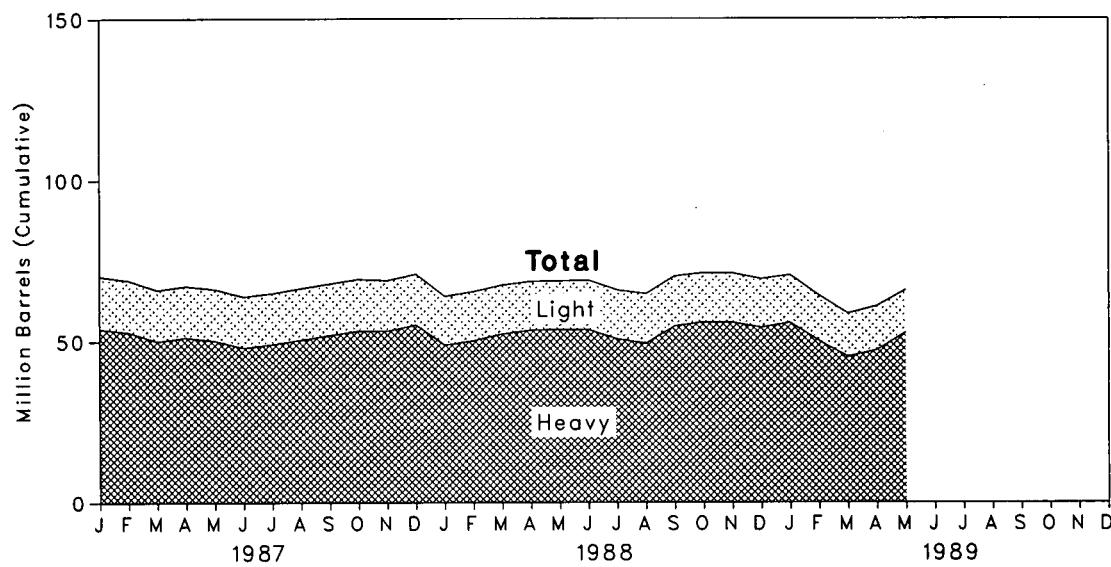
Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding.

Sources: • 1973 through September 1977: Federal Power Commission, Form 4, "Monthly Power Plant Report," • October 1977 through 1981: Federal Energy Regulatory Commission, FPC Form 4, "Monthly Power Plant Report," • 1982 forward: Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

**Figure 7.4 Coal Stocks at Electric Utilities, End of Period**



**Figure 7.5 Petroleum Stocks at Electric Utilities, End of Period**



**Table 7.4 Coal and Petroleum Stocks at Electric Utilities, End of Period**

	Coal				Petroleum			
	Anthracite	Bituminous Coal	Lignite	Total	Heavy <sup>a</sup>	Light <sup>b</sup>	Total Liquids	Petroleum Coke
					Thousand Short Tons		Thousand Barrels	
1973 Year .....	1,066	84,941	961	86,967	(c)	(c)	89,216	312
1974 Year .....	930	81,712	867	83,509	(c)	(c)	112,917	35
1975 Year .....	982	107,927	1,815	110,724	(c)	(c)	125,257	31
1976 Year .....	1,000	114,130	2,306	117,436	(c)	(c)	121,696	32
1977 Year .....	2,321	128,210	2,688	133,219	(c)	(c)	144,031	44
1978 Year .....	2,178	123,020	3,027	128,225	(c)	(c)	118,788	198
1979 Year .....	3,274	152,981	3,459	156,714	(c)	(c)	131,422	183
1980 Year .....	4,741	174,154	4,115	183,010	105,351	30,023	135,374	52
1981 Year .....	5,537	158,258	5,098	168,893	102,042	26,094	128,136	42
1982 Year .....	6,080	170,480	4,573	181,132	95,515	23,369	118,884	41
1983 Year .....	6,507	145,250	3,841	155,598	70,573	18,801	89,375	55
1984 Year .....	6,710	167,118	5,899	178,727	68,503	19,116	87,819	50
1985 Year .....	7,189	142,144	7,043	156,376	57,304	16,386	73,689	49
1986 Year .....	7,099	148,665	6,042	161,806	56,841	16,269	73,111	40
1987 January .....	7,091	144,044	5,926	157,061	53,789	16,365	70,153	35
February .....	7,087	145,206	6,030	158,322	52,847	16,085	68,932	34
March .....	7,098	148,020	6,530	161,648	50,035	15,946	65,981	41
April .....	7,103	151,205	6,795	165,103	51,201	15,970	67,171	35
May .....	7,098	151,329	7,255	165,683	50,221	16,006	66,227	43
June .....	7,098	149,394	6,868	163,361	48,047	15,822	63,869	55
July .....	7,102	136,385	6,729	150,217	49,123	15,819	64,942	64
August .....	7,083	132,535	6,488	146,106	50,451	16,038	66,489	57
September .....	7,068	138,490	6,403	151,961	51,858	16,029	67,887	48
October .....	7,070	147,034	6,838	160,942	53,175	16,081	69,256	60
November .....	6,963	154,545	6,767	168,274	53,160	15,704	68,864	63
December .....	6,940	156,670	7,187	170,797	55,069	15,759	70,827	51
1988 January .....	6,905	150,019	6,657	163,581	48,872	15,107	63,979	56
February .....	6,864	146,977	6,583	160,424	50,168	15,277	65,445	55
March .....	6,821	148,955	6,826	162,603	52,197	15,223	67,420	58
April .....	6,780	152,121	6,848	165,750	53,375	15,149	68,524	54
May .....	6,732	152,743	6,853	166,328	53,579	15,098	68,676	56
June .....	6,785	147,752	6,677	161,215	53,533	15,337	68,870	77
July .....	6,659	134,933	6,641	148,234	50,681	15,213	65,894	73
August .....	6,614	128,139	6,635	141,389	49,308	15,395	64,703	63
September .....	6,601	129,707	6,522	142,830	54,636	15,518	70,154	82
October .....	6,611	133,965	6,371	146,947	55,830	15,332	71,161	83
November .....	6,595	136,652	6,539	149,785	55,752	15,320	71,072	90
December .....	6,561	133,072	6,512	146,145	54,187	15,086	69,273	86
1989 January .....	6,513	128,902	6,266	141,682	55,670	14,829	70,498	58
February .....	6,494	124,424	6,217	137,136	50,071	14,109	64,180	56
March .....	6,475	126,078	6,367	138,919	45,129	13,373	58,503	62
April .....	6,447	131,653	6,477	144,577	47,237	13,603	60,841	102
May .....	6,416	137,650	6,767	150,833	52,595	13,279	65,874	64

<sup>a</sup>Heavy oil includes Grade Nos. 4, 5, and 6, and residual fuel oils.

<sup>b</sup>Light oil includes Grade No. 2 heating oil, kerosene, and jet fuel.

<sup>c</sup>Prior to 1980, petroleum stock data were not disaggregated by type of fuel. Disaggregation by prime mover type is provided in Table 7.5.

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

Sources: • 1973 through September 1977: Federal Power Commission, Form 4, "Monthly Power Plant Report," • October 1977 through 1981: Federal Energy Regulatory Commission, FPC Form 4, "Monthly Power Plant Report," • 1982 forward: Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

**Table 7.5 Petroleum Consumption and Stocks at Electric Utilities by Prime Mover Type  
(Thousand Barrels)**

	Petroleum Consumption			Petroleum Stocks, End of Period		
	Steam Plants	GT/IC <sup>a</sup>	Total Liquids	Steam Plants	GT/IC <sup>a</sup>	Total Liquids
1973 Total .....	513,190	47,058	560,248	79,121	10,095	89,216
1974 Total .....	483,146	53,128	536,274	97,718	15,199	112,917
1975 Total .....	467,221	38,907	506,128	108,825	16,432	125,257
1976 Total .....	514,077	41,843	555,920	106,993	14,703	121,696
1977 Total .....	574,869	48,837	623,705	124,750	19,281	144,031
1978 Total .....	588,319	47,520	635,839	102,402	16,386	118,788
1979 Total .....	492,606	30,691	523,297	111,121	20,301	131,422
1980 Total .....	401,863	18,351	420,214	117,227	18,147	135,374
1981 Total .....	339,680	11,431	351,111	112,380	15,756	128,136
1982 Total .....	243,537	6,234	249,771	105,287	13,597	118,884
1983 Total .....	237,845	7,652	245,497	78,285	11,090	89,375
1984 Total .....	197,050	7,429	204,479	76,836	10,784	87,619
1985 Total .....	166,842	6,572	173,414	64,704	8,985	73,689
1986 Total .....	222,500	7,983	230,482	64,258	8,853	73,111
1987 January .....	19,718	668	20,386	61,042	9,111	70,153
February .....	17,004	655	17,658	59,907	9,025	68,932
March .....	16,335	633	16,968	57,052	8,929	65,981
April .....	12,873	457	13,330	58,250	8,921	67,171
May .....	13,017	586	13,603	57,521	8,706	66,227
June .....	16,976	814	17,790	55,063	8,806	63,869
July .....	19,754	1,513	21,268	56,236	8,706	64,942
August .....	17,948	1,170	19,118	57,748	8,741	66,489
September .....	12,441	498	12,939	58,902	8,984	67,887
October .....	11,108	321	11,429	60,138	9,117	69,256
November .....	15,651	651	16,302	59,873	8,991	68,864
December .....	17,994	593	18,587	61,705	9,123	70,827
Total .....	190,818	8,560	199,378			
1988 January .....	25,334	1,556	26,890	55,231	8,749	63,979
February .....	18,888	567	19,456	56,448	8,997	65,445
March .....	15,478	473	15,951	58,686	8,734	67,420
April .....	12,117	325	12,441	59,743	8,781	68,524
May .....	11,659	407	12,067	59,882	8,795	68,676
June .....	15,355	1,307	16,662	60,025	8,845	68,870
July .....	22,158	1,413	23,571	57,126	8,768	65,894
August .....	24,601	2,712	27,313	55,890	8,814	64,703
September .....	16,100	542	16,642	60,991	9,162	70,154
October .....	21,307	602	21,909	62,002	9,160	71,161
November .....	23,579	714	24,293	61,990	9,082	71,072
December .....	28,912	1,661	30,574	60,311	8,962	69,273
Total .....	235,490	12,278	247,768			
1989 January .....	24,160	1,211	25,370	61,456	9,043	70,498
February .....	27,880	1,502	29,382	55,689	8,490	64,180
March .....	25,826	1,924	27,749	50,490	8,013	58,503
April .....	18,564	537	19,101	52,787	8,054	60,841
May .....	15,922	956	16,878	57,994	7,879	65,874
5-Month Total ....	112,352	6,130	118,482			
1988 5-Month Total ....	83,477	3,327	86,804			
1987 5-Month Total ....	78,946	2,998	81,944			

<sup>a</sup>GT/IC=Gas turbine and internal combustion plants.

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

Sources: • 1973 through September 1977: Federal Power Commission, Form 4, "Monthly Power Plant Report," • October 1977 through 1981: Federal Energy Regulatory Commission, FPC Form 4, "Monthly Power Plant Report," • 1982 forward: Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

## Section 8. Nuclear

In May 1989, U.S. nuclear generating units produced a total of 38 net terawatthours (billion kilowatthours) of electricity, 6 percent<sup>17</sup> lower than in May 1988. Nuclear units generated at an average capacity factor of 52.8 percent, 5 percentage points below the level in May 1988. Nuclear power supplied 17.4 percent of the total electricity generated in May 1989, compared with 19.5 percent in May 1988.

No Low or Full Power Operating Licenses were issued by the Nuclear Regulatory Commission (NRC) during May 1989. Prior to May 31, 1989, Seabrook 1, a 1,186 net-megawatt-electric (MWe) unit located in Seabrook, New Hampshire, was issued a Low Power Operating License by the NRC authorizing fuel loading and low-power testing. In April 1989, the NRC issued a Full Power Operating License to Shoreham, an 804 MWe

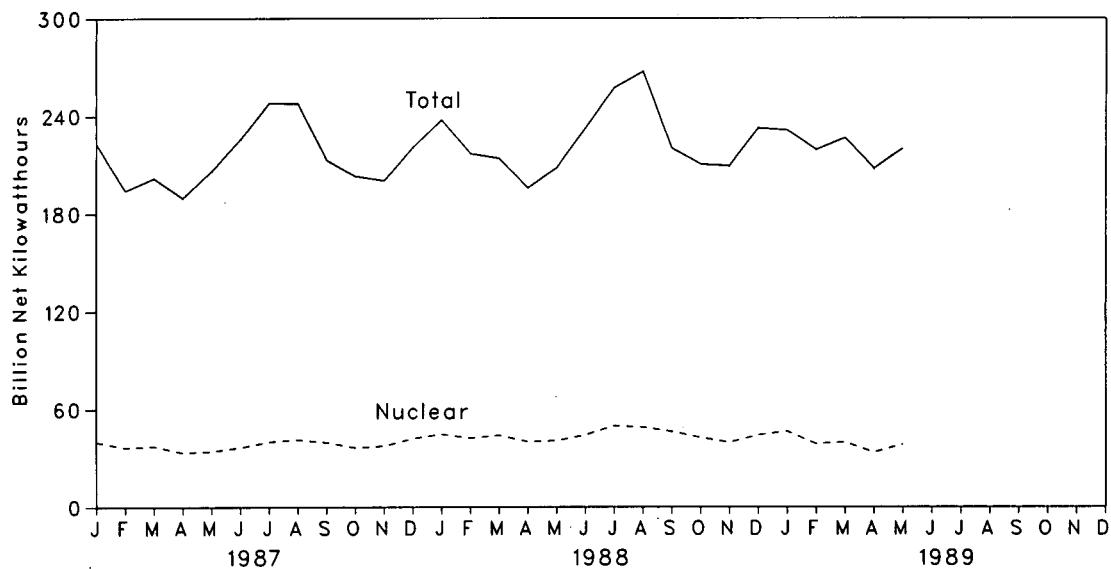
unit located in Brookhaven, New York. Shoreham, however, is not currently scheduled to operate.

On May 31, 1989, there were 110 operable nuclear generating units in the United States, with a collective net summer generating capability of 98 million kilowatts of electricity. (This total does not include Shoreham). Of the 110 operable units, 41 units generated at less than 25 percent of capacity and 27 units were out of service at least part of the month for maintenance or refueling.

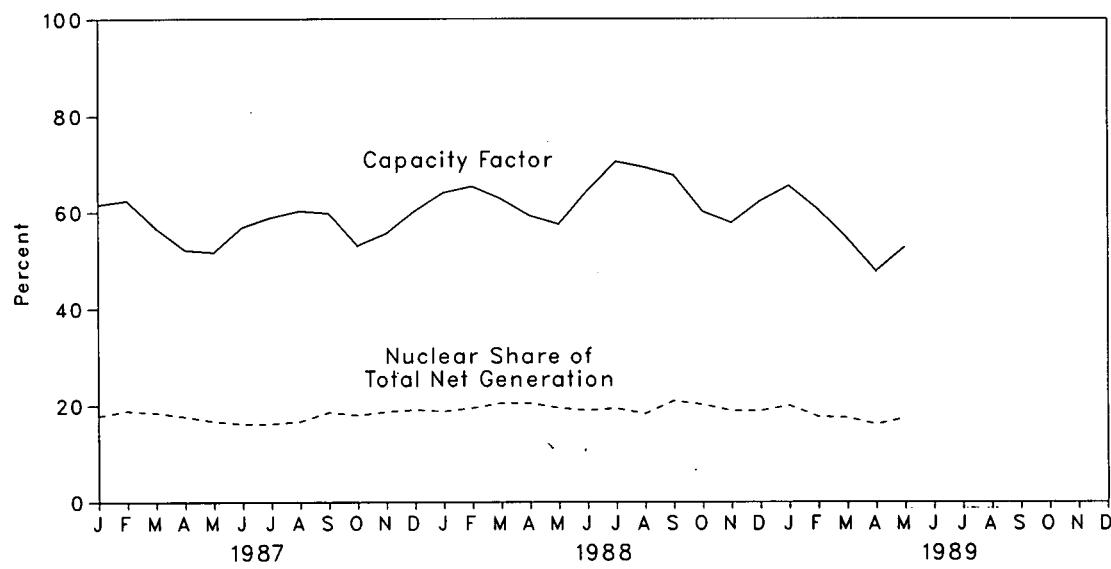
As of May 31, there were 122 domestic nuclear generating units in all stages of construction and operation, with an aggregate design capacity of 114 million net kilowatts.

<sup>17</sup>Percentage changes are based on numbers shown in the following tables.

**Figure 8.1 Nuclear and Total Net Generation of Electricity**



**Figure 8.2 Nuclear Power Plants' Capacity Factor and Share of Total Net Generation**



**Table 8.1 Nuclear Power Plant Operations**

	Operable Units <sup>a</sup> <sup>b</sup>	Nuclear Electricity Generation	Nuclear Portion of Domestic Electricity Generation	Net Summer Capability of Operable Units <sup>a</sup> <sup>c</sup>	Capacity Factor <sup>d</sup>
			Number	Million Net Kilowatthours	Percent
1973 Year .....	39	83,479	4.5	22,615	53.7
1974 Year .....	48	113,976	6.1	31,803	47.9
1975 Year .....	54	172,505	9.0	37,161	56.0
1976 Year .....	61	191,104	9.4	43,657	54.9
1977 Year .....	65	250,883	11.8	46,202	63.4
1978 Year .....	70	276,403	12.5	50,709	64.7
1979 Year .....	68	255,155	11.4	49,630	58.5
1980 Year .....	70	251,116	11.0	51,668	56.4
1981 Year .....	74	272,674	11.9	55,914	58.4
1982 Year .....	77	282,773	12.6	59,927	56.7
1983 Year .....	80	293,877	12.7	63,009	54.4
1984 Year .....	86	327,634	13.6	69,652	56.3
1985 Year .....	95	383,691	15.5	79,397	58.0
1986 Year .....	100	414,038	16.6	85,241	56.9
1987 January .....	102	39,975	17.9	87,248	61.6
February .....	102	36,598	18.9	87,248	62.4
March .....	103	37,290	18.5	88,446	56.7
April .....	103	33,518	17.7	89,330	52.2
May .....	103	34,320	16.7	89,330	51.7
June .....	103	36,560	16.2	89,330	56.9
July .....	105	40,056	16.2	91,488	58.9
August .....	106	41,352	16.7	92,324	60.3
September .....	106	39,666	18.6	92,324	59.8
October .....	106	36,492	18.0	92,324	53.1
November .....	107	37,438	18.7	93,583	55.6
December .....	107	42,006	19.1	93,583	60.3
Year .....		455,270	17.7		57.5
1988 January .....	107	44,658	18.8	93,583	64.1
February .....	106	42,246	19.5	92,743	65.4
March .....	107	43,912	20.5	93,982	62.8
April .....	107	40,067	20.5	93,982	59.3
May .....	108	40,650	19.5	95,089	57.5
June .....	108	44,079	19.0	95,089	64.5
July .....	108	49,828	19.4	95,089	70.5
August .....	108	48,985	18.3	95,089	69.3
September .....	108	46,270	21.0	95,089	67.7
October .....	108	42,581	20.2	95,089	60.2
November .....	108	39,578	18.9	95,089	57.8
December .....	108	44,046	18.9	95,089	62.3
Year .....		526,901	19.5		63.5
1989 January .....	108	46,328	20.0	95,089	65.5
February .....	108	38,725	17.7	95,089	60.6
March .....	110	39,636	17.5	97,526	54.6
April .....	110	33,495	16.1	97,526	47.8
May .....	110	38,339	17.4	97,526	52.8

<sup>a</sup>Monthly data are the status as of the last day of the month. Yearly data are the status as of December 31 of each year.

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

<sup>c</sup>When possible, net summer capability is used. When a unit has not operated long enough to permit determination of a net summer capability, an estimation is made based on the net design electrical rating. For the definitions of net summer capability and net design electrical rating, see Note 3 at end of section.

<sup>d</sup>For an explanation of the method of calculating the capacity factor, see Note 4 at end of section.

Note: Geographic coverage is the 50 States and the District of Columbia.

Sources: See end of section.

**Table 8.2 Status of Nuclear Generating Units<sup>a</sup>**

	Licensed for Operation		Construction Permits		On Order	Announced	Total	Total Design Capacity <sup>d</sup>
	Operable <sup>b</sup>	In Startup <sup>c</sup>	Granted	Pending				
	Number of Units							Million Net Kilowatts
1973 Year .....	39	3	51	58	50	20	219	212
1974 Year .....	48	5	58	80	28	16	235	234
1975 Year .....	54	2	69	73	19	19	236	236
1976 Year .....	61	0	72	66	16	19	234	236
1977 Year .....	65	1	80	52	13	9	220	220
1978 Year .....	70	0	90	32	9	4	205	204
1979 Year .....	68	0	91	21	3	0	183	179
1980 Year .....	70	2	82	12	3	0	169	163
1981 Year .....	74	0	75	11	3	0	163	157
1982 Year .....	77	2	60	3	2	0	144	135
1983 Year .....	80	3	53	0	2	0	138	129
1984 Year .....	86	6	38	0	2	0	132	123
1985 Year .....	95	3	30	0	2	0	130	121
1986 Year .....	100	7	19	0	2	0	128	119
1987 January .....	102	6	18	0	2	0	128	119
February .....	102	6	18	0	2	0	128	119
March .....	103	6	17	0	2	0	128	119
April .....	103	5	17	0	2	0	127	119
May .....	103	6	16	0	2	0	127	119
June .....	103	6	16	0	2	0	127	119
July .....	105	4	16	0	2	0	127	119
August .....	106	3	16	0	2	0	127	119
September .....	106	4	15	0	2	0	127	119
October .....	106	4	15	0	2	0	127	119
November .....	107	3	15	0	2	0	127	119
December .....	107	4	14	0	2	0	127	119
1988 January .....	107	4	14	0	2	0	127	119
February .....	106	4	14	0	2	0	126	118
March .....	107	3	14	0	2	0	126	118
April .....	107	3	14	0	2	0	126	118
May .....	108	2	14	0	2	0	126	118
June .....	108	2	14	0	2	0	126	118
July .....	108	2	14	0	2	0	126	118
August .....	108	2	14	0	2	0	126	118
September .....	108	2	14	0	0	0	124	116
October .....	108	2	13	0	0	0	R 123	R 115
November .....	108	2	13	0	0	0	R 123	R 115
December .....	108	3	12	0	0	0	R 123	R 115
1989 January .....	108	3	112	0	0	0	R 123	R 115
February .....	108	3	112	0	0	0	R 123	R 115
March .....	110	2	111	0	0	0	R 123	R 115
April .....	110	R 1	111	0	0	0	R 122	R 114
May .....	110	R 1	111	0	0	0	122	114

<sup>a</sup>Monthly data are the status as of the last day of the month. Annual data are the status as of December 31 of each year.

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

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

<sup>d</sup>Net design electrical rating (DER) is used because many of the units were canceled prior to being assigned a net summer capability.

See Note 3 at end of section.

\*On the December 31, 1988, Form EIA-254 "Semiannual Report on Status of Reactor Construction," the two planned units were reported cancelled as of September 1988.

<sup>e</sup>Seabrook 2 has been deleted from this category because its construction permit expired in October 1988.

<sup>f</sup>Shoreham received a Full Power Operating License in April 1989. Since the unit is not currently scheduled to operate, it has not been included in the "Operable" column.

R=Revised data.

Note: Geographic coverage is the 50 States and the District of Columbia.

Sources: See end of section.

## Notes and Sources for the Nuclear Section

### Notes

**1. Operable Units:** Nuclear generating units that have been issued a Full Power Operating License by the Nuclear Regulatory Commission (NRC). The Hanford-N unit (840 megawatt-electric (MWe) net summer capability), was included prior to cold shutdown by the Department of Energy (DOE) in February 1988. The Shippingport unit (net summer capability of 60 MWe) operated by DOE was included prior to retirement from service on October 1, 1982, except during March 1974 through August 1977, when it was excluded because of a major core modification outage. The DOE-operated Experimental Breeder Reactor 2 unit (EBR-2) is not included because the electricity it generates is not distributed commercially.

Six units were deleted subsequent to their removal from service: Peach Bottom 1 (net summer capability of 40 MWe) and Indian Point 1 (net summer capability of 265 MWe), both out of service since November 1974; Humboldt Bay (net summer capability of 65 MWe), down since August 1976 for major seismic modifications and subsequently officially retired; Dresden 1 (net summer capability of 200 MWe), out of service since January 1979 for major modifications and officially retired in August 1984; Three Mile Island 2 (net summer capability of 880 MWe), whose core was severely damaged by a loss-of-coolant accident in March 1979; and LaCrosse (net summer capability of 51 MWe), out of service as of April 30, 1987.

Six units with Full Power Operating Licenses have been shut down by the NRC for an extended period. The names of the six units, their net summer capabilities, and dates of shut down are as follows: Browns Ferry 1, 1,067 MWe, March 1985; Browns Ferry 2, 1,067 MWe, September 1984; Browns Ferry 3, 1,067 MWe, September 1985; Peach Bottom 3, 1,033 MWe, March 1987; Nine Mile Point 1, 610 MWe, January 1985; and Shoreham, 804 MWe, April 1989.

**2. In Startup:** One unit, Seabrook 1 (1,186 MWe), has been issued a Low Power Operating License by the NRC authorizing fuel loading and low power testing prior to issuance of a Full Power Operating License.

**3. Capacity:** Nuclear generating units may have more than one type of net capacity rating including:

(a) **Net Summer Capability**--The steady hourly output which generating equipment is expected to supply to system load exclusive of auxiliary power, as demonstrated by test at the time of summer peak demand.

Auxiliary power of a typical nuclear power plant is about 5 percent of gross generation.

(b) **Net Design Capacity or Net Design Electrical Rating (DER)**--The nominal net electrical output of the unit, specified by the utility and used for plant design.

**4. Monthly Capacity Factors:** The monthly capacity factors are computed as the actual monthly generation divided by the maximum possible generation for that month. The maximum possible generation is the number of hours in the month multiplied by the monthly net summer capability. This fraction is then multiplied by 100 to obtain a percentage. Annual capacity factors are averages of the monthly values for that year.

### Sources

**Nuclear Units Licensed for Operation:** Nuclear Regulatory Commission Report NUREG-0020, "Licensed Operating Reactors."

**Electricity Generation:** 1973 through September 1977--Federal Power Commission, Form 4, "Monthly Power Plant Report." October 1977 through 1981--Federal Energy Regulatory Commission, FPC Form 4, "Monthly Power Plant Report." 1982 forward--Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

**Net Summer Capability:** Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

**Capacity Factor:** Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

**Unit Construction and Planning Data:** 1973 through June 1982--Compiled from various sources, primarily the Department of Energy, Office of Nuclear Reactor Programs, "U.S. Central Station Nuclear Electric Generating Units: Significant Milestones," Nuclear Regulatory Commission Report NUREG-0020, "Licensed Operating Reactors," and from the Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels. July 1982 forward--Nuclear Regulatory Commission Report NUREG-0871, "Summary Information Report," Nuclear Regulatory Commission Report NUREG-0020, "Licensed Operating Reactors," and various trade journals.

**Total Design Capacity:** Nuclear Regulatory Commission report NUREG-0020, "Licensed Operating Reactors," Nuclear Regulatory Commission Report NUREG-0871, "Summary Information Report," and Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

## Section 9. Price

**Crude Oil.** The average price of domestic crude oil purchased at the wellhead was \$16.73 per barrel in May 1989, 19 percent above the level in May 1988. The refiner acquisition cost of imported crude oil in May 1989 was \$19.06 per barrel, 19 percent above the May 1988 level. The cost of domestic crude oil in May 1989 was \$19.02, an increase of 16 percent from the May 1988 average.

