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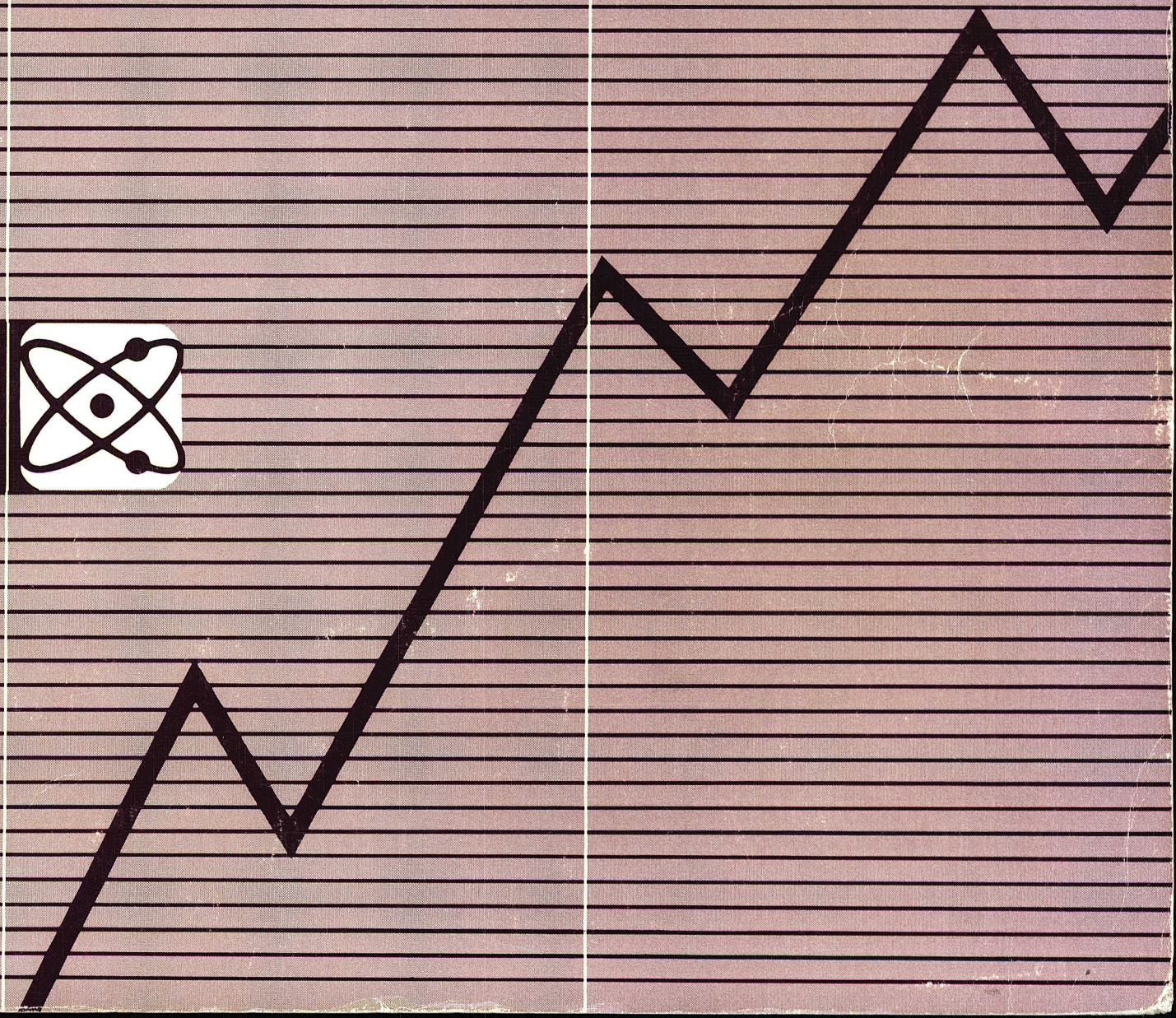

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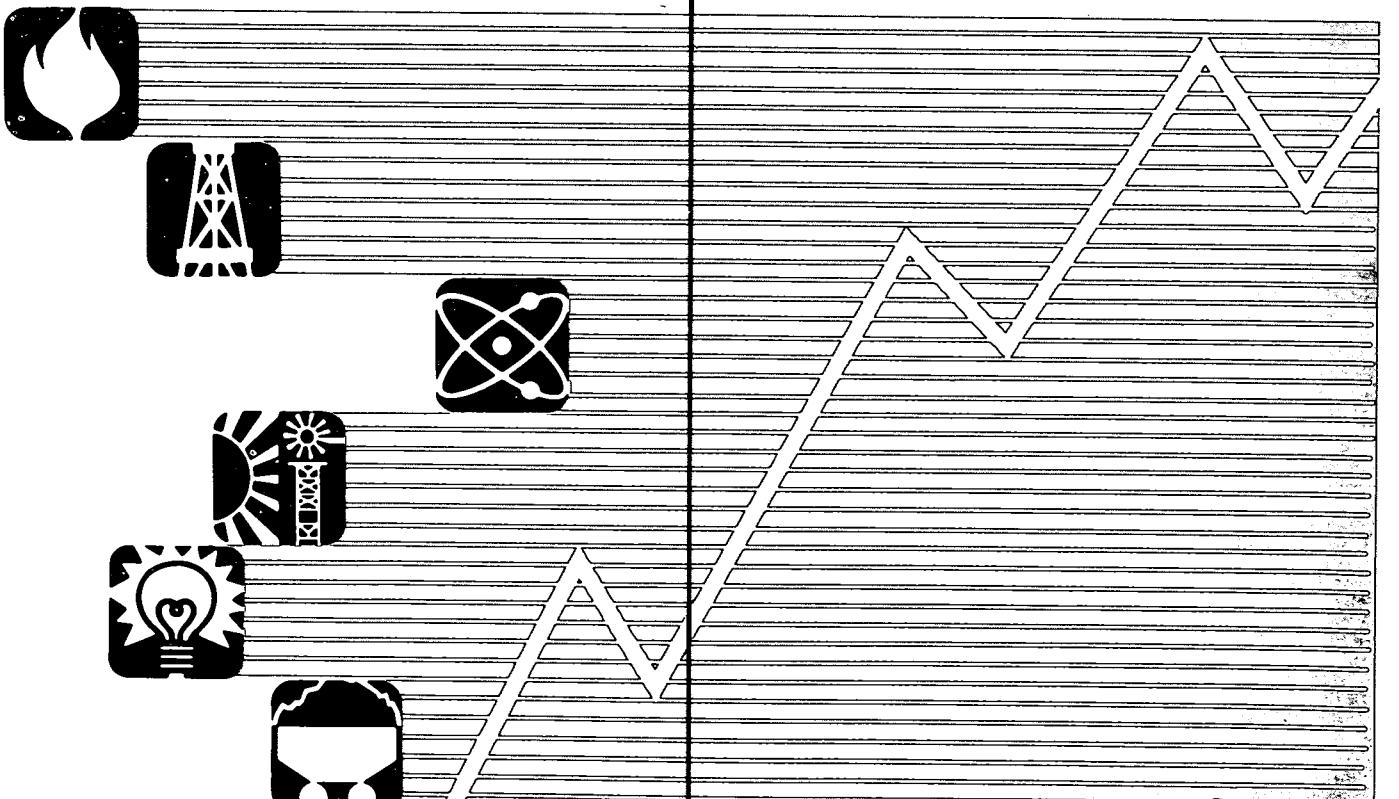


Contents

Major Energy Developments, 1983

Introduction. Total energy consumption in the United States in 1983 was 70.5 quadrillion Btu, down about 0.5 percent from 1982. In comparison, the annual rate of decline for 1979 through 1982 equalled 3.5 percent. The 1983 decline in consumption occurred despite an increase of 3.4 percent in economic activity (GNP) and a decline of 13 percent in crude oil prices. The role energy conservation continues to play in the economy is indicated by the fact that energy consumption per dollar of GNP declined 4 percent in 1983. Nearly all of the absolute decline in energy use occurred in the natural gas sector where consumption fell 5 percent primarily because of reduced use for electric power generation. Lower crude oil prices, increased drilling costs and weakened natural gas marketing conditions adversely affected the rate of domestic oil and gas drilling activities. International crude oil markets remained weak. Crude oil production, especially by members of the Organization of Petroleum Exporting Countries (OPEC), continued to decline. Despite lower crude oil prices, OPEC's share of world oil production continued to fall in 1983. Another notable international development was a substantial increase in electricity production by nuclear power utility plants in non-Communist countries. West European nuclear generation, led by France, exceeded North American totals for the first time in 1983.

Energy Production. Energy production in the United States in 1983 declined for the third consecutive year, as small gains in hydropower and nuclear power production were offset by losses in natural gas and coal production (see Table 2). The 4.4-percent decline was the largest since the recession year of 1958.

Energy Consumption. For the fourth consecutive year, energy consumption in the United States declined. However, consumption for each of the last seven months of 1983 exceeded that for the comparable month in 1982. Only natural gas consumption was down significantly, the result of price-induced conservation and fuel-switching at electric utilities. The continuing role of conservation is seen in the fact that per capita energy consumption fell for the fifth straight year, to 301 million Btu, the lowest level since 1967 (see Table 4).

Exploration and Development. The downward trend in rotary rig use, which began in early 1982, continued into early 1983, when the trend was reversed. However, the average utilization of 2,232 rigs in 1983 was down 28 percent from the 1982 average and was well below the record of 3,970 set in 1981 (see Table 28). Petroleum and natural gas well completions, which increased each year from 1974 through 1982, also declined in 1983. The 53,000 wells completed in 1983 were 11 percent fewer than those completed in 1982 (see Table 30).

Crude Oil Production. In 1983, domestic crude oil (including lease condensate) production increased slightly to 8.7 million barrels per day, the result of Alaskan output, which reached a record 1.71 million barrels per day. During 1982 and 1983, the annual decline in the lower-48 States averaged about 12,000 barrels per day compared to nearly 300,000 barrels per day during 1973 through 1979 (see Table 36).

Petroleum Imports. For the fourth consecutive year, the United States was able to reduce its dependence on foreign petroleum sources. This was accomplished by increasing crude oil production, reducing demand, and drawing down inventories (excluding crude oil stocks in the U.S. Government's Strategic Petroleum Reserve). Net imports of petroleum as a share of petroleum consumption (product supplied) fell in 1983 to 28.0 percent of consumption. This was the lowest level since 1972, the last full year of petroleum import controls. U.S. dependence on OPEC countries also declined. During 1983, the United States received only 42.7 percent of its net petroleum imports from OPEC members, down for the sixth consecutive year from the high of 72.3 percent in 1977 (see Table 41). Net quantities imported from OPEC countries fell 15 percent during 1983, with Nigeria and Saudi Arabia experiencing declines of 43 and 39 percent, respectively. Saudi Arabia, which had been the major source of petroleum imports from 1976 through 1981, fell to fifth place in 1983, while Mexico, a non-OPEC country, remained the leader for the second straight year. Other major non-OPEC sources were Canada and the United Kingdom.

Petroleum Refining. Total input to distillation units averaged 12.6 million barrels per day in 1983, down 1.8 percent from 1982, a reflection of the decline in consumption (see Table 42). Refinery utilization increased to 76 percent, the result of substantial refinery shutdowns (67 since 1981). Operable capacity fell to 16.9 million barrels per day on January 1, 1983, from the January 1, 1981, high of 18.6 million barrels per day (see Table 43). The shutdowns were primarily the result of shifts in petroleum demand, economic factors, and changes in governmental regulations.

Petroleum Consumption. Petroleum consumption (product supplied), which averaged 15.2 million barrels per day in 1983, declined for the

fifth consecutive year, to the lowest level since 1970 (see Table 45). The principal factor contributing to the decline in 1983 was reduced usage by the industrial and residential/commercial sectors. The consumption of residual fuel oil, a principal petroleum product burned in the industrial sector, declined 18.3 percent (see Table 45).

Petroleum Stocks. Petroleum inventories, excluding crude oil in the U.S. Government's Strategic Petroleum Reserve (SPR), were drawn down by 62 million barrels in 1983. This reduction averaged nearly 170,000 barrels per day (see Table 51). Stocks were added to SPR in 1983 at the rate of 234,000 barrels per day. At year-end, SPR inventories of 379 million barrels were equal to 124 days of non-SPR crude oil imports at the 1983 level (see Table 52).

Natural Gas. Natural gas consumption and marketed production fell substantially during 1982 and 1983, a reflection of price-induced conservation, fuel-switching, and a relatively warm 1982-1983 winter. The 17.0 trillion cubic feet consumed in 1983 was about 2.5 trillion cubic feet less than that consumed in 1981. The level of consumption in 1983 was the lowest since 1966 (see Table 67). The price of natural gas delivered to residences in 1982 averaged $5.17 per thousand cubic feet, a $0.88-per-thousand-cubic-feet increase over 1981 prices (see Table 72).

Coal. During 1983, coal consumption increased 4.0 percent to 735 million short tons, as coal burned at electric utilities increased 5.4 percent (see Table 75). Coal production, however, declined to 785 million short tons, from 838 million short tons in 1982. This decline was the result of the depressed coal export market and the drawdown of consumers' stocks (see Table 74). Production of coal west of the Mississippi continued to represent a growing share of total coal production, accounting for 36 percent in 1983, up from 30 percent in 1980. Similarly, subbituminous coal and lignite production (combined) rose from 23 percent of production in 1980 to 29 percent in 1983.

Electricity. Electricity production, which increased each year in the post-World War II period until declining in 1982, increased again in 1983 to a record 2.31 trillion kilowatt-hours. Production from petroleum and natural gas declined, whereas production from coal, nuclear power, and hydropower increased, each to record levels (see Table 85). Electricity sales also increased in 1983, as sales to each major end-use sector increased—gains in the industrial sector were a substantial 4.1 percent (see Table 87).

Prices. Changes in energy prices in 1983 were mixed. Whereas most petroleum prices declined, prices of natural gas, coal, and electricity rose:

- Crude oil wellhead price averaged $26.07 per barrel, 9 percent below the 1982 average (see Table 58).
- Refiner acquisition cost for imported crude oil averaged $29.30 per barrel, 13 percent below the 1982 average (see Table 60).
- Natural gas wellhead price averaged $2.60 per thousand cubic feet, 6 percent above the 1982 average (see Table 71).
- Bituminous coal and lignite prices at the mines averaged $28.00 per short ton, 3 percent above the 1982 average (see Table 83).
- Leaded regular motor gasoline (which accounted for almost half of total motor gasoline consumption in 1983) price at service stations averaged $1.16 per gallon (including taxes) in 1983, 5 percent below the 1982 average (see Table 62).
- Residential heating oil prices averaged $1.08 per gallon, down 7 percent from the 1982 average (see Table 62).
- Residential electricity prices averaged 7.18 cents per kilowatt-hour, 5 percent above the 1982 average (see Table 93).

World Petroleum Production. World crude oil production (excluding natural gas plant liquids) of 52.8 million barrels per day in 1983 was down for the fourth straight year and was substantially below the all-time high of 62.5 million barrels per day in 1979. During this 4-year period, OPEC production declined 43 percent, and the OPEC share of world production fell from about 49 to 33 percent. Saudi Arabia accounted for most of the decline, with production since 1980 falling nearly 5 million barrels per day. Among the major OPEC countries only Iran and Indonesia reported production gains in 1983. Canada was the only other major producer to report a significant increase in output in 1983 (see Table 54).

World Petroleum Prices. The official price for nearly all major foreign crude oils fell for the third straight year in 1983. January 1, 1984, prices for most major crudes were down about $5 per barrel from January 1, 1983. The official price for Saudi Arabian Light, the "marker" crude, was $29 per barrel on January 1, 1984 (see Table 63).

World Petroleum Stocks. Downward pressure on world petroleum production was intensified by stock drawdowns by industrialized countries. During June 30, 1982, through June 30, 1983, stocks held by the Organization for Economic Cooperation and Development (OECD) countries (excluding stocks in the U.S. Strategic Petroleum Reserve) fell from 3.0 billion barrels to 2.8 billion barrels. During this period, OECD countries reduced stocks at a rate of 356,000 barrels per day (see Tables 52 and 57).

Section 1. Energy Overview

During 1983, the United States recorded declines in all major aspects of energy: production, consumption, imports, and exports.

Production. Based on preliminary data, energy production in the United States fell for the third consecutive year to 61.0 quadrillion British thermal units (Btu) in 1983, 4.4 percent below the 1982 level. The fall in natural gas and coal production accounted for the decline. However, small gains were recorded in nuclear power electricity generation, hydropower electricity generation, crude oil (including lease condensate) production, and natural gas plant liquids output.

During the period 1972 through 1983, the pattern of energy production shifted considerably. The production of coal, nuclear power, and hydropower increased from 28.0 percent of total production to 39.4 percent. During this period petroleum, natural gas, and natural gas plant liquids production declined from 71.9 percent of the total to 60.4 percent (see Table 2).

Consumption. Energy consumption in the United States totaled 70.5 quadrillion Btu during 1983, 0.5 percent below the 1982 level and 10.6 percent below the peak level of 78.8 quadrillion Btu during 1979 (see Table 3). During 1983, the United States consumed less petroleum and natural gas, but more coal, nuclear power, and hydropower. On a Btu basis, natural gas consumption declined 5.8 percent, and petroleum, 0.8 percent. Hydropower increased 7.3 percent, coal, 3.7 percent, and nuclear power, 3.3 percent. Petroleum consumption, which peaked in 1978 at 38.0 quadrillion Btu (18.8 million barrels per day), measured only 30.0 quadrillion Btu in 1983 (15.2 million barrels per day). The 1983 decrease in petroleum consumption was the fifth consecutive annual drop in petroleum usage in the United States, nonetheless petroleum still contributed the largest share of total energy usage, accounting for 42.6 percent during 1983. The share held by natural gas fell to 24.7 from a high of 33.1 percent in 1971.

Energy consumption in the three major end-use sectors declined during 1983, but the decline was less than 1 percent in each sector (with electricity distributed) (see Table 4). The industrial sector accounted for 36.8 percent of all energy consumed in the United States during 1983, the residential and commercial sector accounted for 36.2 percent, and the transportation sector consumed 27.0 percent of the total.

Consumption of energy by electric utilities for power generation increased in 1983 after having declined in 1982 for the first time since 1958. The 25.0 quadrillion Btu consumed was up 2.9 percent from the 1982 level. Of this total, only 7.3 quadrillion Btu (29.4 percent) was sold to consumers. The remaining 17.6 quadrillion Btu (70.6 percent) represented energy used to generate and transport electricity (see Table 12).

Trade. During 1983, the United States consumed 15 percent more energy than it produced. This difference was met primarily by imported energy. Total imported energy during 1983 was 11.9 quadrillion Btu, and petroleum accounted for 88 percent of the total. The United States exported 3.7 quadrillion Btu of energy during 1983, of which 55 percent was coal exports. Although in 1983 net imports of energy increased for the first time in 6 years, they were still 10 quadrillion Btu less than the level of imports during the peak year of 1977 (see Table 13).

Prices. Prices (as measured at a point nearest to production) of all major fossil fuels except crude oil continued to rise in 1983. In current dollars per million Btu, the price of crude oil remained the highest at $4.50, down from $4.92 in 1982. Natural gas rose to $2.35; bituminous coal and lignite was $1.27; anthracite reached $2.23. The composite price of these fossil fuels was $2.73. It should be noted, however, that in terms of constant 1972 dollars these preliminary data show that the composite price fell $0.07 (see Table 16).

The value of major fossil fuels produced in the United States during 1983 was $148 billion, in current dollars. The total value was comprised of petroleum at $82 billion, followed by natural gas at $43 billion and coal at $22 billion (see Table 17).

Energy Profitability and Investment. Declines in crude oil prices evident since mid-1981 had an adverse effect on the earnings of the 26 major companies that report to the Financial Reporting System (FRS). Profitability of these companies, as measured by the ratio of net income to stockholders' equity, declined from 21.1 percent in 1980 to 18.1 percent in 1981 (see Table 23).

Despite the decline in real crude oil prices, the 26 FRS companies continued to emphasize investment in oil and gas operations. Over 60 percent of their additions to property were directed toward oil and gas operations in 1981 (see Table 25). These companies have made substantial investments for upgrading their domestic refineries to accept a wider variety of crude oil qualities and to produce a larger relative yield of higher-octane products. Capital outlays for FRS companies' domestic refining and marketing operations rose 40 percent between 1980 and 1981 (see Table 25). Although petroleum and natural gas are predominant in the FRS companies' investment strategies, accounting for 75 percent of additions to property in 1981, almost $4 billion was expended by them for coal, nuclear, and nonconventional energy operations (see Table 25).

In 1981, FRS companies accounted for 56 percent of U.S. crude oil and natural gas liquid production, 46 percent of natural gas production, 78 percent of refinery output, and 37 percent of uranium production. The FRS companies' share of U.S. bituminous coal and lignite production increased from 13.6 percent in 1975 to 18.9 percent in 1981 (see Table 23).

Residential Energy Consumption Survey (RECS). Based on the EIA RECS, 8.54 quadrillion Btu of energy were consumed by households from April 1982 through March 1983, down from 9.51 quadrillion Btu during the previous 12-month period. Approximately 55 percent of the energy consumed was natural gas, 27 percent was electricity, 14 percent was distillate fuel oil and kerosene, and 3 percent was liquefied petroleum gas (see Table 5).

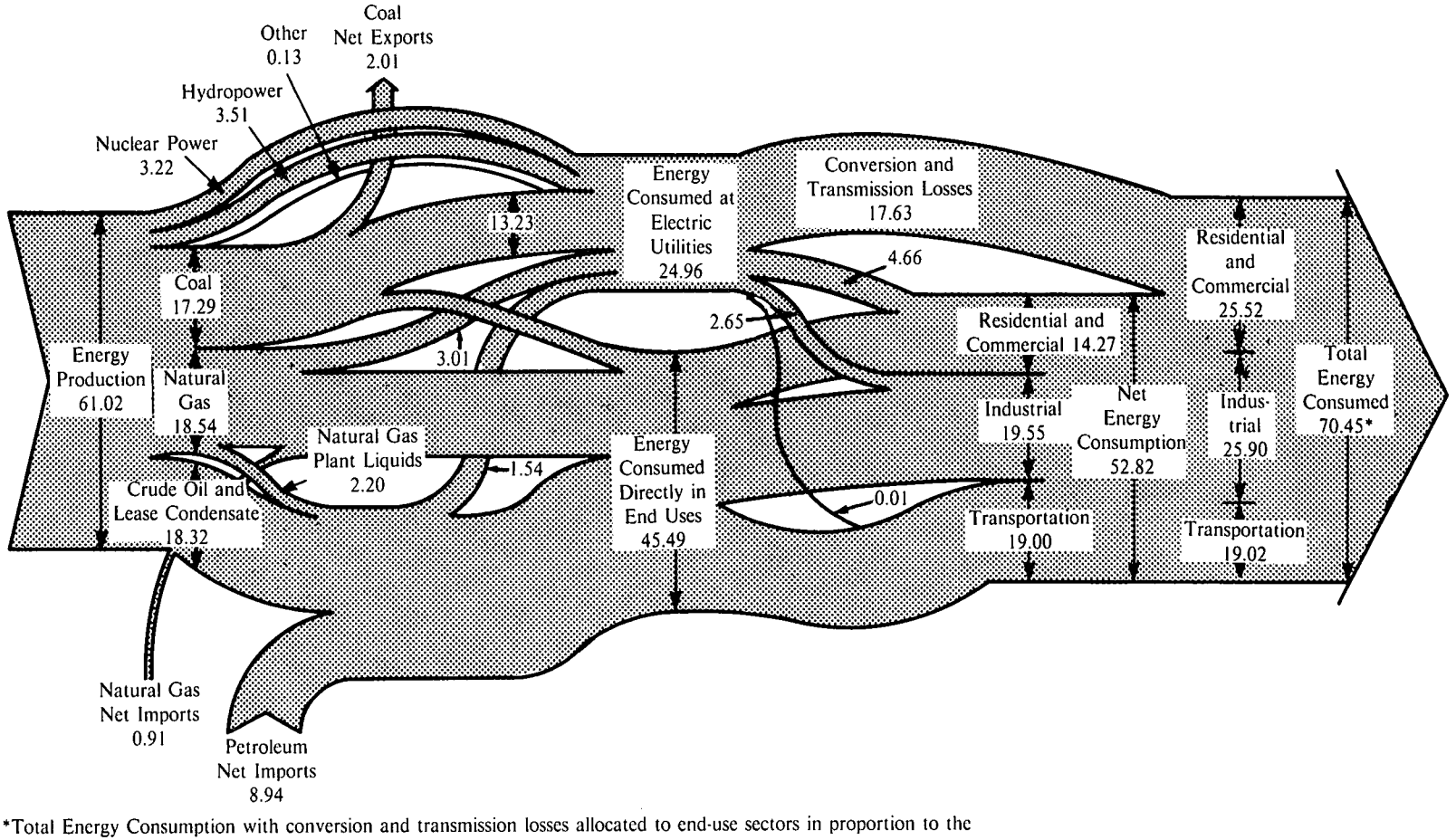
Of the 83.8 million households reported in the RECS for November 1982, almost all reported possession of a refrigerator and kitchen range. Saturation levels for other major appliances are as follows: color television, 85 percent; clothes washer (automatic), 69 percent; and clothes dryer (electric), 45 percent (see Table 9).

Based on the RECS survey on household vehicles in 1981, the average household vehicle is driven 734 miles per month and consumes 49 gallons of fuel at a cost of $64 per month (see Table 50). The number of households that burned wood during the period December 1981 through November 1982 totaled 21.4 million, up from 15.6 million during the previous 12-month period. More than 20 percent of these homes were built after 1974. Wood was the main heating fuel for 26 percent of all wood-burning households and houses in which wood was the main heating fuel accounted for nearly 60 percent of all household wood burned.

Annual U.S. Government energy use in recent years has fluctuated between 1.7 and 1.8 quadrillion Btu. During fiscal 1983, petroleum was the source of 59 percent of this energy, followed by electricity, 29 percent, and natural gas, 8 percent. The Department of Defense consumed 83 percent of the total (see Table 10).

Figure 1. Energy Flow Diagram, 1983

(Quadrillion Btu)



*Total Energy Consumption with conversion and transmission losses allocated to end-use sectors in proportion to the sectors' use of electricity.

Sum of components does not equal total due to independent rounding; the use of preliminary conversion factors; and the exclusion of changes in stocks, miscellaneous supply and disposition, and unaccounted for quantities.

Figure 2. Energy Supply and Disposition

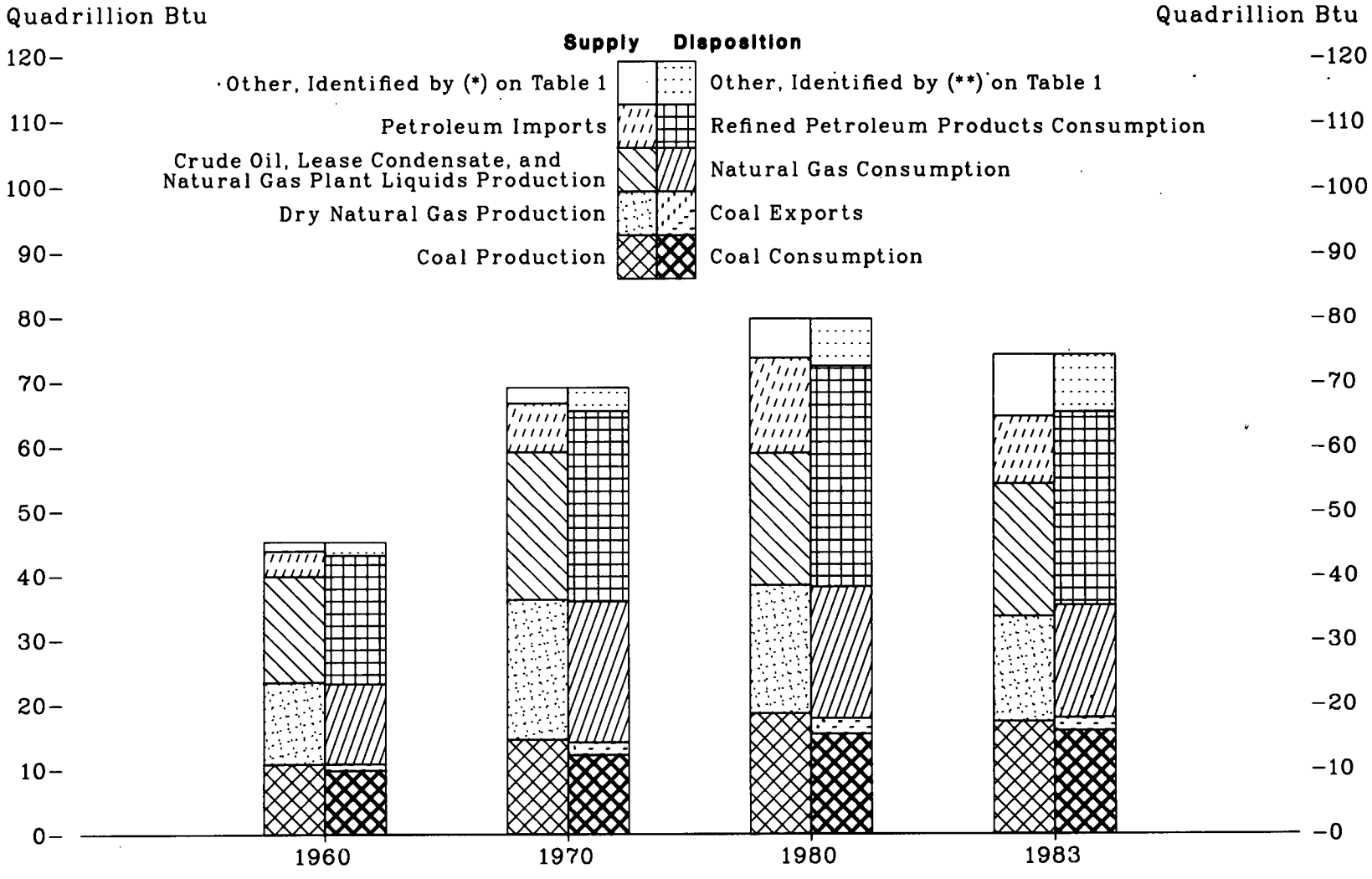


Table 1. Energy Supply and Disposition, 1960 and 1970-1983

(Quadrillion Btu)

Activity and Fuel	1960	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983 [1]
Supply															
Production															
Crude Oil and Lease Condensate	14.93	20.40	20.03	20.04	19.49	18.57	17.73	17.26	17.45	18.43	18.10	18.25	18.15	18.31	18.32
Natural Gas Plant Liquids	1.46	2.51	2.54	2.60	2.57	2.47	2.37	2.33	2.33	2.25	2.29	2.25	2.31	2.19	2.20
Natural Gas [2]	12.66	21.67	22.28	22.21	22.19	21.21	19.64	19.48	19.57	19.49	20.08	19.91	19.70	18.25	16.34
Coal [3]	10.77	14.53	13.13	14.03	13.93	14.01	14.93	15.65	15.68	14.86	17.48	18.54	18.33	18.60	17.29
Nuclear Power*	0.01	0.24	0.41	0.58	0.91	1.27	1.90	2.11	2.70	3.02	2.78	2.74	3.01	3.11	3.22
Hydropower*	1.61	2.63	2.82	2.86	2.86	3.18	3.15	2.98	2.33	2.94	2.93	2.90	2.76	3.27	3.51
Other [4] **	([12])	0.02	0.02	0.03	0.05	0.06	0.07	0.08	0.08	0.07	0.09	0.11	0.13	0.11	0.14
Total Production	41.44	62.00	61.23	62.36	61.99	60.77	59.80	59.89	60.14	61.05	63.74	64.71	64.38	63.85	61.02
Imports															
Crude Oil [5]	2.20	2.81	3.57	4.71	6.89	7.40	8.72	11.24	14.03	13.46	13.83	11.19	9.34	7.42	7.02
Refined Petroleum Products [6]	1.80	4.66	4.97	5.59	6.58	5.73	4.23	4.43	4.73	4.36	4.11	3.46	3.30	3.36	3.48
Natural Gas*	0.16	0.85	0.96	1.05	1.06	0.99	0.98	0.99	1.04	0.99	1.30	1.01	0.92	0.95	0.96
Other [7] *	0.07	0.07	0.08	0.11	0.21	0.31	0.19	0.18	0.30	0.44	0.39	0.31	0.42	0.38	0.42
Total Imports	4.23	8.39	9.58	11.46	14.73	14.42	14.11	16.84	20.09	19.26	19.62	15.97	13.98	12.11	11.88
Adjustments [8] *	- 0.44	- 1.36	- 0.82	- 0.48	- 0.46	- 0.48	- 1.07	- 0.24	- 1.95	- 0.34	- 1.65	- 1.05	- 0.08	- 0.51	1.28
Total Supply	45.23	69.02	70.00	73.33	76.27	74.70	72.84	76.49	78.29	79.97	81.72	79.63	78.27	75.45	74.18
Disposition															
Exports															
Coal [3]	1.02	1.94	1.55	1.53	1.43	1.62	1.76	1.60	1.44	1.08	1.75	2.42	2.94	2.79	2.04
Other [9] **	0.46	0.73	0.63	0.61	0.63	0.60	0.60	0.59	0.63	0.85	1.12	1.31	1.39	1.85	1.68
Total Exports	1.48	2.66	2.18	2.14	2.05	2.22	2.36	2.19	2.07	1.93	2.87	3.73	4.33	4.63	3.72
Consumption															
Refined Petroleum Products [10]	19.92	29.52	30.56	32.95	34.84	33.45	32.73	35.17	37.12	37.97	37.12	34.20	31.93	30.23	29.98
Natural Gas	12.39	21.79	22.47	22.70	22.51	21.73	19.95	20.35	19.93	20.00	20.67	20.39	19.93	18.51	17.43
Coal [3]	9.78	12.19	11.54	12.01	12.90	12.60	12.60	13.52	13.85	13.71	14.98	15.37	15.86	15.29	15.85
Nuclear Power **	0.01	0.24	0.41	0.58	0.91	1.27	1.90	2.11	2.70	3.02	2.78	2.74	3.01	3.11	3.22
Hydropower [11] **	1.66	2.65	2.86	2.94	3.01	3.31	3.22	3.07	2.51	3.14	3.14	3.12	3.11	3.59	3.86
Other [4] **	([12])	0.02	0.02	0.03	0.05	0.06	0.07	0.08	0.08	0.07	0.09	0.11	0.13	0.11	0.14
Net Imports of Coal Coke **	- 0.01	- 0.06	- 0.03	- 0.03	- 0.01	0.06	0.01	([12])	0.02	0.13	0.07	- 0.04	- 0.02	- 0.02	- 0.02
Total Consumption	43.75	66.36	67.82	71.19	74.21	72.48	70.48	74.30	76.21	78.04	78.84	75.90	73.94	70.82	70.45
Total Disposition	45.23	69.02	70.00	73.33	76.27	74.70	72.84	76.49	78.29	79.97	81.72	79.63	78.27	75.45	74.18

[1] Preliminary.
[2] Dry natural gas.
[3] Bituminous coal, subbituminous coal, lignite, and anthracite.
[4] Geothermal, wood, refuse, and other vegetal fuels used for electricity generation at utilities (see Note).
[5] Includes imports of crude oil for the Strategic Petroleum Reserve.
[6] Includes imports of unfinished oils and natural gas plant liquids.
[7] Includes bituminous coal, subbituminous coal, lignite, anthracite, coal coke, and hydropower.
[8] A balancing item. Includes stock changes, losses, gains, miscellaneous blending components, unaccounted for supply, and anthracite shipped overseas to U.S. Armed Forces.
[9] Includes crude oil, refined petroleum products, natural gas, coal coke, and hydropower.
[10] Refined petroleum products supplied includes natural gas plant liquids and crude oil burned as fuel.
[11] Includes industrial generation of hydropower and net electricity imports.
[12] Less than 0.005 quadrillion Btu.

Note: Data do not include the consumption of wood-derived fuel (other than that consumed by the electric utility industry) which amounted to an estimated 2.2 quadrillion Btu in 1981. This table also excludes small quantities of other energy forms for which consistent historical data are not available, such as solar energy obtained by the use of thermal and photovoltaic collectors; wind energy; and geothermal, biomass, and waste energy other than that consumed at electric utilities.

Note: Sum of components may not equal total due to independent rounding.

*Included in "Other Supply" in Figure 2.

**Included in "Other Disposition" in Figure 2.

Sources: See sources for Tables 35, 39, 66, 73, 78, 84, 86, and EIA estimates for industrial hydropower, and conversion factors in the Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

Figure 3. Production of Energy by Source

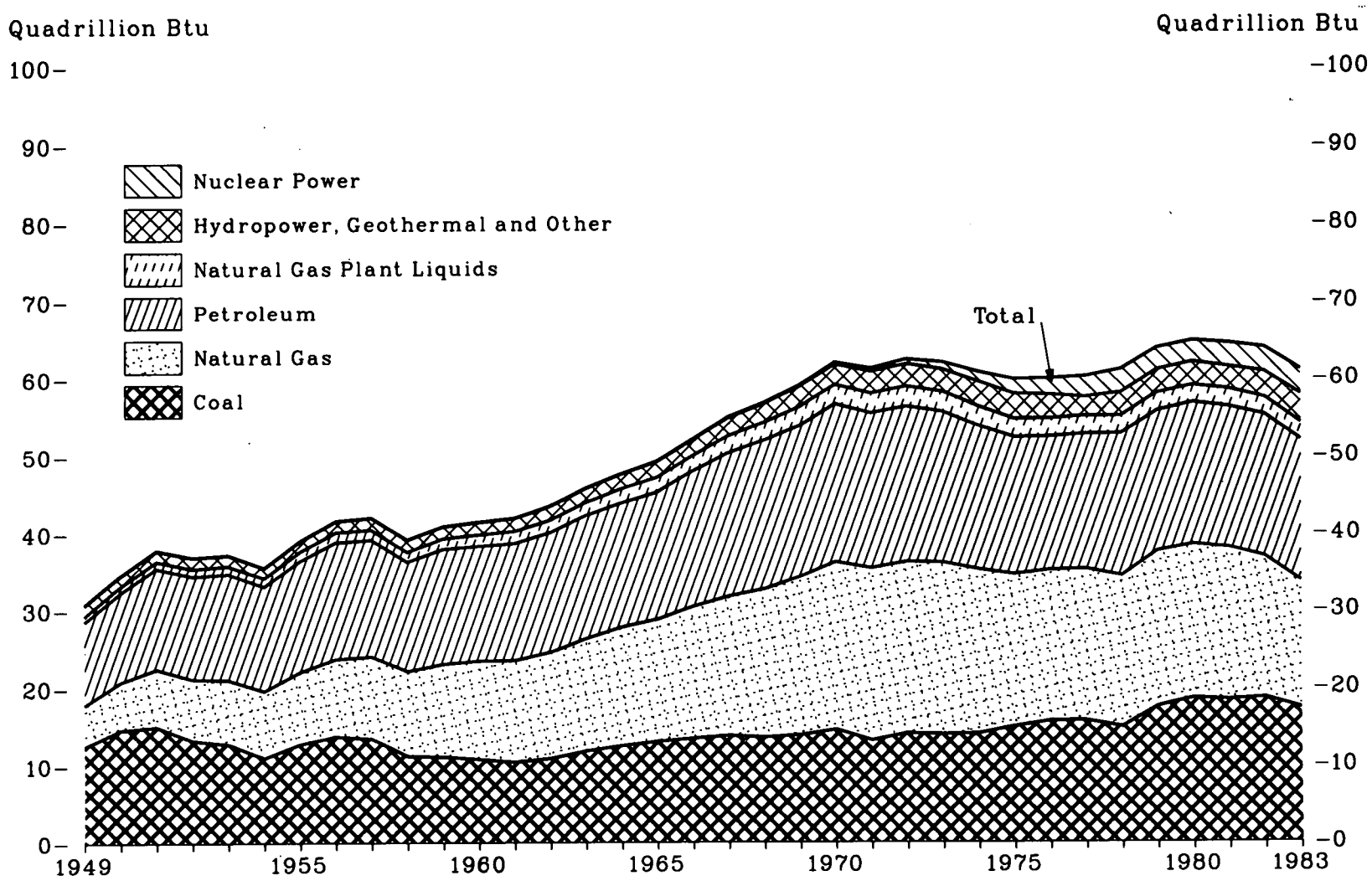


Table 2. Production of Energy by Source, 1949-1983

Year	Coal [1]		Natural Gas [2]		Petroleum [3]		Natural Gas Plant Liquids		Hydropower [4,5]		Nuclear Power [5]		Geothermal [5]		Wood and Waste [6]		Total Energy Production	Change from Previous Year
	Quadrillion Btu	Million Short Tons	Quadrillion Btu	Trillion Cubic Feet	Quadrillion Btu	Million Barrels	Quadrillion Btu	Million Barrels	Quadrillion Btu	Billion kWh [7]	Quadrillion Btu	Billion kWh [7]	Quadrillion Btu	Billion kWh [7]	Quadrillion Btu	Billion kWh [7]	Quadrillion Btu	Percent [8]
1949	12.53	480.6	5.38	5.20	10.68	1,842	0.71	157	1.42	94.8	0	0	0	0	(9)	(10)	30.73	—
1950	14.62	560.4	6.23	6.02	11.45	1,974	0.82	182	1.42	100.9	0	0	0	0	(9)	(10)	34.55	12.4
1951	15.04	576.3	7.42	7.16	13.04	2,248	0.92	205	1.42	104.4	0	0	0	0	(9)	(10)	37.84	9.5
1952	13.23	507.4	7.96	7.69	13.28	2,290	1.00	224	1.47	109.7	0	0	0	0	(9)	(10)	36.95	-2.4
1953	12.74	488.2	8.34	8.06	13.67	2,357	1.06	239	1.41	109.6	0	0	0	0	(9)	(10)	37.23	0.8
1954	10.98	420.8	8.68	8.39	13.43	2,315	1.11	252	1.36	111.6	0	0	0	0	(9)	(10)	35.56	-4.5
1955	12.72	490.8	9.34	9.03	14.41	2,484	1.24	281	1.36	116.2	0	0	0	0	(9)	(10)	39.08	9.9
1956	13.72	529.8	10.00	9.66	15.18	2,617	1.28	293	1.43	125.2	0	0	0	0	(9)	(10)	41.62	6.5
1957	13.42	518.0	10.61	10.25	15.18	2,617	1.29	295	1.52	133.4	0	0	0	0	(9)	(10)	42.00	0.9
1958	11.18	431.6	10.94	10.57	14.20	2,449	1.29	295	1.59	143.6	(9)	0.2	0	0	(9)	(10)	39.21	-6.7
1959	11.08	432.7	11.95	11.55	14.93	2,575	1.38	321	1.55	141.2	(9)	0.2	0	0	(9)	(10)	40.90	4.3
1960	10.77	434.3	12.66	12.23	14.93	2,575	1.46	340	1.61	149.4	0.01	0.5	0	0	(9)	0.1	41.44	1.3
1961	10.40	420.4	13.10	12.66	15.21	2,622	1.55	362	1.66	155.5	0.02	1.7	(9)	0.1	(9)	0.1	41.94	1.2
1962	10.85	439.0	13.72	13.25	15.52	2,676	1.59	373	1.82	172.0	0.03	2.3	(9)	0.1	(9)	0.1	43.53	3.8
1963	11.80	477.2	14.51	14.08	15.97	2,753	1.71	401	1.77	169.0	0.04	3.2	(9)	0.2	(9)	0.1	45.80	5.2
1964	12.46	504.2	15.30	14.82	16.16	2,787	1.80	422	1.89	180.3	0.04	3.3	(9)	0.2	(9)	0.1	47.66	4.1
1965	12.99	527.0	15.78	15.29	16.52	2,849	1.88	442	2.06	197.0	0.04	3.7	(9)	0.2	(9)	0.3	49.28	3.4
1966	13.40	546.8	17.01	16.47	17.56	3,028	2.00	469	2.06	197.9	0.06	5.5	(9)	0.2	(9)	0.3	52.10	5.7
1967	13.76	564.9	17.94	17.39	18.65	3,216	2.18	514	2.35	224.9	0.09	7.7	0.01	0.3	(9)	0.3	54.98	5.5
1968	13.55	556.7	19.07	18.49	19.31	3,329	2.32	550	2.35	225.9	0.14	12.5	0.01	0.4	(9)	0.4	56.75	3.2
1969	13.80	571.0	20.45	19.83	19.56	3,372	2.42	580	2.65	253.5	0.15	13.9	0.01	0.6	(9)	0.3	59.04	4.0
1970	14.53	612.7	21.67	21.01	20.40	3,517	2.51	606	2.63	251.0	0.24	21.8	0.01	0.5	(9)	0.4	62.00	5.0
1971	13.13	560.9	22.28	21.61	20.03	3,454	2.54	618	2.82	269.5	0.41	38.1	0.01	0.5	(9)	0.3	61.23	-1.2
1972	14.03	602.5	22.21	21.62	20.04	3,455	2.60	638	2.86	275.9	0.58	54.1	0.03	1.5	(9)	0.3	62.36	1.8
1973	13.93	598.6	22.19	21.73	19.49	3,361	2.57	634	2.86	275.4	0.91	83.5	0.04	2.0	(9)	0.3	61.99	-0.6
1974	14.01	610.0	21.21	20.71	18.57	3,203	2.47	616	3.18	304.2	1.27	114.0	0.05	2.5	(9)	0.3	60.77	-2.0
1975	14.93	654.6	19.64	19.24	17.73	3,057	2.37	596	3.15	303.2	1.90	172.5	0.07	3.2	(9)	0.2	59.80	-1.6
1976	15.65	684.9	19.48	19.10	17.26	2,976	2.33	587	2.98	286.9	2.11	191.1	0.08	3.6	(9)	0.3	59.89	0.1
1977	15.68	697.2	19.57	19.16	17.45	3,009	2.33	590	2.33	223.6	2.70	250.9	0.08	3.6	0.01	0.5	60.14	0.4
1978	14.86	670.2	19.49	19.12	18.43	3,178	2.25	572	2.94	283.5	3.02	276.4	0.06	3.0	(9)	0.3	61.05	1.5
1979	17.48	781.1	20.08	19.66	18.10	3,121	2.29	578	2.93	283.1	2.78	255.2	0.08	3.9	0.01	0.5	63.74	4.4
1980	18.54	829.7	19.91	19.40	18.25	3,146	2.25	576	2.90	279.2	2.74	251.1	0.11	5.1	(9)	0.4	64.71	1.5
1981	18.33	823.8	19.70	19.18	18.15	3,129	2.31	587	2.76	263.8	3.01	272.7	0.12	5.7	(9)	0.4	64.38	-0.5
1982	18.60	838.1	18.25	17.76	18.31	3,157	2.19	566	3.27	312.4	3.11	282.8	0.10	4.8	(9)	0.3	63.85	-0.8
1983 [11]	17.29	784.9	16.34	15.90	18.32	3,159	2.20	571	3.51	335.3	3.22	292.1	0.13	6.1	(9)	0.4	61.02	-4.4

[1] Bituminous coal, subbituminous coal, lignite, and anthracite.
[2] Dry natural gas.
[3] Crude oil and lease condensate.
[4] Electric utility and industrial generation of hydropower.
[5] Consumed by electric utilites.
[6] Wood, refuse, and other vegetal fuels consumed by electric utilities. Converted to Btu by applying national average heat rates for fossil fuel steam electric plants. Data do not include the consumption of wood-derived fuel (other than that consumed by the electric utility industry) which amounted to an estimated 2.2 quadrillion Btu in 1981. This table excludes small quantities of energy forms for which consistent historical data are not available, such as solar energy obtained by the use of thermal and photovoltaic collectors; wind energy; and geothermal, biomass, and waste energy other than that consumed at electric utilities.
[7] See Explanatory Note 1.
[8] Percent change calculated from data prior to rounding.
[9] Less than 0.005 quadrillion Btu.
[10] Less than 0.05 billion kWh.
[11] Preliminary.

Note: Sum of components may not equal total due to independent rounding.

Sources: See sources for Tables 35, 66, 74, 86, and EIA estimates for industrial hydropower, and conversion factors in the Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

Figure 4. Consumption of Energy by Source

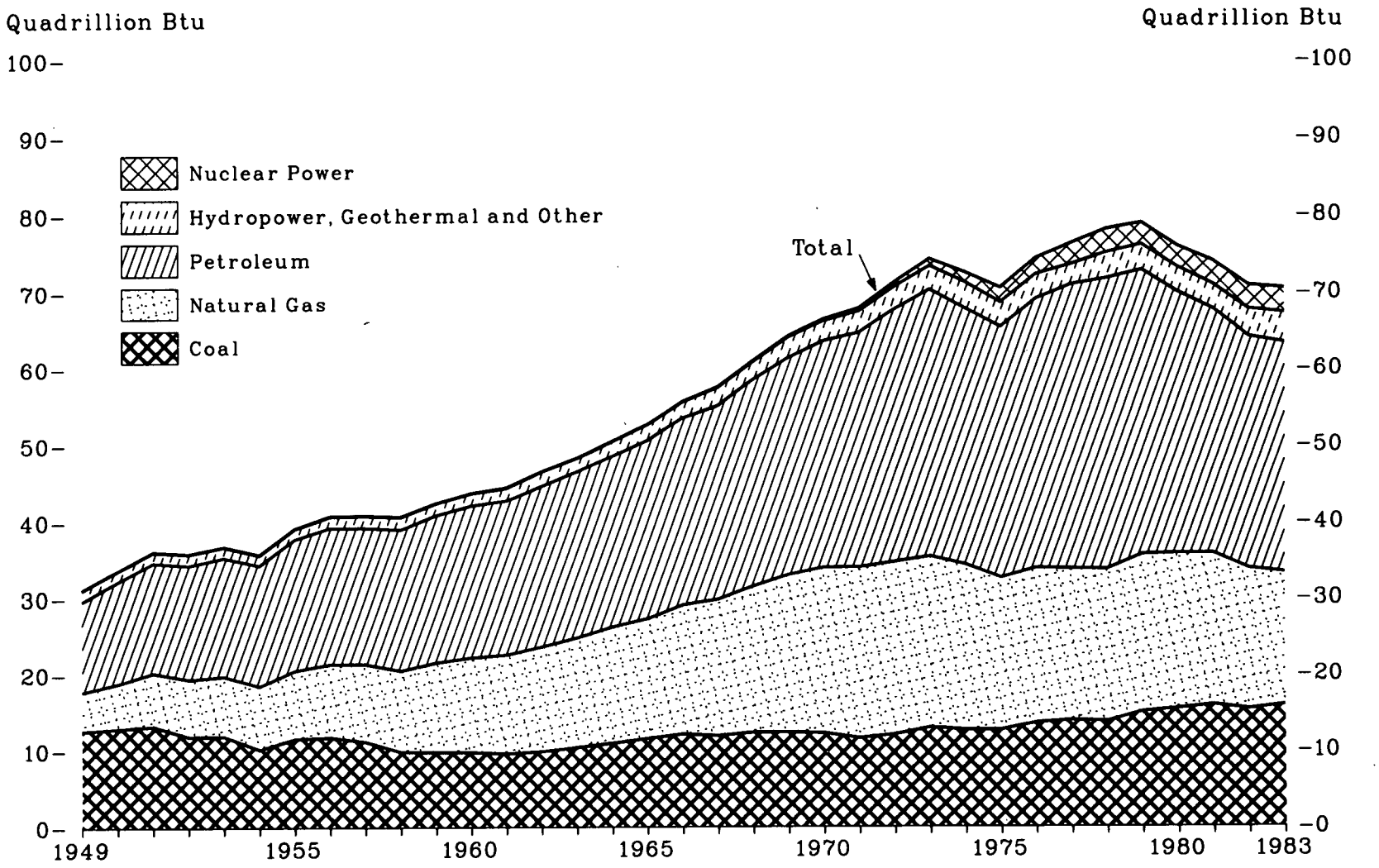


Table 3. Consumption of Energy by Source, 1949-1983

Year	Coal [1]		Natural Gas		Petroleum [2]		Hydropower [3]		Nuclear Power		Geothermal [4]		Wood and Waste [5]		Net Imports of Coal Coke		Total Energy Consumption	Change from Previous Year
	Quadrillion Btu	Million Short Tons	Quadrillion Btu	Trillion Cubic Feet	Quadrillion Btu	Million Barrels	Quadrillion Btu	Billion kWh [6]	Quadrillion Btu	Billion kWh [6]	Quadrillion Btu	Billion kWh [6]	Quadrillion Btu	Billion kWh [6]	Quadrillion Btu	Thousand Short Tons	Quadrillion Btu	Percent [7]
1949	12.60	483.2	5.15	4.97	11.88	2,104	1.45	96.4	0	0	0	0	(8)	(8)	- 0.01	- 269	31.08	—
1950	12.89	494.1	5.97	5.77	13.32	2,357	1.44	102.7	0	0	0	0	(8)	(8)	(8)	40	33.62	8.2
1951	13.20	505.9	7.05	6.81	14.43	2,561	1.45	106.6	0	0	0	0	(8)	(8)	- 0.02	- 865	36.11	7.4
1952	11.84	454.1	7.55	7.29	14.96	2,661	1.50	112.0	0	0	0	0	(8)	(8)	- 0.01	- 479	35.83	- 0.8
1953	11.87	454.8	7.91	7.64	15.56	2,774	1.44	111.6	0	0	0	0	(8)	(8)	- 0.01	- 363	36.76	2.6
1954	10.17	389.9	8.33	8.05	15.84	2,831	1.39	114.0	0	0	0	0	(8)	(8)	- 0.01	- 272	35.73	- 2.8
1955	11.52	447.0	9.00	8.69	17.25	3,086	1.41	120.3	0	0	0	0	(8)	(8)	- 0.01	- 405	39.17	9.6
1956	11.72	456.9	9.61	9.29	17.94	3,212	1.49	129.8	0	0	0	0	(8)	(8)	- 0.01	- 525	40.75	4.0
1957	11.14	434.5	10.19	9.85	17.93	3,215	1.56	137.0	0	0	0	0	(8)	(8)	- 0.02	- 704	40.80	0.1
1958	9.83	385.7	10.66	10.30	18.53	3,328	1.63	146.9	(8)	0.2	0	0	(8)	(8)	- 0.01	- 271	40.65	- 0.4
1959	9.79	385.1	11.72	11.32	19.32	3,477	1.59	144.7	(8)	0.2	0	0	(8)	(8)	- 0.01	- 337	42.41	4.3
1960	9.78	398.1	12.39	11.97	19.92	3,586	1.66	154.0	0.01	0.5	(8)	0	(8)	0.1	- 0.01	- 227	43.75	3.2
1961	9.58	390.4	12.93	12.49	20.22	3,641	1.68	157.8	0.02	1.7	(8)	0.1	(8)	0.1	- 0.01	- 318	44.41	1.5
1962	9.86	402.3	13.73	13.27	21.05	3,796	1.82	172.6	0.03	2.3	(8)	0.1	(8)	0.1	- 0.01	- 222	46.48	4.7
1963	10.36	423.5	14.40	13.97	21.70	3,921	1.77	169.1	0.04	3.2	(8)	0.2	(8)	0.1	- 0.01	- 298	48.27	3.8
1964	10.91	445.7	15.29	14.81	22.30	4,034	1.91	182.3	0.04	3.3	(8)	0.2	(8)	0.1	- 0.01	- 421	50.44	4.5
1965	11.51	472.0	15.77	15.28	23.25	4,202	2.06	196.8	0.04	3.7	(8)	0.2	(8)	0.3	- 0.02	- 744	52.62	4.3
1966	12.08	497.7	17.00	16.45	24.40	4,411	2.07	199.0	0.06	5.5	(8)	0.2	(8)	0.3	- 0.03	- 1,006	55.59	5.7
1967	11.85	491.4	17.94	17.39	25.28	4,585	2.34	224.6	0.09	7.7	0.01	0.3	(8)	0.3	- 0.02	- 618	57.50	3.4
1968	12.27	509.8	19.21	18.63	26.98	4,902	2.34	225.2	0.14	12.5	0.01	0.4	(8)	0.4	- 0.02	- 698	60.94	6.0
1969	12.31	516.4	20.68	20.06	28.34	5,160	2.66	254.5	0.15	13.9	0.01	0.6	(8)	0.3	- 0.04	- 1,456	64.12	5.2
1970	12.19	523.2	21.79	21.14	29.52	5,364	2.65	252.9	0.24	21.8	0.01	0.5	(8)	0.4	- 0.06	- 2,325	66.36	3.5
1971	11.54	501.6	22.47	21.79	30.56	5,553	2.86	273.1	0.41	38.1	0.01	0.5	(8)	0.3	- 0.03	- 1,335	67.82	2.2
1972	12.01	524.3	22.70	22.10	32.95	5,990	2.94	283.6	0.58	54.1	0.03	1.5	(8)	0.3	- 0.03	- 1,047	71.19	5.0
1973	12.90	562.6	22.51	22.05	34.84	6,317	3.01	289.7	0.91	83.5	0.04	2.0	(8)	0.3	- 0.01	- 317	74.21	4.2
1974	12.60	558.4	21.73	21.22	33.45	6,078	3.31	316.9	1.27	114.0	0.05	2.5	(8)	0.3	0.06	2,262	72.48	- 2.3
1975	12.60	562.6	19.95	19.54	32.73	5,958	3.22	309.3	1.90	172.5	0.07	3.2	(8)	0.2	0.01	546	70.48	- 2.8
1976	13.52	603.8	20.35	19.95	35.17	6,391	3.07	295.5	2.11	191.1	0.08	3.6	(8)	0.3	(8)	- 4	74.30	5.4
1977	13.85	625.3	19.93	19.52	37.12	6,727	2.51	241.0	2.70	250.9	0.08	3.6	0.01	0.5	0.02	588	76.21	2.6
1978	13.71	625.2	20.00	19.63	37.97	6,879	3.14	303.2	3.02	276.4	0.06	3.0	(8)	0.3	0.13	5,029	78.04	2.4
1979	14.98	680.5	20.67	20.24	37.12	6,757	3.14	303.4	2.78	255.2	0.08	3.9	0.01	0.5	0.07	2,534	78.84	1.0
1980	15.37	702.7	20.39	19.88	34.20	6,242	3.12	300.1	2.74	251.1	0.11	5.1	(8)	0.4	- 0.04	- 1,412	75.90	- 3.7
1981	15.86	732.6	19.93	19.40	31.93	5,861	3.11	297.1	3.01	272.7	0.12	5.7	(8)	0.4	- 0.02	- 643	73.94	- 2.6
1982	15.29	706.9	18.51	18.00	30.23	5,583	3.59	343.1	3.11	282.8	0.10	4.8	(8)	0.3	- 0.02	- 873	70.82	- 4.2
1983[10]	15.85	735.4	17.43	16.95	29.98	5,542	3.86	368.3	3.22	292.1	0.13	6.1	(8)	0.4	- 0.02	- 630	70.45	- 0.5

[1] Bituminous coal, subbituminous coal, lignite, and anthracite.
[2] Refined petroleum products supplied including natural gas plant liquids and crude oil burned as fuel.
[3] Electric utility and industrial generation of hydropower and net electricity imports.
[4] Consumed by electric utilities.
[5] Wood, refuse, and other vegetal fuels consumed by electric utilities. Converted to Btu by applying national average heat rates for fossil fuel steam electric plants. Data do not include the consumption of wood-derived fuel (other than that consumed by the electric utility industry) which amounted to an estimated 2.2 quadrillion Btu in 1981. This table excludes small quantities of energy forms for which consistent historical data are not available, such as solar energy obtained by the use of thermal and photovoltaic collectors; wind energy; and geothermal, biomass, and waste energy other than that consumed at electric utilities.
[6] See Explanatory Note 1.
[7] Percent change calculated from data prior to rounding.
[8] Less than 0.005 quadrillion Btu.
[9] Less than 0.05 billion kWh.
[10] Preliminary.

Note: Sum of components may not equal total due to independent rounding.

Sources: See sources for Tables 35, 66, 73, 78, 84, 86, and EIA estimates for industrial hydropower, and conversion factors in the Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

Figure 5. Consumption of Energy by End-Use Sector, Population, and Annual Per Capita Consumption

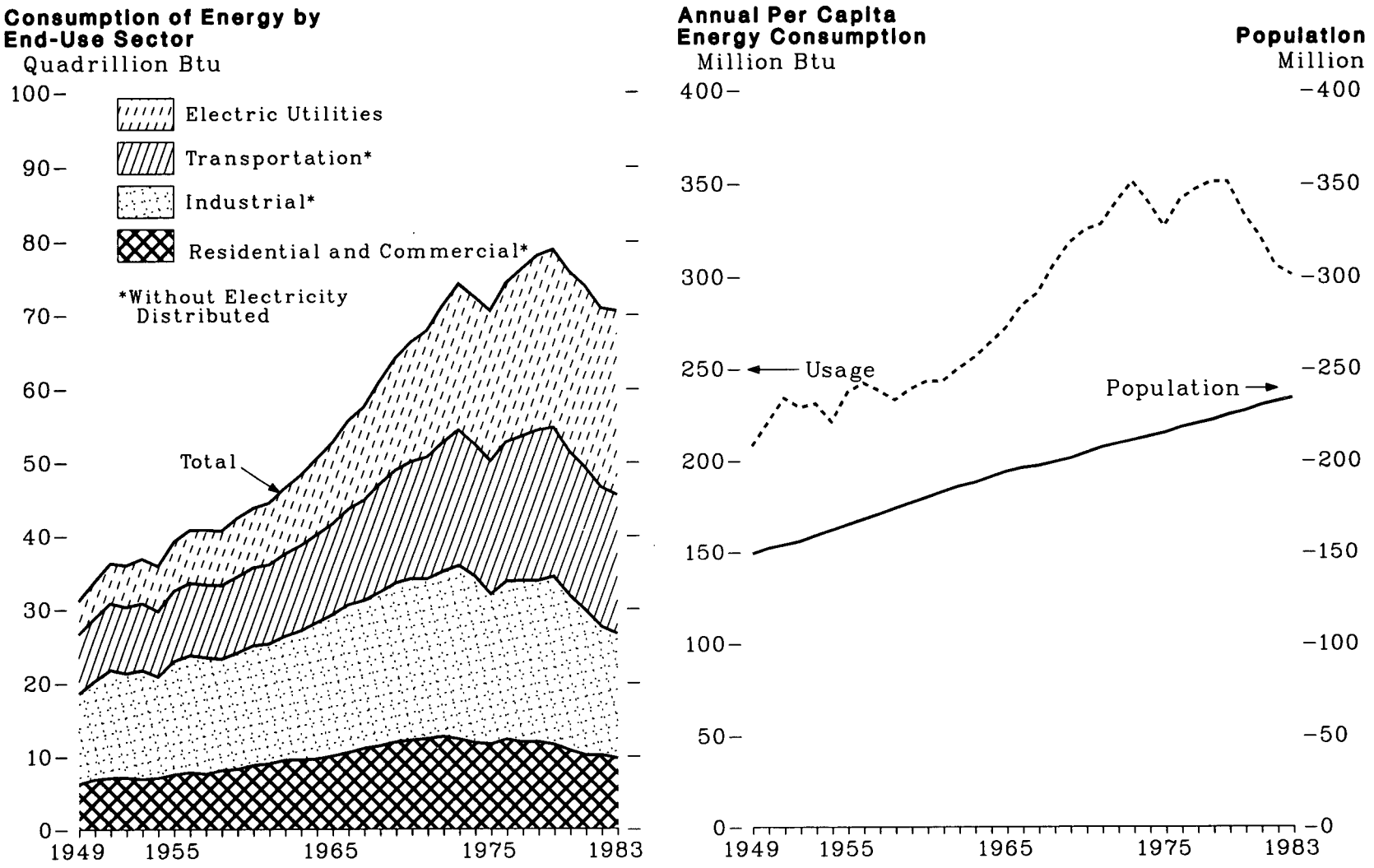


Table 4. Consumption of Energy by End-Use Sector, [1] Population, and Annual Per Capita Energy Consumption, 1949-1983

(Quadrillion Btu, except as noted)

Year	Residential and Commercial		Industrial		Transportation		Electric Utilities	Total Energy Consumption	Population (million) [4]	Annual Per Capita Consumption (million Btu)
	Fossil Fuels [2]	Total [3]	Fossil Fuels [2]	Total [3]	Fossil Fuels [2]	Total [3]				
1949	6.24	8.49	12.21	14.48	7.99	8.11	4.56	31.08	149.8	208
1950	6.81	9.13	13.38	15.91	8.47	8.58	4.90	33.62	151.9	221
1951	7.03	9.57	14.64	17.40	9.03	9.14	5.35	36.11	154.0	234
1952	7.05	9.78	14.15	16.98	8.97	9.07	5.60	35.83	156.4	229
1953	6.84	9.73	14.80	17.86	9.07	9.17	6.00	36.76	159.0	231
1954	7.01	10.01	13.75	16.78	8.85	8.93	6.06	35.73	161.9	221
1955	7.47	10.61	15.42	18.99	9.49	9.57	6.75	39.17	165.1	237
1956	7.78	11.17	15.87	19.70	9.81	9.88	7.26	40.75	168.1	242
1957	7.54	11.17	15.85	19.73	9.85	9.91	7.53	40.80	171.2	238
1958	8.04	11.82	15.13	18.82	9.96	10.01	7.48	40.65	174.1	233
1959	8.23	12.32	15.76	19.73	10.30	10.35	8.08	42.41	177.1	239
1960	8.75	13.05	16.19	20.10	10.56	10.60	8.21	43.75	180.0	243
1961	8.96	13.44	16.20	20.20	10.73	10.77	8.49	44.41	183.0	243
1962	9.45	14.27	16.77	20.99	11.18	11.22	9.05	46.48	185.8	250
1963	9.48	14.72	17.50	21.90	11.62	11.65	9.64	48.27	188.5	256
1964	9.60	15.23	18.50	23.21	11.96	11.99	10.34	50.44	191.1	264
1965	10.00	16.04	19.17	24.16	12.39	12.42	11.03	52.62	193.5	272
1966	10.47	17.06	20.03	25.44	13.05	13.09	12.01	55.59	195.6	284
1967	11.04	18.11	20.02	25.67	13.70	13.73	12.71	57.50	197.5	291
1968	11.39	19.24	20.80	26.85	14.81	14.84	13.89	60.94	199.4	306
1969	11.90	20.59	21.55	28.05	15.45	15.48	15.19	64.12	201.4	318
1970	12.14	21.72	21.86	28.57	16.04	16.07	16.28	66.36	204.0	325
1971	12.35	22.59	21.61	28.53	16.67	16.70	17.16	67.82	206.8	328
1972	12.64	23.69	22.33	29.81	17.67	17.70	18.53	71.19	209.3	340
1973	12.28	24.15	23.47	31.46	18.57	18.60	19.85	74.21	211.4	351
1974	11.77	23.73	22.56	30.63	18.08	18.11	20.02	72.48	213.3	340
1975	11.60	23.90	20.30	28.34	18.20	18.24	20.35	70.48	215.5	327
1976	12.25	25.02	21.38	30.18	19.06	19.09	21.57	74.30	217.6	341
1977	11.87	25.38	21.83	31.02	19.77	19.81	22.69	76.21	219.8	347
1978	11.91	26.09	21.81	31.36	20.56	20.59	23.72	78.04	222.1	351
1979	11.53	25.81	22.72	32.56	20.43	20.47	24.13	78.84	224.6	351
1980	10.72	25.65	20.99	30.56	19.66	19.69	24.50	75.90	227.2	334
1981	10.05	25.25	19.65	29.21	19.46	19.50	24.75	73.94	229.5	322
1982	10.07	25.63	17.42	26.12	19.03	19.07	24.27	70.82	231.8	306
1983[5]	9.61	25.52	16.89	25.93	18.96	18.99	24.96	70.45	234.0	301

[1] Data do not include consumption of wood-derived fuel (other than that consumed by the electric utility industry) which amounted to an estimated 2.2 quadrillion Btu in 1981. Also, small quantities of other energy forms for which consistent historical data are not available, such as solar energy obtained by the use of thermal and photovoltaic collectors; wind energy; and geothermal, biomass, and waste energy other than that consumed at electric utilities, are not included. See Explanatory Note 2.

[2] Includes only those fossil fuels consumed directly in the sector. See Figure 1.

[3] Includes those fossil fuels consumed directly in the sector, utility electricity sales to the sector, and energy losses in the conversion and transmission of electricity. Conversion and transmission losses are allocated to sectors in proportion to electricity sales to sectors (see Figure 1).

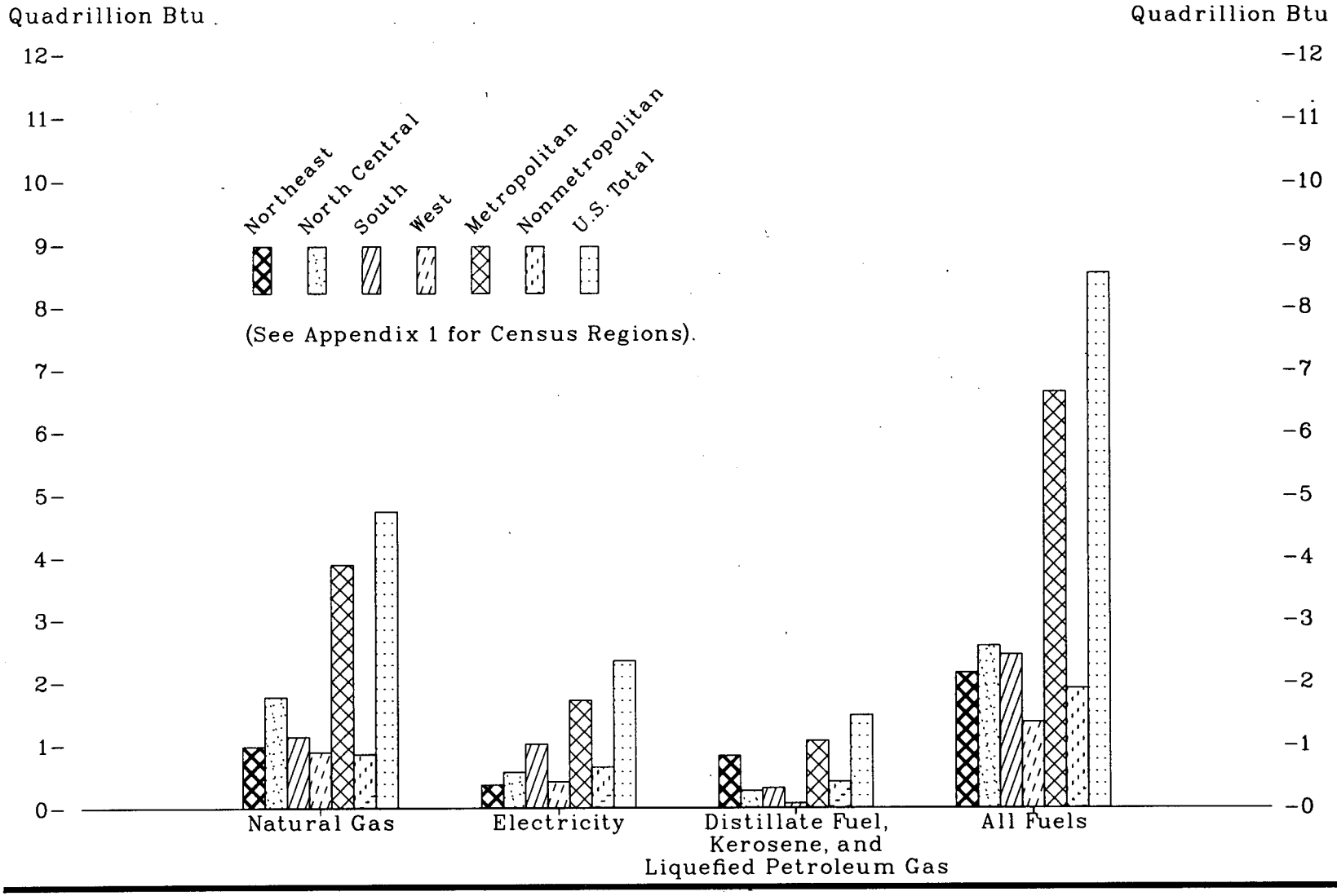
[4] Resident population of the 50 States and the District of Columbia estimated for July 1 of each year.