**Motor Gasoline.** The national city average retail price of leaded regular gasoline at all types of stations was \$1.09 per gallon in June 1989, 20 percent higher than the price in June 1988. The price of unleaded regular gasoline at all types of stations was \$1.11 per gallon in June 1989, 17 percent higher than the price in June 1988. The price of unleaded premium gasoline averaged \$1.28 per gallon in June 1989, 15 percent higher than the price in June 1988.

**Residual Fuel Oil.** The average price, excluding taxes, of residual fuel oil sold to end users in May 1989 was 41 cents per gallon, about the same as the previous month's price but 22 percent above the May 1988 average. The average resale price, excluding taxes, of residual fuel oil in May 1989 was 38 cents per gallon, 1 percent below the April 1989 average but 20 percent above the price 1 year earlier.

**Aviation Fuel.** The average price, excluding taxes, of aviation gasoline sold to end users in May 1989 was \$1.07 per gallon, 8 percent higher than the price in the previous month and 19 percent above the price in May 1988. The average price, excluding taxes, of kerosene-type jet fuel sold to end users in May 1989 was 58 cents per gallon, 4 percent below the previous month's price but 10 percent higher than the May 1988 average.

**No. 2 Distillate Fuel Oil.** The May 1989 national average price, excluding taxes, of heating oil sold to residential customers was 87 cents per gallon, 1 percent

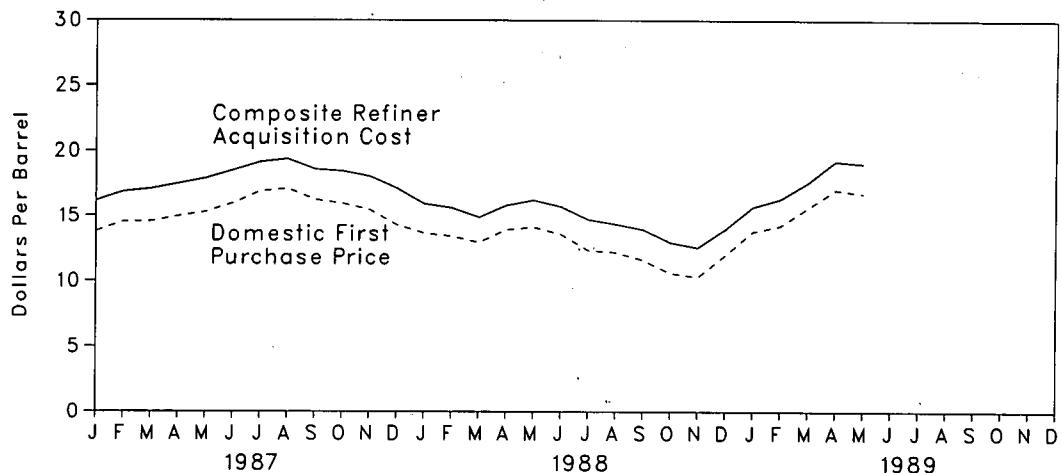
below the April 1989 price but 6 percent higher than the May 1988 price. The average price for resale was 53 cents per gallon in May 1989, 7 percent below the price in the previous month but 5 percent higher than the May 1988 average.

**Electricity.** Beginning with January 1986, there are new series of national average price estimates based on a statistically derived sample of both publicly and privately owned electric utilities. Previously, average price estimates were derived from selected privately-owned electric utilities and were not national averages.

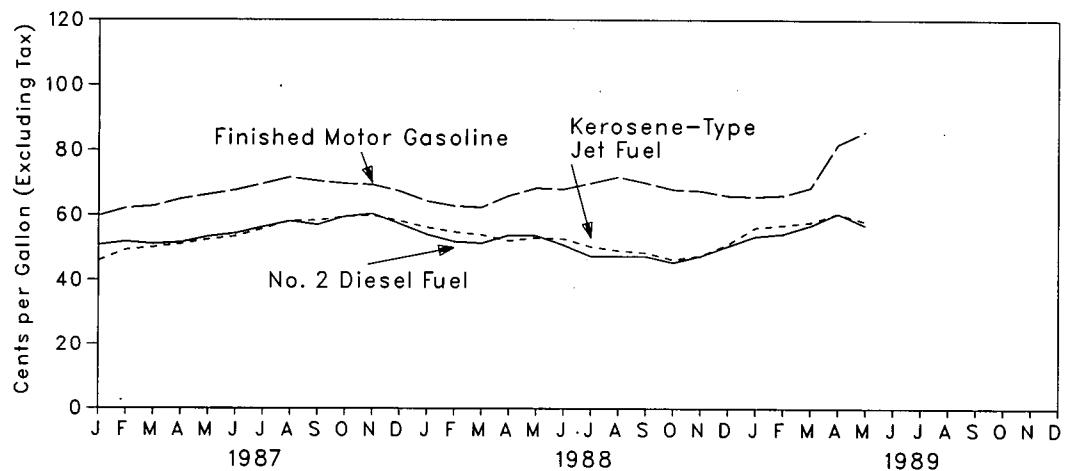
The mean price of electricity to all ultimate consumers in the United States in May 1989 was 6.31 cents per kilowatthour, 3 percent above the May 1988 mean price. The national retail price of electricity to residential consumers in May 1989 was 7.72 cents per kilowatthour, 2 percent higher than the May 1988 price. The price of electricity to commercial consumers averaged 7.14 cents per kilowatthour in May 1989, 3 percent above the May 1988 price. The May national retail price of electricity to other consumers was 6.24 cents per kilowatthour, 6 percent above the May 1988 price. The average electricity price to industrial users during May 1989 was 4.62 cents per kilowatthour, 4 percent above the price 1 year earlier.

**Natural Gas.** In April 1989 (latest data available) the average wellhead price of natural gas was \$1.62 per thousand cubic feet, 1 percent less than the April 1988 price. The average price of natural gas delivered to electric utility plants was \$2.31 per thousand cubic feet in April 1989, 5 percent above the April 1988 price. The average price of natural gas used by residential consumers in May 1989 was \$5.91 per thousand cubic feet, slightly higher than the May 1988 price. The average price of natural gas used by industrial consumers in May 1989 was \$2.76 per thousand cubic feet, 1 percent below the May 1988 price.

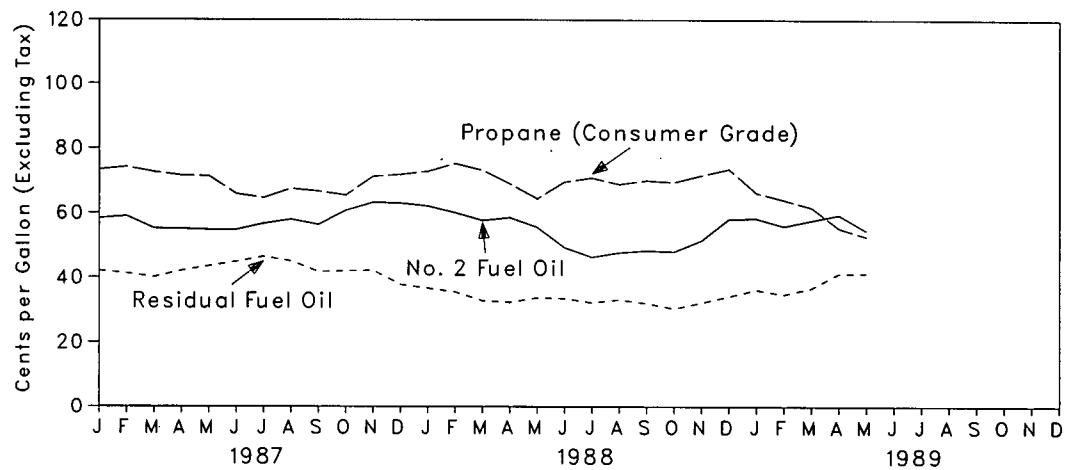
**Figure 9.1 Crude Oil Prices**



**Figure 9.2 Refiner Sales Prices to End Users:  
Motor Gasoline, Diesel Fuel, and Jet Fuel**



**Figure 9.3 Refiner Sales Prices to End Users:  
No. 2 Fuel Oil, Propane, and Residual Fuel Oil**



**Table 9.1 Crude Oil Price Summary**  
**(Dollars per Barrel)**

	Domestic First Purchase Price <sup>a</sup>	FOB Cost of Imports <sup>b</sup>	Landed Cost of Imports <sup>c</sup>	Refiner Acquisition Cost <sup>d</sup>		
				Domestic	Imported	Composite
1973 Average .....	3.89	5.21	6.41	4.17	4.08	4.15
1974 Average .....	6.87	10.91	12.32	7.18	12.52	9.07
1975 Average .....	7.67	11.18	12.70	8.39	13.93	10.38
1976 Average .....	8.19	12.17	13.34	8.84	13.48	10.89
1977 Average .....	8.57	13.24	14.31	9.55	14.53	11.96
1978 Average .....	9.00	13.30	14.38	10.61	14.57	12.46
1979 Average .....	12.64	20.19	21.65	14.27	21.67	17.72
1980 Average .....	21.59	32.27	33.95	24.23	33.89	28.07
1981 Average .....	31.77	35.10	36.52	34.33	37.05	35.24
1982 Average .....	28.52	32.11	33.18	31.22	33.55	31.87
1983 Average .....	26.19	27.73	28.93	28.87	29.30	28.99
1984 Average .....	25.88	27.44	28.46	28.53	28.88	28.63
1985 Average .....	24.09	25.83	26.66	26.66	26.99	26.75
1986 Average .....	12.51	12.52	13.49	14.82	14.00	14.55
1987 January .....	13.79	15.30	16.16	16.01	16.45	16.16
February .....	14.51	15.95	16.86	16.77	16.98	16.83
March .....	14.54	16.31	17.05	16.93	17.26	17.04
April .....	14.95	16.79	17.53	17.21	17.89	17.44
May .....	15.29	17.20	17.91	17.63	18.25	17.85
June .....	15.95	17.53	18.34	18.33	18.71	18.47
July .....	16.88	17.90	18.87	19.04	19.26	19.13
August .....	17.06	17.72	18.88	19.39	19.32	19.36
September .....	16.25	17.09	18.04	18.57	18.57	18.57
October .....	15.95	16.56	17.67	18.36	18.53	18.43
November .....	15.46	16.41	17.52	17.94	18.14	18.02
December .....	14.27	14.73	16.03	17.02	17.20	17.09
Average .....	15.40	16.69	17.65	17.76	18.13	17.90
1988 January .....	13.64	13.66	14.92	15.82	16.10	15.92
February .....	13.41	13.76	14.72	15.61	15.61	15.61
March .....	12.95	13.46	14.48	14.92	14.82	14.88
April .....	13.91	14.28	15.17	15.88	15.69	15.81
May .....	14.11	14.49	15.51	16.35	16.02	16.22
June .....	13.57	13.99	14.89	15.83	15.52	15.71
July .....	12.36	13.27	14.08	14.65	14.80	14.71
August .....	12.20	12.94	13.70	14.36	14.37	14.36
September .....	11.61	12.28	13.07	13.97	13.90	13.94
October .....	10.60	11.69	12.42	12.90	13.03	12.96
November .....	10.30	11.94	12.49	12.61	12.54	12.58
December .....	11.99	13.21	14.10	13.88	14.08	13.97
Average .....	12.57	13.27	14.09	14.76	14.64	14.71
1989 January .....	13.79	14.67	15.69	15.49	15.98	15.70
February .....	14.23	15.49	16.40	16.11	16.59	16.31
March .....	15.63	R 16.72	R 17.48	17.39	17.77	17.55
April .....	R 17.01	R 18.30	R 19.04	18.92	19.59	19.22
May .....	16.73	17.76	18.46	19.02	19.06	19.03

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

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

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

<sup>d</sup>See Note 4 at end of section.

R=Revised data.

Notes: • Geographic coverage is the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, and all U.S. Territories and Possessions. • Values for Domestic First Purchase Price and Refiner Acquisition Cost of Crude Oil for the current month and for FOB and Landed Cost of Crude Oil Imports for the current 2 months are preliminary.

Sources: See end of section.

**Table 9.2 FOB Cost of Crude Oil Imports from Selected Countries<sup>a</sup>**  
(Dollars per Barrel)

	Algeria	Indonesia	Iran	Mexico	Nigeria	Saudi Arabia	United Kingdom	Venezuela	Other Countries	Arab OPEC <sup>b</sup>	Total OPEC <sup>c</sup>
1973 Average ....	7.23	5.67	4.24	NA	7.81	3.25	NA	5.39	4.84	4.06	5.43
1974 Average ....	13.23	11.99	10.85	NA	12.44	10.17	NA	10.71	10.02	10.96	11.33
1975 Average ....	11.93	12.55	10.81	11.44	11.82	10.87	NA	11.04	10.86	11.18	11.34
1976 Average ....	13.05	12.76	11.61	12.22	13.08	11.69	13.09	11.32	11.92	12.06	12.23
1977 Average ....	14.36	13.57	12.67	13.42	14.44	12.37	14.11	12.68	13.19	13.13	13.29
1978 Average ....	14.10	13.64	12.65	13.24	14.04	12.70	13.82	12.45	13.35	13.28	13.30
1979 Average ....	20.65	19.35	23.71	20.29	21.80	17.63	21.20	17.37	21.43	19.25	19.91
1980 Average ....	36.57	32.37	( <sup>d</sup> )	31.11	35.82	28.53	34.58	24.78	34.24	31.61	32.25
1981 Average ....	39.09	35.93	( <sup>d</sup> )	33.13	38.53	32.48	36.08	28.86	36.69	34.73	35.11
1982 Average ....	34.23	35.27	30.93	28.07	35.13	33.50	33.46	23.77	31.96	33.84	33.45
1983 Average ....	30.06	29.93	28.25	25.19	29.78	28.03	29.84	21.48	27.96	28.38	28.45
1984 Average ....	28.04	29.10	26.93	26.37	29.39	27.60	28.90	24.16	27.65	27.68	27.59
1985 Average ....	26.84	27.12	W	25.33	28.04	22.04	27.63	23.64	26.11	24.30	25.66
1986 Average ....	13.62	13.19	W	11.84	14.35	11.36	13.84	10.92	13.32	11.59	12.21
1987 January ....	16.30	15.22	W	15.55	17.38	14.51	17.42	13.75	15.72	14.81	14.92
February ....	16.00	17.75	W	15.34	18.07	W	W	13.93	16.52	16.12	15.84
March .....	W	16.91	W	16.02	17.72	W	17.36	14.76	16.31	16.37	16.34
April .....	W	17.24	W	16.40	18.44	W	17.79	15.29	16.83	16.46	16.78
May .....	W	17.28	W	17.68	18.68	16.77	18.36	15.65	17.14	16.83	16.92
June .....	W	17.67	W	17.78	18.75	W	18.61	16.24	17.58	16.76	17.24
July .....	W	17.89	W	18.75	18.93	16.43	19.33	16.49	18.07	16.72	17.35
August .....	18.09	18.46	W	17.54	19.58	W	19.55	15.70	18.18	17.03	17.35
September .....	W	17.74	W	16.27	18.58	W	18.35	15.50	17.47	16.89	17.05
October .....	W	17.66	W	16.64	18.69	12.74	18.40	15.69	17.39	14.22	16.01
November .....	W	17.56	NA	15.51	18.49	12.99	17.90	14.47	17.03	15.64	16.27
December .....	W	16.28	NA	12.72	17.61	12.35	W	13.23	15.99	13.29	14.50
Average ....	16.79	17.40	W	16.36	18.47	15.12	18.28	15.08	17.11	15.80	16.43
1988 January ....	W	16.62	NA	12.79	17.04	11.80	16.23	12.37	14.96	12.39	13.29
February ....	W	16.16	NA	12.91	15.69	12.80	W	12.31	14.59	13.15	13.68
March .....	W	13.65	NA	11.82	15.69	W	14.68	12.67	13.82	13.31	13.86
April .....	W	14.59	NA	13.65	16.10	12.77	15.20	13.44	14.70	13.37	14.23
May .....	W	15.63	NA	13.68	16.06	W	16.10	13.54	14.91	13.61	14.44
June .....	W	15.26	NA	12.82	15.60	12.71	15.32	13.80	14.17	13.26	14.17
July .....	W	14.06	NA	12.26	15.15	11.27	14.43	13.18	13.55	12.23	13.41
August .....	W	13.58	NA	12.37	14.93	W	14.86	12.65	13.07	11.86	12.91
September .....	W	12.84	NA	11.69	13.71	9.45	W	12.37	12.33	10.40	12.23
October .....	W	11.47	NA	10.00	13.66	W	12.69	13.00	11.51	11.36	12.34
November .....	W	11.48	NA	10.16	13.74	W	W	12.45	11.80	12.92	12.80
December .....	W	W	NA	12.31	15.56	W	13.59	13.46	12.78	13.51	13.85
Average ....	W	13.81	NA	12.18	15.15	12.27	14.80	12.97	13.44	12.64	13.46
1989 January ....	W	14.52	NA	13.98	16.11	W	W	13.10	15.08	14.91	14.77
February ....	W	17.14	NA	14.25	17.15	W	16.33	14.00	15.83	16.35	15.98
March .....	W	17.05	NA	14.98	18.37	W	W	16.62	R 17.29	R 17.45	R 17.37
April .....	W	R 17.78	NA	R 17.44	R 19.81	W	W	R 17.77	R 18.74	17.56	R 18.53
May .....	W	W	NA	16.97	19.17	W	W	16.91	18.05	18.04	17.95

<sup>a</sup>The Free on Board (FOB) cost at the country of origin excludes all costs related to insurance and transportation. See Note 2 at end of section.

<sup>b</sup>The Arab members of OPEC are Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and the United Arab Emirates.

<sup>c</sup>"Total OPEC" consists of Ecuador, Gabon, Indonesia, Iran, Nigeria, and Venezuela, as well as the Arab members. The cost of imports from the Neutral Zone between Kuwait and Saudi Arabia is included in the cost of imports from "Total OPEC."

<sup>d</sup>No crude oil was imported.

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

Notes: • Values for the current 2 months are preliminary. • Prices through 1980 reflect the period of reporting; prices since then reflect the period of loading. Annual averages are the weighted average of the 12 monthly prices, including those prices that were not published. • Cargoes that were purchased on a "netback" basis, or under similar contractual arrangements whereby the actual purchase price is not established at the time the crude is acquired for importation into the United States, are not included in the published data until the actual prices have been determined and reported.

Sources: See end of section.

**Table 9.3 Landed Cost of Crude Oil Imports from Selected Countries<sup>a</sup>**  
(Dollars per Barrel)

	Algeria	Canada	Indonesia	Iran	Mexico	Nigeria	Saudi Arabia	United Kingdom	Venezuela	Other Countries	Arab OPEC <sup>b</sup>	Total OPEC <sup>c</sup>
1973 Average ....	8.39	5.33	7.22	6.48	NA	9.08	5.37	NA	5.99	6.99	5.92	6.85
1974 Average ....	13.97	11.48	13.20	12.48	W	13.16	11.63	NA	11.25	12.93	12.39	12.49
1975 Average ....	12.72	12.72	13.79	12.21	12.61	12.62	12.30	NA	11.65	12.66	12.71	12.70
1976 Average ....	13.81	13.57	13.82	12.82	12.64	13.80	13.04	W	11.80	13.31	13.31	13.32
1977 Average ....	15.20	14.21	14.63	13.80	13.75	15.25	13.61	14.83	13.13	14.56	14.30	14.35
1978 Average ....	14.91	14.50	14.64	13.88	13.54	14.86	13.92	14.53	12.83	14.58	14.36	14.34
1979 Average ....	21.90	20.43	20.69	25.02	20.86	22.96	19.15	22.16	18.18	23.18	20.79	21.29
1980 Average ....	37.90	30.47	33.92	(d)	31.80	37.05	30.02	35.88	25.86	36.02	32.97	33.56
1981 Average ....	40.49	32.16	37.57	(e)	33.78	39.70	34.19	37.24	29.87	38.54	36.22	36.60
1982 Average ....	35.28	26.92	36.75	32.40	28.64	36.17	35.00	34.28	24.82	34.03	35.15	34.81
1983 Average ....	31.26	25.63	31.57	29.81	25.78	30.84	29.76	30.87	22.94	29.68	30.03	29.87
1984 Average ....	29.08	26.59	30.64	28.67	26.87	30.50	29.50	29.60	25.15	29.20	29.12	28.93
1985 Average ....	27.48	25.71	28.67	25.79	25.63	28.96	24.72	28.35	24.43	27.33	25.88	26.85
1986 Average ....	14.82	13.43	14.63	12.38	12.17	15.29	12.84	14.63	11.52	14.25	13.14	13.46
1987 January ....	16.96	14.65	16.24	W	15.92	18.02	15.87	17.47	14.45	17.18	16.08	16.02
February ....	16.70	15.49	18.10	17.79	15.67	18.54	17.80	18.14	14.63	18.11	17.29	16.95
March ....	W	15.72	18.19	17.78	16.32	18.30	17.61	18.02	15.27	17.75	17.49	17.25
April ....	18.06	16.31	18.32	17.87	16.71	18.96	17.69	18.19	16.03	18.06	17.55	17.69
May ....	18.51	17.11	18.38	18.00	18.02	19.29	17.66	19.04	16.24	18.36	17.82	17.82
June ....	W	17.73	19.04	18.37	18.07	19.54	17.80	19.43	16.85	18.65	17.96	18.28
July ....	W	18.61	19.10	18.69	19.08	19.95	17.69	20.38	17.09	19.13	18.02	18.53
August ....	19.05	19.00	19.69	19.00	17.89	20.63	18.01	20.41	16.53	19.45	18.36	18.73
September	18.26	17.81	19.18	18.67	16.61	19.38	17.93	18.96	16.14	18.54	18.11	18.14
October ....	W	17.68	18.97	18.37	16.98	19.45	15.71	19.05	16.26	18.35	16.74	17.41
November ..	18.18	17.38	18.77	W	15.84	19.44	15.59	18.76	15.19	18.13	17.21	17.54
December ..	W	16.13	17.75	NA	13.09	18.50	14.79	17.99	13.90	17.15	15.46	16.05
Average ....	17.87	17.04	18.49	18.28	16.69	19.32	16.81	18.78	15.76	18.30	17.32	17.64
1988 January ....	W	14.58	17.99	W	13.16	17.91	13.23	17.56	13.10	16.34	14.16	14.61
February ....	W	14.37	17.44	NA	13.30	16.48	13.99	16.70	13.05	15.87	14.23	14.59
March ....	W	13.66	15.13	NA	12.22	16.45	14.12	15.72	13.50	15.13	14.35	14.77
April ....	W	14.39	16.30	NA	13.97	16.88	14.12	16.11	14.18	15.77	14.71	15.27
May ....	W	15.12	16.94	NA	14.09	17.00	14.51	16.97	14.24	16.01	15.05	15.50
June ....	W	14.67	16.40	NA	13.21	16.59	13.95	16.29	14.33	15.19	14.34	15.04
July ....	W	13.28	15.11	NA	12.67	15.68	13.17	15.52	13.78	14.68	13.63	14.25
August ....	W	13.13	14.90	NA	12.77	15.55	12.74	15.72	13.28	14.07	13.29	13.82
September	W	12.89	14.05	NA	12.09	14.49	11.87	14.38	12.96	13.21	12.12	12.98
October ....	W	11.73	12.60	NA	10.42	14.32	11.93	13.33	13.65	12.66	11.99	12.74
November ..	W	11.58	12.82	NA	10.56	14.49	12.79	14.02	13.12	12.51	12.44	12.87
December ..	W	12.57	14.05	NA	12.81	16.31	14.62	15.12	14.34	13.97	14.44	14.67
Average ....	W	13.50	15.15	W	12.59	15.87	13.41	15.80	13.66	14.45	13.63	14.21
1989 January ....	W	14.47	16.30	NA	14.48	17.54	15.91	17.17	14.05	15.88	15.74	15.99
February ....	W	14.97	17.86	NA	14.55	18.19	16.60	17.82	14.62	17.22	16.52	16.74
March ....	W	15.88	18.67	NA	15.37	19.32	R 17.00	17.90	17.30	R 18.33	R 17.33	R 17.80
April ....	R 22.13	R 17.42	R 19.11	NA	R 17.75	R 20.53	R 19.21	R 20.00	R 18.45	R 19.48	R 19.20	R 19.39
May ....	W	17.79	19.37	NA	17.34	20.16	17.61	20.26	17.49	19.05	17.88	18.44

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

<sup>b</sup>The Arab members of OPEC are Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and the United Arab Emirates.

<sup>c</sup>"Total OPEC" consists of Ecuador, Gabon, Indonesia, Iran, Nigeria, and Venezuela, as well as the Arab members. The cost of imports from the Neutral Zone between Kuwait and Saudi Arabia is included in the cost of imports from "Total OPEC."

<sup>d</sup>No crude oil was imported.

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

Notes: • Values for the current 2 months are preliminary. • Prices through 1980 reflect the period of reporting; prices since then reflect the period of loading. Annual averages are the weighted average of the 12 monthly prices, including those prices that were not published. • Cargoes that were purchased on a "netback" basis, or under similar contractual arrangements whereby the actual purchase price is not established at the time the crude is acquired for importation into the United States, are not included in the published data until the actual prices have been determined and reported.

Sources: See end of section.

**Table 9.4 U.S. City Average Retail Prices of Motor Gasoline<sup>a</sup>**  
 (Cents per Gallon, Including Taxes)

	Leaded Regular	Unleaded Regular	Unleaded Premium	Average for All Types <sup>b</sup>
<b>1973 Average .....</b>	<b>38.8</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
1974 Average .....	53.2	NA	NA	NA
1975 Average .....	56.7	NA	NA	NA
1976 Average .....	59.0	61.4	NA	NA
1977 Average .....	62.2	65.6	NA	NA
1978 Average .....	62.6	67.0	NA	NA
1979 Average .....	85.7	90.3	NA	65.2
1980 Average .....	119.1	124.5	NA	88.2
1981 Average <sup>c</sup> .....	131.1	137.8	147.0	135.3
1982 Average .....	122.2	129.6	141.5	128.1
1983 Average .....	115.7	124.1	138.3	122.5
1984 Average .....	112.9	121.2	136.6	119.8
1985 Average .....	111.5	120.2	134.0	119.6
1986 Average .....	85.7	92.7	108.5	93.1
<b>1987 January .....</b>	<b>80.6</b>	<b>86.2</b>	<b>100.7</b>	<b>86.8</b>
February .....	84.8	90.5	104.7	91.1
March .....	85.6	91.2	105.2	91.8
April .....	87.9	93.4	107.3	94.0
May .....	88.8	94.1	107.9	94.8
June .....	90.6	95.8	109.8	96.6
July .....	92.1	97.1	111.5	98.0
August .....	94.6	99.5	113.9	100.4
September .....	94.0	99.0	113.6	100.0
October .....	93.1	97.6	112.8	98.8
November .....	92.8	97.6	112.5	98.7
December .....	91.2	96.1	111.9	97.5
<b>Average .....</b>	<b>89.7</b>	<b>94.8</b>	<b>109.3</b>	<b>95.7</b>
<b>1988 January .....</b>	<b>88.1</b>	<b>93.3</b>	<b>109.5</b>	<b>94.7</b>
February .....	85.9	91.3	108.2	92.8
March .....	85.0	90.4	107.4	92.0
April .....	88.3	93.0	108.8	94.6
May .....	91.1	95.5	110.5	97.0
June .....	91.0	95.5	111.1	97.1
July .....	92.3	96.7	112.3	98.4
August .....	94.5	98.7	113.8	100.4
September .....	93.3	97.4	113.0	99.2
October .....	91.0	95.6	111.9	97.5
November .....	90.4	94.9	111.6	97.2
December .....	88.5	93.0	110.1	95.3
<b>Average .....</b>	<b>89.9</b>	<b>94.6</b>	<b>110.7</b>	<b>96.3</b>
<b>1989 January .....</b>	<b>87.6</b>	<b>91.8</b>	<b>109.1</b>	<b>94.4</b>
February .....	88.6	92.6	110.0	95.5
March .....	90.7	94.0	111.5	97.4
April .....	104.7	106.5	122.1	109.8
May .....	109.8	111.9	127.8	115.2
June .....	109.3	111.4	127.8	115.0

<sup>a</sup>See Note 5 at end of section.

<sup>b</sup>Also includes types of gasoline not shown separately.

<sup>c</sup>In September 1981, the Bureau of Labor Statistics changed the weights used in the calculation of average motor gasoline prices. From September 1981 forward, in the average for all types category, gasohol is included and unleaded premium is weighted more heavily.

NA=Not available.

Note: Geographic coverage for 1974 through 1977 is 56 urban areas. For 1978 forward, it is 85 urban areas. • Annual values shown in this table are calculated by EIA as the simple average of the monthly data.

Sources: See end of section.

**Table 9.5 Refiner Sales Prices of Residual Fuel Oil<sup>a</sup>**  
 (Cents per Gallon, Excluding Taxes)

	Residual Fuel Oil Sulfur Content Less Than or Equal to 1 Percent		Residual Fuel Oil Sulfur Content Greater Than 1 Percent		Average	
	Sales for Resale	Sales to End Users	Sales for Resale	Sales to End Users	Sales for Resale	Sales to End Users
1978 Average .....	29.3	31.4	24.5	27.5	26.3	29.8
1979 Average .....	45.0	46.8	36.6	38.9	39.9	43.6
1980 Average .....	60.8	67.5	47.9	52.3	52.8	60.7
1981 Average .....	74.8	82.9	62.2	67.3	66.3	75.6
1982 Average .....	69.5	74.7	57.2	61.1	61.2	67.6
1983 Average .....	64.3	69.5	59.1	61.1	60.9	65.1
1984 Average .....	68.5	72.0	63.9	65.9	65.4	68.7
1985 Average .....	61.0	64.4	56.0	58.2	57.7	61.0
1986 Average .....	32.8	37.2	28.9	31.7	30.5	34.3
<b>1987 January .....</b>	<b>39.3</b>	<b>45.5</b>	<b>35.7</b>	<b>37.9</b>	<b>37.4</b>	<b>42.0</b>
February .....	40.0	43.8	34.4	38.3	37.1	41.2
March .....	38.8	43.4	33.4	37.2	35.8	40.0
April .....	39.7	43.9	35.5	39.9	37.1	42.0
May .....	41.1	44.9	38.6	41.7	39.6	43.4
June .....	43.7	45.8	40.6	43.5	42.0	44.8
July .....	44.9	48.3	41.9	44.1	43.4	46.4
August .....	44.6	46.0	41.4	44.0	42.9	45.0
September .....	41.4	44.0	36.8	39.7	39.1	41.7
October .....	41.3	44.5	36.3	39.5	38.8	41.9
November .....	41.3	45.0	34.6	38.7	37.5	42.1
December .....	39.2	41.4	28.2	33.0	33.9	37.8
<b>Average .....</b>	<b>41.2</b>	<b>44.7</b>	<b>36.2</b>	<b>39.6</b>	<b>38.5</b>	<b>42.3</b>
<b>1988 January .....</b>	<b>36.6</b>	<b>41.8</b>	<b>27.8</b>	<b>31.8</b>	<b>32.3</b>	<b>36.7</b>
February .....	35.3	40.2	27.3	31.5	32.0	35.6
March .....	32.3	36.9	25.0	29.1	28.4	32.9
April .....	33.7	35.8	27.5	30.2	30.0	32.4
May .....	34.1	36.8	29.5	32.1	31.3	33.8
June .....	32.9	35.3	28.8	32.3	30.9	33.6
July .....	32.0	35.7	26.5	30.0	29.0	32.3
August .....	32.7	36.0	28.3	30.7	30.7	33.2
September .....	31.4	34.7	26.7	30.1	28.7	32.1
October .....	29.2	34.4	22.0	26.7	25.0	30.5
November .....	31.9	36.1	23.9	27.2	27.8	32.3
December .....	35.6	38.8	25.7	28.6	29.3	34.3
<b>Average .....</b>	<b>33.3</b>	<b>37.2</b>	<b>26.5</b>	<b>30.0</b>	<b>29.7</b>	<b>33.4</b>
<b>1989 January .....</b>	<b>37.8</b>	<b>41.7</b>	<b>29.2</b>	<b>31.3</b>	<b>32.6</b>	<b>36.3</b>
February .....	36.5	39.8	28.9	30.2	32.3	34.9
March .....	38.0	41.8	27.5	30.1	32.2	36.8
April .....	43.9	46.6	R 33.2	35.5	R 38.2	41.2
May .....	42.9	46.5	34.5	37.0	37.7	41.3

<sup>a</sup>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 commercial customers.

R=Revised data.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Values for the current month are preliminary. • Prices prior to 1983 are Energy Information Administration estimates. See Note 6 at end of section.

Sources: See end of section.

**Table 9.6 Refiner Sales Prices of Petroleum Products for Resale<sup>a</sup>**  
 (Cents per Gallon, Excluding Taxes)

	Finished Motor Gasoline <sup>b</sup>	Finished Aviation Gasoline	Kerosene- Type Jet Fuel	Kerosene	No. 2 Fuel Oil	No. 2 Diesel Fuel	Propane (Consumer Grade)
1978 Average .....	43.4	53.7	38.6	40.4	36.9	36.5	23.7
1979 Average .....	63.7	72.1	66.0	62.4	56.9	57.4	29.1
1980 Average .....	94.1	112.8	86.8	86.4	80.3	80.1	41.5
1981 Average .....	106.4	125.0	101.2	106.6	97.6	97.2	46.6
1982 Average .....	97.3	122.8	95.3	101.8	91.4	91.4	42.7
1983 Average .....	88.2	117.8	85.4	89.2	81.5	80.8	48.4
1984 Average .....	83.2	116.5	83.0	91.6	82.1	80.3	45.0
1985 Average .....	83.5	113.0	79.4	87.4	77.6	77.2	39.8
1986 Average .....	53.1	91.2	49.5	60.6	48.6	45.2	29.0
1987 January .....	53.3	82.9	49.0	59.2	50.6	49.5	25.0
February .....	55.1	84.9	49.7	56.6	49.3	49.6	24.4
March .....	56.3	83.6	49.1	54.2	49.0	48.7	23.6
April .....	57.8	84.1	50.2	55.6	49.4	49.7	24.4
May .....	59.5	85.2	51.6	55.6	51.5	52.1	24.0
June .....	60.8	86.9	52.7	55.4	52.6	53.1	23.6
July .....	62.5	86.6	55.3	57.0	54.9	55.1	24.4
August .....	63.8	86.9	57.0	59.0	55.1	57.1	25.6
September .....	60.6	86.8	55.9	58.6	53.3	56.0	26.1
October .....	60.5	86.9	58.0	62.7	56.7	58.1	26.8
November .....	59.9	87.2	58.6	63.5	57.0	57.9	27.1
December .....	55.3	86.3	55.6	60.7	54.2	53.8	26.0
Average .....	58.9	85.9	53.8	59.2	52.7	53.4	25.2
1988 January .....	53.7	86.0	53.0	59.3	52.1	51.2	26.7
February .....	53.9	84.2	52.1	57.2	48.9	49.1	26.4
March .....	53.8	84.4	50.2	54.3	47.8	49.1	25.4
April .....	58.4	84.6	50.3	54.2	50.8	51.5	25.0
May .....	59.8	85.2	51.1	53.3	50.1	51.3	24.6
June .....	59.2	85.3	50.7	49.9	46.6	47.8	24.1
July .....	62.3	86.3	47.5	48.3	43.3	43.4	21.7
August .....	61.3	88.9	47.8	48.9	44.3	45.0	21.9
September .....	58.0	86.0	47.0	49.8	43.2	44.8	22.4
October .....	57.3	84.0	45.2	49.4	41.9	42.0	22.0
November .....	58.1	83.5	46.8	52.9	45.1	44.6	22.0
December .....	54.9	84.0	50.1	57.8	49.9	48.0	22.8
Average .....	57.7	85.2	49.4	54.9	47.3	47.3	23.9
1989 January .....	58.3	84.0	56.3	63.1	53.2	51.1	24.0
February .....	57.5	86.0	55.2	59.5	51.0	52.9	22.7
March .....	61.2	86.6	56.5	61.3	54.4	56.0	22.5
April .....	74.2	94.2	R 59.4	60.3	56.5	59.9	R 22.6
May .....	78.5	102.0	56.6	55.9	52.6	54.1	22.1

<sup>a</sup>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.

<sup>b</sup>See Note 5 at end of section.

R=Revised data.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Values for the current month are preliminary. • Prices prior to 1983 are Energy Information Administration estimates. See Note 6 at end of section.

Sources: See end of section.

**Table 9.7 Refiner Sales Prices of Petroleum Products to End Users<sup>a</sup>**  
 (Cents per Gallon, Excluding Taxes)

	Finished Motor Gasoline <sup>b</sup>	Finished Aviation Gasoline	Kerosene- Type Jet Fuel	Kerosene	No. 2 Fuel Oil	No. 2 Diesel Fuel	Propane (Consumer Grade)
<b>1978 Average .....</b>	<b>48.4</b>	<b>51.6</b>	<b>38.7</b>	<b>42.1</b>	<b>40.0</b>	<b>37.7</b>	<b>33.5</b>
<b>1979 Average .....</b>	<b>71.3</b>	<b>68.9</b>	<b>54.7</b>	<b>58.5</b>	<b>51.6</b>	<b>58.5</b>	<b>35.7</b>
<b>1980 Average .....</b>	<b>103.5</b>	<b>108.4</b>	<b>86.8</b>	<b>90.2</b>	<b>78.8</b>	<b>81.8</b>	<b>48.2</b>
<b>1981 Average .....</b>	<b>114.7</b>	<b>130.3</b>	<b>102.4</b>	<b>112.3</b>	<b>91.4</b>	<b>99.5</b>	<b>56.5</b>
<b>1982 Average .....</b>	<b>106.0</b>	<b>131.2</b>	<b>96.3</b>	<b>108.9</b>	<b>90.5</b>	<b>94.2</b>	<b>59.2</b>
<b>1983 Average .....</b>	<b>95.4</b>	<b>125.5</b>	<b>87.8</b>	<b>96.1</b>	<b>91.6</b>	<b>82.8</b>	<b>70.9</b>
<b>1984 Average .....</b>	<b>90.7</b>	<b>123.4</b>	<b>84.2</b>	<b>103.6</b>	<b>91.6</b>	<b>82.3</b>	<b>73.7</b>
<b>1985 Average .....</b>	<b>91.2</b>	<b>120.1</b>	<b>79.6</b>	<b>103.0</b>	<b>84.9</b>	<b>78.9</b>	<b>71.7</b>
<b>1986 Average .....</b>	<b>62.4</b>	<b>101.1</b>	<b>52.9</b>	<b>79.0</b>	<b>56.0</b>	<b>47.8</b>	<b>74.5</b>
<b>1987 January .....</b>	<b>59.7</b>	<b>87.9</b>	<b>45.9</b>	<b>82.8</b>	<b>58.3</b>	<b>50.7</b>	<b>73.3</b>
February .....	62.1	89.7	49.2	80.4	58.9	51.7	74.1
March .....	62.7	90.3	50.0	82.0	55.1	51.0	72.5
April .....	64.9	89.8	51.0	78.2	55.0	51.5	71.4
May .....	66.3	90.6	52.4	66.8	54.7	53.3	71.2
June .....	67.7	91.3	53.4	59.8	54.7	54.3	65.8
July .....	69.6	91.5	55.7	60.4	56.6	56.3	64.6
August .....	71.6	92.4	58.2	60.2	57.9	58.1	67.4
September .....	70.5	91.9	58.3	77.0	56.3	57.0	66.6
October .....	69.7	91.4	59.5	78.8	60.7	59.5	65.4
November .....	69.4	91.0	59.9	83.1	63.2	60.4	71.1
December .....	67.4	90.0	58.2	87.9	63.0	57.3	71.7
<b>Average .....</b>	<b>66.9</b>	<b>90.7</b>	<b>54.3</b>	<b>77.0</b>	<b>58.1</b>	<b>55.1</b>	<b>70.1</b>
<b>1988 January .....</b>	<b>64.3</b>	<b>88.0</b>	<b>58.2</b>	<b>84.1</b>	<b>62.1</b>	<b>54.0</b>	<b>72.7</b>
February .....	62.8	87.9	54.8	84.7	60.0	51.8	75.2
March .....	62.4	87.8	53.9	77.5	57.8	51.3	73.1
April .....	66.0	87.6	52.1	82.2	58.5	53.8	68.9
May .....	68.4	89.9	53.0	61.2	55.5	53.7	64.4
June .....	68.1	87.2	52.7	55.4	49.3	50.8	69.5
July .....	69.9	90.3	50.3	56.0	48.3	47.3	70.7
August .....	71.8	93.0	49.1	56.3	47.7	47.3	68.8
September .....	70.0	91.7	48.4	66.1	48.3	47.3	69.9
October .....	68.0	89.4	46.3	71.8	48.0	45.4	69.4
November .....	67.6	89.6	47.5	71.1	51.5	47.4	71.5
December .....	68.1	89.4	51.1	74.1	58.1	50.5	73.5
<b>Average .....</b>	<b>67.2</b>	<b>89.4</b>	<b>51.2</b>	<b>73.8</b>	<b>54.3</b>	<b>50.0</b>	<b>71.3</b>
<b>1989 January .....</b>	<b>65.8</b>	<b>89.1</b>	<b>58.2</b>	<b>71.4</b>	<b>58.3</b>	<b>53.5</b>	<b>66.2</b>
February .....	66.2	89.7	57.0	72.2	55.9	54.3	64.1
March .....	68.6	90.5	57.9	67.6	57.7	58.9	61.8
April .....	81.9	99.0	60.6	66.2	59.4	60.6	R 55.3
May .....	85.8	106.9	58.1	59.7	54.5	56.9	52.7

<sup>a</sup>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.

<sup>b</sup>See Note 5 at end of section.

R=Revised data.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Values for the current month are preliminary. • Prices prior to 1983 are Energy Information Administration estimates. See Note 6 at end of section.

Sources: See end of section.

**Table 9.8a Sales Prices of No. 2 Distillate to Residences for Selected States<sup>a</sup>**  
 (Cents per Gallon, Excluding Taxes)

	CT	ME	MA	NH	RI	VT	DE	DC
1978 Average .....	50.1	48.6	48.8	50.3	50.7	50.8	47.8	50.7
1979 Average .....	72.0	68.8	70.9	72.5	72.8	72.5	68.2	74.2
1980 Average .....	98.3	96.3	97.8	100.4	101.1	101.5	95.4	102.6
1981 Average .....	121.7	120.4	121.3	123.7	123.8	125.4	117.3	127.4
1982 Average .....	118.3	115.5	117.6	117.4	120.1	120.1	111.3	124.5
1983 Average .....	109.1	102.8	109.1	104.1	110.5	112.9	106.0	117.0
1984 Average .....	112.1	103.9	111.6	108.4	111.4	111.9	109.6	118.7
1985 Average .....	108.0	99.7	107.0	102.4	106.7	107.7	104.6	114.3
1986 Average .....	89.0	74.4	82.1	75.9	82.8	86.6	85.0	93.1
<b>1987 January .....</b>	<b>80.0</b>	<b>72.7</b>	<b>80.5</b>	<b>76.2</b>	<b>79.8</b>	<b>78.2</b>	<b>78.1</b>	<b>87.3</b>
February .....	83.4	73.1	80.3	75.4	81.5	79.5	79.4	92.6
March .....	82.2	74.2	79.6	74.0	81.5	79.1	79.4	91.9
April .....	82.4	75.0	79.0	73.5	81.4	78.4	77.9	91.6
May .....	82.8	74.9	79.9	74.7	80.8	79.8	78.4	91.0
June .....	81.6	74.1	78.6	74.4	79.5	79.9	74.8	92.3
July .....	82.2	74.5	78.7	74.3	80.5	80.8	74.7	90.2
August .....	82.0	74.8	77.2	75.7	79.4	80.3	74.8	92.4
September .....	82.5	74.7	78.9	76.0	80.5	81.1	76.2	91.4
October .....	84.3	73.4	81.0	78.0	83.0	83.5	78.8	92.1
November .....	87.3	75.2	83.1	79.3	86.2	84.3	82.4	93.5
December .....	87.8	79.1	83.7	81.9	87.1	84.9	82.5	95.3
Average .....	83.4	74.7	80.6	76.5	82.5	81.1	79.3	91.8
<b>1988 January .....</b>	<b>89.2</b>	<b>80.1</b>	<b>85.7</b>	<b>82.4</b>	<b>88.1</b>	<b>85.9</b>	<b>83.7</b>	<b>95.8</b>
February .....	88.5	79.6	84.1	81.6	87.0	85.6	83.1	95.5
March .....	87.5	79.1	83.3	80.3	85.2	84.8	NA	92.8
April .....	88.1	78.6	83.1	79.0	85.6	85.3	82.8	90.8
May .....	86.6	77.5	82.4	78.3	85.1	84.9	82.3	91.9
June .....	86.6	75.4	77.7	79.3	81.6	83.4	80.9	90.4
July .....	83.6	73.3	76.2	76.5	76.3	81.4	73.4	84.8
August .....	81.9	75.7	74.1	73.7	79.7	81.1	73.5	84.6
September .....	80.8	71.8	79.2	74.0	79.7	77.5	71.1	84.7
October .....	79.9	69.0	77.8	71.9	76.7	76.4	70.4	83.1
November .....	80.5	72.0	78.0	73.1	80.1	77.2	73.5	84.5
December .....	84.4	80.2	82.8	77.9	83.9	81.6	79.6	88.6
Average .....	85.3	77.6	82.0	78.6	84.4	82.5	79.7	90.9
<b>1989 January .....</b>	<b>88.5</b>	<b>85.5</b>	<b>87.1</b>	<b>83.0</b>	<b>87.4</b>	<b>86.0</b>	<b>84.4</b>	<b>94.0</b>
February .....	88.8	87.3	86.3	83.8	88.3	86.9	84.1	95.1
March .....	89.8	88.2	88.1	84.8	90.0	88.2	82.9	96.0
April .....	89.4	87.2	87.8	83.2	89.9	87.8	84.8	NA
May .....	88.1	80.9	86.8	83.1	88.8	86.7	83.5	92.1

<sup>a</sup>The States are listed by geographic region of the country. State names are abbreviated as follows: CT - Connecticut, ME - Maine, MA - Massachusetts, NH - New Hampshire, RI - Rhode Island, VT - Vermont, DE - Delaware, DC - District of Columbia, MD - Maryland, NJ - New Jersey, NY - New York, PA - Pennsylvania, VA - Virginia, WV - West Virginia, IL - Illinois, IN - Indiana, MI - Michigan, MN - Minnesota, OH - Ohio, WI - Wisconsin, ID - Idaho, AK - Alaska, OR - Oregon, WA - Washington.

Footnotes continued on following page.

**Table 9.8b Sales Prices of No. 2 Distillate to Residences for Selected States<sup>a</sup>  
(continued)  
(Cents per Gallon, Excluding Taxes)**

	MD	NJ	NY	PA	VA	WV	IL	IN
1978 Average .....	49.2	49.6	50.1	48.8	49.1	46.2	46.5	46.5
1979 Average .....	70.1	71.0	71.2	69.8	70.4	65.1	68.8	72.7
1980 Average .....	97.9	97.9	98.2	96.4	98.5	92.2	95.8	99.6
1981 Average .....	121.4	121.5	123.2	118.1	120.5	115.0	114.9	118.5
1982 Average .....	117.1	117.4	120.5	113.7	117.7	109.3	110.9	114.3
1983 Average .....	110.3	107.9	112.1	105.8	108.7	101.0	100.4	100.7
1984 Average .....	113.5	111.0	115.5	107.9	110.5	102.1	100.1	103.1
1985 Average .....	108.8	105.9	111.3	102.3	106.3	98.0	97.5	98.1
1986 Average .....	91.4	90.2	91.1	81.4	86.6	74.6	NA	74.8
1987 January .....	82.0	83.5	84.0	75.2	75.8	75.6	76.9	73.0
February .....	84.8	84.7	85.0	76.0	79.6	77.6	78.1	72.3
March .....	85.4	83.0	84.4	74.6	80.1	75.2	78.3	71.2
April .....	84.4	82.6	84.3	74.1	81.3	73.2	78.3	73.1
May .....	83.7	82.0	84.9	73.2	79.6	74.8	80.1	75.8
June .....	85.8	82.1	83.5	70.8	77.8	74.2	80.5	75.9
July .....	87.2	82.4	82.7	72.6	78.5	74.2	79.9	76.7
August .....	87.1	81.8	83.4	73.9	77.9	75.6	83.7	77.1
September .....	87.3	82.5	82.8	74.8	78.8	74.6	79.4	77.1
October .....	88.4	84.2	85.3	77.7	81.0	74.9	87.3	79.4
November .....	90.4	86.3	87.4	80.8	82.9	78.3	88.2	80.8
December .....	90.6	87.2	88.0	81.7	82.5	80.5	85.2	79.6
Average .....	86.6	84.3	85.2	76.9	79.5	76.4	79.8	75.4
1988 January .....	90.9	88.1	89.2	83.4	82.2	78.7	85.4	79.9
February .....	90.3	87.7	88.7	82.6	81.8	76.0	86.1	76.9
March .....	88.2	86.7	87.5	81.6	82.6	75.5	86.1	76.7
April .....	89.1	85.7	86.7	81.1	82.8	75.5	87.4	79.6
May .....	87.9	85.4	85.0	79.7	81.7	73.6	86.7	77.0
June .....	86.8	82.5	83.6	75.3	79.1	71.8	82.9	78.9
July .....	85.0	80.9	82.1	71.6	77.4	70.5	83.8	73.8
August .....	84.2	78.3	78.3	64.5	77.1	67.9	80.5	73.7
September .....	76.1	75.7	81.1	68.9	76.0	68.9	67.6	69.5
October .....	78.0	77.8	81.2	70.1	75.0	71.4	68.6	71.0
November .....	81.4	78.8	83.3	72.4	77.2	74.1	70.6	72.1
December .....	85.1	84.0	87.8	77.4	79.9	74.4	73.0	75.1
Average .....	87.0	84.8	86.4	78.4	80.2	74.3	77.5	75.4
1989 January .....	88.0	87.3	90.9	81.8	82.9	76.1	76.6	77.9
February .....	88.7	87.0	92.1	82.2	82.3	78.0	75.8	77.2
March .....	89.3	88.9	93.2	83.2	82.4	77.1	76.5	77.9
April .....	R 90.6	87.8	93.7	83.2	R 82.1	R 77.0	79.8	R 80.2
May .....	89.6	87.1	92.8	82.2	82.6	77.1	79.0	78.1

Footnotes continued on following page.

**Table 9.8c Sales Prices of No. 2 Distillate to Residences for Selected States<sup>a</sup> (continued)**  
**(Cents per Gallon, Excluding Taxes)**

	MI	MN	OH	WI	ID	AK	OR	WA	U.S. Average
<b>1978 Average .....</b>	<b>47.9</b>	<b>47.8</b>	<b>47.4</b>	<b>44.7</b>	<b>43.6</b>	<b>53.2</b>	<b>45.8</b>	<b>48.6</b>	<b>49.0</b>
<b>1979 Average .....</b>	<b>70.9</b>	<b>72.4</b>	<b>68.6</b>	<b>67.3</b>	<b>62.1</b>	<b>68.2</b>	<b>68.0</b>	<b>69.7</b>	<b>70.4</b>
<b>1980 Average .....</b>	<b>97.8</b>	<b>99.9</b>	<b>91.9</b>	<b>91.5</b>	<b>91.6</b>	<b>97.8</b>	<b>97.3</b>	<b>100.8</b>	<b>97.4</b>
<b>1981 Average .....</b>	<b>118.3</b>	<b>118.4</b>	<b>113.2</b>	<b>109.1</b>	<b>110.4</b>	<b>118.0</b>	<b>111.4</b>	<b>116.5</b>	<b>119.4</b>
<b>1982 Average .....</b>	<b>113.9</b>	<b>115.1</b>	<b>110.2</b>	<b>107.8</b>	<b>110.4</b>	<b>117.4</b>	<b>111.6</b>	<b>117.6</b>	<b>116.0</b>
<b>1983 Average .....</b>	<b>106.4</b>	<b>103.1</b>	<b>101.3</b>	<b>101.2</b>	<b>101.8</b>	<b>108.8</b>	<b>103.6</b>	<b>109.0</b>	<b>107.8</b>
<b>1984 Average .....</b>	<b>105.0</b>	<b>104.1</b>	<b>102.1</b>	<b>101.0</b>	<b>98.5</b>	<b>106.9</b>	<b>99.3</b>	<b>102.6</b>	<b>109.1</b>
<b>1985 Average .....</b>	<b>102.1</b>	<b>101.9</b>	<b>98.7</b>	<b>98.3</b>	<b>97.2</b>	<b>108.3</b>	<b>97.1</b>	<b>101.1</b>	<b>105.3</b>
<b>1986 Average .....</b>	<b>81.0</b>	<b>79.2</b>	<b>77.7</b>	<b>75.6</b>	<b>73.8</b>	<b>94.9</b>	<b>70.4</b>	<b>77.5</b>	<b>83.6</b>
<b>1987 January .....</b>	<b>76.6</b>	<b>71.8</b>	<b>71.1</b>	<b>72.6</b>	<b>63.1</b>	<b>86.4</b>	<b>68.1</b>	<b>73.0</b>	<b>78.5</b>
February .....	76.7	71.7	73.3	73.9	65.1	86.9	71.4	75.9	79.9
March .....	76.1	71.6	71.9	74.0	65.7	83.3	70.9	76.1	79.1
April .....	74.7	71.8	71.1	74.1	65.4	76.5	70.3	75.9	78.7
May .....	75.1	72.4	70.9	71.6	65.2	78.2	69.5	74.0	78.6
June .....	76.1	72.7	75.0	74.3	70.0	84.6	67.6	74.2	77.8
July .....	77.1	75.5	76.5	73.5	70.5	87.5	NA	77.4	78.7
August .....	77.4	75.9	73.4	74.5	74.9	88.7	NA	79.3	78.8
September .....	77.4	74.4	74.6	74.3	77.3	89.5	77.1	81.2	78.9
October .....	78.1	78.9	76.9	77.5	76.3	92.6	75.1	82.8	81.2
November .....	80.9	79.7	79.1	79.3	77.3	92.3	74.7	84.3	83.5
December .....	80.2	77.0	78.7	78.4	76.8	90.6	75.8	84.8	84.0
<b>Average .....</b>	<b>77.5</b>	<b>74.6</b>	<b>74.7</b>	<b>75.1</b>	<b>68.8</b>	<b>86.5</b>	<b>72.5</b>	<b>79.5</b>	<b>80.3</b>
<b>1988 January .....</b>	<b>81.6</b>	<b>76.9</b>	<b>76.7</b>	<b>77.2</b>	<b>74.5</b>	<b>88.4</b>	<b>75.9</b>	<b>82.8</b>	<b>84.9</b>
February .....	80.8	75.7	76.5	76.4	72.3	87.4	75.0	82.1	84.0
March .....	78.4	74.8	76.5	76.1	70.8	89.1	74.3	81.9	83.3
April .....	78.6	74.7	77.3	78.1	73.6	88.8	74.4	82.5	83.2
May .....	77.0	74.5	74.7	76.6	72.7	89.4	74.8	82.4	81.9
June .....	73.7	73.6	72.4	74.3	70.5	87.8	74.0	77.6	79.3
July .....	73.4	75.8	70.0	72.9	67.6	85.4	66.6	72.7	77.0
August .....	74.0	72.3	69.2	71.4	64.5	85.4	64.4	69.8	74.0
September .....	74.6	72.3	71.4	69.4	67.5	88.2	64.7	73.7	75.3
October .....	76.7	70.7	71.1	67.8	66.8	86.6	62.5	70.4	75.3
November .....	75.3	72.4	73.5	69.9	66.6	85.7	62.3	72.7	77.4
December .....	76.6	72.8	75.6	71.6	66.9	86.0	64.3	75.0	81.6
<b>Average .....</b>	<b>77.6</b>	<b>74.3</b>	<b>74.7</b>	<b>74.0</b>	<b>68.9</b>	<b>87.3</b>	<b>70.9</b>	<b>78.4</b>	<b>81.4</b>
<b>1989 January .....</b>	<b>79.1</b>	<b>75.4</b>	<b>78.0</b>	<b>73.9</b>	<b>68.0</b>	<b>87.0</b>	<b>66.7</b>	<b>76.5</b>	<b>85.0</b>
February .....	79.4	75.7	76.7	74.0	71.4	91.2	76.8	86.0	85.5
March .....	81.6	77.0	77.5	75.6	78.2	96.0	84.3	92.9	87.1
April .....	83.1	R 82.3	79.4	76.3	85.8	99.5	87.4	R 94.1	87.8
May .....	83.0	82.1	78.5	78.0	83.5	100.8	79.7	86.6	86.7

Footnotes continued.