[5] Preliminary.

Note: Sum of components may not equal total due to independent rounding.

Sources: See sources for Tables 46, 67, 75, 78, 86, 87, and EIA estimates for industrial hydropower, and conversion factors in the Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

Figure 6. Energy Consumed by Households, April 1982 through March 1983



restructure its gas sales and transportation rates to make them more competitive with other fuels and other pipelines.

The actions, which Columbia seeks as of June 1, would put its commodity gas sale price at $3.94/MMBTU—down 20.5¢, and in most cases allow an end user that buys gas directly from a producer a savings of at least 10¢/MMBTU below Columbia's present transportation fee.

If Congress doesn't move soon with a comprehensive natural gas bill, an independent effort will be made to repeal the Fuel Use Act—which restricts gas use in power plants.

George Lawrence, president of the American Gas Association, says a coalition will be formed quickly.

"The Fuel Use Act has greatly outlived its usefulness. The gas supply problem, which has plagued the industry in the past, is behind us," he said.

FERC tentatively has agreed on procedures to require producers to refund money to pipelines, and pipelines to distributors within 6 months under the recent "dry" gas ruling.

The refunds, totaling about $1 billion, are required under a federal court decision which struck down FERC's "dry" gas rules (OGJ, Jan. 23, p. 52).

FERC is expected to provide some relief for small producers who would have to make the lump sum payments.

Meanwhile, FERC is seeking public comment on ways to amend rules under which pipelines recover purchased gas costs.

FERC is concerned that the current purchased gas adjustment regulations may inhibit the end-market from signaling gas is overpriced—especially when some categories of gas are decontrolled Jan. 1.

December 1983 was a good month for energy sales, the Commerce Department confirms.

The month ranks seventh among the top 10 coldest months on record with a national average temperature of 26.2°. The rest of the top 10 months all are Januarys.

U.S. petroleum imports in 1983 were at the lowest in 12 years, the Energy Information Administration says.

The drop, the sixth consecutive one, took imports to their lowest level in 1981. And the 4.2 million b/d average of imports included 200,000 b/d for the Strategic Petroleum Reserve.

EIA said U.S. petroleum consumption was down 0.7% overall from 1982, the fifth straight annual drop.

Natural gas use fell 5.8% to 17 trillion cu ft, the fourth straight decline and the least gas use since 1966. EIA said the decrease largely was due to consumer response to higher natural gas prices.

Transportation Sec. Elizabeth Dole says the Reagan administration no longer opposes a bill creating a $200 million trust fund to clean up oil spills.

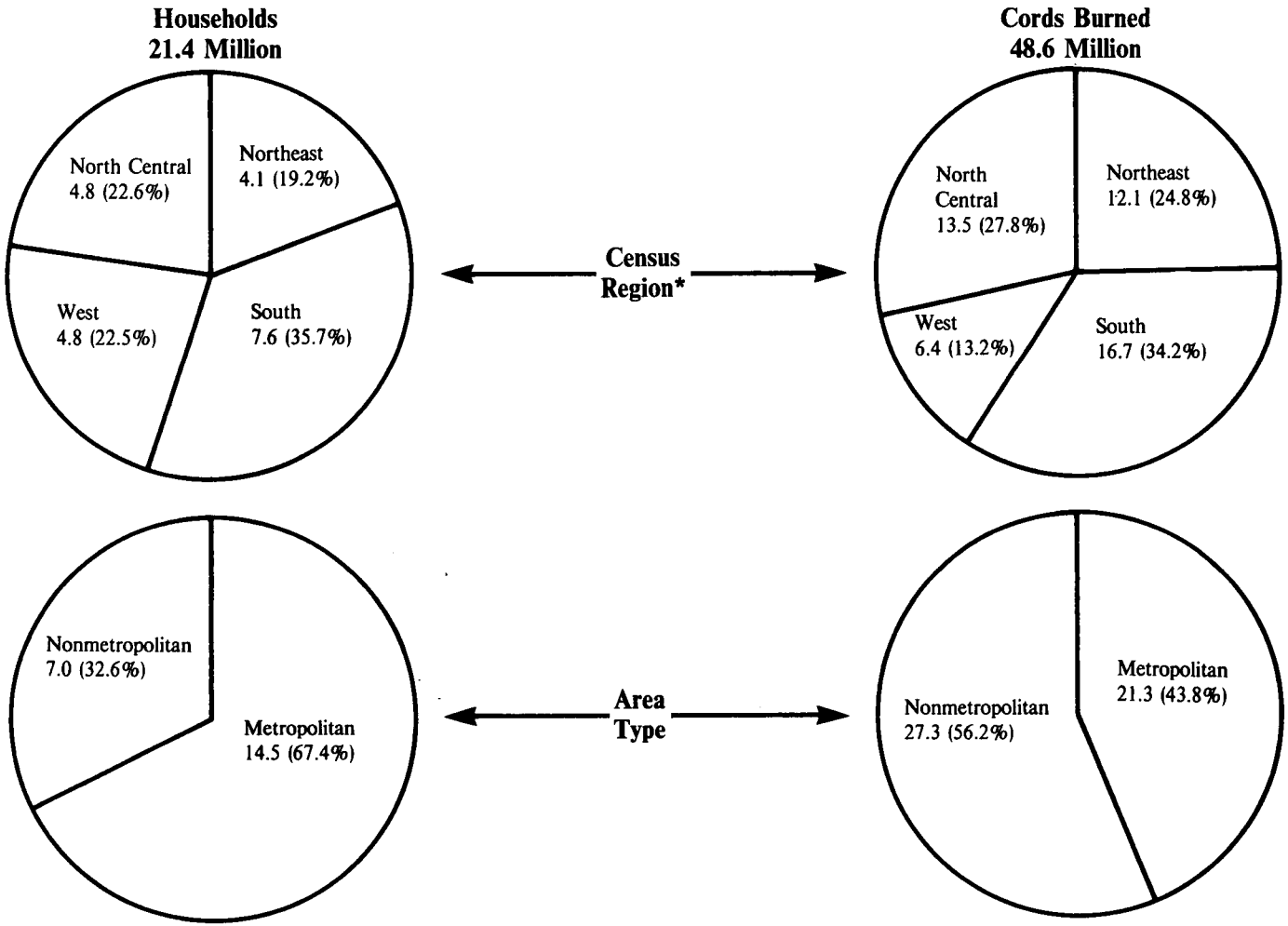
Table 5. Energy Consumed by Households, April 1982 through March 1983 [1]

(Quadrillion Btu, except as noted)

Household Characteristics	Number of Households (Million)	Consumption					Energy Consumption per Household (Million Btu)
		Natural Gas	Electricity	Distillate Fuel Oil and Kerosene	Liquefied Gases	Total	
Total	83.8	4.73	2.34	1.18	0.29	8.54	102
Census Region							
Northeast	18.0	0.97	0.36	0.80	0.02	2.15	120
North Central	21.3	1.76	0.56	0.16	0.11	2.58	121
South	28.1	1.13	1.01	0.19	0.12	2.44	87
West	16.5	0.88	0.41	0.03	0.04	1.36	83
Type Area							
Metropolitan	63.2	3.88	1.71	0.96	0.10	6.64	105
Nonmetropolitan	20.6	0.85	0.64	0.22	0.19	1.90	92
Type of Structure							
Single Family Detached	53.8	3.34	1.76	0.75	0.23	6.07	113
Single Family Attached	3.9	0.29	0.10	0.04	0.01	0.43	112
Two to Four Unit Building	10.1	0.63	0.18	0.16	—	0.97	96
Five or More Unit Building	12.2	0.40	0.20	0.19	—	0.79	65
Mobile Home	3.7	0.07	0.11	0.03	0.05	0.27	72
Number of Rooms							
One to Three	10.8	0.33	0.16	0.15	0.01	0.65	60
Four	16.8	0.74	0.36	0.18	0.06	1.34	80
Five	19.8	1.06	0.53	0.24	0.07	1.90	96
Six	18.2	1.16	0.58	0.26	0.07	2.06	113
Seven	9.3	0.68	0.34	0.15	0.03	1.20	129
Eight or More	8.8	0.77	0.37	0.20	0.04	1.38	156
Year House Built							
Before 1940	23.6	1.58	0.47	0.56	0.10	2.71	115
1940 to 1949	7.0	0.42	0.18	0.14	0.01	0.75	107
1950 to 1959	13.4	0.89	0.34	0.19	0.04	1.45	109
1960 to 1964	8.6	0.51	0.25	0.11	0.02	0.90	104
1965 to 1969	8.1	0.45	0.27	0.04	0.02	0.79	97
1970 to 1974	10.2	0.45	0.35	0.06	0.04	0.90	88
1975 to 1979	10.0	0.35	0.39	0.08	0.04	0.85	85
After 1979	2.9	0.08	0.10	—	0.01	0.19	66
Household Members							
One	19.3	0.84	0.32	0.26	0.06	1.48	77
Two	26.3	1.40	0.69	0.38	0.08	2.55	97
Three	13.6	0.83	0.42	0.18	0.04	1.47	108
Four	14.2	0.91	0.51	0.20	0.05	1.67	117
Five or More	10.4	0.76	0.40	0.15	0.05	1.37	132

[1] Data are preliminary.
Note: A dash (—) represents less than 0.005 quadrillion Btu, zero, not available, or not applicable.
Note: Sum of components may not equal total due to independent rounding.
Source: Energy Information Administration, Form EIA-457, "The 1982 Residential Energy Consumption Survey."

Figure 7. Households that Burn Wood, December 1981 through November 1982



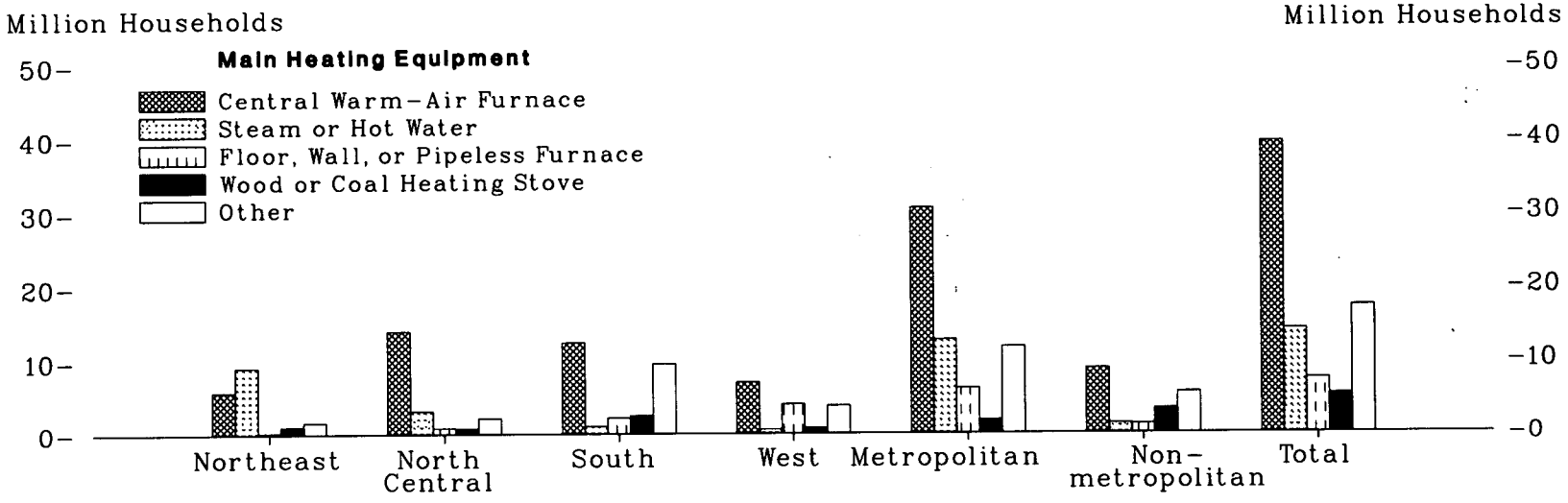
*See Appendix 1 for Census Regions.

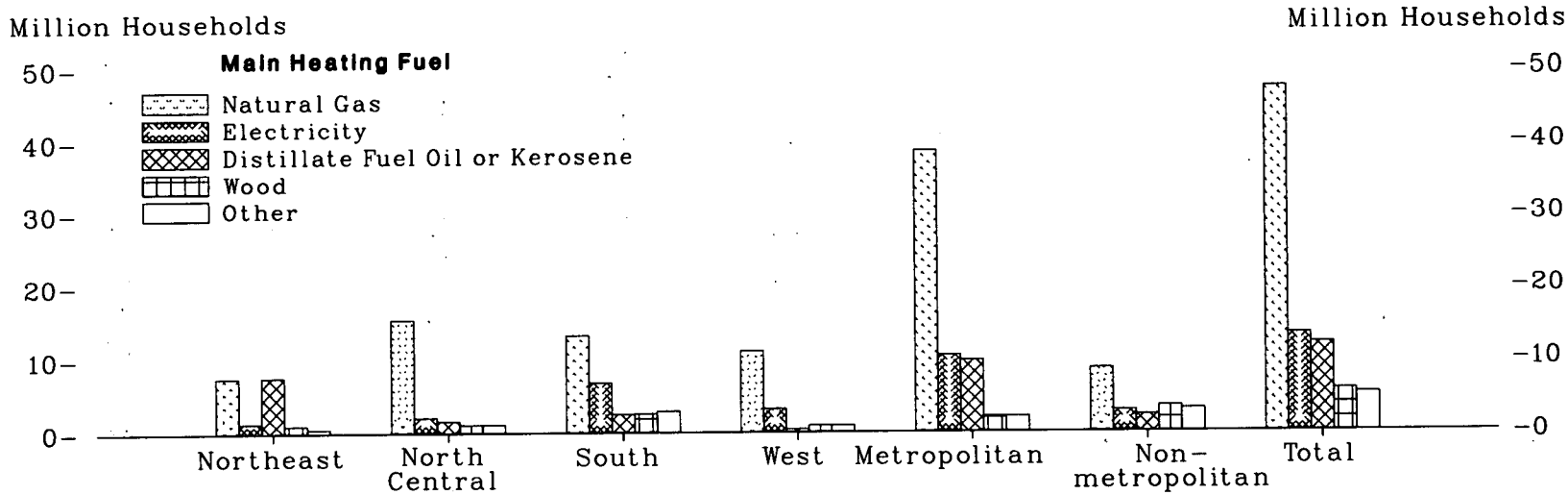
Table 6. Households that Burn Wood, December 1981 through November 1982

Household Characteristics	Households That Burn Wood		Cords Burned		Average Amount Burned per Household (cords)
	(million)	(percent)	(million)	(percent)	
Total Households	21.4	100.0	48.6	100.0	2.3
Census Regions					
Northeast	4.1	19.2	12.1	24.8	2.9
North Central	4.8	22.6	13.5	27.8	2.8
South	7.6	35.7	16.7	34.2	2.2
West	4.8	22.5	6.4	13.2	1.3
Area Type					
Metropolitan	14.5	67.4	21.3	43.8	1.5
Nonmetropolitan	7.0	32.6	27.3	56.2	3.9
Year House was Built					
Before 1940	4.6	21.6	15.4	31.7	3.3
1940 to 1949	1.6	7.4	3.5	7.1	2.2
1950 to 1959	3.1	14.7	6.4	13.1	2.0
1960 to 1964	2.2	10.4	3.8	7.9	1.7
1965 to 1969	2.2	10.5	4.3	8.8	1.9
1970 to 1974	3.3	15.2	7.0	14.3	2.1
1975 to 1979	3.6	16.6	6.2	12.8	1.7
After 1979	0.8	3.7	2.1	4.2	2.6
Main Heating Fuel					
Natural Gas	8.7	40.8	9.0	18.5	1.0
Wood	5.6	26.3	28.8	59.3	5.1
Fireplace	0.4	1.7	1.2	2.4	3.0
Airtight Stove	4.1	19.2	20.3	41.8	4.9
Nonairtight Stove	0.7	3.2	3.7	7.6	5.4
Furnace/Other	0.4	2.0	3.5	7.3	8.2
Electricity	3.0	13.9	3.6	7.4	1.2
Fuel Oil or Kerosene	2.8	13.0	4.5	9.3	1.6
LPG/Other	1.4	6.2	2.8	5.7	2.0
Amount of Wood Burned					
1.49 Cords or Less	11.7	54.6	5.3	10.9	0.5
1.50 to 2.49 Cords	3.0	13.9	5.5	11.2	1.8
2.50 to 3.49 Cords	2.0	9.5	5.9	12.1	2.9
3.50 to 4.49 Cords	1.1	5.3	4.5	9.3	3.9
4.50 or More Cords	3.6	16.7	27.4	56.4	7.7

Note: Sum of components may not equal total due to independent rounding.
Source: Energy Information Administration, Form EIA-457, "The 1982 Residential Energy Consumption Survey."

Figure 8. Household Fuel-Use Characteristics, November 1982





*See Appendix 1 for Census Regions.

Table 7. Household Fuel-Use Characteristics, November 1982

(Million Households)

Household Characteristics	Census Region				Area Type		Total
	Northeast	North Central	South	West	Metropolitan	Non-metropolitan	
Total Households	18.0	21.3	28.1	16.5	63.2	20.6	83.8
Main Heating Equipment							
Central Warm-Air Furnace (Excluding Heat Pump)	5.9	14.1	12.5	7.1	30.6	8.9	39.5
Steam or Hot Water [1]	9.2	3.3	1.1	0.6	12.8	1.4	14.2
Heat Pump	0.2	0.4	2.3	0.8	3.1	0.5	3.6
Floor, Wall or Pipeless Furnace	0.2	0.9	2.3	4.1	6.2	1.3	7.5
Room Heater, Oil or Gas	0.4	0.8	4.4	0.9	3.6	2.8	6.4
Built-In Electric Units	0.9	1.0	1.6	1.5	3.6	1.5	5.0
Wood or Coal Stove	1.1	0.8	2.6	0.8	1.9	3.4	5.3
Other or None	0.2	0.1	1.3	0.7	1.5	0.8	2.3
Main Heating Fuel							
Natural Gas	7.5	15.5	13.3	11.1	38.7	8.7	47.4
Electricity	1.3	2.1	6.8	3.2	10.5	2.9	13.4
Distillate Fuel Oil or Kerosene	7.6	1.6	2.5	0.4	9.8	2.3	12.1
Wood	1.0	1.1	2.6	0.9	2.1	3.5	5.7
Liquefied Gases	0.2	1.0	2.3	0.4	1.5	2.2	3.8
Other or None	0.3	0.1	0.6	0.5	0.6	0.9	1.4
Main Water-Heating Fuel							
Natural Gas	8.7	14.7	12.4	11.3	39.6	7.4	47.0
Electricity	3.7	5.5	13.2	4.3	16.7	10.0	26.7
Distillate Fuel Oil or Kerosene	5.0	0.1	0.4	0.1	5.2	0.5	5.6
Liquefied Gases	0.4	0.9	1.6	0.7	1.3	2.2	3.5
Wood	0.1	—	0.3	—	0.1	0.3	0.4
Solar	—	—	0.1	0.1	0.2	0.1	0.3
Other or None	0.2	0.1	0.1	—	0.2	0.2	0.3
Main Cooking Fuel							
Electricity	7.7	12.0	16.6	8.7	32.0	13.0	45.0
Natural Gas	9.3	8.3	8.8	7.1	28.9	4.7	33.6
Liquefied Gases	0.9	0.9	2.5	0.6	2.2	2.7	4.9
Wood	—	—	0.1	—	—	0.1	0.1
Other or None	0.1	0.1	0.1	—	0.1	0.1	0.2

[1] Includes systems with radiators, base-board convertors, and in-floor pipes.
Note: A dash (—) represents less than 0.05 households, zero, not available, or not applicable.
Note: Sum of components may not equal total due to independent rounding.
Source: Energy Information Administration, Form EIA-457, "The 1982 Residential Energy Consumption Survey."

Figure 9. Type of Heating in Occupied Housing Units

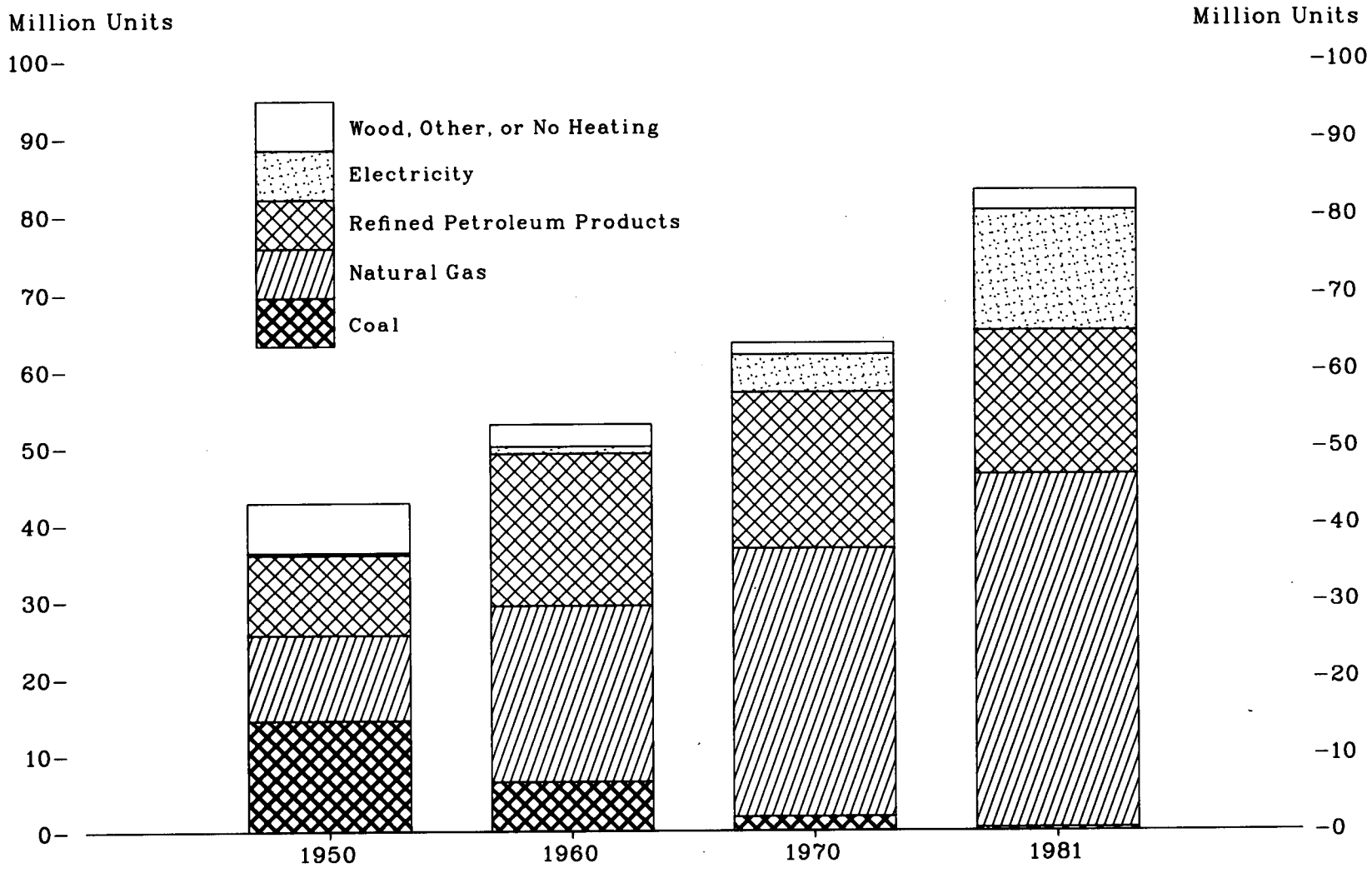


Table 8. Type of Heating in Occupied Housing[1] Units, 1950, 1960, 1970, and 1973-1981

Year	Coal [2]	Natural Gas	Liquefied Gas	Distillate Fuel Oil	Kerosene	Electricity	Wood	Other	None [3]	Total
Million										
1950	14.48	11.12	0.98	9.46	(4)	0.28	4.17	0.77	1.57	42.83
1960	6.46	22.85	2.69	17.16	(4)	0.93	2.24	0.22	0.48	53.02
1970	1.82	35.01	3.81	16.47	(4)	4.88	0.79	0.27	0.40	63.45
1973	0.80	38.46	4.42	17.24	(4)	7.21	0.60	0.15	0.45	69.34
1974	0.74	39.47	4.14	16.84	(4)	8.41	0.66	0.09	0.48	70.83
1975	0.57	40.93	4.15	16.30	(4)	9.17	0.85	0.08	0.47	72.52
1976	0.48	41.22	4.24	16.45	(4)	10.15	0.91	0.09	0.46	74.01
1977	0.45	41.54	4.18	15.62	0.44	11.15	1.24	0.15	0.51	75.28
1978	0.40	42.52	4.13	15.65	0.42	12.26	1.07	0.12	0.60	77.17
1979	0.36	43.32	4.13	15.30	0.41	13.24	1.14	0.10	0.57	78.57
1980	0.33	44.40	4.17	14.50	0.37	14.21	1.38	0.11	0.61	80.07
1981	0.36	46.08	4.17	14.13	0.37	15.49	1.89	0.10	0.59	83.18
Percent										
1950	33.8	26.0	2.3	22.1	(4)	0.6	9.7	1.8	3.7	100.0
1960	12.2	43.1	5.1	32.4	(4)	1.8	4.2	0.4	0.9	100.0
1970	2.9	55.2	6.0	26.0	(4)	7.7	1.3	0.4	0.6	100.0
1973	1.2	55.5	6.4	24.9	(4)	10.4	0.9	0.2	0.7	100.0
1974	1.0	55.7	5.8	23.8	(4)	11.9	0.9	0.1	0.7	100.0
1975	0.8	56.4	5.7	22.5	(4)	12.6	1.2	0.1	0.6	100.0
1976	0.7	55.7	5.7	22.2	(4)	13.7	1.2	0.1	0.6	100.0
1977	0.6	55.2	5.6	20.7	0.6	14.8	1.6	0.2	0.7	100.0
1978	0.5	55.1	5.4	20.3	0.5	15.9	1.4	0.2	0.8	100.0
1979	0.5	55.1	5.3	19.5	0.5	16.9	1.4	0.1	0.7	100.0
1980	0.4	55.4	5.2	18.1	0.5	17.7	1.7	0.1	0.8	100.0
1981	0.4	55.4	5.0	17.0	0.4	18.6	2.3	0.1	0.7	100.0

[1] Includes mobile homes and individual housing units in apartment buildings. Housing units with more than one type of heating system are classified according to the principal type of heating system.
[2] Includes coal coke.
[3] Includes non-reporting units in 1950 and 1960 which totaled 997 and 2,000 units, respectively.
[4] Included in distillate fuel oil.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1950, 1960, and 1970—Bureau of the Census, *Census of Population and Housing.* •1973 through 1981—Bureau of the Census, *Annual Housing Survey.*

Figure 10. Household Appliance Data, November 1982

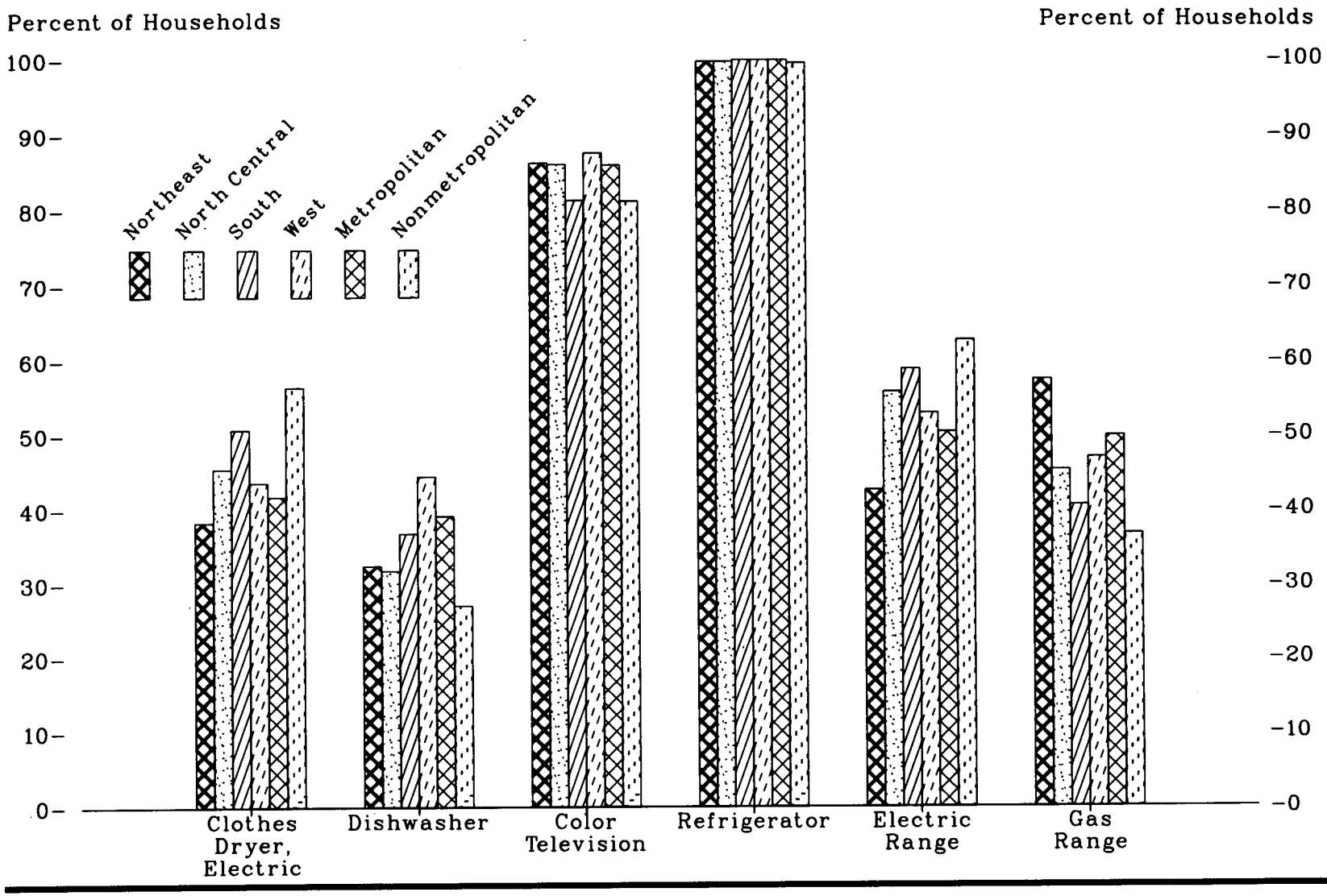


Table 9. Household Appliance Data, November 1982

(Million Households)

Appliance	Census Region								Area Type				Total	
	Northeast		North Central		South		West		Metropolitan		Non-metropolitan			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Households	18.0	100.0	21.3	100.0	28.1	100.0	16.5	100.0	63.2	100.0	20.6	100.0	83.8	100.0
Type Appliances														
Electric Appliances														
Television Set (Color)	15.5	86.2	18.3	86.0	22.8	81.2	14.4	87.5	54.3	85.9	16.7	81.1	71.0	84.8
Television Set (B/W)	8.9	49.5	10.6	49.7	13.7	48.7	5.8	35.2	29.6	46.8	9.3	45.3	38.9	46.5
Clothes Washer (Automatic)	11.9	66.3	14.5	68.0	20.2	71.9	11.4	69.0	42.4	67.1	15.5	75.2	57.9	69.1
Clothes Washer (Wringer)	0.5	2.8	1.0	4.7	0.9	3.2	0.1	0.9	1.5	2.3	1.0	5.0	2.5	3.0
Range (Stove-Top or Burners)	7.6	42.6	11.9	55.7	16.5	58.8	8.7	52.8	31.8	50.3	12.9	62.6	44.7	53.3
Oven (Not Microwave) [1]	7.0	39.1	10.0	46.8	15.0	53.6	7.7	46.6	28.3	44.8	11.4	55.5	39.7	47.4
Microwave [1]	0.6	3.5	1.6	7.4	1.3	4.5	1.4	8.5	3.7	5.9	1.1	5.6	4.9	5.8
Clothes Dryer	6.9	38.3	9.7	45.4	14.2	50.7	7.2	43.6	26.3	41.7	11.6	56.4	37.9	45.3
Separate Freezer	5.0	27.9	9.1	42.5	12.0	42.9	4.9	29.6	19.9	31.5	11.1	53.8	31.0	37.0
Dishwasher	5.8	32.5	6.8	31.8	10.3	36.8	7.3	44.4	24.7	39.1	5.6	27.1	30.3	36.1
Humidifier	2.5	13.7	6.3	29.7	1.7	5.9	0.8	5.0	7.8	12.4	3.5	16.8	11.3	13.5
Dehumidifier	2.4	13.4	3.9	18.4	1.1	4.1	0.1	0.5	5.5	8.7	2.1	10.0	7.5	9.0
Window or Ceiling Fan	5.0	27.9	6.5	30.7	10.0	35.6	1.9	11.6	17.6	27.8	5.9	28.6	23.5	28.0
Whole House Cooling Fan	1.3	7.4	1.8	8.4	2.8	10.0	0.6	3.6	5.0	8.0	1.5	7.2	6.5	7.8
Evaporative Cooler	—	0.1	0.1	0.5	0.6	2.2	2.8	17.2	3.0	4.8	0.6	2.7	3.6	4.2
Gas Appliances														
Range (Stove-Top or Burners)	10.3	57.4	9.6	45.2	11.4	40.5	7.7	46.9	31.5	49.8	7.6	36.7	39.0	46.6
Oven [1]	8.9	49.6	8.1	38.2	9.7	34.7	6.9	42.1	27.3	43.3	6.3	30.8	33.7	40.2
Clothes Dryer	2.7	15.1	4.3	20.4	2.4	8.6	2.8	16.7	10.6	16.7	1.6	8.0	12.2	14.6
Outdoor Piped Gas Grill	0.7	3.6	0.6	3.0	1.3	4.5	0.5	2.9	2.7	4.2	0.4	1.8	3.0	3.6
Outdoor LPG Gas Grill	2.4	13.1	1.5	7.0	1.8	6.6	0.7	4.4	4.9	7.8	1.5	7.1	6.4	7.7
Outdoor Gas Light	0.1	0.7	0.5	2.2	0.7	2.4	0.1	0.9	1.2	1.8	0.3	1.2	1.4	1.7
Swimming Pool Heater	—	0.1	0.1	0.5	—	0.1	0.1	0.9	0.3	0.5	—	0.1	0.3	0.4
Refrigerators														
One	15.2	84.4	17.6	82.8	25.1	89.5	14.5	88.1	54.6	86.4	17.8	86.5	72.4	86.4
Two or More	2.7	15.2	3.6	16.8	2.9	10.3	1.9	11.7	8.5	13.4	2.7	12.9	11.1	13.3
None	0.1	0.4	0.1	0.4	0.1	0.2	—	0.2	0.1	0.2	0.1	0.5	0.2	0.3
Air Conditioning (A/C)														
Central	2.1	12.0	5.9	27.4	11.8	42.1	3.5	21.6	19.2	30.4	4.1	20.1	23.3	27.8
Individual Room Units	7.2	40.2	6.4	30.2	9.5	33.7	2.2	13.3	19.3	30.5	6.0	29.4	25.3	30.2
None	8.6	47.9	9.0	42.4	6.8	24.2	10.7	65.1	24.7	39.1	10.4	50.5	35.1	41.9

[1] Data are for only the most used oven.

Note: A dash (—) represents less than 0.05 million households, zero, not available, or not applicable.

Note: Sum of components may not equal total due to independent rounding.

Source: Energy Information Administration, Form EIA-457, "The 1982 Residential Energy Consumption Survey."

Figure 11. U.S. Government Energy Use

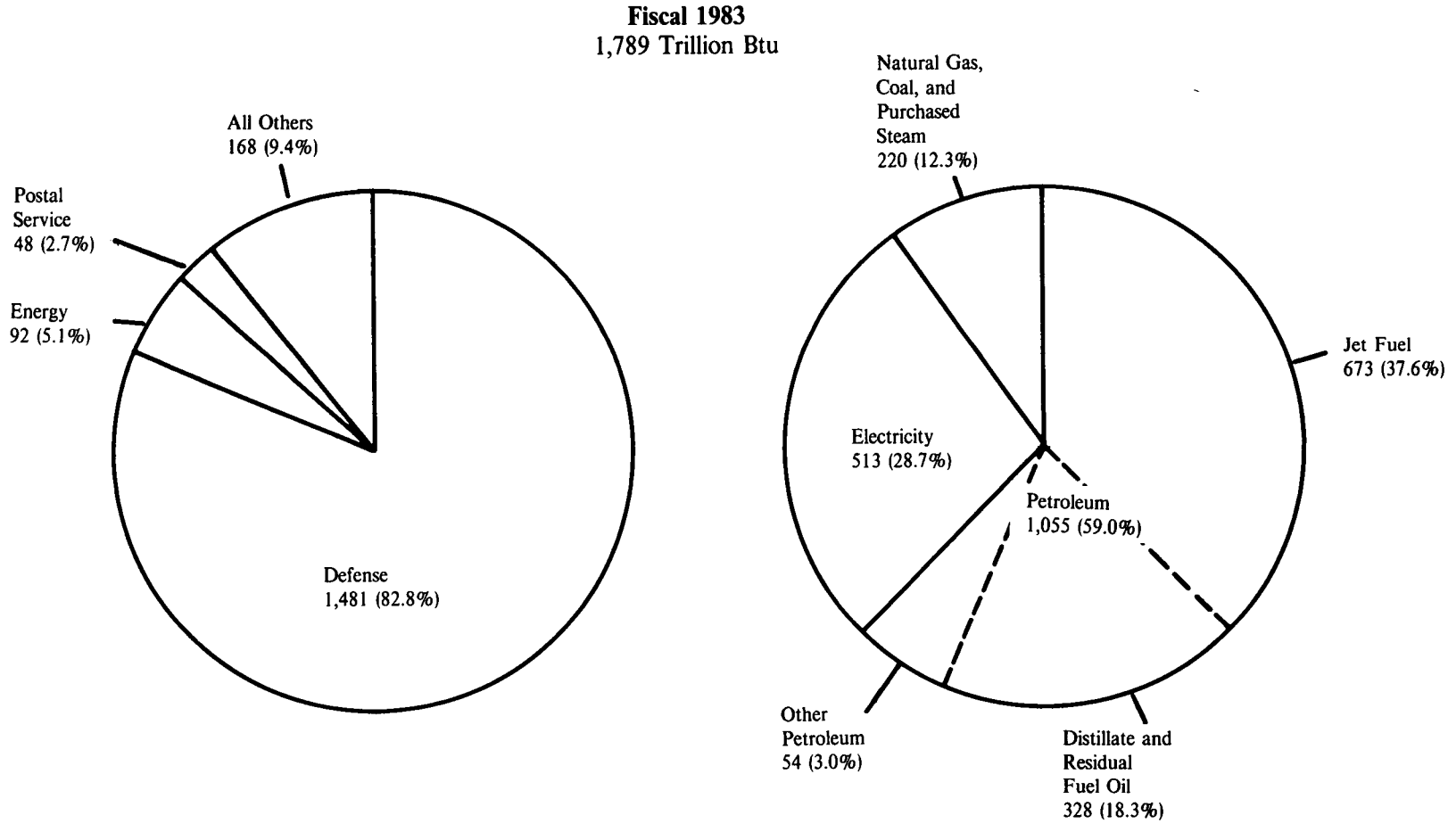


Table 10. U.S. Government Energy Use, Fiscal Years, 1975-1983
(Trillion Btu)

Activity	1975	1976	1977	1978	1979	1980	1981	1982	1983 [1]
Agency									
Defense	1,505	1,387	1,401	1,366	1,384	1,395	1,455	1,484	1,481
Energy	87	92	88	88	87	84	86	90	92
Postal Service	59	58	63	59	56	52	51	49	48
General Services Administration	43	41	41	41	41	39	39	39	37
Veterans Administration	39	36	38	39	38	38	37	38	39
Transportation	28	27	29	29	28	28	28	29	29
NASA	27	25	24	22	22	21	21	22	22
Agriculture	12	12	11	11	11	11	11	10	10
Interior	12	13	14	12	13	12	11	11	12
Health and Human Services	9	10	10	10	10	10	11	10	10
Justice	6	7	7	7	7	7	7	8	NA
Other [2]	16	15	16	17	18	17	17	16	9
Total	1,843	1,724	1,742	1,702	1,714	1,713	1,774	1,806	1,789
Energy Source									
Petroleum									
Motor Gasoline	64	62	62	60	59	54	56	51	48
Aviation Gasoline	16	13	9	6	5	5	4	4	2
Jet Fuel, Total	649	646	621	603	619	646	650	673	673
Distillate and Residual Fuel Oils	361	342	348	331	324	300	356	354	328
Liquefied Petroleum Gas	5	4	4	3	4	4	4	5	4
Subtotal	1,095	1,067	1,044	1,003	1,011	1,009	1,070	1,087	1,055
Electricity	492	444	478	479	480	486	486	500	513
Natural Gas	171	152	143	144	149	148	147	144	147
Coal	78	55	70	68	65	63	63	66	61
Purchased Steam and Other	7	6	7	8	9	8	8	9	12
Total	1,843	1,724	1,742	1,702	1,714	1,713	1,774	1,806	1,789

[1] Preliminary.
[2] Includes Commerce, Panama Canal Commission, Tennessee Valley Authority, National Science Foundation, Housing and Urban Development, State, Office of Personnel Management, Interstate Commerce Commission, Small Business Administration, Federal Communications Commission, Civil Aeronautics Board, and Environmental Protection Agency.
Note: Sum of components may not equal total due to independent rounding.
Source: Department of Energy Form DOE 6200.2, "Quarterly Federal Energy Usage Report."

Figure 12. A Comparison of Fuel and Non-Fuel Use of Fossil Fuels

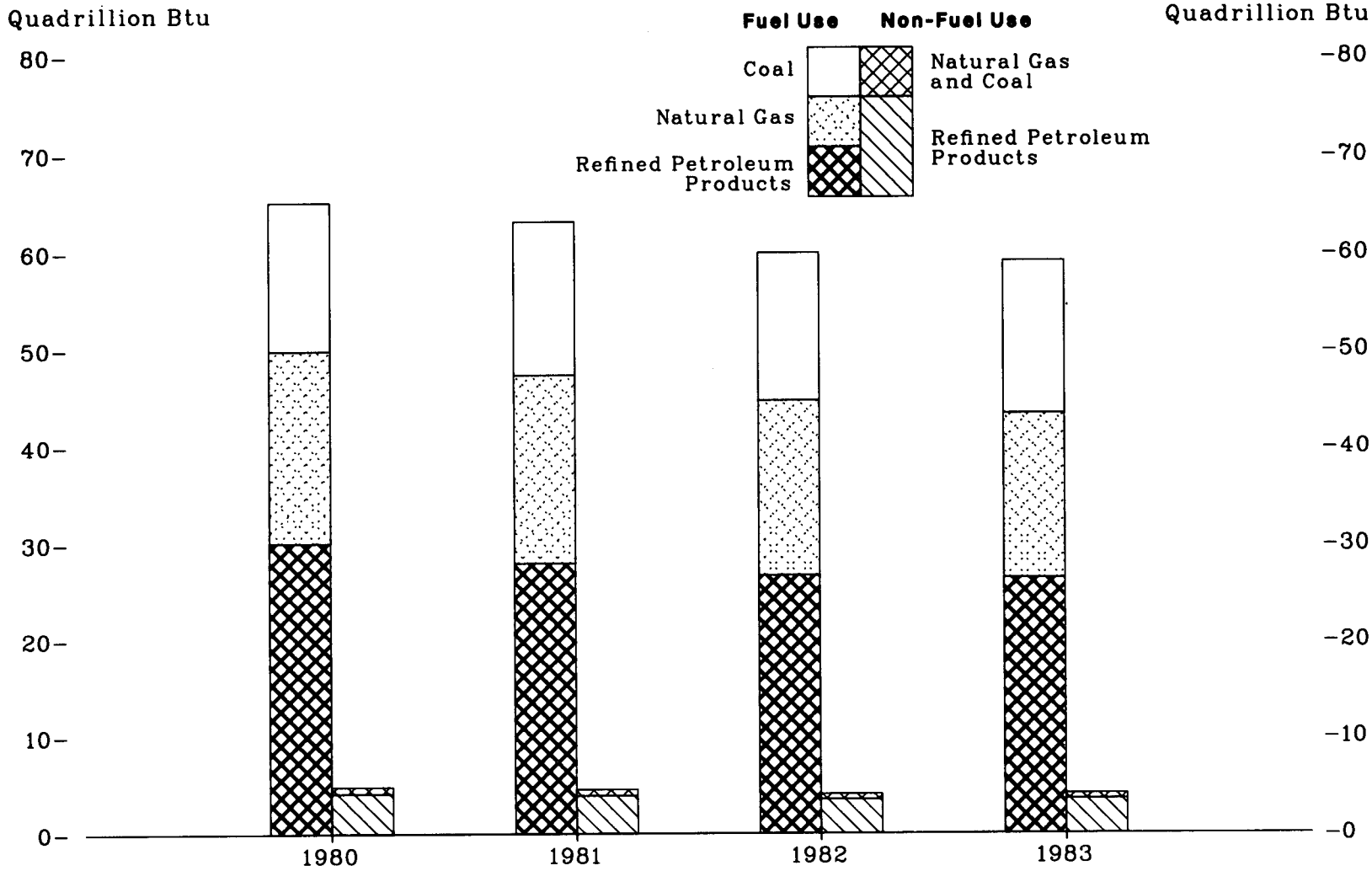


Table 11. A Comparison of Fuel and Non-Fuel Use of Fossil Fuels, 1980-1983

Commodity	Physical Units				Quadrillion Btu			
	1980	1981	1982	1983 [1]	1980	1981	1982	1983 [1]
	Million Barrels							
Refined Petroleum Products								
Fuel Use	5,455	5,109	4,889	4,842	30.08	28.02	26.73	26.44
Non-Fuel Use								
Asphalt and Road Oil	145	125	125	136	0.96	0.83	0.83	0.90
Ethane [2]	110	117	142	144	0.34	0.36	0.44	0.44
Liquefied Gases [3]	121	113	117	115	0.48	0.45	0.46	0.46
Lubricants	58	56	51	52	0.35	0.34	0.31	0.31
Petrochemical Feedstock	253	236	169	163	1.43	1.33	0.95	0.92
Petroleum Coke	16	34	28	26	0.10	0.21	0.17	0.16
Special Naphtha	37	27	25	29	0.19	0.14	0.13	0.15
Wax	6	7	5	6	0.03	0.04	0.03	0.03
Miscellaneous	41	36	32	29	0.24	0.21	0.18	0.17
Total Non-Fuel	788	752	694	700	4.13	3.91	3.50	3.54
Percent Non-Fuel	12.6	12.8	12.4	12.6	12.1	12.2	11.6	11.8
	Billion Cubic Feet							
Natural Gas								
Fuel Use	19,288	18,858	17,510	16,473	19.79	19.37	18.01	16.93
Non-Fuel Use								
Chemical Feedstock	569	546	491	482	0.58	0.56	0.50	0.50
Carbon Black	20	(4)	(4)	(4)	0.02	(4)	(4)	(4)
Total Non-Fuel	589	546	491	482	0.60	0.56	0.50	0.50
Percent Non-Fuel	3.0	2.8	2.7	2.8	3.0	2.8	2.7	2.9
	Million Short Tons							
Coal								
Fuel Use	699.81	730.1	705.1	733.9	15.27	15.78	15.24	15.80
Non-Fuel Use								
Crude Tar	2.3	2.1	1.4	1.2	0.08	0.08	0.05	0.05
Other	0.6	0.5	0.4	0.3	0.01	0.01	(5)	(5)
Total Non-Fuel	2.9	2.5	1.8	1.5	0.10	0.08	0.05	0.05
Percent Non-Fuel	0.4	0.3	0.3	0.2	0.6	0.5	0.3	0.3
Total Non-Fuel Use of Fossil Fuels	—	—	—	—	4.82	4.55	4.05	4.09
Percent Non-Fuel Use of Fossil Fuels	—	—	—	—	6.9	6.8	6.3	6.5

[1] Preliminary.
[2] Includes ethane, ethylene, and ethane share of ethane-propane mixtures.
[3] Includes propane, propylene, propane share of ethane-propane mixtures, butane, butylene, butane-propane mixtures, and isobutane.
[4] Included in Chemical Feedstock.
[5] Less than 0.01 quadrillion Btu.
— Indicates data not applicable.

Note: All non-fuel use of energy is consumed by the industrial sector except for quantities of lubricants which are consumed in the transportation sector as follows, in million barrels (and quadrillion Btu): 1980 - 32(0.19); 1981 - 28(0.16); 1982 - 25(0.15); and 1983 - 25(0.15).

Note: Sum of components may not equal total due to independent rounding.

Sources: **Refined Petroleum Products:** • 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual* and *Sales of Liquefied Petroleum Gases and Ethane in 1980.* • 1981 and 1982—Energy Information Administration, *Petroleum Supply Annual* and unpublished data. • 1983—Energy Information Administration, *Petroleum Supply Monthly* and Energy Information Administration estimates. **Natural Gas:** • 1980— Bureau of the Census, 1980 Survey of Manufactures, *Hydrocarbon, Coal, and Coke Materials Consumed.* • 1981 through 1983—Department of Commerce estimates. **Coal:** • 1980 - Energy Information Administration, *Coke and Coal Chemicals in 1980.* • 1981 - Energy Information Administration, Energy Data Report, *Coke Plant Report,* quarterly. • 1982 and 1983—Energy Information Administration, *Quarterly Coal Report* and Energy Information Administration estimates.

Figure 13. Energy Consumption and Losses by Electric Utilities and Electricity Sales

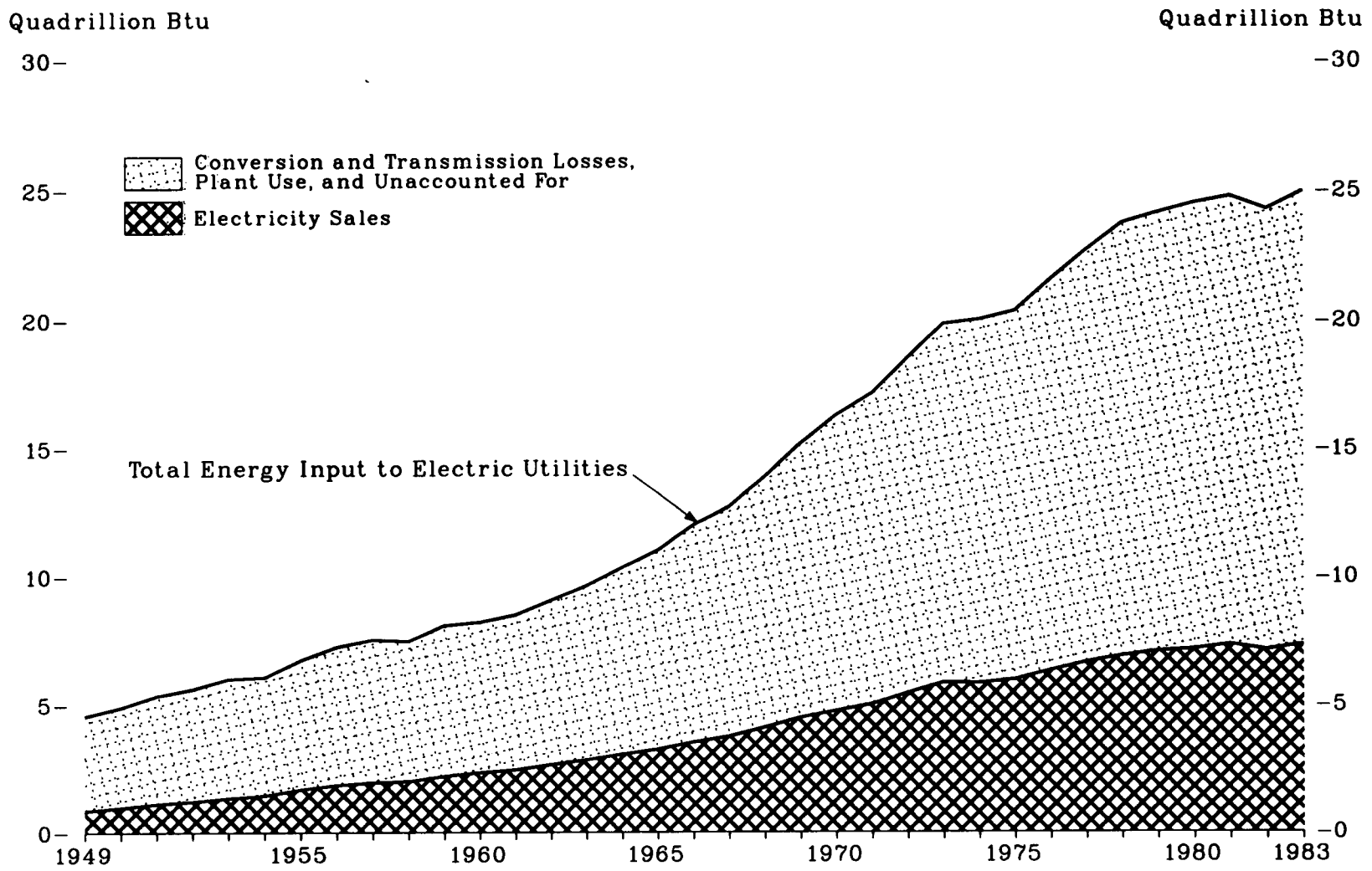


Table 12. Energy Consumption and Losses by Electric Utilities and Electricity Sales, 1949-1983

(Quadrillion Btu)

Year	Consumption/Generation									Total		Conversion and Transmission Losses, Plant Use, and Unaccounted for		Electricity Sales
				Hydropower [1]		Nuclear Power		Geothermal, Wood, and Waste						
	Coal [2]	Natural Gas	Petroleum [3]	Fossil Fuel Equivalent [4]	Electricity Equivalent [5]	Heat Equivalent [6]	Electricity Equivalent [5]	Heat Equivalent [7]	Electricity Equivalent [5]	Fossil Fuel/Heat Equivalent [8]	Electricity Equivalent [9]	Fossil Fuel/Heat Equivalent [10]	Electricity Equivalent [11]	
1949	2.19	0.57	0.41	1.37	0.31	0	0	(12)	(12)	4.56	3.49	3.69	2.62	0.87
1950	2.40	0.65	0.47	1.37	0.33	0	0	(12)	(12)	4.90	3.86	3.91	2.87	0.99
1951	2.76	0.79	0.40	1.39	0.35	0	0	(12)	(12)	5.35	4.30	4.22	3.18	1.13
1952	2.80	0.94	0.42	1.43	0.37	0	0	(12)	(12)	5.60	4.53	4.39	3.31	1.22
1953	3.03	1.07	0.51	1.38	0.37	0	0	(12)	(12)	6.00	4.98	4.65	3.63	1.35
1954	3.10	1.21	0.42	1.33	0.37	0	0	(12)	(12)	6.06	5.09	4.61	3.65	1.45
1955	3.71	1.19	0.47	1.37	0.40	0	0	(12)	(12)	6.75	5.78	5.05	4.08	1.69
1956	4.07	1.28	0.45	1.45	0.43	0	0	(12)	(12)	7.26	6.24	5.39	4.37	1.86
1957	4.13	1.38	0.50	1.52	0.46	(12)	(12)	(12)	(12)	7.53	6.47	5.57	4.50	1.96
1958	3.97	1.42	0.49	1.59	0.49	(12)	(12)	(12)	(12)	7.48	6.37	5.47	4.37	2.01
1959	4.29	1.69	0.55	1.55	0.48	(12)	(12)	(12)	(12)	8.08	7.01	5.87	4.80	2.21
1960	4.25	1.79	0.55	1.62	0.51	0.01	(12)	(12)	(12)	8.21	7.10	5.86	4.75	2.35
1961	4.37	1.89	0.56	1.64	0.53	0.02	0.01	(12)	(12)	8.49	7.35	6.02	4.89	2.46
1962	4.64	2.03	0.56	1.79	0.58	0.03	0.01	(12)	(12)	9.05	7.82	6.40	5.16	2.65
1963	5.06	2.21	0.58	1.74	0.57	0.04	0.01	0.01	(12)	9.64	8.44	6.80	5.60	2.84
1964	5.39	2.40	0.63	1.87	0.61	0.04	0.01	0.01	(12)	10.34	9.05	7.29	5.99	3.06
1965	5.84	2.40	0.72	2.02	0.66	0.04	0.01	0.01	(12)	11.03	9.63	7.77	6.37	3.25
1966	6.32	2.70	0.88	2.04	0.67	0.06	0.02	0.01	(12)	12.01	10.58	8.47	7.05	3.53
1967	6.46	2.83	1.01	2.31	0.75	0.09	0.03	0.01	(12)	12.71	11.08	8.96	7.33	3.75
1968	7.01	3.25	1.18	2.31	0.76	0.14	0.04	0.01	(12)	13.89	12.24	9.79	8.13	4.10
1969	7.23	3.60	1.57	2.62	0.86	0.15	0.05	0.02	(12)	15.19	13.30	10.71	8.82	4.48
1970	7.24	4.05	2.12	2.62	0.85	0.24	0.07	0.02	(12)	16.28	14.34	11.53	9.59	4.75
1971	7.31	4.10	2.49	2.83	0.92	0.41	0.13	0.02	(12)	17.16	14.95	12.14	9.94	5.01
1972	7.82	4.08	3.10	2.91	0.96	0.58	0.18	0.03	0.01	18.53	16.15	13.08	10.70	5.44
1973	8.66	3.75	3.51	2.98	0.98	0.91	0.28	0.05	0.01	19.85	17.19	14.01	11.35	5.84
1974	8.53	3.52	3.36	3.28	1.07	1.27	0.39	0.06	0.01	20.02	16.89	14.20	11.07	5.82
1975	8.79	3.24	3.17	3.19	1.04	1.90	0.59	0.07	0.01	20.35	16.84	14.39	10.88	5.96
1976	9.72	3.15	3.48	3.03	1.00	2.11	0.65	0.08	0.01	21.57	18.01	15.24	11.68	6.33
1977	10.24	3.28	3.90	2.48	0.81	2.70	0.86	0.08	0.01	22.69	19.11	16.05	12.46	6.65
1978	10.24	3.30	3.99	3.11	1.02	3.02	0.94	0.07	0.01	23.72	19.50	16.84	12.61	6.89
1979	11.26	3.61	3.28	3.11	1.02	2.78	0.87	0.09	0.01	24.13	20.07	17.06	13.00	7.07
1980	12.12	3.81	2.63	3.08	1.01	2.74	0.86	0.11	0.02	24.50	20.45	17.35	13.30	7.15
1981	12.58	3.76	2.20	3.07	1.00	3.01	0.93	0.13	0.02	24.75	20.50	17.43	13.17	7.33
1982	12.58	3.34	1.57	3.56	1.16	3.11	0.96	0.11	0.02	24.27	19.63	17.15	12.51	7.12
1983[13]	13.23	3.01	1.54	3.82	1.25	3.22	1.00	0.14	0.02	24.96	20.05	17.63	12.72	7.33

[1] Includes net imports of electricity.
[2] Includes bituminous coal, subbituminous coal, lignite, and anthracite.
[3] Includes distillate fuel oil, residual fuel oil (including crude oil burned as fuel), jet fuel, and petroleum coke.
[4] The equivalent of fossil fuel energy required to generate the electricity distributed using the average fossil fuel steam electric plant thermal efficiency. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section for factors to convert physical unit data into Btu.
[5] The equivalent amount of heat that could be produced by the electricity distributed using the conversion factor 3,412 Btu per kilowatt-hour.
[6] The amount of heat released in reactors by fissioning uranium at electric utilities.
[7] Includes for geothermal plants the heat content of the steam consumed and for wood and waste plants the fossil fuel equivalent using national average heat rate for fossil fuel steam electric plants. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section for factors to convert physical unit data into Btu.
[8] Total of fossil fuels and the fossil fuel/heat equivalent of non-fossil fuel energy sources.
[9] Total of fossil fuels and electricity equivalent of non-fossil fuel energy sources.
[10] Balancing item, the difference between Total Fossil Fuel/Heat Equivalent and Electricity Sales.
[11] Balancing item, the difference between Total Electricity Equivalent and Electricity Sales.
[12] Less than 0.005 quadrillion Btu.
[13] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Source: See sources for Tables 86, 87, and 88 and conversion factors in the Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

Figure 14. Trade in Energy

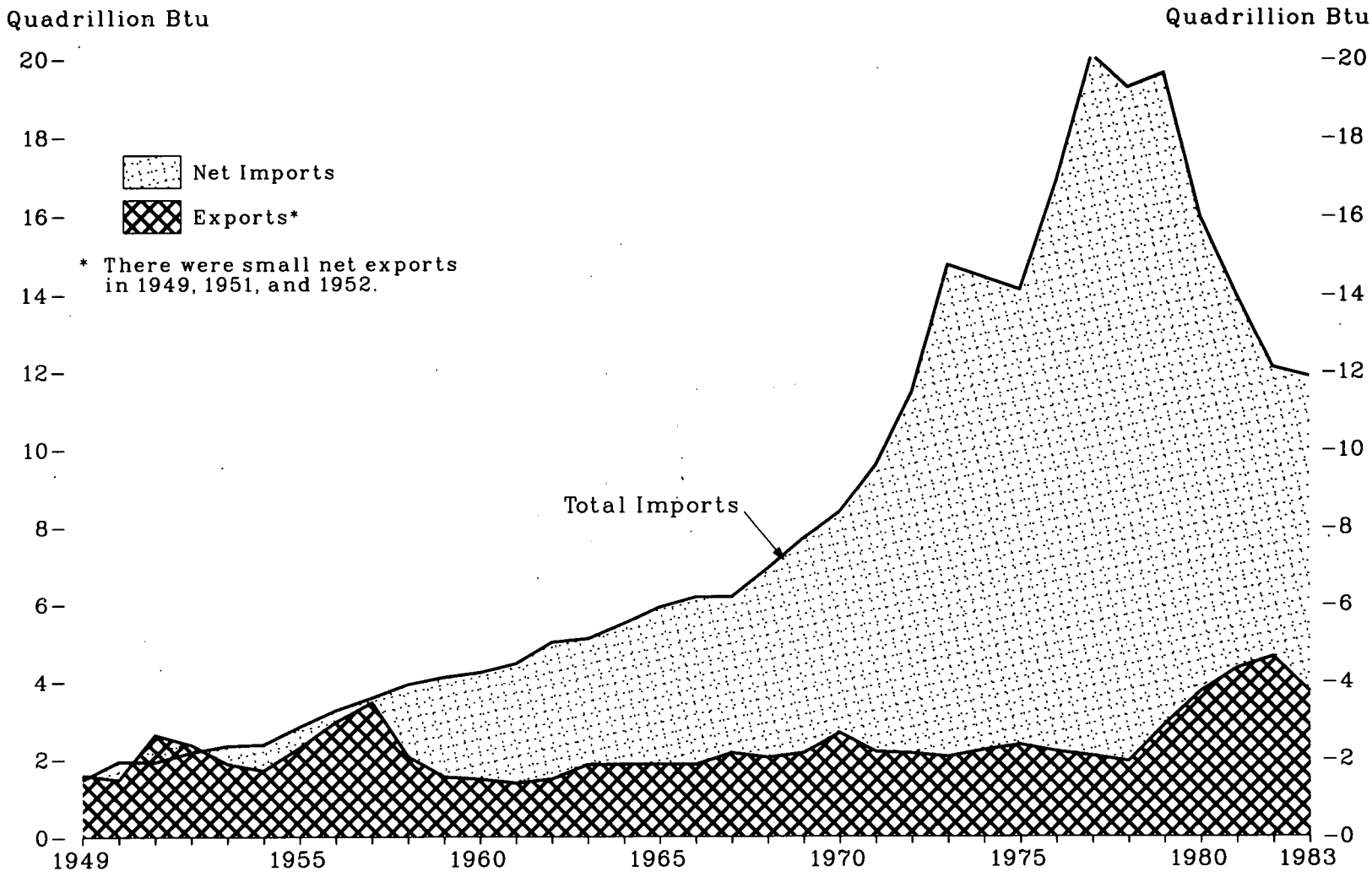


Table 13. Trade in Energy, 1949-1983

(Quadrillion Btu)

Year	Imports					Exports					Net Trade [1]				
	Coal [2]	Petroleum [3]	Natural Gas (Dry)	Other [4]	Total	Coal [2]	Petroleum [3]	Natural Gas (Dry)	Other [4]	Total	Coal [2]	Petroleum [3]	Natural Gas (Dry)	Other [4]	Total
1949	0.01	1.43	(5)	0.03	1.47	0.88	0.68	0.02	0.02	1.59	0.87	-0.75	0.02	-0.02	0.13
1950	0.01	1.89	(5)	0.04	1.93	0.79	0.64	0.03	0.01	1.47	0.78	-1.24	0.03	-0.03	-0.47
1951	0.01	1.87	(5)	0.04	1.92	1.68	0.89	0.03	0.03	2.62	1.67	-0.98	0.03	-0.01	0.71
1952	0.01	2.11	0.01	0.04	2.17	1.40	0.91	0.03	0.02	2.37	1.40	-1.20	0.02	-0.02	0.20
1953	0.01	2.28	0.01	0.04	2.34	0.98	0.84	0.03	0.02	1.87	0.97	-1.44	0.02	-0.02	-0.47
1954	0.01	2.32	0.01	0.04	2.37	0.91	0.75	0.03	0.01	1.70	0.91	-1.58	0.02	-0.02	-0.67
1955	0.01	2.75	0.01	0.06	2.83	1.46	0.77	0.03	0.02	2.29	1.46	-1.98	0.02	-0.04	-0.54
1956	0.01	3.17	0.01	0.06	3.25	1.98	0.91	0.04	0.02	2.95	1.98	-2.26	0.03	-0.04	-0.30
1957	0.01	3.46	0.04	0.06	3.57	2.17	1.20	0.04	0.04	3.45	2.16	-2.26	(5)	-0.02	-0.12
1958	0.01	3.72	0.14	0.05	3.92	1.42	0.58	0.04	0.02	2.06	1.41	-3.14	-0.10	-0.03	-1.86
1959	0.01	3.91	0.14	0.05	4.11	1.05	0.45	0.02	0.02	1.54	1.04	-3.46	-0.12	-0.03	-2.57
1960	0.01	4.00	0.16	0.06	4.23	1.02	0.43	0.01	0.02	1.48	1.02	-3.57	-0.15	-0.04	-2.74
1961	(5)	4.19	0.23	0.04	4.46	0.98	0.37	0.01	0.02	1.38	0.98	-3.82	-0.22	-0.02	-3.08
1962	0.01	4.56	0.42	0.03	5.01	1.08	0.36	0.02	0.03	1.48	1.08	-4.20	-0.40	(5)	-3.53
1963	0.01	4.65	0.42	0.03	5.10	1.36	0.44	0.02	0.03	1.85	1.35	-4.21	-0.40	0.01	-3.25
1964	0.01	4.96	0.46	0.07	5.49	1.34	0.43	0.02	0.06	1.85	1.33	-4.53	-0.44	-0.01	-3.65
1965	0.00	5.40	0.47	0.04	5.92	1.38	0.39	0.03	0.06	1.86	1.37	-5.01	-0.44	0.02	-4.06
1966	(5)	5.63	0.50	0.05	6.18	1.35	0.41	0.03	0.06	1.85	1.35	-5.21	-0.47	0.01	-4.32
1967	0.01	5.56	0.58	0.04	6.19	1.35	0.65	0.08	0.06	2.15	1.35	-4.91	-0.50	0.02	-4.04
1968	0.01	6.21	0.67	0.04	6.93	1.38	0.49	0.10	0.07	2.03	1.37	-5.73	-0.58	0.02	-4.90
1969	(5)	6.90	0.75	0.06	7.71	1.53	0.49	0.05	0.08	2.15	1.53	-6.42	-0.70	0.03	-5.56
1970	(5)	7.47	0.85	0.07	8.39	1.94	0.55	0.07	0.11	2.66	1.93	-6.92	-0.77	0.04	-5.72
1971	(5)	8.54	0.96	0.08	9.58	1.55	0.47	0.08	0.08	2.18	1.54	-8.07	-0.88	-(5)	-7.41
1972	(5)	10.30	1.05	0.11	11.46	1.53	0.47	0.08	0.06	2.14	1.53	-9.83	-0.97	-0.05	-9.32
1973	(5)	13.47	1.06	0.20	14.73	1.43	0.49	0.08	0.06	2.05	1.42	-12.98	-0.98	-0.14	-12.68
1974	0.05	13.13	0.99	0.25	14.42	1.62	0.46	0.08	0.06	2.22	1.57	-12.66	-0.91	-0.19	-12.19
1975	0.02	12.95	0.98	0.16	14.11	1.76	0.44	0.07	0.09	2.36	1.74	-12.51	-0.90	-0.08	-11.75
1976	0.03	15.67	0.99	0.15	16.84	1.60	0.47	0.07	0.06	2.19	1.57	-15.20	-0.92	-0.09	-14.65
1977	0.04	18.76	1.04	0.26	20.09	1.44	0.51	0.06	0.06	2.07	1.40	-18.24	-0.98	-0.20	-18.02
1978	0.07	17.82	0.99	0.37	19.26	1.08	0.77	0.05	0.03	1.93	1.00	-17.06	-0.94	-0.34	-17.33
1979	0.05	17.93	1.30	0.34	19.62	1.75	1.00	0.06	0.06	2.87	1.70	-16.93	-1.24	-0.28	-16.75
1980	0.03	14.66	1.01	0.28	15.97	2.42	1.16	0.05	0.10	3.73	2.39	-13.50	-0.96	-0.18	-12.25
1981	0.03	12.64	0.92	0.39	13.98	2.94	1.26	0.06	0.06	4.33	2.92	-11.38	-0.86	-0.33	-9.64
1982	0.02	10.78	0.95	0.36	12.11	2.79	1.73	0.05	0.06	4.63	2.77	-9.05	-0.90	-0.30	-7.47
1983[6]	0.03	10.50	0.96	0.39	11.88	2.04	1.57	0.06	0.06	3.72	2.01	-8.94	-0.91	-0.33	-8.16

[1] Net trade = exports minus imports.
[2] Bituminous coal, subbituminous coal, lignite, and anthracite.
[3] Crude oil and refined petroleum products, including unfinished oils and natural gas plant liquids. Includes imports into the Strategic Petroleum Reserve which began in 1977.
[4] Coal coke and small amounts of electricity transmitted across U.S. borders with Canada and Mexico.
[5] Less than 0.005 quadrillion Btu.
[6] Preliminary.
Note: Sum of components may not equal totals or net trade items due to independent rounding.
Note: Includes trade between the United States (50 States and the District of Columbia) and its territories and possessions.
Source: See sources for Tables 35, 39, 66, 73, 78, and 84 and conversion factors in the Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

Figure 15. Production of Fossil Fuels on Federally Administered Lands

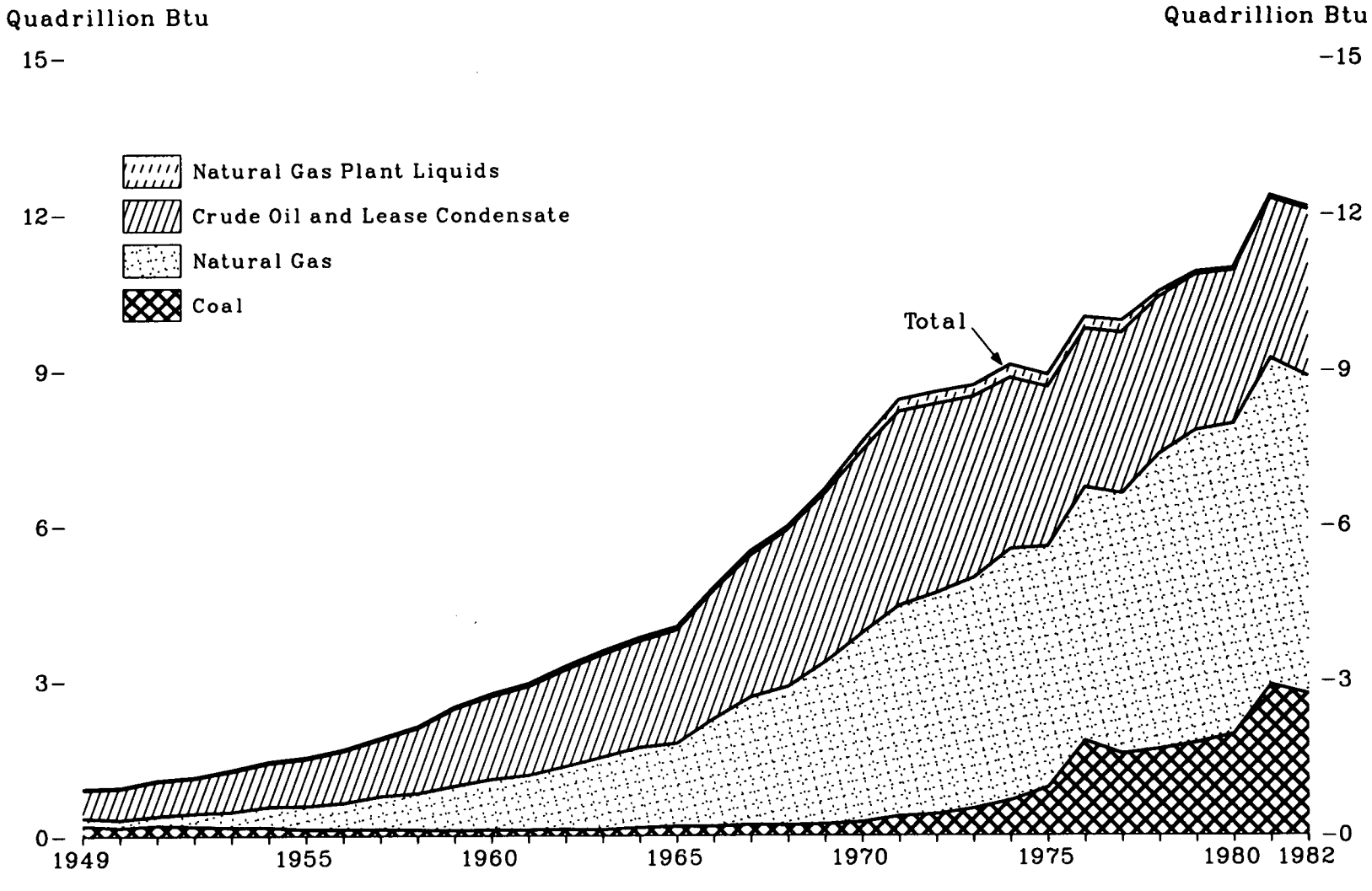


Table 14. Production of Fossil Fuels on Federally Administered Lands, 1949-1982

Year	Crude Oil and Lease Condensate [1]			Natural Gas Plant Liquids [2]			Natural Gas [3]			Coal [4]			Total	
	Million Barrels	Quadrillion Btu	Percent U.S. Total [5]	Million Barrels	Quadrillion Btu	Percent U.S. Total [5]	Trillion Cubic Feet	Quadrillion Btu	Percent U.S. Total [5]	Million Short Tons	Quadrillion Btu	Percent U.S. Total [5]	Quadrillion Btu	Percent U.S. Total
1949	95.2	0.55	5.2	4.4	0.02	2.8	0.15	0.15	2.8	9.5	0.20	2.0	0.92	3.1
1950	105.9	0.61	5.4	4.4	0.02	2.4	0.14	0.15	2.4	7.7	0.16	1.4	0.94	2.9
1951	117.3	0.68	5.2	5.3	0.02	2.6	0.17	0.18	2.4	9.3	0.20	1.6	1.08	3.0
1952	118.7	0.69	5.2	5.5	0.02	2.5	0.25	0.25	3.2	8.7	0.18	1.7	1.15	3.2
1953	136.9	0.79	5.8	5.7	0.03	2.4	0.29	0.30	3.6	7.5	0.16	1.5	1.28	3.6
1954	146.5	0.85	6.3	6.1	0.03	2.4	0.39	0.40	4.6	7.4	0.16	1.8	1.43	4.2
1955	159.5	0.92	6.4	6.0	0.03	2.1	0.43	0.45	4.8	5.9	0.12	1.2	1.53	4.0
1956	174.1	1.01	6.7	6.4	0.03	2.2	0.49	0.51	5.1	5.8	0.12	1.1	1.67	4.1
1957	189.4	1.10	7.2	6.6	0.03	2.2	0.62	0.64	6.1	5.7	0.12	1.1	1.89	4.7
1958	216.8	1.26	8.9	8.0	0.04	2.7	0.69	0.71	6.5	5.3	0.11	1.2	2.11	5.6
1959	258.2	1.50	10.0	9.5	0.04	3.0	0.83	0.86	7.2	4.9	0.10	1.1	2.50	6.4
1960	277.3	1.61	10.8	11.6	0.05	3.4	0.95	0.98	7.8	5.2	0.11	1.2	2.75	6.9
1961	297.3	1.72	11.3	13.5	0.06	3.7	1.03	1.06	8.1	5.2	0.11	1.2	2.95	7.3
1962	321.7	1.87	12.0	15.3	0.07	4.1	1.18	1.22	8.9	5.8	0.12	1.3	3.27	7.8
1963	342.8	1.99	12.5	16.0	0.07	4.0	1.37	1.41	9.7	5.4	0.11	1.1	3.58	8.1
1964	356.0	2.07	12.8	15.5	0.07	3.7	1.51	1.55	10.2	7.1	0.15	1.4	3.84	8.4
1965	378.6	2.20	13.3	14.3	0.06	3.2	1.56	1.61	10.2	8.2	0.17	1.6	4.04	8.6
1966	426.7	2.47	14.1	15.2	0.06	3.2	2.02	2.09	12.3	8.3	0.17	1.5	4.80	9.6
1967	472.6	2.74	14.7	20.1	0.09	3.9	2.41	2.48	13.8	9.5	0.20	1.7	5.51	10.5
1968	523.7	3.04	15.7	13.7	0.06	2.5	2.61	2.69	14.1	9.1	0.19	1.6	5.97	11.0
1969	563.8	3.27	16.7	19.9	0.08	3.4	3.05	3.14	15.4	10.1	0.21	1.8	6.70	11.9
1970	605.6	3.51	17.2	40.6	0.17	6.7	3.56	3.67	16.9	12.0	0.25	2.0	7.60	12.9
1971	648.9	3.76	18.8	54.0	0.22	8.7	3.95	4.08	18.3	17.3	0.36	3.1	8.42	14.5
1972	630.5	3.66	18.2	56.7	0.23	8.9	4.17	4.28	19.3	19.0	0.40	3.1	8.56	14.5
1973	604.3	3.51	18.0	54.9	0.22	8.7	4.37	4.46	20.1	24.2	0.51	4.1	8.70	14.9
1974	570.2	3.31	17.8	61.9	0.25	10.1	4.75	4.87	22.9	32.1	0.67	5.3	9.10	16.2
1975	531.5	3.08	17.4	59.7	0.24	10.0	4.57	4.67	23.8	43.6	0.92	6.7	8.90	16.3
1976	525.7	3.05	17.7	57.2	0.23	9.7	4.81	4.91	25.2	86.4	1.82	12.6	10.00	18.3
1977	535.0	3.10	17.8	57.4	0.23	9.7	4.94	5.04	25.8	74.8	1.57	10.7	9.94	18.1
1978	523.6	3.04	16.5	25.9	0.10	4.5	5.60	5.71	29.3	79.2	1.66	11.8	10.51	19.1
1979	519.8	3.01	16.7	11.9	0.05	2.1	5.93	6.05	30.1	84.9	1.78	10.9	10.89	18.8
1980	510.4	2.96	16.2	10.5	0.04	1.8	5.85	6.01	30.2	92.9	1.95	11.2	10.96	18.6
1981	529.3	3.07	16.9	12.3	0.05	2.1	6.15	6.31	32.1	138.8	2.91	16.8	12.35	21.1
1982	552.3	3.20	17.5	15.0	0.06	2.7	5.97	6.14	33.6	130.0	2.73	15.5	12.13	21.2

[1] Production from Naval Petroleum Reserve No. 1 (NPR#1) for 1974 and earlier years are for fiscal years (July through June). In 1982, production from NPR#1 accounted for 10.8 percent of total crude oil and lease condensate production on Federally Administered Land.

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

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

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

[5] Based on physical units.

Sources: **Coal:** •1949 through 1980—U.S. Geological Survey—*Coal, Phosphate, Potash, Sodium, and Other Mineral Production, Royalty Income, and Related Statistics,* June 1981. •1981 and 1982—U.S. Minerals Management Service- *Royalties-A Report on Federal and Indian Mineral Revenues* and *Mineral Revenues - The 1982 Report on Receipts from Federal and Indian Leases.* **Other:** •1949-1980—U.S. Geological Survey, *Oil and Gas Production, Royalty Income, and Related Statistics;* June 1981, Department of Energy, Office of Petroleum and Oil Shale Reserves, unpublished data, and U.S. Geological Survey, National Petroleum Reserve in Alaska, unpublished data. •1981 and 1982—U.S. Minerals Management Service, *Royalties-A Report on Federal and Indian Mineral Revenues, Mineral Revenues - The 1982 Report on Receipts from Federal and Indian Leases,* and unpublished data, Department of Energy, Office of Petroleum and Oil Shale Reserves, unpublished data, and U.S. Geological Survey, National Petroleum Reserve in Alaska, unpublished data.

Figure 16. International Primary Energy Production
(Quadrillion Btu)

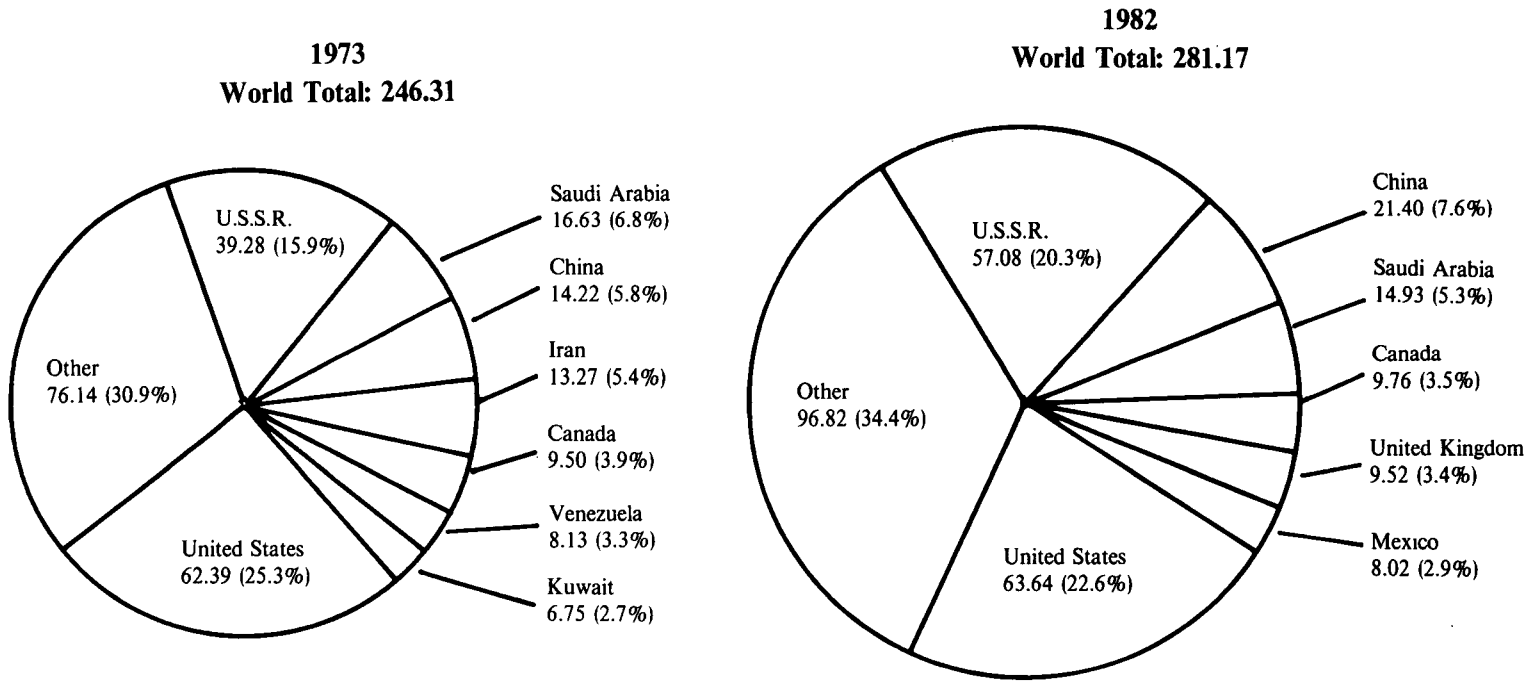


Table 15. International Primary Energy Production,[1] 1973-1982

(Quadrillion Btu)

Area and Country	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982[2]
North, Central, and South America										
Canada	9.50	9.38	8.89	8.73	9.16	9.26	9.95	10.13	9.86	9.76
Mexico	1.87	2.15	2.44	2.76	3.16	3.79	4.55	5.85	6.85	8.02
United States	62.39	61.17	59.99	60.01	60.21	61.16	63.76	64.70	64.31	63.64
Venezuela	8.13	7.29	5.90	5.79	5.70	5.49	5.94	5.66	5.56	5.15
Other	4.72	4.81	4.71	4.99	5.30	5.89	6.42	6.47	6.45	6.54
Total	86.61	84.80	81.93	82.28	83.53	85.59	90.62	92.81	93.03	93.11
Western Europe										
France	1.78	1.82	1.88	1.71	2.00	2.02	2.03	2.26	2.74	2.70
Germany, West	4.92	4.95	4.87	4.96	4.96	4.97	5.26	5.25	5.38	5.45
Netherlands	2.52	2.86	3.16	3.44	2.90	2.49	2.69	3.33	3.09	2.65
Norway	0.83	0.88	1.22	1.50	1.49	2.10	2.71	3.06	3.12	3.17
United Kingdom	4.66	4.47	4.97	5.49	6.69	7.31	8.41	8.56	8.91	9.52
Other	4.87	5.03	5.26	5.19	5.86	5.92	6.30	6.20	6.70	7.08
Total	19.58	20.01	21.36	22.29	23.90	24.81	27.40	28.66	29.94	30.57
Eastern Europe and U.S.S.R.										
Germany, East	2.19	2.19	2.20	2.26	2.30	2.32	2.36	2.44	2.53	2.51
Poland	4.94	5.09	5.37	5.59	5.81	6.02	6.21	6.01	5.10	5.82
Romania	2.14	2.19	2.30	2.39	2.49	2.34	2.48	2.49	2.56	2.46
U.S.S.R.	39.28	41.77	43.62	46.16	48.43	50.68	52.42	54.41	55.35	57.08
Other	2.89	2.93	3.02	3.11	3.20	3.28	3.28	3.31	3.37	3.54
Total	51.44	54.17	56.51	59.51	62.23	64.64	66.75	68.66	68.91	71.41
Middle East										
Iran	13.27	13.68	12.23	13.43	12.88	11.93	7.44	3.87	3.21	5.01
Iraq	4.35	4.25	4.89	5.25	5.08	5.44	7.37	5.36	2.13	2.07
Kuwait	6.75	5.67	4.68	4.85	4.47	4.87	5.68	3.87	2.63	1.96
Saudi Arabia	16.63	18.68	15.68	18.95	20.57	18.48	21.25	22.30	22.10	14.93
United Arab Emirates	3.27	3.56	3.56	4.20	4.45	4.09	4.11	3.89	3.45	2.99
Other	2.34	2.49	2.54	2.52	2.39	2.40	2.57	2.43	2.40	2.19
Total	46.61	48.33	43.58	49.20	49.84	47.21	48.42	41.72	35.92	29.15
Africa										
Algeria	2.47	2.35	2.34	2.63	2.68	3.22	3.15	2.91	2.61	2.31
Libya	4.72	3.32	3.27	4.26	4.53	4.36	4.59	3.98	2.57	2.62
Nigeria	4.45	4.89	3.88	4.51	4.50	4.06	4.95	4.43	3.15	2.86
South Africa, Republic of	1.48	1.57	1.65	1.84	2.03	2.15	2.53	2.86	3.22	3.46
Other	1.69	1.80	2.05	2.16	2.64	2.66	2.85	3.36	3.33	3.56
Total	14.81	13.93	13.19	15.40	16.38	16.45	18.07	17.54	14.88	14.81
Far East and Oceania										
Australia	3.25	3.44	3.64	3.99	4.08	4.20	4.68	4.64	5.19	5.17
China	14.22	15.39	16.30	17.16	18.03	20.16	20.68	20.43	20.21	21.40
India	2.22	2.36	2.68	2.84	2.90	3.09	3.15	3.15	3.79	4.03
Indonesia	2.90	2.99	2.90	3.38	3.85	3.72	3.84	4.12	4.24	3.57
Japan	1.53	1.70	1.82	1.87	1.66	1.91	2.06	2.33	2.30	2.52
Other	3.13	3.30	3.56	3.91	4.07	4.22	4.71	5.07	5.03	5.44
Total	27.25	29.18	30.90	33.15	34.59	37.30	39.12	39.74	40.76	42.13
World Total	246.31	250.41	247.47	261.83	270.47	276.00	290.38	289.14	283.44	281.17

[1] See Explanatory Note 3.
[2] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Note: Primary energy includes crude oil, lease condensate, natural gas plant liquids, dry natural gas, coal, net hydroelectric power, and net nuclear power.
Source: Energy Information Administration, *1982 International Energy Annual.*

Figure 17. Fossil Fuel Prices

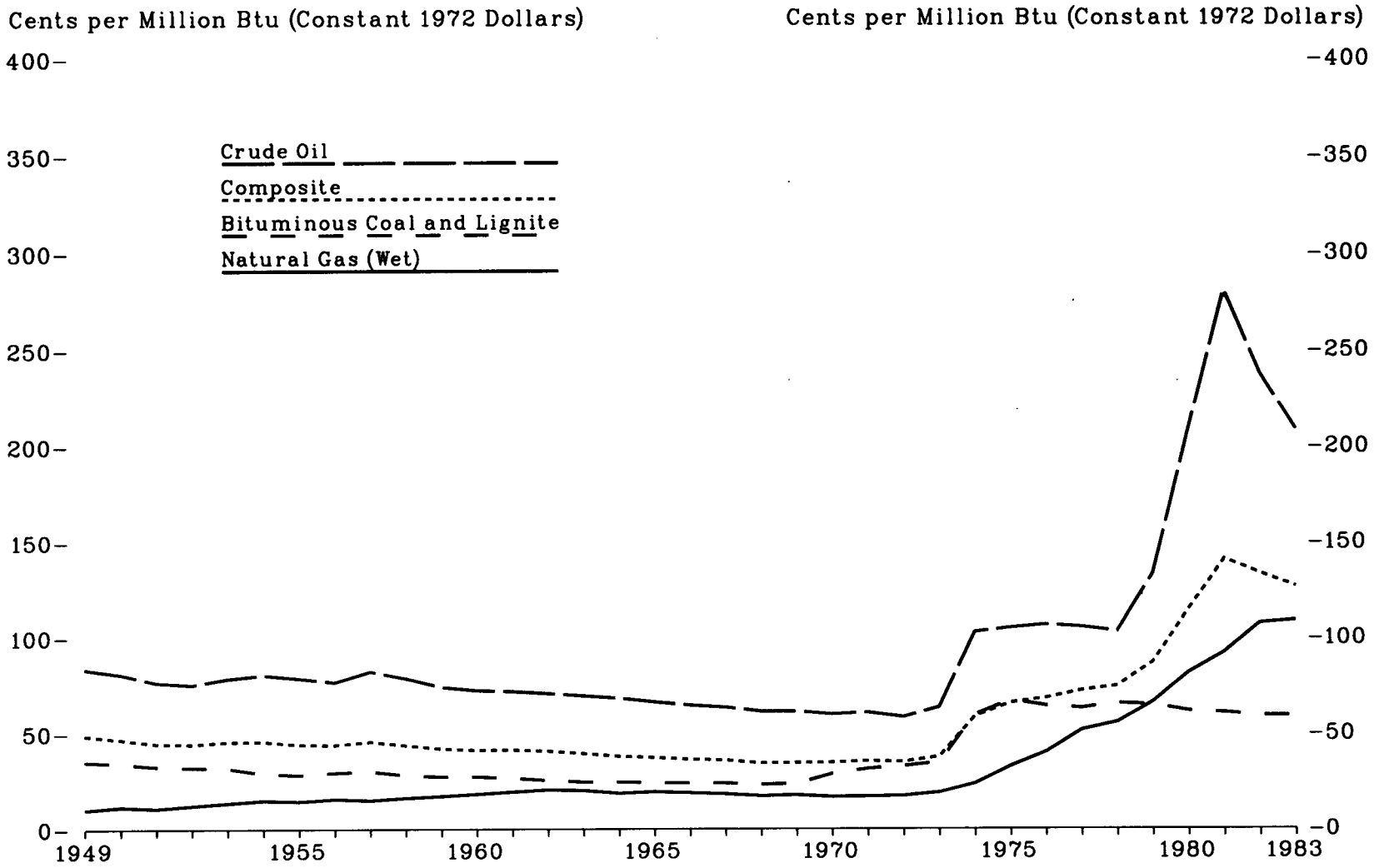


Table 16. Fossil Fuel Prices, 1949-1983

(Cents per Million Btu)

Year	Crude Oil [1]		Natural Gas [2]		Bituminous Coal and Lignite		Anthracite		Composite [3]	
	Current	Constant [4]	Current	Constant [4]	Current	Constant [4]	Current	Constant [4]	Current	Constant [4]
1949	43.8	83.4	5.4	10.3	18.6	35.4	36.0	68.6	25.7	49.0
1950	43.3	80.8	6.3	11.8	18.5	34.5	37.5	70.0	25.1	46.9
1951	43.6	76.4	6.3	11.0	18.8	32.9	40.2	70.4	25.5	44.7
1952	43.6	75.3	7.2	12.4	18.7	32.3	38.9	67.2	25.7	44.4
1953	46.2	78.5	8.1	13.8	18.8	32.0	40.2	68.3	26.9	45.7
1954	47.9	80.4	9.0	15.1	17.3	29.1	35.6	59.8	27.3	45.8
1955	47.8	78.6	8.9	14.6	17.3	28.4	32.6	53.6	26.9	44.2
1956	48.1	76.6	9.9	15.8	18.6	29.6	34.2	54.5	27.6	44.0
1957	53.3	82.1	9.9	15.2	19.6	30.2	37.6	57.9	29.7	45.7
1958	51.9	78.6	10.8	16.4	18.7	28.3	37.3	56.5	28.9	43.8
1959	50.0	74.0	11.7	17.3	18.6	27.5	35.1	51.9	28.4	42.0
1960	49.7	72.3	12.6	18.3	18.9	27.5	33.0	48.0	28.4	41.3
1961	49.8	71.8	13.5	19.5	18.5	26.7	33.8	48.8	28.7	41.4
1962	50.0	70.8	14.5	20.5	18.1	25.6	32.8	46.5	28.8	40.8
1963	49.8	69.5	14.5	20.2	17.7	24.7	35.7	49.8	28.3	39.5
1964	49.7	68.3	13.6	18.7	18.0	24.7	37.0	50.8	27.7	38.1
1965	49.3	66.3	14.5	19.5	18.0	24.2	35.3	47.5	27.8	37.4
1966	49.7	64.7	14.5	18.9	18.5	24.1	33.7	43.9	28.0	36.5
1967	50.3	63.6	14.5	18.3	19.0	24.0	34.7	43.9	28.5	36.0
1968	50.7	61.4	14.3	17.3	19.2	23.3	37.6	45.6	28.5	34.5
1969	53.3	61.4	15.4	17.7	20.6	23.7	42.3	48.7	30.0	34.6
1970	54.8	59.9	15.4	16.8	26.4	28.9	47.1	51.5	31.8	34.8
1971	58.4	60.8	16.3	17.0	30.2	31.5	51.4	53.5	34.1	35.5
1972	58.4	58.4	17.3	17.3	32.9	32.9	52.9	52.9	35.1	35.1
1973	67.1	63.5	20.1	19.0	36.7	34.7	58.9	55.7	39.9	37.7
1974	118.4	102.9	27.3	23.7	68.6	59.6	98.4	85.5	67.7	58.8
1975	132.2	105.1	41.1	32.7	84.3	67.0	137.9	109.6	82.6	65.7
1976	141.2	106.7	53.1	40.1	85.0	64.2	149.0	112.6	90.2	68.2
1977	147.8	105.5	72.3	51.6	88.2	63.0	150.4	107.4	100.9	72.0
1978	155.2	103.2	83.6	55.6	98.3	65.4	149.9	99.7	111.7	74.3
1979	217.9	133.3	108.1	66.1	105.7	64.7	174.1	106.5	141.8	86.8
1980	372.2	208.6	144.8	81.2	109.7	61.5	182.1	102.1	204.3	114.5
1981	547.8	280.7	179.5	92.0	118.2	60.6	186.9	95.8	274.7	140.8
1982	491.7	237.7	222.2	107.4	122.3	59.1	210.4	101.7	275.9	133.4
1983[5]	449.5	208.4	234.9	108.9	127.2	59.0	223.2	103.5	273.4	126.8

[1] Includes lease condensate.

[2] Wet natural gas, prior to extraction of natural gas plant liquids.

[3] Derived by multiplying the price per Btu of each fossil fuel by the total Btu content of the production of each fossil fuel and dividing the accumulated price of total fossil fuel production by the accumulated Btu content of total fossil fuel production.

[4] Constant 1972 prices calculated using GNP implicit price deflators, 1972 = 100. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

[5] Preliminary.

Note: All fuel prices taken as close as possible to the point of production.

Sources: See sources for Tables 58, 71, and 83 and the GNP implicit price deflators in the Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

Figure 18. Value of Fossil Fuel Production

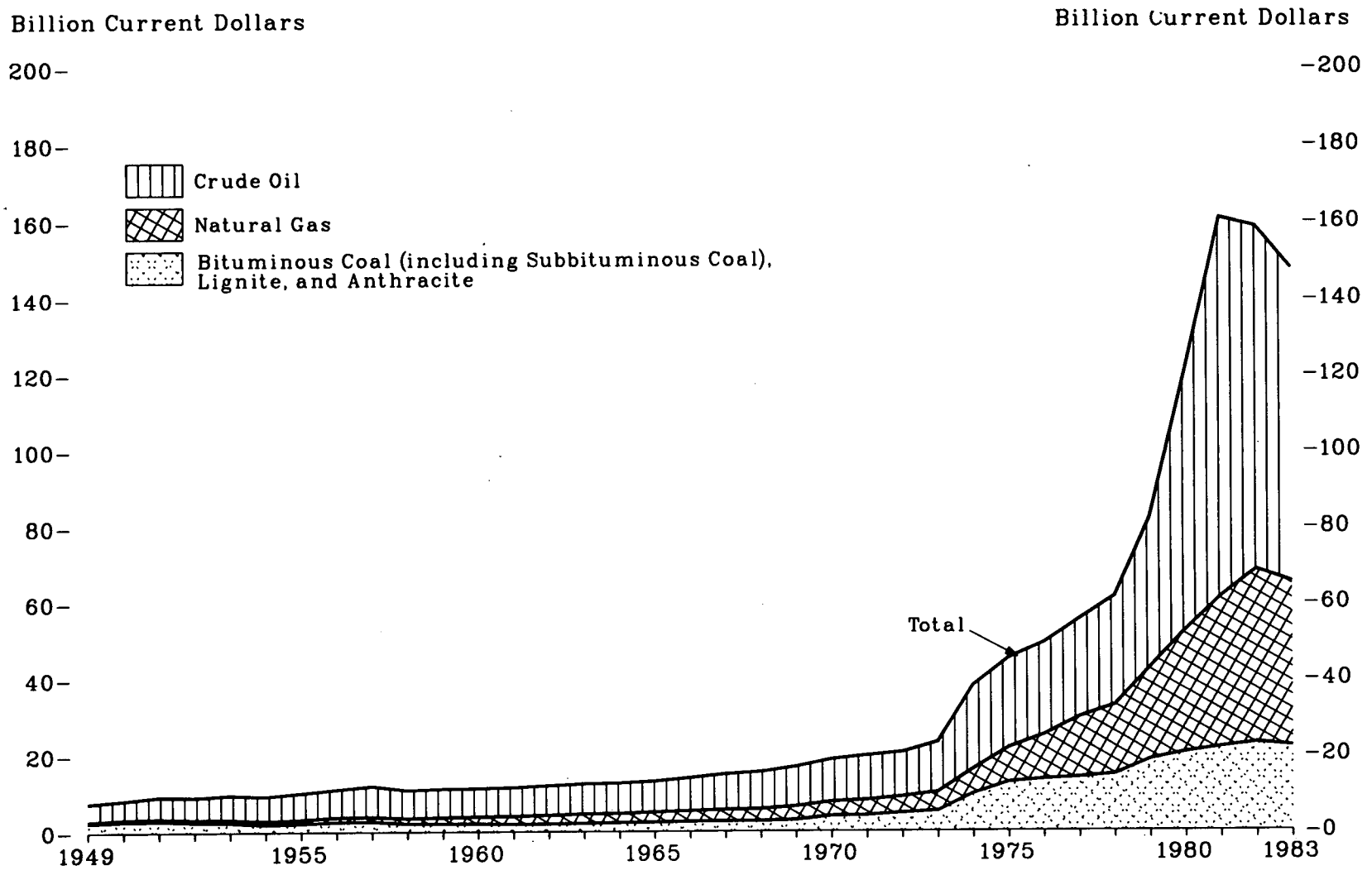


Table 17. Value of Fossil Fuel Production, 1949-1983

(Billion Dollars)

Year	Crude Oil [1]		Natural Gas (Marketed Production)		Bituminous Coal and Lignite		Anthracite		Total	
	Current	Constant [2]	Current	Constant [2]	Current	Constant [2]	Current	Constant [2]	Current	Constant [2]
1949	4.68	8.92	0.33	0.63	2.14	4.08	0.38	0.72	7.53	14.35
1950	4.95	9.24	0.44	0.82	2.50	4.67	0.41	0.77	8.30	15.50
1951	5.69	9.97	0.52	0.91	2.63	4.61	0.42	0.74	9.26	16.23
1952	5.79	10.00	0.64	1.10	2.29	3.95	0.39	0.67	9.11	15.72
1953	6.32	10.74	0.76	1.29	2.25	3.83	0.31	0.53	9.64	16.39
1954	6.44	10.81	0.87	1.46	1.77	2.97	0.25	0.42	9.33	15.66
1955	6.88	11.31	0.94	1.55	2.09	3.44	0.21	0.35	10.12	16.65
1956	7.30	11.63	1.11	1.77	2.41	3.84	0.24	0.38	11.06	17.62
1957	8.09	12.46	1.17	1.80	2.50	3.85	0.23	0.35	11.99	18.46
1958	7.37	11.16	1.32	2.00	1.99	3.01	0.19	0.29	10.87	16.46
1959	7.47	11.05	1.57	2.32	1.97	2.91	0.18	0.27	11.19	16.55
1960	7.42	10.80	1.79	2.61	1.95	2.84	0.15	0.22	11.31	16.47
1961	7.58	10.93	1.99	2.87	1.85	2.67	0.14	0.20	11.56	16.67
1962	7.76	10.99	2.22	3.14	1.89	2.68	0.13	0.18	12.00	16.99
1963	7.96	11.11	2.36	3.29	2.01	2.80	0.16	0.22	12.49	17.42
1964	8.03	11.03	2.33	3.20	2.17	2.98	0.15	0.21	12.68	17.42
1965	8.15	10.96	2.57	3.46	2.27	3.05	0.13	0.17	13.12	17.64
1966	8.72	11.36	2.75	3.58	2.42	3.15	0.10	0.13	13.99	18.22
1967	9.39	11.88	2.91	3.68	2.55	3.23	0.10	0.13	14.95	18.92
1968	9.79	11.86	3.09	3.74	2.55	3.09	0.10	0.12	15.53	18.81
1969	10.42	12.01	3.52	4.06	2.80	3.23	0.10	0.12	16.84	19.42
1970	11.19	12.24	3.73	4.08	3.77	4.12	0.11	0.12	18.80	20.56
1971	11.71	12.20	4.05	4.22	3.90	4.06	0.11	0.11	19.77	20.59
1972	11.71	11.71	4.28	4.28	4.56	4.56	0.09	0.09	20.64	20.64
1973	13.07	12.36	4.98	4.71	5.05	4.78	0.09	0.09	23.19	21.94
1974	22.00	19.12	6.48	5.63	9.50	8.26	0.15	0.13	38.13	33.14
1975	23.45	18.64	9.05	7.19	12.47	9.91	0.20	0.16	45.17	35.90
1976	24.37	18.41	11.57	8.74	13.19	9.97	0.21	0.16	49.34	37.28
1977	25.79	18.41	15.82	11.30	13.70	9.78	0.20	0.14	55.51	39.63
1978	28.60	19.01	18.18	12.09	14.49	9.63	0.18	0.12	61.45	40.85
1979	39.45	24.14	24.16	14.78	18.36	11.23	0.20	0.12	82.17	50.27
1980	67.93	38.07	32.09	17.99	20.20	11.32	0.26	0.15	120.48	67.53
1981	99.40	50.94	39.51	20.25	21.51	11.02	0.24	0.12	160.66	82.33
1982	90.03	43.52	45.56	22.02	22.62	10.93	0.23	0.11	158.44	76.58
1983 [3]	82.36	38.19	43.11	19.99	21.86	10.14	0.21	0.10	147.54	68.42

[1] Includes lease condensate.
[2] Constant 1972 dollars calculated using GNP implicit price deflators, 1972 = 100. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.
[3] Preliminary.
Sources: See Tables 36, 58, 66, 71, 74, and 83.

Figure 19. Purchased Fuel Expenditures and Electricity Sales

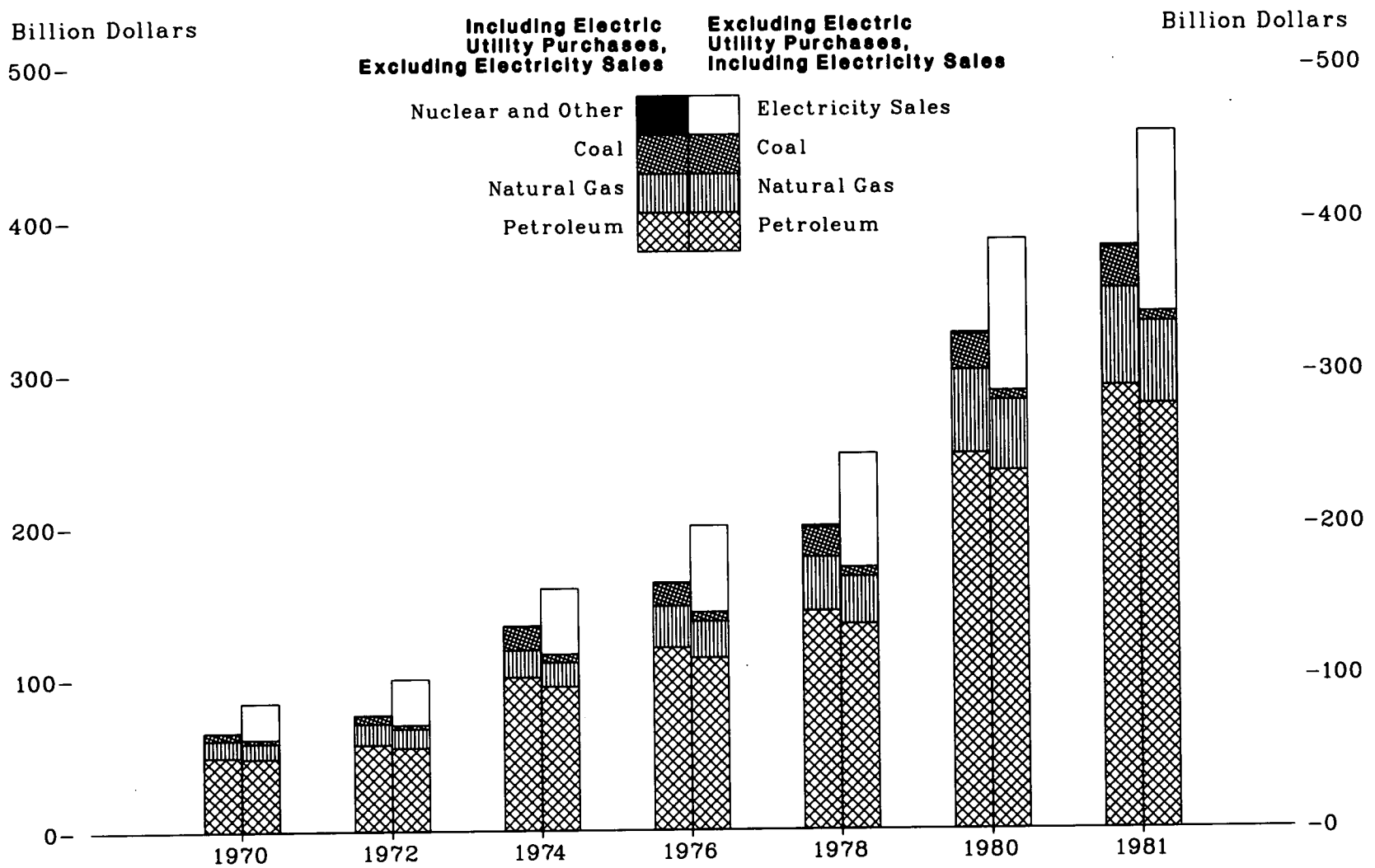


Table 18. Purchased Fuel Expenditures and Electricity Sales, 1970-1981

(Billion Dollars)

Energy Source	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Coal												
Metallurgical Coal	1.2	1.2	1.5	1.8	3.3	4.0	3.9	3.5	3.6	3.8	3.6	3.7
Other Coal	3.4	3.7	4.1	5.1	12.0	11.3	10.9	13.3	15.8	16.7	19.2	22.3
(Excluding Electric Utility Purchases)	(1.2)	(1.1)	(1.1)	(1.0)	(1.9)	(2.1)	(2.0)	(2.2)	(2.6)	(2.5)	(2.4)	(3.0)
Total Coal	4.7	5.0	5.5	6.8	15.3	15.2	14.8	16.8	19.4	20.6	22.8	26.0
(Excluding Electric Utility Purchases)	(2.4)	(2.3)	(2.5)	(2.8)	(5.2)	(6.0)	(5.9)	(5.7)	(6.2)	(6.3)	(5.9)	(6.7)
Natural Gas	11.4	12.7	13.8	14.7	17.7	21.6	27.2	32.0	35.8	47.5	54.5	64.1
(Excluding Electric Utility Purchases)	(10.3)	(11.4)	(12.5)	(13.4)	(16.0)	(19.2)	(23.9)	(27.8)	(31.1)	(41.2)	(46.1)	(53.6)
Petroleum												
Asphalt and Road Oil	0.7	0.9	0.9	1.1	1.9	1.9	1.9	2.1	2.5	3.0	3.5	4.2
Aviation Gasoline	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.7	0.9	0.9
Distillate Fuel Oil	6.1	6.8	7.4	9.2	15.1	15.6	18.4	21.7	23.3	32.0	40.6	48.7
(Excluding Electric Utility Purchases)	(6.0)	(6.6)	(7.2)	(9.0)	(14.5)	(15.2)	(17.9)	(21.1)	(22.7)	(31.3)	(39.7)	(47.9)
Jet Fuel	1.5	1.7	1.8	2.1	3.4	4.5	4.9	5.9	6.6	9.1	14.8	15.6
(Excluding Electric Utility Purchases)	(1.5)	(1.7)	(1.7)	(2.1)	(3.3)	(4.4)	(4.8)	(5.8)	(6.5)	(9.1)	(14.7)	(15.6)
Kerosene	0.7	0.6	0.6	0.6	0.9	0.9	1.1	1.2	1.3	2.0	2.3	2.3
Liquefied Gases and Ethane	2.4	2.5	2.9	4.0	5.4	5.4	6.1	7.0	6.7	9.6	11.2	12.5
Lubricants	1.6	1.7	1.9	2.1	2.9	2.8	3.1	3.5	3.8	5.0	5.9	6.6
Motor Gasoline	31.6	33.5	35.3	39.7	54.1	59.4	64.5	70.0	74.4	95.2	123.3	137.1
Residual Fuel Oil	2.2	3.1	3.7	5.0	11.0	10.8	12.1	14.9	14.1	18.3	22.5	23.6
(Excluding Electric Utility Purchases)	(1.4)	(1.8)	(2.0)	(2.5)	(5.3)	(4.9)	(5.8)	(7.0)	(6.3)	(9.1)	(12.0)	(12.5)
Other Petroleum Products [1]	1.6	1.7	1.9	2.5	5.4	5.9	7.0	8.9	9.8	14.7	21.4	38.6
(Excluding Electric Utility Purchases)	(1.6)	(1.7)	(1.9)	(2.5)	(5.3)	(5.9)	(7.0)	(8.9)	(9.8)	(14.7)	(21.4)	(38.6)
Total Petroleum	48.8	52.8	56.8	66.7	100.5	107.6	119.3	135.6	143.0	189.5	246.4	290.1
(Excluding Electric Utility Purchases)	(48.0)	(51.3)	(54.7)	(63.8)	(94.1)	(101.2)	(112.5)	(126.9)	(134.3)	(179.5)	(234.9)	(278.1)
Nuclear Power, Wood, and Waste Electricity Generation	[3]	0.1	0.1	0.2	0.3	0.5	0.5	0.7	1.0	0.9	1.2	1.4
Net Imports of Coal Coke [2]	-0.1	[3]	[3]	[3]	0.1	0.1	0	[3]	0.4	0.2	-0.1	-0.1
Electricity Sales	23.6	26.4	30.0	34.0	42.9	51.1	57.5	66.9	75.0	82.9	99.3	117.9
Total (Including Electric Utility Purchases, Excluding Electricity Purchases)	64.9	70.5	76.2	88.4	134.0	144.9	161.9	185.1	199.5	258.7	324.7	381.6
Total (Excluding Electric Utility Purchases, Including Electricity Purchases)	84.1	91.4	99.7	114.1	158.4	177.5	199.8	227.3	247.0	310.2	386.1	456.3

[1] Includes isopentane, natural gasoline, unfractionated steam (including plant condensate), petrochemical feedstocks, special naphthas, petroleum coke, still gas, wax, and miscellaneous products.

[2] Negative entries indicate that export values exceeded import values.

[3] Less than 0.5 million dollars.

Note: There are no associated fuel expenditures for hydropower and geothermal power.

Source: Energy Information Administration, *State Energy Price and Expenditure System, 1970-1981.*

Figure 20. Average Energy Prices by End-Use Sector and Energy Source

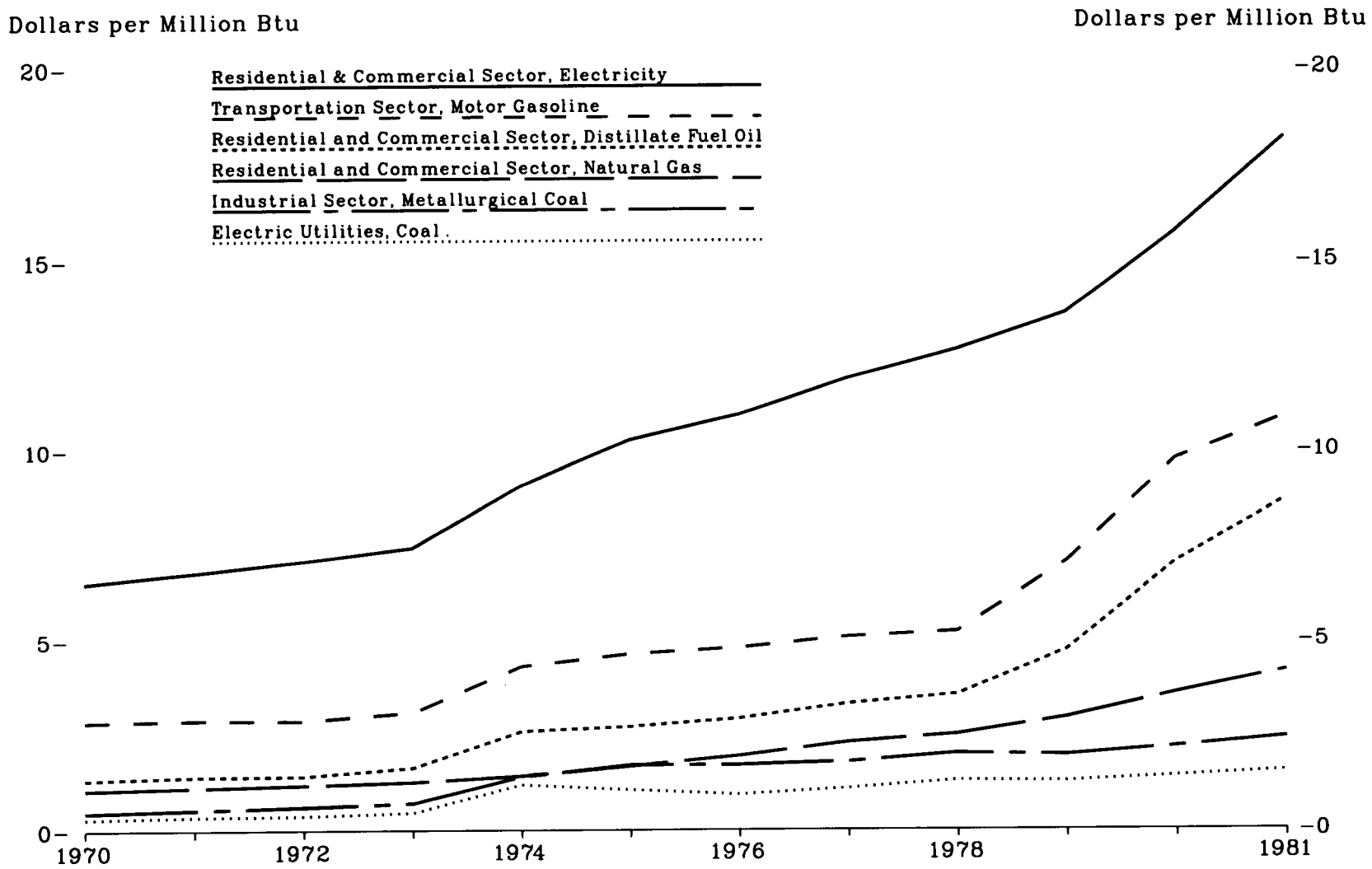


Table 19. Average Energy Prices by End-Use Sector and Energy Source, 1970-1981

(Dollars per Million Btu)

End-Use Sector (Including Electric Utilities)	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Residential and Commercial Sector [1]												
Coal	0.35	0.92	0.99	1.17	2.16	2.38	2.32	2.48	2.55	2.32	2.75	3.34
Natural Gas	1.06	1.12	1.18	1.26	1.42	1.67	1.94	2.30	2.51	2.94	3.59	4.18
Petroleum [2]	1.52	1.57	1.60	2.08	2.86	3.02	3.25	3.66	3.83	5.08	7.27	8.72
Distillate Fuel Oil	1.33	1.41	1.42	1.64	2.60	2.72	2.93	3.32	3.56	4.73	7.05	8.69
L.P.G. [3]	2.09	2.05	2.15	3.62	3.73	4.01	4.38	4.91	4.76	6.52	7.79	8.32
Motor Gasoline	2.85	2.90	2.88	3.10	4.32	4.64	4.80	5.09	5.23	7.06	9.75	10.86
Residual Fuel Oil	0.50	0.66	0.71	0.87	1.93	2.03	1.98	2.27	2.22	3.10	4.44	5.48
Electricity Sales	6.51	6.79	7.10	7.45	9.08	10.28	10.93	11.88	12.64	13.59	15.71	18.17
Average	2.09	2.23	2.37	2.73	3.40	3.83	4.15	4.80	5.19	6.00	7.54	8.91
Industrial Sector												
Coal	0.42	0.41	0.46	0.46	0.87	1.14	1.08	1.17	1.37	1.29	1.34	1.52
Metallurgical Coal	0.47	0.54	0.61	0.70	1.40	1.70	1.70	1.78	2.00	1.95	2.17	2.42
Natural Gas	0.33	0.37	0.40	0.45	0.63	0.86	1.09	1.32	1.50	2.18	2.36	2.92
Petroleum [4]	0.88	0.95	0.96	1.11	2.18	2.36	2.46	2.74	2.83	3.84	5.39	7.00
Asphalt	0.67	0.79	0.81	0.83	1.59	1.88	1.86	1.95	2.13	2.58	3.67	5.05
Distillate Fuel Oil	0.72	0.75	0.75	0.92	1.99	2.21	2.38	2.68	2.81	3.91	5.63	7.39
L.P.G. [3]	1.11	1.17	1.19	1.32	2.45	2.54	2.74	3.18	3.09	4.08	5.25	6.06
Lubricants	5.36	5.56	5.89	5.91	8.46	9.29	9.30	9.81	10.02	12.59	16.55	19.37
Residual Fuel Oil	0.46	0.61	0.66	0.80	1.82	1.90	1.88	2.13	2.09	2.77	3.72	4.84
Electricity Sales	2.98	3.21	3.41	3.65	4.95	6.07	6.47	7.32	8.19	8.94	10.81	12.57
Average	0.74	0.81	0.88	0.99	1.66	2.04	2.23	2.57	2.81	3.55	4.48	5.62
Transportation Sector												
Coal	0.42	0.41	0.46	0.46	0.87	1.14	1.08	1.17	[5]	[5]	[5]	[5]
Petroleum [6]	2.32	2.39	2.39	2.58	3.72	4.05	4.21	4.48	4.61	6.19	8.60	9.75
Distillate Fuel Oil	1.29	1.36	1.35	1.58	2.61	2.79	2.95	3.21	3.31	4.90	7.06	8.29
Jet Fuel	0.78	0.82	0.82	0.97	1.67	2.18	2.39	2.75	3.04	4.15	6.76	7.58
Motor Gasoline	2.85	2.90	2.88	3.10	4.32	4.64	4.80	5.09	5.23	7.06	9.75	10.86
Residual Fuel Oil	0.36	0.49	0.53	0.64	1.41	1.45	1.52	1.68	1.51	2.37	3.18	4.11
Electricity Sales	4.38	5.03	5.63	6.43	10.06	10.92	11.07	10.14	11.50	12.70	14.16	15.24
Average	2.32	2.39	2.39	2.58	3.72	4.06	4.22	4.48	4.61	6.19	8.60	9.76
Electric Utilities												
Coal	0.31	0.36	0.38	0.46	1.19	1.05	0.92	1.08	1.29	1.26	1.39	1.53
Natural Gas	0.28	0.31	0.33	0.34	0.48	0.75	1.03	1.29	1.42	1.74	2.19	2.80
Petroleum [7]	0.42	0.58	0.66	0.81	1.90	2.01	1.97	2.23	2.16	3.05	4.35	5.43
Residual Fuel Oil	0.40	0.56	0.63	0.78	1.88	2.00	1.95	2.19	2.12	2.98	4.26	5.33
Nuclear Power	0.18	0.18	0.18	0.21	0.21	0.25	0.26	0.27	0.32	0.34	0.45	0.47
Wood and Waste	0.68	0.72	0.75	0.79	0.86	0.94	0.99	1.04	1.12	1.56	1.80	1.24
Average	0.32	0.38	0.42	0.49	1.11	1.08	1.06	1.23	1.34	1.51	1.78	2.00

[1] All entries in this sector, including average, are for the residential sector, except motor gasoline and residual fuel oil, which are for the commercial sector.
[2] In addition to listed products, includes kerosene.
[3] L.P.G. = Liquefied Petroleum Gases.
[4] In addition to listed products, includes jet fuel, kerosene, motor gasoline, road oil, still gas, special naphthas, petrochemical feedstocks, petroleum coke, miscellaneous products, waxes, natural gasoline, and plant condensate.
[5] Not applicable.
[6] In addition to listed products, includes aviation gasoline, liquefied petroleum gases, and lubricants.
[7] In addition to listed products, includes distillate fuel oil, jet fuel, and petroleum coke.
Source: Energy Information Administration, *State Energy Price and Expenditure System, 1970-1981.*

Figure 21. Value of Fossil Fuel Imports

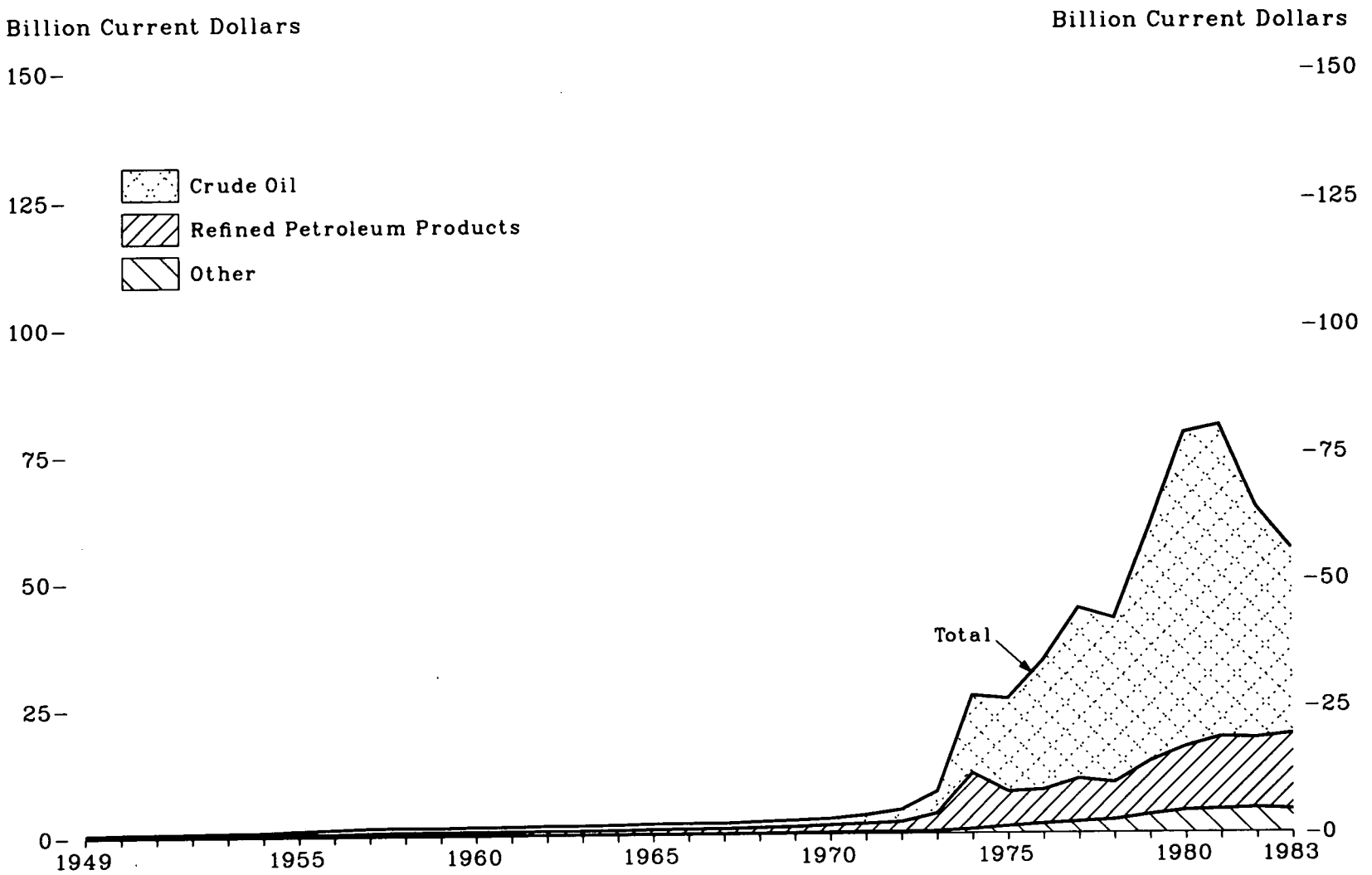


Table 20. Value of Fossil Fuel Imports, 1949-1983

(Billion Current Dollars)

Year	Coal	Coal Coke	Natural Gas	Crude Oil [1]	Refined Petroleum Products	Total
1949	[2]	[2]	[2]	0.30	0.14	0.45
1950	[2]	0.01	[2]	0.37	0.21	0.59
1951	[2]	[2]	[2]	0.37	0.23	0.61
1952	[2]	[2]	[2]	0.42	0.25	0.68
1953	[2]	[2]	[2]	0.51	0.25	0.77
1954	[2]	[2]	[2]	0.54	0.28	0.83
1955	[2]	[2]	[2]	0.65	0.44	1.10
1956	[2]	[2]	[2]	0.84	0.45	1.29
1957	[2]	[2]	[2]	0.98	0.57	1.56
1958	[2]	[2]	0.02	0.94	0.68	1.65
1959	[2]	[2]	0.03	0.87	0.66	1.57
1960	[2]	[2]	0.03	0.90	0.73	1.66
1961	[2]	[2]	0.04	0.93	0.71	1.69
1962	[2]	[2]	0.09	1.01	0.75	1.86
1963	[2]	[2]	0.10	1.03	0.74	1.87
1964	[2]	[2]	0.10	1.08	0.78	1.97
1965	[2]	[2]	0.11	1.12	0.92	2.15
1966	[2]	[2]	0.11	1.12	0.99	2.21
1967	[2]	[2]	0.13	1.06	1.02	2.21
1968	[2]	[2]	0.15	1.18	1.16	2.50
1969	[2]	[2]	0.20	1.30	1.24	2.74
1970	[2]	[2]	0.26	1.26	1.48	3.00
1971	[2]	0.01	0.31	1.69	1.66	3.66
1972	[2]	[2]	0.31	2.37	1.99	4.68
1973	[2]	0.04	0.36	4.24	3.50	8.14
1974	0.06	0.19	0.53	15.25	11.01	27.05
1975	0.02	0.16	1.15	18.29	6.77	26.39
1976	0.02	0.11	1.66	25.46	6.65	33.90
1977	0.04	0.13	2.00	33.59	8.42	44.18
1978	0.07	0.41	2.06	32.30	7.30	42.15
1979	0.05	0.34	3.13	46.06	10.45	60.03
1980	0.03	0.06	4.21	61.90	12.54	78.75
1981	0.03	0.04	4.41	61.46	14.30	80.24
1982	0.03	0.01	4.69	45.72	13.86	64.32
1983[3]	0.05	[2]	4.40	36.49	14.94	55.89

[1] Includes imports into the Strategic Petroleum Reserve.
[2] Less than $5 million.
[3] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Note: Includes value of imports into Puerto Rico from foreign countries; excludes receipts into the 50 States and the District of Columbia from the Virgin Islands and Puerto Rico.
Sources: **Natural Gas:** • 1949 through 1962—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT110. •1963—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT125. •1964 through 1971—Bureau of the Census, *U.S. Imports for Consumption and General Imports*, FT246. • 1972 and 1973—Federal Power Commission, *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG*. • 1974 through 1977—Federal Power Commission, *United States Imports and Exports of Natural Gas*, annual. • 1978 through 1981—Energy Information Administration, *U.S. Imports and Exports of Natural Gas*, annual. • 1982—Energy Information Administration, *Natural Gas Monthly*, July 1983 issue. • 1983—EIA estimate. **Others:** • 1949 through 1962—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT110. •1963—Bureau of the Census *U.S. Imports of Merchandise for Consumption*, FT125. • 1964 through 1982—Bureau of the Census, *U.S. Imports for Consumption and General Imports*, FT246. • 1983—Bureau of the Census, *U.S. Imports for Consumption and General Imports*, IM146.

Figure 22. Value of Fossil Fuel Exports

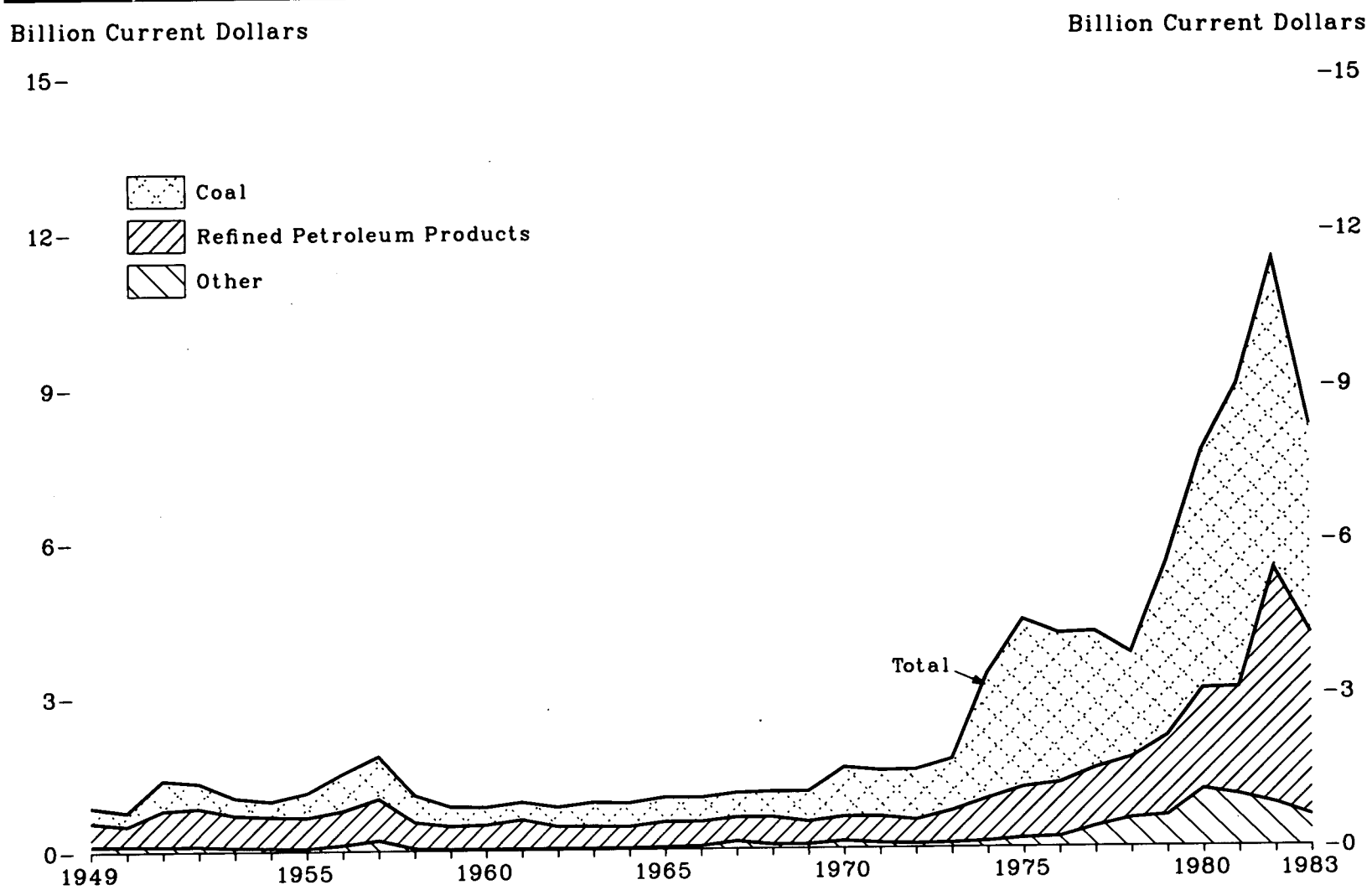


Table 21. Value of Fossil Fuel Exports, 1949-1983

(Billion Current Dollars)

Year	Coal	Coal Coke	Natural Gas	Crude Oil	Refined Petroleum Products	Total
1949	0.30	0.01	(1)	0.10	0.46	0.87
1950	0.27	0.01	(1)	0.10	0.39	0.78
1951	0.59	0.02	(1)	0.08	0.70	1.39
1952	0.49	0.01	(1)	0.08	0.74	1.33
1953	0.34	0.01	(1)	0.06	0.63	1.04
1954	0.30	0.01	(1)	0.05	0.61	0.97
1955	0.48	0.01	0.01	0.04	0.60	1.14
1956	0.73	0.01	0.01	0.09	0.67	1.51
1957	0.83	0.01	0.01	0.17	0.81	1.84
1958	0.53	0.01	0.01	0.01	0.51	1.07
1959	0.38	0.01	0.01	0.01	0.45	0.85
1960	0.35	0.01	(1)	0.01	0.47	0.84
1961	0.34	0.01	(1)	0.01	0.57	0.93
1962	0.38	0.01	(1)	0.01	0.43	0.83
1963	0.47	0.01	(1)	(1)	0.43	0.92
1964	0.46	0.01	(1)	(1)	0.42	0.90
1965	0.48	0.02	0.01	(1)	0.50	1.00
1966	0.47	0.02	0.02	0.01	0.48	1.00
1967	0.48	0.02	0.03	0.09	0.47	1.09
1968	0.50	0.02	0.04	0.01	0.54	1.11
1969	0.59	0.04	0.03	0.01	0.45	1.12
1970	0.96	0.08	0.03	0.02	0.48	1.57
1971	0.90	0.04	0.04	0.01	0.52	1.51
1972	0.98	0.03	0.04	(1)	0.47	1.53
1973	1.01	0.03	0.04	(1)	0.63	1.72
1974	2.44	0.04	0.05	0.01	0.84	3.39
1975	3.26	0.07	0.09	(1)	1.00	4.43
1976	2.91	0.07	0.10	0.03	1.06	4.16
1977	2.66	0.07	0.11	0.21	1.14	4.18
1978	2.05	0.05	0.11	0.39	1.18	3.77
1979	3.39	0.08	0.13	0.39	1.55	5.55
1980	4.63	0.13	0.23	0.75	1.96	7.70
1981	5.92	0.07	0.35	0.58	2.09	9.01
1982	6.00	0.06	0.30	0.47	4.59	11.42
1983[2]	4.06	0.05	0.32	0.22	3.55	8.21

[1] Less than $5 million.

[2] Preliminary.

Note: Includes value of exports from Puerto Rico to foreign countries; excludes shipments from the 50 States and the District of Columbia to the Virgin Islands and Puerto Rico.

Note: Sum of components may not equal total due to independent rounding.

Sources: **Natural Gas:** •1949 through 1971—Bureau of the Census, *U.S. Exports*, FT410. •1972 and 1973—Federal Power Commission, *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG*. • 1974 through 1977—Federal Power Commission, *United States Imports and Exports of Natural Gas*, annual. • 1978 through 1981—Energy Information Administration, *U.S. Imports and Exports of Natural Gas*, annual. • 1982—Energy Information Administration, *Natural Gas Monthly*, July 1983 issue. • 1983—EIA estimate. **Others:** • 1949 through 1982—Bureau of the Census, *U.S. Exports*, FT410. •1983—Bureau of the Census, *U.S. Exports by Schedule B Commodities*, EM522.

Figure 23. Value of Net Trade in Fossil Fuels

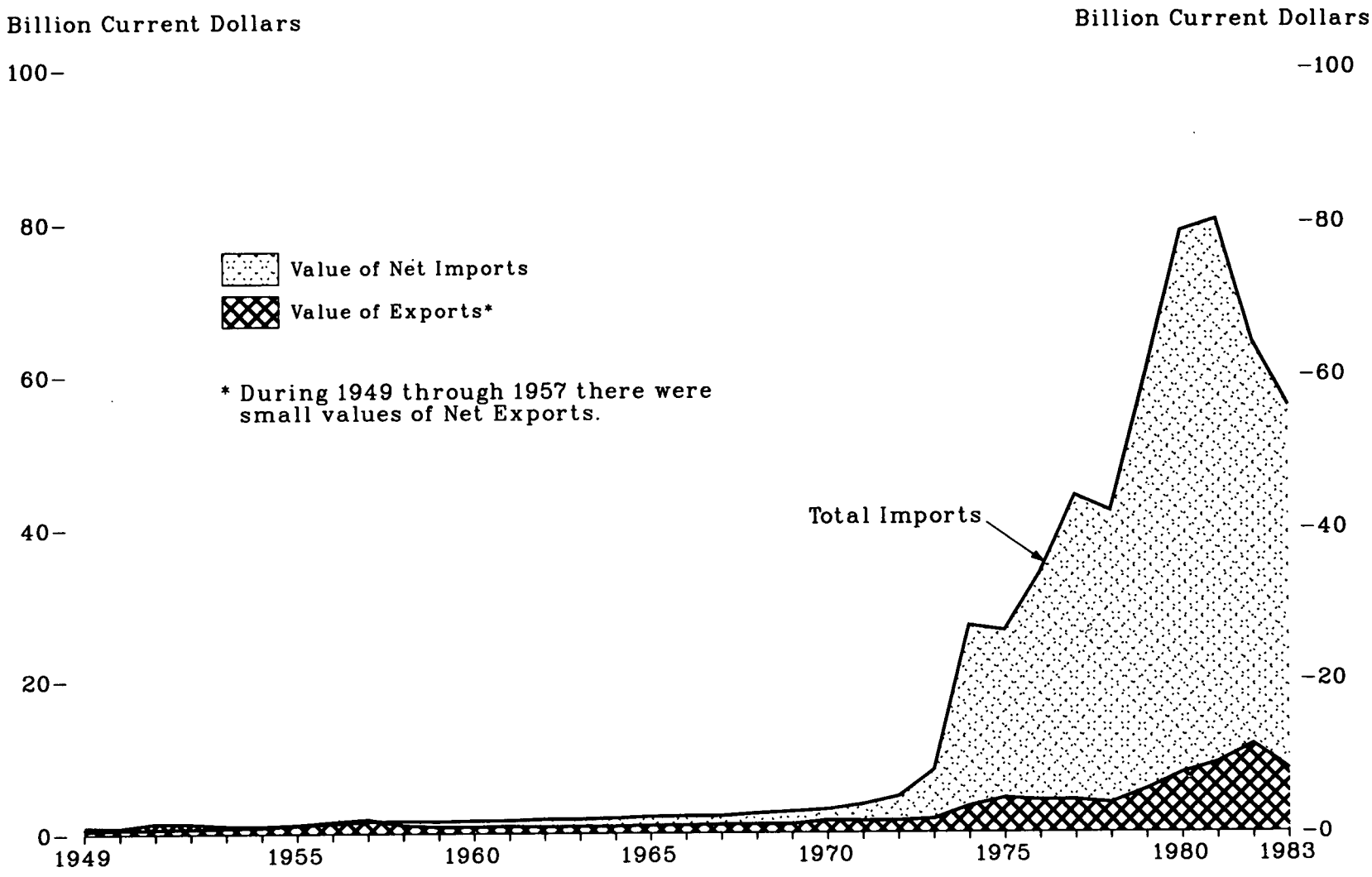


Table 22. Value of Net Trade[1] in Fossil Fuels, 1949-1983

(Billion Current Dollars)

Year	Coal	Coal Coke	Natural Gas	Crude Oil	Refined Petroleum Products	Total
1949	0.29	[2]	[2]	-0.21	0.32	0.42
1950	0.27	[2]	[2]	-0.27	0.18	0.18
1951	0.58	0.02	[2]	-0.29	0.47	0.78
1952	0.49	0.01	[2]	-0.34	0.49	0.65
1953	0.33	0.01	[2]	-0.45	0.38	0.27
1954	0.30	[2]	[2]	-0.50	0.32	0.14
1955	0.48	0.01	0.01	-0.62	0.16	0.04
1956	0.73	0.01	0.01	-0.75	0.22	0.22
1957	0.83	0.01	0.01	-0.81	0.24	0.28
1958	0.52	0.01	-0.01	-0.92	-0.17	-0.58
1959	0.38	0.01	-0.02	-0.87	-0.21	-0.71
1960	0.35	0.01	-0.02	-0.89	-0.26	-0.82
1961	0.34	0.01	-0.04	-0.92	-0.14	-0.76
1962	0.38	0.01	-0.08	-1.01	-0.32	-1.03
1963	0.47	0.01	-0.09	-1.02	-0.31	-0.95
1964	0.46	0.01	-0.10	-1.08	-0.36	-1.06
1965	0.48	0.01	-0.10	-1.11	-0.43	-1.15
1966	0.47	0.02	-0.09	-1.11	-0.51	-1.21
1967	0.48	0.01	-0.10	-0.97	-0.55	-1.12
1968	0.50	0.02	-0.11	-1.17	-0.63	-1.39
1969	0.59	0.04	-0.17	-1.29	-0.78	-1.62
1970	0.96	0.08	-0.23	-1.24	-1.00	-1.43
1971	0.90	0.04	-0.27	-1.68	-1.13	-2.15
1972	0.98	0.03	-0.28	-2.37	-1.51	-3.15
1973	1.01	-0.01	-0.32	-4.24	-2.87	-6.42
1974	2.38	-0.15	-0.48	-15.24	-10.17	-23.66
1975	3.24	-0.08	-1.06	-18.29	-5.77	-21.96
1976	2.89	-0.04	-1.56	-25.43	-5.59	-29.73
1977	2.62	-0.06	-1.89	-33.38	-7.28	-40.00
1978	1.97	-0.36	-1.95	-31.91	-6.13	-38.37
1979	3.34	-0.26	-3.00	-45.66	-8.90	-54.48
1980	4.60	0.07	-3.98	-61.15	-10.58	-71.05
1981	5.89	0.03	-4.06	-60.88	-12.21	-71.23
1982	5.97	0.05	-4.39	-45.25	-9.27	-52.91
1983[3]	4.01	0.04	-4.08	-36.27	-11.39	-47.68

[1] Net trade = exports minus imports.
[2] Less than $5 million.
[3] Preliminary.
Note: Sum of components may not equal total due to independent rounding. Data on this table may not equal data on Table 21 minus data on Table 20 due to independent rounding.
Sources: Compiled from Tables 20 and 21.