R=Revised data. NA=Not available.

Notes: • Values for the current month are preliminary. • Prices prior to 1983 are Energy Information Administration estimates. See Note 6 at end of section.

Sources: See end of section.

**Table 9.9 Retail Prices<sup>a</sup> of Electricity  
(Cents per kilowatthour)**

	Residential		Commercial		Industrial		Other		Total <sup>b</sup>	
	Old Series <sup>c</sup>	New Series								
1973 Average .....	2.54		2.41		1.25		2.10		1.96	
1974 Average .....	3.10		3.04		1.69		2.75		2.49	
1975 Average .....	3.51		3.45		2.07		3.08		2.92	
1976 Average .....	3.73		3.69		2.21		3.27		3.09	
1977 Average .....	4.05		4.09		2.50		3.51		3.42	
1978 Average .....	4.31		4.36		2.79		3.62		3.69	
1979 Average .....	4.64		4.68		3.05		3.96		3.99	
1980 Average .....	5.36		5.48		3.69		4.76		4.73	
1981 Average .....	6.20		6.29		4.29		5.28		5.46	
1982 Average .....	6.86		6.86		4.95		5.92		6.13	
1983 Average .....	7.18		7.02		4.86		6.38		6.30	
1984 Average .....	7.54		7.33		5.04		6.78		6.52	
1985 Average .....	7.79		7.47		5.16		6.96		6.71	
1986 Averaged <sup>d</sup> .....	7.79	7.41	7.41	7.13	5.10	4.90	7.09	6.64	6.70	6.42
1987 January .....	7.24	6.93	7.06	6.86	4.84	4.71	6.86	6.46	6.40	6.18
February .....	7.29	6.95	7.06	6.86	4.78	4.64	6.86	6.53	6.35	6.13
March .....	7.47	7.14	7.16	6.96	4.79	4.67	6.88	6.54	6.40	6.19
April .....	7.61	7.26	7.18	6.94	4.75	4.62	7.45	6.87	6.40	6.17
May .....	7.79	7.47	7.16	6.92	4.79	4.65	6.97	6.56	6.44	6.22
June .....	8.15	7.80	7.36	7.09	4.97	4.79	7.13	6.77	6.75	6.49
July .....	8.27	7.80	7.40	7.07	5.12	4.90	7.02	6.66	6.94	6.61
August .....	8.22	7.76	7.39	7.10	5.06	4.85	7.07	6.70	6.92	6.60
September .....	8.12	7.66	7.42	7.13	5.00	4.80	7.13	6.90	6.78	6.48
October .....	7.98	7.63	7.45	7.20	4.85	4.72	7.12	6.83	6.61	6.38
November .....	7.66	7.39	7.26	7.06	4.68	4.59	6.88	6.46	6.39	6.20
December .....	7.37	7.09	7.03	6.86	4.70	4.60	6.80	6.43	6.32	6.14
Average .....	7.78	7.41	7.25	7.01	4.86	4.72	7.01	6.64	6.57	6.32
1988 January .....	7.16	6.92	6.92	6.81	4.67	4.48	6.63	5.90	6.28	6.09
February .....	7.25	6.98	6.99	6.85	4.65	4.50	6.71	6.49	6.28	6.11
March .....	7.39	7.13	7.02	6.90	4.62	4.46	6.82	6.37	6.28	6.10
April .....	7.58	7.30	6.98	6.86	4.60	4.44	6.90	6.09	6.26	6.07
May .....	7.89	7.58	7.10	6.96	4.61	4.43	6.97	5.90	6.36	6.13
June .....	8.17	7.86	7.36	7.19	4.84	4.66	6.89	5.94	6.68	6.44
July .....	8.23	7.92	7.19	7.04	5.28	5.00	6.92	5.51	6.91	6.61
August .....	8.32	7.95	7.21	7.07	5.27	5.02	6.89	5.38	6.96	6.65
September .....	8.20	7.84	7.45	7.26	5.00	4.77	6.92	5.94	6.83	6.56
October .....	8.00	7.71	7.42	7.25	4.81	4.61	6.81	6.24	6.60	6.37
November .....	7.72	7.47	7.07	6.96	4.58	4.44	6.68	6.32	6.32	6.16
December .....	7.53	7.28	6.97	6.88	4.57	4.50	6.70	6.64	6.31	6.19
Average .....	7.79	7.49	7.15	7.01	4.80	4.62	6.82	6.01	6.52	6.30
1989 January .....	7.44	7.16	6.97	6.89	4.65	4.55	6.63	6.46	6.37	6.21
February .....	7.47	7.17	7.07	6.97	4.69	4.62	6.91	6.83	6.39	6.25
March .....	7.52	7.24	7.07	6.98	4.69	4.61	6.82	6.62	6.40	6.25
April .....	7.81	7.52	7.16	7.08	4.70	4.61	6.92	6.45	6.44	6.28
May .....	8.01	7.72	7.23	7.14	4.73	4.62	6.98	6.24	6.50	6.31
5-Month Average ....	7.63	7.34	7.10	7.01	4.69	4.60	6.85	6.51	6.42	6.26
1988 5-Month Average ....	7.42	7.15	7.00	6.88	4.83	4.46	6.80	6.14	6.29	6.10
1987 5-Month Average ....	7.46	7.13	7.12	6.91	4.79	4.66	7.00	6.59	6.40	6.18

<sup>a</sup>Prices are calculated by dividing revenues by sales. Revenues may not correspond to sales for a particular month because of utility billing and accounting procedures. This could result in uncharacteristic increases or decreases in the monthly prices.

<sup>b</sup>Average price for total sales to ultimate consumers.

<sup>c</sup>Data through 1979 cover privately owned electric utilities in Classes A and B. Data for 1980 forward cover selected privately owned electric utilities in Class A whose electric operating revenues were \$100 million or more during the previous year.

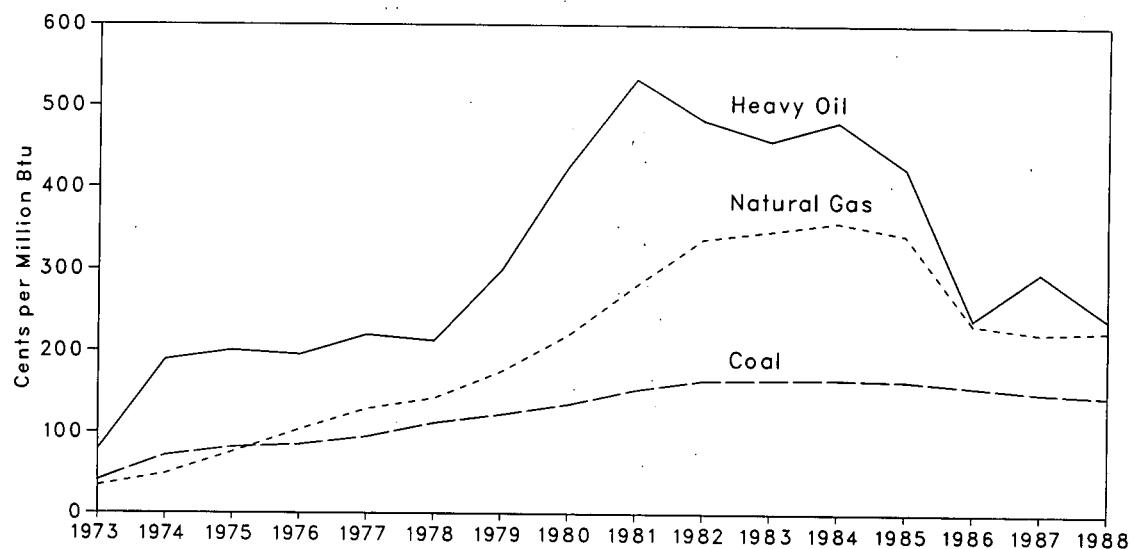
<sup>d</sup>See Note 7 at end of section.

Note: Geographic coverage is the 50 States and the District of Columbia.

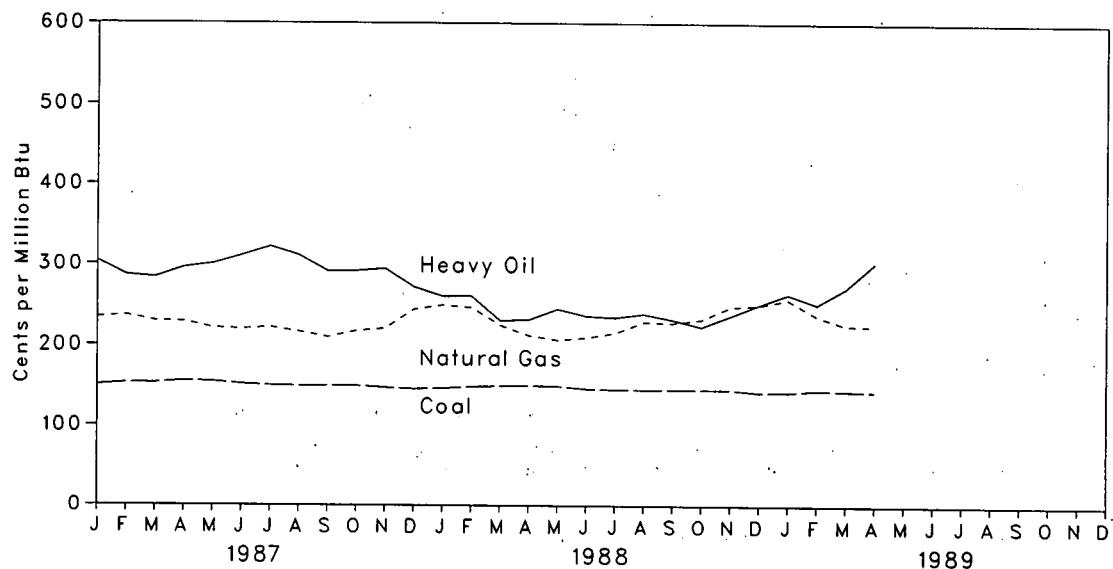
Sources: See end of section.

**Figure 9.4 Cost of Fossil Fuels Delivered to Steam-Electric Utility Plants**

Yearly



Monthly



**Table 9.10 Cost of Fossil Fuels Delivered to Steam-Electric Utility Plants<sup>a</sup>**  
 (Cents per million Btu)

	Coal	Heavy Oil <sup>b</sup>	Natural Gas <sup>c</sup>	All Fossil Fuels <sup>b</sup>
1973 Average .....	40.5	78.5	33.8	47.6
1974 Average .....	70.9	189.0	48.2	91.4
1975 Average .....	81.4	200.5	75.2	104.4
1976 Average .....	84.8	195.2	103.4	111.9
1977 Average .....	94.7	219.8	129.1	129.7
1978 Average .....	111.6	212.5	142.2	141.1
1979 Average .....	122.4	298.8	174.9	163.9
1980 Average .....	135.1	426.7	219.9	192.8
1981 Average .....	153.2	533.4	280.5	225.6
1982 Average .....	164.7	483.2	337.6	224.9
1983 Average .....	165.6	457.8	347.4	220.6
1984 Average .....	166.4	481.2	358.3	219.2
1985 Average .....	164.8	424.4	343.1	209.6
1986 Average .....	157.9	240.1	234.4	175.0
1987 January .....	150.4	304.1	233.8	173.3
February .....	152.7	286.5	236.3	172.1
March .....	152.6	283.6	229.3	170.0
April .....	155.2	295.6	228.6	174.2
May .....	154.4	300.4	221.2	172.7
June .....	151.6	310.6	219.8	172.3
July .....	150.0	321.7	221.9	177.3
August .....	149.3	310.8	216.6	172.6
September .....	149.6	291.1	209.9	166.1
October .....	149.6	291.7	217.5	165.6
November .....	147.4	294.5	220.6	166.1
December .....	145.8	271.9	244.2	166.8
Average .....	150.6	297.6	223.5	170.7
1988 January .....	146.6	260.6	249.6	167.4
February .....	148.8	261.0	246.6	169.5
March .....	149.4	230.2	224.8	165.8
April .....	150.0	231.5	212.3	163.0
May .....	149.6	245.0	206.8	163.3
June .....	146.4	236.2	209.7	162.4
July .....	145.6	234.5	215.8	165.5
August .....	145.4	239.0	229.2	167.2
September .....	145.5	232.0	228.0	163.2
October .....	145.6	223.6	232.2	161.6
November .....	145.6	236.8	248.3	163.4
December .....	142.3	251.2	250.3	162.2
Average .....	146.7	240.3	226.5	164.5
1989 January .....	142.7	264.1	257.5	164.9
February .....	145.3	251.6	236.9	164.7
March .....	144.4	271.8	225.6	165.0
April .....	143.6	303.0	224.6	166.6
4-Month Average .....	143.9	271.9	233.8	165.3
1988 4-Month Average .....	148.7	247.4	232.1	166.4
1987 4-Month Average .....	152.7	293.2	231.7	172.4

<sup>a</sup>Data through 1982 cover all steam-electric utility plants with a capacity of 25 megawatts or greater. From 1974 through 1982, data include peaking units. Beginning with 1983, data cover steam-electric utility plants with a capacity of 50 megawatts or greater.

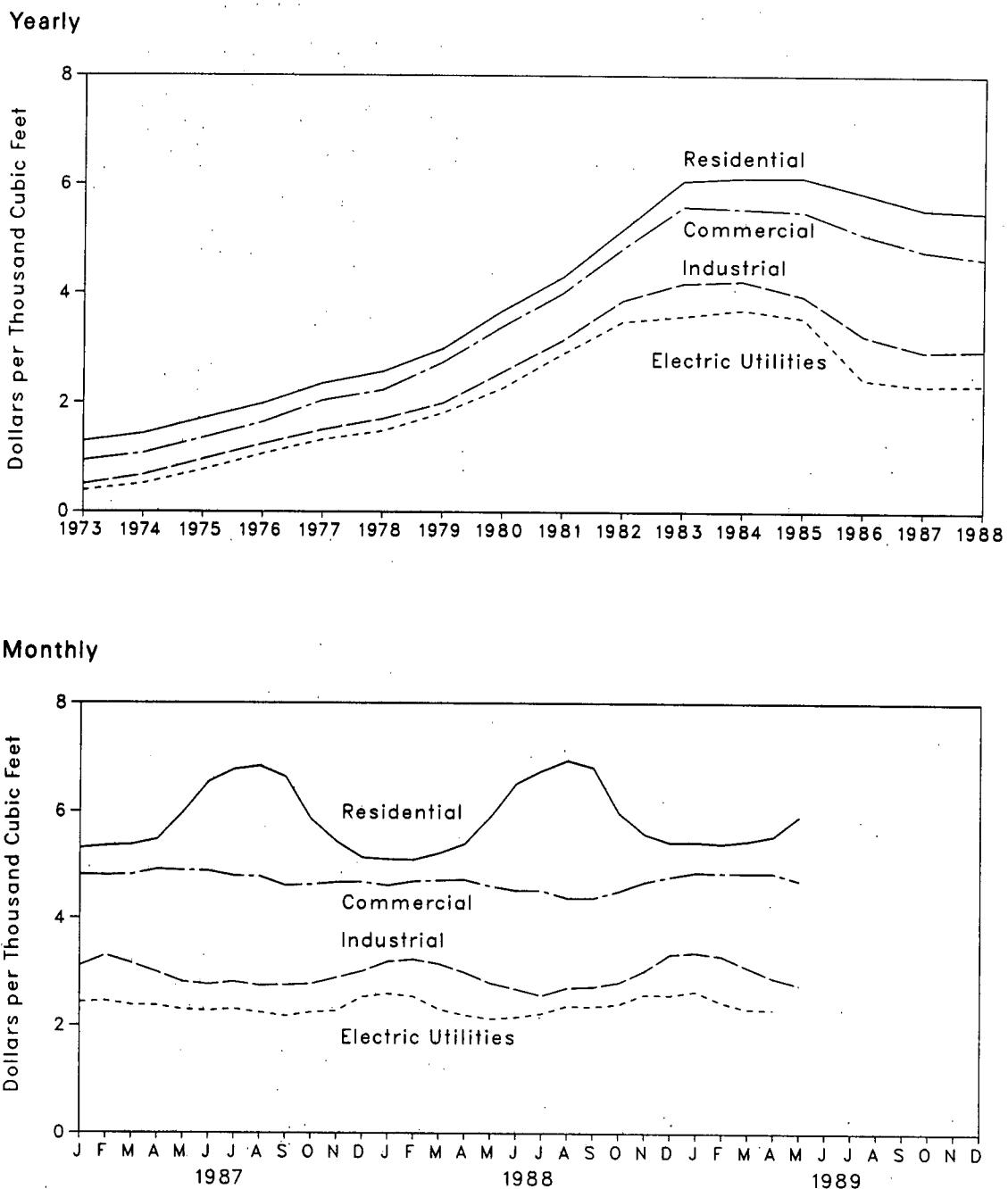
<sup>b</sup>See Note 8 at end of section.

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

Note: Geographic coverage is the 50 States and the District of Columbia.

Sources: See end of section.

**Figure 9.5 Natural Gas Prices**



**Table 9.11 Natural Gas Prices<sup>a</sup>**  
(Dollars per Thousand Cubic Feet)

	Wellhead	Major Interstate Pipeline Companies		City Gate	Delivered to Consumers <sup>b</sup>				
		Imports	Purchases from Producers		Residential	Commercial	Industrial	Electric Utilities <sup>c</sup>	Average
1973 Average .....	0.22	NA	NA	NA	1.29	0.94	0.50	0.38	0.73
1974 Average .....	.30	NA	NA	NA	1.43	1.07	.67	.51	.89
1975 Average .....	.44	NA	NA	NA	1.71	1.35	.98	.77	1.19
1976 Average .....	.58	NA	NA	NA	1.98	1.64	1.24	1.06	1.47
1977 Average .....	.79	NA	NA	NA	2.35	2.04	1.50	1.32	1.78
1978 Average .....	.91	2.21	0.83	NA	2.56	2.23	1.70	1.48	1.98
1979 Average .....	1.18	2.60	1.22	NA	2.98	2.73	1.99	1.81	2.34
1980 Average .....	1.59	4.42	1.63	NA	3.68	3.39	2.56	2.27	2.91
1981 Average .....	1.98	4.84	2.15	NA	4.29	4.00	3.14	2.89	3.51
1982 Average .....	2.46	4.94	2.72	NA	5.17	4.82	3.87	3.48	4.32
1983 Average .....	2.59	4.51	2.93	NA	6.06	5.59	4.18	3.58	4.82
1984 Average .....	2.66	4.08	2.91	3.95	6.12	5.55	4.22	3.70	4.85
1985 Average .....	2.51	3.19	2.85	3.75	6.12	5.50	3.95	3.55	4.72
1986 Average .....	1.94	2.53	2.39	3.22	5.83	5.08	3.23	2.43	4.13
1987 January .....	1.74	2.13	2.29	2.98	5.30	4.81	3.11	2.43	4.48
February .....	1.73	2.21	2.29	3.03	5.34	4.80	3.30	2.45	4.54
March .....	1.73	2.30	2.06	2.91	5.36	4.81	3.16	2.38	4.39
April .....	1.69	2.25	2.05	2.86	5.46	4.91	2.99	2.37	4.20
May .....	1.65	2.22	2.15	2.81	5.98	4.89	2.81	2.30	3.85
June .....	1.65	2.28	2.04	2.84	6.55	4.88	2.76	2.28	3.80
July .....	1.66	2.73	2.19	2.92	6.78	4.79	2.81	2.31	3.51
August .....	1.63	2.17	1.84	2.89	6.84	4.78	2.74	2.25	3.39
September .....	1.56	2.36	2.17	2.83	6.64	4.61	2.75	2.18	3.48
October .....	1.57	1.98	1.98	2.69	5.85	4.63	2.77	2.25	3.74
November .....	1.64	1.94	2.08	2.76	5.42	4.67	2.89	2.28	3.98
December .....	1.70	2.00	2.17	2.84	5.13	4.68	3.01	2.53	4.21
Average .....	1.67	2.17	2.10	2.87	5.84	4.78	2.94	2.32	4.05
1988 January .....	1.97	1.84	2.04	2.90	5.10	4.61	3.19	2.59	4.42
February .....	1.88	2.02	2.22	2.93	5.09	4.69	3.23	2.54	4.39
March .....	1.76	2.32	2.03	2.84	5.21	4.71	3.15	2.31	4.26
April .....	1.84	2.36	2.09	2.75	5.38	4.72	2.99	2.20	4.10
May .....	1.57	2.00	2.14	2.70	5.90	4.80	2.79	2.13	3.85
June .....	1.58	1.98	2.05	2.82	6.52	4.52	2.68	2.16	3.53
July .....	1.59	2.34	1.93	2.81	6.76	4.52	2.56	2.23	3.34
August .....	1.59	1.86	2.09	2.87	6.95	4.38	2.70	2.37	3.39
September .....	1.81	1.95	2.11	3.00	6.82	4.38	2.72	2.36	3.80
October .....	1.82	1.94	2.29	2.88	5.98	4.51	2.80	2.40	3.85
November .....	1.72	1.98	2.19	2.94	5.57	4.68	3.02	2.58	4.32
December .....	1.86	2.03	2.25	3.08	5.41	4.78	3.33	2.57	4.57
Average .....	1.71	2.02	2.12	2.89	5.49	4.64	2.98	2.34	4.09
1989 January .....	1.87	1.77	2.35	3.13	5.42	4.86	3.36	2.64	4.87
February .....	1.88	2.21	2.16	3.07	5.39	4.85	3.30	2.44	4.59
March .....	1.69	1.99	2.17	2.88	5.44	4.85	3.09	2.32	4.43
April .....	1.62	2.01	2.22	2.81	5.53	4.85	2.89	2.31	4.15
May .....	NA	NA	NA	2.93	5.91	4.71	2.76	NA	NA

<sup>a</sup>Prices shown on this page are intended to include all taxes. See Note 9 at end of section.

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

<sup>c</sup>Data through December 1982 cover all steam-electric utility plants with a capacity of 25 megawatts or greater. From 1974 through 1982, data include peaking units. Beginning with January 1983, data cover steam-electric utility plants with a capacity of 50 megawatts or greater.

<sup>d</sup>The decline from the previous month was primarily the result of refunds in the form of reduced charges.

NA=Not available.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Data through 1987 are final. Subsequent data are preliminary.

Sources: See end of section.

## Notes and Sources for the Price Section

### Notes

1. The average domestic first purchase price represents the average price at which all domestic crude oil is purchased. Prior to February 1976, the price represented an estimate of the average of posted prices; after February 1976, the price represents an average of actual first purchase prices. The data series was previously called "Actual Domestic Wellhead Price."
2. FOB literally means "Free on Board." It denotes a transaction whereby the seller makes the product available with an agreement on a given port at a given price; it is the responsibility of the buyer to arrange for the transportation and insurance.
3. The landed cost of imported crude oil from selected countries does not represent the total cost of all imported crude. Prior to March 1975, imported crude costs to U.S. company-owned refineries in the Caribbean were not included in the landed cost, and costs of crude oil from countries that export only small amounts to the United States were also excluded. Beginning in March 1975, however, coverage was expanded to include U.S. company-owned refineries in the Caribbean. Landed costs do not include supplemental fees.
4. Beginning with January 1981, refiner acquisition costs of crude oil are from data collected on EIA Form 14, the "Refiners' Monthly Cost Report." These prices were previously published from data collected on ERA Form 49, the "Domestic Crude Oil Entitlements Program Refiners Monthly Report." The ERA Form 49 was discontinued with the decontrol of crude oil on January 28, 1981. Crude oil purchases and costs are defined for EIA Form 14 in accordance with conventions used for ERA Form 49. Also, the respondents for the two forms are essentially the same. However, due to possible different interpretations of the filing requirements and a different method for handling prior period adjustments, care must be taken in comparing the data collected on the two forms.

The refiner acquisition cost of crude oil is the average price paid by refiners for crude oil booked into their refineries in accordance with accounting procedures generally accepted and consistently and historically applied by the refiners concerned. Domestic crude oil is that oil produced in the United States or from the outer continental shelf as defined in 43 USC Section 1331. Imported crude oil is either that oil reported on ERA Form 51, the "Transfer Pricing Report," or any crude oil that is not domestic oil. The composite cost is the weighted average of domestic and imported crude oil costs.

Crude oil costs and volumes reported on ERA Form 49 excluded unfinished oils but included the Strategic Petroleum Reserve (SPR). Crude oil costs and volumes reported on the FEA Form P110-M-1 included unfinished oils but excluded SPR. Imported averages derived from ERA Form 49 exclude oil purchased for SPR, whereas the composite averages derived from ERA Form 49 include SPR. None of the prices derived from EIA Form 14 include either unfinished oils or SPR.

5. Several different series of motor gasoline prices are published in this section. U.S. City Average Retail Prices of Motor Gasoline are calculated monthly by the Bureau of Labor Statistics during the development of the Consumer Price Index (CPI). These prices include all Federal, State, and local taxes paid at the time of sale. For the period 1974 through 1978, prices were collected in 56 urban areas. For the period 1978 forward, prices were collected from a new sample of service stations 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-serve).

Refiner and Gas Plant Operator Sales Prices of Finished Motor Gasoline for Resale and to End Users are determined by the Energy Information Administration in a monthly survey of refiners and gas plant operators (Form EIA-782A). The prices do not include any Federal, State, or local taxes paid at the time of sale. Estimates of prices prior to January 1983 are based on FEA Form P302-M-1/EIA-460, "Petroleum Industry Monthly Report for Product Prices," and also exclude all Federal, State, or local taxes paid at the time of sale. Sales for Resale are those made to purchasers who are other-than-ultimate consumers. Sales to End Users are sales made directly to the consumer of the product, including bulk consumers such as agriculture, industry, and utilities, as well as residential and commercial consumers.

6. Starting in January 1983, Form EIA-782, "Monthly Petroleum Product Sales Report," replaced 10 previous surveys. Every attempt was made to continue the most important price series. However, prices published through December 1982 and those published since January 1983 do not necessarily form continuous data series due to changes in survey forms, definitions, instructions, populations, samples, processing systems, and statistical procedures. To provide historical data, continuous annual data series have been generated for 1978-1980, and monthly series for 1981 and 1982, by estimating the prices that would have been published had the EIA-782 survey and system been in operation at that time. This form of estimation was performed after detailed adjustment for product and sales type matching, and for discontinuity due to other factors.

An important difference between the previous and present prices is the distinction between wholesale and resale, and between retail and end user. The resale category continues to include sales among resellers. However, bulk sales to utility, industrial, and commercial accounts previously included in the wholesale category are now counted as made to end users. The end user category continues to include retail sales through company owned and operated outlets but also includes the bulk utility, industrial, and commercial sales. Additional information may be found in "Estimated Historic Time Series for the EIA-782," a feature article reprinted from the December 1983 [3] *Petroleum Marketing Monthly* published by the Energy Information Administration.

7. Beginning with January 1986, national average price estimates are based on a statistically derived sample of both publicly and privately owned electric utilities. Prior to that time, national average price estimates were based on a sample of only privately owned electric utilities. Respondents to Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions," formerly the "Electric Utility Company Monthly Statement," consist of a sample of over 200 electric utilities that were statistically chosen using stratification techniques. The respondents were chosen from more than 3,000 electric utilities reporting on Form EIA-861, "Annual Electric Utility Report." This scheme differs from the cut-off sample used prior to January 1986. Data are shown for both the old and new series. Publication of both series will continue until sufficient information exists to estimate historical data based on the new series.

8. Heavy fuel oil prices include fuel oils No. 4, No. 5, and No. 6, and topped crude fuel oil prices. The weighted average for all fossil fuels includes both residual fuel oil prices and light oil (No. 2 fuel oil, kerosene, and jet fuel) prices.

9. Natural gas prices are intended to include all taxes. Instructions on the data collection forms specifically direct that all U.S., State, and local taxes, surcharges, and/or adjustments billed to consumers are to be included. However, sales and other taxes itemized on consumers' bills are sometimes excluded by the reporting utilities.

## Sources

### Petroleum and Petroleum Products:

- Domestic First Purchase Prices--Economic Regulatory Administration (ERA), January 1976: FEA Form 90, "Crude Petroleum Production Monthly Report"; February 1976 through September 1979: FEA Form P124, "Domestic Crude Oil Purchaser's (Monthly) Report"; October 1979 through December 1982: ERA Form 182, "Domestic Crude Oil First Purchase Report"; January

1983 forward: EIA Form 182, "Domestic Crude Oil First Purchase Report."

- Crude Oil Import Prices--Energy Information Administration (EIA), 1975 through January 1979: FEA Form F701-M-0, "Transfer Pricing Report"; February 1979 through September 1982: ERA Form 51, "Transfer Pricing Report"; October 1982 through June 1984: EP Form 51, "Monthly Foreign Crude Oil Transaction Report"; July 1984 forward: Form EIA-856, "Monthly Foreign Crude Oil Acquisition Report."
- Refiner Acquisition Costs--EIA, January 1976: FEO Form 96, "Monthly Cost Allocation Report"; February 1976 through June 1978: FEA Form P110-M-1, "Refiners' Monthly Cost Allocation Report"; July 1978 through December 1980: ERA Form 49, "Domestic Crude Oil Entitlements Program Refiners Monthly Report"; January 1981 forward: EIA Form 14, "Refiners' Monthly Cost Report."
- U.S. City Average Retail Motor Gasoline Prices--Bureau of Labor Statistics, *Consumer Prices: Energy*, monthly.
- No. 2 Distillate to Residences--January 1983 forward, EIA Form-782A, "Refiners/Gas Plant Operators' Monthly Petroleum Product Sales Report" and EIA-782B, "Resellers/Retailers' Monthly Petroleum Product Sales Report." Prices prior to January 1983 are EIA estimates using data from FEA Form P112-M-1/EIA-9, "No. 2 Heating Oil Supply/Price Monitoring Report" and EIA Form 9A, "No. 2 Distillate Price Monitoring Report." See Note 6 on the previous page for additional information on the estimated data.
- All Other Petroleum Products--January 1983 forward, EIA Form-782A, "Refiners/Gas Plant Operators' Monthly Petroleum Product Sales Report." Prices prior to January 1983 are EIA estimates using data from FEA Form 302-M-1/EIA-460, "Petroleum Industry Monthly Report for Product Prices." See Note 6 on the previous page for additional information on the estimated data.

### Natural Gas:

- Average Wellhead--Annual data through 1982 from EIA, *Natural Gas Annual*, 1973 through 1982. Annual data for 1983 through 1987 from Form EIA-627, "Annual Quantity and Value of Natural Gas Report" and the U.S. Minerals Management Service. Monthly data from January 1988 forward and the 1988 average are estimated primarily on the basis of values reported by State agencies in Mississippi, New Mexico, Oklahoma, and Texas. These States together account for almost 50 percent of total U.S. marketed production. The monthly and annual estimates are adjusted to conform with final reported annual data.

- Imports and Purchases from Producers by Major Interstate Pipeline Companies--FERC Form 11, "Interstate Pipeline Company Purchases, and Industrial Sales".
- City Gate--EIA, October 1983 forward: Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers."
- Residential, Commercial, Industrial and Consumer Average--Annual data from EIA, Form EIA-176 "Annual Report of Natural and Supplemental Gas Supply and Disposition." Monthly data from EIA, Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers." Monthly data are adjusted to conform to final reported annual data.

- Electric Utilities--EIA, FPC Form 423, "Monthly Report of Cost and Quality of Fuels for Electric Plants."

**Electricity:**

- Cost of Fossil Fuels--EIA, FPC Form 423, "Monthly Report of Cost and Quality of Fuels for Electric Plants."
- Retail Prices--EIA, January 1973 through February 1980: FPC Form 5, "Monthly Statement of Electric Operating Revenue and Income"; March 1980 through December 1982: FERC Form 5, "Electric Utility Company Monthly Statement"; January 1983 through December 1986: Form EIA-826, "Electric Utility Company Monthly Statement"; January 1987 forward: Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions."

## Section 10. International

**Crude Oil Production.** World crude oil production during May 1989 was 59 million barrels per day, down 0.1 million barrels per day from the level in the previous month.

Organization of Petroleum Exporting Countries (OPEC) production during May 1989 averaged 22 million barrels per day, up 0.1 million barrels per day from the level during the previous month. Production by the Arab members of OPEC during May 1989 averaged 14 million barrels per day, up 0.5 million barrels per day from the April 1989 level. During May 1989, production increased in Kuwait by 300 thousand barrels per day, in Saudi Arabia by 100 thousand barrels per day, and in Qatar by 80 thousand barrels per day. Production was unchanged in Algeria, Iraq, Libya, and the United Arab Emirates. Among the non-Arab members of OPEC, production during May 1989 decreased in Iran by 400 thousand barrels per day. Production was unchanged in Indonesia, Nigeria, and Venezuela.

Among the non-OPEC nations, the United States registered a production increase in May 1989 of 60 thousand barrels per day from the level in the previous month. The United Kingdom and Canada registered decreases in production of 155 thousand barrels per day and 32 thousand barrels per day, respectively. Production was unchanged in Mexico, China, and the U.S.S.R..

**Petroleum Consumption.** In February 1989, consumption in all Organization for Economic Cooperation and Development (OECD) countries was 39 million barrels per day, 1 percent higher than the level in February 1988. Compared with levels 1 year earlier, consumption was higher in Canada by 1 percent but lower in Japan by 2 percent and essentially the same in the United States. Consumption in all European OECD countries combined in February 1989 was 13 million barrels per day, 2 percent higher than the level in the previous February. Consumption was higher in Italy by 11 percent, in France by 5 percent, and in the United King-

dom by 1 percent but lower in West Germany by 8 percent, compared with levels 1 year earlier.

**Petroleum Stocks.** For all OECD countries, petroleum stocks at the end of February 1989 totaled 3.4 billion barrels, 1 percent higher than the ending stock level in February 1988.

Stocks were higher in Japan by 3 percent and in the United States by 2 percent but lower in Canada by 2 percent compared with levels 1 year earlier. Stock levels in all European OECD countries as of the end of February 1989 were 1.1 billion barrels, essentially the same as in February 1988. Stocks were up in France by 9 percent and in the United Kingdom by 1 percent, but lower in Italy by 3 percent and in West Germany by 2 percent, compared with levels 1 year earlier.

**Nuclear Electricity Generation.** In May 1989, the 20 non-Communist countries with nuclear capacity generated 123 gross terawatthours (billion kilowatthours) of nuclear-generated electricity, slightly less than in May 1988.

Based on *Nucleonics Week* information, as of May 31, 1989, there were 351 operable nuclear generating units in the 20 non-Communist countries. The units had a collective gross generating capacity of 288.2 gigawatts (million kilowatts).

On March 31, 1989, the United Kingdom's Berkeley 1 and 2 units were formally decommissioned by the Central Electricity Generating Board. On April 14, 1989, the United States' South Texas 2 unit and South Korea's Ulchin unit began generating electricity.

Generation figures which were previously estimated for Argentina and the United Kingdom have been updated to reflect the actual generations for both countries.

In May 1989, the 110 U.S. units accounted for 103.8 gross gigawatts, 36.0 percent of the total non-Communist nuclear generating capacity.

**Table 10.1a World Crude Oil<sup>a</sup> Production  
(Thousand Barrels per Day)**

	Algeria	Iraq	Kuwait <sup>b</sup>	Libya	Qatar	Saudi Arabia <sup>b</sup>	United Arab Emirates	Arab OPEC <sup>c</sup>	Indonesia	Iran	Nigeria	Venezuela
1973 Average .....	1,097	2,018	3,020	2,175	570	7,596	1,533	18,009	1,339	5,861	2,054	3,366
1974 Average .....	1,009	1,971	2,546	1,521	518	8,480	1,679	17,724	1,375	6,022	2,255	2,976
1975 Average .....	983	2,262	2,084	1,480	438	7,075	1,664	15,986	1,307	5,350	1,783	2,346
1976 Average .....	1,075	2,415	2,145	1,933	497	8,577	1,936	18,578	1,504	5,883	2,067	2,294
1977 Average .....	1,152	2,348	1,969	2,063	445	9,245	1,999	19,221	1,686	5,663	2,085	2,238
1978 Average .....	1,231	2,563	2,131	1,983	487	8,301	1,831	18,527	1,635	5,242	1,897	2,165
1979 Average .....	1,224	3,477	2,500	2,092	508	9,532	1,831	21,164	1,591	3,168	2,302	2,356
1980 Average .....	1,106	2,514	1,656	1,787	472	9,900	1,709	19,144	1,577	1,662	2,055	2,168
1981 Average .....	1,002	1,000	1,125	1,140	405	9,815	1,474	15,961	1,605	1,380	1,433	2,102
1982 Average .....	987	1,012	823	1,150	330	6,483	1,250	12,035	1,339	2,214	1,295	1,895
1983 Average .....	968	1,005	1,064	1,105	295	5,086	1,149	10,672	1,343	2,440	1,241	1,801
1984 Average .....	1,014	1,209	1,157	1,087	394	4,663	1,146	10,670	1,412	2,174	1,388	1,798
1985 Average .....	1,037	1,433	1,023	1,059	301	3,388	1,193	9,434	1,325	2,250	1,495	1,677
1986 Average .....	945	1,690	1,419	1,034	308	4,870	1,330	11,596	1,390	2,035	1,484	1,787
1987 January .....	950	1,650	1,250	950	285	3,930	1,235	10,250	1,280	2,600	1,290	1,670
February .....	950	1,670	1,165	950	250	3,796	1,215	9,996	1,250	2,500	1,190	1,670
March .....	950	1,700	1,105	850	200	3,239	1,195	9,238	1,265	2,500	1,280	1,806
April .....	950	1,900	1,125	925	150	3,955	1,235	10,240	1,280	2,300	1,182	1,700
May .....	950	1,900	1,090	930	280	4,119	1,265	10,534	1,300	2,600	1,347	1,725
June .....	950	2,000	1,180	950	350	4,159	1,435	11,024	1,300	2,500	1,412	1,765
July .....	1,020	1,950	1,772	1,100	450	4,517	1,605	12,414	1,330	2,500	1,412	1,886
August .....	1,020	2,200	1,772	1,200	420	4,667	1,855	13,133	1,450	2,700	1,400	1,795
September ..	1,020	2,300	1,740	900	330	4,567	1,995	12,852	1,310	2,100	1,350	1,745
October .....	1,020	2,500	1,375	1,000	320	4,552	1,895	12,662	1,320	2,400	1,400	1,750
November ...	1,020	2,550	1,390	950	300	4,169	1,895	12,274	1,320	2,200	1,450	1,745
December .....	1,020	2,600	1,350	950	300	4,527	1,645	12,392	1,320	2,200	1,350	1,745
Average .....	985	2,079	1,361	972	304	4,186	1,541	11,428	1,311	2,426	1,340	1,751
1988 January .....	950	2,550	1,330	1,000	340	4,230	1,205	11,605	1,220	2,100	1,350	1,790
February .....	990	2,600	1,200	1,000	400	4,400	1,055	11,645	1,220	2,000	1,400	1,790
March .....	1,020	2,650	1,205	1,000	300	4,410	1,255	11,840	1,270	2,100	1,350	1,790
April .....	970	2,650	1,300	950	300	4,550	1,425	12,145	1,320	2,200	1,400	1,805
May .....	1,000	2,600	1,210	1,000	300	4,565	1,405	12,080	1,320	2,200	1,450	1,805
June .....	1,000	2,700	1,410	1,000	300	4,665	1,405	12,480	1,320	2,100	1,450	1,805
July .....	1,000	2,600	1,375	1,000	300	4,725	1,430	12,430	1,320	2,300	1,400	1,805
August .....	1,000	2,600	1,570	1,000	300	5,270	1,905	13,645	1,320	2,300	1,450	1,805
September ..	1,000	2,700	1,660	1,050	300	5,410	1,965	14,085	1,220	2,400	1,500	1,880
October .....	1,000	2,700	1,650	1,100	350	6,450	2,000	15,250	1,320	2,400	1,500	1,880
November ...	1,040	2,700	1,750	1,100	350	6,650	2,100	15,690	1,220	2,500	1,450	2,030
December .....	1,040	2,700	1,675	1,100	350	6,775	2,100	15,740	1,320	2,500	1,550	2,030
Average .....	1,001	2,646	1,445	1,025	324	5,178	1,606	13,224	1,283	2,259	1,438	1,851
1989 January .....	1,040	2,650	1,250	1,050	400	5,000	1,735	13,125	1,350	2,800	1,450	1,840
February .....	1,040	2,650	1,350	1,050	420	4,750	1,650	R 12,910	1,350	2,850	1,450	1,840
March .....	1,040	2,650	1,390	1,050	340	4,590	1,675	R 12,735	1,350	3,200	1,600	1,840
April .....	1,040	2,750	1,695	1,100	330	4,995	R 1,705	R 13,615	1,350	2,900	1,650	1,840
May .....	1,040	2,750	1,995	1,100	410	5,095	1,705	14,095	1,350	2,500	1,650	1,840
5-Mo. Avg. .	1,040	2,690	1,539	1,070	380	4,888	1,695	13,302	1,350	2,850	1,562	1,840

<sup>a</sup>Includes lease condensate, excludes natural gas plant liquids.

<sup>b</sup>Includes about one-half of the production in the Kuwait-Saudi Arabia Neutral Zone. In May 1989, total production in that region amounted to approximately 390 thousand barrels per day.

<sup>c</sup>The Arab members of the Organization of Petroleum Exporting Countries (OPEC) are Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and the United Arab Emirates. Production in the Neutral Zone between Kuwait and Saudi Arabia is included in "Arab OPEC" production.

Footnotes continued on following page.

**Table 10.1b World Crude Oil<sup>a</sup> Production (continued)**  
 (Thousand Barrels per Day)

	Total OPEC <sup>d</sup>	Persian Gulf Nations <sup>e</sup>	Canada	Mexico	United Kingdom	United States	China	USSR	Other <sup>f</sup>	Market Economies <sup>g</sup>	World
1973 Average .....	30,988	20,668	1,798	465	2	9,208	1,090	8,329	3,804	45,805	55,684
1974 Average .....	30,729	21,282	1,551	571	2	8,774	1,315	8,856	3,862	45,021	55,660
1975 Average .....	27,154	18,934	1,430	705	12	8,375	1,490	9,472	4,139	41,338	52,777
1976 Average .....	30,737	21,514	1,314	831	245	8,132	1,670	9,985	4,355	45,132	57,269
1977 Average .....	31,299	21,725	1,321	981	768	8,245	1,874	10,485	4,816	46,745	59,589
1978 Average .....	29,875	20,606	1,316	1,209	1,082	8,707	2,082	10,950	4,782	46,497	60,003
1979 Average .....	30,998	21,066	1,500	1,461	1,568	8,552	2,122	11,187	5,089	48,725	62,477
1980 Average .....	26,985	17,961	1,435	1,936	1,622	8,597	2,114	11,460	5,204	45,355	59,353
1981 Average .....	22,843	15,245	1,285	2,313	1,811	8,572	2,012	11,552	5,390	41,784	55,778
1982 Average .....	19,145	12,156	1,271	2,748	2,065	8,649	2,045	11,615	5,646	39,069	53,184
1983 Average .....	17,891	11,081	1,356	2,689	2,291	8,688	2,120	11,684	6,248	38,703	52,967
1984 Average .....	17,857	10,784	1,438	2,780	2,480	8,879	2,296	11,576	6,897	39,893	54,203
1985 Average .....	16,634	9,630	1,471	2,745	2,530	8,971	2,505	11,250	7,540	39,463	53,646
1986 Average .....	18,751	11,696	1,474	2,435	2,539	8,680	2,620	11,540	7,850	41,299	55,889
1987 January .....	17,510	10,992	1,489	2,510	2,640	8,480	2,690	11,634	8,164	40,361	55,116
February .....	17,015	10,638	1,473	2,540	2,569	8,389	2,690	11,609	8,145	39,698	54,430
March .....	16,284	9,981	1,484	2,520	2,516	8,464	2,690	11,728	8,021	38,855	53,707
April .....	16,852	10,707	1,468	2,530	2,537	8,498	2,690	11,659	8,121	39,572	54,354
May .....	17,696	11,298	1,499	2,555	2,536	8,336	2,690	11,659	8,210	40,398	55,180
June .....	18,191	11,668	1,585	2,530	1,936	8,279	2,690	11,659	7,976	40,063	54,845
July .....	19,752	12,838	1,605	2,520	2,486	8,251	2,690	11,713	8,295	42,476	57,313
August .....	20,819	13,654	1,625	2,545	2,451	8,210	2,690	11,703	8,070	43,286	58,113
September .....	19,767	13,074	1,554	2,560	2,456	8,205	2,690	11,872	8,369	42,478	57,473
October .....	20,002	13,086	1,534	2,555	2,501	8,364	2,690	11,703	8,416	42,939	57,765
November .....	19,459	12,546	1,514	2,560	2,531	8,397	2,690	11,634	8,515	42,542	57,299
December .....	19,492	12,664	1,559	2,560	2,546	8,318	2,690	11,703	8,504	42,546	57,373
Average .....	18,584	11,939	1,533	2,540	2,476	E 8,349	2,690	11,690	8,234	41,283	56,096
1988 January .....	18,540	11,797	1,520	2,560	2,569	8,250	2,710	11,705	8,710	41,740	56,564
February .....	18,540	11,697	1,600	2,530	2,564	8,374	2,710	11,715	8,604	41,803	56,637
March .....	18,835	11,962	1,615	2,515	2,564	8,374	2,710	11,655	8,753	42,247	57,021
April .....	19,355	12,468	1,575	2,490	2,554	8,288	2,710	11,675	8,709	42,562	57,356
May .....	19,340	12,323	1,600	2,525	2,409	8,229	2,690	11,675	8,589	42,283	57,057
June .....	19,640	12,623	1,590	2,530	2,039	8,170	2,690	11,675	8,378	41,938	56,712
July .....	19,740	12,773	1,630	2,530	2,124	8,040	2,690	11,675	8,714	42,364	57,143
August .....	21,005	13,988	1,645	2,530	2,089	8,079	2,695	11,675	8,609	43,543	58,327
September .....	21,570	14,478	1,600	2,285	2,114	7,895	2,765	11,675	8,763	43,813	58,667
October .....	22,835	15,595	1,605	2,530	2,069	8,023	2,780	11,675	8,810	45,458	60,337
November .....	23,375	16,094	1,605	2,510	2,094	8,023	2,790	11,675	8,703	45,896	60,775
December .....	23,625	16,144	1,605	2,530	2,084	7,942	2,790	11,675	8,822	46,194	61,073
Average .....	20,539	13,500	1,599	2,506	2,272	8,140	2,728	11,679	8,681	43,326	58,145
1989 January .....	21,050	13,878	1,579	2,525	1,814	E 7,913	2,790	11,735	R 9,075	R 43,542	R 58,481
February .....	R 20,855	R 13,713	1,570	2,495	1,764	E 7,830	2,790	11,735	R 9,023	R 43,123	R 58,062
March .....	R 21,185	R 13,888	1,575	2,535	1,809	E 7,610	2,790	11,735	R 9,194	R 43,494	R 58,433
April .....	R 21,835	R 14,418	1,589	2,525	1,709	E 7,747	R 2,690	11,735	R 9,058	R 44,049	R 58,888
May .....	21,895	14,498	1,557	2,525	1,554	E 7,807	2,690	11,735	9,033	43,957	58,796
5-Mo. Avg. ....	21,371	14,084	1,574	2,521	1,729	E 7,781	2,750	11,735	9,078	43,640	58,539

Footnotes continued.

<sup>d</sup>"Total OPEC" consists of Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela. Production from the Neutral Zone between Kuwait and Saudi Arabia is included in "Total OPEC" production.

<sup>e</sup>The Persian Gulf Nations are Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates. Production from the Neutral Zone between Kuwait and Saudi Arabia is included in "Persian Gulf Nations" production.

<sup>f</sup>'Other is a calculated total derived from the difference between World and the sum of production in Total OPEC, Canada, Mexico, the United Kingdom, the United States, China and the USSR.

<sup>g</sup>World excluding Albania, Bulgaria, China, Cuba, Czechoslovakia, East Germany, Hungary, Kampuchea, Laos, Mongolia, North Korea, Poland, Romania, U.S.S.R., Vietnam, and Yugoslavia.

R=Revised data. E=Estimate.

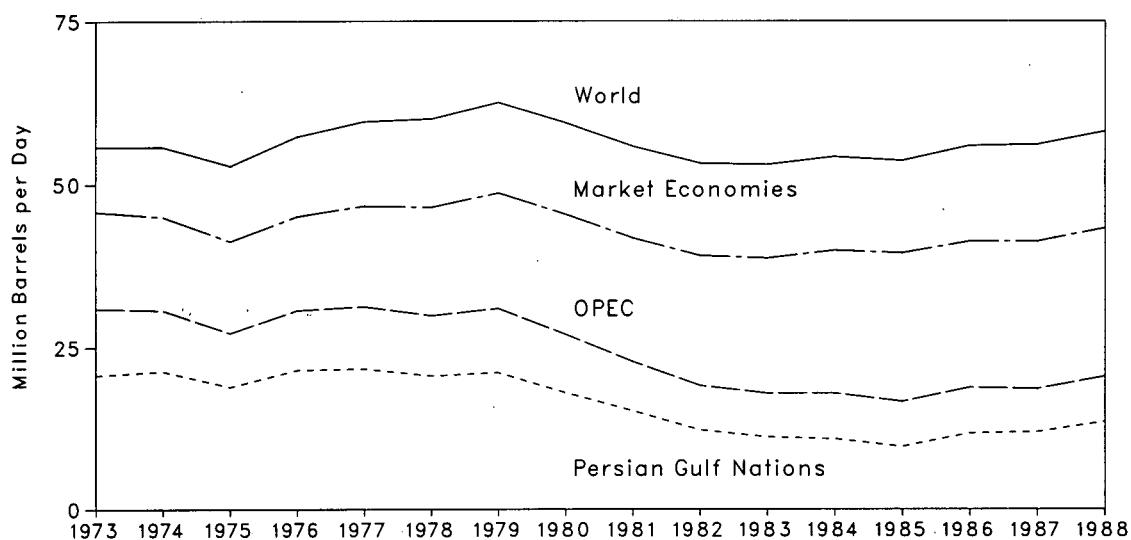
Note: • U.S. geographic coverage is the 50 States and the District of Columbia. • Monthly data are often preliminary figures and may not average to the annual totals because of rounding or because updates to the preliminary monthly data are not available.

Sources: • United States—1973 through 1988: Energy Information Administration (EIA), *Petroleum Supply Annual*. 1989 forward: EIA, *Petroleum Supply Monthly*. • Other Countries—1973 through 1987 annual data: EIA, *International Energy Annual*. 1988 annual data: Average of monthly data.

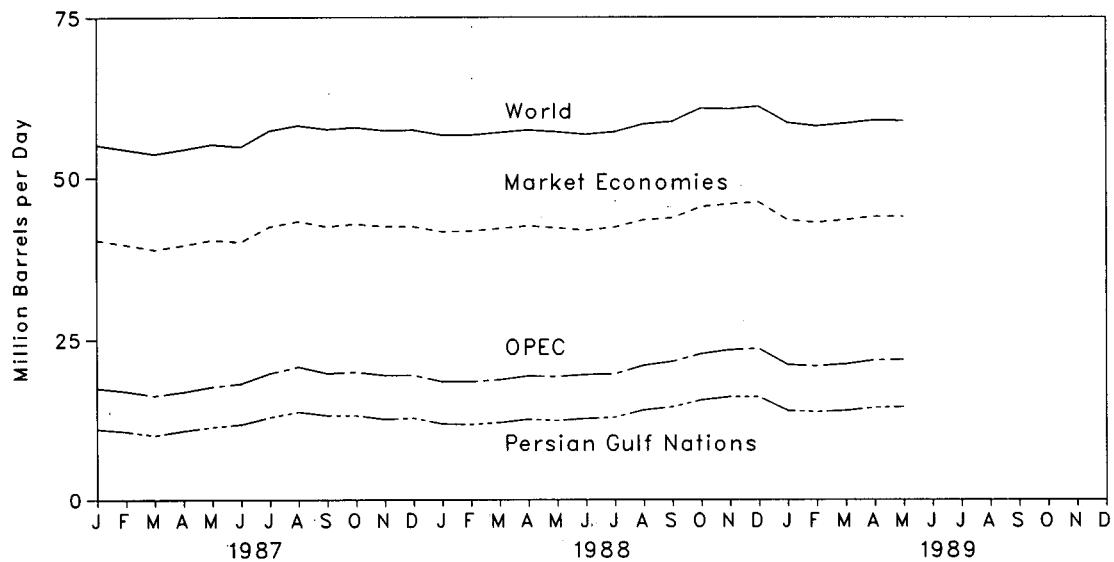
Monthly data: *Petroleum Intelligence Weekly*, the *Oil and Gas Journal*, and other industry sources. • World—1973 through 1987 annual data: *International Energy Annual*. 1988 annual data and 1988 monthly data forward: Sum of all countries.