Figure 24. Selected Statistics for FRS* Companies' Operations

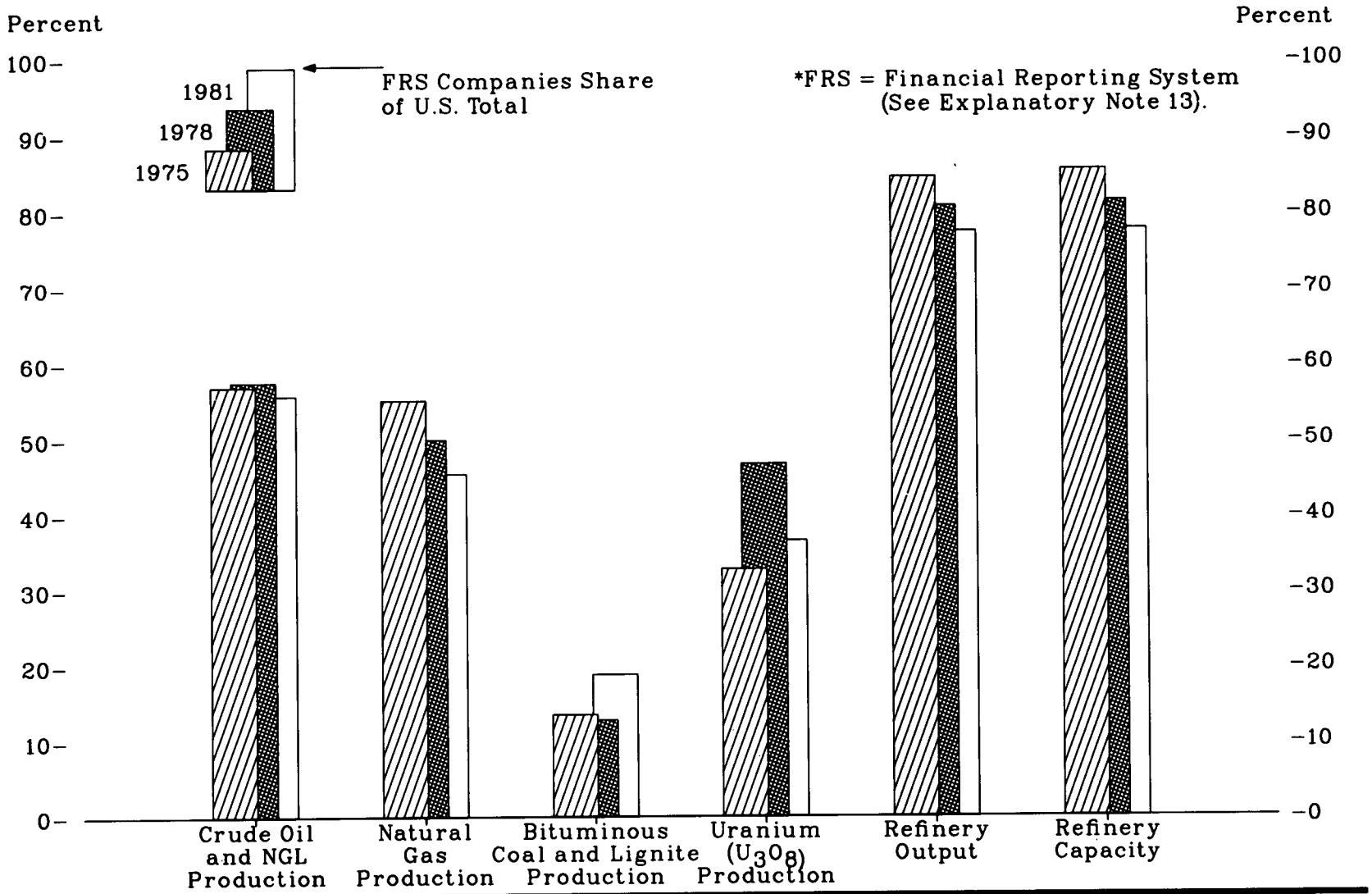
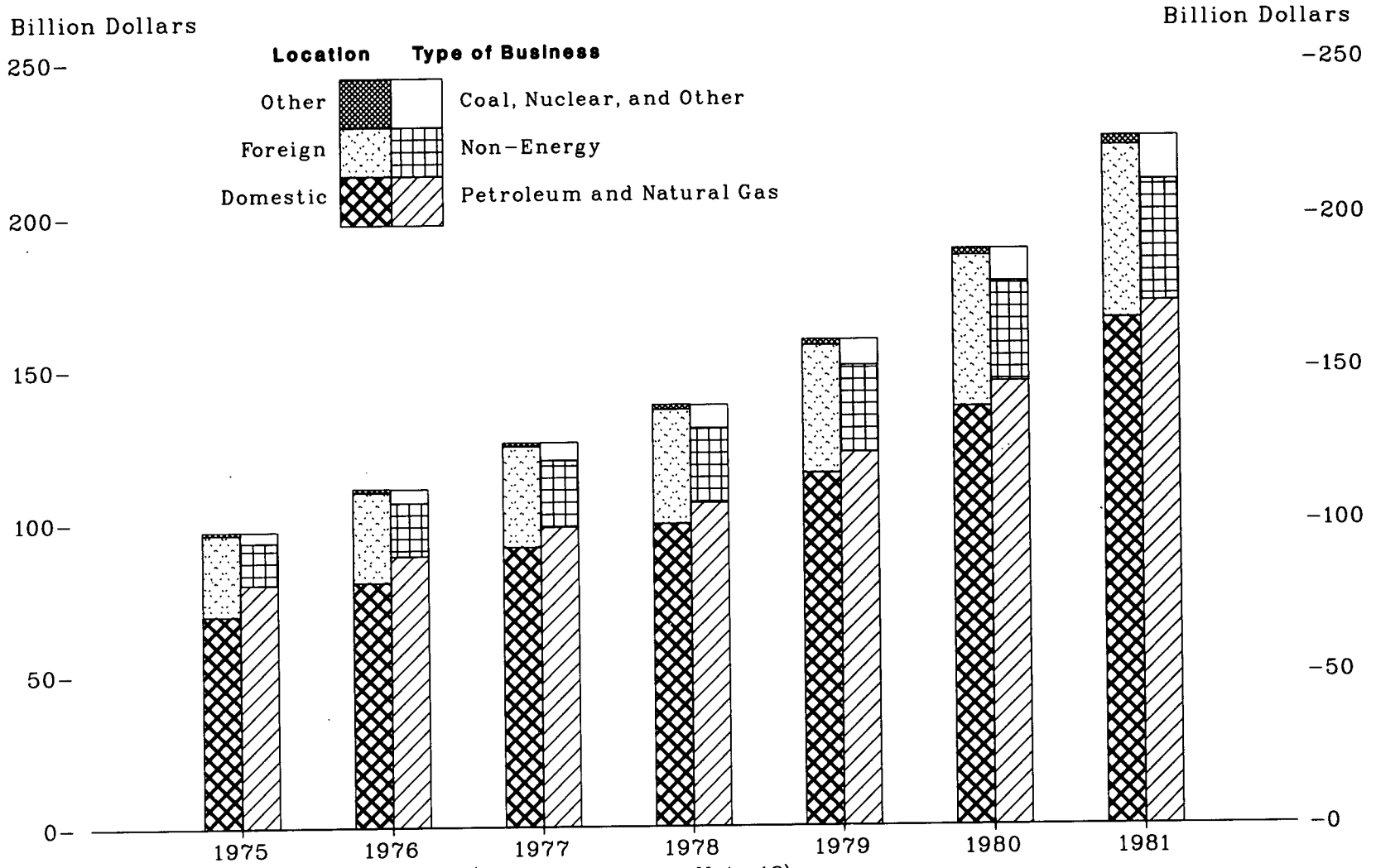


Table 23. Selected Statistics for FRS [1] Companies' Operations, 1975-1981

Activity	1975	1976	1977	1978	1979	1980	1981
Production							
Crude Oil and NGL [2] (million barrels)	2,080.9	2,002.0	2,008.4	2,160.6	2,110.9	2,068.7	2,072.4
(Percent of U.S. Total)	57.0	56.2	55.8	57.6	57.0	55.6	55.8
Dry Natural Gas (trillion cubic feet)	11.1	10.6	10.3	10.0	10.0	9.0	9.2
(Percent of U.S. Total)	55.2	53.0	51.5	50.0	48.8	44.1	45.5
Bituminous Coal [3] and Lignite (million short tons)	88.1	88.5	89.1	85.5	123.3	142.3	154.8
(Percent of U.S. Total)	13.6	13.0	12.9	12.9	15.9	17.3	18.9
Uranium (million pounds of U_3O_8)	7.6	6.5	16.0	17.3	16.7	19.0	14.5
(Percent of U.S. Total)	32.8	25.5	53.5	46.8	44.6	43.5	36.6
Refining							
Capacity [4] (million barrels per day)	13.4	14.2	14.6	14.8	14.8	15.1	14.6
(Percent of U.S. Total)	85.5	84.0	81.9	81.4	79.2	77.8	77.7
Output (million barrels per day)	12.2	12.8	13.7	13.6	13.3	12.2	11.3
(Percent of U.S. Total)	84.5	82.6	81.5	80.7	80.1	78.7	77.4
Financial Indicators (Percent)							
Net Income to Stockholders' Equity	12.3	13.1	12.6	12.8	18.8	21.1	18.1
Net Income Plus Interest to Total Invested Capital	11.3	11.7	11.6	12.3	16.9	18.7	16.8
Long-Term Debt to Stockholders' Equity	35.6	38.7	38.9	35.6	33.7	31.5	32.2
Addition to PP&E to Net PP&E [5]	21.5	20.7	19.0	18.2	23.4	25.3	26.1

[1] FRS = Financial Reporting System (See Explanatory Note 13).
[2] NGL = Natural Gas Liquids.
[3] Includes subbituminous coal.
[4] Operable capacity as of January 1 of the following year.
[5] PP&E = Property Plant and Equipment.
Note: FRS Crude Oil and NGL and Natural Gas (Dry Marketed) production are on a net ownership interest basis (see Glossary).
Sources: **FRS Companies:** • 1975 through 1979 — Energy Information Administration, *Energy Company Development Patterns in the Postembargo Era*, Vol. 2, October 1982. • 1980 and 1981 — Energy Information Administration, *Performance Profiles of Major Energy Producers, 1981*, June 1983. **U.S. Total, Production: Crude Oil and NGL:** • 1975 — Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976 through 1980 — Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* • 1981 — Energy Information Administration, *Petroleum Supply Annual.* **U.S. Total, Production: Dry Natural Gas:** • 1975 — Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. • 1976 through 1978 — Energy Information Administration, Energy Data Reports, *Natural Gas, Annual.* • 1979 — Energy Information Administration, *Natural Gas Production and Consumption- 1979.* • 1980 and 1981 — Energy Information Administration, *Natural Gas Annual.* **U.S. Total, Production: Bituminous Coal and Lignite:** • 1975 — Bureau of Mines, *Minerals Yearbook*, "Coal — Bituminous and Lignite" chapter. • 1976 — Energy Information Administration, Energy Data Report, *Coal-Bituminous and Lignite in 1976.* • 1977 and 1978 — Energy Information Administration, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations — 1977, ...1978.* • 1980 — Energy Information Administration, Energy Data Report, *Weekly Coal Report.* • 1981 — Energy Information Administration, *Weekly Coal Production.* **U.S. Total, Production: Uranium.** • 1975 through 1981 — U.S. Department of Energy, Grand Junction Office, Colorado, *Statistical Data of the Uranium Industry*, Report No. GJO-100, annual. **U.S. Total, Refining:** • 1975 through 1980 — Energy Information Administration, *Energy Company Development Patterns in the Postembargo Era*, Vol. 1, October 1982. • 1981 — Energy Information Administration, *Petroleum Supply Annual.*

Figure 25. Net Property Investment by FRS* Companies



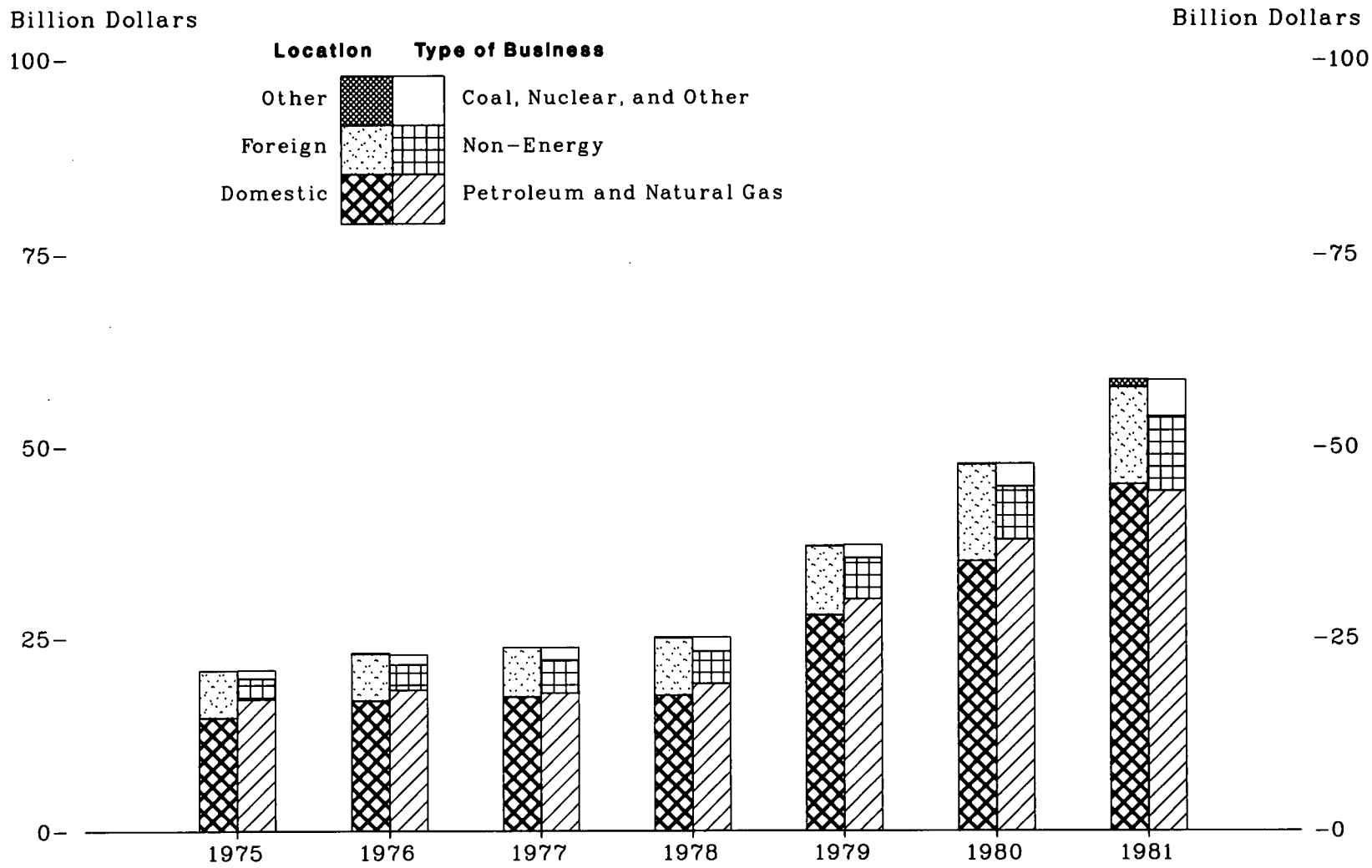
*FRS = Financial Reporting System (See Explanatory Note 13).

Table 24. Net Property [1] Investment by FRS [2] Companies, 1975-1981

Item	1975		1976		1977		1978		1979		1980		1981	
	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage
Location														
Domestic	69.4	*71.3*	80.3	*72.3*	91.7	*72.8*	99.3	*71.9*	115.7	*72.6*	137.0	*72.5*	165.9	*73.8*
Foreign	26.8	*27.5*	29.6	*26.6*	33.0	*26.2*	37.3	*27.0*	41.8	*26.2*	49.7	*26.3*	56.0	*24.9*
Eliminations, etc. [3]	1.0	*1.0*	1.2	*1.1*	1.2	*1.0*	1.5	*1.1*	1.8	*1.1*	2.2	*1.2*	3.0	*1.3*
Total	97.3	*100.0*	111.1	*100.0*	125.9	*100.0*	138.1	*100.0*	159.3	*100.0*	188.9	*100.0*	224.9	*100.0*
Type-of-Business														
Petroleum and Natural Gas	79.8	*82.0*	88.9	*80.0*	98.4	*78.2*	106.2	*76.9*	122.4	*76.8*	145.3	*76.9*	171.3	*76.2*
Coal	1.6	*1.6*	2.0	*1.8*	2.7	*2.1*	3.1	*2.2*	3.7	*2.3*	4.6	*2.4*	6.8	*3.0*
Nuclear	0.3	*0.3*	0.4	*0.4*	0.7	*0.6*	0.9	*0.7*	1.1	*0.7*	1.2	*0.6*	1.3	*0.6*
Other Energy	0.8	*0.8*	1.0	*0.9*	1.2	*1.0*	2.2	*1.6*	2.1	*1.3*	2.7	*1.4*	3.0	*1.3*
Non-Energy	13.7	*14.1*	17.6	*15.8*	21.8	*17.3*	24.2	*17.5*	28.4	*17.8*	33.0	*17.5*	39.5	*17.6*
Eliminations, etc. [3]	1.0	*1.0*	1.1	*1.0*	1.2	*1.0*	1.4	*1.0*	1.6	*1.0*	2.1	*1.1*	3.0	*1.3*
Total	97.3	*100.0*	111.1	*100.0*	125.9	*100.0*	138.1	*100.0*	159.3	*100.0*	188.9	*100.0*	224.9	*100.0*
Domestic Petroleum and Natural Gas														
Production	27.8	*50.7*	31.4	*50.9*	36.4	*53.5*	40.4	*55.3*	51.7	*60.5*	65.7	*64.6*	83.1	*67.8*
Refining/Marketing	20.0	*36.5*	20.7	*33.5*	20.8	*30.5*	21.6	*29.5*	23.0	*26.9*	25.1	*24.7*	28.5	*23.2*
Transportation	7.0	*12.8*	9.5	*15.4*	11.0	*16.2*	11.0	*15.0*	10.8	*12.6*	10.9	*10.7*	10.9	*8.9*
Eliminations, etc. [3]	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	0.1	*0.1*	(4)	(5)	0.0	*0.0*
Total	54.8	*100.0*	61.7	*100.0*	68.1	*100.0*	73.1	*100.0*	85.5	*100.0*	101.7	*100.0*	122.5	*100.0*
Foreign Petroleum and Natural Gas														
Production	9.4	*37.8*	11.4	*42.1*	14.0	*46.4*	16.6	*50.2*	20.0	*54.6*	25.9	*59.4*	30.4	*62.3*
Refining/Marketing	10.3	*41.4*	10.3	*38.0*	10.5	*34.8*	11.1	*33.5*	11.3	*30.9*	12.4	*28.4*	13.6	*27.9*
Transportation	5.2	*20.9*	5.4	*19.9*	5.6	*18.5*	5.4	*16.3*	5.3	*14.5*	5.3	*12.2*	4.8	*9.9*
Eliminations, etc. [3]	(4)	(5)	(4)	(5)	(4)	*0.1*	0.1	*0.3*	0.1	*0.5*	0.1	*0.2*	0.0	*0.0*
Total	24.9	*100.0*	27.1	*100.0*	30.2	*100.0*	33.1	*100.0*	36.6	*100.0*	43.6	*100.0*	48.8	*100.0*

[1] Property, Plant, and Equipment.
[2] FRS = Financial Reporting System (See Explanatory Note 13).
[3] Eliminations and Nontraceables.
[4] Less than $50 million.
[5] Less than 0.05 percent.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1975 through 1980 — Energy Information Administration, *Energy Company Development Patterns in the Postembargo Era*, Vol. 2, October 1982. •1981 — Energy Information Administration, *Performance Profiles of Major Energy Producers, 1981*, June 1983.

Figure 26. Additions to Property by FRS* Companies



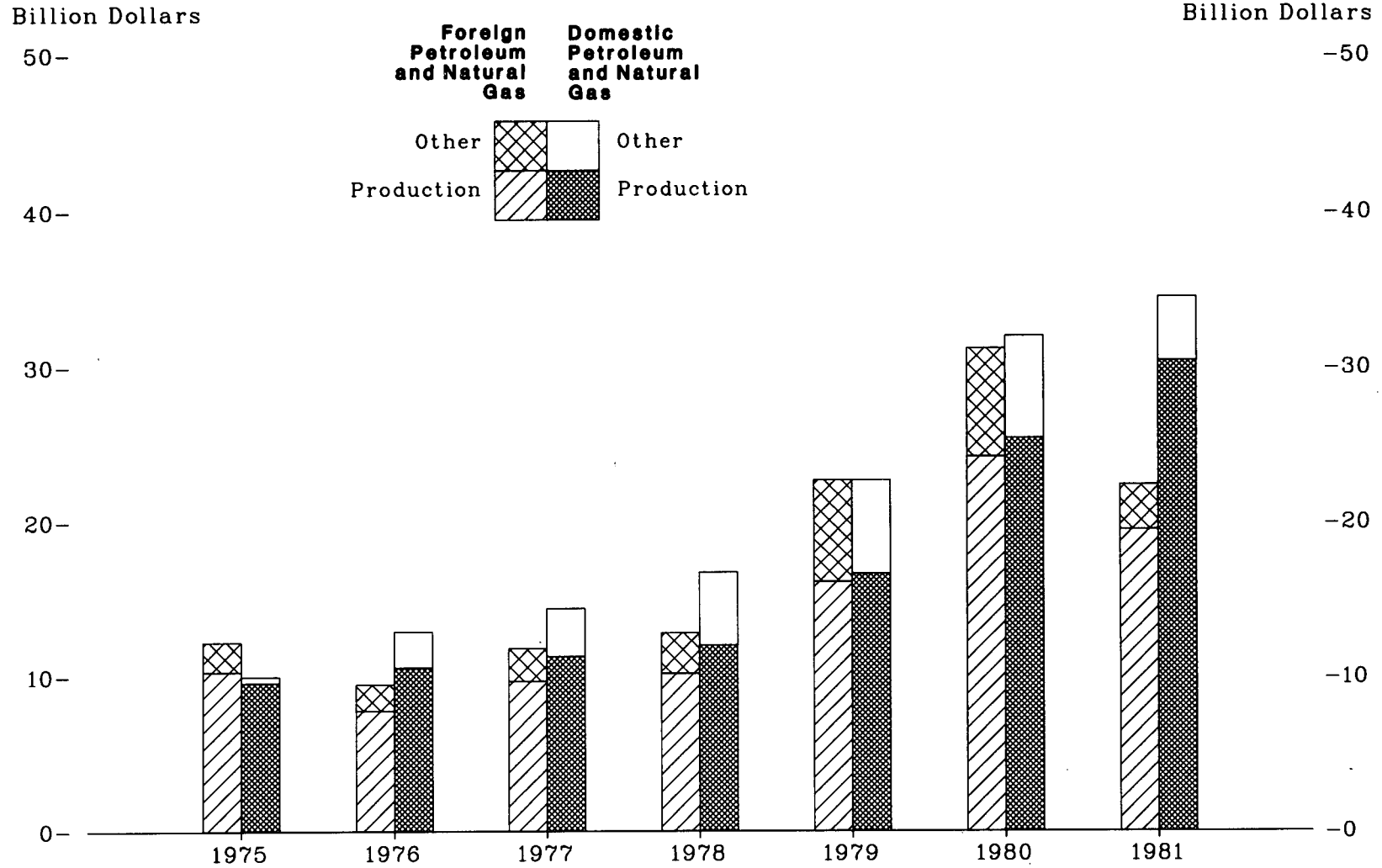
*FRS = Financial Reporting System (See Explanatory Note 13)

Table 25. Additions to Property [1] by FRS [2] Companies, 1975-1981

Item	1975		1976		1977		1978		1979		1980		1981	
	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage
Location														
Domestic	14.7	*70.3*	16.9	*73.5*	17.4	*72.8*	17.6	*70.1*	28.0	*75.3*	35.0	*73.2*	45.1	*76.7*
Foreign	6.1	*29.2*	6.1	*26.5*	6.4	*26.7*	7.4	*29.5*	9.0	*24.2*	12.7	*26.6*	12.6	*21.5*
Eliminations, etc. [3]	(4)	*0.2*	0.1	*0.4*	(4)	*0.2*	0.1	*0.4*	0.1	*0.3*	0.1	*0.2*	1.0	*1.8*
Total	20.9	*100.0*	23.0	*100.0*	23.9	*100.0*	25.1	*100.0*	37.2	*100.0*	47.8	*100.0*	58.7	*100.0*
Type-of-Business														
Petroleum and Natural Gas	17.1	*81.8*	18.3	*79.6*	17.9	*74.9*	19.1	*76.1*	30.1	*80.9*	37.9	*79.3*	44.2	*75.3*
Coal	0.5	*2.4*	0.5	*2.2*	0.8	*3.3*	0.7	*2.8*	0.7	*1.9*	1.2	*2.5*	2.8	*4.8*
Nuclear	0.1	*0.5*	0.1	*0.4*	0.3	*1.3*	0.3	*1.2*	0.3	*0.8*	0.3	*0.6*	0.2	*0.3*
Other Energy	0.3	*1.4*	0.5	*2.2*	0.3	*1.3*	0.5	*2.0*	0.4	*1.1*	0.8	*1.7*	0.7	*1.2*
Non-Energy	2.7	*12.9*	3.3	*14.3*	4.3	*18.0*	4.2	*16.7*	5.3	*14.2*	6.9	*14.4*	9.7	*16.5*
Eliminations, etc. [3]	0.2	*1.0*	0.2	*0.9*	0.2	*0.8*	0.3	*1.2*	0.4	*1.1*	0.7	*1.5*	1.0	*1.7*
Total	20.9	*100.0*	23.0	*100.0*	23.9	*100.0*	25.1	*100.0*	37.2	*100.0*	47.8	*100.0*	58.7	*100.0*
Domestic Petroleum and Natural Gas														
Production	6.0	*51.7*	7.4	*56.5*	8.4	*70.0*	9.3	*73.2*	18.1	*81.5*	21.7	*80.7*	26.7	*79.7*
Refining/Marketing	2.8	*24.1*	2.8	*21.4*	2.2	*18.3*	2.8	*22.0*	3.5	*15.8*	4.3	*16.0*	6.0	*17.9*
Transportation	2.8	*24.1*	2.8	*21.4*	1.4	*11.7*	0.6	*4.7*	0.6	*2.7*	1.0	*3.7*	0.8	*2.4*
Eliminations, etc. [3]	0.0	*0.0*	(4)	*0.4*	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	0.0	*0.0*
Total	11.6	*100.0*	13.1	*100.0*	12.0	*100.0*	12.7	*100.0*	22.2	*100.0*	26.9	*100.0*	33.5	*100.0*
Foreign Petroleum and Natural Gas														
Production	3.0	*54.5*	3.6	*67.9*	4.1	*69.5*	4.7	*73.4*	5.9	*75.6*	8.4	*76.4*	8.0	*74.8*
Refining/Marketing	1.4	*25.5*	1.0	*18.9*	1.1	*18.6*	1.5	*23.4*	1.5	*19.2*	2.1	*19.1*	2.4	*22.4*
Transportation	1.1	*20.0*	0.7	*13.2*	0.7	*11.9*	0.2	*3.1*	0.5	*6.4*	0.5	*4.5*	0.3	*2.8*
Eliminations, etc. [3]	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	(4)	(5)	0.0	*0.0*
Total	5.5	*100.0*	5.3	*100.0*	5.9	*100.0*	6.4	*100.0*	7.8	*100.0*	11.0	*100.0*	10.7	*100.0*

[1] Property, Plant, and Equipment.
[2] FRS = Financial Reporting System (See Explanatory Note 13).
[3] Eliminations and Nontraceables.
[4] Less than $50 million.
[5] Less than 0.05 percent.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1975 through 1980 — Energy Information Administration, *Energy Company Development Patterns in the Postembargo Era*, Vol. 1 and Vol. 2, October 1982. • 1981—Energy Information Administration, *Performance Profiles of Major Energy Producers, 1981*, June 1983.

Figure 27. Operating Income of FRS* Companies



*FRS = Financial Reporting System (See Explanatory Note 13)

Table 26. Operating Income of FRS [1] Companies, 1975-1981

Item	1975		1976		1977		1978		1979		1980		1981	
	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage	Billion Dollars	Percentage
Location														
Domestic	12.2	*50.2*	15.2	*63.3*	16.4	*60.1*	18.0	*60.4*	25.2	*53.8*	33.3	*53.1*	35.0	*63.9*
Foreign	12.6	*51.9*	9.9	*41.2*	12.2	*44.7*	13.4	*45.0*	23.8	*50.9*	32.6	*52.0*	22.9	*41.8*
Eliminations, etc. [2]	-0.5	*-2.1*	-1.1	*-4.6*	-1.3	*-4.8*	-1.6	*-5.4*	-2.2	*-4.7*	-3.2	*-5.1*	-3.0	*-5.5*
Total	24.3	*100.0*	24.0	*100.0*	27.3	*100.0*	29.8	*100.0*	46.8	*100.0*	62.7	*100.0*	54.8	*100.0*
Type-of-Business														
Petroleum and Natural Gas	22.7	*93.4*	22.4	*93.3*	26.2	*96.0*	29.5	*99.0*	45.4	*97.0*	63.2	*100.8*	56.9	*103.8*
Coal	0.4	*1.6*	0.3	*1.2*	0.2	*0.7*	0.1	*0.3*	0.2	*0.4*	0.3	*0.5*	0.2	*0.4*
Nuclear	-0.1	*-0.4*	-0.1	*-0.4*	-0.1	*-0.4*	-0.1	*-0.3*	-0.1	*-0.2*	-0.1	*-0.2*	-0.2	*-0.4*
Other Energy	-0.2	*-0.8*	-0.1	*-0.4*	-0.1	*-0.4*	-0.2	*-0.7*	-0.2	*-0.4*	[3]	[4]	-0.5	*-0.9*
Non-Energy	2.6	*10.7*	2.9	*12.1*	2.4	*8.8*	2.1	*7.0*	3.7	*7.9*	2.4	*3.8*	1.4	*2.6*
Eliminations, etc. [2]	-1.2	*-4.9*	-1.4	*-5.8*	-1.3	*-4.8*	-1.6	*-5.4*	-2.1	*-4.5*	-3.1	*-4.9*	-3.0	*-5.5*
Total	24.3	*100.0*	24.0	*100.0*	27.3	*100.0*	29.8	*100.0*	46.8	*100.0*	62.7	*100.0*	54.8	*100.0*
Domestic Petroleum and Natural Gas														
Production	9.6	*96.0*	10.6	*82.2*	11.3	*78.5*	12.0	*71.9*	16.6	*73.1*	25.4	*79.4*	30.4	*88.1*
Refining/Marketing	-0.2	*-2.0*	1.6	*12.4*	2.4	*16.7*	2.7	*16.2*	3.5	*15.4*	3.8	*11.9*	0.9	*2.6*
Transportation	0.6	*6.0*	0.8	*6.2*	0.9	*6.2*	2.1	*12.6*	2.7	*11.9*	3.0	*9.4*	3.1	*9.0*
Eliminations, etc. [2]	[3]	[4]	-0.1	*-0.8*	-0.1	*-0.7*	-0.1	*-0.6*	-0.1	*-0.4*	-0.1	*-0.3*	[3]	[4]
Total	10.0	*100.0*	12.9	*100.0*	14.4	*100.0*	16.7	*100.0*	22.7	*100.0*	32.0	*100.0*	34.5	*100.0*
Foreign Petroleum and Natural Gas														
Production	10.3	*84.4*	7.8	*82.1*	9.7	*82.2*	10.2	*79.7*	16.1	*70.9*	24.2	*77.6*	19.5	*87.1*
Refining/Marketing	1.8	*14.8*	2.1	*22.1*	1.7	*14.4*	2.4	*18.8*	6.4	*28.2*	7.0	*22.4*	3.0	*13.4*
Transportation	-0.1	*-0.8*	0.2	*2.1*	0.1	*0.8*	[3]	*0.4*	0.2	*0.9*	0.1	*0.3*	-0.1	*-0.4*
Eliminations, etc. [2]	0.2	*1.6*	-0.5	*-5.3*	0.1	*0.8*	0.1	*0.8*	[3]	*0.1*	-0.1	*-0.3*	[3]	[4]
Total	12.2	*100.0*	9.5	*100.0*	11.8	*100.0*	12.8	*100.0*	22.7	*100.0*	31.2	*100.0*	22.4	*100.0*

[1] FRS = Financial Reporting System (See Explanatory Note 13).
[2] Eliminations and Nontraceables.
[3] Less than $50 million.
[4] Less than 0.05 percent.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1975 through 1980 — Energy Information Administration, *Energy Company Development Patterns in the Postembargo Era*, Vol. 2, October 1982 and Form EIA-28. •1981—Energy Information Administration, *Performance Profiles of Major Energy Producers, 1981*, June 1983.

Section 2. Petroleum and Natural Gas Resources, Exploration and Development, and Reserves

The earth's crust has been constantly altered, primarily by erosion, deposition, and movement over geologic time. These actions formed a variety of strata and structures into which crude oil and natural gas migrated and became trapped.

Resources. Crude oil and natural gas are nonrenewable energy resources; therefore, it is important to know the recoverable quantities of these resources in the United States. They are defined as concentrations of naturally occurring liquid or gaseous hydrocarbons in or on the earth's crust in such form that recovery is currently or potentially economically feasible. The latest assessment of U.S. undiscovered recoverable crude oil and natural gas resources by the U.S. Geological Survey provides a mean estimate of domestic undiscovered recoverable crude oil resources of 82.6 billion barrels. Some 66 percent is onshore. Major areas containing these resources are Alaska (including offshore areas), 23 percent, and the Gulf of Mexico area (including the onshore Gulf Coast), 16 percent (see Table 27).

Exploration and Development. Finding oil and gas is a two-step process. First, geological and geophysical (primarily seismic) exploration identifies the most likely areas for the occurrence of oil and gas resources. The second step is the drilling of exploratory wells to confirm the presence of these hydrocarbons.

The line miles logged by seismic crews, which increased each year since 1977, reached a record 807,000 in 1982 (the latest year for which data are available), more than twice the 1980 level (see Table 28). This reflected a favorable economic environment and an accelerated offshore leasing program.

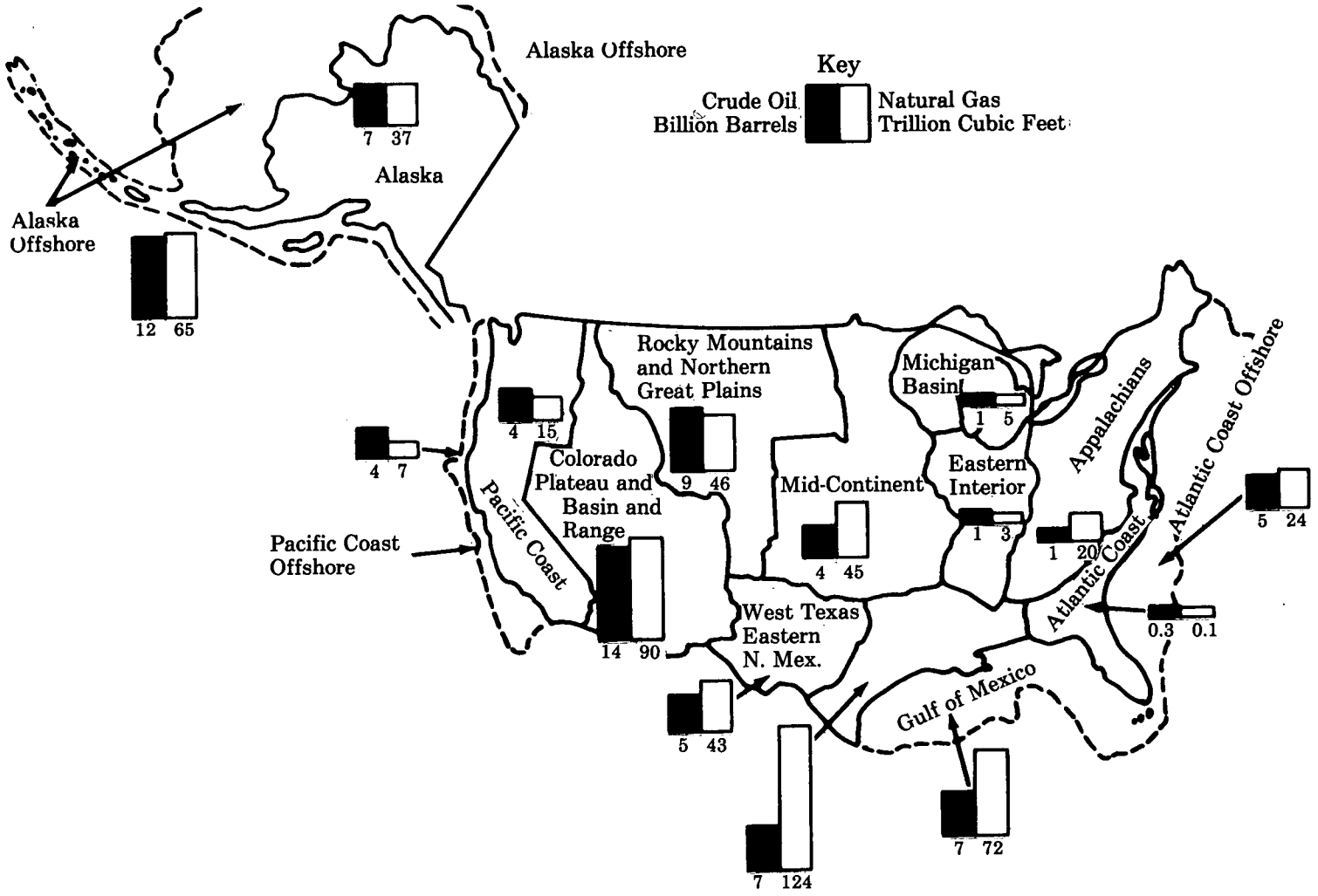
Drilling is done principally with rotary rigs. The 1983 rotary rig count average of 2,232 was down 44 percent from 1981 when rig count reached a record average of 3,970 (see Table 28). Preliminary 1983 data indicate that 13,900 exploratory wells were drilled, down from 16,500 in 1982 (see Table 29). The success rate also fell. The 28.7 percent success rate was down from the all-time high of 30.2 percent in 1981. Total number of wells drilled (exploratory and development wells combined) was 76,000, down from the U.S. record high of 86,000 in 1982. Total footage drilled was 326 million feet, indicating that the average well depth was about 4,300 feet (see Table 30). The average cost of wells drilled rose again in 1982, but at a slower rate than in recent years. The average cost per foot drilled was $109 in 1982, nearly twice that of 1978.

Domestic Reserves. Proved reserves of crude oil have declined significantly since the 1970 inclusion of Alaska's North Slope proved reserves. Although the decline had eased in 1980 and 1981, the decline in 1982 was a substantial 5.3 percent (see Table 33). Proved reserves of natural gas decreased 0.1 percent in 1982, while reserves for natural gas liquids increased 2.2 percent. On a crude oil basis, natural gas reserves at the end of 1983 were 28 percent larger than crude oil reserves.

World Reserves. World crude oil reserves were estimated to be 669 billion barrels at the end of 1983, virtually unchanged from 1982. Fifty-five percent were located in the Middle East. The countries with the largest reserves, in order, were Saudi Arabia (25 percent), Kuwait, the U.S.S.R., Iran, Mexico, and Iraq. These six countries accounted for 66 percent of the world's crude oil reserves. The United States ranked eighth with 4.1 percent of the world total (see Table 34).

World natural gas reserves were estimated to be 3.2 quadrillion cubic feet at the end of 1983, up more than 5 percent from 1982 and nearly 20 percent from 1980. Countries with the largest reserves, in order, were the U.S.S.R., Iran, United States, Saudi Arabia, and Algeria. These five countries accounted for 72 percent of the world's natural gas reserves (see Table 34).

Figure 28. Estimated Undiscovered Recoverable Crude Oil and Natural Gas Resources, 1980



Note: Quantities are scaled according to the Btu content of the resources. 1 billion barrels of crude oil equals approximately 5.3 trillion cubic feet of wet natural gas.

Table 27. Estimated Undiscovered Recoverable Crude Oil and Natural Gas Resources, 1980

Region	Crude Oil (billion barrels)			Natural Gas (trillion cubic feet)		
		Estimated Range [1]			Estimated Range [1]	
	Mean [2]	Low	High	Mean [2]	Low	High
Onshore						
Alaska	6.9	2.5	14.6	36.6	19.8	62.3
Pacific Coast	4.4	2.1	7.9	14.7	8.2	24.9
Colorado Plateau and Basin and Range	14.2	6.9	25.9	90.1	53.5	142.4
Rocky Mountains and Northern Great Plains	9.4	6.0	14.0	45.7	29.6	69.0
West Texas and Eastern New Mexico	5.4	2.7	9.4	42.8	22.4	75.2
Gulf Coast	7.1	3.6	12.6	124.4	56.5	249.1
Mid-Continent	4.4	2.3	7.7	44.5	22.9	80.8
Michigan Basin	1.1	0.3	2.7	5.1	1.8	10.9
Eastern Interior	0.9	0.3	1.9	2.7	1.2	5.0
Appalachians	0.6	0.1	1.5	20.1	6.4	45.8
Atlantic Coast	0.3	0.1	0.8	0.1	[3]	0.4
Total Onshore	54.6	41.7	71.0	426.8	322.5	567.9
Offshore						
Alaska [4]	12.2	4.6	24.2	64.6	33.3	109.6
Pacific Coast	3.8	1.7	7.9	6.9	3.7	13.6
Gulf of Mexico	6.5	3.1	11.1	71.8	41.7	114.2
Atlantic Coast	5.4	1.1	12.9	23.7	9.2	42.8
Total Offshore	28.0	16.9	43.5	167.0	117.4	230.6
Total United States	82.6	64.3	105.1	593.8	474.6	739.3

[1] The low value of the range is the quantity associated with a 95 percent probability (19 in 20 chance) that there is at least this amount. The high value is the quantity with a 5 percent probability (1 in 20 chance) that there is at least this amount. Totals for the low and high values are not obtained by arithmetic summation; they are derived by statistical methods.
[2] The calculated mean from the probability curve using the Monte Carlo technique.
[3] Less than 0.1 trillion cubic feet.
[4] Includes quantities considered recoverable only if technology permits their exploitation beneath Arctic ice — a condition not yet met.
Source: U.S. Geological Survey, *Geological Estimates of Undiscovered Recoverable Conventional Resources of Oil and Gas in the United States, A Summary*, Circular 860, 1981.

Figure 29. Oil and Gas Exploration and Rotary Rigs in Use

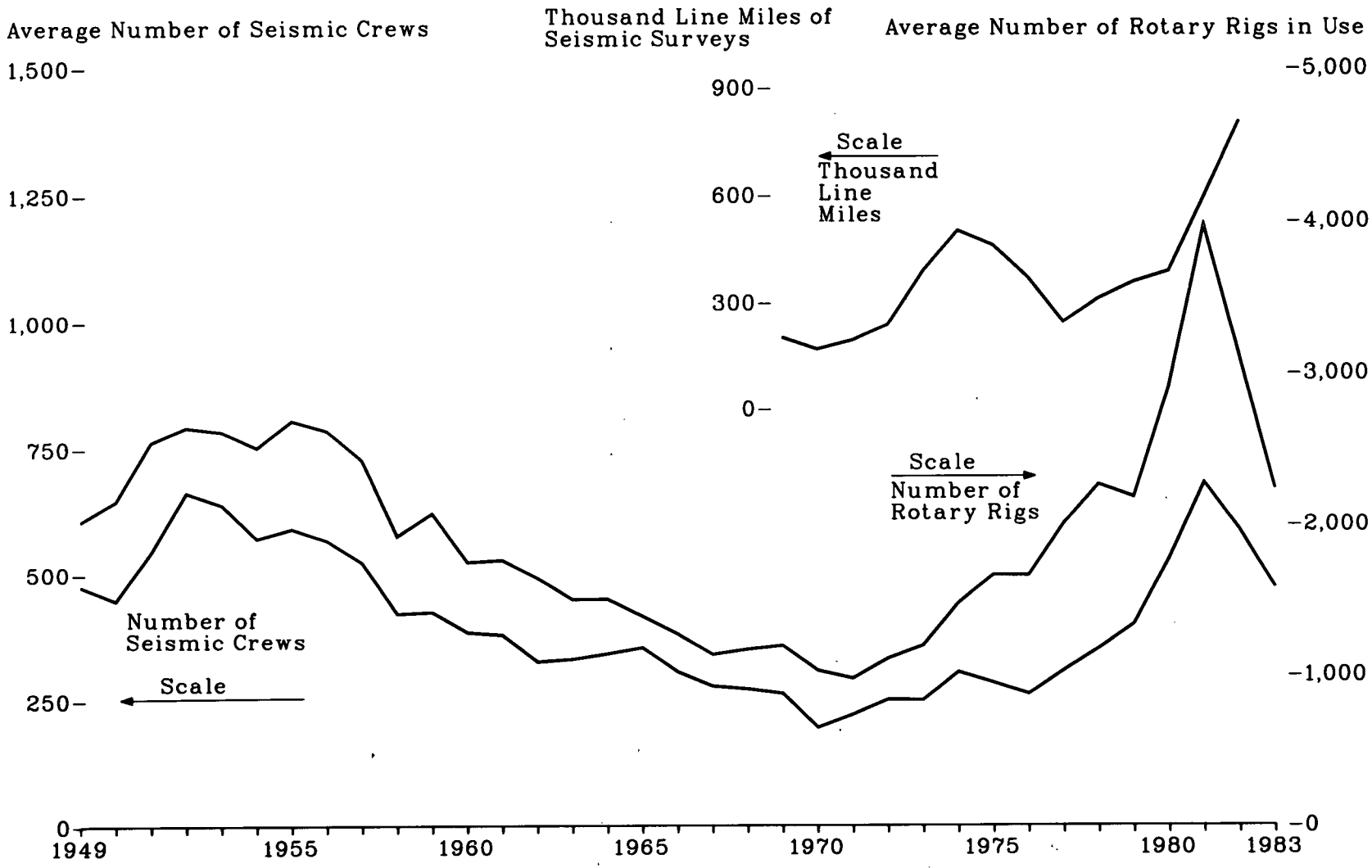


Table 28. Oil and Gas Exploration and Rotary Rigs in Use, 1949-1983

Year	Average Number of Seismic Crews	Line Miles of Seismic Surveys (thousand)	Average Number of Rotary Rigs in Use [1]
1949	476	NA	2,017
1950	448	NA	2,154
1951	545	NA	2,543
1952	663	NA	2,641
1953	639	NA	2,613
1954	572	NA	2,508
1955	591	NA	2,686
1956	568	NA	2,620
1957	524	NA	2,426
1958	422	NA	1,922
1959	425	NA	2,071
1960	385	NA	1,748
1961	380	NA	1,761
1962	326	NA	1,641
1963	331	NA	1,499
1964	342	NA	1,501
1965	354	NA	1,388
1966	306	NA	1,272
1967	278	NA	1,135
1968	272	NA	1,169
1969	263	199.9	1,194
1970	195	167.3	1,028
1971	221	191.7	976
1972	251	235.7	1,107
1973	250	386.1	1,194
1974	305	500.4	1,472
1975	284	460.0	1,660
1976	262	369.2	1,658
1977	308	244.7	2,001
1978	352	310.5	2,259
1979	400	357.1	2,177
1980	530	386.8	2,909
1981	681	594.4	3,970
1982	588	806.9	3,105
1983	473	NA	2,232

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

NA = Not available.

Sources: •Average Number of Seismic Crews and Line Miles of Seismic Surveys: Society of Exploration Geophysicists, *SEG News Release,* Monthly, Tulsa, Oklahoma. •Average Number of Rotary Rigs in Use: *Rotary Rigs Running-By States,* Hughes Tool Company, Houston, Texas.

Figure 30. Exploratory Wells Drilled for Oil and Gas

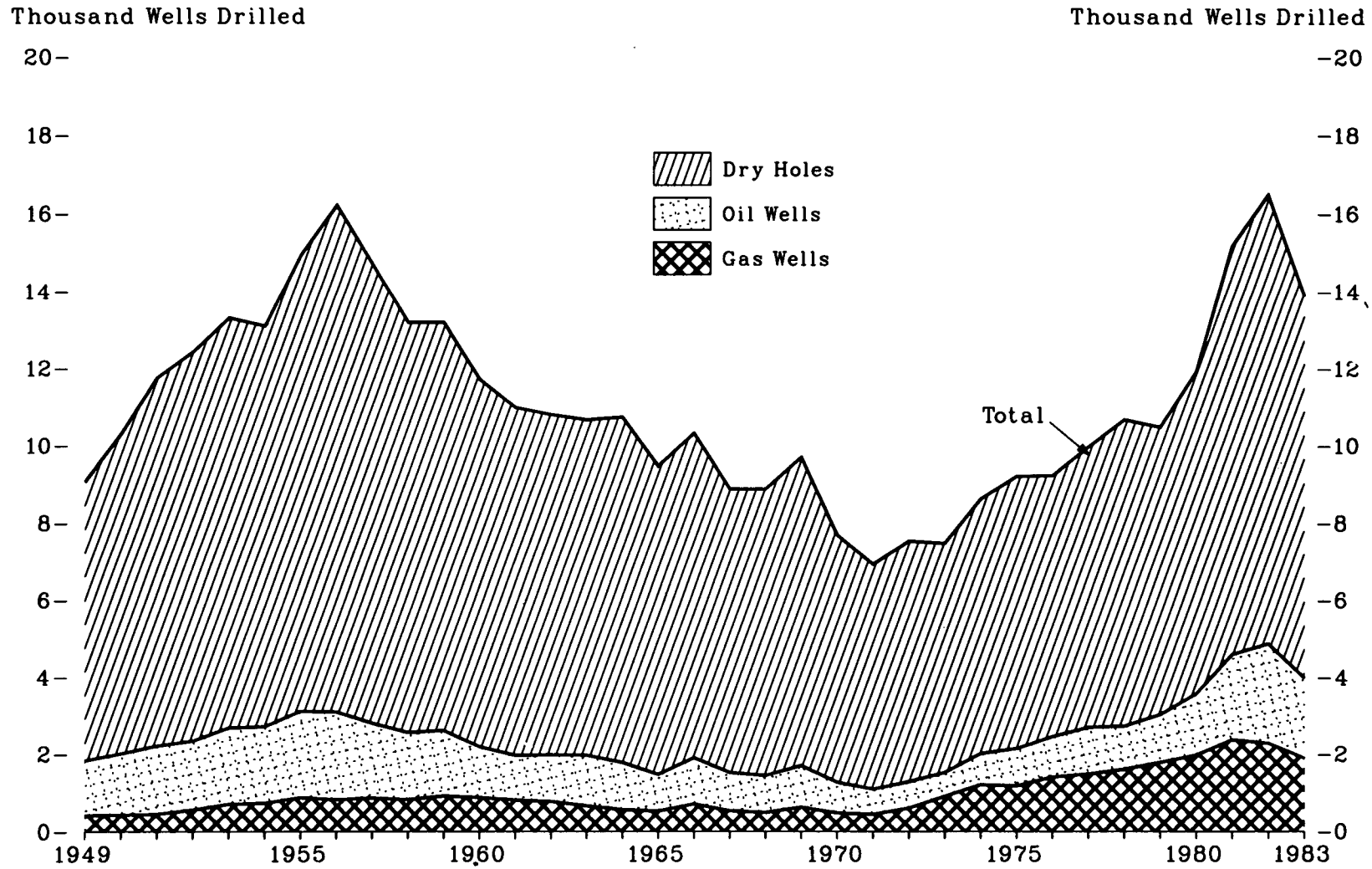


Table 29. Exploratory Wells Drilled for Oil and Gas, 1949-1983

Year	Wells Drilled (thousands)				Footage Drilled (million feet)				Average Depth (feet)				Successful Wells (percent)
	Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total	
1949	1.41	0.42	7.23	9.06	6.0	2.4	26.4	34.8	4,232	5,682	3,658	3,842	20.2
1950	1.58	0.43	8.29	10.31	6.9	2.4	31.0	40.2	4,335	5,466	3,733	3,898	19.5
1951	1.76	0.45	9.54	11.76	8.1	2.5	38.7	49.3	4,609	5,497	4,059	4,197	18.9
1952	1.78	0.56	10.09	12.42	8.5	3.4	43.7	55.6	4,781	6,071	4,334	4,476	18.8
1953	1.98	0.70	10.63	13.31	9.4	4.0	47.3	60.7	4,761	5,654	4,447	4,557	20.1
1954	1.98	0.73	10.39	13.10	9.4	4.4	45.8	59.6	4,740	6,059	4,408	4,550	20.7
1955	2.24	0.87	11.83	14.94	10.8	5.2	53.2	69.2	4,819	5,964	4,498	4,632	20.8
1956	2.27	0.82	13.12	16.21	11.1	5.2	58.0	74.3	4,901	6,301	4,425	4,587	19.1
1957	1.94	0.86	11.90	14.71	9.8	6.0	53.4	69.2	5,036	6,898	4,488	4,702	19.1
1958	1.74	0.82	10.63	13.20	8.7	5.5	47.3	61.5	4,993	6,657	4,449	4,658	19.4
1959	1.70	0.91	10.58	13.19	8.5	6.0	48.7	63.3	5,021	6,613	4,602	4,795	19.8
1960	1.32	0.87	9.52	11.70	6.8	5.5	43.5	55.8	5,170	6,298	4,575	4,770	18.7
1961	1.16	0.81	9.02	10.99	5.9	5.2	43.3	54.4	5,099	6,457	4,799	4,953	17.9
1962	1.21	0.77	8.82	10.80	6.2	5.2	42.2	53.6	5,124	6,728	4,790	4,966	18.4
1963	1.31	0.66	8.69	10.66	6.4	4.2	42.8	53.5	4,878	6,370	4,933	5,016	18.5
1964	1.22	0.56	8.95	10.73	6.7	4.2	44.6	55.5	5,509	7,547	4,980	5,174	16.6
1965	0.95	0.52	8.00	9.47	5.4	3.8	40.1	49.2	5,672	7,295	5,007	5,198	15.4
1966	1.20	0.70	8.42	10.31	6.8	5.8	43.1	55.7	5,700	8,321	5,117	5,402	18.4
1967	0.99	0.53	7.36	8.88	5.7	4.0	38.2	47.8	5,758	7,478	5,188	5,388	17.1
1968	0.95	0.49	7.44	8.88	5.6	3.7	41.6	51.0	5,914	7,697	5,589	5,739	16.2
1969	1.08	0.62	8.00	9.70	6.6	5.0	45.9	57.5	6,054	8,092	5,739	5,924	17.5
1970	0.79	0.48	6.42	7.69	5.1	3.7	36.5	45.3	6,399	7,639	5,687	5,882	16.5
1971	0.65	0.44	5.83	6.92	3.7	3.3	33.3	40.4	5,702	7,616	5,716	5,835	15.7
1972	0.68	0.60	6.25	7.54	4.0	4.6	36.4	45.0	5,850	7,641	5,828	5,975	17.0
1973	0.62	0.90	5.95	7.47	3.9	6.2	34.8	44.8	6,226	6,856	5,844	5,997	20.3
1974	0.81	1.20	6.61	8.62	4.9	7.7	37.7	50.3	5,961	6,421	5,709	5,832	23.3
1975	0.97	1.17	7.07	9.21	5.7	8.0	40.1	53.8	5,863	6,831	5,678	5,844	23.3
1976	1.05	1.40	6.78	9.23	6.1	9.2	37.5	52.8	5,864	6,550	5,525	5,719	26.5
1977	1.21	1.48	7.28	9.96	7.1	9.7	40.9	57.7	5,834	6,550	5,626	5,788	27.0
1978	1.12	1.60	7.95	10.68	6.8	10.8	45.6	63.2	6,039	6,747	5,740	5,923	25.6
1979	1.24	1.78	7.46	10.48	7.5	11.8	43.2	62.5	6,023	6,599	5,794	5,958	28.8
1980	1.60	1.97	8.34	11.92	9.3	13.7	46.9	69.9	5,787	6,974	5,625	5,870	30.0
1981	2.22	2.37	10.58	15.17	13.3	15.7	60.1	89.1	5,979	6,648	5,678	5,873	30.2
1982	2.58	2.28	11.62	16.48	15.0	16.0	64.7	95.7	5,792	7,034	5,569	5,806	29.5
1983[1]	2.09	1.89	9.91	13.89	10.7	11.6	49.9	72.2	5,114	6,130	5,040	5,199	28.7

[1] Preliminary.

Note: Sum of components may not equal total due to independent rounding. Average depth may not equal average of components due to independent rounding.

Note: For the period 1960 forward, data are for well completion reports received by the American Petroleum Institute during the reporting year.

Sources: •1949 through 1960—American Association of Petroleum Geologists, *Statistics on Exploratory Drilling in the United States, 1940 through 1960,* Tulsa, Oklahoma, 1962, pp. 4-19. •1961 through 1965 —*Bulletin of the American Association of Petroleum Geologists,* "North American Developments" issue, Tulsa, Oklahoma. •1966 through 1983—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States,* annual summaries and monthly reports.

Figure 31. Total Wells Drilled for Oil and Gas

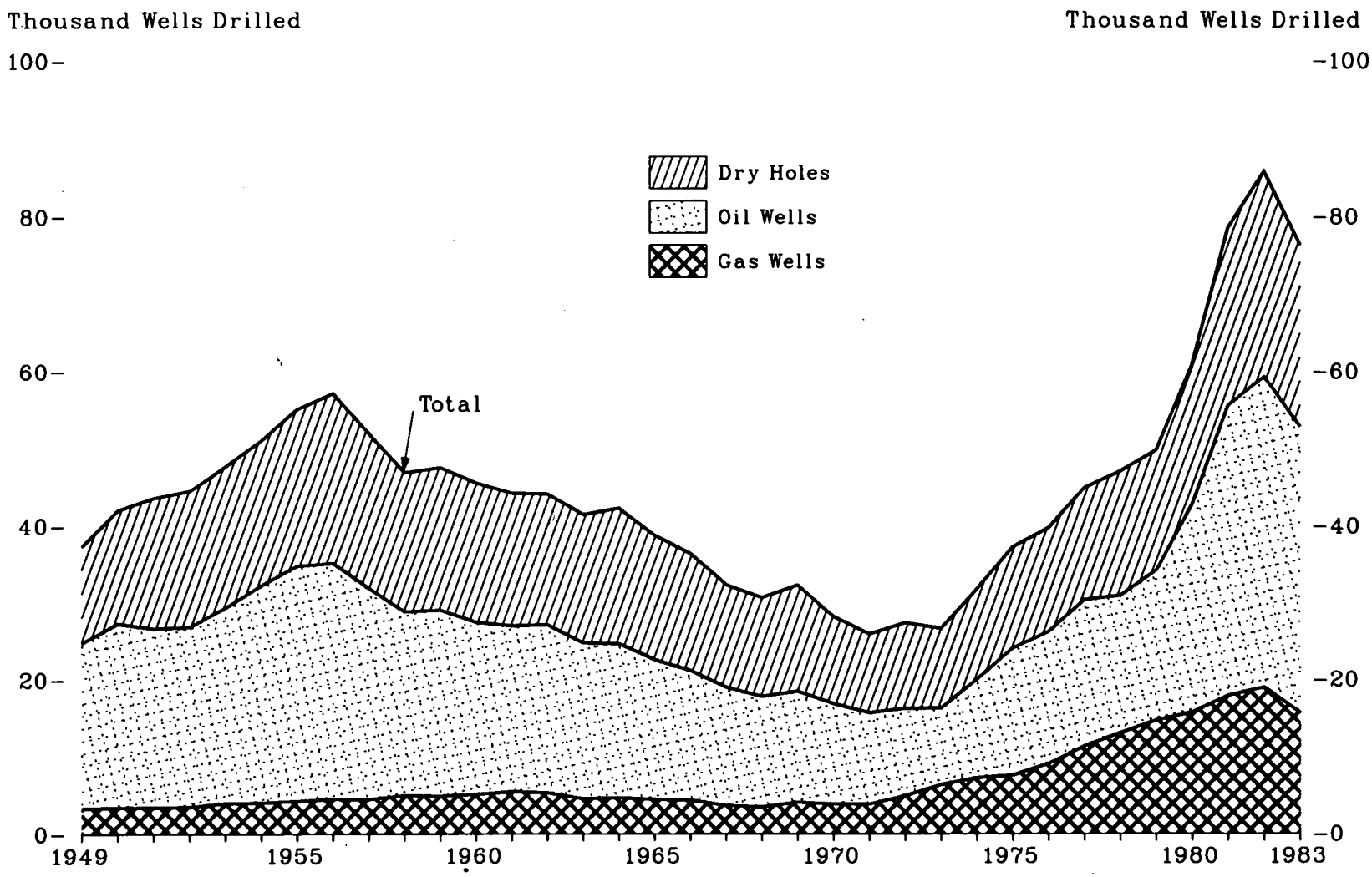


Table 30. Total Wells [1] Drilled for Oil and Gas, 1949-1983

Year	Wells Drilled (thousands)				Footage Drilled (million feet)				Average Depth (feet)				Successful Wells (percent)
	Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total	Oil	Gas	Dry Holes	Total	
1949	21.35	3.36	12.60	37.31	79.4	12.4	43.8	135.6	3,720	3,698	3,473	3,635	66.2
1950	23.81	3.44	14.80	42.05	92.7	13.7	51.0	157.4	3,893	3,979	3,445	3,742	64.8
1951	23.18	3.44	17.03	43.64	95.1	13.9	63.1	172.1	4,103	4,056	3,706	3,944	61.0
1952	23.29	3.51	17.76	44.56	98.1	15.3	70.7	184.1	4,214	4,342	3,983	4,132	60.1
1953	25.32	3.97	18.45	47.74	102.1	18.2	73.9	194.2	4,033	4,599	4,004	4,069	61.4
1954	28.14	4.04	18.93	51.11	113.4	18.9	75.8	208.0	4,028	4,670	4,004	4,070	63.0
1955	30.43	4.27	20.45	55.15	121.1	19.9	85.1	226.2	3,981	4,672	4,161	4,101	62.9
1956	30.53	4.53	22.11	57.17	120.4	22.7	90.2	233.3	3,942	5,018	4,079	4,080	61.3
1957	27.36	4.48	20.16	52.00	110.0	23.8	83.2	217.0	4,021	5,326	4,126	4,174	61.2
1958	23.77	5.00	18.16	46.94	93.1	25.6	74.6	193.3	3,916	5,106	4,110	4,118	61.3
1959	24.04	4.93	18.59	47.56	94.6	26.6	79.5	200.7	3,935	5,396	4,275	4,220	60.9
1960	22.26	5.15	18.21	45.62	86.6	28.2	77.4	192.2	3,889	5,486	4,248	4,213	60.1
1961	21.44	5.49	17.33	44.25	85.6	29.3	74.7	189.6	3,994	5,339	4,311	4,285	60.8
1962	21.73	5.35	17.08	44.16	88.4	28.9	77.3	194.6	4,070	5,408	4,524	4,408	61.3
1963	20.14	4.57	16.76	41.47	81.8	24.5	76.3	182.6	4,063	5,368	4,552	4,405	59.6
1964	19.90	4.69	17.69	42.29	80.5	25.6	81.4	187.4	4,042	5,453	4,598	4,431	58.2
1965	18.06	4.48	16.23	38.77	73.3	24.9	76.6	174.9	4,059	5,562	4,723	4,510	58.2
1966	16.78	4.38	15.23	36.38	67.3	25.9	69.6	162.9	4,013	5,928	4,573	4,478	58.1
1967	15.33	3.66	13.25	32.23	58.6	21.6	61.1	141.4	3,825	5,898	4,616	4,385	58.9
1968	14.33	3.46	12.81	30.60	59.5	20.7	64.7	145.0	4,153	5,994	5,053	4,738	58.1
1969	14.37	4.08	13.74	32.19	61.6	24.2	71.4	157.1	4,286	5,918	5,195	4,881	57.3
1970	13.02	3.84	11.26	28.12	57.1	22.9	59.3	139.3	4,385	5,961	5,265	4,953	60.0
1971	11.86	3.83	10.16	25.85	48.6	22.6	53.1	124.2	4,094	5,907	5,221	4,806	60.7
1972	11.31	4.93	11.06	27.29	48.5	26.8	59.3	134.6	4,293	5,431	5,363	4,932	59.5
1973	9.90	6.38	10.30	26.59	44.6	35.6	56.1	136.4	4,508	5,576	5,449	5,129	61.2
1974	12.78	7.24	11.67	31.70	50.2	39.0	61.4	150.6	3,927	5,385	5,256	4,750	63.2
1975	16.41	7.58	13.25	37.24	64.5	41.9	68.0	174.4	3,932	5,531	5,133	4,685	64.4
1976	17.06	9.08	13.62	39.76	66.7	47.5	67.6	181.8	3,910	5,229	4,961	4,571	65.7
1977	18.91	11.38	14.69	44.98	75.3	59.5	76.0	210.8	3,982	5,233	5,173	4,687	67.3
1978	17.78	13.06	16.22	47.06	72.5	70.2	84.4	227.1	4,081	5,373	5,203	4,826	65.5
1979	19.38	14.68	15.75	49.82	78.6	77.8	82.3	238.7	4,057	5,296	5,223	4,791	68.4
1980	27.03	15.73	18.09	60.84	109.5	85.0	89.9	284.5	4,053	5,406	4,969	4,675	70.3
1981	37.67	17.89	22.97	78.54	150.7	96.9	113.9	361.4	4,000	5,414	4,956	4,602	70.7
1982	40.30	18.95	26.54	85.80	159.4	107.2	129.4	396.0	3,955	5,657	4,875	4,616	69.1
1983[2]	37.21	15.63	23.49	76.33	135.9	83.2	106.6	325.8	3,653	5,325	4,538	4,268	69.2

[1] Includes exploratory and development wells; excludes service wells, stratigraphic tests, and core tests.
[2] Preliminary.
Note: Sum of components may not equal total due to independent rounding. Average depth may not equal average of components due to independent rounding.
Note: For the period 1960 forward, data are for well completion reports received by the American Petroleum Institute during the reporting year.
Sources: •1949 through 1965—*World Oil*, "Forecast-Review" issue, Houston, Texas. •1966 through 1983—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports.