**Figure 10.1 World Crude Oil Production**

Yearly

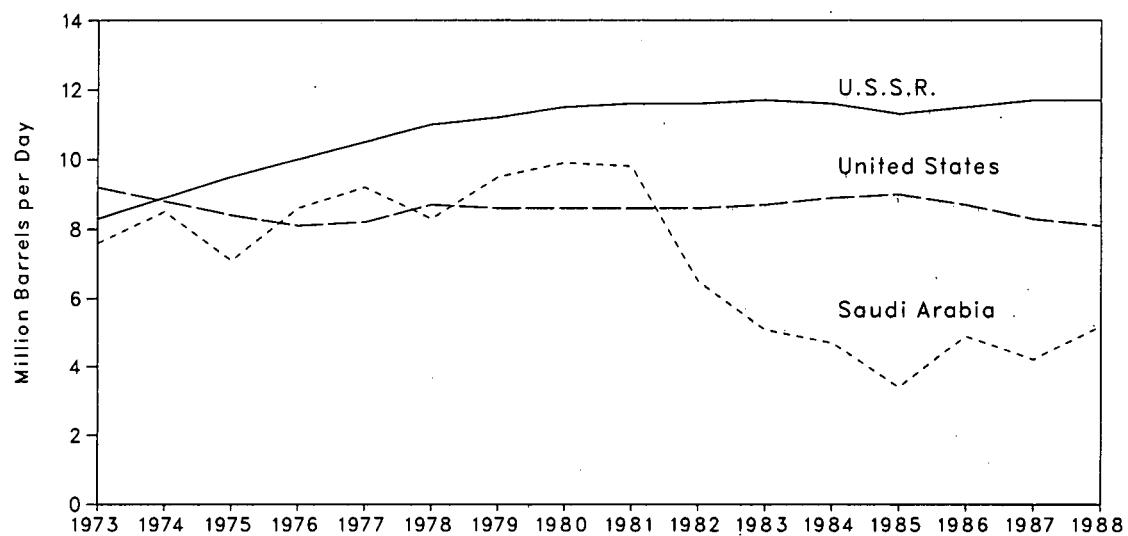


Monthly

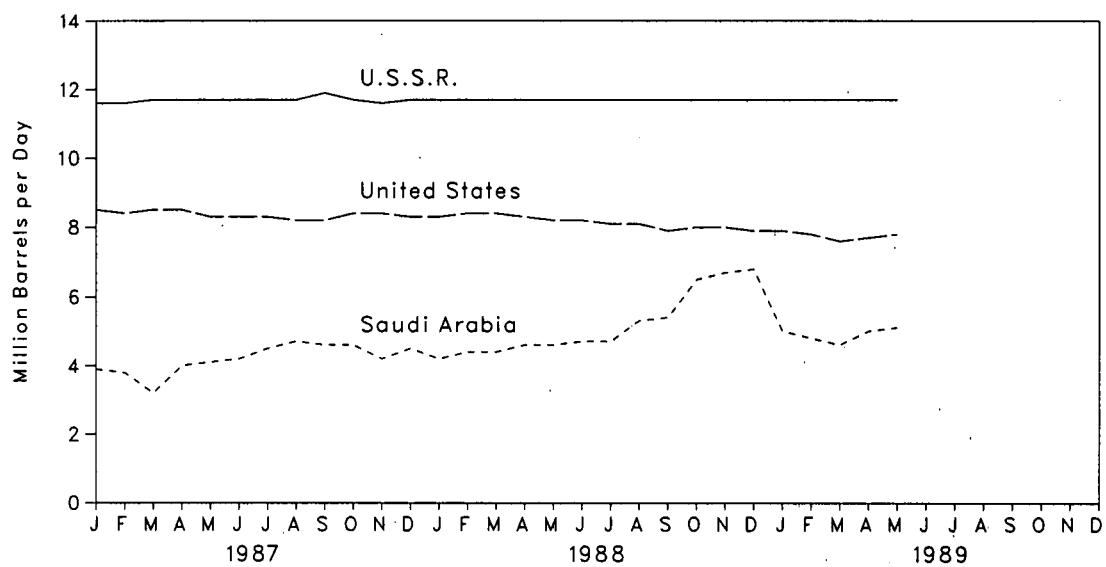


**Figure 10.2 Crude Oil Production In Selected Countries**

Yearly

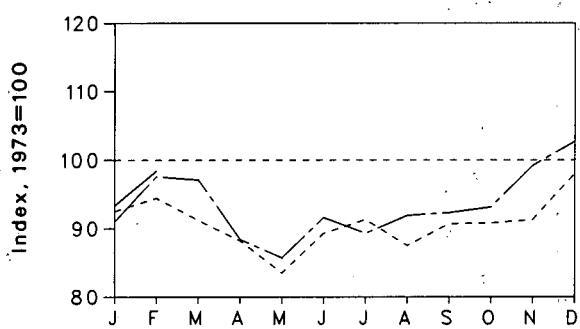


Monthly

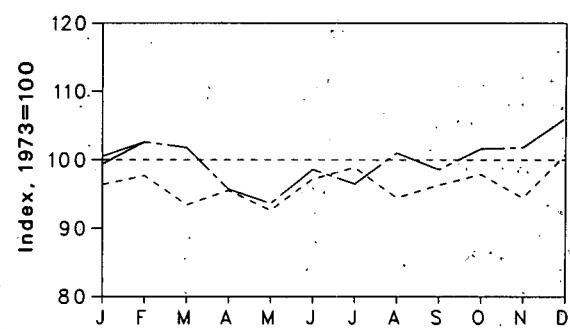


**Figure 10.3 Petroleum Consumption In OECD Countries**

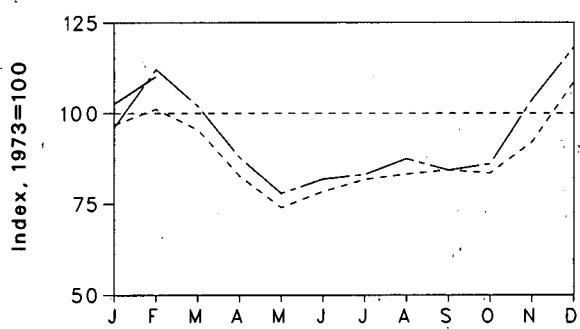
**OECD**



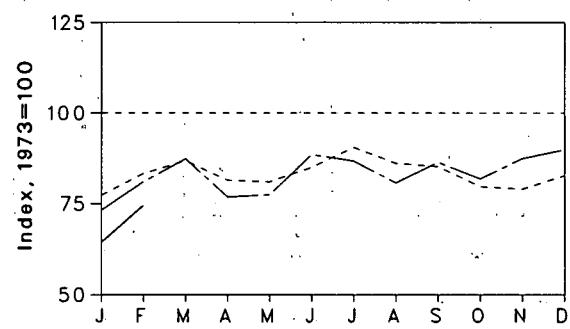
**United States**



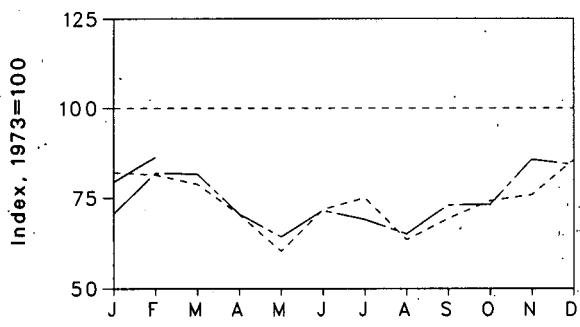
**Japan**



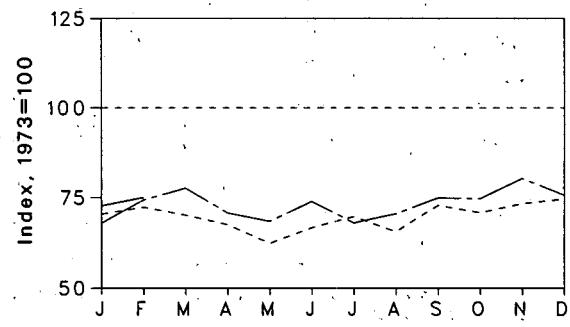
**West Germany**



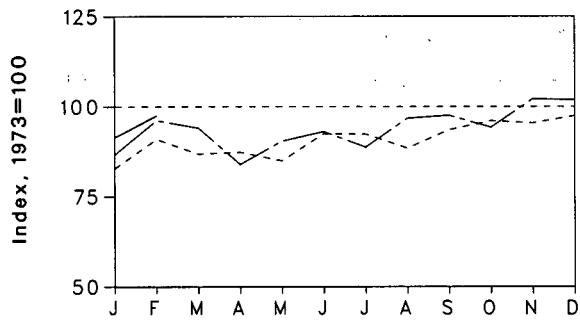
**France**



**United Kingdom**

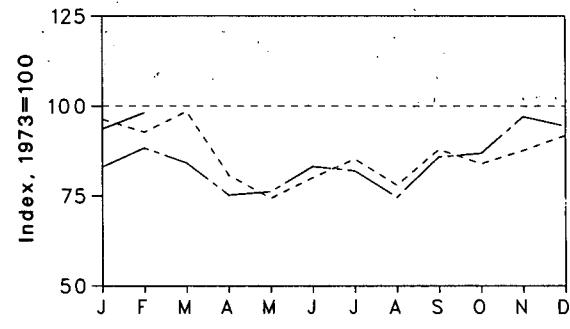


**Canada**



----- 1986  
— 1987  
- - - 1988

**Italy**



**Table 10.2 Petroleum Consumption in OECD Countries<sup>a</sup>**  
 (Thousand Barrels per Day)

	Canada	France	Italy	Japan	United Kingdom	United States	West Germany	OECD Europe <sup>b</sup>	Other OECD <sup>c</sup>	OECD <sup>a</sup>
1973 Average .....	1,707	2,422	2,147	5,071	2,301	17,308	2,915	14,521	1,006	39,612
1974 Average .....	1,740	2,260	2,090	4,960	2,138	16,653	2,612	13,708	1,056	38,117
1975 Average .....	1,718	2,136	1,940	4,502	1,872	16,322	2,515	13,059	999	36,600
1976 Average .....	1,751	2,280	1,991	4,771	1,856	17,461	2,708	13,813	1,068	38,864
1977 Average .....	1,779	2,235	1,907	5,231	1,880	18,431	2,837	13,795	1,123	40,359
1978 Average .....	1,823	2,189	1,948	5,142	1,850	18,847	3,048	13,963	1,117	40,892
1979 Average .....	1,893	2,385	2,013	5,480	1,930	18,513	3,073	14,670	1,090	41,646
1980 Average .....	1,873	2,256	1,934	4,960	1,725	17,056	2,707	13,634	1,072	38,595
1981 Average .....	1,768	2,023	1,874	4,848	1,590	16,058	2,449	12,515	1,080	36,289
1982 Average .....	1,578	1,880	1,781	4,582	1,590	15,296	2,372	12,053	1,008	34,517
1983 Average .....	1,448	1,835	1,750	4,395	1,531	15,231	2,324	11,765	954	33,793
1984 Average .....	1,472	1,754	1,646	4,576	1,849	15,726	2,322	11,736	989	34,500
1985 Average .....	R 1,504	R 1,775	R 1,717	R 4,384	R 1,634	R 15,726	R 2,338	R 11,681	R 976	R 34,271
1986 Average .....	1,506	1,772	R 1,738	R 4,439	R 1,649	R 16,281	2,498	R 12,102	R 951	R 35,279
1987 January .....	1,411	1,986	R 2,069	R 4,910	1,620	16,684	2,254	R 12,718	R 898	R 36,622
February .....	1,552	1,972	R 1,892	R 5,128	1,663	16,908	2,427	R 12,861	R 921	R 37,370
March .....	1,481	1,909	R 2,114	R 4,844	1,614	16,165	2,531	R 12,758	R 868	R 36,116
April .....	1,490	1,705	R 1,732	R 4,193	1,553	16,524	2,374	R 11,678	R 1,015	R 34,899
May .....	1,448	1,460	R 1,596	R 3,750	1,436	16,026	2,362	R 10,943	R 885	R 33,053
June .....	1,580	1,738	R 1,717	R 3,976	1,534	16,830	2,478	R 11,974	R 992	R 35,351
July .....	1,578	1,816	R 1,830	R 4,141	1,604	17,113	2,637	R 12,330	R 985	R 36,147
August .....	1,510	1,537	R 1,671	R 4,217	1,510	16,346	2,510	R 11,650	R 902	R 34,624
September .....	1,598	1,679	R 1,887	R 4,279	1,674	16,670	2,482	R 12,408	R 950	R 35,905
October .....	1,640	1,798	R 1,801	R 4,233	1,630	16,941	2,325	R 12,231	R 907	R 35,953
November .....	1,630	1,839	R 1,880	R 4,664	1,686	16,343	2,302	R 12,457	R 1,028	R 36,122
December .....	1,664	2,070	R 1,972	R 5,511	1,717	17,445	2,411	R 13,125	R 1,045	R 38,789
Average .....	1,548	1,789	R 1,855	R 4,484	1,603	16,665	2,424	R 12,255	R 949	R 35,902
1988 January .....	1,478	1,711	R 1,782	R 4,867	1,563	17,403	2,135	R 11,438	R 836	R 36,021
February .....	1,642	1,984	R 1,897	R 5,690	1,711	17,760	2,360	R 12,639	R 919	R 38,650
March .....	1,607	1,976	R 1,805	R 5,172	1,786	17,612	2,546	R 13,000	R 1,045	R 38,437
April .....	1,432	1,707	R 1,614	R 4,453	1,627	16,561	2,240	R 11,615	R 915	R 34,976
May .....	1,544	1,557	R 1,634	R 3,948	1,575	16,197	2,256	R 11,247	R 978	R 33,914
June .....	1,590	1,732	R 1,784	R 4,149	1,700	17,059	2,580	R 12,461	R 1,008	R 36,267
July .....	1,514	1,671	R 1,758	R 4,213	1,565	16,695	2,528	R 11,948	R 959	R 35,329
August .....	1,652	1,577	R 1,602	R 4,432	1,622	17,482	2,352	R 11,798	R 1,001	R 36,364
September .....	1,666	1,769	R 1,841	R 4,277	1,724	17,072	2,519	R 12,585	R 947	R 36,547
October .....	R 1,610	1,772	R 1,863	R 4,359	1,718	17,580	2,384	R 12,340	R 951	R 36,840
November .....	R 1,742	2,076	R 2,084	R 5,264	1,849	17,620	2,549	R 13,690	R 939	R 39,256
December .....	R 1,739	2,039	R 2,030	R 6,001	1,742	18,365	2,622	R 13,612	R 952	R 40,670
Average .....	R 1,601	1,798	R 1,807	R 4,732	1,681	17,283	2,422	R 12,360	R 954	R 36,930
1989 January .....	1,560	1,923	R 2,012	R 5,202	1,673	17,211	1,878	R 12,048	R 914	R 36,935
February .....	1,665	2,089	2,107	5,588	1,727	17,765	2,172	12,868	1,055	38,940
2-Mo. Average ....	1,609	2,002	2,057	5,385	1,699	17,474	2,017	12,437	981	37,886

<sup>a</sup>The Organization for Economic Cooperation and Development (OECD) consists of Canada, Japan, and the United States, as well as "OECD Europe" and "Other OECD."

<sup>b</sup>"OECD Europe" consists of Austria, Belgium, Denmark, Finland, France, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and West Germany.

<sup>c</sup>"Other OECD" consists of Australia, New Zealand, and the U.S. Territories.

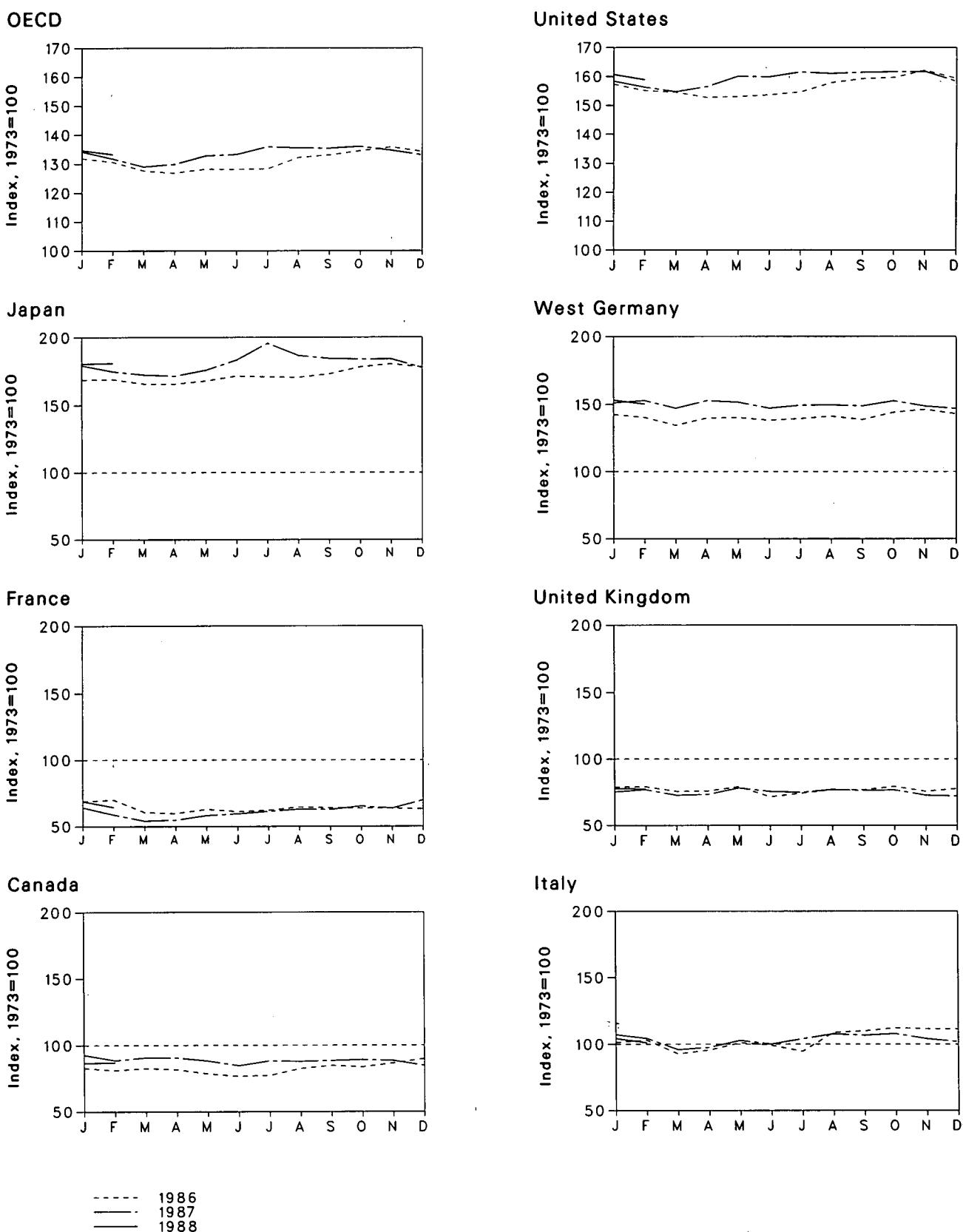
R=Revised data.

Notes: • U.S. geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding. • Data through 1986 are final. Subsequent data are preliminary.

Sources: • U.S. data: Energy Information Administration, *Petroleum Supply Annual*. • OECD data: International Energy Agency, *Quarterly Oil Statistics, Monthly Oil Statistics*.

Historical data are revised to incorporate adjustments from the International Energy Agency.

**Figure 10.4 Petroleum Stocks in OECD Countries, End of Period**



**Table 10.3 Petroleum Stocks<sup>a</sup> in OECD Countries,<sup>b</sup> End of Period  
(Million Barrels)**

	Canada	France	Italy	Japan	United Kingdom	United States	West Germany	OECD Europe <sup>c</sup>	Other OECD <sup>d</sup>	OECD <sup>b</sup>
1973 Year .....	140	201	152	303	156	1,008	181	1,070	67	2,588
1974 Year .....	145	249	167	370	161	1,074	213	1,227	64	2,880
1975 Year .....	174	225	143	375	165	1,133	187	1,154	67	2,903
1976 Year .....	153	234	143	380	165	1,112	208	1,205	68	2,918
1977 Year .....	167	239	161	409	148	1,312	225	1,268	68	3,224
1978 Year .....	144	201	154	413	157	1,278	238	1,219	68	3,122
1979 Year .....	150	226	163	460	169	1,341	272	1,353	75	3,379
1980 Year .....	164	243	170	495	168	1,392	319	1,464	72	3,587
1981 Year .....	161	214	167	482	143	1,484	297	1,337	67	3,531
1982 Year .....	136	193	179	484	125	1,430	272	1,258	68	3,376
1983 Year .....	121	153	149	470	118	1,454	249	1,142	68	3,255
1984 Year .....	128	152	159	479	112	1,556	239	1,130	69	3,362
1985 Year .....	113	139	157	494	123	1,519	233	1,092	66	3,284
1986 Year .....	111	127	155	509	124	1,593	252	1,133	72	3,418
1987 January .....	116	138	154	511	123	1,586	258	1,136	66	3,415
February .....	114	140	156	512	123	1,563	254	1,125	68	3,381
March .....	115	122	141	502	118	1,557	R 243	R 1,061	68	R 3,303
April .....	114	120	145	502	118	1,539	253	1,063	64	3,283
May .....	110	126	154	509	123	1,542	254	1,094	64	3,318
June .....	107	123	151	520	111	1,548	R 250	R 1,075	65	R 3,315
July .....	108	125	144	518	116	1,558	252	1,069	68	3,321
August .....	115	130	165	516	120	1,592	256	1,127	69	3,420
September .....	119	128	167	524	120	1,606	R 251	R 1,127	69	R 3,444
October .....	117	128	171	540	124	1,610	261	1,141	72	3,480
November .....	121	128	169	547	118	1,635	265	1,141	71	3,514
December .....	126	127	169	540	121	1,607	R 259	R 1,130	72	R 3,474
1988 January .....	130	129	163	544	117	1,597	274	1,136	68	3,474
February .....	124	118	159	530	120	1,576	277	1,112	69	3,411
March .....	127	108	146	522	113	1,559	R 266	R 1,065	65	R 3,338
April .....	127	110	148	519	114	1,578	276	1,072	66	3,361
May .....	123	117	156	533	122	1,614	274	1,103	65	3,438
June .....	118	120	152	556	118	1,612	R 266	R 1,099	64	R 3,450
July .....	124	123	158	593	117	1,629	270	1,103	68	3,516
August .....	123	126	164	566	120	1,624	271	1,127	66	3,505
September .....	124	126	162	559	119	1,628	270	1,127	66	3,504
October .....	125	131	164	557	119	1,630	276	R 1,145	64	R 3,520
November .....	124	128	158	558	113	1,631	269	R 1,104	69	R 3,486
December .....	119	R 140	155	R 538	R 112	1,597	266	R 1,121	R 71	R 3,446
1989 January .....	121	138	159	547	121	1,620	277	1,129	69	3,486
February .....	122	129	154	548	121	1,602	272	1,108	69	3,449

<sup>a</sup>Petroleum stocks include crude oil (including strategic reserves), unfinished oils, natural gas plant liquids, and refined products. Petroleum stocks include all nonmilitary petroleum held for storage, regardless of ownership, within each country in bulk terminals, refinery tanks, pipeline tankage, intercoastal tankers, tankers in port, and inland ship bunkers. Data exclude oil held in pipelines (except for the United States), rail and truck cars, sea-going ships' bunkers, service stations, retail stores, and tankers at sea.

<sup>b</sup>The Organization for Economic Cooperation and Development (OECD) includes Canada, Japan, and the United States, as well as "OECD Europe" and "Other OECD."

<sup>c</sup>"OECD Europe" consists of Austria, Belgium, Denmark, Finland, France, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and West Germany.

<sup>d</sup>"Other OECD" consists of Australia, New Zealand, and the U.S. Territories.

R=Revised data.

Notes: • U.S. geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding. • In the United States in January 1975, 1981, and 1983, numerous respondents were added to bulk terminal and pipeline surveys affecting subsequent stocks reported. Using the new basis, the end-of-year U.S. stocks, in million barrels, would have been 1,121 in 1974, 1,420 in 1980, and 1,462 in 1982. • Data through 1986 are final. Subsequent data are preliminary.

Sources: • U.S. data: Energy Information Administration, *Petroleum Supply Annual*. • OECD data: International Energy Agency, *Quarterly Oil Statistics, Monthly Oil Statistics*.

**Table 10.4a Nuclear Electricity Generation by Non-Communist Countries<sup>a</sup>**  
(Billion Gross Kilowatthours)

	Argentina	Belgium	Brazil	Canada	Finland	France	India	Italy	Japan	Netherlands	Pakistan
1973 Total .....	0	0	0	15.3	0	14.7	2.5	3.1	9.4	1.1	.5
1974 Total .....	1.0	0.1	0	15.4	0	14.7	1.9	3.4	18.9	3.3	.6
1975 Total .....	2.5	6.8	0	13.2	0	18.3	2.5	3.8	21.3	3.3	.5
1976 Total .....	2.6	10.0	0	18.0	0	15.8	3.2	3.8	36.6	3.9	.5
1977 Total .....	1.6	11.9	0	26.6	2.7	17.9	2.8	3.4	28.2	3.7	.3
1978 Total .....	2.9	12.5	0	33.0	3.3	30.6	2.3	4.5	53.1	4.1	.2
1979 Total .....	2.7	11.4	0	38.4	6.7	39.9	3.2	2.6	62.0	3.5	(s)
1980 Total .....	2.3	12.5	0	40.4	7.0	61.2	2.9	2.2	82.8	4.2	.1
1981 Total .....	2.8	12.8	0	43.3	14.5	105.2	3.1	2.7	86.0	3.7	.2
1982 Total .....	1.9	15.6	0.1	42.6	16.5	108.9	2.2	6.8	104.5	3.9	.1
1983 Total .....	3.4	24.1	.2	53.0	17.4	144.2	2.9	5.8	109.1	3.6	.2
1984 Total .....	4.5	27.7	2.1	53.8	18.5	191.2	4.1	6.9	127.2	3.8	.3
1985 Total .....	5.8	34.5	3.4	62.9	18.8	224.0	4.5	7.0	152.0	3.9	.3
1986 Total .....	5.7	38.6	.1	74.6	18.8	254.3	5.1	8.7	164.8	4.2	.5
1987 January .....	.7	4.1	0	7.2	1.8	27.3	.5	.1	14.7	.2	.1
February .....	.5	3.6	0	6.7	1.6	25.2	.5	.1	13.0	(s)	(s)
March .....	.6	3.4	(s)	7.0	1.8	25.8	.4	(s)	15.1	.1	(s)
April .....	.7	3.3	.3	6.7	1.7	20.6	.5	0	14.4	.4	(s)
May .....	.6	2.9	.4	4.8	1.3	20.2	.4	0	14.2	.4	(s)
June .....	.4	2.3	.3	6.5	1.3	19.7	.5	0	13.9	.4	(s)
July .....	.7	3.2	0	6.8	1.4	18.3	.5	0	15.2	.4	(s)
August .....	.1	3.6	0	6.5	1.6	16.1	.5	0	14.9	.4	0
September .....	.4	3.6	0	6.3	1.7	20.1	.5	0	16.7	.4	0
October .....	0	3.6	0	7.4	1.8	20.6	.3	0	17.4	.2	0
November .....	0	4.0	0	7.1	1.7	24.5	.5	0	16.9	.4	(s)
December .....	.5	4.3	0	7.5	1.8	27.0	.4	0	16.5	.4	(s)
Total .....	5.2	41.9	1.0	80.6	19.4	265.5	5.5	.2	182.8	3.6	.3
1988 January .....	.5	3.9	0	7.7	1.8	26.1	.3	0	15.0	.3	.1
February .....	.5	3.2	0	7.5	1.6	24.5	.4	0	13.5	(s)	(s)
March .....	.5	3.7	0	7.9	1.8	26.0	.4	0	14.7	(s)	(s)
April .....	.2	3.4	0	6.9	1.7	21.0	.4	0	14.9	.2	0
May .....	.2	3.3	0	6.7	1.3	18.9	.5	0	15.7	.4	0
June .....	.2	2.7	0	6.6	1.4	20.1	.6	0	14.8	.4	(s)
July .....	.7	3.3	0	7.2	1.2	20.6	.7	0	15.5	.4	(s)
August .....	.5	3.8	0	7.4	1.5	20.9	.6	0	15.8	.4	0
September .....	.5	3.9	0	6.9	1.7	23.4	.5	0	14.1	.4	0
October .....	.5	3.9	0	6.6	1.8	24.0	.5	0	13.6	.4	0
November .....	.5	3.9	0	6.7	1.7	23.3	.4	0	11.5	.4	0
December .....	.5	4.1	.3	7.7	1.8	26.1	.5	0	14.6	.4	0
Total .....	5.1	43.1	.3	85.6	19.3	274.9	6.1	0	173.6	3.7	.2
1989 January .....	.5	4.1	.2	8.1	1.8	30.5	.3	0	15.2	.4	0
February .....	.4	3.4	.2	6.9	1.6	27.1	.3	0	14.4	(s)	0
March .....	.5	3.6	.2	7.7	1.8	27.8	.3	0	16.2	.2	0
April .....	.4	3.0	.3	7.3	1.7	25.4	.4	0	13.3	.4	0
May .....	.5	3.0	(s)	6.2	1.2	22.6	.4	0	13.8	.4	0
5-Month Total ....	2.3	17.2	.9	36.2	8.1	133.5	1.6	0	72.9	1.3	0
1988 5-Month Total ....	1.8	17.5	0	36.7	8.1	116.5	2.1	0	73.7	.9	.1
1987 5-Month Total ....	3.2	17.3	.7	32.5	8.1	119.1	2.3	.2	71.4	1.0	.2

<sup>a</sup>Figures are for gross electricity generation, as opposed to net electricity generation. Net figures are generally less than gross figures by about 5 percent, the difference being the energy consumed by the generating plants themselves.

<sup>b</sup>Monthly data for the United Kingdom are totals for 4- or 5-week reporting periods, not calendar months.

<sup>c</sup>Some Central Electricity Generating Board figures were unavailable for March 1988. This number does not reflect the total generation for March.

(s)=Less than 0.05 billion gross kilowatthours.

Footnotes continued on following page.

**Table 10.4b Nuclear Electricity Generation by Non-Communist Countries<sup>a</sup>  
(continued)  
(Billion Gross Kilowatthours)**

	South Africa	South Korea	Spain	Sweden	Switzer- land	Taiwan	United King- dom <sup>b</sup>	West Germany	Non- Communist World Excluding U.S.	United States	Non- Communist World
1973 Total .....	0	0	6.5	2.1	6.2	0	28.2	11.9	101.4	87.8	189.3
1974 Total .....	0	0	7.2	2.3	7.0	0	33.8	12.0	121.7	124.3	246.0
1975 Total .....	0	0	7.5	12.0	7.7	0	30.5	21.7	151.8	182.3	334.1
1976 Total .....	0	0	7.6	16.0	7.9	0	36.8	24.5	187.1	201.8	388.9
1977 Total .....	0	0.1	6.5	19.9	8.1	0.1	38.1	36.0	207.8	264.2	472.0
1978 Total .....	0	2.3	7.6	23.8	8.3	2.7	36.6	35.7	263.5	292.4	555.9
1979 Total .....	0	3.2	6.7	21.0	11.8	6.3	38.5	42.2	300.1	270.6	570.7
1980 Total .....	0	3.5	5.2	26.7	14.3	8.2	37.2	43.7	354.3	285.4	619.8
1981 Total .....	0	2.9	9.4	37.7	15.2	10.7	38.9	53.4	442.4	288.5	730.9
1982 Total .....	0	3.8	8.8	38.8	15.0	13.1	44.1	63.4	489.9	298.6	788.5
1983 Total .....	0	9.0	10.7	40.4	15.5	18.9	49.8	65.8	573.9	313.6	887.5
1984 Total .....	4.2	11.8	23.1	51.3	16.3	24.3	54.1	92.6	717.7	343.8	1,061.5
1985 Total .....	5.7	16.5	28.0	58.6	22.4	28.7	59.8	125.8	862.4	402.6	1,265.0
1986 Total .....	9.3	26.1	37.5	69.9	22.5	26.9	58.2	118.9	944.8	432.9	1,377.8
1987 January .....	.7	3.2	3.4	7.2	2.3	3.2	5.0	12.2	93.9	42.0	135.9
February .....	.7	3.0	3.3	6.6	2.1	3.1	5.2	11.8	86.9	38.2	125.0
March .....	.8	2.5	4.0	7.1	2.3	3.0	6.7	12.6	93.3	39.2	132.5
April .....	.5	2.4	3.7	6.1	2.2	2.6	4.6	10.7	81.4	35.0	116.5
May .....	.7	3.1	2.1	4.8	1.9	3.2	4.4	8.7	74.3	36.3	110.6
June .....	.6	3.8	2.5	3.5	1.1	3.1	4.1	8.6	72.6	38.4	111.0
July .....	.4	3.3	3.3	2.7	1.3	3.0	3.4	8.6	72.5	42.9	115.3
August .....	.8	3.2	3.3	4.1	1.0	2.9	4.0	9.3	72.4	43.2	115.6
September .....	.3	2.9	3.5	5.1	1.9	2.5	5.1	10.3	81.3	41.9	123.2
October .....	.4	3.2	3.9	6.0	2.3	2.4	3.9	12.0	85.3	38.3	123.6
November .....	.7	3.4	3.9	6.8	2.2	2.1	3.7	12.5	90.4	39.4	129.8
December .....	0	3.8	4.2	7.2	2.3	2.1	6.2	12.9	97.1	43.7	140.8
Total .....	6.6	37.8	41.3	67.2	23.0	33.1	56.2	130.2	1,001.3	478.5	1,479.8
1988 January .....	.3	3.9	4.2	7.2	2.3	2.2	4.9	13.1	93.5	47.4	140.9
February .....	.7	3.1	3.4	6.8	2.2	2.0	4.3	12.4	86.1	44.5	130.5
March .....	1.1	2.8	3.5	7.2	2.3	2.7	1.8	13.5	90.0	46.2	136.1
April .....	1.3	2.9	3.7	6.8	2.2	2.6	4.5	11.4	84.1	42.2	126.3
May .....	1.4	2.8	4.4	5.4	2.0	2.2	4.3	11.0	80.3	42.7	123.0
June .....	1.3	3.1	4.4	4.3	1.2	2.6	5.7	10.6	80.0	46.3	126.4
July .....	1.3	3.6	3.8	3.7	1.3	2.9	5.1	10.6	82.1	51.7	133.8
August .....	.8	3.5	2.7	3.6	1.0	3.0	5.3	10.0	80.8	51.7	132.5
September .....	.7	3.1	4.6	4.5	1.5	2.9	6.0	12.2	86.8	48.7	135.5
October .....	.7	3.8	4.9	6.6	2.3	2.4	5.3	13.7	91.0	44.6	135.5
November .....	.7	3.0	5.0	6.7	2.2	2.2	5.0	13.4	86.7	41.7	128.4
December .....	.9	3.2	4.6	6.7	2.3	2.2	7.2	13.2	96.2	46.4	142.7
Total .....	11.1	38.7	49.2	69.4	22.7	29.9	59.4	145.2	1,037.5	554.1	1,591.6
1989 January .....	1.1	3.4	4.9	7.2	2.3	2.4	6.8	13.0	102.1	48.7	150.9
February .....	.5	3.7	4.2	6.5	2.1	1.8	6.3	13.5	92.9	40.8	133.7
March .....	.6	4.4	4.2	6.7	2.3	1.7	R 6.7	14.8	R 99.8	41.8	141.6
April .....	.7	3.7	4.8	5.6	2.2	2.2	R 5.9	13.4	R 90.9	35.3	R 126.2
May .....	.7	3.8	4.7	3.9	2.0	2.1	5.7	11.1	82.1	40.8	122.9
5-Month Total ....	3.6	19.1	22.9	30.0	10.8	10.2	31.4	65.9	487.8	207.5	675.2
1988 5-Month Total ....	4.7	15.5	19.2	33.4	10.9	11.7	19.7	61.4	433.9	222.9	656.9
1987 5-Month Total ....	3.4	14.2	16.6	31.8	10.9	15.1	25.9	56.0	429.8	190.7	620.5

Footnotes continued.

R=Revised data.

Notes: • U.S. geographic coverage is the 50 States and the District of Columbia. • Monthly data may not sum to annual totals due to independent rounding, revisions in annual data not reflected in the monthly data, or both. Data for countries may not sum to world totals due to independent rounding.

Source: *Nucleonics Week* (New York: McGraw-Hill Publishing Company).

# Appendix. Conversion Factors

## Using Conversion Factors

Physical conversion factors can be used to compare energy quantities expressed in units of volume and weight. For example, 6.65 barrels of crude oil weighs approximately 1 short ton, as indicated in Table A1.

However, the heat content of a "short ton" of crude oil is greater than the heat content of a short ton of coal. The heat content, measured in British thermal units (Btu), of a given quantity of energy can be calculated using the thermal conversion factors presented in Tables A2 through A9.

Based on the thermal conversion factor shown for crude oil (production) in Table A2, a short ton of crude oil has a heat content of approximately 39 million Btu ( $6.65 \text{ barrels} \times 5.8 \text{ million Btu per barrel} = 38.57 \text{ million Btu}$ , which rounds to 39). As calculated from the thermal conversion factor for coal (production) in Table A6, a short ton of coal has a heat content of 22

million Btu (1 short ton  $\times 21.922 \text{ million Btu per short ton} = 21.922 \text{ million Btu}$ , which rounds to 22). A short ton of crude oil, therefore, has a heat content almost two times greater than does a short ton of coal.

The thermal conversion factors in Tables A2 through A9 are computed from final annual data. When the current year's final data are not yet available for publication, thermal conversion factors for the current year are computed from the best available data and are labeled "preliminary." The source of each factor is described in a section entitled "Thermal Conversion Factor Source Documentation," which follows Table A9 in this appendix.

Thermal conversion factors for hydrocarbon mixes (Table A2) are weighted averages of the thermal conversion factors for each hydrocarbon included in the mix. For example, in calculating the thermal conversion factor for a 60/40 butane/propane mixture, the thermal conversion factor for butane is weighted 1.5 times more heavily than the thermal conversion factor for propane.

**Table A1. Physical Conversion Factors for Energy Units**

Unit	Equivalent
<b>Crude Oil (Average Gravity)</b>	
1 U.S. barrel	42 U.S. gallons
1 short ton	6.65 barrels
1 metric ton	7.33 barrels
<b>Coal</b>	
1 short ton	2,000 pounds
1 long ton	2,240 pounds
1 metric ton	2,204.62 pounds
1 metric ton	1,000 kilograms
<b>Uranium</b>	
1 short ton $U_3O_8$	0.769 metric ton of uranium
1 short ton $UF_6$	0.613 metric ton of uranium
1 metric ton $UF_6$	0.676 metric ton of uranium
<b>Wood (Average Dry Hardwood)</b>	
1 cord	1.25 short tons
1 cord	128 cubic feet
1 cubic foot	0.028 cubic meters

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A9.

**Table A2. Approximate Heat Content of Petroleum Products**  
(Million Btu per Barrel)

Petroleum Product	Heat Content	Petroleum Product	Heat Content
Asphalt .....	6.636	Petrochemical Feedstocks	
Aviation Gasoline .....	5.048	Naphtha 400° F or less .....	5.248
Butane .....	4.326	Other Oils over 400° F .....	5.825
Butane-Propane Mixture <sup>a</sup> .....	4.130	Still Gas .....	6.000
Distillate Fuel Oil .....	5.825	Petroleum Coke .....	6.024
Ethane .....	3.082	Plant Condensate .....	5.418
Ethane-Propane Mixture <sup>b</sup> .....	3.308	Propane .....	3.836
Isobutane .....	3.974	Residual Fuel Oil .....	6.287
Jet Fuel, Kerosene Type .....	5.670	Road Oil .....	6.636
Jet Fuel, Naphtha Type .....	5.355	Special Naphthas .....	5.248
Kerosene .....	5.670	Still Gas .....	6.000
Lubricants .....	6.065	Unfinished Oils .....	5.825
Motor Gasoline .....	5.253	Unfractionated Stream .....	5.418
Natural Gasoline and Isopentane .....	4.620	Waxes .....	5.537
Pentanes Plus .....	4.620	Miscellaneous .....	5.796

<sup>a</sup>60 percent butane and 40 percent propane.

<sup>b</sup>70 percent ethane and 30 percent propane.

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A9.

**Table A3. Approximate Heat Content of Crude Oil,<sup>a</sup> Crude Oil and Products, and Natural Gas Plant Liquids**  
(Million Btu per Barrel)

	Crude Oil Only			Crude Oil and Products		Natural Gas Plant Liquids
	Production	Imports	Exports	Imports	Exports	
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	5.868	5.800	5.800	5.848	3.812
1989 <sup>b</sup> .....	5.800	5.868	5.800	5.800	5.848	3.812

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

<sup>b</sup>Preliminary.

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A9.

**Table A4. Approximate Heat Content of Petroleum Product Weighted Averages<sup>a</sup>**  
 (Million Btu per Barrel)

	Consumption					Imports	Exports	LPG Consumption
	Residential and Commercial	Industrial	Transportation	Electric Utilities	Total			
1973 .....	5.387	5.568	5.395	6.245	5.515	5.983	5.752	3.746
1974 .....	5.377	5.538	5.394	6.238	5.504	5.959	5.773	3.730
1975 .....	5.358	5.528	5.392	6.250	5.494	5.935	5.747	3.715
1976 .....	5.383	5.538	5.395	6.251	5.504	5.980	5.743	3.711
1977 .....	5.389	5.555	5.400	6.249	5.518	5.908	5.796	3.677
1978 .....	5.382	5.553	5.404	6.251	5.519	5.955	5.814	3.669
1979 .....	5.471	5.418	5.428	6.258	5.494	5.811	5.864	3.680
1980 .....	5.468	5.376	5.440	6.254	5.479	5.748	5.841	3.674
1981 .....	5.409	5.313	5.432	6.258	5.448	5.659	5.837	3.643
1982 .....	5.392	5.263	5.422	6.258	5.415	5.664	5.829	3.615
1983 .....	5.286	5.272	5.416	6.255	5.406	5.677	5.800	3.614
1984 .....	5.261	5.252	5.425	6.251	5.395	5.613	5.867	3.599
1985 .....	5.203	5.261	5.423	6.247	5.387	5.572	5.819	3.603
1986 .....	5.238	5.335	5.423	6.257	5.418	5.624	5.839	3.640
1987 .....	5.245	5.291	5.424	6.249	5.403	5.599	5.860	3.659
1988 .....	5.240	5.296	5.423	6.250	5.408	5.649	5.859	3.652
1989 <sup>b</sup> .....	5.240	5.296	5.423	6.250	5.408	5.649	5.859	3.652

<sup>a</sup>Weighted averages of the products included in each category are calculated using heat content values shown in Table A1.

<sup>b</sup>Preliminary.

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A9.

**Table A5. Approximate Heat Content of Natural Gas**  
 (Btu per Cubic Foot)

	Production		Consumption			Imports	Exports
	Dry	Marketed (Wet)	Non-Electric Utility Users	Electric Utilities	Total		
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 <sup>a</sup> .....	1,031	1,112	1,031	1,032	1,031	999	1,011
1989 <sup>b</sup> .....	1,031	1,112	1,031	1,032	1,031	999	1,011

<sup>a</sup>Preliminary.

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A9.

**Table A6. Approximate Heat Content of Coal**  
(Million Btu per Short Ton)

	Production	Consumption					Imports	Exports
		Residential and Commercial	Coke Plants	Other Industrial <sup>a</sup>	Electric Utilities <sup>b</sup>	Total		
1973 .....	23.376	22.831	26.780	22.586	22.246	23.057	25.000	26.596
1974 .....	23.072	22.479	26.778	22.419	21.781	22.677	25.000	26.700
1975 .....	22.897	22.261	26.782	22.436	21.642	22.506	25.000	26.562
1976 .....	22.855	22.774	26.781	22.530	21.679	22.498	25.000	26.601
1977 .....	22.597	22.919	26.787	22.322	21.508	22.265	25.000	26.548
1978 .....	22.248	22.466	26.789	22.207	21.275	22.017	25.000	26.478
1979 .....	22.454	22.242	26.788	22.452	21.364	22.100	25.000	26.548
1980 .....	22.415	22.543	26.790	22.690	21.295	21.947	25.000	26.384
1981 .....	22.308	22.474	26.794	22.585	21.085	21.713	25.000	26.160
1982 .....	22.239	22.695	26.797	22.712	21.194	21.674	25.000	26.223
1983 .....	22.052	22.775	26.798	22.691	21.133	21.576	25.000	26.291
1984 .....	22.010	22.844	26.799	22.543	21.101	21.573	25.000	26.402
1985 .....	21.870	22.646	26.798	22.020	20.959	21.366	25.000	26.307
1986 .....	21.913	22.947	26.798	22.198	21.084	21.462	25.000	26.292
1987 .....	21.922	23.404	26.792	22.381	21.136	21.517	25.000	26.291
1988 <sup>c</sup> .....	21.832	23.089	26.788	22.367	20.923	21.340	25.000	26.316
1989 <sup>b</sup> .....	21.832	23.089	26.788	22.367	20.923	21.340	25.000	26.316

<sup>a</sup>Includes transportation.

<sup>b</sup>Data shown in this column are not the same as those shown in the *Electric Power Monthly* (EPM). The EPM data report coal receipts; the data shown here represent coal consumption.

<sup>c</sup>Preliminary.

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A9.

**Table A7. Approximate Heat Content of Bituminous Coal and Lignite**  
(Million Btu per Short Ton)

	Production	Consumption					Imports	Exports
		Residential and Commercial	Coke Plants	Other Industrial <sup>a</sup>	Electric Utilities	Total		
1973 .....	23.391	22.887	26.800	22.585	22.262	23.073	25.000	26.612
1974 .....	23.087	22.523	26.800	22.420	21.799	22.694	25.000	26.716
1975 .....	22.910	22.258	26.800	22.439	21.659	22.522	25.000	26.573
1976 .....	22.863	22.819	26.800	22.528	21.692	22.509	25.000	26.613
1977 .....	22.597	22.594	26.800	22.290	21.521	22.266	25.000	26.561
1978 .....	22.242	22.078	26.800	22.175	21.284	22.014	25.000	26.501
1979 .....	22.449	21.884	26.800	22.436	21.372	22.100	25.000	26.570
1980 .....	22.411	22.488	26.800	22.690	21.301	21.950	25.000	26.404
1981 .....	22.301	22.010	26.800	22.572	21.091	21.710	25.000	26.176
1982 .....	22.233	22.226	26.800	22.695	21.200	21.670	25.000	26.231
1983 .....	22.048	22.438	26.800	22.680	21.141	21.576	25.000	26.300
1984 .....	22.005	22.406	26.800	22.525	21.108	21.570	25.000	26.410
1985 .....	21.867	22.568	26.800	22.013	20.965	21.368	25.000	26.320
1986 .....	21.908	22.669	26.800	22.185	21.091	21.462	25.000	26.308
1987 .....	21.918	22.800	26.800	22.360	21.143	21.514	25.000	26.304
1988 <sup>b</sup> .....	21.828	22.690	26.800	22.344	20.929	21.337	25.000	26.316
1989 <sup>b</sup> .....	21.828	22.690	26.800	22.344	20.929	21.337	25.000	26.316

<sup>a</sup>Includes transportation.

<sup>b</sup>Preliminary.

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A9.

**Table A8. Approximate Heat Content of Anthracite and Coal Coke**  
 (Million Btu per Short Ton)

Production	Anthracite				Imports and Exports	Coal Coke Imports and Exports		
	Consumption			Total				
	Non-Electric Utility Users	Electric Utilities						
1973 .....	22.132	22.674	17.920	21.464	25.400	24.800		
1974 .....	21.711	22.330	17.200	20.919	25.400	24.800		
1975 .....	21.582	22.272	17.064	20.762	25.400	24.800		
1976 .....	22.045	22.618	17.526	21.254	25.400	24.800		
1977 .....	22.661	24.101	17.244	22.066	25.400	24.800		
1978 .....	23.079	24.388	17.104	22.398	25.400	24.800		
1979 .....	23.170	24.272	17.454	22.069	25.400	24.800		
1980 .....	22.869	22.719	17.652	21.405	25.400	24.800		
1981 .....	23.291	23.749	18.168	22.080	25.400	24.800		
1982 .....	23.289	24.578	18.160	22.518	25.400	24.800		
1983 .....	22.734	24.536	16.516	21.583	25.400	24.800		
1984 .....	23.107	25.128	17.018	22.322	25.400	24.800		
1985 .....	22.428	23.031	16.784	20.817	25.400	24.800		
1986 .....	23.084	24.399	15.578	21.512	25.400	24.800		
1987 .....	23.108	26.293	15.962	22.435	25.400	24.800		
1988 <sup>a</sup> .....	23.108	25.721	17.428	22.473	25.400	24.800		
1989 <sup>a</sup> .....	23.108	25.721	17.428	22.473	25.400	24.800		

<sup>a</sup>Preliminary.

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A9.

**Table A9. Approximate Heat Rates for Electricity**  
 (Btu per Kilowatthour)

	By Type of Generation			Electricity Consumption
	Fossil Fuel Steam-Electric Power Plant Generation <sup>a</sup>	Nuclear Power Plant Generation	Geothermal Energy Power Plant Generation	
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 .....	10,323	10,843	21,303	3,412
1985 .....	10,339	10,813	21,263	3,412
1986 .....	10,261	10,799	21,263	3,412
1987 .....	10,253	10,776	21,263	3,412
1988 <sup>b</sup> .....	10,253	10,776	21,263	3,412
1989 <sup>b</sup> .....	10,253	10,776	21,263	3,412

<sup>a</sup>This thermal conversion factor is used for hydroelectric power generation and for wood and waste, wind, photovoltaic, and solar thermal energy consumed at electric utilities.

<sup>b</sup>Preliminary.

Sources: See "Thermal Conversion Factor Source Documentation," which follows this table.

# Thermal Conversion Factor Source Documentation

## Approximate Heat Content of Petroleum Products

**Asphalt.** 1973 forward: 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.** 1973 forward: 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*, 1968.

**Butane.** 1973 forward: 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.** 1973 forward: 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."

**Distillate Fuel Oil.** 1973 forward: 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 Value of Various Fuels*, adopted January 3, 1950.

**Ethane.** 1973 forward: 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.** 1979 forward: EIA calculated 3.308 million Btu per barrel based on an assumed mixture of 70 percent ethane and 30 percent propane. See "Ethane" and "Propane."

**Isobutane.** 1973 forward: 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.** 1973 forward: EIA adopted the Bureau of Mines thermal conversion factor of 5.670 million Btu per barrel as published for "Jet Fuel, Commercial" by the Texas Eastern Transmission Corpora-

tion in the report *Competition and Growth in American Energy Markets 1947-1985*, 1968.

**Jet Fuel, Naphtha Type.** 1973 forward: EIA adopted the Bureau of Mines thermal conversion factor of 5.355 million Btu per barrel as published for "Jet Fuel, Military" by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947-1985*, 1968.

**Kerosene.** 1973 forward: EIA adopted the Bureau of Mines thermal conversion factor of 5.670 million Btu per barrel as reported in a Bureau of Mines internal memorandum, *Bureau of Mines Standard Average Heating Values of Various Fuels*, adopted January 3, 1950.

**Lubricants.** 1973 forward: EIA adopted the thermal conversion factor of adopted the thermal conversion factor of 6.065 million Btu per barrel as estimated by the 6.065 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

**Miscellaneous Products.** 1973 forward: 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, Statement, Annual, 1956*.

**Motor Gasoline.** 1973 forward: EIA adopted the Bureau of Minesthermal conversion factor of 5.253 million Btu per barrel as published for "Gasoline, Motor Fuel" by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947-1985*, 1968.

**Natural Gasoline.** 1973 forward: 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.** 1984 forward: EIA assumed the thermal conversion factor to be 4.620 million Btu per barrel or equal to that for natural gasoline. See "Natural Gasoline."

**Petrochemical Feedstocks, Naphtha 400 Degrees Fahrenheit or Less.** 1973 forward: Assumed by EIA to be 5.248 million Btu per barrel, equal to the thermal conversion to the thermal conversion factor for special naphtha. See "Special Naphtha."

**Petrochemical Feedstock, Oils Over 400 Degrees Fahrenheit.** 1973 forward: 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 Feedstock, Still Gas.** 1973 forward: 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.** 1973 forward: 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 Bureau of Mines internal memorandum *Bureau of Mines Standard Average Heating Value of Standard Average Heating Value of Various Fuels, adopted Various Fuels, adopted January 3, 1950*. The Bureau of Mines calculated this factor by dividing the 30,120,000 Btu per short ton as given in the referenced Bureau of Mines internal memorandum by 5.0 barrels per short ton as given in the Bureau of Mines Form 6-1300-M and successor EIA forms.

**Plant Condensate.** 1973 forward: Estimated to be 5.418 million Btu per barrel by EIA from data provided by McClanahan Consultants, Inc., Houston, Texas.

**Propane.** 1973 forward: 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.** 1973 forward: 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.** 1973 forward: EIA adopted the Bureau of Mines thermal conversion factor of 6.636 million Btu per barrel which was assumed to be equal to that of asphalt (see "Asphalt") and was first published by the Bureau of Mines in the *Petroleum Statement, Annual, 1970*.

**Special Naphtha.** 1973 forward: EIA adopted the Bureau of Mines thermal conversion factor of 5.248 million Btu per barrel which was assumed to be equal to that of total gasoline (aviation and motor) factor and was first published in the *Petroleum Statement, Annual, 1970*.

**Still Gas.** 1973 forward: EIA adopted the Bureau of Mines estimated thermal adopted the Bureau of Mines estimated thermal conversion factor of 6.000 million Btu per barrel and first published in the *Petroleum Statement, Annual, 1970*.

**Unfinished Oil.** 1973 forward: EIA assumed the thermal conversion factor to be 5.825 million Btu per barrel or equal to that for distillate fuel oil (see "Distillate Fuel Oil") and first published in the *Annual Report to Congress, Volume 3, 1977*.

**Unfractionated Stream.** 1979 forward: EIA assumed the thermal conversion factor to be 5.418 million Btu per barrel or equal to that for plant condensate (see "Plant Condensate") and first published in the *Annual Report to Congress, Volume 2, 1981*.

**Wax.** 1973 forward: 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 Fuels

### Petroleum

**Crude Oil, Exports.** 1973 forward: 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.** 1973 forward: 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 using National Bureau of Standards, Miscellaneous Publication No. 97, *Thermal Properties of Petroleum Products*, 1933.

**Crude Oil and Lease Condensate, Production.** 1973 forward: 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.** 1973 forward: 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 "Petroleum Products, Exports."

**Crude Oil and Petroleum Products, Imports.** 1973 forward: Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product and each type of 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."

**Natural Gas Plant Liquids, Production.** 1973 forward: 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.

**Petroleum Products, Consumption.** 1973 forward: Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products con-

sumed, weighted by the quantity of each petroleum product consumed.

**Petroleum Products, Consumption by Electric Utilities.** 1973-1987: 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 consumed is estimated in the State Energy Data System as documented in the *State Energy Data Report*. 1988 forward: Estimated by EIA.

**Petroleum Products, Consumption by Industrial Users.** 1973-1987: 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 States Energy Data System as documented in the *State Energy Data Report*. 1988 forward: Estimated by EIA.

**Petroleum Products, Consumption by Residential and Commercial Users.** 1973-1987: 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 the *State Energy Data Report*. 1988 forward: Estimated by EIA.

**Petroleum Products, Consumption by Transportation Users.** 1973-1987: Calculated annually by EIA as the average of the thermal conversion factor for all petroleum products consumed in the transportation sector, weighted by the estimated quantity of each petroleum product consumed in the transportation sector. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in the *State Energy Data Report*. 1988 forward: Estimated by EIA.