Figure 32. Average Cost of Oil and Gas Wells Drilled

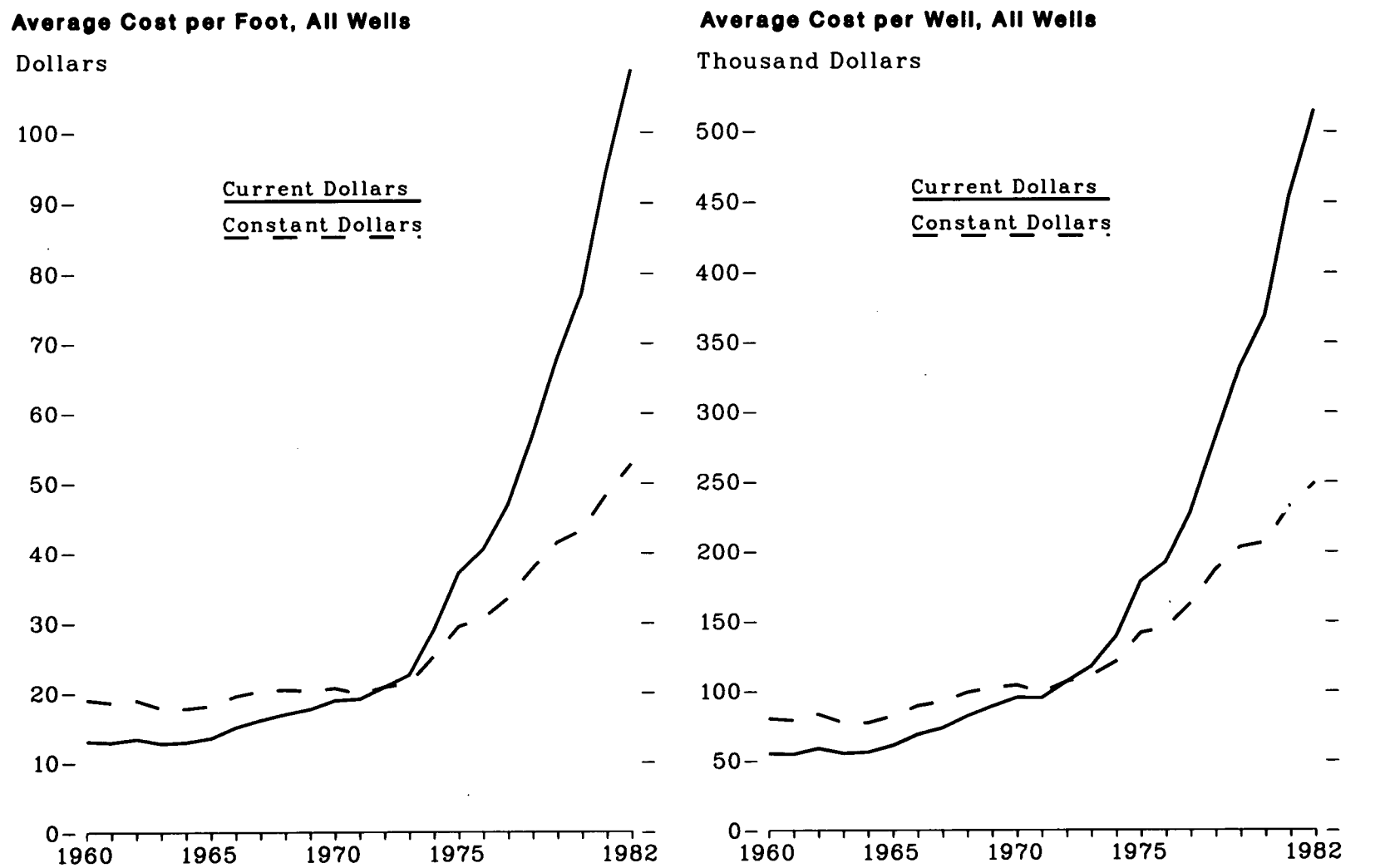


Table 31. Average Cost of Oil and Gas Wells Drilled, 1960-1982

Year	Average Cost per Well (thousand dollars)					Average Cost per Foot (dollars)				
	Oil	Gas	Dry Holes	All		Oil	Gas	Dry Holes	All	
	(current)	(current)	(current)	(current)	(constant)[1]	(current)	(current)	(current)	(current)	(constant)[1]
1960	52.2	102.7	44.0	54.9	80.0	13.22	18.57	10.56	13.01	18.94
1961	51.3	94.7	45.2	54.5	78.6	13.11	17.65	10.56	12.85	18.53
1962	54.2	97.1	50.8	58.6	83.0	13.41	18.10	11.20	13.31	18.85
1963	51.8	92.4	48.2	55.0	76.8	13.20	17.19	10.58	12.69	17.71
1964	50.6	104.8	48.5	55.8	76.7	13.12	18.57	10.64	12.86	17.67
1965	56.6	101.9	53.1	60.6	81.6	13.94	18.35	11.21	13.44	18.07
1966	62.2	133.8	56.9	68.4	89.1	15.04	21.75	12.34	14.95	19.48
1967	66.6	141.0	61.5	72.9	92.2	16.61	23.05	12.87	15.97	20.20
1968	79.1	148.5	66.2	81.5	98.7	18.63	24.05	12.88	16.83	20.39
1969	86.5	154.3	70.2	88.6	102.0	19.28	25.58	13.23	17.56	20.23
1970	86.7	160.7	80.9	94.9	103.8	19.29	26.75	15.21	18.84	20.60
1971	78.4	166.6	86.8	94.7	98.6	18.41	27.70	16.02	19.03	19.82
1972	93.5	157.8	94.9	106.4	106.4	20.77	27.78	17.28	20.76	20.76
1973	103.8	155.3	105.8	117.2	110.8	22.54	27.46	19.22	22.50	21.28
1974	110.2	189.2	141.7	138.7	120.5	27.82	34.11	26.76	28.93	25.14
1975	138.6	262.0	177.2	177.8	141.3	34.17	46.23	33.86	36.99	29.41
1976	151.1	270.4	190.3	191.6	144.8	37.35	49.78	36.94	40.46	30.57
1977	170.0	313.5	230.2	227.2	162.2	41.16	57.57	43.49	46.81	33.42
1978	208.0	374.2	281.7	280.0	186.1	49.72	68.37	52.55	56.63	37.65
1979	243.1	443.1	339.6	331.4	202.8	58.29	80.66	64.60	67.70	41.43
1980	272.1	536.4	376.5	367.7	206.1	66.36	95.16	73.70	77.02	43.17
1981	336.3	698.6	464.0	453.7	232.5	80.40	122.17	90.03	94.30	48.32
1982	347.4	864.3	515.4	514.4	248.6	86.34	146.20	104.09	108.73	52.56

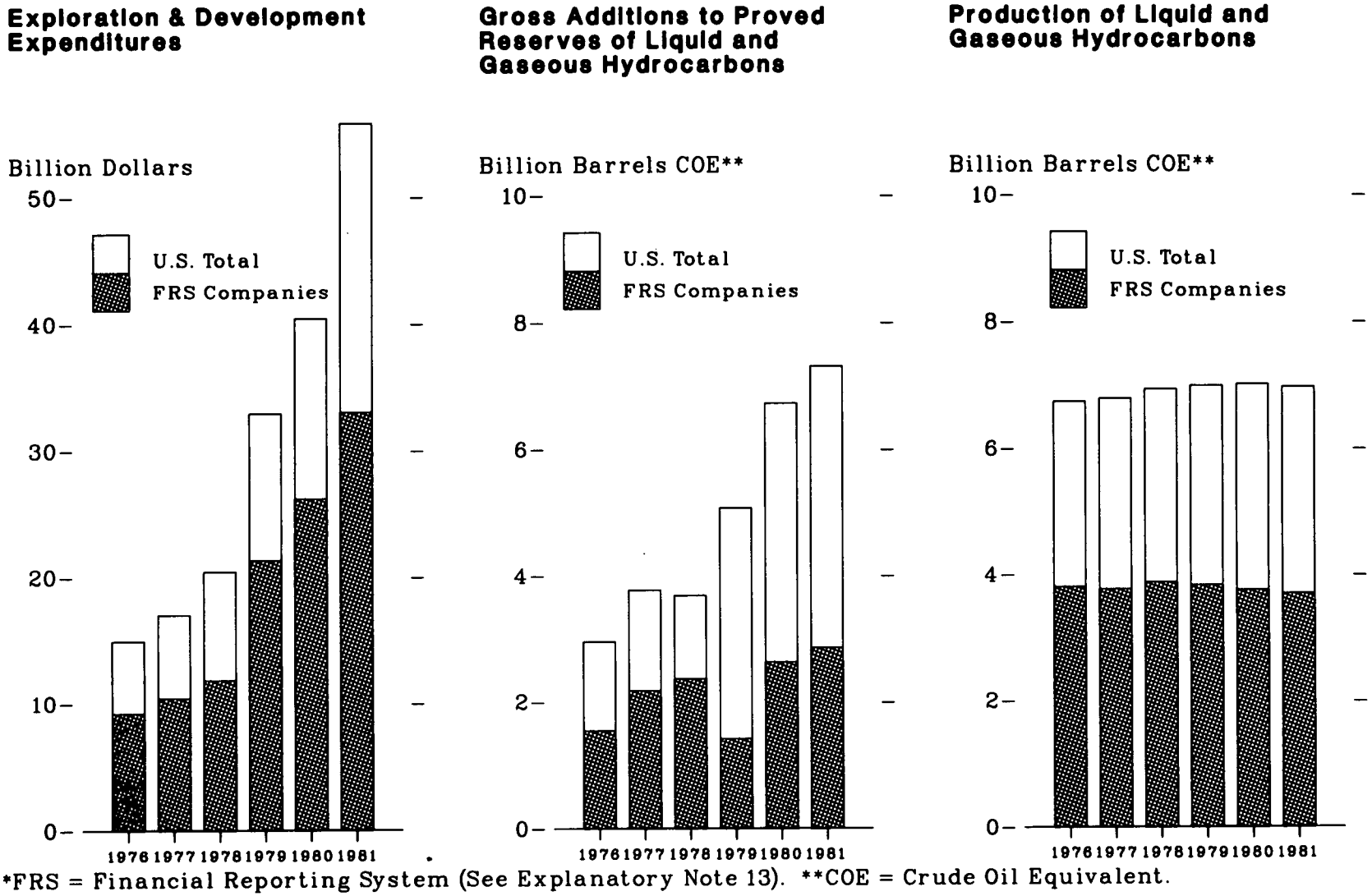
[1] Constant 1972 costs calculated using GNP implicit price deflators, 1972 = 100. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

Note: Average cost is the arithmetic mean and includes all costs for drilling and equipping wells and for surface producing facilities. Wells drilled include exploratory and development wells; excludes service wells, stratigraphic tests, and core tests.

Note: The information reported for 1965 and prior years is not strictly comparable with the more recent surveys.

Source: American Petroleum Institute, Independent Petroleum Association of America, Mid-Continent Oil and Gas Association, Washington, D.C., *Joint Association Survey of the U.S. Oil and Gas Producing Industry.*

Figure 33. Exploration and Development Expenditures, Gross Additions to Proved Reserves, and Production of Liquid and Gaseous Hydrocarbons by FRS* Companies



*FRS = Financial Reporting System (See Explanatory Note 13). **COE = Crude Oil Equivalent.

Table 32. Exploration and Development Expenditures, Gross Additions to Proved Reserves, and Production of Liquid and Gaseous Hydrocarbons by FRS [1] Companies, 1976-1981

	1976	1977	1978	1979	1980	1981
Exploration and Development Expenditures (Billion Dollars)						
FRS Companies	9.2	10.4	11.8	21.3	26.2	33.0
U.S. Total	14.9	17.0	20.4	32.9	40.4	55.7
Gross Additions to Proved Reserves [2] of Liquid and Gaseous Hydrocarbons [3] (Million Barrels COE [4])						
FRS Companies [5]	1,541.7	2,171.6	2,355.4	1,416.1	2,624.5	2,847.6
U.S. Total	2,946.6	3,765.3	3,678.9	5,071.3	6,723.1	7,303.6
Production of Liquid and Gaseous Hydrocarbons (Million Barrels COE [4])						
FRS Companies [5]	3,796.5	3,760.7	3,867.1	3,822.0	3,746.9	3,693.0
U.S. Total	6,729.5	6,776.6	6,918.0	6,969.9	6,995.3	6,954.4

[1] FRS = Financial Reporting System (See Explanatory Note 13).
[2] Gross additions to proved reserves equal annual change in proved reserves plus annual production.
[3] Liquid and gaseous hydrocarbons include crude oil, natural gas liquids, and natural gas.
[4] Crude oil equivalent: converted to Btu based on annual average conversion factors. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.
[5] Based on net ownership interest (See Glossary).

Sources: **FRS Companies:** Energy Information Administration, *Form EIA-28,* "Financial Reporting System." **U.S. Total, Exploration and Development Expenditures:** •1976 through 1981 - Bureau of the Census, *Annual Survey of Oil and Gas.* **U.S. Total, Gross Additions to Proved Reserves of Liquid and Gaseous Hydrocarbons:** •1976 through 1979 - American Gas Association, American Petroleum Institute, and Canadian Petroleum Association (published jointly), *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada as of December 31, 1979,* Volume 34, June 1980. • 1980 through 1981 - Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 1982 Annual Report.* **U.S. Total, Production of Liquid and Gaseous Hydrocarbons:** •1976 through 1981, see Tables 35 and 66.

Figure 34. Proved Reserves of Liquid and Gaseous Hydrocarbons, Year-End

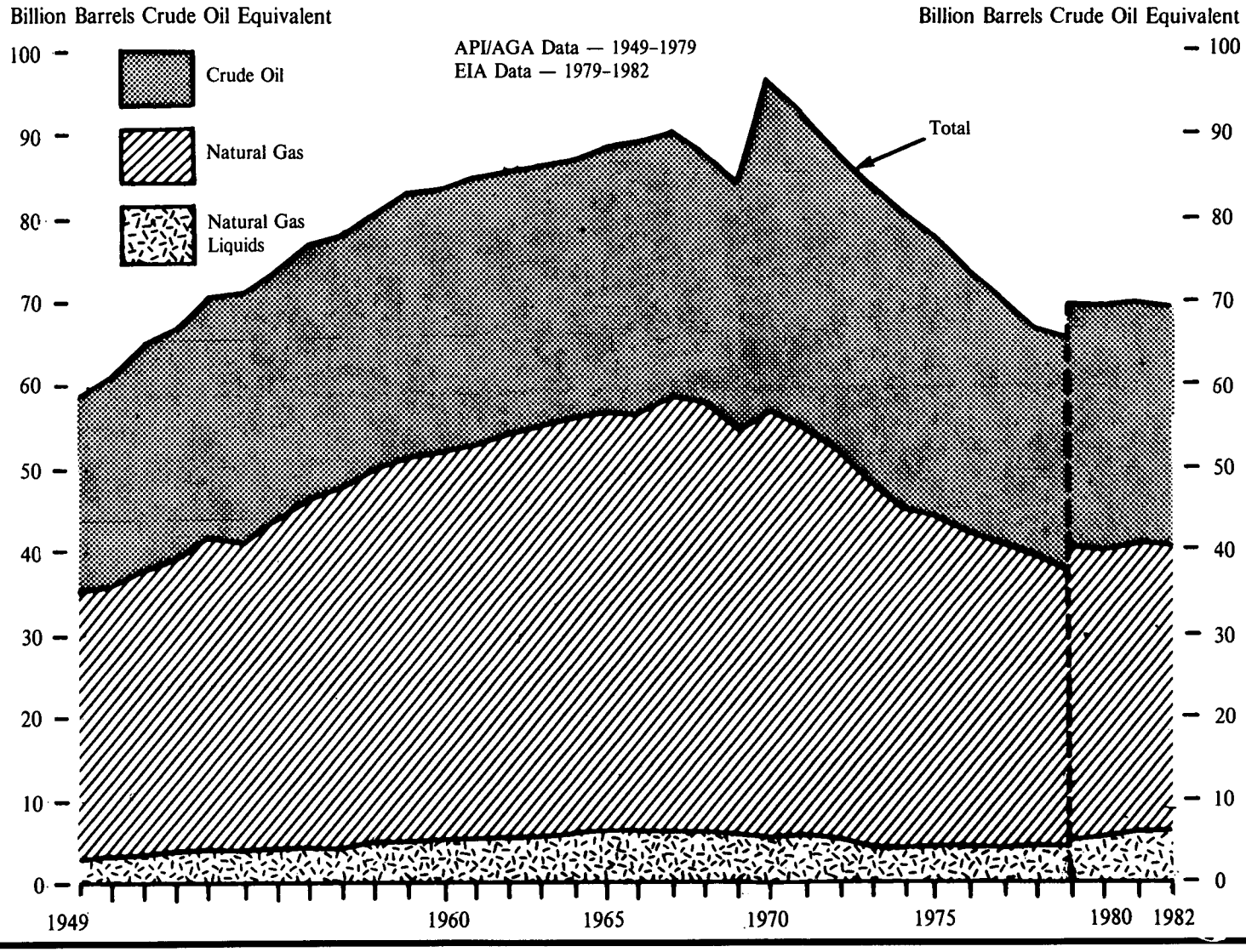


Table 33. Proved Reserves of Liquid and Gaseous Hydrocarbons, Year-End 1949-1982

Year	Crude Oil	Natural Gas		Natural Gas Liquids		Total
	Billion Barrels	Trillion Cubic Feet [1]	Billion Barrels COE [2]	Billion Barrels	Billion Barrels COE [2]	Billion Barrels COE
	American Petroleum Institute and American Gas Association Data					
1949	24.6	179.4	32.0	3.7	3.1	59.7
1950	25.3	184.6	32.9	4.3	3.5	61.7
1951	27.5	192.8	34.4	4.7	3.9	65.7
1952	28.0	198.6	35.4	5.0	4.1	67.5
1953	28.9	210.3	37.5	5.4	4.4	70.9
1954	29.6	210.6	37.6	5.2	4.2	71.3
1955	30.0	222.5	39.7	5.4	4.4	74.1
1956	30.4	236.5	42.2	5.9	4.7	77.3
1957	30.3	245.2	43.8	5.7	4.5	78.6
1958	30.5	252.8	45.1	6.2	5.0	80.6
1959	31.7	261.2	46.6	6.5	5.2	83.5
1960	31.6	262.3	46.8	6.8	5.4	83.8
1961	31.8	266.3	47.5	7.0	5.6	84.8
1962	31.4	272.3	48.6	7.3	5.8	85.7
1963	31.0	276.2	49.1	7.7	6.0	86.1
1964	31.0	281.3	50.0	7.7	6.1	87.1
1965	31.4	286.5	51.0	8.0	6.3	88.6
1966	31.5	289.3	51.5	8.3	6.5	89.5
1967	31.4	292.9	52.1	8.6	6.7	90.2
1968	30.7	287.3	51.1	8.6	6.7	88.5
1969	29.6	275.1	48.9	8.1	6.3	84.8
1970	39.0	290.7	51.7	7.7	5.9	96.6
1971	38.1	278.8	49.6	7.3	5.5	93.2
1972	36.3	266.1	47.1	6.8	5.1	88.5
1973	35.3	250.0	44.0	6.5	4.8	84.1
1974	34.2	237.1	41.9	6.4	4.7	80.8
1975	32.7	228.2	40.2	6.3	4.6	77.5
1976	30.9	216.0	38.0	6.4	4.7	73.6
1977	29.5	208.9	36.8	6.0	4.4	70.6
1978	27.8	200.3	35.2	5.9	4.3	67.3
1979	27.1	194.9	34.3	5.7	4.1	65.5
	Energy Information Administration Data					
1977	31.8	207.4	36.5	NA	NA	NA
1978	31.4	208.0	36.5	6.8	4.9	72.8
1979	29.8	201.0	35.4	6.6	4.8	70.0
1980	29.8	199.0	35.2	6.7	4.9	69.9
1981	29.4	201.7	35.7	7.1	5.2	70.3
1982	27.9	201.5	35.7	7.2	5.2	68.8

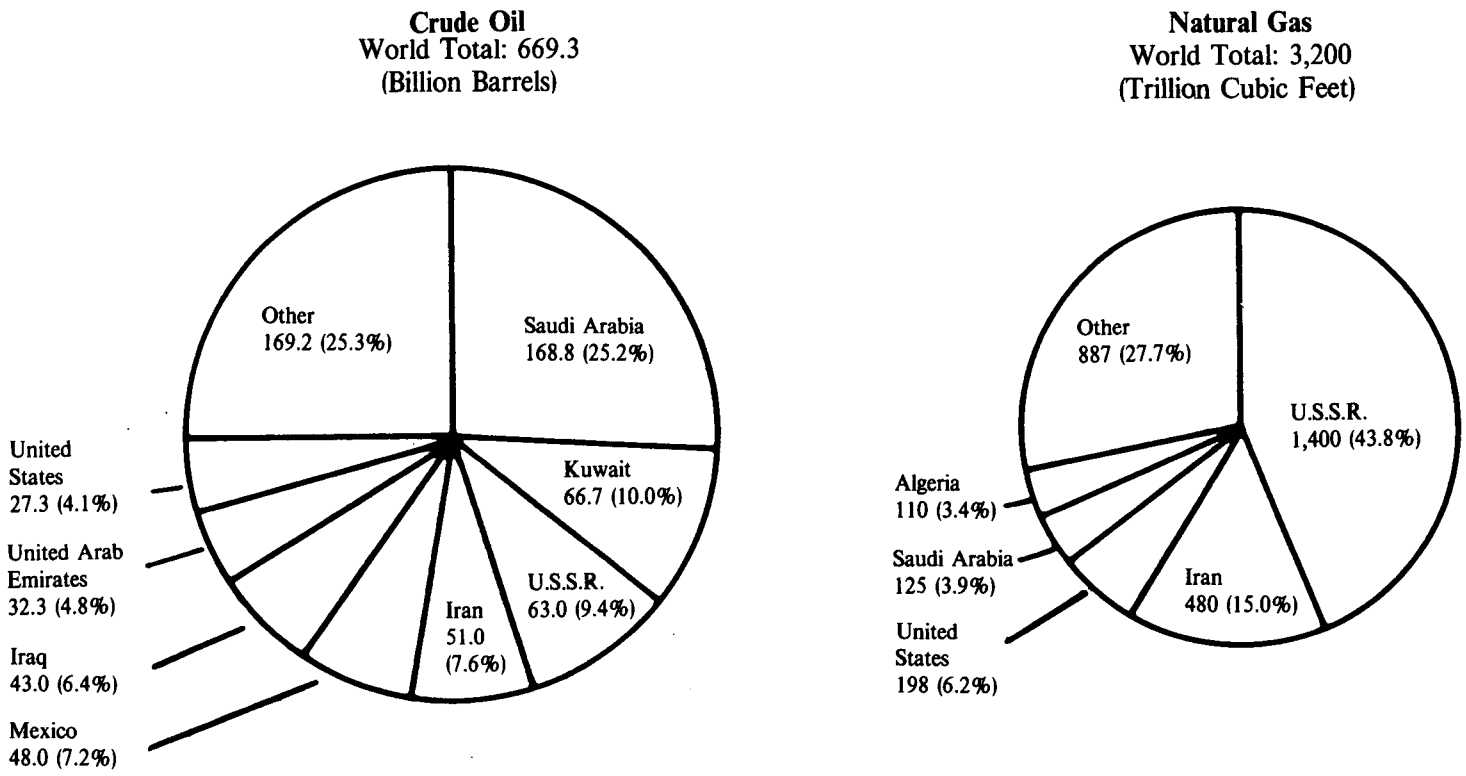
[1] The American Gas Association estimates of natural gas proved reserves include volumes of gas held in underground storage. In 1979 this volume amounted to 4.9 trillion cubic feet. Energy Information Administration data do not include gas in underground storage.

[2] Crude oil equivalent; converted to Btu based on annual average conversion factors. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

NA = Not available.

Sources: •**API/AGA Data**—American Gas Association, American Petroleum Institute, and Canadian Petroleum Association (published jointly). *Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the United States and Canada as of December 31, 1979.* Volume 34, June 1980. •**EIA Data**—Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 1982 Annual Report.*

Figure 35. Estimated International Crude Oil and Natural Gas Proved Reserves, December 31, 1983



Note: Quantities are scaled in proportion to area according to the Btu content of the reserves. 1 billion barrels of crude oil equals approximately 5.3 trillion cubic feet of wet natural gas.

Table 34. Estimated International Crude Oil and Natural Gas Proved Reserves, December 31, 1983

Area and Country	Crude Oil (billion barrels)	Natural Gas (trillion cubic feet)
North America		
Canada	6.7	91
Mexico	48.0	75
United States	27.3	198
Total	82.0	364
Central and South America		
Argentina	2.4	24
Bolivia	0.2	5
Brazil	1.8	3
Chile	0.7	2
Colombia	0.6	4
Ecuador	1.7	4
Peru	0.8	1
Trinidad and Tobago	0.6	13
Venezuela	24.9	55
Other	[2]	[3]
Total	33.7	111
Western Europe		
Denmark	0.3	3
Germany, West	0.3	7
Italy	0.8	4
Netherlands	0.3	50
Norway	7.7	59
United Kingdom	13.2	25
Other	0.8	10
Total	23.4	158
Eastern Europe and U.S.S.R.		
U.S.S.R.	63.0	1,400
Other	2.5	17
Total	65.5	1,417
Middle East		
Bahrain	0.2	7
Iran	51.0	480
Iraq	43.0	29
Kuwait [1]	66.7	35
Oman	2.8	3
Qatar	3.3	62
Saudi Arabia [1]	168.8	125
Syria	1.5	1
United Arab Emirates	32.3	31
Other	[2]	[3]
Total	369.7	774
Africa		
Algeria	9.2	110
Angola	1.7	2
Cameroon	0.5	4
Congo	0.4	2
Egypt	3.5	7
Gabon	0.5	1
Libya	21.3	21
Nigeria	16.6	35
Tunisia	1.8	4
Other	1.5	4
Total	56.9	190
Far East and Oceania		
Australia	1.6	18
Bangladesh	0	7
Brunei	1.4	7
China	19.1	30
India	3.5	15
Indonesia	9.1	30
Malaysia	3.0	48
New Zealand	0.2	6
Pakistan	0.1	16
Thailand	[2]	9
Other	0.1	2
Total	38.1	187
World Total	669.3	3,200

[1] Include one-half of the Partitioned Zone (formerly called Neutral Zone).
[2] Less than 0.05 billion barrels.
[3] Less than 0.05 trillion cubic feet.

Note: Sum of components may not equal total due to independent rounding. All reserve figures except those for the U.S.S.R. and natural gas reserves in Canada are proved reserves recoverable with present technology and prices. U.S.S.R. figures are "explored reserves," which include proved, probable, and some possible. The Canadian natural gas figure includes proved and some probable.

Source: *Oil and Gas Journal*, December 26, 1983. Petroleum Publishing Co., Tulsa, Oklahoma. The Energy Information Administration (EIA) does not necessarily subscribe to the *Oil and Gas Journal* data but reproduces it as a matter of convenience. The latest EIA data are for December 31, 1982, see Table 33.

Section 3. Petroleum Supply and Disposition

The first part of this section presents petroleum supply and distribution data in barrels, and the second part contains price and cost data. Although most petroleum consumed by individuals in the United States is purchased by the gallon, most petroleum accounting is generally measured in U.S. barrels. One barrel equals 42 U.S. gallons and is a somewhat smaller measure than the U.S. standard drum, which contains 55 U.S. gallons.

Production. U.S. crude oil (including lease condensate, the liquid condensed from natural gas at or near the surface of gas wells during production operations) is produced primarily in Texas, Alaska, Louisiana, and California, and their associated offshore areas. Crude oil production from an estimated 597 thousand oil wells averaged about 14.5 barrels per day per well during 1983 (see Table 36). Domestic crude oil (and lease condensate) production averaged 8.7 million barrels per day during 1983, essentially unchanged from the 1982 level (see Table 36). All of the slight increase occurred in offshore areas.

Consumption. Consumption (products supplied) of petroleum products declined 0.7 percent in 1983 to 15.2 million barrels per day, the lowest level since 1970. Reduced use of residual fuel oil, used primarily to produce steam at electric powerplants and industrial facilities, accounted for most of the decline; consumption fell 18 percent from 1.7 million barrels per day in 1982 to 1.4 million barrels per day in 1983. Between 1977 and 1983, residual fuel oil use declined at an average annual rate of 12.2 percent (see Table 45). The decline in petroleum use meant that fewer petroleum imports were required—imports fell about 2.4 percent to just under 5.0 million barrels per day in 1983 (see Table 38). Similarly, the decline in consumption caused some refiners to reduce throughput capacity. Total capacity fell by over 1 million barrels per day in 1983. As a result, refinery utilization rose to 76 percent from 74 percent in 1982 (see Table 43).

Stocks. At year-end 1983, crude oil stocks totaled 722 million barrels, a 12-percent increase over the 1982 year-end level (see Table 51). Most of the increase was in stocks held at the Strategic Petroleum Reserve (SPR—a U.S. Government program to hedge against supply disruptions). The 379 million barrels in SPR at year-end 1983 were equal to 124 days of non-SPR crude oil imports that year. This compares to SPR stocks equal to 88 days of crude oil imports in 1982 (see Table 52).

International Production. World production of crude oil decreased in 1983 to under 53 million barrels per day, 16 percent less than the all-time high of 63 million barrels per day in 1979 (see Table 54).

International Consumption. World consumption of petroleum decreased in 1980 and 1981 as the world recession and conservation continued to inhibit demand. Consumption fell 6.8 percent, from 65 million barrels per day in 1979 to 61 million barrels per day in 1981 (the latest data available). The major consumers were the United States, the U.S.S.R., Japan, West Germany, and France, which together accounted for 57 percent of consumption in 1981 (see Table 56).

Domestic Prices. U.S. average crude oil wellhead prices (in current dollars) increased each year from 1973 through 1981. Between 1979 and 1981, the increases were substantial, occurring at a rate of nearly $10.00 per barrel yearly. In 1982 and 1983, however, prices declined (see Table 58). Although the declines were relatively small, $3.25 and $2.45 per barrel in 1982 and 1983, respectively, they were significant in their impact on international crude oil export prices. Refiner acquisition cost of imported crude oil also declined. The 1983 price of $29.30 per barrel was down $7.75 per barrel (20.9 percent) from the 1981 price (see Table 60). These reductions in refiners' prices were reflected in the wholesale prices (excluding taxes) of most major refined petroleum products, which declined in the range of 6 to 16 percent (depending on the product) during this 2-year period (see Table 61). The retail price of motor gasoline (including taxes) fell 11.7 percent during the two years (see Table 62).

International Prices. The official prices of foreign crude oil fell substantially after 1980, as the result of decreases in demand. The official price for Saudi Arabian light, the benchmark crude, declined the least (9 percent from January 1, 1981, to January 1, 1984). For comparison, the official price for Libyan Es Sider crude fell 26 percent during the same period (see Table 63).

Figure 36. Petroleum Flow Diagram, 1983

Million Barrels per Day

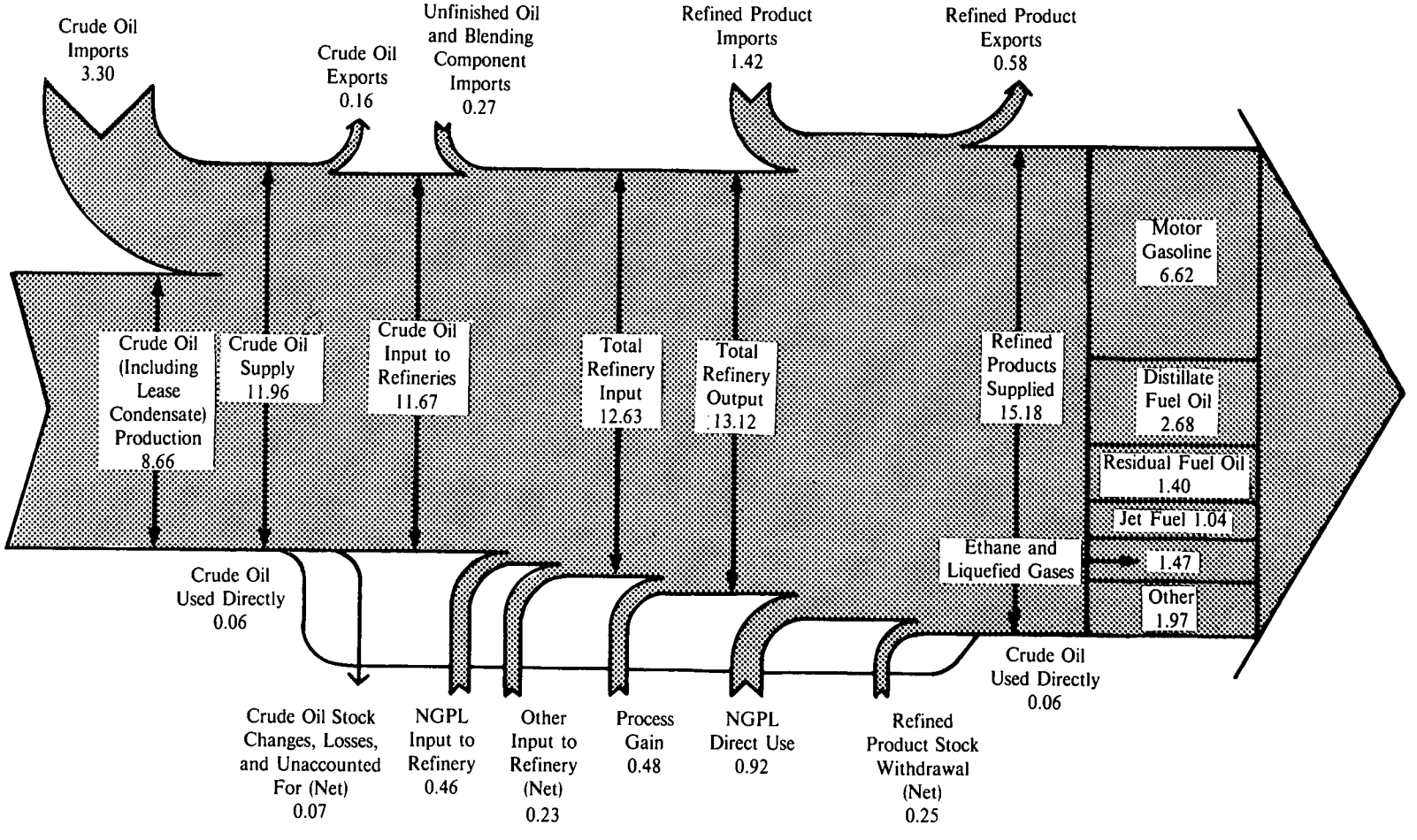


Figure 37. Petroleum Supply and Disposition

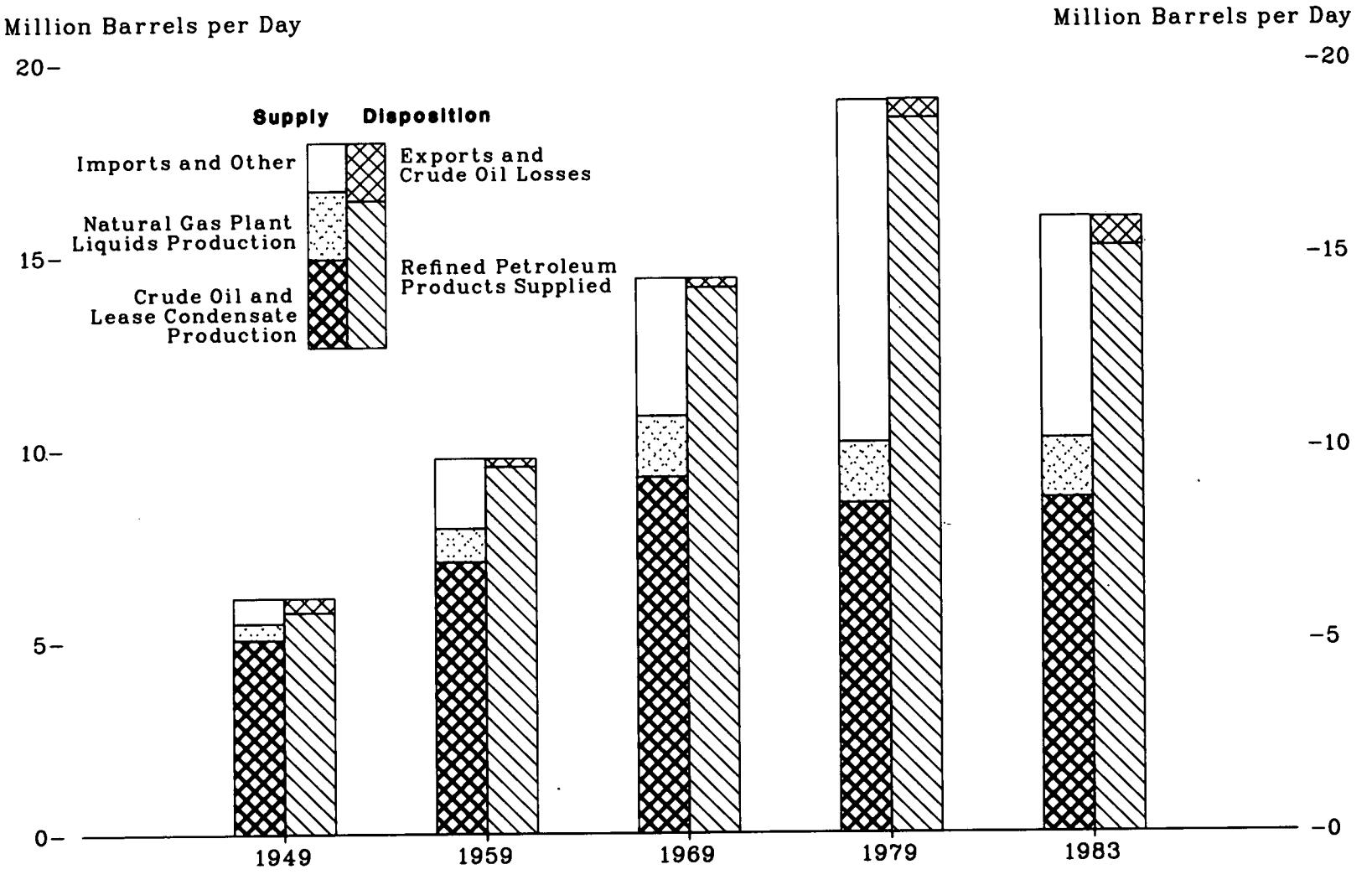


Table 35. Petroleum Supply and Disposition, 1949-1983

(Million Barrels per Day)

Year	Supply: Production: Crude Oil [1]	Supply: Production: Natural Gas Plant Liquids	Supply: Production: Total Production	Supply: Imports: Crude Oil [2]	Supply: Imports: Refined Products [3]	Supply: Imports: Total Imports	Supply: Change in Stocks [4]	Supply: Other Supply [5]	Supply: Total Supply	Disposition: Exports	Disposition: Crude Oil Losses	Disposition: Refined Petroleum Products Supplied	Disposition: Total Disposition	Net Trade [6]
1949	5.05	0.43	5.48	0.42	0.22	0.65	0.01	(7)	6.13	0.33	0.04	5.76	6.13	-0.32
1950	5.41	0.50	5.91	0.49	0.36	0.85	0.06	(7)	6.81	0.30	0.05	6.46	6.81	-0.55
1951	6.16	0.56	6.72	0.49	0.35	0.84	-0.10	0.01	7.47	0.42	0.03	7.02	7.47	-0.42
1952	6.26	0.61	6.87	0.57	0.38	0.95	-0.11	0.01	7.72	0.43	0.02	7.27	7.72	-0.52
1953	6.46	0.65	7.11	0.65	0.39	1.03	-0.14	0.02	8.02	0.40	0.02	7.60	8.02	-0.63
1954	6.34	0.69	7.03	0.66	0.40	1.05	0.03	0.02	8.14	0.36	0.03	7.76	8.14	-0.70
1955	6.81	0.77	7.58	0.78	0.47	1.25	(7)	0.04	8.86	0.37	0.04	8.46	8.86	-0.88
1956	7.15	0.80	7.95	0.93	0.50	1.44	-0.18	0.04	9.25	0.43	0.05	8.78	9.25	-1.01
1957	7.17	0.81	7.98	1.02	0.55	1.57	-0.17	0.04	9.43	0.57	0.05	8.81	9.43	-1.01
1958	6.71	0.81	7.52	0.95	0.75	1.70	0.14	0.06	9.42	0.28	0.03	9.12	9.42	-1.42
1959	7.05	0.88	7.93	0.97	0.81	1.78	-0.05	0.09	9.75	0.21	0.01	9.53	9.75	-1.57
1960	7.04	0.93	7.96	1.02	0.80	1.81	0.08	0.15	10.01	0.20	0.01	9.80	10.01	-1.61
1961	7.18	0.99	8.17	1.05	0.87	1.92	-0.11	0.18	10.16	0.17	0.01	9.98	10.16	-1.74
1962	7.33	1.02	8.35	1.13	0.96	2.08	-0.03	0.18	10.58	0.17	0.01	10.40	10.58	-1.91
1963	7.54	1.10	8.64	1.13	0.99	2.12	(7)	0.20	10.96	0.21	0.01	10.74	10.96	-1.91
1964	7.61	1.15	8.77	1.20	1.06	2.26	-0.01	0.22	11.23	0.20	0.01	11.02	11.23	-2.06
1965	7.80	1.21	9.01	1.24	1.23	2.47	0.01	0.22	11.71	0.19	0.01	11.51	11.71	-2.28
1966	8.30	1.28	9.58	1.22	1.35	2.57	-0.10	0.25	12.29	0.20	0.01	12.08	12.29	-2.37
1967	8.81	1.41	10.22	1.13	1.41	2.54	-0.17	0.29	12.88	0.31	0.01	12.56	12.88	-2.23
1968	9.10	1.50	10.60	1.29	1.55	2.84	-0.15	0.35	13.64	0.23	0.01	13.39	13.64	-2.61
1969	9.24	1.59	10.83	1.41	1.76	3.17	0.05	0.34	14.38	0.23	0.01	14.14	14.38	-2.93
1970	9.64	1.66	11.30	1.32	2.10	3.42	-0.10	0.35	14.97	0.26	0.01	14.70	14.97	-3.16
1971	9.46	1.69	11.16	1.68	2.25	3.93	-0.07	0.44	15.45	0.22	0.01	15.21	15.45	-3.70
1972	9.44	1.74	11.18	2.22	2.53	4.74	0.23	0.44	16.60	0.22	0.01	16.37	16.60	-4.52
1973	9.21	1.74	10.95	3.24	3.01	6.26	-0.14	0.49	17.55	0.23	0.01	17.31	17.55	-6.02
1974	8.77	1.69	10.46	3.48	2.64	6.11	-0.18	0.49	16.89	0.22	0.01	16.65	16.89	-5.89
1975	8.37	1.63	10.01	4.10	1.95	6.06	-0.03	0.51	16.54	0.21	0.01	16.32	16.54	-5.85
1976	8.13	1.60	9.74	5.29	2.03	7.31	0.06	0.59	17.70	0.22	0.01	17.46	17.70	-7.09
1977	8.24	1.62	9.86	6.61	2.19	8.81	-0.55	0.57	18.69	0.24	0.02	18.43	18.69	-8.56
1978	8.71	1.57	10.27	6.36	2.01	8.36	0.09	0.49	19.22	0.36	0.02	18.85	19.22	-8.00
1979	8.55	1.58	10.14	6.52	1.94	8.46	-0.15	0.56	19.00	0.47	0.02	18.51	19.00	-7.99
1980	8.60	1.57	10.17	5.26	1.65	6.91	-0.14	0.68	17.61	0.54	0.01	17.06	17.61	-6.36
1981	8.57	1.61	10.18	4.40	1.60	6.00	-0.16	0.64	16.66	0.59	(7)	16.06	16.66	-5.40
1982	8.65	1.55	10.20	3.49	1.63	5.11	0.15	0.65	16.11	0.82	(7)	15.30	16.11	-4.30
1983[8]	8.66	1.56	10.22	3.30	1.69	4.99	-0.02	0.74	15.92	0.74	(7)	15.18	15.92	-4.25

[1] Includes lease condensate.
[2] Includes imports for the Strategic Petroleum Reserve, which began in 1977.
[3] Includes plant condensate, natural gasoline, unfinished oils, motor gasoline blending components, and aviation gasoline blending components.
[4] Negative numbers denote a net addition to stocks or a reduction in supply. Positive numbers denote a net withdrawal from stocks or an addition to supply.
[5] Includes benzol, other hydrocarbons, hydrogen, alcohol, processing gains, and unaccounted for crude oil.
[6] Net trade = exports minus imports.
[7] Less than 5,000 barrels per day.
[8] Preliminary.

Note: Sum of components may not equal total due to independent rounding.

Sources: •1949 through 1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* •1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* •1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* •1983—Energy Information Administration, *Petroleum Supply Monthly.*

Figure 38. Crude Oil and Lease Condensate Production and Oil Well Productivity

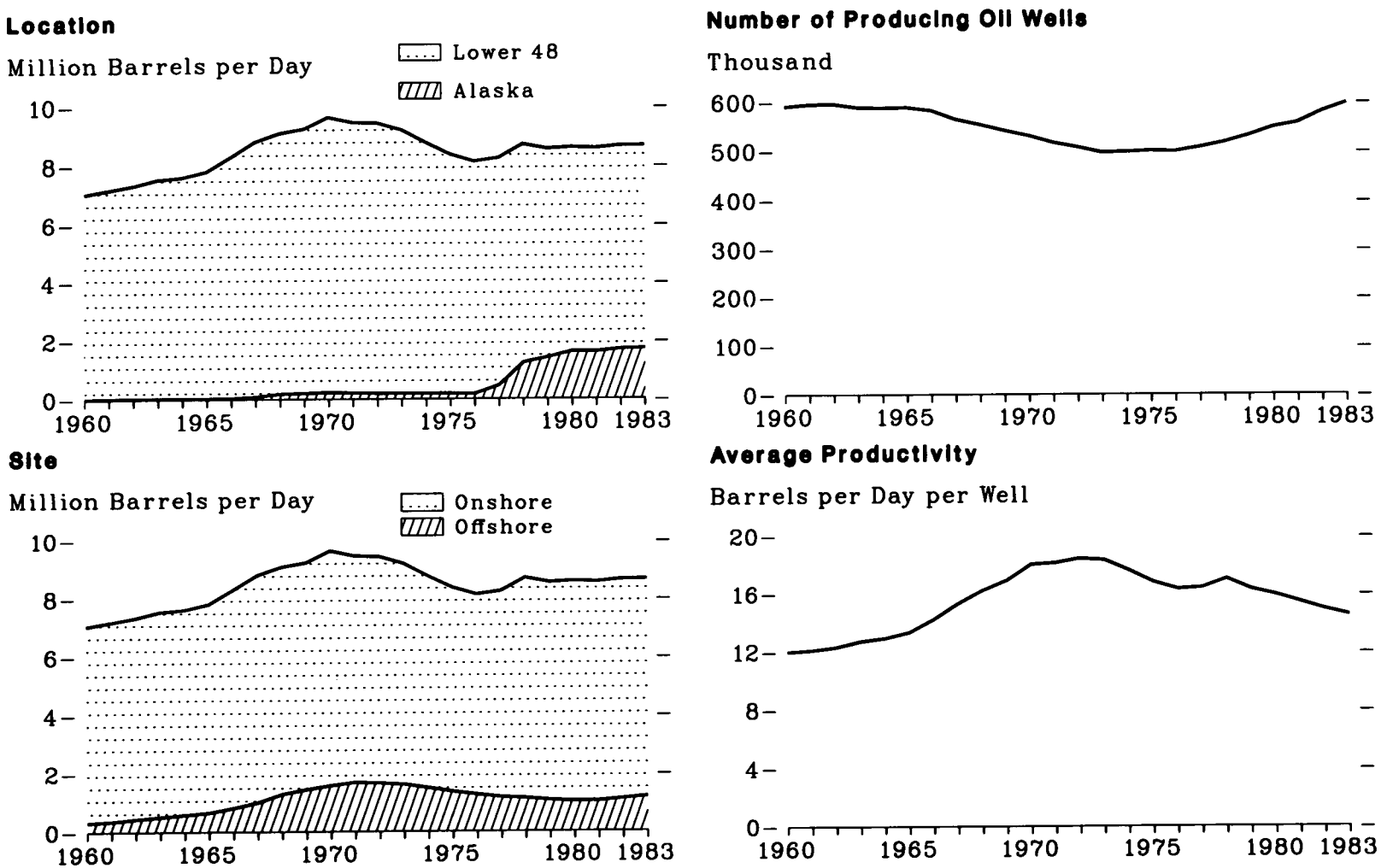


Table 36. Crude Oil and Lease Condensate Production and Oil Well Productivity, 1954-1983

(Thousand Barrels per Day, except as noted)

Year	Location		Site		Type			Oil Well Productivity	
	Lower 48	Alaska	Onshore	Offshore	Crude Oil	Lease Condensate	Total	Thousands of Producing Wells [1]	Average Productivity [2] (barrels per day per well)
1954	6,342	0	6,209	133	6,342	(3)	6,342	511	12.6
1955	6,807	0	6,645	162	6,807	(3)	6,807	524	13.2
1956	7,151	0	6,951	201	7,151	(3)	7,151	551	13.3
1957	7,170	0	6,940	229	7,170	(3)	7,170	569	12.8
1958	6,710	0	6,473	236	6,710	(3)	6,710	575	11.7
1959	7,053	1	6,779	274	7,054	(3)	7,054	583	12.2
1960	7,034	2	6,716	319	7,035	(3)	7,035	591	12.0
1961	7,166	17	6,817	365	7,183	(3)	7,183	595	12.1
1962	7,304	28	6,888	444	7,332	(3)	7,332	596	12.3
1963	7,512	29	7,026	515	7,542	(3)	7,542	589	12.7
1964	7,584	30	7,027	587	7,614	(3)	7,614	588	12.9
1965	7,774	30	7,140	665	7,804	(3)	7,804	589	13.3
1966	8,256	39	7,473	823	8,295	(3)	8,295	583	14.2
1967	8,730	80	7,802	1,009	8,810	(3)	8,810	565	15.3
1968	8,915	181	7,808	1,287	8,660	436	9,096	554	16.2
1969	9,035	203	7,797	1,441	8,778	460	9,238	542	16.9
1970	9,408	229	8,060	1,577	9,180	457	9,637	531	18.0
1971	9,245	218	7,779	1,684	9,032	431	9,463	517	18.1
1972	9,242	199	7,780	1,660	8,998	443	9,441	508	18.4
1973	9,010	198	7,592	1,616	8,784	424	9,208	497	18.3
1974	8,581	193	7,285	1,489	8,375	399	8,774	498	17.6
1975	8,183	191	7,012	1,362	8,007	367	8,375	500	16.8
1976	7,958	173	6,868	1,264	7,776	356	8,132	499	16.3
1977	7,781	464	7,069	1,176	7,875	370	8,245	507	16.4
1978	7,478	1,229	7,571	1,136	8,353	355	8,707	517	17.0
1979	7,151	1,401	7,485	1,067	8,181	371	8,552	531	16.3
1980	6,980	1,617	7,562	1,034	8,210	386	8,597	548	15.9
1981	6,962	1,609	7,537	1,034	8,176	395	8,572	557	15.4
1982	6,953	1,696	7,538	1,110	8,261	387	8,649	580	14.9
1983[4]	6,941	1,715	7,473	1,183	8,656	(3)	8,656	597	14.5

[1] As of December 31.

[2] For 1954 through 1976, average productivity is based on the average number of producing wells. For 1977 forward, average productivity is based on the number of wells producing at year end.

[3] Included in crude oil.

[4] Preliminary.

Note: Sum of components may not equal total due to independent rounding.

Sources: **Offshore:** •1954 through 1969—U.S. Geological Survey, *Outer Continental Shelf Statistics*, June 1979, p. 98. •1970 through 1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* •1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* •1981—Energy Information Administration, *Petroleum Supply Annual.* •1982—Energy Information Administration, *Petroleum Supply Monthly* and *Weekly Petroleum Status Report.* **Oil Well Productivity:** •1954 through 1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. •1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* •1981 and 1982—Independent Petroleum Association of America, *The Oil Producing Industry in Your State.* •1983—Energy Information Administration, estimate. **All Other Data:** •1954 through 1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* •1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* •1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* •1983—Energy Information Administration, *Petroleum Supply Monthly.*

Figure 39. Imports of Refined Petroleum Products

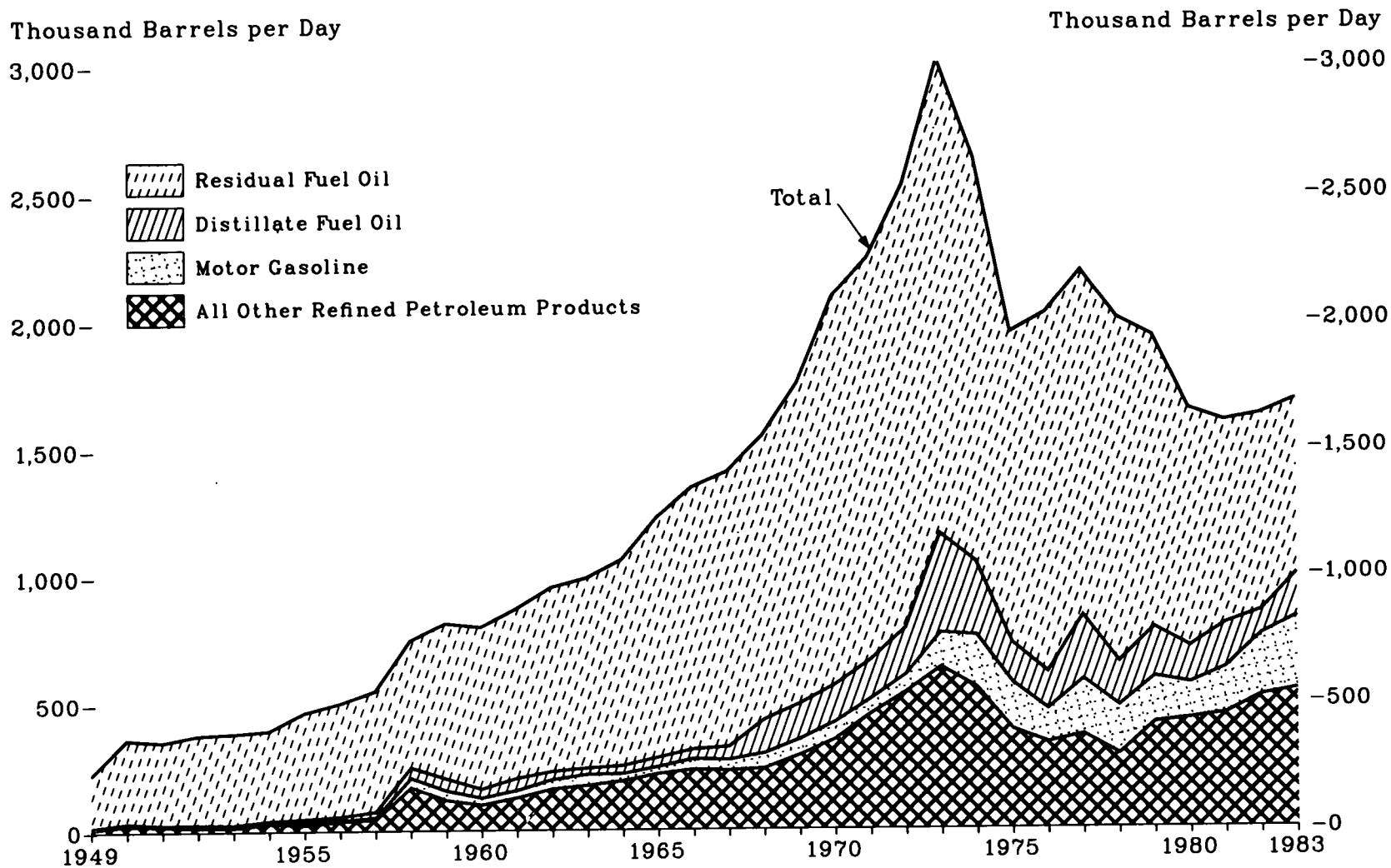


Table 37. Imports[1] of Refined Petroleum Products, 1949-1983

(Thousand Barrels per Day)

Year	Motor Gasoline [2]	Jet Fuel [3]	Distillate Fuel Oil	Residual Fuel Oil	Liquefied Gases [4]	Unfinished Oils	Other Products [5]	Total
1949	0	NA	5	206	0	10	3	224
1950		NA	7	329	0	21	6	363
1951	1	NA	5	326	0	14	7	354
1952	5	NA	7	351	0	9	7	380
1953	1	NA	9	360	0	9	7	386
1954	3	NA	9	354	0	21	9	396
1955	13	NA	12	417	0	15	9	466
1956	5	21	14	445	0	7	10	502
1957	8	25	23	475	0	3	18	552
1958	38	57	41	499	0	92	21	747
1959	37	37	48	610	0	63	19	814
1960	27	34	35	637	4	45	17	799
1961	29	28	48	666	5	69	26	872
1962	38	30	32	724	6	89	36	955
1963	44	41	25	747	7	87	41	992
1964	29	33	32	808	11	89	58	1,060
1965	28	81	36	946	21	92	27	1,229
1966	43	86	38	1,032	29	97	24	1,348
1967	42	89	51	1,085	27	97	20	1,409
1968	59	105	132	1,120	32	80	22	1,549
1969	62	125	139	1,265	35	106	25	1,757
1970	67	144	147	1,528	52	108	49	2,095
1971	59	180	153	1,583	70	124	76	2,245
1972	68	194	182	1,742	89	125	126	2,525
1973	134	212	392	1,853	132	137	152	3,012
1974	204	163	289	1,587	123	121	148	2,635
1975	184	133	155	1,223	112	36	108	1,951
1976	131	76	146	1,413	130	32	97	2,026
1977	217	75	250	1,359	161	31	99	2,193
1978	190	86	173	1,355	123	27	53	2,008
1979	181	78	193	1,151	217	59	58	1,937
1980	140	80	142	939	216	55	76	1,646
1981	181	38	173	800	244	112	52	1,599
1982	239	29	93	776	226	174	88	1,625
1983[6]	284	26	169	689	190	233	94	1,686

[1] Includes imports from U.S. possessions and territories.
[2] Includes motor gasoline blending components. Prior to 1964, motor gasoline data were for total gasoline, including motor gasoline, aviation gasoline, and special naphtha.
[3] Prior to 1965, imports of kerosene-type jet fuel were included with kerosene, which is listed under "Other Products."
[4] Includes ethane after 1977.
[5] Includes aviation gasoline, kerosene, petrochemical feedstocks, special naphthas, lubricants, wax, asphalt, natural gasoline, unfractionated stream, plant condensate, aviation gasoline blending components, and miscellaneous products.
[6] Preliminary.
NA = Not available.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 through 1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* •1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* •1983—Energy Information Administration, *Petroleum Supply Monthly.*

Figure 40. Imports of Petroleum by Country of Origin

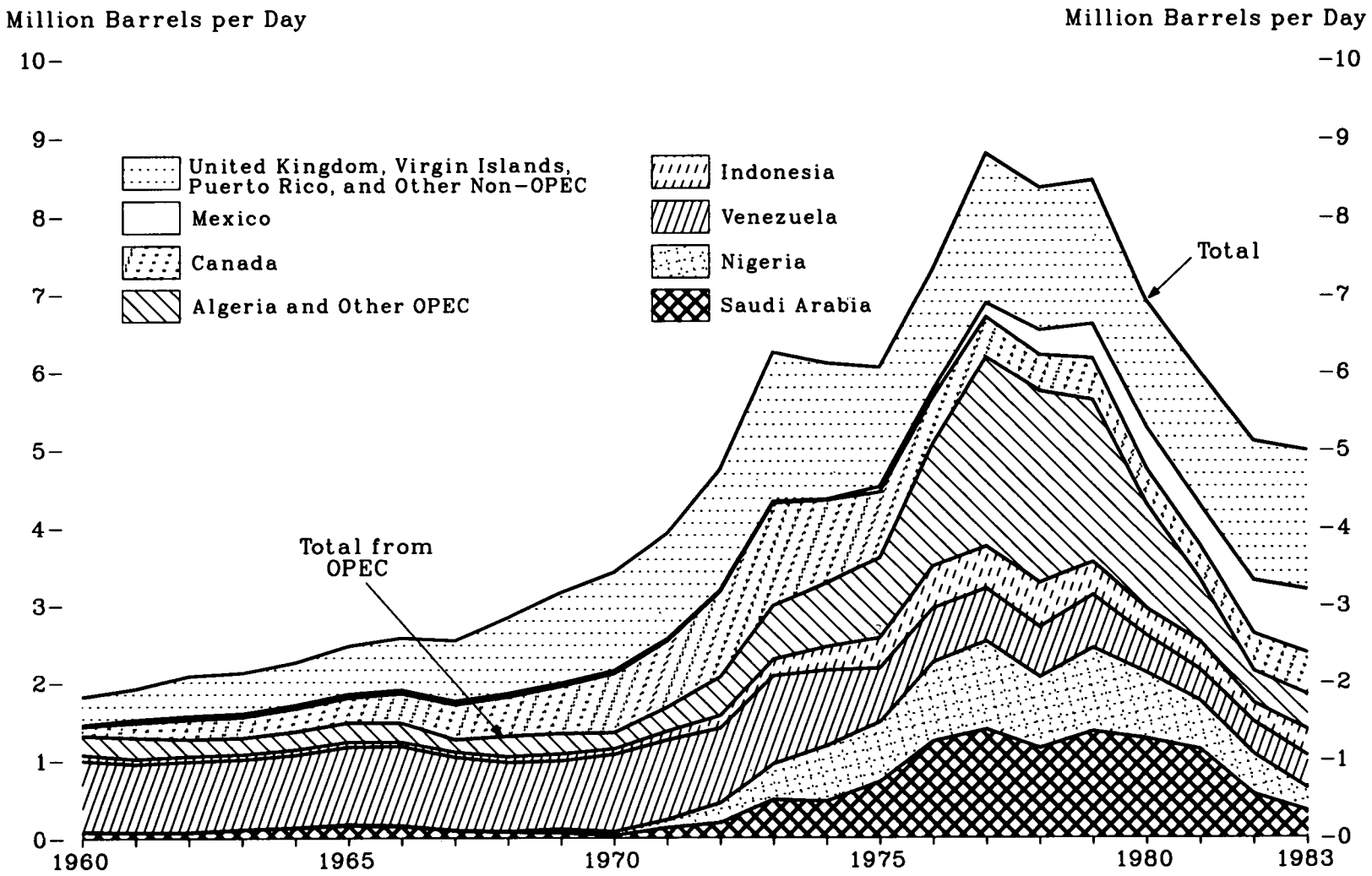


Table 38. Imports of Petroleum by Country of Origin, 1960-1983

(Thousand Barrels per Day)

Year	Organization of Petroleum Exporting Countries (OPEC) [1]													
	Algeria	Indonesia	Nigeria	Saudi Arabia	Venezuela	Other OPEC [2]	Total OPEC [3]	Arab Members of OPEC [4]	Canada	Mexico	United Kingdom	Virgin Is. and Puerto Rico	Other Non-OPEC	Total
1960	1	77	0	84	911	241	1,314	292	120	16	(5)	36	328	1,815
1961	0	62	0	73	879	272	1,286	284	190	40	1	44	357	1,917
1962	0	69	0	74	906	216	1,265	241	250	49	2	41	475	2,082
1963	1	63	0	108	900	211	1,283	258	265	48	3	44	480	2,123
1964	6	68	0	131	933	223	1,361	293	299	47	(5)	47	505	2,259
1965	9	63	15	158	994	237	1,476	324	323	48	(5)	47	574	2,468
1966	4	53	11	147	1,018	238	1,471	300	384	45	6	61	606	2,573
1967	5	66	5	92	938	153	1,259	177	450	49	11	96	673	2,537
1968	6	73	9	74	886	255	1,302	272	506	45	28	145	814	2,840
1969	2	88	49	65	875	256	1,336	276	608	43	20	189	971	3,166
1970	8	70	50	30	989	197	1,343	196	766	42	11	271	985	3,419
1971	15	111	102	128	1,020	296	1,673	327	857	27	10	368	991	3,926
1972	92	164	251	190	959	406	2,063	530	1,108	21	9	432	1,108	4,741
1973	136	213	459	486	1,135	564	2,993	915	1,325	16	15	429	1,479	6,256
1974	190	300	713	461	979	635	3,280	752	1,070	8	8	481	1,265	6,112
1975	282	390	762	715	702	750	3,601	1,383	846	71	14	496	1,026	6,056
1976	432	539	1,025	1,230	700	1,140	5,066	2,424	599	87	31	510	1,019	7,313
1977	559	541	1,143	1,380	690	1,880	6,193	3,185	517	179	126	571	1,221	8,807
1978	649	573	919	1,144	645	1,821	5,751	2,963	467	318	180	522	1,126	8,363
1979	636	420	1,080	1,356	690	1,456	5,637	3,056	538	439	202	523	1,116	8,456
1980	488	348	857	1,261	481	865	4,300	2,551	455	533	176	476	969	6,909
1981	311	366	620	1,129	406	491	3,323	1,848	447	522	375	389	939	5,996
1982	170	248	514	552	412	250	2,146	854	482	685	456	366	979	5,113
1983[6]	235	335	294	336	414	218	1,832	625	542	822	381	323	1,088	4,988

[1] See Glossary for membership.
[2] Includes Ecuador, Gabon, Iran, Iraq, Kuwait, Libya, Qatar, and United Arab Emirates.
[3] Excludes petroleum imported into the United States indirectly from OPEC countries, primarily from Caribbean and West European refining areas, as petroleum products which were refined from crude oil produced in OPEC countries.
[4] Includes Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates.
[5] Less than 500 barrels per day.
[6] Preliminary.
Note: Data include imports for the Strategic Petroleum Reserve, which began in 1977.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1960 through 1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" Chapter. •1976 through 1980—Energy Information Administration, Energy Data Reports, *P.A.D. Districts Supply/Demand, Annual*. •1981 and 1982—Energy Information Administration, *Petroleum Supply Annual*. •1983—Energy Information Administration, *Petroleum Supply Monthly*.

Figure 41. Exports of Petroleum by Type

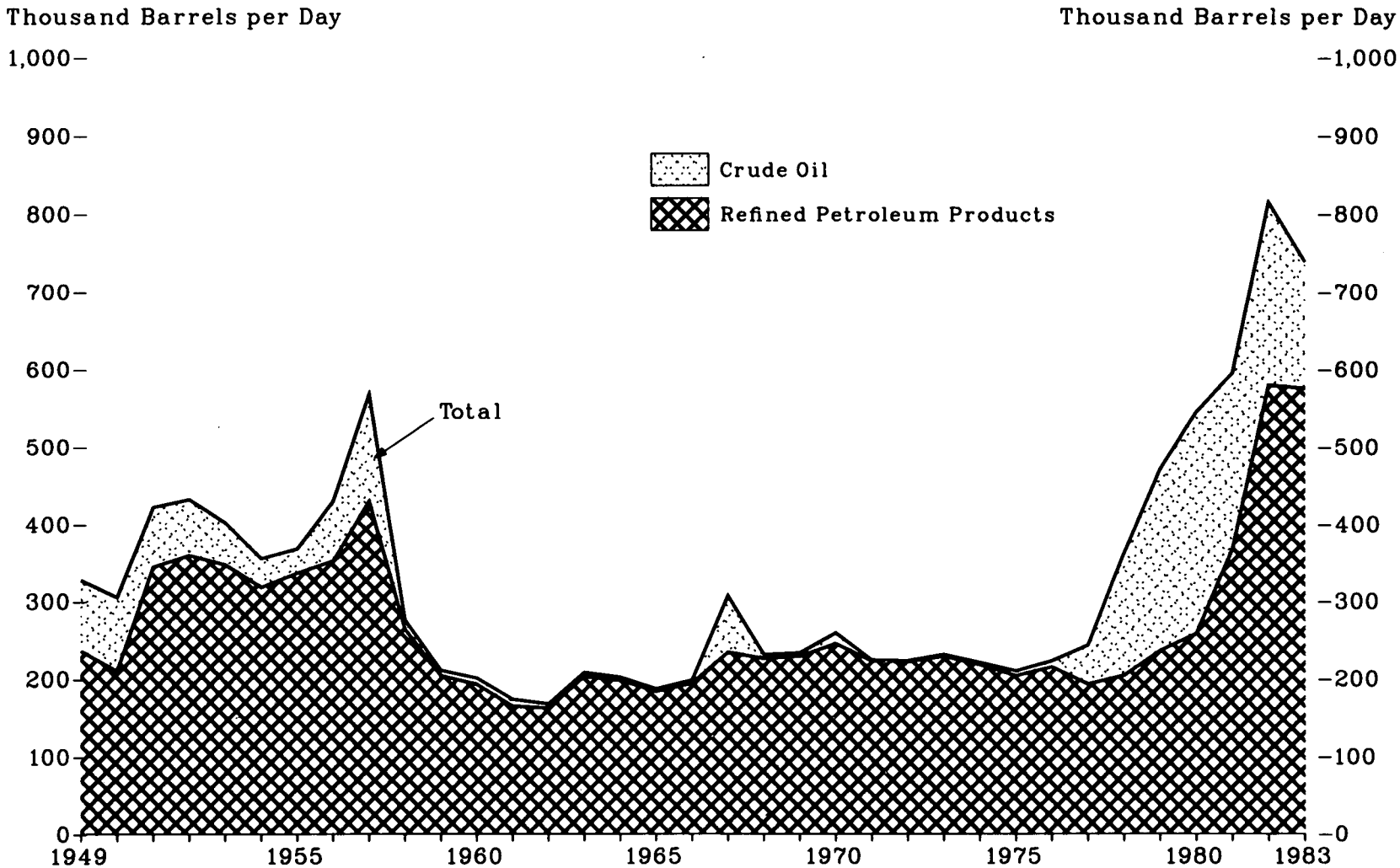


Table 39. Exports[1] of Petroleum by Type, 1949-1983

(Thousand Barrels per Day)

Year	Crude Oil	Refined Petroleum Products							Total Petroleum
		Liquefied Gases[2]	Residual Fuel Oil	Petrochemical Feedstocks	Lubricants	Petroleum Coke	Other Products[3]	Total Refined Products	
1949	91	4	35	0	35	7	156	236	327
1950	95	4	44	0	39	7	115	210	305
1951	78	6	79	0	48	12	199	344	422
1952	73	7	76	0	44	11	222	359	432
1953	55	8	71	0	36	10	222	347	402
1954	37	11	73	0	41	9	184	318	355
1955	32	12	93	0	39	12	180	336	368
1956	78	12	76	0	38	18	209	352	430
1957	138	12	106	0	38	14	260	430	568
1958	12	8	71	0	36	12	138	264	276
1959	7	6	57	0	38	13	90	204	211
1960	8	8	51	0	43	19	73	193	202
1961	9	10	38	0	47	20	50	165	174
1962	5	11	35	0	48	20	49	163	168
1963	5	13	42	0	50	29	69	203	208
1964	4	15	52	0	50	37	45	198	202
1965	3	21	41	5	45	32	40	184	187
1966	4	22	35	7	47	40	43	194	198
1967	73	25	60	8	51	45	45	234	307
1968	5	29	55	8	49	53	32	226	231
1969	4	35	46	11	45	63	29	229	233
1970	14	27	54	10	44	84	25	245	259
1971	1	26	36	14	43	74	29	223	224
1972	1	31	33	13	41	85	19	222	222
1973	2	27	23	19	35	96	29	229	231
1974	3	25	14	15	33	113	18	218	221
1975	6	26	15	22	25	102	14	204	209
1976	8	25	12	30	26	103	19	215	223
1977	50	18	6	24	26	102	15	193	243
1978	158	20	13	23	27	111	10	204	362
1979	235	15	9	31	23	146	12	236	471
1980	287	21	33	29	23	136	14	258	544
1981	228	42	118	26	19	138	24	367	595
1982	236	65	209	24	16	156	109	579	815
1983[4]	164	73	185	20	16	195	87	575	739

[1] Includes exports to U.S. possessions and territories.
[2] Includes ethane in 1981 forward.
[3] Includes aviation gasoline, motor gasoline, jet fuel, distillate fuel oil, kerosene, special naphthas, wax, asphalt, and miscellaneous products.
[4] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 through 1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* •1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* •1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* •1983—Energy Information Administration, *Petroleum Supply Monthly.*

Figure 42. Exports of Petroleum by Major Country of Destination

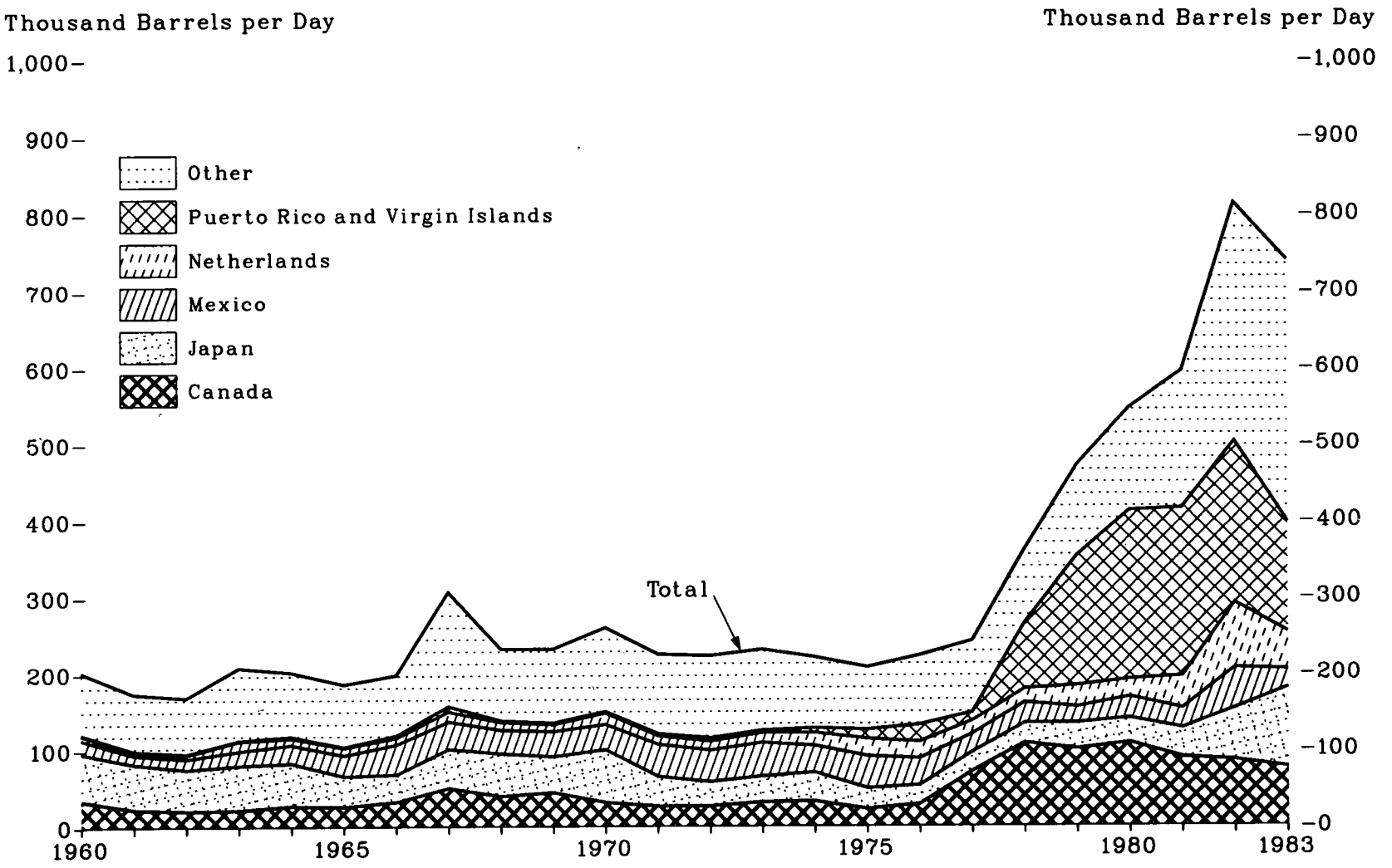


Table 40. Exports of Petroleum by Major Country of Destination, 1960-1983

(Thousand Barrels per Day)

Year	Canada	Japan	Mexico	Netherlands	Belgium[1]	Italy	United Kingdom	France	Brazil	Puerto Rico	Virgin Islands	Other	Total
1960	34	62	18	6	3	6	12	4	4	1	NA	52	202
1961	23	59	12	4	4	5	10	4	4	1	(2)	48	174
1962	21	54	14	5	3	5	8	3	5	1	(2)	50	168
1963	22	58	19	13	9	8	11	4	4	1	(2)	59	208
1964	27	56	24	9	4	8	10	4	4	1	1	55	202
1965	26	40	27	10	3	7	12	3	3	1	1	54	187
1966	32	36	39	9	3	7	12	4	4	3	(2)	49	198
1967	50	51	36	13	5	9	62	3	6	7	(2)	65	307
1968	39	56	31	10	4	8	14	4	8	2	(2)	55	231
1969	44	47	33	9	4	9	13	4	7	2	1	59	233
1970	31	69	33	15	5	10	12	5	7	1	(2)	71	259
1971	26	39	42	11	7	8	9	5	9	3	(2)	67	224
1972	26	32	41	12	13	9	10	5	9	3	(2)	63	222
1973	31	34	44	13	15	9	9	5	8	3	(2)	60	231
1974	32	38	35	17	13	9	6	4	9	4	2	52	221
1975	22	27	42	23	9	10	7	6	6	5	7	44	209
1976	28	25	35	22	12	10	13	6	7	21	1	43	223
1977	71	25	24	17	16	10	9	9	6	6	5	44	243
1978	108	26	27	18	15	10	7	9	8	44	42	47	362
1979	100	34	21	28	19	15	7	13	7	64	106	57	471
1980	108	32	28	23	20	14	7	11	4	86	134	79	544
1981	89	38	26	42	12	22	5	15	1	81	140	124	595
1982	85	68	53	85	17	32	14	24	8	95	116	216	815
1983[3]	76	104	24	49	22	35	8	23	2	33	111	251	739

[1] Including Luxembourg.
[2] Less than 500 barrels per day.
[3] Preliminary.
NA = Not available.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1960 through 1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* •1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* • 1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* •1983—Bureau of the Census, *U.S. Exports by Schedule B Commodities,* EM522; *Shipments of Merchandise from the United States to Puerto Rico, U.S. Virgin Islands, and Shipments from Puerto Rico to the United States,* EM594; and Energy Information Administration, *Petroleum Supply Monthly.*

Figure 43. Net Imports of Petroleum by Country of Origin

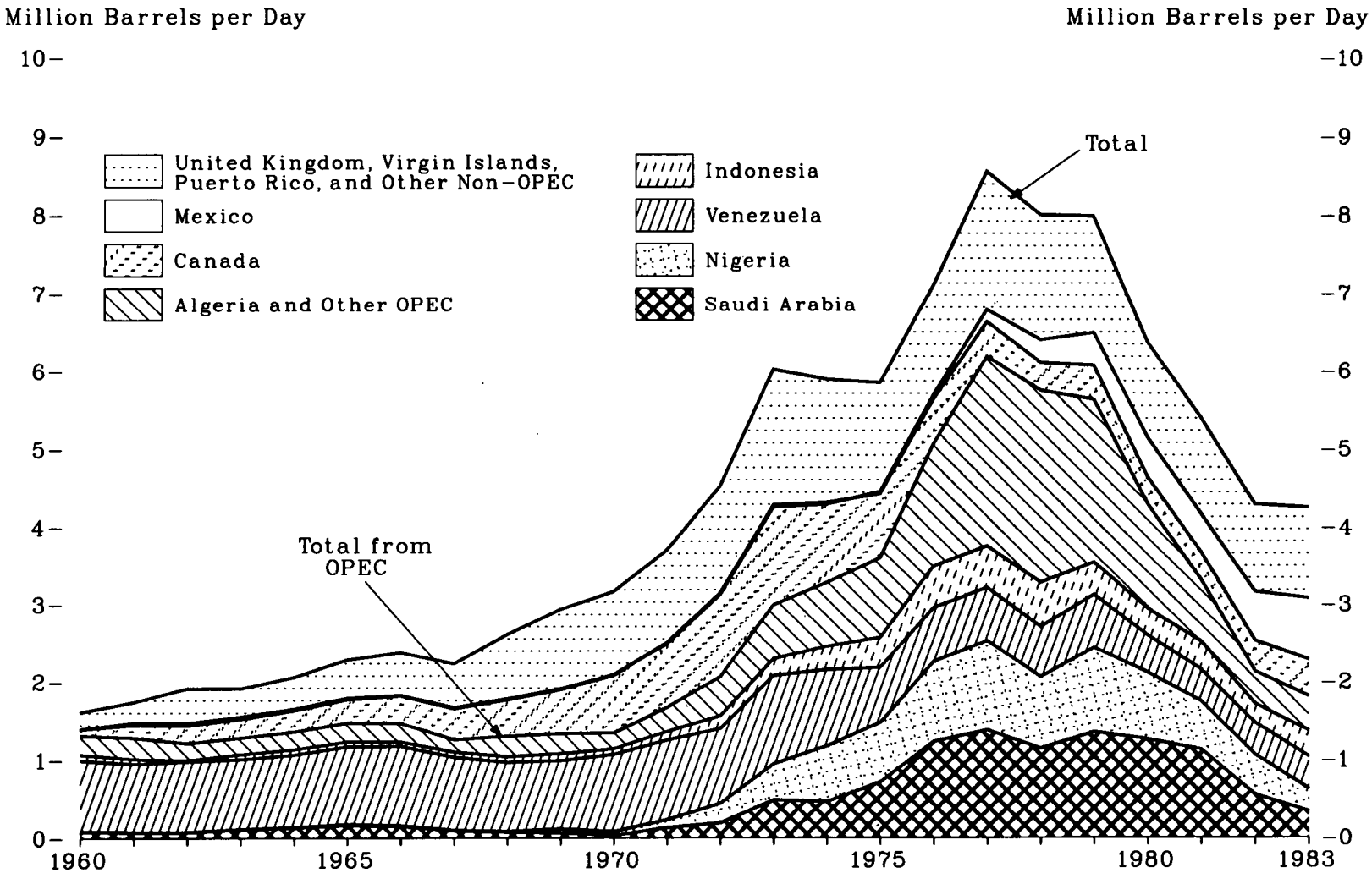


Table 41. Net Imports [1] of Petroleum by Country of Origin, 1960-1983

(Thousand Barrels per Day, except as shown)

Year	Organization of Petroleum Exporting Countries (OPEC)														U.S. Dependence on OPEC	
	Algeria	Indonesia	Nigeria	Saudi Arabia	Venezuela	Other OPEC [2]	Total OPEC	Arab Members of OPEC [3]	Canada	Mexico	United Kingdom	Virgin Is. and Puerto Rico	Other Non-OPEC	Total	Percent of Net Imports [4]	Percent of Consumption [5]
1960	1	75	0	84	910	241	1,311	292	86	-2	-12	34	195	1,613	81.3	13.4
1961	0	60	0	73	878	272	1,283	284	167	27	-10	42	232	1,743	73.6	12.9
1962	0	16	0	74	905	216	1,210	241	229	35	-6	40	405	1,913	63.3	11.6
1963	1	62	0	108	899	211	1,282	258	243	29	-7	43	325	1,915	67.0	11.9
1964	6	67	0	131	932	223	1,359	293	272	23	-9	45	368	2,057	66.1	12.3
1965	9	62	15	158	994	237	1,475	324	297	21	-11	45	454	2,281	64.7	12.8
1966	4	52	11	147	1,018	238	1,470	291	352	6	-6	58	494	2,375	61.9	12.2
1967	5	66	5	92	937	153	1,258	177	400	13	-51	89	521	2,230	56.4	10.0
1968	6	72	9	74	886	255	1,302	272	468	15	13	143	668	2,609	49.9	9.7
1969	2	88	49	65	875	256	1,336	276	564	10	7	186	831	2,933	45.5	9.4
1970	8	70	50	30	989	197	1,343	196	736	9	-1	270	804	3,161	42.5	9.1
1971	15	111	102	128	1,019	296	1,671	327	831	-14	1	365	848	3,701	45.2	11.0
1972	92	164	251	189	959	406	2,061	529	1,082	-20	-1	428	969	4,519	45.6	12.6
1973	136	213	459	485	1,134	564	2,991	914	1,294	-28	(6)	426	1,343	6,025	49.6	17.3
1974	190	300	713	461	978	635	3,277	752	1,038	-27	1	475	1,127	5,892	55.6	19.7
1975	282	389	762	714	702	750	3,599	1,382	824	29	7	484	904	5,846	61.6	22.0
1976	432	538	1,025	1,229	699	1,139	5,063	2,423	571	53	24	488	891	7,090	71.4	29.0
1977	559	541	1,143	1,379	689	1,879	6,190	3,184	446	155	117	560	1,097	8,565	72.3	33.6
1978	649	573	919	1,142	644	1,820	5,747	2,962	359	291	173	436	996	8,002	71.8	30.5
1979	636	420	1,080	1,354	688	1,455	5,633	3,054	438	418	196	353	948	7,985	70.5	30.4
1980	488	348	857	1,259	478	864	4,293	2,549	347	506	169	256	794	6,365	67.4	25.2
1981	311	365	620	1,128	403	489	3,315	1,844	358	497	370	169	693	5,401	61.4	20.6
1982	170	247	512	551	409	246	2,136	852	397	632	442	154	538	4,298	49.7	14.0
1983[7]	235	333	290	335	412	208	1,813	623	466	798	372	179	620	4,249	42.7	11.9

[1] Imports minus exports; negative numbers indicate that exports exceed imports.
[2] Includes Ecuador, Gabon, Iran, Iraq, Kuwait, Libya, Qatar, and United Arab Emirates.
[3] Includes Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates.
[4] Calculated by dividing net petroleum imports from OPEC countries by total net petroleum imports.
[5] Calculated by dividing net petroleum imports from OPEC countries by total U.S. petroleum product supplied (consumption).
[6] Less than 500 barrels per day.
[7] Preliminary.

Note: Data include imports for the Strategic Petroleum Reserve which began in 1977.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1960 through 1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. •1976 through 1980—Energy Information Administration, Energy Data Reports, *P.A.D. Districts Supply/Demand, Annual.* •1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* •1983—Energy Information Administration, *Petroleum Supply Monthly.*

Figure 44. Refinery Input and Output

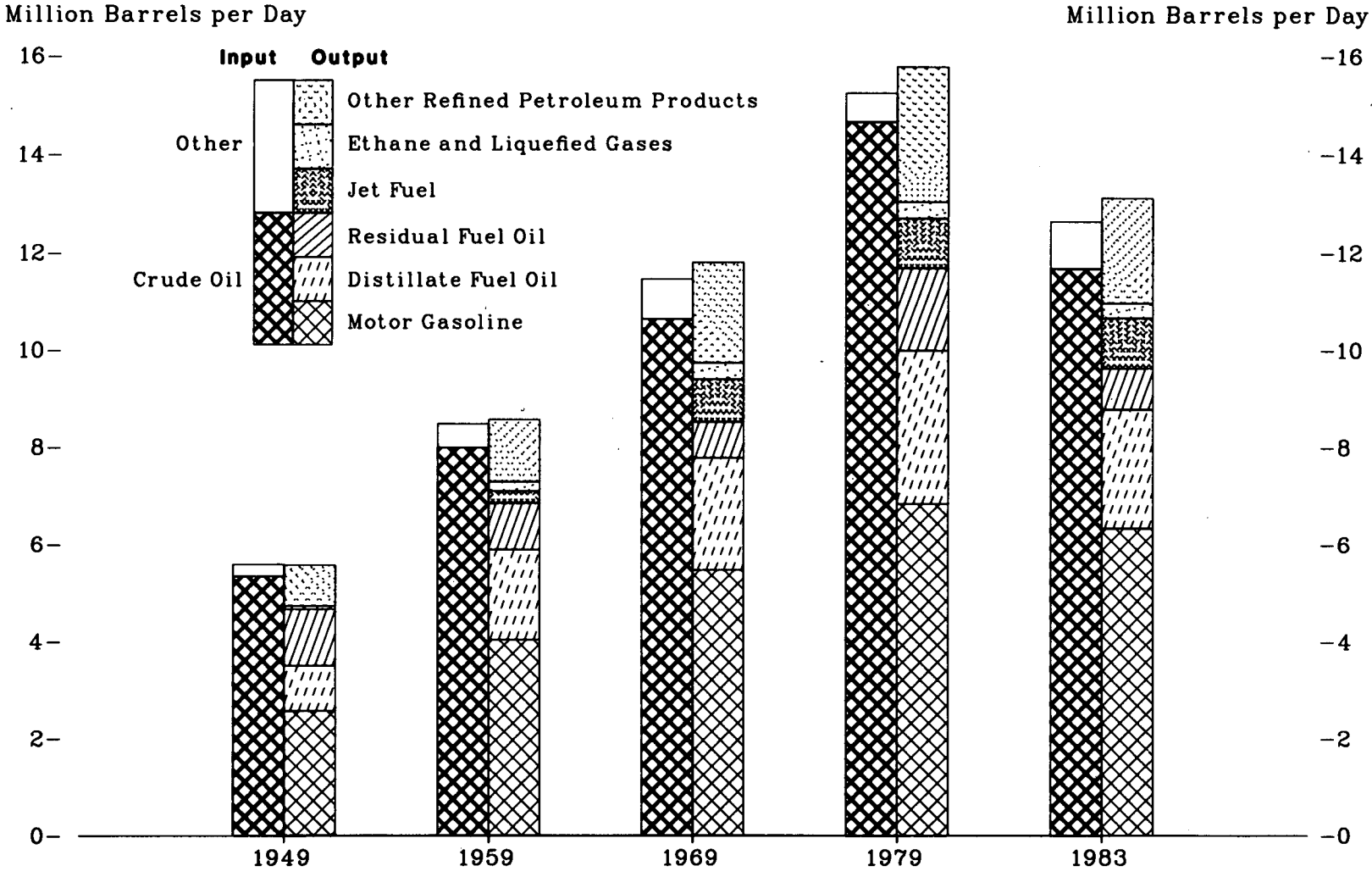


Table 42. Refinery Input and Output, 1949-1983

(Million Barrels per Day)

Year	Input				Output							Processing Gain or Loss
	Crude Oil	Natural Gas Plant Liquids	Other Liquids [1]	Total Input	Motor Gasoline [2]	Jet Fuel [2]	Distillate Fuel Oil	Residual Fuel Oil	Ethane and Liquefied Gases	Other Products [3]	Total Output	
1949	5.33	0.23	0.03	5.59	2.57	NA	0.93	1.16	0.06	0.85	5.59	(4)
1950	5.74	0.26	0.02	6.02	2.74	NA	1.09	1.16	0.08	0.95	6.02	(4)
1951	6.49	0.27	0.03	6.80	3.04	NA	1.30	1.29	0.09	1.09	6.80	0.01
1952	6.67	0.28	0.01	6.97	3.12	0.06	1.42	1.24	0.08	1.06	6.97	0.01
1953	7.00	0.30	(4)	7.31	3.38	0.10	1.45	1.23	0.09	1.08	7.33	0.02
1954	6.96	0.32	0.02	7.30	3.38	0.13	1.49	1.14	0.09	1.10	7.32	0.02
1955	7.48	0.34	0.03	7.86	3.65	0.16	1.65	1.15	0.12	1.17	7.89	0.03
1956	7.94	0.37	0.01	8.32	3.82	0.18	1.82	1.17	0.14	1.24	8.36	0.04
1957	7.92	0.41	(4)	8.33	3.88	0.17	1.83	1.14	0.15	1.20	8.37	0.04
1958	7.64	0.37	0.09	8.11	3.87	0.20	1.73	1.00	0.16	1.22	8.17	0.06
1959	7.99	0.42	0.07	8.48	4.04	0.25	1.86	0.95	0.19	1.28	8.57	0.09
1960	8.07	0.45	0.06	8.58	4.13	0.24	1.82	0.91	0.21	1.42	8.73	0.15
1961	8.18	0.46	0.06	8.71	4.15	0.26	1.91	0.86	0.22	1.49	8.89	0.18
1962	8.41	0.50	0.08	8.99	4.30	0.28	1.97	0.81	0.21	1.59	9.16	0.18
1963	8.69	0.52	0.09	9.30	4.39	0.27	2.09	0.76	0.26	1.72	9.50	0.20
1964	8.81	0.58	0.07	9.46	4.37	0.29	2.03	0.73	0.29	1.97	9.68	0.22
1965	9.04	0.62	0.09	9.75	4.51	0.52	2.10	0.74	0.29	1.81	9.97	0.22
1966	9.44	0.65	0.09	10.18	4.77	0.59	2.15	0.72	0.29	1.90	10.43	0.25
1967	9.82	0.67	0.09	10.58	4.94	0.75	2.20	0.76	0.31	1.92	10.87	0.29
1968	10.31	0.71	0.08	11.10	5.20	0.86	2.29	0.75	0.32	1.99	11.42	0.32
1969	10.63	0.72	0.11	11.46	5.47	0.88	2.32	0.73	0.34	2.06	11.79	0.34
1970	10.87	0.76	0.12	11.75	5.70	0.83	2.45	0.71	0.35	2.08	12.11	0.36
1971	11.20	0.78	0.14	12.12	5.97	0.83	2.50	0.75	0.36	2.09	12.50	0.38
1972	11.70	0.83	0.17	12.69	6.28	0.85	2.63	0.80	0.36	2.17	13.08	0.39
1973	12.43	0.82	0.15	13.40	6.53	0.86	2.82	0.97	0.37	2.30	13.85	0.45
1974	12.13	0.75	0.14	13.02	6.36	0.84	2.67	1.07	0.34	2.23	13.50	0.48
1975	12.44	0.71	0.07	13.23	6.52	0.87	2.65	1.24	0.31	2.10	13.68	0.46
1976	13.42	0.73	0.06	14.20	6.84	0.92	2.92	1.38	0.34	2.28	14.68	0.48
1977	14.60	0.67	0.07	15.35	7.03	0.97	3.28	1.75	0.35	2.49	15.87	0.52
1978	14.74	0.64	0.09	15.47	7.17	0.97	3.17	1.67	0.35	2.64	15.97	0.50
1979	14.65	0.51	0.08	15.24	6.84	1.01	3.15	1.69	0.34	2.74	15.76	0.53
1980	13.48	0.46	0.08	14.02	6.49	1.00	2.66	1.58	0.33	2.56	14.62	0.60
1981	12.47	0.52	0.49	13.48	6.40	0.97	2.61	1.32	0.31	2.37	13.99	0.51
1982	11.77	0.52	0.57	12.86	6.34	0.98	2.61	1.07	0.27	2.13	13.39	0.53
1983[5]	11.67	0.46	0.50	12.63	6.33	1.02	2.45	0.85	0.32	2.14	13.12	0.48

[1] Prior to 1981, includes unfinished oils (net), hydrogen, and hydrocarbons not included elsewhere. 1981 forward includes unfinished oils (net), motor gasoline blending components (net), aviation gasoline blending components (net), hydrogen, other hydrocarbons, and alcohol. See Explanatory Note 4.

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

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

[4] Less than 5,000 barrels per day.

[5] Preliminary.

Note: Sum of components may not equal total due to independent rounding.

Sources: •1949 through 1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* •1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* • 1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* •1983—Energy Information Administration, *Petroleum Supply Monthly.*

Figure 45. Refinery Capacity and Utilization

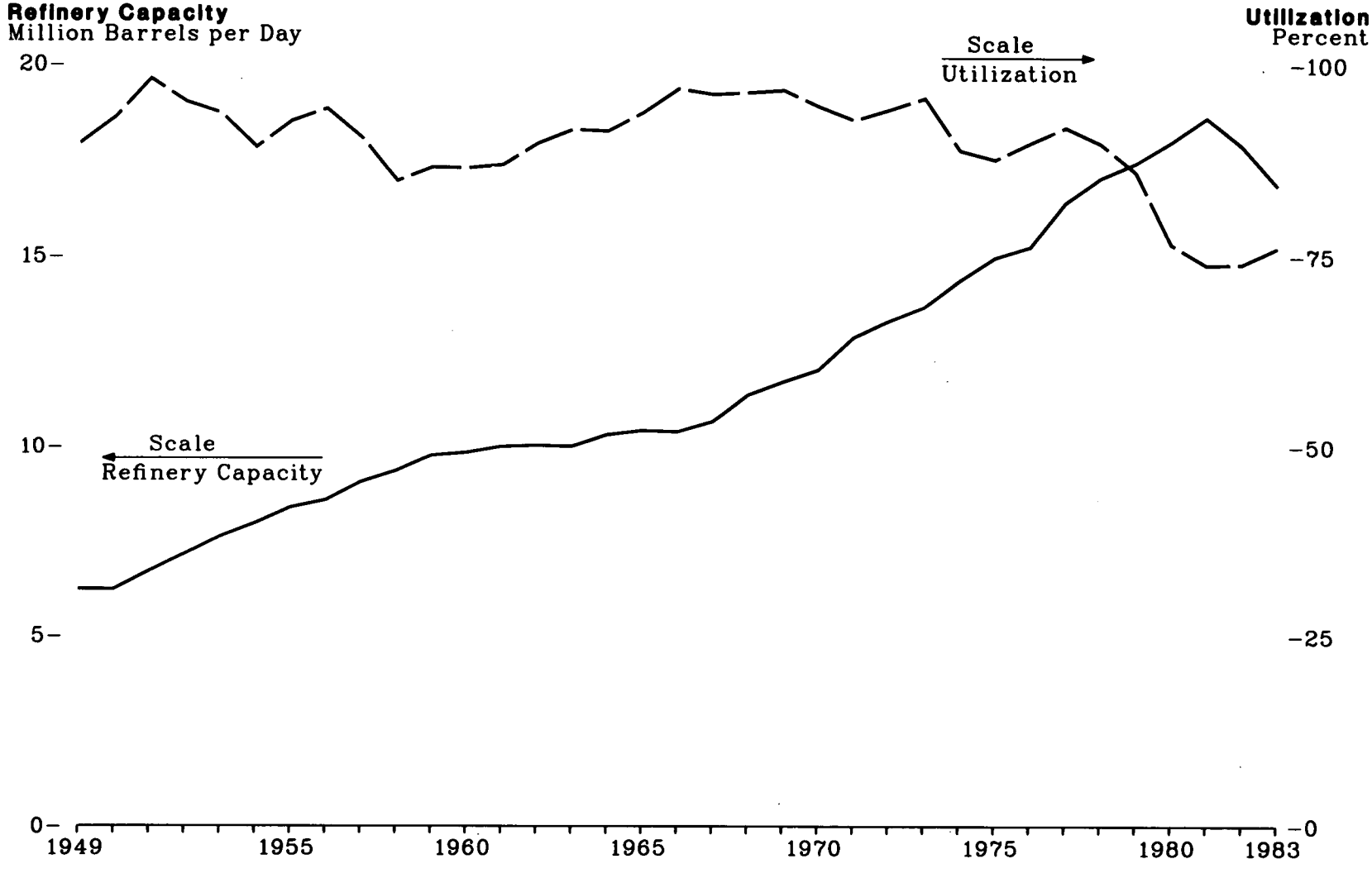


Table 43. Refinery Capacity and Utilization, 1949-1983

(Million Barrels per Day, except as noted)

Year	Operable Refineries		Total Refinery Input	Utilization [3] (percent)
	Number [1]	Capacity [2]		
1949	336	6.23	5.59	89.7
1950	320	6.22	6.02	98.1
1951	325	6.70	6.80	98.1
1952	327	7.16	6.97	95.1
1953	315	7.62	7.31	93.6
1954	308	7.98	7.30	89.2
1955	296	8.39	7.86	92.6
1956	294	8.58	8.32	94.2
1957	298	9.07	8.33	90.4
1958	289	9.36	8.11	84.8
1959	291	9.76	8.48	86.6
1960	290	9.84	8.58	86.5
1961	289	10.00	8.71	86.9
1962	287	10.03	8.99	89.7
1963	287	10.01	9.30	91.5
1964	282	10.31	9.46	91.3
1965	273	10.42	9.75	93.7
1966	267	10.39	10.18	96.8
1967	260	10.66	10.58	96.1
1968	270	11.35	11.10	96.3
1969	264	11.70	11.46	96.6
1970	262	12.02	11.75	94.5
1971	253	12.86	12.12	92.7
1972	250	13.29	12.69	94.1
1973	253	13.67	13.40	95.6
1974	257	14.36	13.02	88.8
1975	262	14.96	13.23	87.6
1976	265	15.24	14.20	89.8
1977	273	16.40	15.35	91.8
1978	290	17.05	15.47	89.7
1979	301	17.44	15.24	86.0
1980	311	17.99	14.02	76.6
1981	315	18.62	13.48	73.9
1982	301	17.89	12.86	74.0
1983	258	16.86	12.63	76.1

[1] Prior to 1982 the numbers are operating refineries.

[2] Operable distillation capacity in million barrels per calendar day as of January 1.

[3] Derived by dividing total refinery input by one-half of the sum of the current year January 1 capacity and the following year January 1 capacity. January 1, 1984 capacity is estimated based on 95 percent of the projected January 1, 1984 barrels per stream day capacity. Percentages derived from unrounded numbers.

Note: Data are for refineries in the United States, excluding the Hawaiian Foreign Trade Zone.

Sources: •1949 through 1977—Bureau of Mines, Mineral Industry Surveys, *Petroleum Refineries, Annual.* •1978 through 1981—Energy Information Administration, Energy Data Reports, *Petroleum Refineries in the United States and U.S. Territories.* • 1982 and 1983—Energy Information Administration, *Petroleum Supply Annual.*

Figure 46. Production and Imports of Residual Fuel Oil by Sulfur Content Categories

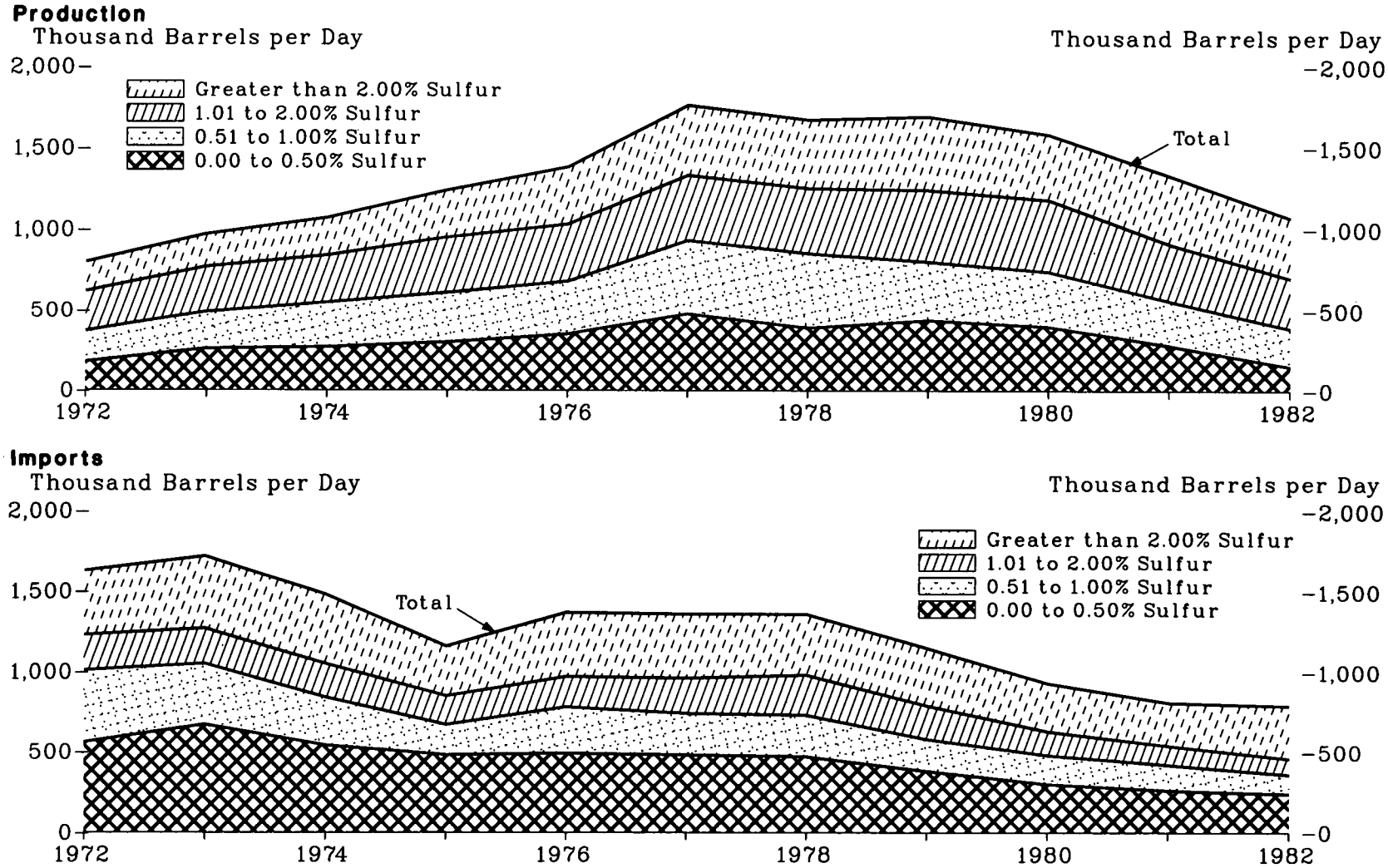


Table 44. Production and Imports of Residual Fuel Oil by Sulfur Content Categories, 1972-1983

(Million Barrels per Day)

Year	Production					Imports [1]				
	0.00 to 0.50% S	0.51 to 1.00% S	1.01 to 2.00% S	Greater Than 2.00% S	Total	0.00 to 0.50% S	0.51 to 1.00% S	1.01 to 2.00% S	Greater Than 2.00% S	Total
1972	0.18	0.19	0.25	0.18	0.80	0.56	0.45	0.22	0.40	1.62
1973	0.26	0.23	0.28	0.20	0.97	0.67	0.38	0.22	0.45	1.72
1974	0.27	0.28	0.29	0.23	1.07	0.54	0.30	0.21	0.43	1.48
1975	0.30	0.31	0.34	0.29	1.24	0.48	0.19	0.18	0.31	1.16
1976	0.35	0.33	0.35	0.35	1.38	0.49	0.29	0.19	0.40	1.37
1977	0.48	0.45	0.40	0.43	1.75	0.48	0.26	0.22	0.40	1.35
1978	0.39	0.46	0.40	0.42	1.67	0.47	0.26	0.25	0.38	1.35
1979	0.44	0.36	0.44	0.45	1.69	0.38	0.20	0.21	0.36	1.15
1980	0.40	0.34	0.44	0.40	1.58	0.30	0.18	0.15	0.30	0.94
1981	0.28	0.28	0.35	0.42	1.32	0.26	0.16	0.12	[2] 0.27	0.80
1982	0.15	0.24	0.31	0.37	1.07	0.24	0.12	0.10	[2] 0.33	0.78
1983	([3])	([3])	([3])	([3])	0.85	([4])	([4])	([4])	([4])	0.69

[1] Excludes imports of residual fuel oil for offshore military use and bonded ships' bunkers for 1980 and earlier years. In 1980 the excluded quantities were 0.2 percent of total residual fuel oil imports.

[2] Includes small amounts of residual fuel oil with unspecified sulfur content.

[3] Categories revised in 1983 as follows in thousand barrels per day: 0.00 to 0.03 percent S-80; 0.31 to 1.00 percent S-268; greater than 1.00 percent S-498.

[4] Categories revised in 1983 as follows in thousand barrels per day: 0.00 to 0.03 percent S-214; 0.31 to 1.00 percent S-154; greater than 1.00 percent S-322.

S=Sulfur.

Note: Sum of components may not equal total due to independent rounding.

Sources: •1972 through 1976—Bureau of Mines, Mineral Industry Surveys, *Availability of Heavy Fuel Oils by Sulfur Levels*, monthly. • 1977 through 1980—Energy Information Administration, Energy Data Reports, *Availability of Heavy Fuel Oils by Sulfur Levels*, monthly. • 1981 and 1982—Energy Information Administration, *Petroleum Supply Annual*. •1983—Energy Information Administration, *Petroleum Supply Monthly*.

Figure 47. Refined Petroleum Products Supplied by Type

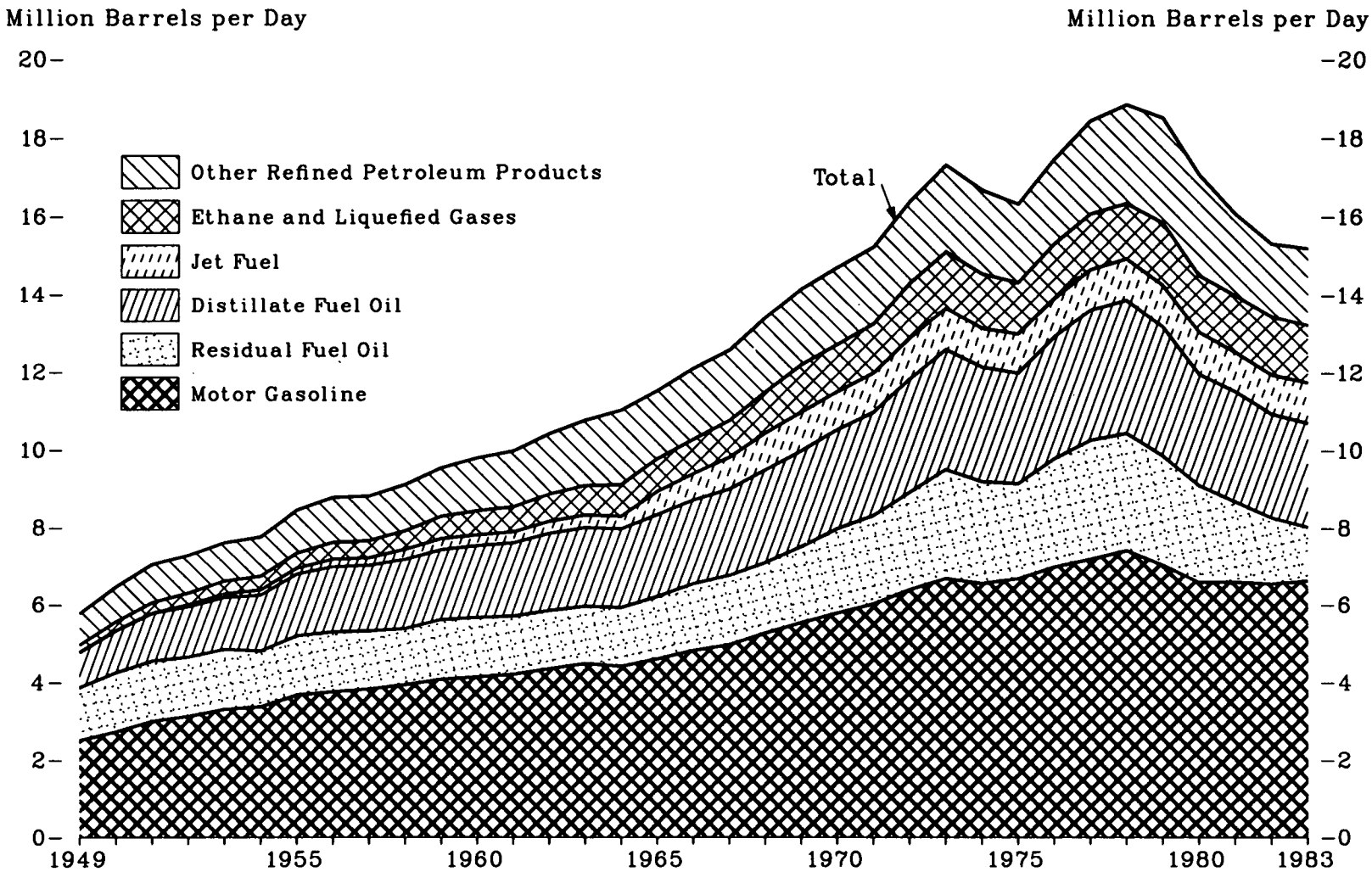


Table 45. Refined Petroleum Products Supplied [1] by Type, 1949-1983

(Million Barrels per Day)

Year	Motor Gasoline [2]	Jet Fuel	Distillate Fuel Oil	Residual Fuel Oil	Ethane and Liquefied Gases	Other Products [3]	Total Products	Percentage Change from Previous Year
1949	2.50	NA	0.90	1.36	0.19	0.81	5.76	0.8
1950	2.72	NA	1.08	1.52	0.23	0.90	6.46	12.1
1951	2.99	NA	1.23	1.55	0.28	0.98	7.02	8.6
1952	3.12	0.05	1.30	1.52	0.30	0.98	7.27	3.9
1953	3.30	0.09	1.34	1.54	0.33	1.00	7.60	4.3
1954	3.37	0.13	1.44	1.43	0.35	1.03	7.76	2.1
1955	3.66	0.15	1.59	1.53	0.40	1.12	8.46	9.0
1956	3.75	0.20	1.68	1.54	0.44	1.16	8.78	4.1
1957	3.82	0.20	1.69	1.50	0.45	1.15	8.81	0.1
1958	3.93	0.26	1.79	1.45	0.49	1.19	9.12	3.5
1959	4.07	0.29	1.81	1.54	0.58	1.24	9.53	4.5
1960	4.13	0.28	1.87	1.53	0.62	1.36	9.80	3.1
1961	4.20	0.29	1.90	1.50	0.64	1.44	9.98	1.5
1962	4.34	0.31	2.01	1.50	0.70	1.55	10.40	4.2
1963	4.47	0.32	2.05	1.48	0.76	1.68	10.74	3.3
1964	4.40	0.32	2.05	1.52	0.81	1.92	11.02	2.9
1965	4.59	0.60	2.13	1.61	0.84	1.74	11.51	4.2
1966	4.81	0.67	2.18	1.72	0.89	1.82	12.08	5.0
1967	4.96	0.82	2.24	1.79	0.94	1.81	12.56	3.9
1968	5.26	0.95	2.39	1.83	1.05	1.91	13.39	6.9
1969	5.53	0.99	2.47	1.98	1.22	1.95	14.14	5.3
1970	5.78	0.97	2.54	2.20	1.22	1.98	14.70	4.0
1971	6.01	1.01	2.66	2.30	1.25	1.98	15.21	3.5
1972	6.38	1.05	2.91	2.53	1.42	2.08	16.37	7.9
1973	6.67	1.06	3.09	2.82	1.45	2.21	17.31	5.5
1974	6.54	0.99	2.95	2.64	1.41	2.13	16.65	-3.8
1975	6.67	1.00	2.85	2.46	1.33	2.00	16.32	-2.0
1976	6.98	0.99	3.13	2.80	1.40	2.16	17.46	7.3
1977	7.18	1.04	3.35	3.07	1.42	2.37	18.43	5.3
1978	7.41	1.06	3.43	3.02	1.41	2.51	18.85	2.3
1979	7.03	1.08	3.31	2.83	1.59	2.67	18.51	-1.8
1980	6.58	1.07	2.87	2.51	1.47	2.57	17.06	-7.6
1981	6.59	1.01	2.83	2.09	1.47	2.08	16.06	-6.1
1982	6.54	1.01	2.67	1.72	1.50	1.86	15.30	-4.7
1983[4]	6.62	1.04	2.68	1.40	1.47	1.97	15.18	-0.7

[1] See Explanatory Notes 4, 5, and 6.

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

[3] Includes kerosene, petrochemical feedstocks, lubricants, wax, petroleum coke, asphalt, road oil, still gas, natural gasoline, unfractionated stream, plant condensate, and miscellaneous products. Since 1964 aviation gasoline and special naphthas are included. Prior to 1965 kerosene-type jet fuel was included in kerosene. 1981 forward, other products include negative barrels per day of distillate and residual fuel oil reclassified as unfinished oils and other products (from both primary and secondary supply) reclassified as gasoline blending components. Starting in 1983, product supplied also includes crude oil burned as fuel.

[4] Preliminary.

Note: Sum of components may not equal total due to independent rounding.

Sources: •1949 through 1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* •1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* •1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* •1983—Energy Information Administration, *Petroleum Supply Monthly.*

Figure 48. Refined Petroleum Products Supplied to End-Use Sectors

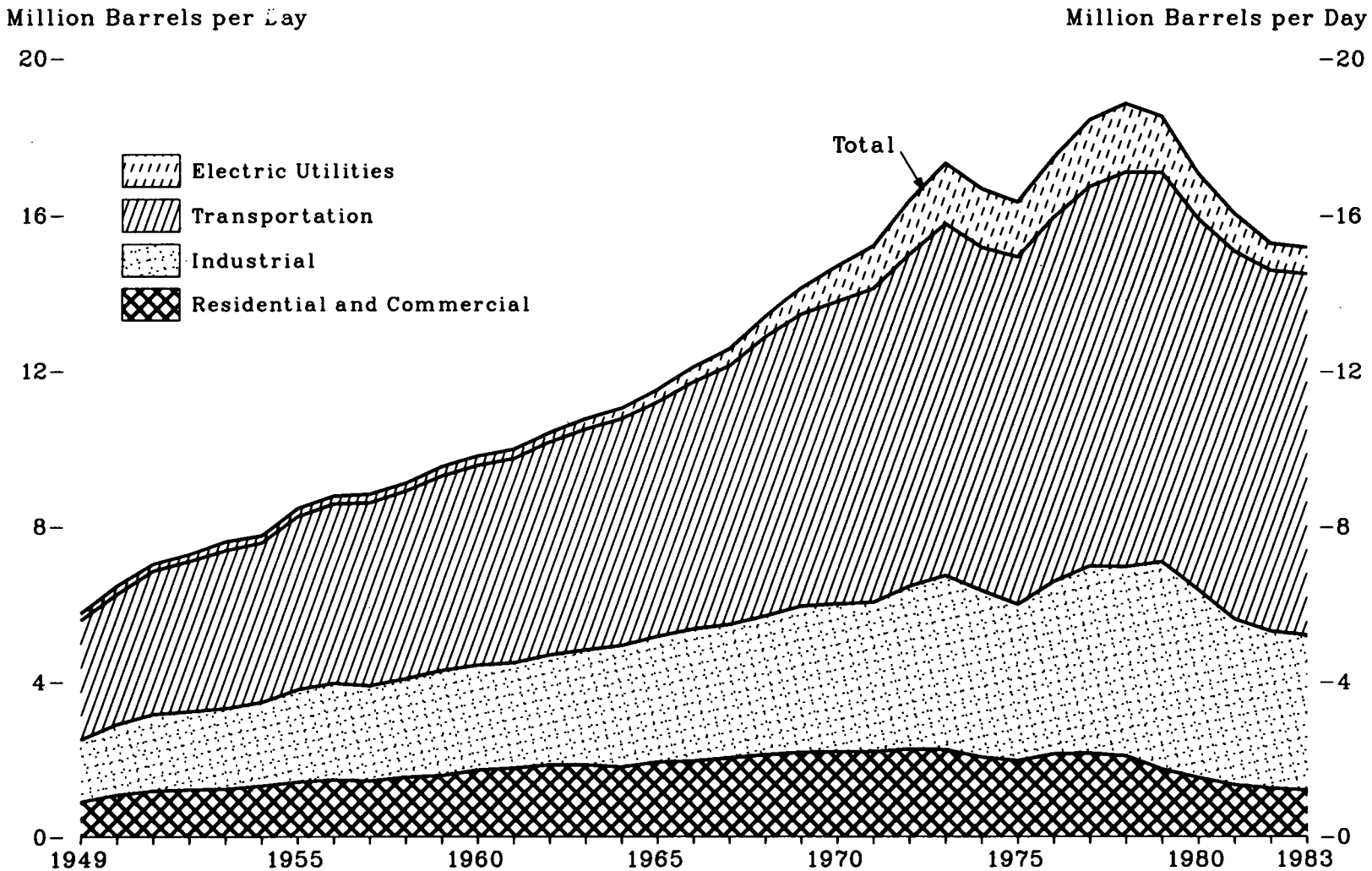


Table 46. Refined Petroleum Products Supplied [1] to End-Use Sectors, 1949-1983

(Million Barrels per Day)

Year	Residential and Commercial	Industrial	Transportation	Electric Utilities	Total
1949	0.90	1.60	3.08	0.18	5.76
1950	1.07	1.82	3.36	0.21	6.46
1951	1.17	1.98	3.69	0.18	7.02
1952	1.20	2.02	3.87	0.18	7.27
1953	1.22	2.08	4.07	0.23	7.60
1954	1.30	2.16	4.11	0.18	7.76
1955	1.40	2.39	4.46	0.21	8.46
1956	1.46	2.49	4.62	0.20	8.78
1957	1.43	2.46	4.71	0.22	8.81
1958	1.53	2.54	4.83	0.21	9.12
1959	1.57	2.71	5.01	0.24	9.53
1960	1.71	2.71	5.14	0.24	9.80
1961	1.76	2.72	5.25	0.24	9.98
1962	1.84	2.84	5.48	0.24	10.40
1963	1.84	2.97	5.68	0.26	10.74
1964	1.79	3.13	5.83	0.28	11.02
1965	1.91	3.25	6.03	0.32	11.51
1966	1.94	3.41	6.35	0.39	12.08
1967	2.02	3.45	6.65	0.44	12.56
1968	2.10	3.59	7.18	0.52	13.39
1969	2.16	3.78	7.51	0.69	14.14
1970	2.18	3.82	7.77	0.93	14.70
1971	2.18	3.86	8.08	1.09	15.21
1972	2.25	4.20	8.55	1.36	16.37
1973	2.23	4.49	9.05	1.54	17.31
1974	2.04	4.30	8.84	1.48	16.65
1975	1.95	4.04	8.95	1.39	16.32
1976	2.12	4.45	9.37	1.52	17.46
1977	2.14	4.83	9.75	1.71	18.43
1978	2.07	4.88	10.14	1.75	18.85
1979	1.73	5.35	10.00	1.44	18.51
1980	1.52	4.84	9.55	1.15	17.06
1981	1.33	4.28	9.48	0.96	16.06
1982	1.24	4.06	9.30	0.69	15.30
1983[2]	1.19	4.01	9.31	0.68	15.18

[1] See Explanatory Note 5.
[2] Estimated.
Note: Sum of components may not equal total due to independent rounding.
Sources: **Total:** •1949 through 1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* •1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual* •1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* •1983—Energy Information Administration, *Petroleum Supply Monthly* and *Weekly Petroleum Status Report.* **Other Data:** •1949 through 1959—Energy Information Administration estimates. •1960 through 1982—Energy Information Administration, *State Energy Data Report,* annual. •1983—Energy Information Administration estimates.

Figure 49. Refined Petroleum Products Supplied by Type and to End-Use Sectors

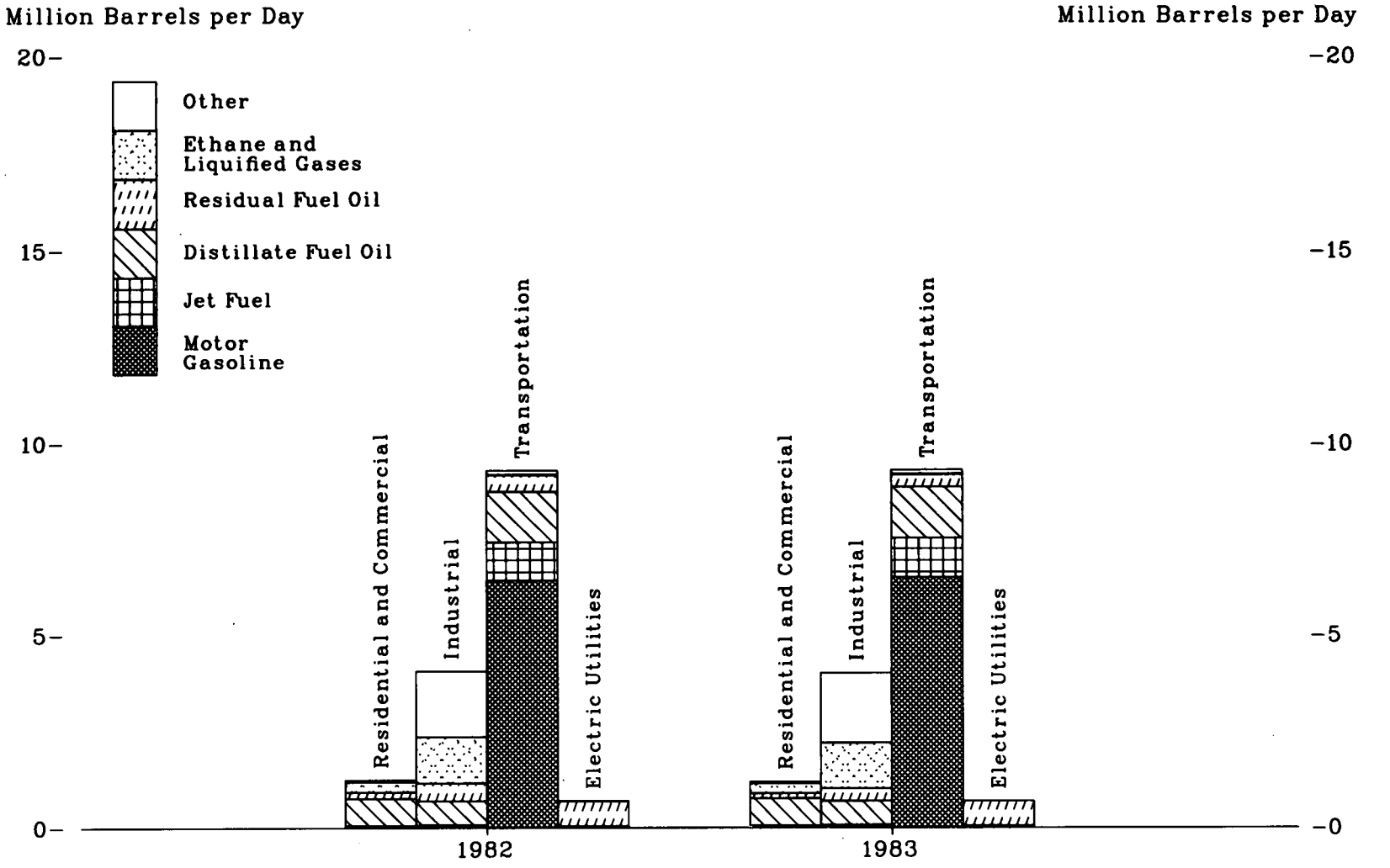


Table 47. Refined Petroleum Products Supplied [1] by Type and to End-Use Sectors, 1982 and 1983

Year and Refined Product	Residential and Commercial		Industrial		Transportation		Electric Utilities		Total	
	Million Barrels Per Day	Quadrillion Btu	Million Barrels Per Day	Quadrillion Btu	Million Barrels Per Day	Quadrillion Btu	Million Barrels Per Day	Quadrillion Btu	Million Barrels Per Day	Quadrillion Btu
1982										
Asphalt and Road Oil	0	0	0.34	0.83	0	0	0	0	0.34	0.83
Aviation Gasoline	0	0	0	0	0.03	0.05	0	0	0.03	0.05
Distillate Fuel Oil	0.70	1.49	0.62	1.31	1.31	2.79	0.04	0.09	2.67	5.68
Jet Fuel	0	0	0	0	1.01	2.07	[3]	[3]	1.01	2.07
Kerosene	0.06	0.13	0.07	0.14	0	0	0	0	0.13	0.27
Liquefied Gases and Ethane	0.26	0.35	1.21	1.60	0.02	0.03	0	0	1.50	1.98
Lubricants	0	0	0.07	0.16	0.07	0.15	0	0	0.14	0.31
Motor Gasoline	0.05	0.09	0.07	0.14	6.42	12.31	0	0	6.54	12.54
Residual Fuel Oil	0.17	0.40	0.46	1.05	0.44	1.02	0.64	1.47	1.72	3.94
All Other [4]	0	0	1.22	2.57	0	0	[3]	[3]	1.22	2.57
Total	1.24	2.45	4.06	7.80	9.30	18.42	0.69	1.57	15.30	30.23
1983 [5]										
Asphalt and Road Oil	0	0	0.37	0.90	0	0	0	0	0.37	0.90
Aviation Gasoline	0	0	0	0	0.03	0.05	0	0	0.03	0.05
Distillate Fuel Oil	0.70	1.48	0.61	1.30	1.33	2.83	0.05	0.10	2.68	5.70
Jet Fuel	0	0	0	0	1.04	2.13	[3]	[3]	1.04	2.13
Kerosene	0.06	0.12	0.07	0.14	0	0	0	0	0.13	0.26
Liquefied Gases and Ethane	0.26	0.34	1.19	1.57	0.02	0.03	0	0	1.47	1.94
Lubricants	0	0	0.07	0.16	0.07	0.15	0	0	0.14	0.31
Motor Gasoline	0.05	0.09	0.07	0.14	6.50	12.46	0	0	6.62	12.69
Residual Fuel Oil	0.13	0.29	0.33	0.76	0.32	0.73	0.63	1.44	1.40	3.22
All Other [4]	0	0	1.29	2.76	0	0	[3]	0.01	1.30	2.77
Total	1.19	2.33	4.01	7.73	9.31	18.38	0.68	1.54	15.18	29.98

[1] See Explanatory Notes 4, 5, and 6.
[2] Less than 0.005 million barrels per day.
[3] Less than 0.005 quadrillion Btu.
[4] Includes petrochemical feedstock, special naphthas, waxes, petroleum coke, still gas, natural gasoline, crude oil, and miscellaneous products.
[5] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1982—Energy Information Administration, *State Energy Data Report*, annual. •1983—Energy Information Administration estimates.

Figure 50. Average Annual Motor Vehicle Mileage and Fuel Consumption

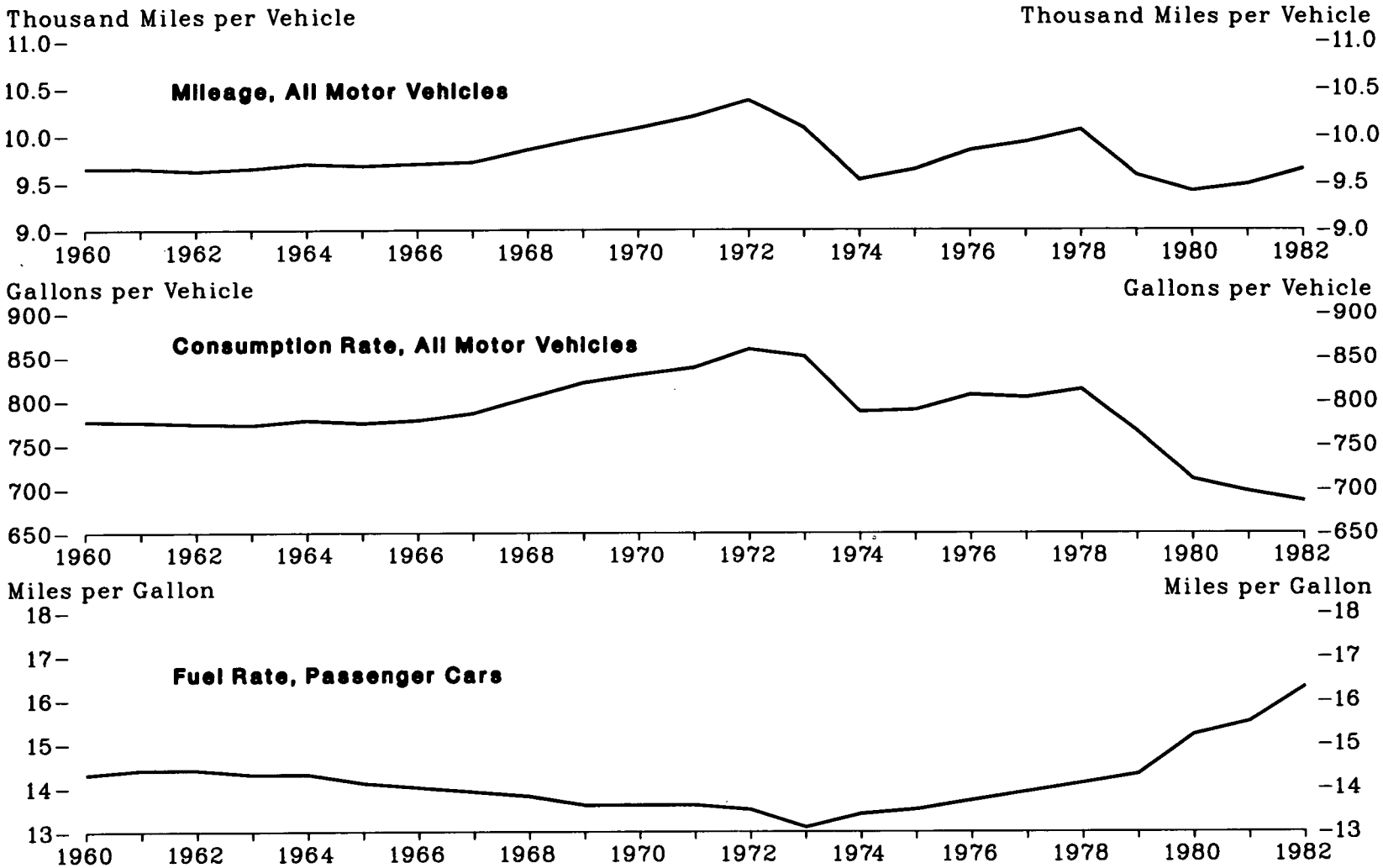


Table 48. Average [1] Annual Motor Vehicle Mileage and Fuel Consumption, 1960-1982

Year	Passenger Cars			Motorcycles		Buses		Trucks		All Motor Vehicles	
	Mileage (thousand miles per vehicle)	Fuel Consumption (gallons per vehicle)	Fuel Rate (miles per gallon)	Mileage (thousand miles per vehicle)	Fuel Consumption (gallons per vehicle)	Mileage (thousand miles per vehicle)	Fuel Consumption (gallons per vehicle)	Mileage (thousand miles per vehicle)	Fuel Consumption (gallons per vehicle)	Mileage (thousand miles per vehicle)	Fuel Consumption (gallons per vehicle)
1960	9.45	661	14.3	[2]	[2]	16.00	3,040	10.58	1,330	9.65	777
1961	9.47	658	14.4	[2]	[2]	15.66	2,957	10.46	1,338	9.65	776
1962	9.44	657	14.4	[2]	[2]	15.51	2,906	10.41	1,334	9.62	774
1963	9.24	648	14.3	[2]	[2]	15.05	2,813	11.64	1,380	9.65	773
1964	9.29	652	14.3	[2]	[2]	15.12	2,829	11.72	1,389	9.70	778
1965	9.39	667	14.1	3.77	50	15.22	2,844	11.59	1,347	9.68	775
1966	9.51	679	14.0	3.93	52	15.01	2,772	11.21	1,316	9.70	778
1967	9.53	684	13.9	3.96	53	14.48	2,693	11.27	1,338	9.72	786
1968	9.63	698	13.8	3.97	53	14.12	2,649	11.57	1,382	9.85	804
1969	9.78	718	13.6	4.02	54	13.83	2,600	11.57	1,384	9.97	821
1970	9.98	735	13.6	3.61	48	13.31	2,491	11.45	1,365	10.08	830
1971	10.12	746	13.6	4.50	90	12.82	2,382	11.47	1,368	10.20	838
1972	10.18	755	13.5	4.50	90	12.55	2,165	12.23	1,446	10.37	859
1973	9.99	763	13.1	4.50	90	11.66	1,991	11.54	1,361	10.08	851
1974	9.45	704	13.4	4.50	90	11.32	1,919	10.86	1,268	9.53	788
1975	9.63	712	13.5	4.50	90	11.14	1,937	10.65	1,227	9.64	790
1976	9.76	711	13.7	4.50	90	12.04	2,015	11.09	1,292	9.84	807
1977	9.84	706	13.9	4.50	90	12.00	2,002	11.15	1,284	9.93	804
1978	10.05	715	14.1	4.50	90	12.14	2,041	10.97	1,270	10.06	813
1979	9.48	664	14.3	4.00	80	11.73	1,966	10.81	1,225	9.58	765
1980	9.14	603	15.2	3.14	63	12.10	2,034	11.43	1,194	9.41	711
1981	9.00	579	15.5	2.57	51	11.95	2,019	12.34	1,209	9.48	697
1982[3]	9.17	561	16.3	2.61	52	11.87	2,003	12.40	1,207	9.64	686

[1] Arithmetic mean.
[2] Motorcycles included with passenger cars, 1960-1964.
[3] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Source: Federal Highway Administration, *Highway Statistics Annual*, Table VM-1.

Figure 51. Motor Vehicle Registration and Motor Fuel Consumption

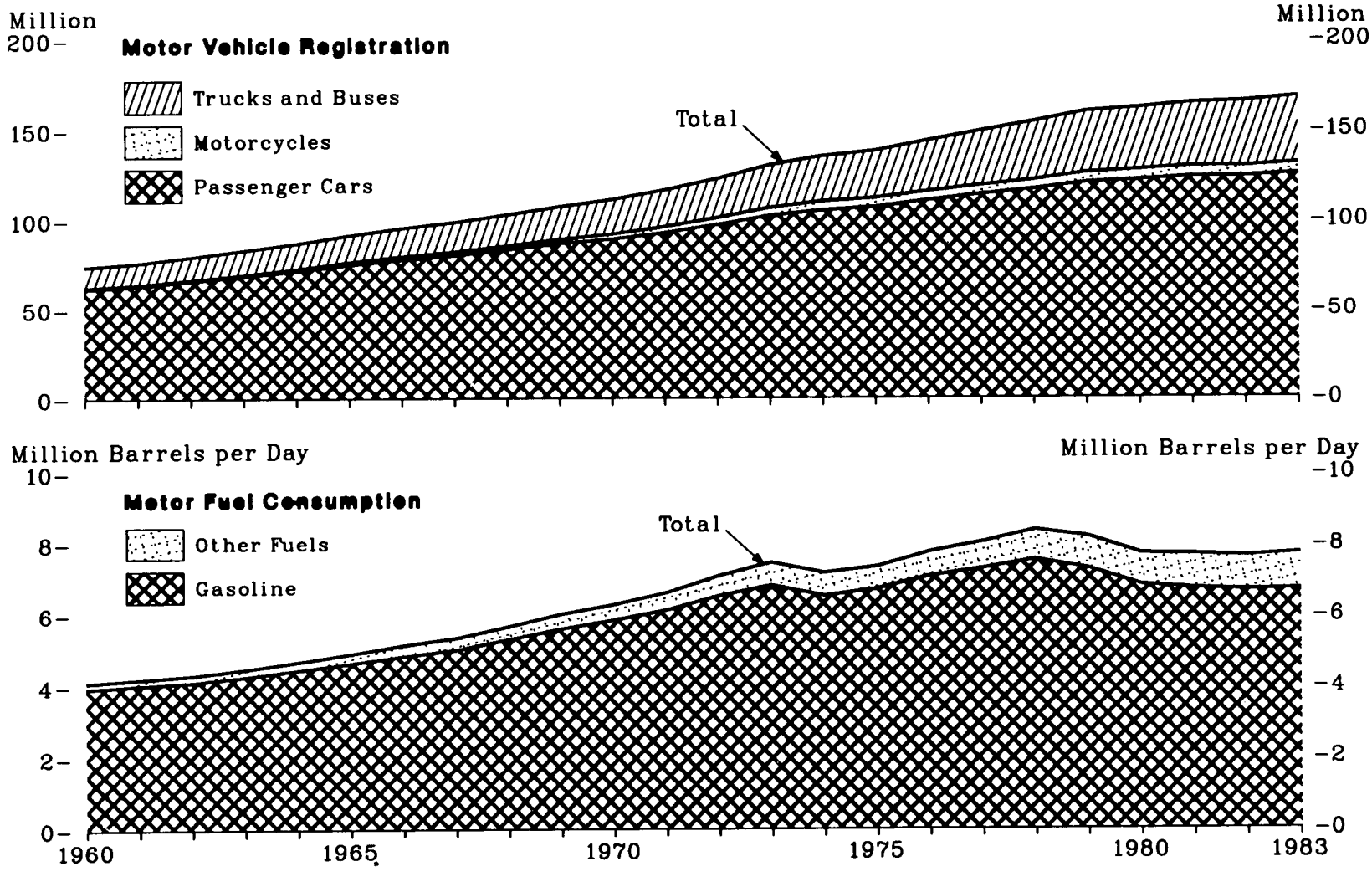


Table 49. Motor Vehicle Registration and Motor Fuel Consumption, 1960-1983

Year	Motor Vehicle Registration (millions)					Motor Fuel Consumption [1] (thousand barrels per day)		
	Passenger Cars	Motorcycles	Buses	Trucks	Total	Gasoline [2]	Other Fuels [3]	Total [4]
1960	61.7	0.6	0.3	11.9	74.4	3,953	159	4,112
1961	63.4	0.6	0.3	12.3	76.6	4,034	176	4,210
1962	66.1	0.7	0.3	12.8	79.8	4,120	192	4,312
1963	69.0	0.8	0.3	13.4	83.5	4,274	211	4,485
1964	72.0	1.0	0.3	14.0	87.3	4,454	236	4,690
1965	75.3	1.4	0.3	14.8	91.7	4,644	269	4,913
1966	78.1	1.8	0.3	15.5	95.7	4,846	306	5,152
1967	80.4	2.0	0.3	16.2	98.9	5,014	329	5,343
1968	83.6	2.1	0.4	16.9	103.0	5,300	370	5,670
1969	86.9	2.3	0.4	17.9	107.4	5,604	413	6,017
1970	89.2	2.8	0.4	18.8	111.2	5,845	439	6,284
1971	92.7	3.3	0.4	19.9	116.3	6,125	494	6,619
1972	97.1	3.8	0.4	21.3	122.6	6,529	554	7,083
1973	102.0	4.4	0.4	23.2	130.0	6,819	642	7,460
1974	104.9	5.0	0.4	24.6	134.9	6,531	639	7,170
1975	106.7	5.0	0.5	25.8	137.9	6,719	628	7,347
1976	110.4	5.0	0.5	27.7	143.5	7,075	697	7,772
1977	113.7	5.0	0.5	29.6	148.8	7,287	760	8,046
1978	116.6	5.1	0.5	31.7	153.9	7,555	837	8,392
1979	120.2	5.5	0.5	33.3	159.6	7,291	913	8,204
1980	121.7	5.7	0.5	33.6	161.6	6,820	896	7,716
1981	123.5	5.8	0.5	34.5	164.3	6,726	969	7,695
1982	123.7	5.7	0.6	35.3	165.3	6,679	972	7,651
1983[7]	125.4	5.8	[5]	[6] 36.6	167.7	6,710	1,030	7,740

[1] Includes only motor fuel taxed at the prevailing tax rates in each State. Excludes motor fuel exempt from tax payment, subject to tax refund, or taxed at rates other than the prevailing tax rate. In 1981, the total motor fuel consumption quantity cited here equaled 99.4 percent of gross reported motor fuel consumption.
[2] Includes motor gasoline, aviation gasoline, and gasohol.
[3] Includes distillate fuel oil (diesel oil), liquefied gases, and kerosene when they are used to operate vehicles on highways. Excludes jet fuel beginning in 1962.
[4] Excludes losses allowed for evaporation, handling, etc.
[5] Included in trucks.
[6] Includes buses.
[7] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1960 through 1975—Federal Highway Administration, *Highway Statistics Summary to 1975,* Tables MV-201 and MF-221. •1976 through 1982—Federal Highway Administration, *Highway Statistics Annual,* Tables MV-1, MF-21, and MF-25. •1983—Federal Highway Administration, Table SS82-1 (October 1983) and Table SS82-2 (October 1983).