**Petroleum Products, Exports.** 1973 forward: 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.** 1973 forward: 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.

**Petroleum Products, Liquefied Petroleum Gases (LPG) Consumption.** 1973 forward: Calculated annually by EIA as the average of the thermal conversion factors of each liquefied petroleum gas consumed weighted

by the quantity of each liquefied petroleum gas consumed.

## Natural Gas

**Natural Gas, Consumption.** 1973-1979: EIA adopted the thermal conversion factor calculated annually by the American Gas Association (AGA) and published in *Gas Facts*, an AGA annual.

1980 forward: Calculated annually by EIA by dividing the total heat content of natural gas consumed by the total quantity natural gas consumed. Heat content and quantity consumed are from Form EIA-176.

**Natural Gas, Consumption by Electric Utilities.** 1973 forward: 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 FERC Form 423 and predecessor forms.

**Natural Gas, Consumption by Non-Electric Utility Users.** 1973 forward: Calculated annually by EIA by dividing the heat content of natural gas consumed by non-electric utility consumers by the quantity of non-electric utility natural gas consumed. Data are from Forms EIA-176, FERC Form 423, EIA-759, and predecessor forms.

**Natural Gas, Exports.** 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.** 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.** 1973 forward: Assumed by EIA to be equal to the thermal conversion factor for the consumption of dry natural gas. See "Natural Gas, Consumption."

**Natural Gas Production, Marketed (Wet).** 1973 forward: Calculated annually by EIA by adding the heat content of dry natural gas 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.

## Coal and Coal Coke

**Anthracite, Consumption.** 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of anthracite consumed by electric utilities and non-electric utilities by the total quantity of anthracite consumed.

**Anthracite, Consumption by Electric Utilities.** 1973 forward: Calculated annually by EIA by dividing the heat content of anthracite receipts at electric utilities by the quantity of anthracite received at electric utilities. Heat contents and receipts are from FERC Form 423 and predecessor forms.

**Anthracite, Consumption by Non-Electric Utility Users.** 1973 forward: Calculated annually by EIA by dividing the heat content of anthracite production less the heat content of the he anthracite consumed at electric utilities, net exports, and shipments to U.S. Armed Forces overseas by the quantity of non-electric utility anthracite consumption less the quantity of anthracite stock changes, losses, and unaccounted for.

**Anthracite, Imports and Exports.** 1973 forward: EIA assumed the anthracite imports and exports to be freshly mined anthracite having an estimated heat content of 25.40 million Btu per short ton.

**Anthracite, Production.** 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of freshly mined anthracite (estimated to have an average heat content of 25.400 million Btu per short ton) and the heat content of anthracite recovered from culm banks and river dredging (estimated to have a heat content of 17.500 million Btu per short ton) by the total quantity of anthracite production.

**Bituminous Coal and Lignite, Consumption.** 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite consumed by electric utilities, coal coke plants, other industrial plants, the residential and commercial sector, and the transportation sector by the sum of their respective tonnages.

**Bituminous Coal and Lignite, Consumption by Coke Plants.** 1973 forward: Estimated by EIA to be 26.800 million Btu per short ton based on an input/output analysis of coal carbonization.

**Bituminous Coal and Lignite, Consumption by Electric Utilities.** 1973 forward: Calculated annually by EIA by dividing the total heat content of bituminous coal and lignite received at electric utilities by the total quantity received at electric utilities. Heat contents and receipts are from FERC Form 423 and predecessor forms.

**Bituminous Coal and Lignite, Consumption by Other Industrial and Transportation Users.** 1973: Calculated by EIA through regression analysis measuring the difference between the average Btu value of coal consumed by other industrial users and that of coal consumed at electric utilities in the 1974-1982 period.

1974 forward: Calculated annually by EIA assuming that the bituminous coal and lignite delivered to other industrial users from each coal-producing district (reported on EIA Form 6 and predecessor Bureau of Mines Form 6-1419-Q) contained a heat value equal to

bituminous coal and lignite received at electric utilities from each of the same coal-producing districts (reported on FERC Form 423). The average Btu value of coal by coal-producing district was applied to the volume of deliveries to other industrial users from each coal-producing district, and the sum total of the heat content was divided by the total volume of deliveries.

**Bituminous Coal and Lignite, Consumption by Residential and Commercial Users.** 1973: Calculated by EIA through regression analysis measuring the difference between the average Btu value of coal consumed by residential and commercial users and that of coal consumed by electric utilities in the 1974-1982 period.

1974 forward: Calculated annually by EIA by assuming that the bituminous coal and lignite delivered to residential and commercial users from each coal-producing district (reported on EIA Form 6 and predecessor Bureau of Mines Form 6-1419-Q) contained a heat value equal to bituminous coal and lignite received at electric utilities from each of the same coal-producing districts (reported on FERC Form 423). The average Btu value of coal by coal-producing district was applied to the volume of deliveries to residential and commercial users from each coal-producing district, and the total of the heat value was divided by the total volume of deliveries.

**Bituminous Coal and Lignite, Exports.** 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of exported metallurgical coal (estimated to average 27.000 million Btu per short ton) and the heat content of exported steam coal (estimated to have an average thermal content of 25.000 million Btu per short ton) by the total quantity of bituminous coal and lignite exported.

**Bituminous Coal and Lignite, Imports.** 1973 forward: EIA estimated the average thermal conversion factor to be 25.000 million Btu per short ton.

**Bituminous Coal and Lignite, Production.** 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite consumption, net exports, stock changes, and unaccounted for by the sum of their respective tonnages. Consumers' stock changes by sectors were assumed to have the same conversion factor as the consumption sector. Producers' stock changes and unaccounted for were assumed to have the same conversion factor as consumption by all users.

**Coal, Consumption.** 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite consumption by the sum of their respective tonnages.

**Coal, Consumption by Electric Utilities.** 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite received at electric utilities by the sum of their respective tonnages received.

**Coal, Consumption by Non-Electric Utility Users.** 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite consumed by non-electric utility users by the sum of their respective tonnages.

**Coal, Exports.** 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite exported by the sum of their respective tonnages.

**Coal, Imports.** 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite imported by the sum of their respective tonnages.

**Coal, Production.** 1973 forward: Calculated annually by EIA by dividing the sum of the total heat content of bituminous coal and lignite and anthracite production by the sum of their respective tonnages.

**Coal Coke, Imports and Exports.** 1973 forward: EIA adopted the Bureau of Mines estimate of 24.800 million Btu per short ton.

the thermal conversion rates for power plants that generate electricity from hydroelectric, wood and waste, wind, photovoltaic, or solar thermal energy sources. EIA has selected a rate that is equal to the prevailing annual average heat rate factor for fossil-fueled steam-electric power plants in the United States. By using that factor, it is possible to evaluate fossil fuel requirements for replacing those sources during periods of interruption such as droughts. The heat content of a kilowatthour of electricity produced, regardless of the generation process, is 3,412 Btu per kilowatthour. 1973 forward: The weighted annual average heat rate for fossil-fueled steam-electric power plants in the United States, as published by EIA in *Historical Plant Cost and Annual Production Expenses for Selected Electric Plants*.

**Geothermal Energy Power Plant Generation.** 1973 forward: Calculated annually by EIA by weighting the average annual heat rates of operating geothermal units by the installed nameplate capacities as reported on Form FPC-12. 1982 forward: Estimated annually by EIA based on an informal survey of relevant plants.

**Nuclear Power Plant Generation.** 1973 forward: Calculated annually by EIA by dividing the total heat content consumed in reactors at nuclear plants by the total (net) electricity generated by nuclear plants as reported on Form FERC-1, EIA-412 and predecessor forms, and as published beginning with 1982 data in EIA, *Historical Plant Cost and Annual Production Expenses for Selected Electric Plants*.

## Approximate Heat Rates for Electricity

**Fossil Fuel Steam-Electric Power Plant Generation.** There is no generally accepted practice for measuring

# Glossary

**Anthracite:** A hard, black, lustrous coal containing a high percentage of fixed carbon and a low percentage of volatile matter. It is often referred to as hard coal. It includes meta-anthracite and semianthracite and conforms to ASTM Specification D388 for anthracite.

**ASTM:** The acronym for the American Society for Testing and Materials.

**Base Gas:** The volume of gas needed as a permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates throughout the withdrawal season. All native gas is included in the base gas volume.

**Bituminous Coal:** A coal that is high in carbonaceous matter having a volatility greater than anthracite and a calorific value greater than lignite. In the United States, it is often referred to as soft coal. In this report, "bituminous coal" conforms to ASTM Specification D388 for bituminous and subbituminous coal. It is used primarily for electricity generation, coke production, and space heating.

**British Thermal Unit (Btu):** The amount of energy required to raise the temperature of 1 pound of water 1 °F at or near 39.2 °F. One Btu is equivalent to about 252 International Steam Table calories. An average Btu content of fuel is a heat value per unit quantity of fuel as determined from tests of fuel samples.

**Butane:** A normally gaseous, paraffinic hydrocarbon ( $C_4H_{10}$ ) extracted from natural gas or refinery gas streams. It includes isobutane (branch-chain) and normal butane (straight-chain) and is covered by ASTM Specification 1835 and Natural Gas Processors Specifications for commercial butane. It is used primarily for blending into high-octane gasoline, for residential and commercial heating, and for industrial purposes, especially the manufacture of chemicals and synthetic rubber.

**Butylene:** A normally gaseous, olefinic hydrocarbon ( $C_4H_8$ ) recovered from refinery processes. Quantities are included with "normal butane" data.

**City Gate Price of Natural Gas:** Price of natural gas at the point it is transferred from a pipeline company to a local distribution company.

**Coal:** Includes all ranks of coal--anthracite, bituminous coal, subbituminous coal, and lignite--conforming to ASTM Specification D388.

**Coal Coke:** The strong, porous residue, consisting of carbon and mineral ash, that is formed when the volatile constituents of bituminous coal are driven off by heat in the absence of or in a limited supply of air. It is used primarily in blast furnaces for smelting ores, especially iron ore.

**Commercial Sector:** Nonmanufacturing business establishments, including hotels, motels, restaurants, wholesale businesses, retail stores, laundries, and other service enterprises; health, social, and educational institutions; and Federal, State, and local governments. Street lights, pumps, bridges, and public services are also included. (For allocation of individual fuels to end-use sectors, see the Notes and Sources for Section 2.)

**Crude Oil Average Domestic First Purchase Price:** The average price at which all domestic crude oil is purchased. Prior to February 1976, the price represented an estimate of the average of posted prices; after February 1976, the price represents an average of actual first purchase prices. This price is frequently called the wellhead price.

**Crude Oil (including lease condensate):** A mixture of hydrocarbons that exists in liquid phase in underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Included are lease condensate and liquid hydrocarbons produced from tar sands, gilsonite, and oil shale. Drip gases are also included, but topped crude oil (residual oil) and other unfinished oils are excluded. Liquids produced at natural gas processing plants and mixed with crude oil are excluded where identifiable.

**Crude Oil Refinery Input:** Total crude oil (including lease condensate) input to crude oil distillation units and other processing units.

**Crude Oil Stocks:** Stocks of crude oil and lease condensate held at refineries, in pipelines, at pipeline terminals, and on leases.

**Degree-Day Normals:** Simple arithmetic averages of monthly or annual degree-days over a long period of time (usually the 30-year period 1951-1980). These may

be simple degree-day normals or population-weighted degree-day normals.

**Degree-Days, Cooling:** 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:** 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 these 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 composed of from three to eight States. The regions 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 these products are then summed to arrive at the national population-weighted degree-day figure.

**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:** Light fuel oils distilled during the refining process and used primarily for space heating, on- and off-highway diesel engine fuel (including railroad engine fuel and fuel for agricultural machinery), and electric power generation. Included are products known as No. 1, No. 2, and No. 4 fuel oils, and No. 1, No. 2, and No. 4 diesel fuels, conforming to ASTM Specifications D396 or D975, respectively. No. 1 fuel oil is a light distillate fuel oil used in vaporizing pot-type burners. No. 2 fuel oil is used in atomizing-type burners for domestic heating or for moderate capacity commercial-industrial burner units. No. 4 fuel oil is a blend of distillate fuel oil and residual fuel oil that is used in commercial burner installations not equipped with preheating facilities; it is used extensively in industrial plants. Diesel fuel oils are used in compression-ignition engines.

**Dry Hole:** An exploratory or development well found to be incapable of producing either oil or gas in suffi-

cient quantities to justify completion as an oil or gas well.

**Electrical System Energy Losses:** The amount of energy lost during generation, transmission, and distribution of electricity, including plant use and unaccounted for electrical energy.

**Electricity Generation:** Net electricity (gross electricity output measured at the generator terminals, minus power plant use) generated at electric utilities. Excludes industrial electricity generation. International data are gross electricity output.

**Electricity Sales:** The gross electricity output measured at the generator terminals, minus power plant use and transmission and distribution losses. Included in each end-use sector are the following: commercial sales of electricity to businesses that generally require less than 1,000 kilowatts of service; industrial sales of electricity to businesses that generally require more than 1,000 kilowatts of service; residential sales of electricity to residences for household purposes; "other" sales of electricity to government, railways, street lighting authorities, and sales not elsewhere included.

**Electric Utility:** A corporation, person, agency, authority, or other entity that owns or operates facilities for the generation, transmission, distribution, or sale of electricity, primarily for use by the public.

**Electric Utility Sector:** Privately and publicly owned establishments that generate electricity primarily for use by the public.

**Ethane:** A normally gaseous, paraffinic hydrocarbon ( $C_2H_6$ ) extracted from natural gas or refinery gas streams. It is used primarily as petrochemical feedstock for production of chemicals and plastic materials.

**Ethylene:** A normally gaseous, olefinic hydrocarbon ( $C_2H_4$ ) recovered from refinery processes. Quantities are included with "ethane" data.

**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, Puerto Rico, the Virgin Islands, and other U.S. possessions and territories.

**F.o.b. (free on board) Price of Imported Crude Oil:** The f.o.b. price is the price actually charged at the producing country's port of loading. The reported price includes deductions for any rebates and discounts and additions of premiums where applicable; it should be the actual price paid with no adjustments for credit terms.

**Fossil Fuel Steam-Electric Power Plant:** An electricity generation plant in which the prime mover is a turbine rotated by high-pressure steam produced in a boiler by heat from burning fossil fuels.

**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.)

**Geothermal Energy (as used at electric utilities):** Hot water or steam, extracted from geothermal reservoirs in the earth's crust, which is supplied to steam turbines at electric utilities that drive generators to produce electricity.

**Gross Energy Consumption:** Total energy use including electrical system energy losses.

**Gross National Product (GNP):** The total value of goods and services produced by the Nation's economy, before deduction of depreciation charges and other allowances for capital consumption. It includes the total purchases of goods and services by private consumers and government, gross private domestic capital investment, and net foreign trade.

**Gross Wet Gas Withdrawal:** Full well stream volume, including all natural gas plant liquid and nonhydrocarbon gases, but excluding lease condensate. Also includes amounts delivered as royalty payments or consumed in field operations.

**Hydroelectric Power:** Electricity generated by an electric power plant whose turbines are driven by falling water.

**Imports:** Receipts of goods into the 50 States and the District of Columbia from foreign countries, Puerto Rico, the Virgin Islands, and other U.S. possessions and territories. (See Petroleum Imports.)

**Industrial Sector:** Manufacturing, construction, mining, agriculture, fishing, and forestry establishments. (For allocation of individual fuels to end-use sectors, see the Notes and Sources for Section 2.)

**Isobutane:** See Butane.

**Landed Cost of Crude Oil Imports:** The price of imported crude oil at the port of discharge. It includes the purchase price at the foreign port plus charges for transporting and insuring the crude oil from the purchase point to the port of discharge. It does not include import tariffs or fees, wharfage charges, or demurrage costs. Coverage includes the United States and its territories.

**Lease and Plant Fuel:** Natural gas used in lease operations, as gas processing plant fuel, and as net used for gas lift.

**Lease Condensate:** A natural gas liquid recovered from gas-well gas (associated and nonassociated) in lease separators or natural gas field facilities. Lease condensate consists primarily of pentanes and heavier hydrocarbons. Generally, it is blended with crude oil for refining.

**Lignite:** A brownish-black coal of low rank with high inherent moisture and volatile matter. It is also referred to as brown coal. It conforms to ASTM Specification D388 for lignite and is used almost exclusively for electric power generation.

**Liquefied Petroleum Gases (LPG):** Ethane, propane, normal butane, ethane-propane mixtures, propane-butane mixtures, and isobutane produced at natural gas processing plants, including plants that fractionate raw natural gas plant liquids. LPG also includes liquefied refinery gases (ethylene, propylene, butylene, and isobutylene produced from crude oil at refineries).

**Motor Gasoline, Finished:** A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, that have been blended to form a fuel suitable for use in spark-ignition engines and conforming to ASTM Specification D439. Included are finished leaded gasoline, finished unleaded gasoline, and gasohol. Excluded are blendstock that has not been blended into finished motor gasoline and alcohol that has not been blended into gasohol.

**Motor Gasoline, Leaded Premium:** A gasoline having an antiknock index of 93 with the use of lead additives or which contains more than 0.05 grams of lead per gallon or more than 0.005 grams of phosphorus per gallon. Includes gasohol.

**Motor Gasoline, Leaded Regular:** A gasoline having an antiknock index of 89 with the use of lead additives or which contains more than 0.05 grams of lead per gallon or more than 0.005 grams of phosphorus per gallon.

**Motor Gasoline, Total:** Includes finished leaded motor gasoline (premium and regular), finished unleaded motor gasoline (premium and regular), motor gasoline blending components, and gasohol.

**Motor Gasoline, Unleaded Premium:** A gasoline having an antiknock index of 90 containing not more than 0.05 grams of lead per gallon and not more than 0.005 grams of phosphorus per gallon. Includes gasohol.

**Motor Gasoline, Unleaded Regular:** A gasoline having an antiknock index of 87 containing not more than 0.05 grams of lead per gallon and not more than 0.005 grams of phosphorus per gallon.

**Natural Gas:** A mixture of hydrocarbons (principally methane) and small quantities of various nonhydrocarbons existing in the gaseous phase or in solution with crude oil in underground reservoirs.

**Natural Gas Plant Liquids (NGPL):** Those natural gas liquids that are recovered from natural gas processing plants, and in some situations, from natural gas field facilities, as well as those that are extracted by fractionators. Natural gas plant liquids are defined according to the published specifications of the ASTM and the Gas Processors Association and are classified as follows: ethane, propane, normal butane, isobutane, pentanes plus, and other products from natural gas processing plants (i.e., products meeting the standards for finished petroleum products produced at natural gas processing plants, such as finished motor gasoline, finished aviation gasoline, special naphthas, kerosene, distillate fuel oil, and miscellaneous products).

**Natural Gas Wellhead Price:** The annual wellhead price of natural gas is calculated by dividing the total reported value at the wellhead by the total quantity produced as reported by the appropriate agencies of individual producing States, as well as the U.S. Geological Survey (through 1981) and the U.S. Minerals Management Service (from 1982 forward). 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.

An estimate of the U.S. natural gas price is made each month based on monthly natural gas prices from four States: Mississippi, New Mexico, Oklahoma, and Texas.

**Net Electricity Generation:** Gross generation less electricity consumed at the generating plant for station use. Electricity required for pumping at pumped-storage plants is regarded as plant use and is deducted from gross generation.

**Net Energy Consumption:** Total energy use excluding electrical system energy losses.

**Normal Butane:** See Butane.

**Nuclear Energy:** 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.

**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.

**Organization for Economic Cooperation and Development (OECD):** Current members: Australia, Austria, Belgium, Canada, Denmark, Finland, France, West Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the United States and its territories (Guam, Puerto Rico, and the Virgin Islands).

**Organization of the Petroleum Exporting Countries (OPEC):** Current members: Algeria, Ecuador, Gabon,

Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela.

**Pentanes Plus:** A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas. This product includes isopentane, natural gasoline, and plant condensate.

**Petroleum:** A generic term applied to oil and oil products in all forms, such as crude oil, lease condensate, unfinished oils, petroleum products, natural gas plant liquids, and nonhydrocarbon compounds blended into finished petroleum products.

**Petroleum Coke:** A solid residue that is the final product of the condensation process in cracking. It consists of aromatic hydrocarbons very poor in hydrogen. Calcination of petroleum coke can yield almost pure carbon or artificial graphite suitable for production of carbon or graphite electrodes, structural graphite, motor brushes, dry cells, and similar products. This product is reported as marketable or catalyst coke.

**Petroleum Imports:** Imports of petroleum into the 50 States and the District of Columbia from foreign countries, Puerto Rico, the Virgin Islands, and other U.S. territories and possessions. Included are imports for the Strategic Petroleum Reserve and withdrawals from bonded warehouses for onshore consumption, offshore bunker use, and military use. Excluded are receipts of foreign petroleum into bonded warehouses and into U.S. territories and U.S. Foreign Trade Zones.

**Petroleum Products:** Petroleum products are obtained from the processing of crude oil (including lease condensate), natural gas, and other hydrocarbon compounds. Petroleum products include unfinished oils, liquefied petroleum gases, pentanes plus, aviation gasoline, motor gasoline, naphtha-type jet fuel, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil, naphtha less than 400 °F end-point, other oils over 400 °F end-point, special naphthas, lubricants, waxes, petroleum coke, asphalt, road oil, still gas, and miscellaneous products.

**Petroleum Products Supplied:** Total petroleum products supplied is the sum of all petroleum products supplied. For each product, the amount supplied is calculated by summing production, crude oil burned directly, imports, and net withdrawals from primary stocks and subtracting exports.

**Petroleum Stocks, Primary:** Stocks of crude oil or petroleum products held in storage at (or in) leases, refineries, natural gas processing plants, pipelines, tankfarms, and bulk terminals that can store at least 50,000 barrels of petroleum products or that can receive petroleum products by tanker, barge, or pipeline. Crude oil that is in transit from Alaska, or that is stored on Federal leases or in the Strategic Petroleum Reserve, is included. Excluded are stocks of foreign origin that are held in bonded warehouse storage.

**Photovoltaic and Solar Thermal Energy (as used at electric utilities):** Energy radiated by the sun as electromagnetic waves (electromagnetic radiation) that is converted at electric utilities into electricity by means of solar (photovoltaic) cells or concentrating (focusing) collectors.

**Propane:** A normally gaseous, paraffinic hydrocarbon ( $C_3H_8$ ). It is extracted from natural gas or refinery gas streams, and includes all products covered by Gas Processors Association Specifications for commercial propane and HD-5 propane and ASTM Specification D1835. Propane is used primarily for residential and commercial heating and cooling, and also as a fuel for transportation. Industrial uses of propane include use as a petrochemical feedstock.

**Propylene:** A normally gaseous, olefinic hydrocarbon ( $C_3H_6$ ) recovered from refinery processes. Quantities are included with "propane" data.

**Refiner Acquisition Cost:** The cost of crude oil to the refiner, including transportation and fees. The composite cost is the weighted average of domestic and imported crude oil costs.

**Renewable Energy:** Energy obtained from sources that are essentially inexhaustible (unlike, for example, the fossil fuels, of which there is a finite supply). Renewable sources of energy include wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

**Reservoir Repressing:** The injection of natural gas into oil and gas reservoir formations for pressure maintenance and cycling.

**Residential Sector:** Private household establishments, which consume energy primarily for space heating, water heating, air conditioning, lighting, refrigeration, cooking, and clothes drying. (For allocation of individual fuels to end-use sectors, see the Notes and Sources for Section 2.)

**Residual Fuel Oil:** The heavier oils that remain after the distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations and that conform to ASTM Specifications D396 and 975. Included are No. 5, a residual fuel oil of medium viscosity; Navy Special, for use in steam-powered vessels in government service and in shore power plants; and No. 6, which includes Bunker C fuel oil, and is used for commercial and industrial heating and electricity generation. Imports of residual fuel oil include imported crude oil burned as fuel.

**Rotary Rig:** A machine, used for drilling wells, that employs a rotating tube attached to a bit for boring holes through rock.

**Strategic Petroleum Reserve (SPR):** Petroleum stocks maintained by the Federal Government for use during periods of major supply interruption.

**Subbituminous Coal:** A dull black coal of rank intermediate between lignite and bituminous coal. It conforms to ASTM Specification D388 for subbituminous coal, and is used almost exclusively for electric power generation. In this report, quantities are included with "bituminous coal" data.

**Supplemental Gaseous Fuels:** Consist primarily of synthetic natural gas, propane-air, and refinery (still) gas. May also include coke oven gas, biomass gas, manufactured gas, and air injected for Btu stabilization.

**Synthetic Natural Gas (SNG):** A product resulting from the manufacture, conversion, or reforming of hydrocarbons that may be easily substituted for, or interchanged with, pipeline-quality natural gas.

**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 indicated demand for crude oil and the total disposition of crude oil. Indicated demand is the sum of crude oil production and imports less changes in crude oil stocks. Total 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.

**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.

**Wind Energy (as used at electric utilities):** The kinetic energy of wind converted at electric utilities into mechanical energy by wind turbines (i.e., blades rotating from a hub) that drive generators to produce electricity for distribution.

**Wood and Waste (as used at electric utilities):** Wood energy (see **Wood Energy**), garbage, bagasse, sewerage gas and other industrial, agricultural, and urban refuse used to generate electricity for distribution.

**Wood Energy:** Wood and wood products used as fuel. Included are round wood (cord wood), limb wood, wood chips, bark, sawdust, forest residues, charcoal, pulp waste, and spent pulping liquor.

**Working Gas:** The volume of gas in an underground storage reservoir above the designed level of the base. It may or may not be completely withdrawn during any particular withdrawal season. Conditions permitting, the total working capacity could be used more than once during any season.

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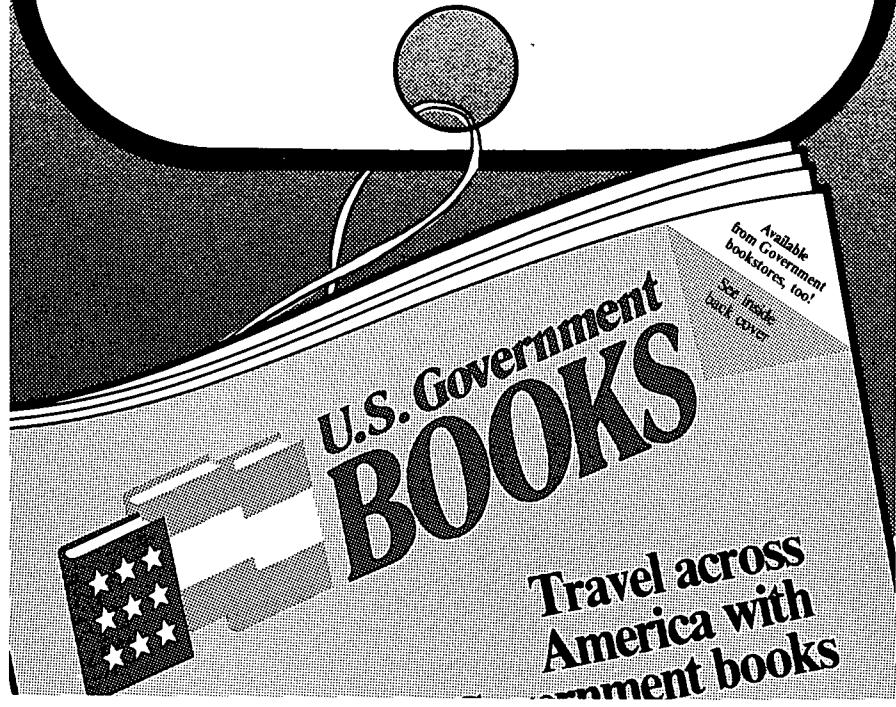
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