Figure 52. Household Vehicle Data, October 1980 through September 1981

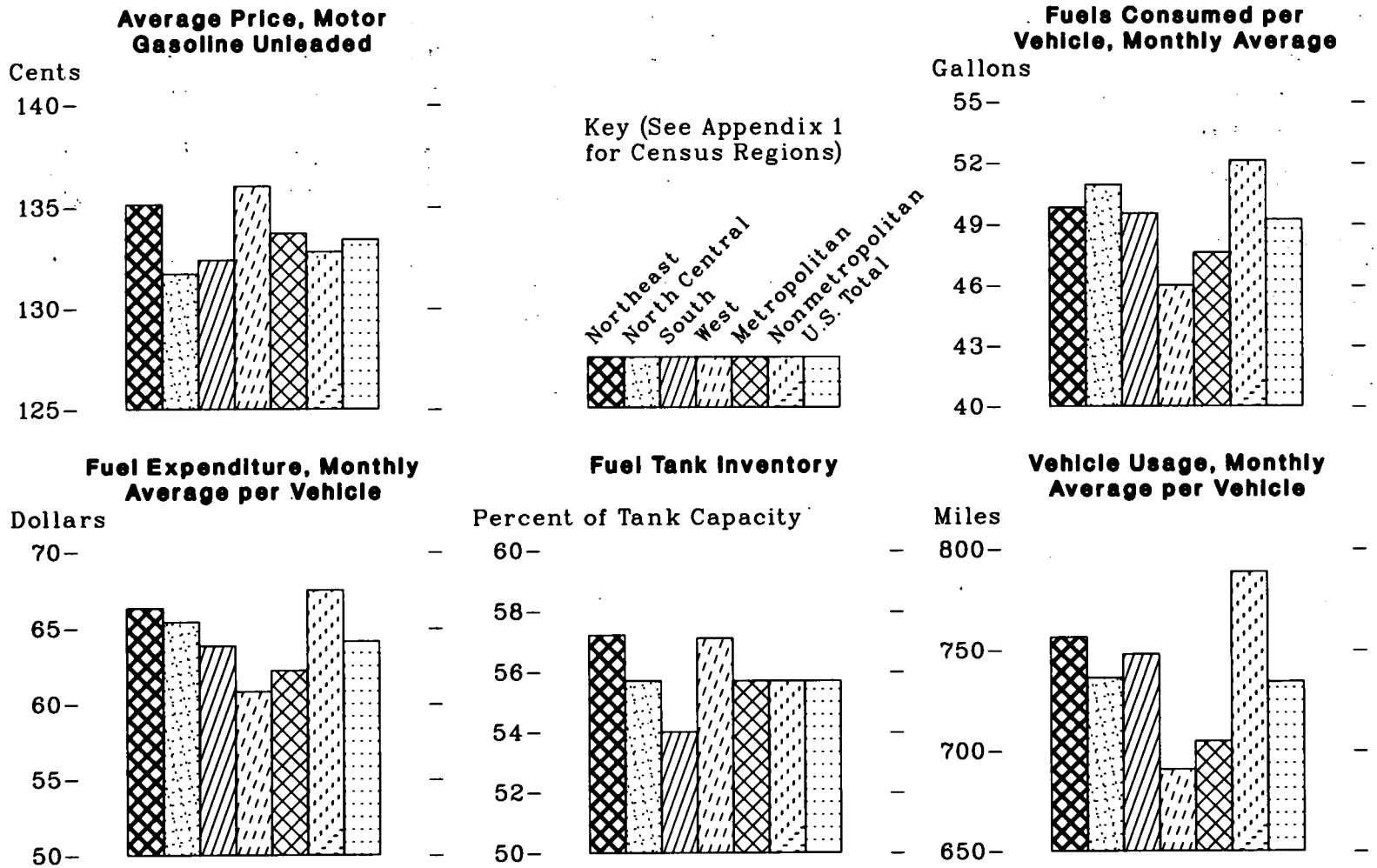


Table 50. Household Vehicle Data, October 1980 through September 1981

Activity	Census Region				Area Type		Total
	Northeast	North Central	South	West	Urban	Rural	
Annual Totals							
Households with Vehicles [1] (million)	14.5	18.8	24.0	14.1	48.7	22.7	71.4
Vehicles [1] (million)	23.2	35.2	43.4	26.6	83.1	45.5	128.6
Vehicle Usage (billion miles)	195.1	287.6	360.1	204.1	648.8	398.1	1,046.9
Fuel Expenditures (billion dollars)							
Motor Gasoline, Leaded	6.1	11.0	12.2	8.0	22.5	14.8	37.3
Motor Gasoline, Unleaded	10.3	13.3	16.4	8.5	31.5	17.0	48.5
Diesel Oil, Other, or Unknown	0.7	1.3	2.1	1.5	3.3	2.3	5.6
Total	17.1	25.6	30.7	18.0	57.3	34.1	91.4
Fuel Purchased (billion gallons)							
Motor Gasoline, Leaded	4.[illegible]	8.8	9.8	6.2	17.9	11.7	29.6
Motor Gasoline, Unleaded	7.6	10.1	12.4	6.3	23.5	12.8	36.4
Diesel Oil, Other, or Unknown	0.5	1.0	1.7	1.2	2.6	1.8	4.4
Total	12.9	19.9	23.9	13.7	44.0	26.3	70.4
Average Price per Gallon (cents)							
Motor Gasoline, Leaded	129.1	124.8	124.3	128.3	125.8	126.5	126.1
Motor Gasoline, Unleaded	135.1	131.7	132.4	136.0	133.7	132.8	133.4
Diesel Oil, Other, or Unknown	129.7	125.7	125.1	126.5	126.6	125.5	126.2
Total	132.7	128.3	128.6	131.7	130.1	129.5	129.9
Monthly Average per Vehicle							
Fuel Consumed (gallons)	49.8	50.9	49.5	46.0	47.6	52.1	49.2
Vehicle Usage (miles)	756.2	736.2	747.7	690.6	704.5	788.4	734.2
Fuel Expenditures (dollars)	66.3	65.4	63.8	60.8	62.2	67.5	64.1
Fuel Tank Inventory (percent of tank capacity)	57.2	55.7	54.0	57.1	55.7	55.7	55.7

[1] June average.
Note: Sum of components may not equal total due to independent rounding.
Source: Energy Information Administration, Form EIA-141, "The Residential Energy Consumption Survey."

Figure 53. Primary Stocks of Petroleum by Type, Year-End

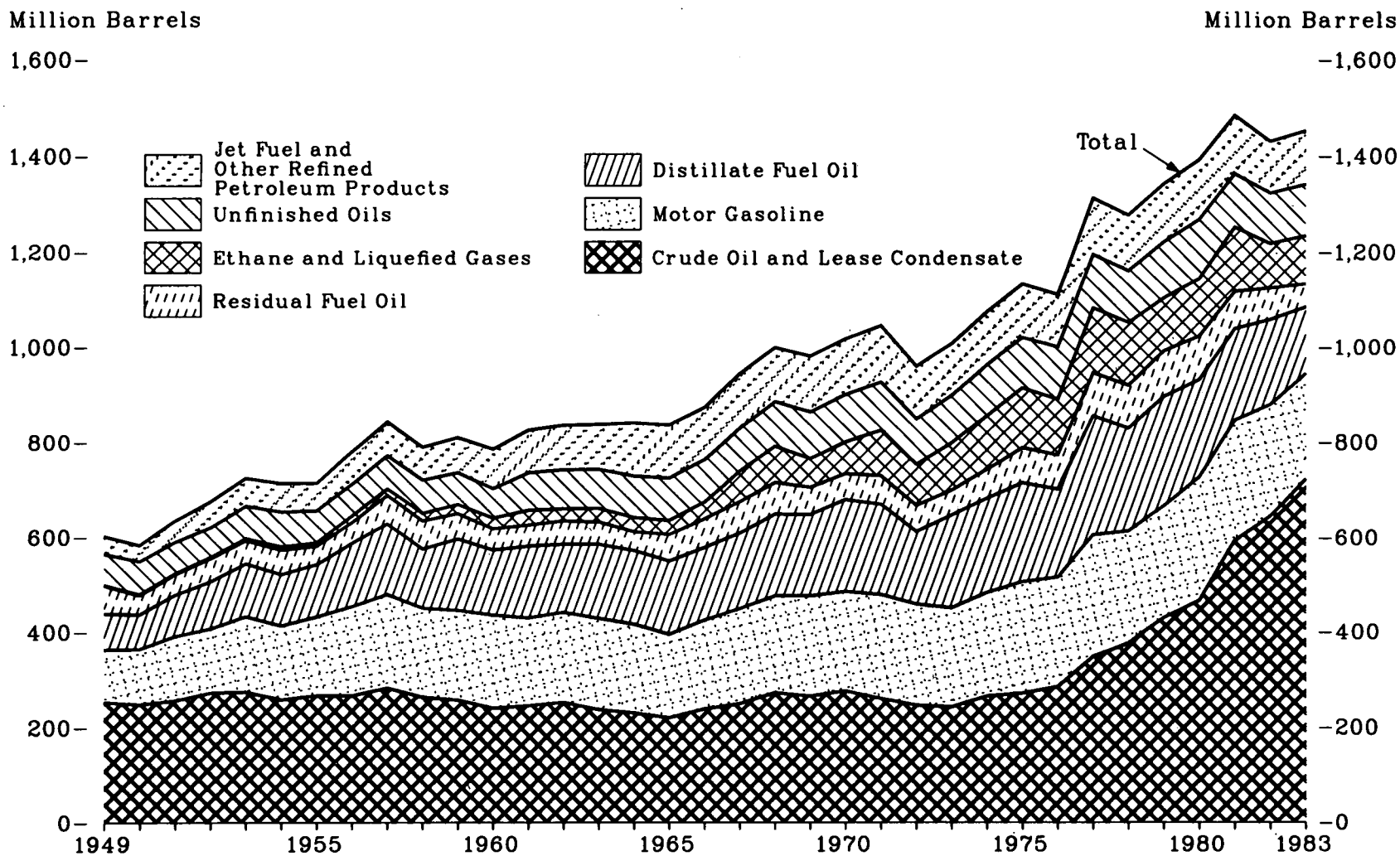


Table 51. Primary Stocks of Petroleum by Type, Year-End 1949-1983

(Million Barrels)

Year	Crude Oil and Lease Condensate [1]	Refined Petroleum Products								Total Petroleum
		Motor Gasoline [2]	Jet Fuel	Distillate Fuel Oil	Residual Fuel Oil	Ethane and Liquefied Gases	Unfinished Oils	Other Products [3]	Total Products	
1949	253	110	NA	75	60	1	66	37	350	603
1950	248	116	NA	72	41	2	70	34	334	583
1951	256	135	NA	87	43	2	67	45	378	634
1952	272	135	2	99	49	3	62	53	402	674
1953	274	158	3	112	49	4	69	56	451	726
1954	258	155	3	108	52	7	74	57	457	715
1955	266	165	3	111	39	7	68	55	449	715
1956	266	187	5	134	44	14	67	63	514	780
1957	282	197	5	149	60	14	69	66	560	841
1958	263	187	6	125	60	16	70	63	526	789
1959	257	188	8	151	54	19	67	66	552	809
1960	240	195	7	138	45	23	62	76	545	785
1961	245	184	8	152	45	31	79	81	580	825
1962	252	189	10	144	50	25	82	83	582	834
1963	237	191	9	157	48	28	82	85	598	836
1964	230	186	19	156	40	30	87	92	609	839
1965	220	175	19	155	56	30	89	92	616	836
1966	238	186	19	154	61	35	89	91	636	874
1967	249	200	22	160	66	64	90	93	695	944
1968	272	204	24	173	67	76	93	89	727	1,000
1969	265	211	28	172	58	60	98	88	715	980
1970	276	209	28	195	54	67	99	89	741	1,018
1971	260	219	28	191	60	95	101	92	784	1,044
1972	246	213	25	154	55	86	95	84	713	959
1973	242	209	29	196	53	99	99	80	766	1,008
1974	265	218	29	200	60	113	106	82	809	1,074
1975	271	235	30	209	74	125	106	82	862	1,133
1976	285	231	32	186	72	116	110	78	826	1,112
1977	348	258	35	250	90	136	113	82	964	1,312
1978	376	238	34	216	90	132	109	82	901	1,278
1979	430	237	39	229	96	111	118	82	911	1,341
1980	466	261	42	205	92	120	124	82	926	1,392
1981	594	253	41	192	78	135	111	80	890	1,484
1982	644	235	37	179	66	94	105	70	786	1,430
1983[4]	722	222	39	140	49	101	107	72	731	1,453

[1] Includes crude oil stored in the Strategic Petroleum Reserve, which began in 1977.
[2] Includes motor gasoline blending components. Prior to 1964, motor gasoline data were for total gasoline which included motor gasoline, aviation gasoline, and special naphthas.
[3] Includes kerosene, petrochemical feedstocks, lubricants, wax, petroleum coke, asphalt, road oil, natural gasoline, unfractionated stream, plant condensate, and miscellaneous products. Since 1964 aviation gasoline and special naphthas are included. 1981 forward, other products include stocks of aviation gasoline blending components, hydrogen, other hydrocarbons, and alcohol.
[4] Preliminary.
NA = Not available.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 through 1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* •1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* •1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* •1983—Energy Information Administration, *Petroleum Supply Monthly.*

Figure 54. Strategic Petroleum Reserve, Quarterly

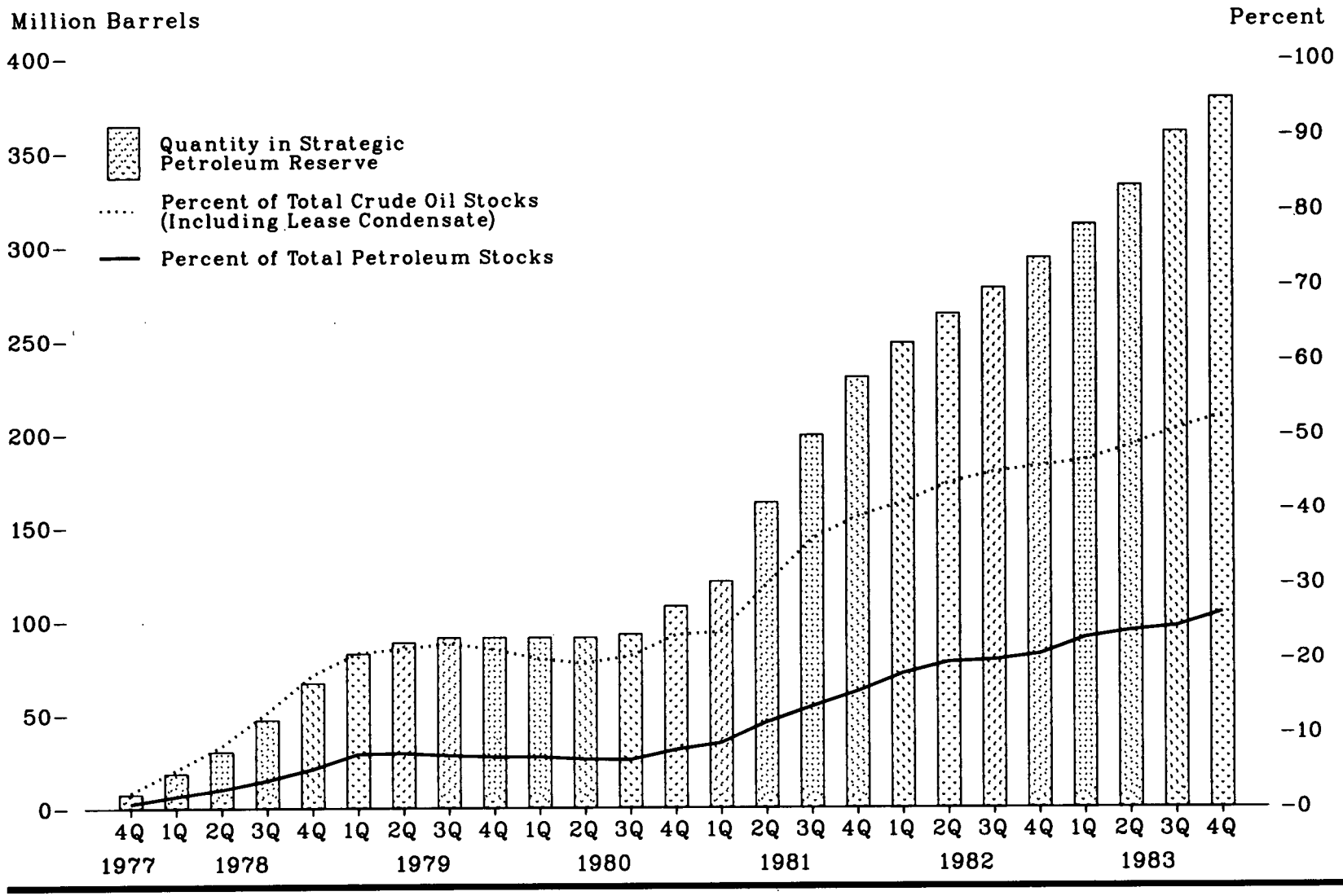


Table 52. Strategic Petroleum Reserve, Quarterly — Fourth Quarter 1977 through Fourth Quarter 1983

(Million Barrels, except as noted)

Year/Quarter	Crude Oil Imports	Domestic Crude Oil Deliveries	End of Quarter Stocks	Percent of Crude Oil [1] Stocks	Percent of Total Petroleum Stocks
1977					
Fourth Quarter [2]	7.54	[3] 0.37	7.46	2.1	0.6
1978					
First Quarter	10.70	0	18.44	5.1	1.6
Second Quarter	11.76	0	30.14	8.3	2.5
Third Quarter	17.22	0	47.09	12.8	3.7
Fourth Quarter	19.28	0	66.86	17.8	5.2
1979					
First Quarter	15.12	0	82.50	20.7	7.2
Second Quarter	6.94	0	88.57	21.3	7.3
Third Quarter	2.37	0	91.19	22.0	7.0
Fourth Quarter	0	(4)	91.19	21.2	6.8
1980					
First Quarter	0	0	91.19	19.9	6.8
Second Quarter	0	0	91.19	19.3	6.5
Third Quarter	1.62	0	92.82	20.3	6.4
Fourth Quarter	14.45	1.30	107.80	23.1	7.7
1981					
First Quarter	9.85	2.13	120.86	23.5	8.6
Second Quarter	29.66	12.22	163.08	29.8	11.4
Third Quarter	26.45	11.52	199.25	35.9	13.5
Fourth Quarter	27.33	2.92	230.34	38.8	15.5
1982					
First Quarter	15.47	3.28	248.54	40.8	17.9
Second Quarter	15.15	0.44	264.14	43.4	19.4
Third Quarter	13.65	0.16	277.88	44.9	19.7
Fourth Quarter	15.92	0	293.83	45.7	20.5
1983					
First Quarter	18.52	0	311.83	46.5	22.7
Second Quarter	20.80	0	332.48	48.4	23.6
Third Quarter	28.62	0	361.00	50.7	24.2
Fourth Quarter	17.35	0	379.09	52.5	26.1

[1] Including lease condensate stocks.
[2] Foreign crude oil receipts for the Strategic Petroleum Reserve began in July 1977; however, these receipts went into bonded storage and were not considered an import until October 1977 when they were withdrawn from bonded storage.
[3] The quantity of domestic fuel oil which was in storage prior to injection of foreign crude oil. Stocks do not include imported quantities in transit to Strategic Petroleum Reserve terminals, pipeline fill, and above-ground storage.
[4] Less than 0.005 million barrels.

Sources: • 1977 through 1980 — Energy Information Administration, Energy Data Report, *Petroleum Statement, Annual.* •1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* • 1983—Energy Information Administration, *Petroleum Supply Monthly.*

Figure 55. International Petroleum Supply and Disposition, 1981
(Thousand Barrels per Day)

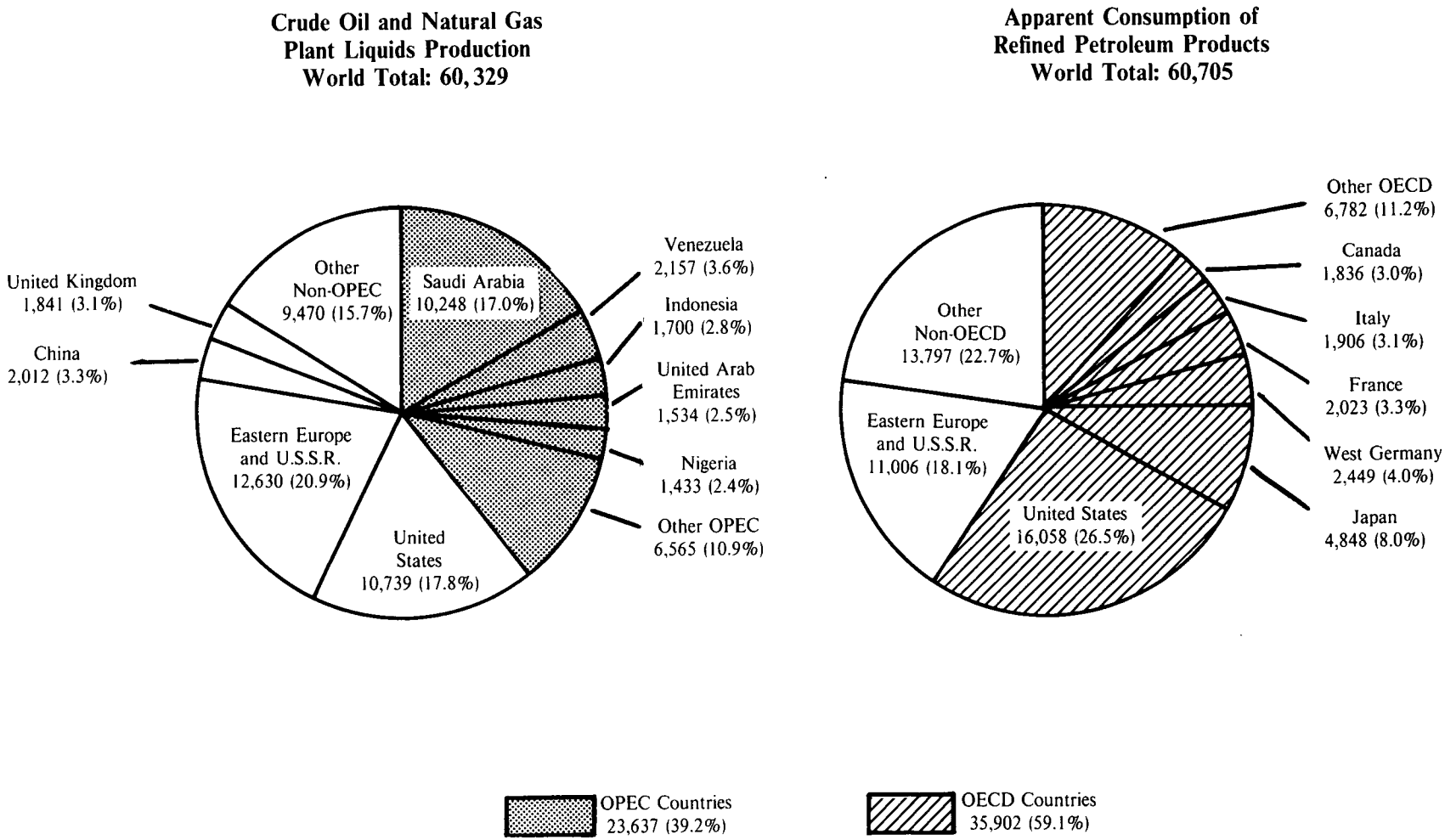


Table 53. International Petroleum Supply and Disposition, 1981

(Thousand Barrels per Day)

Area and Country	Supply				Disposition			
	Crude Oil [1] Production	Natural Gas Plant Liquids Production	Crude Oil Imports	Refined Petroleum Product Imports	Crude Oil Exports	Refined Petroleum Product Exports	Apparent Consumption [2]	International Bunkers
North America								
Canada	1,285	325	509	42	164	123	1,836	18
Mexico	2,313	241	0	8	1,098	65	1,267	2
United States	[3] 9,130	1,609	4,397	1,464	228	367	16,058	482
Other	0	0	0	8	0	0	8	1
Total	12,728	2,175	4,906	1,522	1,490	556	19,169	503
Central and South America								
Argentina	496	12	25	15	1	58	483	9
Bahama Islands	0	0	172	12	0	107	75	3
Brazil	[4] 233	7	842	23	15	69	1,022	21
Chile	41	10	52	1	0	0	97	1
Colombia	125	6	21	30	0	28	172	5
Cuba	2	1	122	79	0	0	207	0
Ecuador	211	2	0	15	128	16	88	5
Netherlands Antilles	0	0	514	48	10	409	137	41
Panama Republic	0	0	39	48	0	6	84	50
Peru	193	4	0	1	55	21	137	2
Puerto Rico	0	0	251	94	0	64	281	2
Trinidad and Tobago	240	5	105	1	121	131	45	10
Venezuela	2,102	55	0	3	1,261	466	433	16
Virgin Islands	0	0	447	12	0	320	111	18
Other	27	4	148	84	0	5	265	5
Total	3,670	106	2,738	466	1,591	1,700	3,637	188
Western Europe								
Austria	25	1	156	45	0	0	225	0
Belgium and Luxembourg	0	0	591	240	0	335	503	54
Denmark	15	0	112	143	5	25	243	10
Finland	0	0	219	52	0	38	241	14
France	34	27	1,917	384	0	329	2,023	60
Germany, West	89	0	1,591	795	0	156	2,449	58
Greece	8	0	368	75	[5]	160	254	36
Ireland	0	0	30	88	0	1	104	5
Italy	37	1	1,702	307	0	262	1,906	73
Netherlands	27	6	798	675	1	846	657	171
Norway	501	50	78	67	418	54	185	5
Portugal	0	0	155	18	0	37	140	12
Spain	25	0	931	123	3	80	941	21
Sweden	0	0	293	204	4	78	471	19
Switzerland	0	0	90	165	0	1	251	14

Continued to next page.

Table 53. International Petroleum Supply and Disposition, 1981 (Continued)

(Thousand Barrels per Day)

Area and Country	Supply				Disposition			
	Crude Oil [1] Production	Natural Gas Plant Liquids Production	Crude Oil Imports	Refined Petroleum Product Imports	Crude Oil Exports	Refined Petroleum Product Exports	Apparent Consumption [2]	International Bunkers
Western Europe (continued)								
Turkey	46	0	232	47	0	8	280	3
United Kingdom	1,811	50	753	294	1,040	297	1,590	96
Yugoslavia	86	2	190	21	0	10	285	0
Other	0	0	0	18	0	0	18	2
Total	2,704	137	10,206	3,762	1,471	2,718	12,766	653
Eastern Europe and U.S.S.R.								
Albania	44	0	0	0	0	0	44	0
Bulgaria	6	0	250	38	0	2	294	0
Czechoslovakia	2	[5]	375	19	0	12	381	0
Germany, East	1	0	400	8	0	54	355	0
Hungary	38	20	155	35	0	19	236	0
Poland	7	1	270	85	0	16	346	1
Romania	241	14	245	[5]	0	171	323	0
U.S.S.R.	11,909	347	140	19	2,400	971	9,027	80
Total	12,248	382	1,835	204	2,400	1,245	11,006	81
Africa								
Algeria	805	213	0	13	830	85	127	7
Angola	130	0	0	3	115	2	20	8
Egypt	598	17	0	2	199	9	276	18
Gabon	151	0	0	3	126	16	12	2
Kenya	0	0	52	3	0	22	39	9
Libya	1,140	35	0	13	1,060	27	115	5
Morocco	1	0	98	8	0	0	93	7
Nigeria	1,433	0	0	21	1,298	9	156	2
South Africa, Republic of	0	0	340	18	0	3	324	67
Tunisia	118	0	28	27	103	0	57	2
Other	199	0	161	147	130	32	277	37
Total	4,575	265	679	258	3,861	205	1,496	164

Continued to next page.

Table 53. International Petroleum Supply and Disposition, 1981 (Continued)

(Thousand Barrels per Day)

Area and Country	Supply				Disposition			
	Crude Oil [1] Production	Natural Gas Plant Liquids Production	Crude Oil Imports	Refined Petroleum Product Imports	Crude Oil Exports	Refined Petroleum Product Exports	Apparent Consumption [2]	International Bunkers
Middle East								
Bahrain	46	8	213	0	0	237	35	14
Iran	1,380	9	0	0	731	85	633	18
Iraq	1,000	5	0	0	759	42	214	2
Israel	1	0	147	26	0	11	163	0
Kuwait	1,125	60	0	0	950	141	116	53
Oman	319	0	0	8	329	0	8	0
Qatar	405	24	0	2	391	15	10	1
Saudi Arabia	9,815	433	0	38	9,300	510	486	52
Syria	166	0	103	16	125	42	120	0
United Arab Emirates	1,474	60	0	42	1,428	0	126	27
Other	0	0	126	31	0	14	150	9
Total	15,731	599	589	163	14,013	1,097	2,061	176
Far East and Oceania								
Australia	394	60	195	64	1	77	584	40
Brunei	163	25	0	1	159	0	5	0
China	2,012	0	10	2	291	77	1,675	0
Hong Kong	0	0	0	132	0	4	128	27
India	325	0	307	102	0	2	729	3
Indonesia	1,605	95	101	218	1,470	95	441	7
Japan	7	1	3,921	567	0	10	4,848	168
Korea, South	0	0	501	36	0	1	536	6
Malaysia	264	0	69	55	251	2	165	5
New Zealand	10	1	56	22	0	0	85	9
Pakistan	10	[5]	82	34	0	21	107	7
Philippines	2	0	180	26	0	4	212	3
Singapore	0	0	778	84	1	648	214	69
Taiwan	3	5	343	53	0	23	377	10
Thailand	[5]	0	165	52	0	[5]	214	3
Other	27	0	131	115	1	20	250	20
Total	4,822	187	6,839	1,563	2,174	984	10,570	377
World Total	56,478	3,851	27,792	7,937	27,000	8,506	60,705	2,142

[1] Data include lease condensate.

[2] Data represent apparent consumption, which includes domestic consumption, refinery fuel and loss, and international bunkering. Apparent consumption is either an actual figure or is derived from the components of refined product output, plus imports, minus exports with no allowance for stock changes. Also includes, where available, liquefied petroleum gases sold directly for fuel and chemical uses from natural gas processing plants.

[3] Includes 558,000 barrels per day of refinery processing gain and other hydrocarbon inputs to refineries.

[4] Includes 20,000 barrels per day of ethyl alcohol.

[5] Denotes less than 500 barrels per day.

Note: Sum of components may not equal total due to independent rounding.

Source: Energy Information Administration, *1982 International Energy Annual.*

Figure 56. International Production of Crude Oil

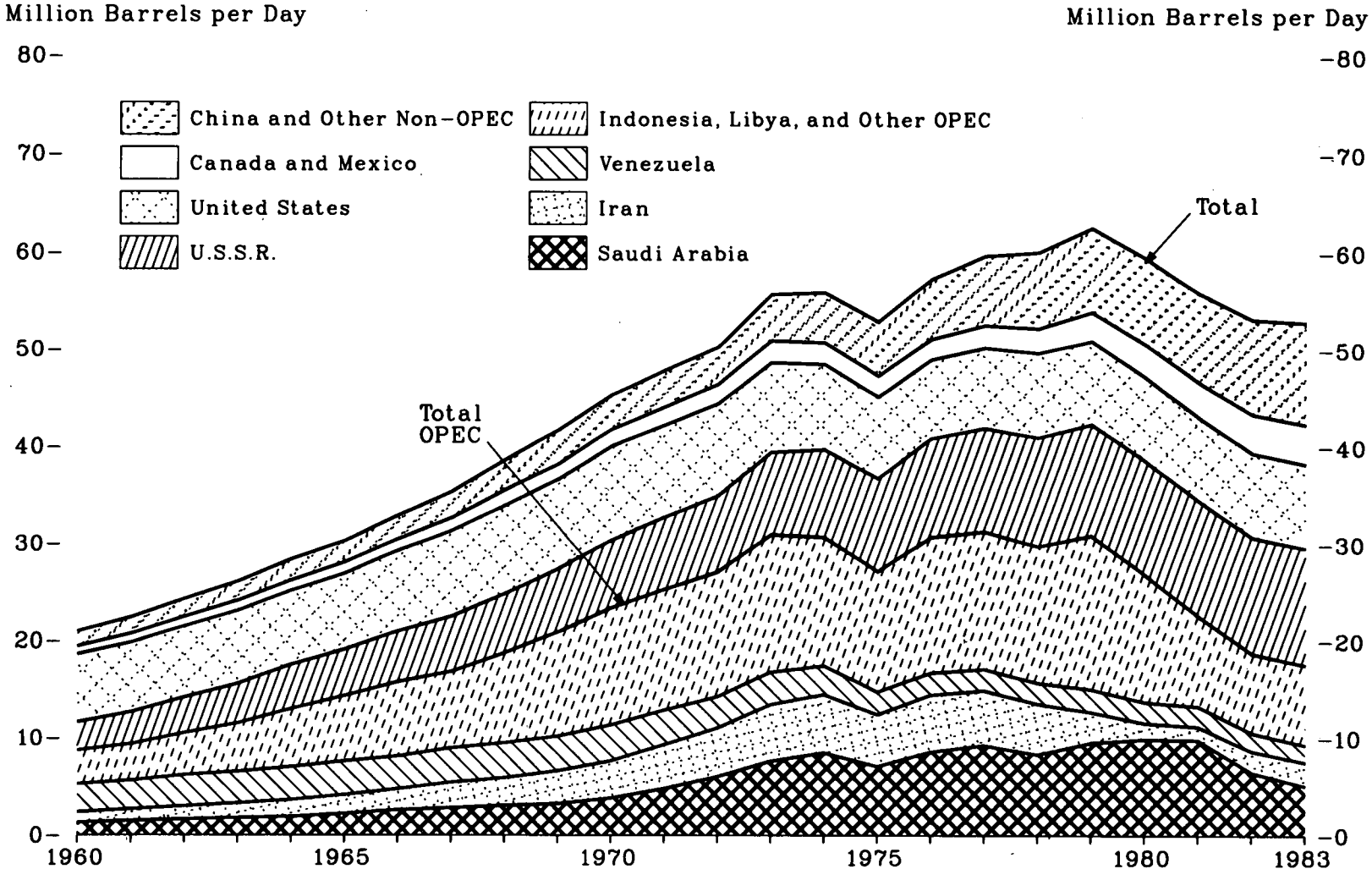


Table 54. International Production of Crude Oil,[1] 1960-1983

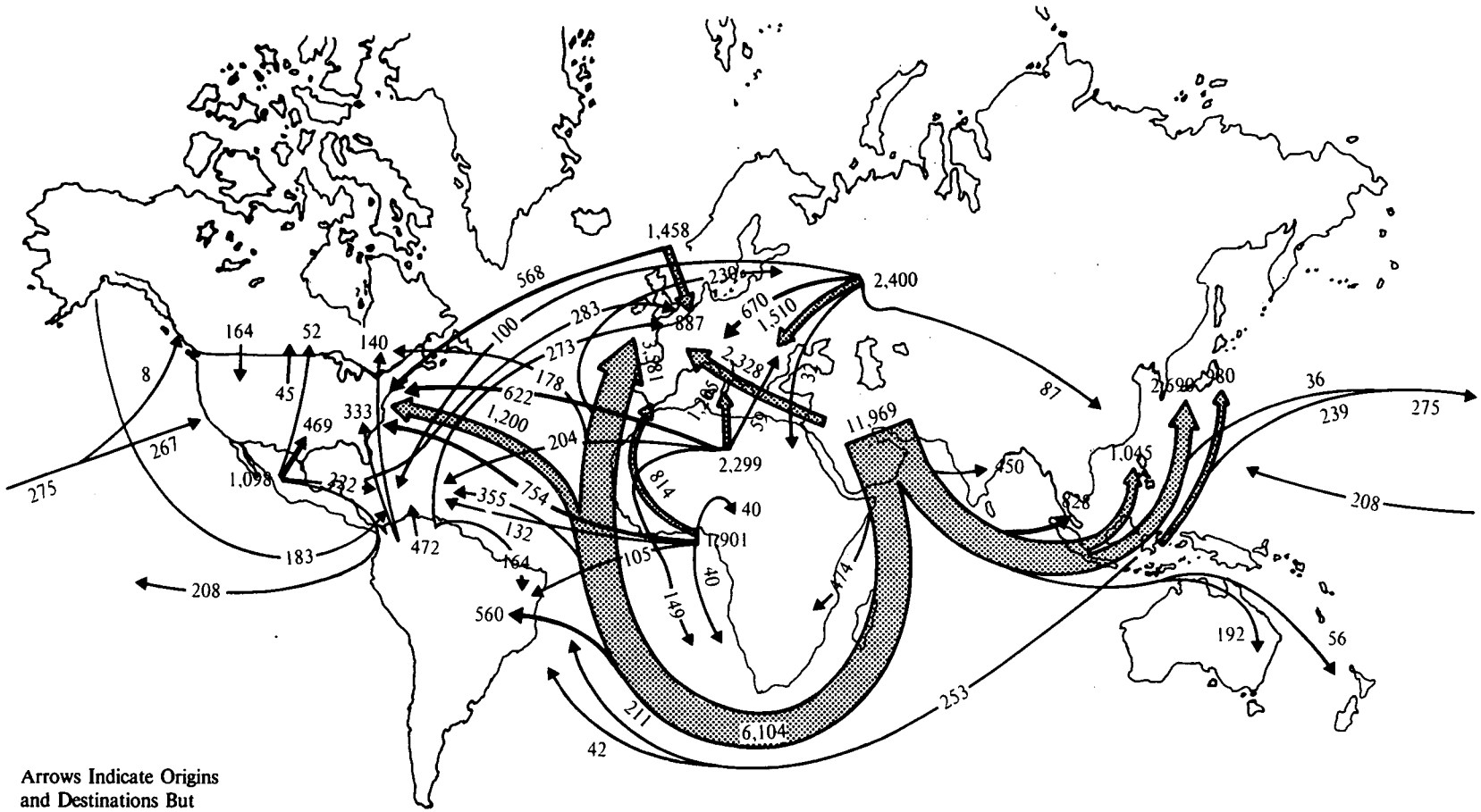
(Million Barrels per Day)

Year	Organization of Petroleum Exporting Countries (OPEC)[2]															
	Indonesia	Iran	Libya	Nigeria	Saudi Arabia[3]	Venezuela	Other OPEC	Total OPEC	Canada	China	Mexico	United States	U.S.S.R.	Other Non-OPEC	Total World	Non-Communist World
1960	0.41	1.07	(4)	0.02	1.31	2.85	3.04	8.70	0.52	0.10	0.27	7.04	2.91	1.42	20.96	17.65
1961	0.42	1.20	0.02	0.05	1.48	2.92	3.27	9.36	0.61	0.11	0.29	7.18	3.28	1.60	22.43	18.66
1962	0.45	1.34	0.18	0.07	1.64	3.20	3.63	10.51	0.67	0.12	0.31	7.33	3.67	1.71	24.32	20.14
1963	0.44	1.49	0.44	0.08	1.79	3.25	4.02	11.51	0.71	0.13	0.32	7.54	4.07	1.85	26.13	21.52
1964	0.46	1.71	0.86	0.12	1.90	3.39	4.54	12.98	0.75	0.18	0.32	7.61	4.60	1.92	28.36	23.15
1965	0.48	1.91	1.22	0.27	2.21	3.47	4.78	14.34	0.81	0.23	0.32	7.80	4.79	2.01	30.30	24.85
1966	0.47	2.13	1.50	0.42	2.60	3.37	5.28	15.77	0.88	0.29	0.33	8.30	5.23	2.13	32.93	26.96
1967	0.51	2.60	1.74	0.32	2.81	3.54	5.33	16.85	0.96	0.28	0.37	8.81	5.68	2.42	35.37	28.95
1968	0.60	2.84	2.60	0.14	3.04	3.61	5.96	18.79	1.19	0.30	0.39	9.10	6.08	2.79	38.64	31.85
1969	0.75	3.38	3.11	0.54	3.22	3.59	6.32	20.91	1.13	0.48	0.46	9.24	6.48	2.99	41.69	34.42
1970	0.85	3.83	3.32	1.08	3.80	3.71	6.82	23.41	1.26	0.60	0.49	9.64	6.97	2.92	45.29	37.36
1971	0.89	4.54	2.76	1.53	4.77	3.55	7.29	25.33	1.35	0.78	0.49	9.46	7.44	2.99	47.84	39.29
1972	1.08	5.02	2.24	1.82	6.02	3.22	7.69	27.09	1.53	0.90	0.51	9.44	7.88	2.91	50.26	41.31
1973	1.34	5.86	2.18	2.05	7.60	3.37	8.59	30.99	1.80	1.09	0.47	9.21	8.47	3.64	55.67	45.66
1974	1.38	6.02	1.52	2.26	8.48	2.98	8.09	30.73	1.68	1.32	0.57	8.77	9.00	3.78	55.85	45.07
1975	1.31	5.35	1.48	1.78	7.08	2.35	7.81	27.16	1.44	1.49	0.71	8.38	9.63	4.07	52.88	41.29
1976	1.50	5.88	1.93	2.07	8.58	2.29	8.49	30.74	1.30	1.67	0.83	8.13	10.14	4.50	57.31	45.02
1977	1.69	5.66	2.06	2.09	9.25	2.24	8.31	31.30	1.32	1.87	0.98	8.25	10.68	5.29	59.69	46.65
1978	1.64	5.24	1.98	1.90	8.30	2.17	8.58	29.81	1.31	2.08	1.21	8.71	11.19	5.75	60.06	46.32
1979	1.59	3.17	2.09	2.30	9.53	2.36	9.89	30.93	1.50	2.12	1.46	8.55	11.46	6.52	62.54	48.51
1980	1.58	1.66	1.79	2.06	9.90	2.17	7.73	26.89	1.44	2.11	1.94	8.60	11.77	6.79	59.54	45.23
1981	1.61	1.38	1.14	1.43	9.82	2.10	5.17	22.65	1.29	2.01	2.31	8.57	11.91	7.16	55.90	41.55
1982	1.34	2.21	1.16	1.30	6.47	1.89	4.41	18.78	1.24	2.03	2.75	8.65	12.00	7.71	53.16	38.67
1983[5]	1.39	2.43	1.08	1.24	5.09	1.79	4.60	17.60	1.39	2.09	2.69	8.66	12.04	8.35	52.82	38.29

[1] Includes lease condensate, excludes natural gas plant liquids.
[2] See Glossary for membership.
[3] Saudi Arabia includes one-half of the production in the Partitioned Zone (formerly Neutral Zone).
[4] Less than 5,000 barrels per day.
[5] Preliminary.
Note: Sum of components may not equal total due to independent rounding.

Sources: **China** •1960 through 1972—Central Intelligence Agency, unpublished data. •1973 through 1982—Energy Information Administration, *1982 International Energy Annual.* •1983—Energy Information Administration, *Monthly Energy Review.* **United States** •1960 through 1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* •1976 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* •1981 and 1982—Energy Information Administration, *Petroleum Supply Annual.* •1983—Energy Information Administration, *Monthly Energy Review.* **U.S.S.R.:** •1960 through 1972—USSR Central Statistical Office, *Narodnoye Khozyaystvo SSSR* (National Economy USSR). •1973 through 1982—Energy Information Administration, *1982 International Energy Annual.* •1983—Energy Information Administration, *Monthly Energy Review.* **All other countries:** •1960 through 1969—Bureau of Mines, *International Petroleum Annual, 1969.* •1970 through 1972—Energy Information Administration, *International Petroleum Annual, 1978.* •1973 through 1982—Energy Information Administration, *1982 International Energy Annual.* •1983—Energy Information Administration, *Monthly Energy Review.*

Figure 57. International Crude Oil Flow, 1981
(Thousand Barrels per Day)



Arrows Indicate Origins and Destinations But Not Necessarily Specific Routes. Several Minor Routes Are Not Displayed.

Table 55. International Crude Oil Flow, 1981

(Thousand Barrels per Day)

Exporting Area and Country	Importing Area or Country										
	North America		Central and South America		Western Europe				Far East and Oceania		
	United States	Canada	Caribbean Area	Other	Via Atlantic Ocean and North Sea	Via Mediterranean Sea	Eastern Europe	Middle East and Africa	Japan	Other	Total [1]
North America											
Canada	164	—	0	0	0	0	0	0	0	0	164
Mexico	469	52	177	45	70	213	0	0	72	0	1,098
United States	—	45	[2] 183	0	0	0	0	0	0	0	228
Central and South America											
Ecuador	38	0	7	18	0	0	0	0	26	39	128
Peru	30	0	8	3	0	0	0	0	14	0	55
Trinidad and Tobago	102	2	10	0	1	6	0	0	0	0	121
Venezuela	147	138	472	164	102	164	2	15	41	16	1,261
Other	16	0	4	0	0	0	0	2	0	0	22
Western Europe											
Norway	114	7	0	0	294	0	0	0	3	0	418
United Kingdom	369	28	50	0	575	18	0	0	0	0	1,040
Other	[3]	0	0	0	0	0	0	0	0	0	[3]
U.S.S.R.	0	0	100	0	340	330	1,510	32	2	85	2,400
Middle East											
Via Suez Canal and Sumed Pipeline	0	0	0	0	510	1,318	0	55	0	0	1,883
Via Eastern Mediterranean	6	18	0	0	40	460	18	70	0	0	612
Via Cape of Good Hope	1,200	178	355	560	2,778	803	230	0	0	0	6,104
Other [4]	20	8	0	0	0	125	0	966	2,690	2,056	5,865
Africa											
North	622	28	145	59	445	760	59	32	69	80	2,299
West	749	5	132	105	527	287	16	40	23	17	1,901
Far East and Oceania	351	0	99	42	20	20	0	55	980	625	2,192
World Total	4,397	509	1,742	996	5,702	4,504	1,835	1,267	3,921	2,918	27,792

[1] The data in this column are total imports; they do not equal reported exports because of changes in stocks at sea, exchanges, transshipments, and other statistical discrepancies.
[2] Includes shipments to Puerto Rico and the Virgin Islands.
[3] Less than 500 barrels per day.
[4] Primarily tanker shipments to countries bordering the Indian or Pacific Oceans.
Note: Transshipments are assigned to the country of original lading, if known.
Note: Sum of components may not equal total due to independent rounding.
Source: Energy Information Administration, *1982 International Energy Annual.*

Figure 58. International Consumption of Refined Petroleum Products

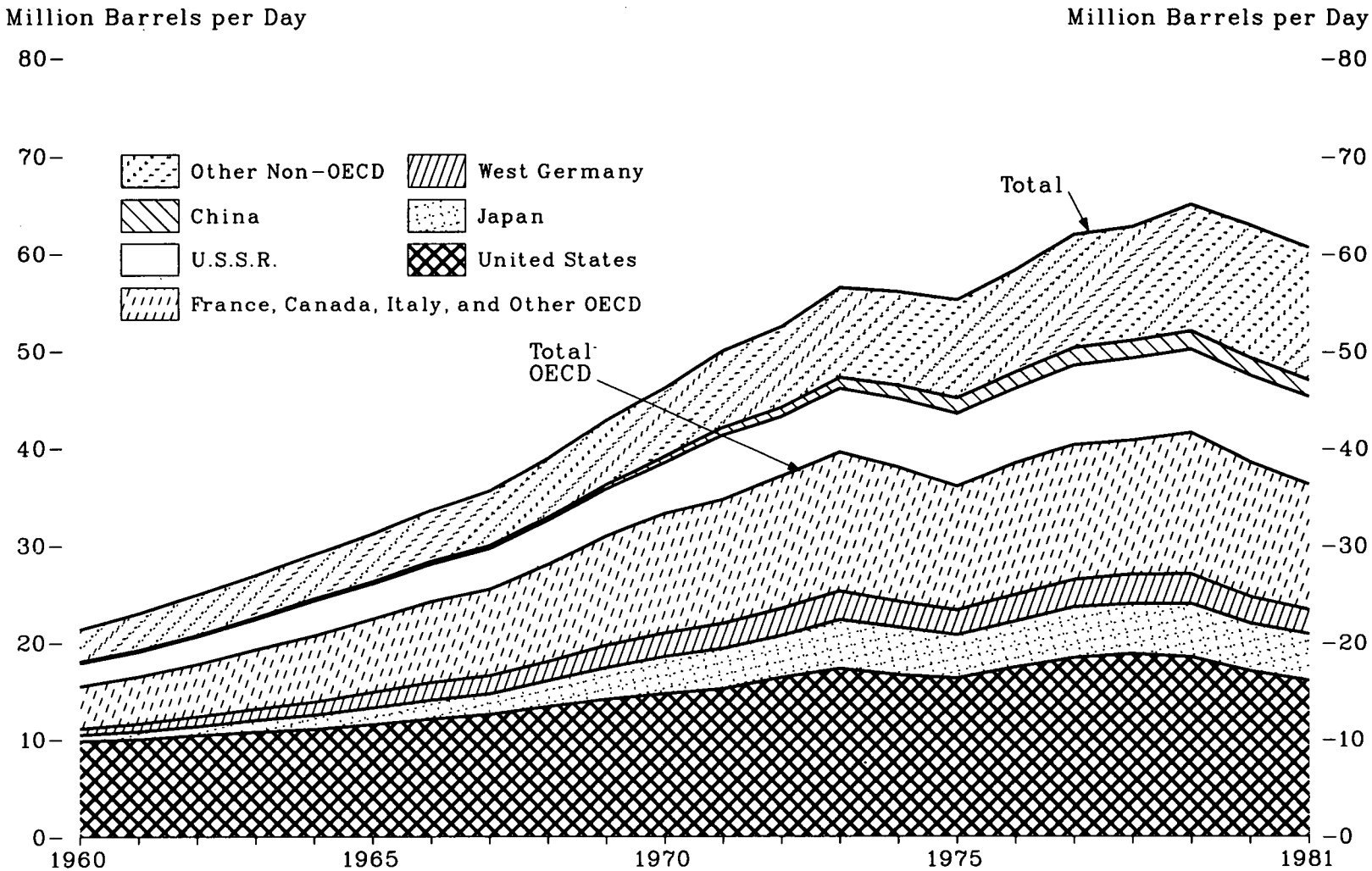


Table 56. International Consumption of Refined Petroleum Products, 1960-1981

(Million Barrels per Day)

Year	Organization for Economic Cooperation and Development (OECD) [1]																
	Australia	Canada	France	West Germany	Italy	Japan	Spain	United Kingdom	United States	Other OECD	Total	Brazil	China	Mexico	U.S.S.R.	Total World	Non-Communist World
1960	0.22	0.84	0.56	0.63	0.44	0.66	0.10	0.94	9.80	1.28	15.47	0.27	0.17	0.30	2.38	21.34	18.32
1961	0.23	0.87	0.63	0.79	0.54	0.82	0.12	1.04	9.98	1.45	16.46	0.28	0.17	0.29	2.57	23.00	19.57
1962	0.25	0.92	0.73	1.00	0.67	0.93	0.12	1.12	10.40	1.62	17.74	0.31	0.14	0.30	2.87	24.89	21.20
1963	0.29	0.99	0.86	1.17	0.77	1.21	0.12	1.27	10.74	1.85	19.26	0.34	0.17	0.31	3.15	26.92	22.90
1964	0.32	1.05	0.98	1.36	0.90	1.48	0.20	1.36	11.02	2.03	20.70	0.35	0.20	0.33	3.58	29.08	24.76
1965	0.35	1.14	1.09	1.61	0.98	1.74	0.23	1.49	11.51	2.30	22.44	0.33	0.23	0.34	3.61	31.14	26.45
1966	0.37	1.21	1.19	1.80	1.08	1.98	0.31	1.58	12.08	2.61	24.20	0.38	0.30	0.36	3.87	33.56	28.53
1967	0.41	1.25	1.34	1.86	1.19	2.14	0.36	1.64	12.56	2.72	25.48	0.38	0.28	0.39	4.22	35.59	30.08
1968	0.45	1.34	1.46	1.99	1.40	2.66	0.46	1.82	13.39	3.08	28.05	0.46	0.31	0.41	4.48	38.96	32.96
1969	0.49	1.42	1.66	2.33	1.69	3.25	0.49	1.98	14.14	3.49	30.94	0.48	0.44	0.45	4.87	42.89	36.37
1970	0.51	1.49	1.89	2.43	1.84	3.85	0.56	2.09	14.70	3.88	33.23	0.51	0.62	0.50	5.30	46.17	39.39
1971	0.54	1.53	2.05	2.61	1.93	4.18	0.60	2.09	15.21	3.95	34.71	0.56	0.79	0.52	6.65	50.03	42.54
1972	0.54	1.62	2.24	2.76	2.07	4.36	0.67	2.24	16.37	4.29	37.15	0.65	0.91	0.56	6.10	52.47	45.06
1973	0.59	1.71	2.42	2.92	2.15	5.07	0.74	2.30	17.31	4.38	39.58	0.77	1.12	0.61	6.57	56.53	47.58
1974	0.62	1.74	2.26	2.61	2.09	4.96	0.78	2.14	16.65	4.23	38.08	0.83	1.38	0.67	7.01	56.12	47.54
1975	0.56	1.69	2.14	2.52	1.58	4.50	0.84	1.87	16.32	4.07	36.09	0.87	1.58	0.74	7.47	55.28	46.20
1976	0.62	1.74	2.28	2.71	1.80	4.77	0.98	1.86	17.46	4.29	38.51	0.97	1.68	0.80	7.65	58.31	47.37
1977	0.66	1.75	2.23	2.84	1.97	5.23	0.93	1.88	18.43	4.41	40.34	1.01	1.83	0.84	8.18	62.02	50.15
1978	0.61	1.74	2.17	3.05	2.18	5.14	0.95	1.85	18.85	4.29	40.81	1.05	1.81	0.92	8.47	62.84	50.55
1979	0.61	1.86	2.39	3.07	2.00	5.48	0.98	1.93	18.51	4.78	41.62	1.18	1.85	0.90	8.58	65.11	51.95
1980	0.59	1.95	2.26	2.71	1.88	4.96	0.99	1.73	17.06	4.49	38.60	1.16	1.83	1.22	8.91	63.03	49.57
1981	0.58	1.84	2.02	2.45	1.91	4.85	0.94	1.59	16.06	4.07	36.30	1.02	1.68	1.27	9.03	60.71	47.44

[1] See Glossary for membership. "Other OECD" includes the United States territories of Puerto Rico, Virgin Islands, and Guam.

Note: Sum of components may not equal total due to independent rounding.

Sources: **United States:** •1960 through 1976—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* •1977 through 1980—Energy Information Administration, Energy Data Reports, *Petroleum Statement, Annual.* •1981—Energy Information Administration, *Petroleum Supply Annual.* **U.S.S.R.:** •1960 through 1976—U.S.S.R. Central Statistical Office, *Narodnoye Khozyaystvo SSSR* (National Economy U.S.S.R.), and *Vneshnyaya Torgvliya SSSR* (Foreign Trade of the U.S.S.R.), annual issues. •1977 through 1979—U.S.S.R. Central Statistical Office, *Narodnoye Khozyaystvo SSSR* (National Economy U.S.S.R.), annual issues; U.S.S.R. trade as imports reported by their trading partners in official trade statistics of the respective countries. •1980 and 1981—Energy Information Administration, *1981..., and 1982 International Energy Annual.* **China:** •1960 through 1979—Central Intelligence Agency, unpublished data. •1980 and 1981—Energy Information Administration, *1981..., and 1982 International Energy Annual.* **All other countries:** •1960 through 1969—Bureau of Mines, *International Petroleum Annual, 1969.* •1970 through 1978—Energy Information Administration, *International Petroleum Annual, 1978.* •1979 through 1981—Energy Information Administration, *1980..., 1981..., and 1982 International Energy Annual.*

Figure 59. Primary Stocks of Petroleum in OECD Countries, End of Quarter

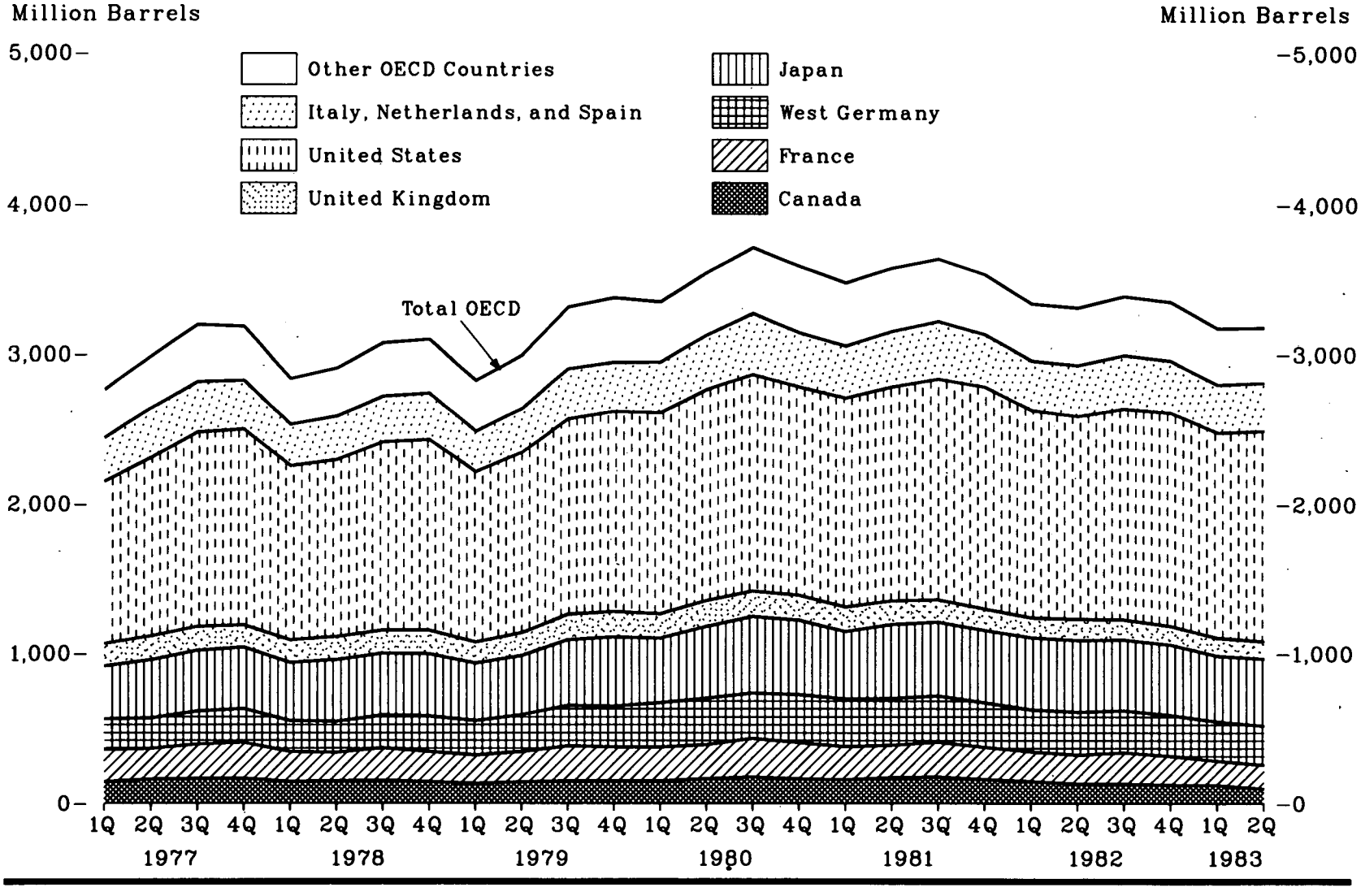


Table 57. Primary Stocks of Petroleum [1] in OECD Countries [2], End of Quarter—First Quarter 1977 through Second Quarter 1983

(Million Barrels)

Quarter	Canada	France	West Germany	Italy	Japan	Netherlands	Spain	United Kingdom	United States	Other OECD [3]	Total OECD
1977											
First Quarter	144	214	206	138	351	77	78	149	1,087	318	2,762
Second Quarter	161	204	204	164	387	85	82	158	1,195	345	2,985
Third Quarter	165	229	220	165	404	88	78	159	1,304	385	3,197
Fourth Quarter	167	239	225	161	409	81	79	148	1,312	364	3,185
1978											
First Quarter	146	198	207	137	387	69	69	150	1,168	303	2,834
Second Quarter	149	190	207	143	411	70	77	153	1,185	320	2,905
Third Quarter	153	216	219	158	412	64	81	153	1,263	354	3,073
Fourth Quarter	144	201	238	154	413	77	76	157	1,278	359	3,097
1979											
First Quarter	133	188	231	136	382	63	71	140	1,142	335	2,821
Second Quarter	142	202	246	147	394	72	72	151	1,210	355	2,991
Third Quarter	150	233	269	165	438	83	85	169	1,309	412	3,313
Fourth Quarter	150	226	272	163	460	87	78	169	1,341	429	3,375
1980											
First Quarter	149	226	296	155	430	99	83	162	1,348	400	3,348
Second Quarter	164	228	309	168	478	104	92	173	1,411	415	3,542
Third Quarter	176	258	302	195	509	112	102	172	1,447	442	3,715
Fourth Quarter	164	243	319	170	495	116	77	168	1,392	443	3,587
1981											
First Quarter	159	220	317	158	450	101	86	163	1,401	420	3,475
Second Quarter	172	217	311	171	493	102	100	158	1,430	421	3,575
Third Quarter	177	233	307	187	492	102	97	150	1,476	418	3,639
Fourth Quarter	161	214	297	167	482	97	88	143	1,484	398	3,531
1982											
First Quarter	148	198	279	158	480	88	82	133	1,392	380	3,338
Second Quarter	131	192	287	156	478	95	88	141	1,360	383	3,311
Third Quarter	131	208	280	179	472	88	88	134	1,414	394	3,388
Fourth Quarter	123	193	273	179	469	87	79	125	1,430	392	3,350
1983											
First Quarter	122	162	262	155	438	83	79	120	1,375	379	3,175
Second Quarter	99	158	262	159	447	78	83	116	1,409	370	3,181

[1] Includes crude oil, lease condensate, natural gas plant liquids, unfinished oils, and finished petroleum products. See Explanatory Note 7.
[2] Organization for Economic Cooperation and Development. See Glossary for membership.
[3] A calculated quantity derived as the difference between "Total OECD" stocks and the sum of the countries identified above.
Sources: • 1977 through 1982 — Organization for Economic Cooperation and Development/International Energy Agency, *Quarterly Oil Statistics*. • First and second quarter 1983 — Energy Information Administration, *Monthly Energy Review*, December 1983 (4).

Figure 60. Crude Oil Wellhead Prices

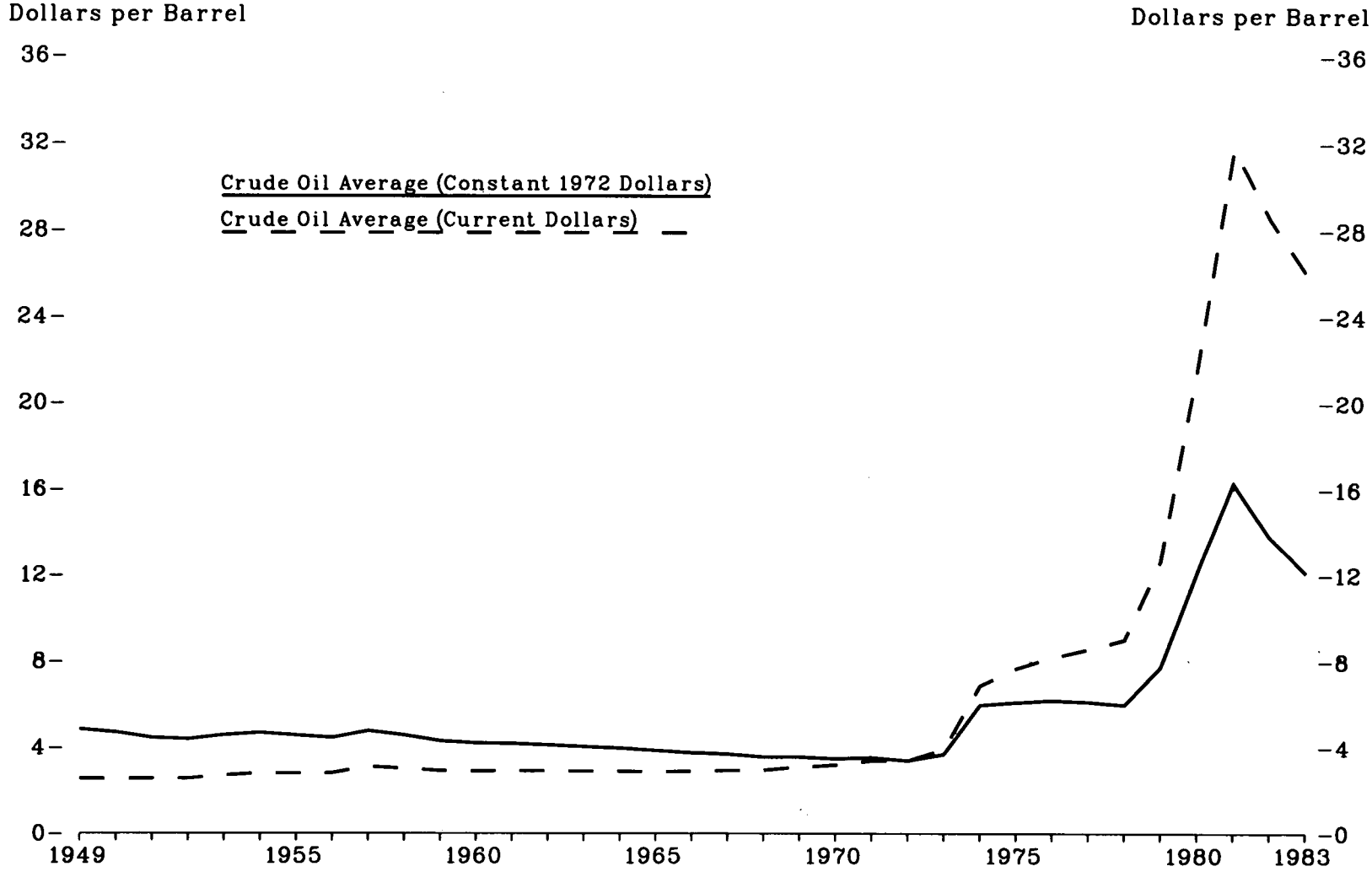


Table 58. Crude Oil Wellhead Prices, 1949-1983

(Dollars per Barrel)

Year	Lower Tier (current)	Upper Tier (current)	Stripper Oil (current)	Domestic Average (current)	Domestic Average (constant)[1]
1949	Not Applicable	Not Applicable	Not Applicable	2.54	4.84
1950	Not Applicable	Not Applicable	Not Applicable	2.51	4.69
1951	Not Applicable	Not Applicable	Not Applicable	2.53	4.43
1952	Not Applicable	Not Applicable	Not Applicable	2.53	4.37
1953	Not Applicable	Not Applicable	Not Applicable	2.68	4.56
1954	Not Applicable	Not Applicable	Not Applicable	2.78	4.67
1955	Not Applicable	Not Applicable	Not Applicable	2.77	4.55
1956	Not Applicable	Not Applicable	Not Applicable	2.79	4.44
1957	Not Applicable	Not Applicable	Not Applicable	3.09	4.76
1958	Not Applicable	Not Applicable	Not Applicable	3.01	4.56
1959	Not Applicable	Not Applicable	Not Applicable	2.90	4.29
1960	Not Applicable	Not Applicable	Not Applicable	2.88	4.19
1961	Not Applicable	Not Applicable	Not Applicable	2.89	4.17
1962	Not Applicable	Not Applicable	Not Applicable	2.90	4.11
1963	Not Applicable	Not Applicable	Not Applicable	2.89	4.03
1964	Not Applicable	Not Applicable	Not Applicable	2.88	3.96
1965	Not Applicable	Not Applicable	Not Applicable	2.86	3.85
1966	Not Applicable	Not Applicable	Not Applicable	2.88	3.75
1967	Not Applicable	Not Applicable	Not Applicable	2.92	3.69
1968	Not Applicable	Not Applicable	Not Applicable	2.94	3.56
1969	Not Applicable	Not Applicable	Not Applicable	3.09	3.56
1970	Not Applicable	Not Applicable	Not Applicable	3.18	3.48
1971	Not Applicable	Not Applicable	Not Applicable	3.39	3.53
1972	Not Applicable	Not Applicable	Not Applicable	3.39	3.39
1973	Not Applicable	Not Applicable	Not Applicable	3.89	3.68
1974	5.03	10.13	Not Applicable	6.87	5.97
1975	5.03	12.03	Not Applicable	7.67	6.10
1976	5.13	11.71	12.16	8.19	6.19
1977	5.19	11.22	13.59	8.57	6.12
1978	5.46	12.15	13.95	9.00	5.98
1979	5.95	13.20	22.93	12.64	7.73
1980	6.51	14.37	35.48	21.59	12.10
1981	(2)	(2)	(2)	31.77	16.28
1982	(2)	(2)	(2)	28.52	13.79
1983	(2)	(2)	(2)	[3] 26.07	[3] 12.09

[1] Constant 1972 dollars calculated using GNP implicit price deflators, 1972=100. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

[2] Crude oil prices were decontrolled on January 28, 1981, and purchasers were no longer required to report prices by category.

[3] Average for January through November.

Note: Crude oil wellhead prices for each category and for the domestic average are derived by dividing the sum of the value of all first purchases by the total volume of all first purchasers' purchases.

Note: From 1974 until February 1976, Lower Tier crude oil was called Old Oil, and Upper Tier crude oil was called New Oil. Alaskan North Slope crude oil is included in Upper Tier and Domestic Average.

Sources: •1949 through 1973—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. •1974 through January 1976—Federal Energy Administration, FEA Form 90, "Crude Petroleum Production Monthly Report." • February 1976 through September 1979—Federal Energy Administration, Form FEA P-124, "Domestic Crude Oil Purchaser's Monthly Report." • October 1979 through 1982—Economic Regulatory Administration, Form 182, "Domestic Crude Oil First Purchase Report." • 1983—Energy Information Administration, Form 182, "Domestic Crude Oil First Purchase Report."

Figure 61. Landed Cost of Crude Oil Imports into the United States from Selected Countries

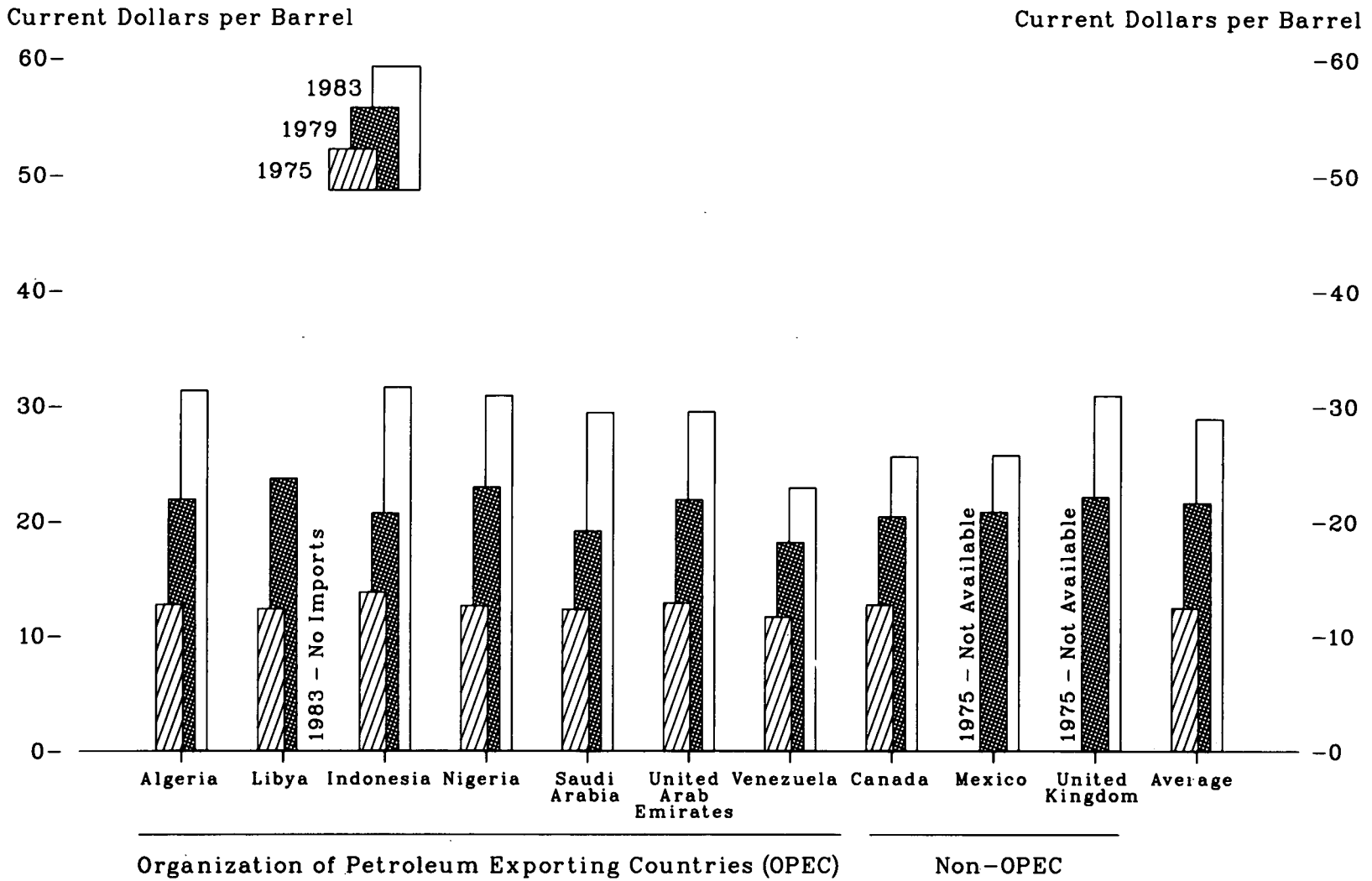


Table 59. Landed Cost of Crude Oil Imports into the United States from Selected Countries, 1975-1983

(Dollars per Barrel)

Country	1975	1976	1977	1978	1979	1980	1981	1982	1983 [1]
Algeria	12.72	13.81	15.20	14.91	21.90	37.90	40.49	35.28	31.29
Canada	12.72	13.57	14.21	14.50	20.43	30.47	32.16	26.92	25.65
Indonesia	13.79	13.82	14.63	14.64	20.69	33.92	37.57	36.75	31.59
Iran	12.21	12.82	13.80	13.88	25.02	(2)	(2)	32.40	29.81
Libya	12.35	13.58	14.87	14.72	23.68	37.72	40.92	36.05	(2)
Mexico	NA	NA	13.75	13.54	20.86	31.80	33.78	28.64	25.77
Nigeria	12.62	13.80	15.25	14.86	22.96	37.05	39.70	36.17	30.86
Saudi Arabia	12.30	13.04	13.61	13.92	19.15	30.02	34.19	35.00	29.42
United Arab Emirates	12.87	13.30	14.04	14.39	21.90	32.89	37.87	36.42	29.50
United Kingdom	NA	NA	NA	NA	22.16	35.88	37.24	34.28	30.89
Venezuela	11.65	11.80	13.13	12.83	18.18	25.86	29.87	24.82	22.92
Others	12.60	13.31	14.57	14.74	23.45	36.06	37.69	33.78	29.72
Average	12.45	13.34	14.31	14.38	21.65	33.95	36.52	33.18	28.91

[1] Average for January through November.
[2] Not applicable; little or no crude oil imported.
NA = Not available.
Sources: •1975 through September 1977—Federal Energy Administration, Form FEA F701-M-0, "Transfer Pricing Report." • October 1977 through January 1979—Energy Information Administration, Form FEA F701-M-0, "Transfer Pricing Report." • February 1980 through September 1982—Energy Information Administration, Form ERA 51, "Transfer Pricing Report." • October 1982 through 1983—Energy Information Administration, Form EP 51, "Foreign Crude Oil Transaction Report."

Figure 62. Refiner Acquisition Cost of Crude Oil

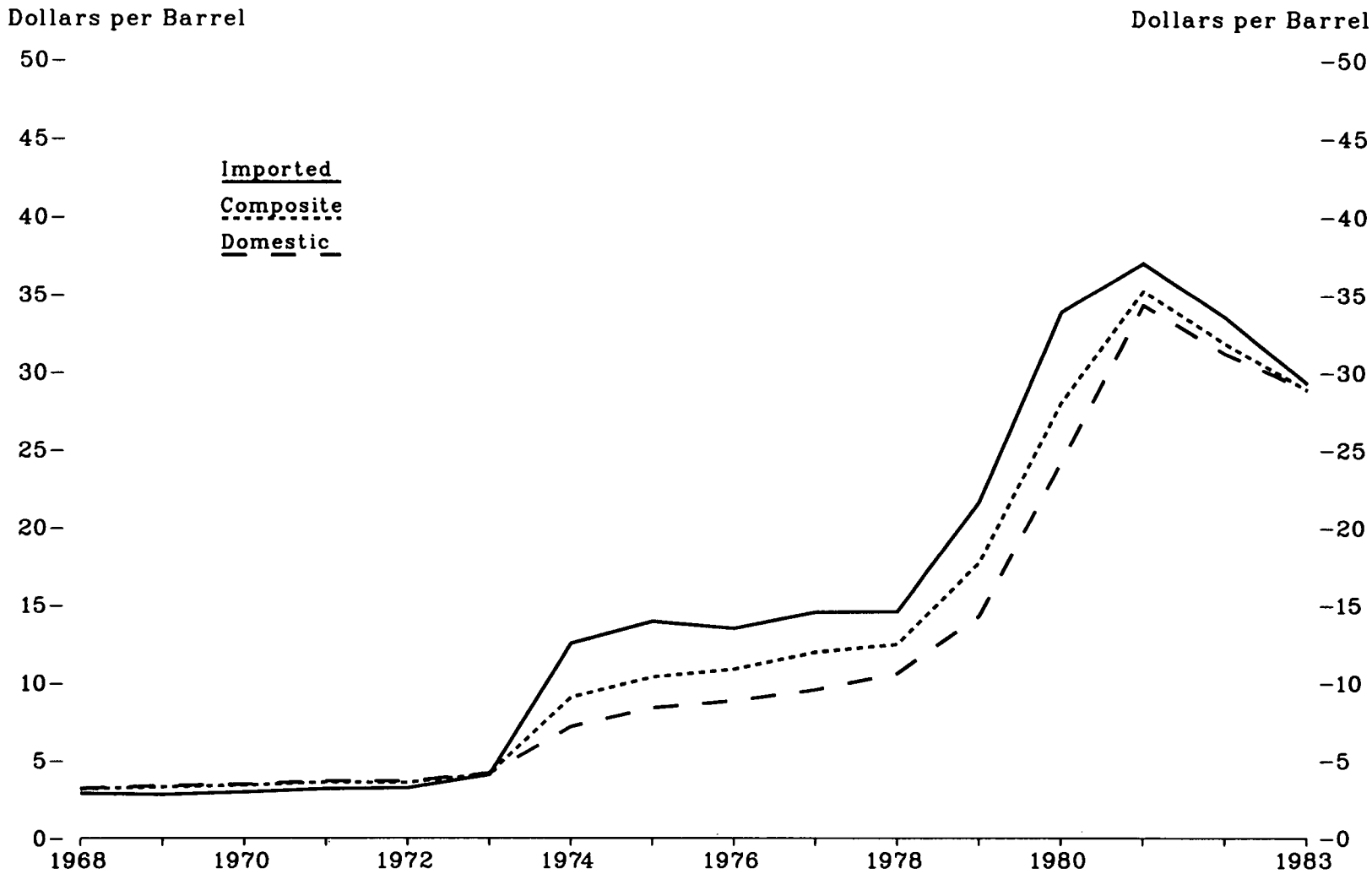


Table 60. Refiner Acquisition Cost[1] of Crude Oil, 1968-1983

(Dollars per Barrel)

Year	Domestic[2]		Imported[2]		Composite[2]	
	Current	Constant	Current	Constant	Current	Constant
1968	3.21	3.89	2.90	3.51	3.17	3.84
1969	3.37	3.88	2.80	3.23	3.29	3.79
1970	3.46	3.78	2.96	3.24	3.40	3.72
1971	3.68	3.83	3.17	3.30	3.60	3.75
1972	3.67	3.67	3.22	3.22	3.58	3.58
1973	4.17	3.94	4.08	3.86	4.15	3.92
1974	7.18	6.24	12.52	10.88	9.07	7.88
1975	8.39	6.67	13.93	11.07	10.38	8.25
1976	8.84	6.68	13.48	10.19	10.89	8.23
1977	9.55	6.82	14.53	10.37	11.96	8.54
1978	10.61	7.05	14.57	9.69	12.46	8.28
1979	14.27	8.73	21.67	13.26	17.72	10.84
1980	24.23	13.58	33.89	18.99	28.07	15.73
1981	34.33	17.59	37.05	18.99	35.24	18.06
1982	31.22	15.09	33.55	16.22	31.87	15.41
1983	28.87	13.39	29.30	13.59	28.99	13.44

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

[2] Data 1968 through 1973 are estimated. See Explanatory Note 8.

Sources: •1974 through January 1976—Federal Energy Administration, Form FEO 96, "Monthly Cost Allocation Report." •February 1976 through September 1977—Federal Energy Administration, Form FEA P110-M-1, "Refiners' Monthly Cost Allocation Report." •October 1977 through June 1978—Energy Information Administration, Form FEA P110-M-1, "Refiners' Monthly Cost Allocation Report." •July 1978 through December 1980—Energy Information Administration, Form ERA 49, "Domestic Crude Oil Entitlements Program Refiners Monthly Report." •1981 through 1983—Energy Information Administration, Form EIA-14, "Refiners' Monthly Cost Report."

Figure 63. Refined Petroleum Product Wholesale Prices

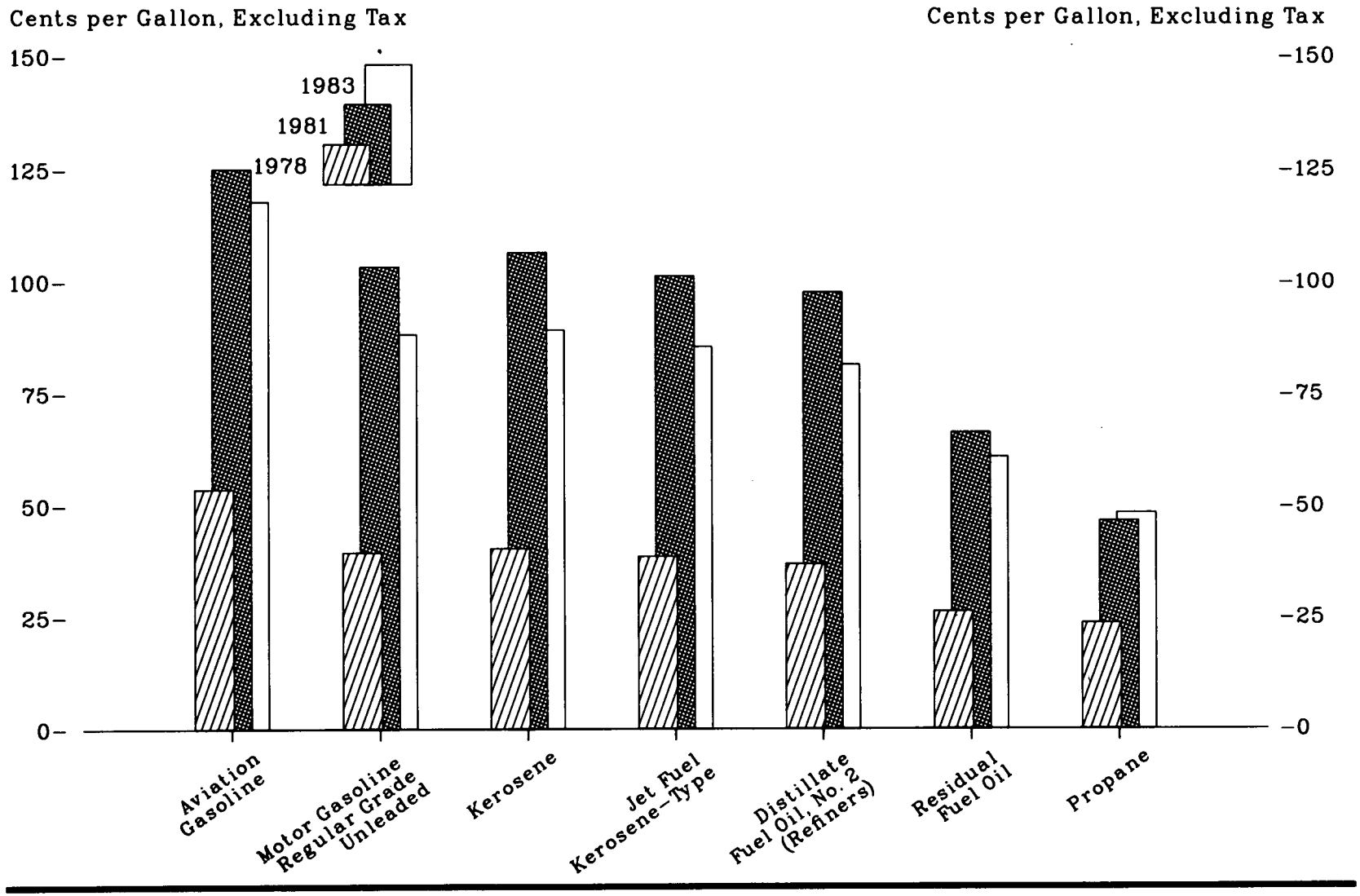


Table 61. Refined Petroleum Product Wholesale Prices, 1978-1983

(Cents per Gallon, Excluding Tax)

Product	1978	1979	1980	1981	1982	1983 [1]
Aviation Gasoline	53.7	72.1	112.8	125.0	122.8	117.8
Motor Gasoline (Leaded Regular Grade)	39.5	62.5	92.2	103.4	94.4	85.0
Kerosene	40.4	62.4	86.4	106.6	101.8	89.2
Jet Fuel, Kerosene-Type	38.6	66.0	86.8	101.2	95.3	85.4
Distillate Fuel Oil (No. 2 Fuel Oil)	36.9	56.9	80.3	97.6	91.4	81.5
Residual Fuel Oil [2]	26.3	39.9	52.8	66.3	61.2	60.9
Propane (Consumer Grade)	23.7	29.1	41.5	46.6	42.7	48.4

[1] Averages are computed using final January through November and preliminary December data.
[2] All sulfur grades of No. 5 fuel oil, No. 6 fuel oil, Bunker C fuel oil, and Navy Special Fuel Oil.
Note: Prices (excluding taxes) as reported by refiners and natural gas plant operators. Petroleum product wholesale prices for each product are derived by dividing the sum of the value of all sales for resale by the sum of the total volume of all reported sales for resale.
Sources: •1978 through 1982—Energy Information Administration, Form EIA-460, "Petroleum Industry Monthly Report for Product Prices," the source for backcast estimates. •1983—Energy Information Administration, Form EIA-782A, "Monthly Petroleum Product Sales Report."

Figure 64. Motor Gasoline and Residential Heating Oil Retail Prices

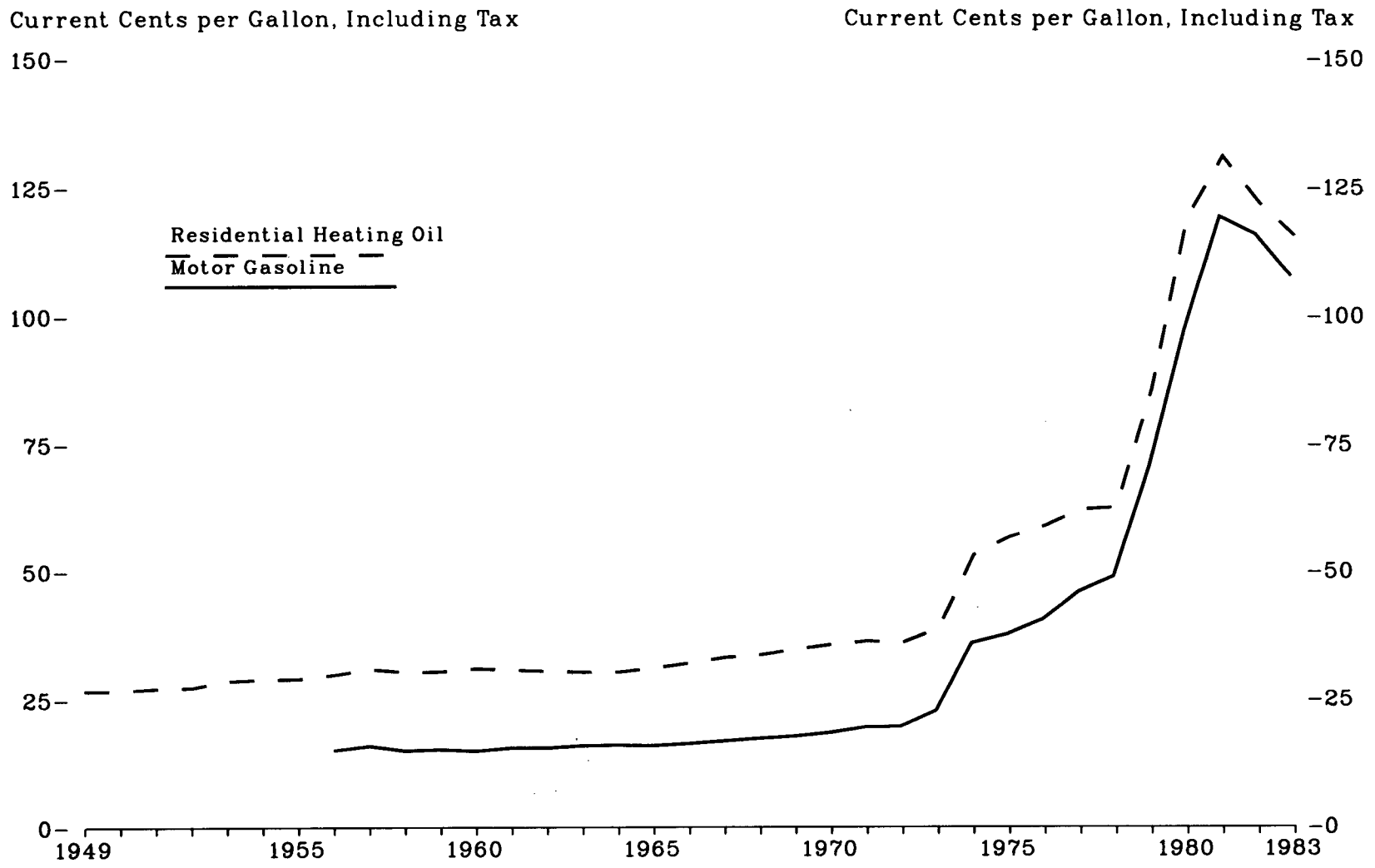


Table 62. Motor Gasoline and Residential Heating Oil Retail Prices, 1949-1983

(Cents per Gallon, Including Tax)

Year	Motor Gasoline [1]		Residential Heating Oil [2]	
	Current	Constant [3]	Current	Constant [3]
1949	26.8	51.1	NA	NA
1950	26.8	50.0	NA	NA
1951	27.2	47.6	NA	NA
1952	27.4	47.3	NA	NA
1953	28.7	48.8	NA	NA
1954	29.0	48.7	NA	NA
1955	29.1	47.8	NA	NA
1956	29.9	47.6	15.2	24.2
1957	31.0	47.7	16.0	24.6
1958	30.4	46.0	15.1	22.9
1959	30.5	45.1	15.3	22.6
1960	31.1	45.3	15.0	21.8
1961	30.8	44.4	15.6	22.5
1962	30.6	43.3	15.6	22.1
1963	30.4	42.4	16.0	22.3
1964	30.4	41.8	16.1	22.1
1965	31.2	42.0	16.0	21.5
1966	32.1	41.8	16.4	21.4
1967	33.2	42.0	16.9	21.4
1968	33.7	40.8	17.4	21.1
1969	34.8	40.1	17.8	20.5
1970	35.7	39.0	18.5	20.2
1971	36.4	37.9	19.6	20.4
1972	36.1	36.1	19.7	19.7
1973	38.8	36.7	22.8	21.6
1974	53.2	46.2	36.0	31.3
1975	56.7	45.1	37.7	30.0
1976	59.0	44.6	40.6	30.7
1977	62.2	44.4	46.0	32.8
1978	62.6	41.6	49.0	32.6
1979	85.7	52.4	70.4	43.1
1980	119.1	66.8	97.4	54.6
1981	131.1	67.2	119.4	61.2
1982	122.2	59.1	116.0	56.1
1983	115.7	53.6	[4] 107.8	[4] 50.0

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

[2] Average residential heating oil (No. 2 fuel oil) prices are derived by dividing the sum of the estimated national value of retail sales for residential heating by the estimated volume of retail sales for residential heating. Data 1978 forward excludes a very small amount of state and local sales taxes. There is no Federal excise tax on residential heating oil.

[3] Constant 1972 prices calculated using GNP price deflators, 1972 = 100. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

[4] Averages are computed using final January through November and preliminary December data.

NA = Not available.

Sources: **Motor Gasoline:** •1949 through 1973— *Platt's Oil Price Handbook and Oilmanac, 1974*, 51st Edition. •1974 through 1983—Bureau of Labor Statistics, *Consumer Prices: Energy*, monthly. **Residential Heating Oil:** •1956 through 1974—Bureau of Labor Statistics, *Retail Prices and Indexes of Fuels and Utilities for Residential Usage*, monthly. •January 1975 through September 1977—Federal Energy Administration, Form FEA P112-M-1, "No. 2 Heating Oil Supply/Price Monitoring Report." •October 1977 through December 1977—Energy Information Administration, Form EIA 9, "No. 2 Heating Oil Supply/Price Monitoring Report." •1978 through 1982—Energy Information Administration, Form EIA-9A, "No. 2 Distillate Price Monitoring Report," the source for backcast estimates. •1983—Energy Information Administration, Form EIA-782A, "Monthly Petroleum Product Sales Report" and Form EIA-782B, "Monthly No. 2 Distillate Sales Report."

Figure 65. Official Prices of Selected Foreign Crude Oils, January 1

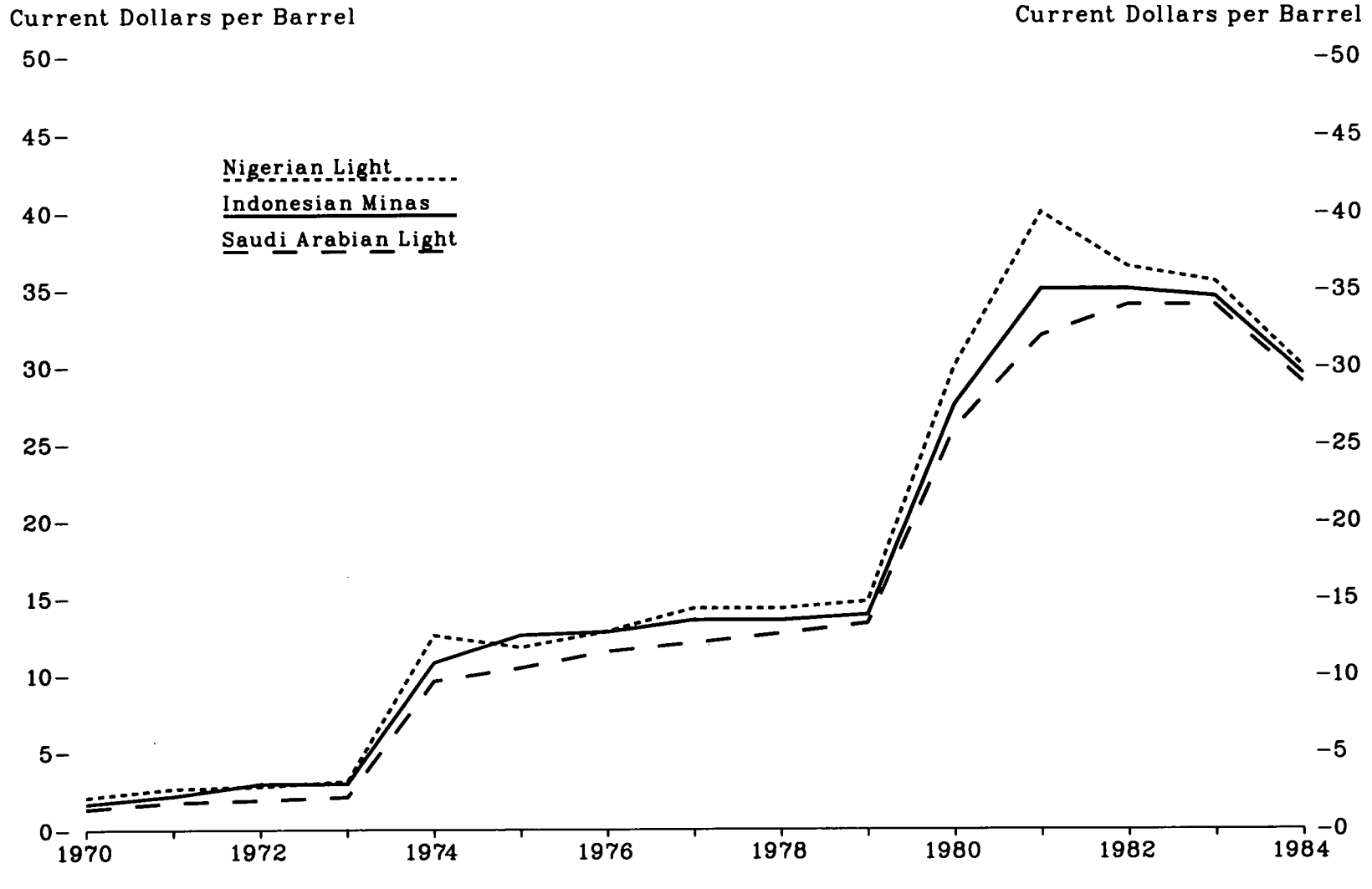


Table 63. Official Prices[1] of Selected Foreign Crude Oils, January 1, 1970-1984

(Dollars per Barrel)

Year	Saudi Arabian Light-34° API		Iranian Light-34° API		Libyan [2] Es Sider-37° API		Nigerian [2] Bonny-37° API		Indonesian Minas-34° API		Venezuelan Tia Juana-26° API	
	Current	Constant [4]	Current	Constant [4]	Current	Constant [4]	Current	Constant [4]	Current	Constant [4]	Current	Constant [4]
1970	1.35	1.48	1.36	1.49	2.09	2.29	2.10	2.30	1.67	1.83	2.05	2.24
1971	1.75	1.82	1.76	1.83	2.80	2.92	2.65	2.76	2.18	2.27	2.45	2.55
1972	1.90	1.90	1.91	1.91	2.80	2.80	2.80	2.80	2.96	2.96	2.45	2.45
1973	2.10	1.99	2.11	2.00	3.10	2.93	3.10	2.93	2.96	2.80	2.60	2.46
1974	9.60	8.34	10.63	9.24	14.30	12.43	12.60	10.95	10.80	9.38	9.30	8.08
1975	10.46	8.32	10.67	8.48	11.98	9.52	11.80	9.38	12.60	10.02	11.00	8.74
1976	11.51	8.70	11.62	8.78	12.21	9.23	12.84	9.70	12.80	9.67	11.12	8.40
1977	12.09	8.63	12.81	9.15	13.74	9.81	14.33	10.23	13.55	9.68	12.72	9.08
1978	12.70	8.44	12.81	8.52	13.80	9.17	14.33	9.53	13.55	9.01	12.82	8.52
1979	13.34	8.16	13.45	8.23	14.52	8.89	14.80	9.06	13.90	8.51	13.36	8.18
1980	26.00	14.57	[5] 30.37	[5] 17.02	34.50	19.34	29.97	16.80	27.50	15.41	25.20	14.12
1981	32.00	16.40	37.00	18.96	40.78	20.90	40.00	20.50	35.00	17.94	32.88	16.85
1982	34.00	16.43	34.20	16.53	36.50	17.64	36.50	17.64	35.00	16.92	32.88	15.89
1983	34.00	15.76	31.20	14.47	35.10	16.27	35.50	16.46	34.53	16.01	32.88	15.25
1984	29.00	13.45	28.00	12.98	30.15	13.98	30.00	13.91	29.53	13.69	27.88	12.93

[1] Selling prices free on board (f.o.b.) at the foreign port of lading. For the period mid-1974 forward, prices are the official selling price including premiums or discounts in cases where they were clearly defined and applicable to all clients. For years prior to mid-1974, average contract selling prices are shown.

[2] Prices for 1974 and 1975 are for 40 degrees API gravity. Prices for 1980 include $4.72 in retroactive charges and market premiums.

[3] Prices from 1977 forward include 2 cents harbor dues.

[4] Constant 1972 dollars using GNP average annual implicit price deflator, 1972=100. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section. January 1, 1984, based on 1983 average annual price deflator.

[5] Price for 1980 includes $1.87 market premiums and credit charges.

Sources: •1970 through 1978—Petroleum and Energy Intelligence Weekly, Inc., *Petroleum Intelligence Weekly.* •1979 through 1984—Energy Information Administration, *Weekly Petroleum Status Report.*

Figure 66. Comparison of Spot Prices and Official Prices for Selected Foreign Crude Oil Mixes

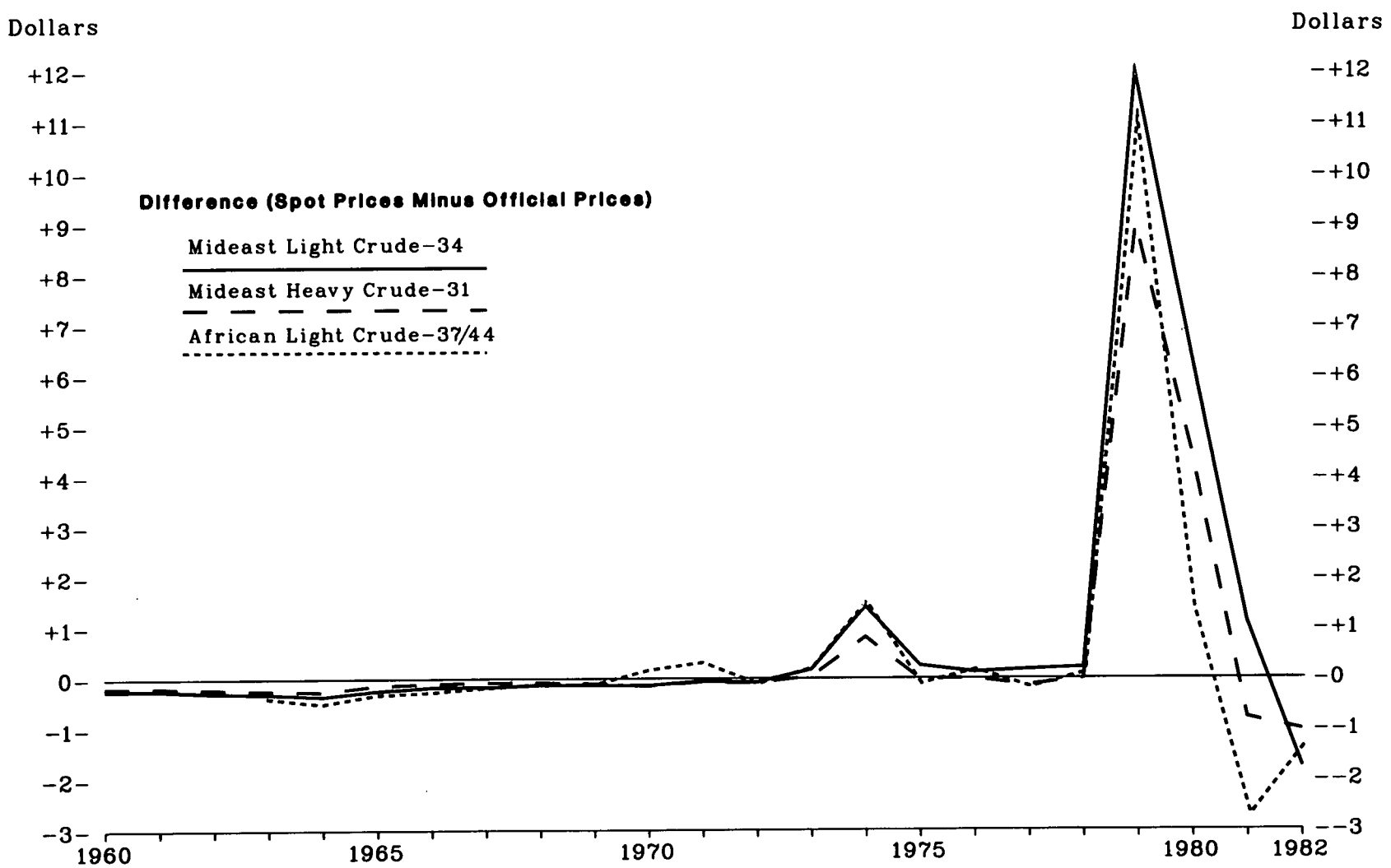


Table 64. Comparison of Spot Prices and Official Prices for Selected Foreign Crude Oil Mixes, 1960-1982

(Dollars per Barrel)

Year	Mideast Light Crude -34 [1]			Mideast Heavy Crude -31 [2]			African Light Crude -37/44 [3]		
	Official Price	Spot Price	Difference [4]	Official Price	Spot Price	Difference [4]	Official Price	Spot Price	Difference [4]
1960	1.86	1.63	-0.23	1.64	1.46	-0.18	NA	NA	NA
1961	1.80	1.57	-0.23	1.59	1.41	-0.18	NA	NA	NA
1962	1.80	1.52	-0.28	1.59	1.38	-0.21	2.23	NA	NA
1963	1.80	1.50	-0.30	1.59	1.35	-0.24	2.23	1.85	-0.38
1964	1.80	1.45	-0.35	1.59	1.33	-0.26	2.23	1.73	-0.50
1965	1.66	1.42	-0.24	1.45	1.31	-0.14	2.00	1.68	-0.32
1966	1.53	1.36	-0.17	1.38	1.28	-0.10	1.90	1.63	-0.27
1967	1.50	1.33	-0.17	1.35	1.27	-0.08	1.95	1.76	-0.19
1968	1.45	1.32	-0.13	1.32	1.24	-0.08	2.00	1.88	-0.12
1969	1.40	1.27	-0.13	1.30	1.20	-0.10	1.95	1.83	-0.12
1970	1.35	1.21	-0.14	1.30	1.15	-0.15	2.10	2.26	0.16
1971	1.75	1.69	-0.06	1.68	1.61	-0.07	2.35	2.66	0.31
1972	1.90	1.82	-0.08	1.80	1.71	-0.09	2.80	2.69	-0.11
1973	[5] 2.64	2.81	0.17	2.04	2.07	0.03	3.20	3.40	0.20
1974	[5] 9.56	10.98	1.42	9.44	10.25	0.81	11.40	12.92	1.52
1975	10.46	10.71	0.25	10.37	10.35	-0.02	11.61	11.50	-0.11
1976	11.51	11.63	0.12	11.26	11.25	-0.01	12.97	13.14	0.17
1977	12.40	12.57	0.17	12.37	12.23	-0.14	14.48	14.30	-0.18
1978	12.70	12.91	0.21	12.27	12.26	-0.01	14.10	14.21	0.11
1979	17.84	29.82	11.98	18.04	27.04	9.00	21.04	32.11	11.07
1980	29.38	35.85	6.47	29.81	34.34	4.53	36.50	37.89	1.39
1981	33.16	34.29	1.13	33.74	32.96	-0.78	39.39	36.68	-2.71
1982	33.51	31.76	-1.75	31.38	30.36	-1.02	34.75	33.42	-1.33

[1] Primarily Arabian Light Crude Oil, 34 degrees API.
[2] Primarily Kuwait Heavy Crude Oil, 31 degrees API.
[3] Primarily Libyan Brega Crude Oil, 40 degrees API during the 1960's and broadened to include Algeria Saharan Crude Oil, 44 degrees API and Nigerian Bonny Light, 37 degrees API from 1970 forward.
[4] Spot price minus official price.
[5] Actual contract prices for Arabian Light Crude -34 degrees API. Although an official Arabian Light Crude -34 degrees API price existed, it applied to only a few direct sales contracts.
NA = Not available.
Sources: Petroleum and Energy Intelligence Weekly, Inc., *Petroleum Intelligence Weekly*, March 8, 1982, April 12, 1982, and March 7, 1983.

Section 4. Natural Gas Supply and Disposition

This section presents data relating to the supply, disposition, and price of natural gas. The first part includes physical data on natural gas production, foreign trade, underground storage, consumption by end-use sector, and international supply and disposition. The second part presents financial information, including wellhead and end-use price data.

Preliminary data for 1983 indicate that gross withdrawals of natural gas from gas and oil wells totaled 18.3 trillion cubic feet, the lowest level since 1965. The 9.3-percent decline during 1983 resulted primarily from reduced consumption.

Production. Although most natural gas is produced from natural gas wells, about 20 to 25 percent is produced from crude oil wells. Almost all of the gas produced from oil wells is separated from the oil at or near the wellhead. In 1982, there were about 211,000 producing gas wells in the United States.

Most of the gas produced is used as a fuel or as chemical feedstock, but small quantities are either vented, flared, or used for reservoir repressuring. Also, small quantities of nonhydrocarbon gases are removed. Data for 1983 show that of gross withdrawals from wells, 0.5 percent was vented or flared, 7.9 percent was used for repressuring, 1.2 percent represented nonhydrocarbon gases removed, and the remaining 90.5 percent was "marketed production." In 1983 marketed production totaled 16.6 trillion cubic feet, down 10.5 percent from the 1982 total.

Consumption. In 1983, approximately 70 percent of natural gas gross withdrawals was processed to extract liquid hydrocarbons, and approximately 30 percent did not contain a volume of liquids sufficient to justify processing (see Figure 67). Gas that has been processed (residue gas) and gas that does not require processing are usually between 90 and 95 percent methane and are frequently referred to as "dry gas." It is this "dry gas" that is consumed by residences, industries, and electric utilities. A decline in natural gas consumption of 5.8 percent in 1983 is attributed to reduced economic activity, price-induced conservation, and fuel substitution at electric utilities.

Storage. Because of fluctuating seasonal, daily, and even hourly marketing requirements, substantial natural gas storage facilities have been created to meet peak supply needs. Many of these facilities are depleted gas reservoirs located near transmission lines and marketing areas. Gas is usually injected into storage when market requirements are less than available gas flow in transmission lines. Gas is withdrawn from storage when supplies from producing fields or the capacity of transmission systems or both are inadequate to meet peak requirements. Net withdrawals from underground storage supplied more than 15 percent of the gas consumed during recent winter heating seasons, and many transmission and distribution companies' peak day deliveries from underground storage exceeded 50 percent of their total maximum daily delivery. At the beginning of the 1983-1984 heating season (October 1983), the total volume of gas in underground storage was 7.1 trillion cubic feet (not shown in this publication). Of this total, 3.3 trillion cubic feet was working gas (i.e., available for withdrawal). Year-end underground storage of natural gas is shown in Table 68.

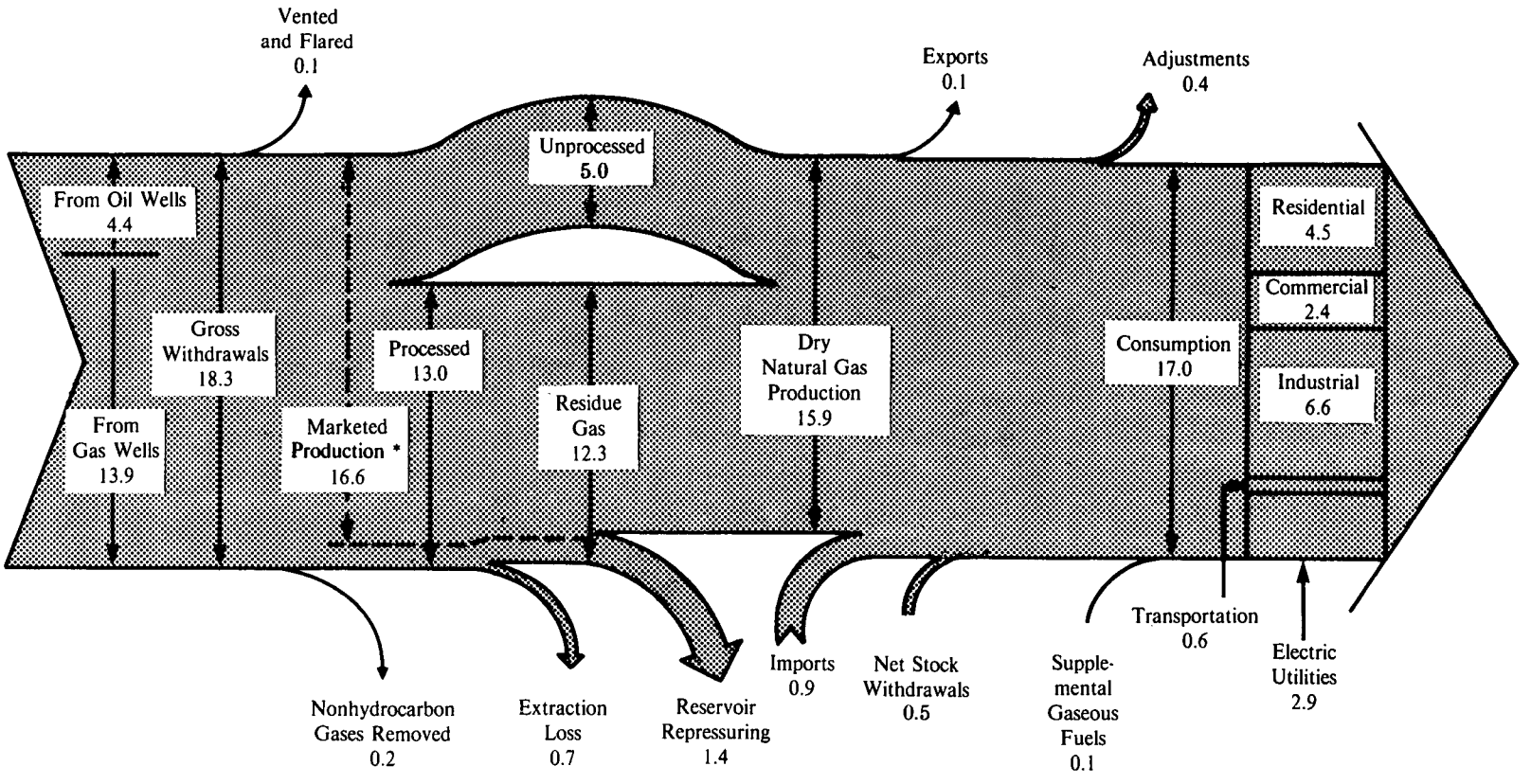
Trade. Imports of natural gas, including liquefied natural gas from Algeria, amounted to about 944 billion cubic feet during 1983. Exports continued at the relatively constant volume of about 55 billion cubic feet per year (see Table 66).

Prices. Natural gas has many price categories resulting from the different rate structures authorized by State and Federal ratemaking commissions. Estimated data indicate that the average wellhead price of natural gas in 1983 was $2.60 per thousand cubic feet, 5.7 percent higher than the 1982 average (see Table 71). Estimated average wellhead prices by categories varied from $1.39 per thousand cubic feet for "old gas" to $6.36 per thousand cubic feet for "high-cost gas." In 1982, residential consumers paid an average of $5.17 per thousand cubic feet, an increase of 21 percent from the 1981 average (see Table 72).

World Production and Trade. World natural gas production in 1981 totaled 54.5 trillion cubic feet continuing an upward trend which began before World War II. The largest producers were the United States, the U.S.S.R., the Netherlands, and Canada, which together accounted for 76 percent of the total. The U.S.S.R., the Netherlands, Norway, and Canada were the leading exporters of natural gas; West Germany, the United States, Japan, and France were the leading importers (see Table 69).

Figure 67. Natural Gas Flow Diagram, 1983

(Trillion Cubic Feet)



*See Glossary.

Figure 68. Natural Gas Production

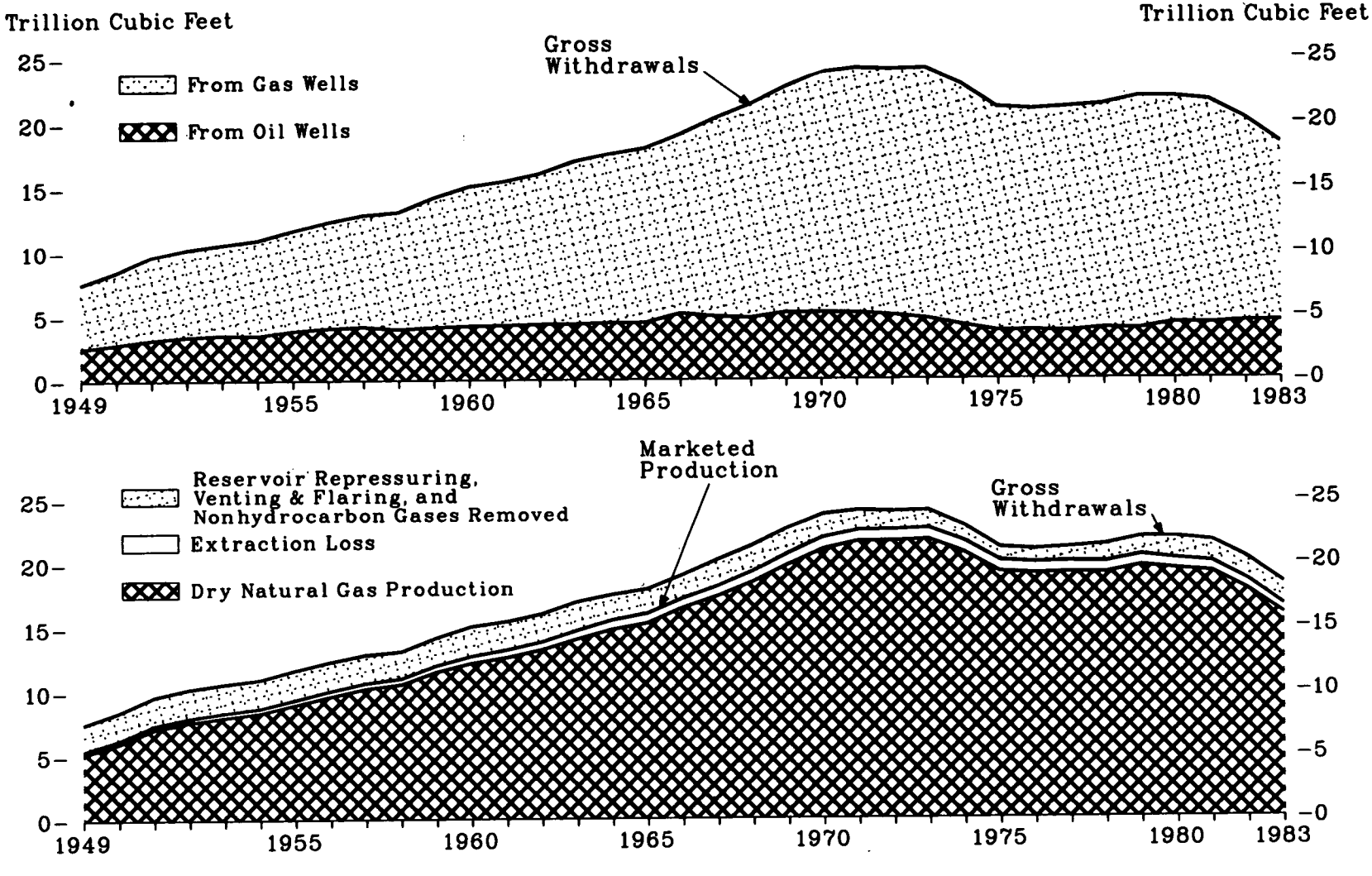


Table 65. Natural Gas Production, 1949-1983

(Trillion Cubic Feet)

Year	Gross Withdrawals			Reservoir Repressuring	Non-hydrocarbon Gases Removed	Vented and Flared	Marketed Production	Extraction Loss.[1]	Dry Natural Gas Production
	From Gas Wells	From Oil Wells	Total						
1949	4.99	2.56	7.55	1.27	NA	0.85	5.42	0.22	5.20
1950	5.60	2.88	8.48	1.40	NA	0.80	6.28	0.26	6.02
1951	6.48	3.21	9.69	1.44	NA	0.79	7.46	0.29	7.16
1952	6.84	3.43	10.27	1.41	NA	0.85	8.01	0.32	7.69
1953	7.10	3.55	10.65	1.44	NA	0.81	8.40	0.34	8.06
1954	7.47	3.52	10.98	1.52	NA	0.72	8.74	0.35	8.39
1955	7.84	3.88	11.72	1.54	NA	0.77	9.41	0.38	9.03
1956	8.31	4.07	12.37	1.43	NA	0.86	10.08	0.42	9.66
1957	8.72	4.19	12.91	1.42	NA	0.81	10.68	0.43	10.25
1958	9.15	3.99	13.15	1.48	NA	0.63	11.03	0.46	10.57
1959	10.10	4.13	14.23	1.61	NA	0.57	12.05	0.50	11.55
1960	10.85	4.23	15.09	1.75	NA	0.56	12.77	0.54	12.23
1961	11.20	4.27	15.46	1.68	NA	0.52	13.25	0.59	12.66
1962	11.70	4.34	16.04	1.74	NA	0.43	13.88	0.62	13.25
1963	12.61	4.37	16.97	1.84	NA	0.38	14.75	0.67	14.08
1964	13.11	4.43	17.54	1.65	NA	0.34	15.55	0.72	14.82
1965	13.52	4.44	17.96	1.60	NA	0.32	16.04	0.75	15.29
1966	13.89	5.14	19.03	1.45	NA	0.38	17.21	0.74	16.47
1967	15.35	4.91	20.25	1.59	NA	0.49	18.17	0.78	17.39
1968	16.54	4.79	21.32	1.49	NA	0.52	19.32	0.83	18.49
1969	17.49	5.19	22.68	1.46	NA	0.53	20.70	0.87	19.83
1970	18.59	5.19	23.79	1.38	NA	0.49	21.92	0.91	21.01
1971	18.93	5.16	24.09	1.31	NA	0.28	22.49	0.88	21.61
1972	19.04	4.97	24.02	1.24	NA	0.25	22.53	0.91	21.62
1973	19.37	4.70	24.07	1.17	NA	0.25	22.65	0.92	21.73
1974	18.67	4.18	22.85	1.08	NA	0.17	21.60	0.89	20.71
1975	17.38	3.72	21.10	0.86	NA	0.13	20.11	0.87	19.24
1976	17.19	3.75	20.94	0.86	NA	0.13	19.95	0.85	19.10
1977	17.42	3.68	21.10	0.93	NA	0.14	20.03	0.86	19.16
1978	17.39	3.91	21.31	1.18	NA	0.15	19.97	0.85	19.12
1979	18.03	3.85	21.88	1.25	NA	0.17	20.47	0.81	19.66
1980	17.57	4.30	21.87	1.37	0.20	0.13	20.18	0.78	19.40
1981	17.34	4.25	21.59	1.31	0.22	0.10	19.96	0.77	19.18
1982	15.80	4.41	20.21	1.39	0.21	0.09	18.52	0.76	17.76
1983[2]	13.88	4.44	18.32	1.44	0.22	0.08	16.58	0.68	15.90

[1] Volume reduction resulting from the removal of natural gas plant liquids. Natural gas plant liquids are transferred to petroleum supply.
[2] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Note: Beginning with 1965 data, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60 degrees F. For prior years, the pressure base is 14.65 p.s.i.a. at 60 degrees F.
Sources: •1949 through 1975—Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. •1976 through 1978—Energy Information Administration, Energy Data Reports, *Natural Gas, Annual.* •1979—Energy Information Administration, *Natural Gas Production and Consumption 1979* •1980 through 1982—Energy Information Administration, *Natural Gas Annual.* •1983—Energy Information Administration, *Natural Gas Monthly.*

Figure 69. Dry Natural Gas Supply and Disposition

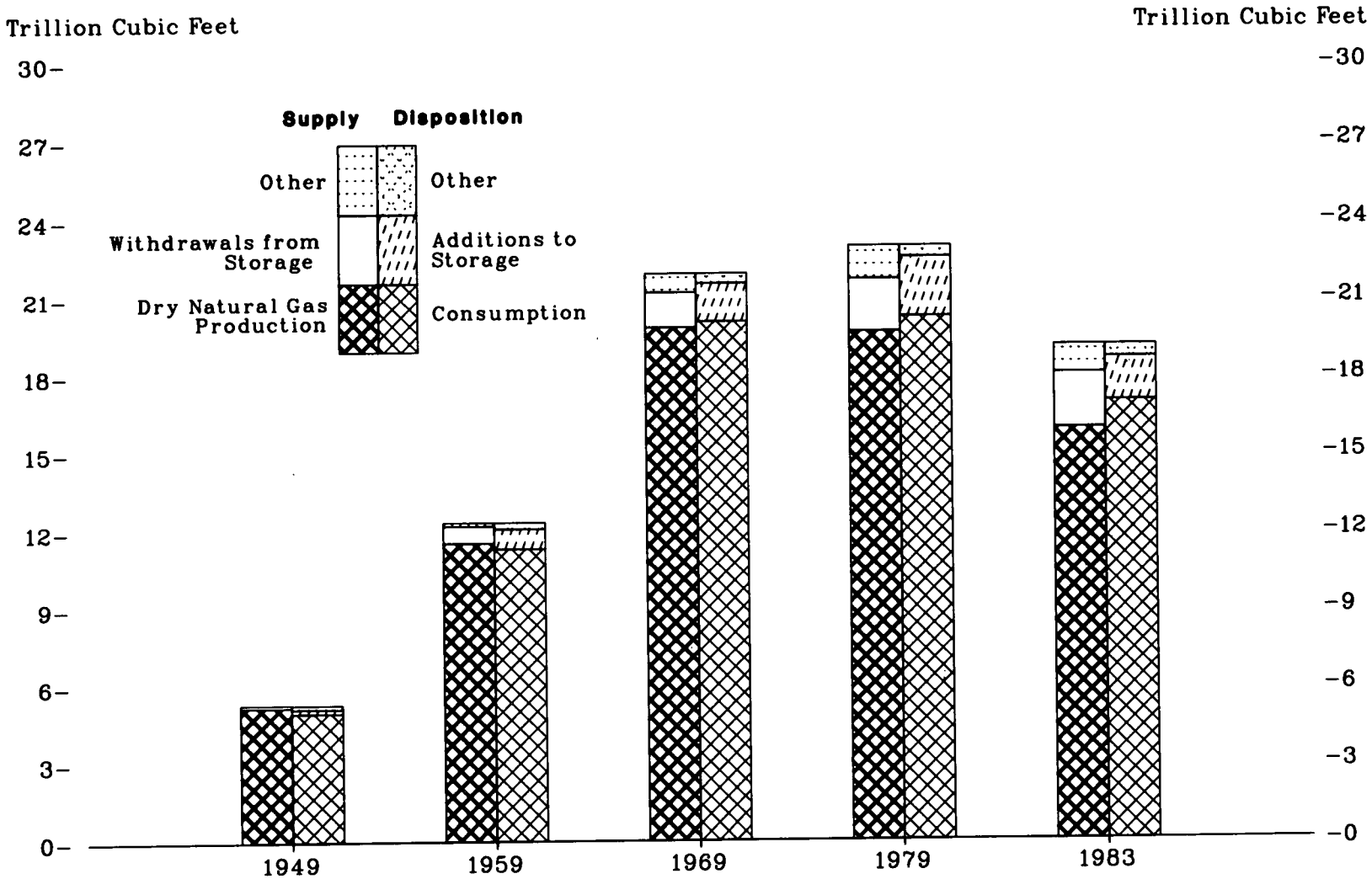


Table 66. Dry Natural Gas [1] Supply and Disposition, 1949-1983

(Trillion Cubic Feet)

Year	Supply					Disposition				
	Dry Natural Gas Production	Withdrawals from Storage [2]	Supplemental Gaseous Fuels	Imports	Total	Additions to Storage [2]	Exports	Unaccounted For [3]	Consumption	Total
1949	5.20	0.11	NA	0	5.30	0.17	0.02	0.14	4.97	5.30
1950	6.02	0.18	NA	0	6.20	0.23	0.03	0.18	5.77	6.20
1951	7.16	0.21	NA	0	7.37	0.35	0.02	0.19	6.81	7.37
1952	7.69	0.22	NA	0.01	7.92	0.40	0.03	0.20	7.29	7.92
1953	8.06	0.25	NA	0.01	8.31	0.40	0.03	0.24	7.64	8.31
1954	8.39	0.33	NA	0.01	8.73	0.43	0.03	0.22	8.05	8.73
1955	9.03	0.44	NA	0.01	9.48	0.51	0.03	0.25	8.69	9.48
1956	9.66	0.45	NA	0.01	10.13	0.59	0.04	0.21	9.29	10.13
1957	10.25	0.48	NA	0.04	10.77	0.67	0.04	0.21	9.85	10.77
1958	10.57	0.62	NA	0.14	11.33	0.70	0.04	0.28	10.30	11.33
1959	11.55	0.67	NA	0.13	12.35	0.79	0.02	0.22	11.32	12.35
1960	12.23	0.71	NA	0.16	13.10	0.84	0.01	0.27	11.97	13.10
1961	12.66	0.70	NA	0.22	13.58	0.84	0.01	0.23	12.49	13.58
1962	13.25	0.85	NA	0.40	14.51	0.94	0.02	0.29	13.27	14.51
1963	14.08	0.92	NA	0.41	15.40	1.05	0.02	0.36	13.97	15.40
1964	14.82	0.89	NA	0.44	16.15	1.01	0.02	0.30	14.81	16.15
1965	15.29	0.96	NA	0.46	16.70	1.08	0.03	0.32	15.28	16.70
1966	16.47	1.14	NA	0.48	18.09	1.21	0.02	0.40	16.45	18.09
1967	17.39	1.13	NA	0.56	19.08	1.32	0.08	0.30	17.39	19.08
1968	18.49	1.33	NA	0.65	20.48	1.43	0.09	0.33	18.63	20.48
1969	19.83	1.38	NA	0.73	21.94	1.50	0.05	0.33	20.06	21.94
1970	21.01	1.46	NA	0.82	23.29	1.86	0.07	0.23	21.14	23.29
1971	21.61	1.51	NA	0.93	24.05	1.84	0.08	0.34	21.79	24.05
1972	21.62	1.76	NA	1.02	24.40	1.89	0.08	0.33	22.10	24.40
1973	21.73	1.53	NA	1.03	24.30	1.97	0.08	0.20	22.05	24.30
1974	20.71	1.70	NA	0.96	23.37	1.78	0.08	0.29	21.22	23.37
1975	19.24	1.76	NA	0.95	21.95	2.10	0.07	0.24	19.54	21.95
1976	19.10	1.92	NA	0.96	21.98	1.76	0.06	0.22	19.95	21.98
1977	19.16	1.75	NA	1.01	21.92	2.31	0.06	0.04	19.52	21.92
1978	19.12	2.16	NA	0.97	22.25	2.28	0.05	0.29	19.63	22.25
1979	19.66	2.05	NA	1.25	22.96	2.30	0.06	0.37	20.24	22.96
1980	19.40	1.97	0.15	0.98	22.51	1.95	0.05	0.64	19.88	22.51
1981	19.18	1.93	0.18	0.90	22.19	2.23	0.06	0.50	19.40	22.19
1982	17.76	2.16	0.14	0.93	21.00	2.47	0.05	0.47	18.00	21.00
1983[4]	15.90	2.14	0.14	0.94	19.12	1.68	0.06	0.42	16.95	19.12

[1] Includes supplemental gaseous fuels.
[2] Beginning with 1980, includes liquefied natural gas (LNG) storage in above ground tanks.
[3] Unaccounted for gas, including net intransit shipments for 1980 forward, is the imbalance between available supplies for consumption and actual consumption. It is derived by subtracting the sum of additions to storage, exports and consumption from total supply.
[4] Preliminary.
NA = Not available.
Note: Sum of components may not equal total due to independent rounding.
Note: Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60 degrees F. For prior years, the pressure base is 14.65 p.s.i.a. at 60 degrees F.
Sources: •1949 through 1982—Energy Information Administration, *Natural Gas Annual, 1982*, Appendix B. •1983— Energy Information Administration, *Natural Gas Monthly*.

Figure 70. Consumption of Dry Natural Gas by End-Use Sector

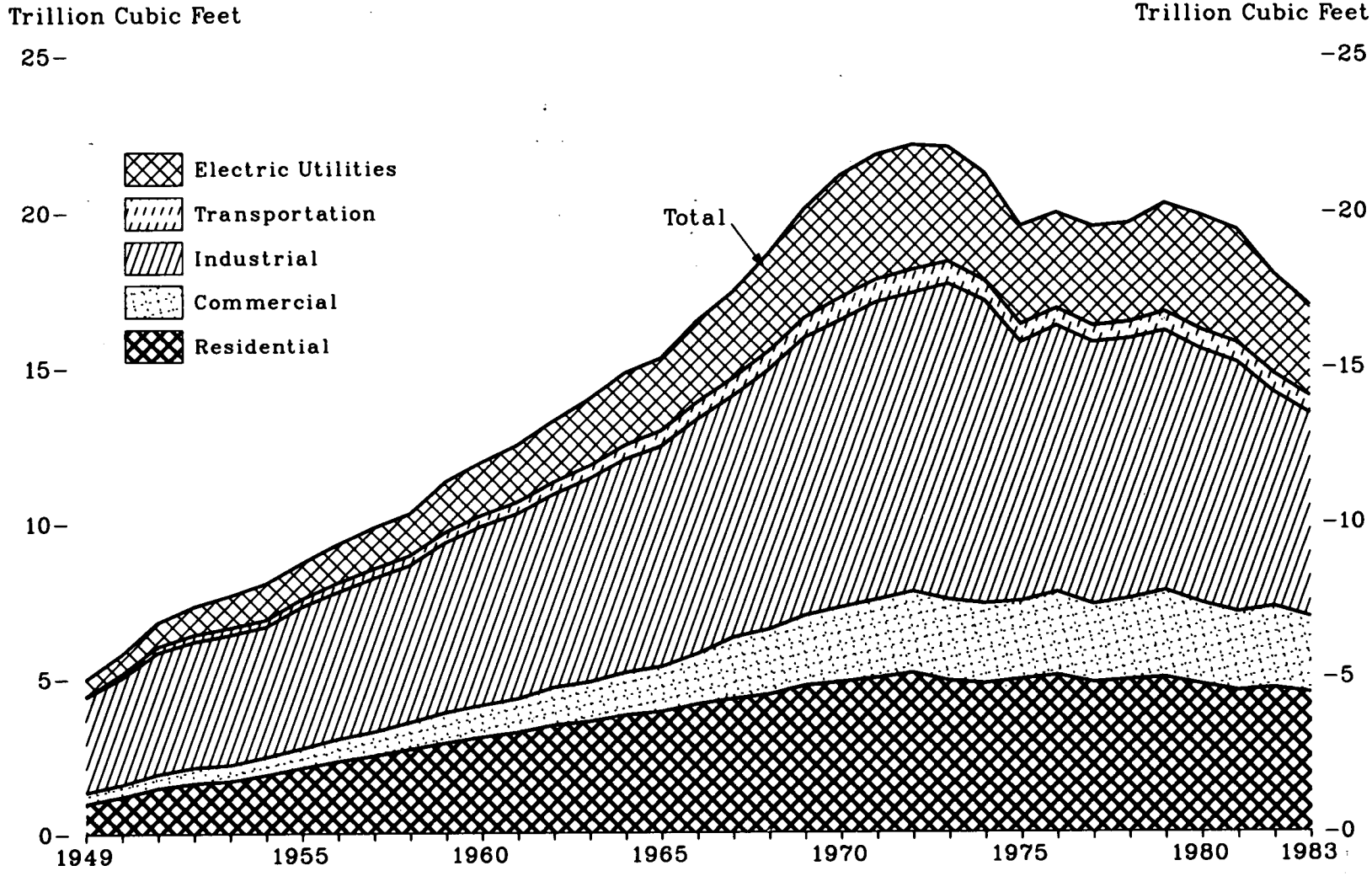


Table 67. Consumption of Dry Natural Gas [1] by End-Use Sector, [2] 1949-1983
(Trillion Cubic Feet)

Year	Residential	Commercial [3]	Industrial			Electric Utilities	Transportation [4]	Total
			Lease and Plant Fuel	Other Industrial	Total Industrial			
1949	0.99	0.35	0.84	2.25	3.08	0.55	NA	4.97
1950	1.20	0.39	0.93	2.50	3.43	0.63	0.13	5.77
1951	1.47	0.46	1.15	2.77	3.91	0.76	0.19	6.81
1952	1.62	0.52	1.16	2.87	4.04	0.91	0.21	7.29
1953	1.69	0.53	1.13	3.03	4.16	1.03	0.23	7.64
1954	1.89	0.58	1.10	3.07	4.17	1.17	0.23	8.05
1955	2.12	0.63	1.13	3.41	4.54	1.15	0.25	8.69
1956	2.33	0.72	1.00	3.71	4.71	1.24	0.30	9.29
1957	2.50	0.78	1.05	3.89	4.93	1.34	0.30	9.85
1958	2.71	0.87	1.15	3.89	5.03	1.37	0.31	10.30
1959	2.91	0.98	1.24	4.22	5.46	1.63	0.35	11.32
1960	3.10	1.02	1.24	4.53	5.77	1.72	0.35	11.97
1961	3.25	1.08	1.29	4.67	5.96	1.83	0.38	12.49
1962	3.48	1.21	1.37	4.86	6.23	1.97	0.38	13.27
1963	3.59	1.27	1.41	5.13	6.55	2.14	0.42	13.97
1964	3.79	1.37	1.37	5.52	6.89	2.32	0.44	14.81
1965	3.90	1.44	1.16	5.96	7.11	2.32	0.50	15.28
1966	4.14	1.62	1.03	6.51	7.55	2.61	0.54	16.45
1967	4.31	1.96	1.14	6.65	7.79	2.75	0.58	17.39
1968	4.45	2.08	1.24	7.13	8.37	3.15	0.59	18.63
1969	4.73	2.25	1.35	7.61	8.96	3.49	0.63	20.06
1970	4.84	2.40	1.40	7.85	9.25	3.93	0.72	21.14
1971	4.97	2.51	1.41	8.18	9.59	3.98	0.74	21.79
1972	5.13	2.61	1.46	8.17	9.62	3.98	0.77	22.10
1973	4.88	2.60	1.50	8.69	10.18	3.66	0.73	22.05
1974	4.79	2.56	1.48	8.29	9.77	3.44	0.67	21.22
1975	4.92	2.51	1.40	6.97	8.36	3.16	0.58	19.54
1976	5.05	2.67	1.63	6.96	8.60	3.08	0.55	19.95
1977	4.82	2.50	1.66	6.82	8.47	3.19	0.53	19.52
1978	4.90	2.60	1.65	6.76	8.40	3.19	0.53	19.63
1979	4.97	2.79	1.50	6.90	8.40	3.49	0.60	20.24
1980	4.75	2.61	1.03	7.17	8.20	3.68	0.63	19.88
1981	4.55	2.52	0.93	7.13	8.06	3.64	0.64	19.40
1982	4.63	2.61	1.11	5.83	6.94	3.23	0.60	18.00
1983[5]	4.48	2.43	0.99	5.58	6.58	2.91	0.56	16.95

[1] Includes supplemental gaseous fuels.
[2] See Explanatory Note 9.
[3] Includes deliveries to municipalities and public authorities for institutional heating and other purposes.
[4] Pipeline fuel.
[5] Preliminary.

Note: Sum of components may not equal total due to independent rounding. Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60 degrees F. For prior years, the pressure base is 14.65 p.s.i.a. at 60 degrees F.

Sources: **Electric Utilities:** •1949 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 and 1983—Energy Information Administration—Form EIA-759, "Monthly Power Plant Report." **All Other Data:** •1949 through 1982—Energy Information Administration, *Natural Gas Annual, 1982,* Appendix B. •1983—Energy Information Administration, *Natural Gas Monthly.*

Figure 71. Underground Storage of Natural Gas, Year-End

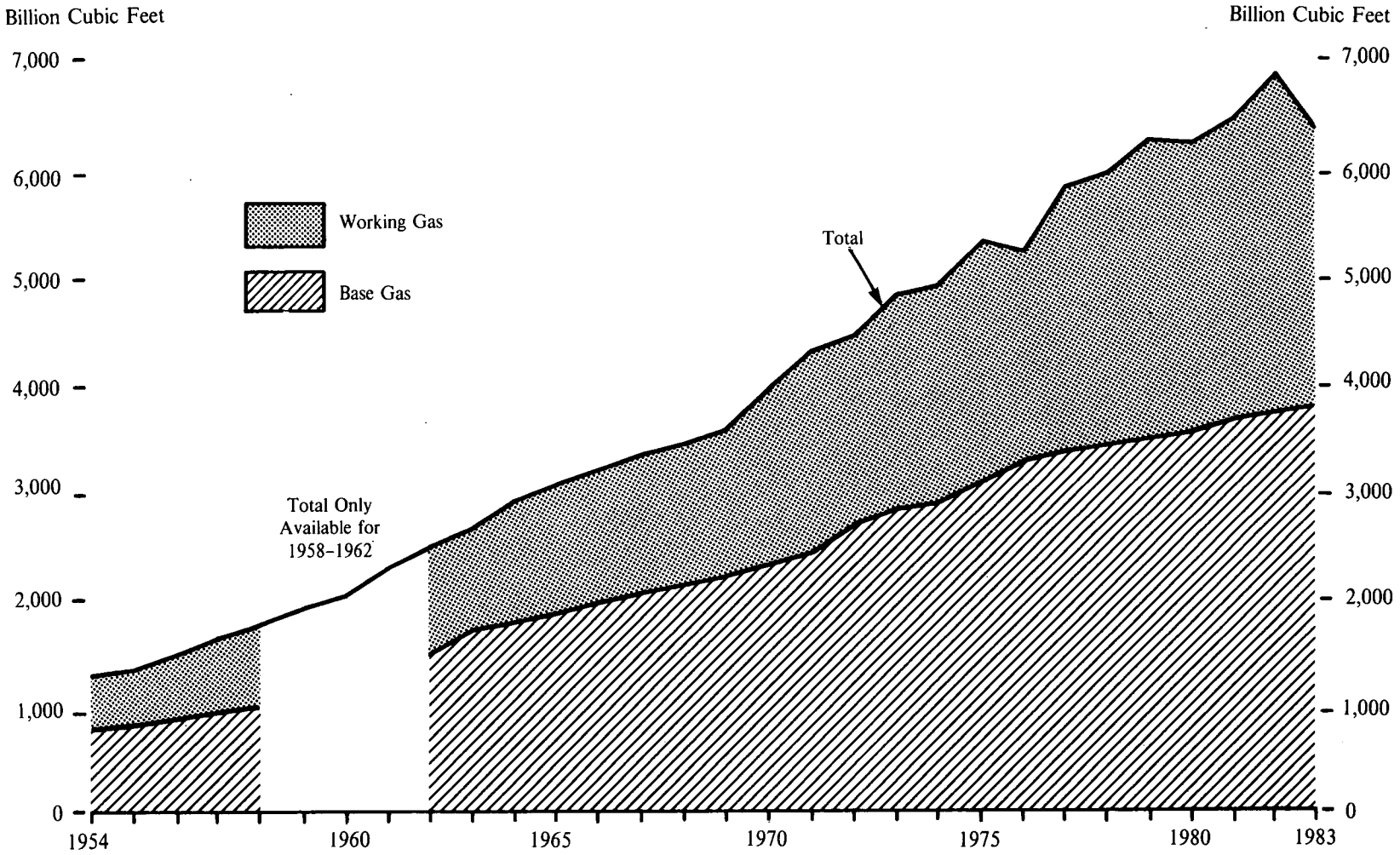


Table 68. Underground Storage of Natural Gas, Year-End 1954-1983
(Billion Cubic Feet)

Year	Base Gas [1]	Working Gas	Total Gas in Storage [1]
1954	817	465	1,281
1955	863	505	1,368
1956	919	583	1,502
1957	1,001	673	1,674
1958	1,056	708	1,764
1959	NA	NA	1,901
1960	NA	NA	2,184
1961	NA	NA	2,344
1962	1,571	933	2,504
1963	1,738	1,007	2,745
1964	1,781	1,159	2,940
1965	1,848	1,242	3,090
1966	1,958	1,267	3,225
1967	2,058	1,318	3,376
1968	2,128	1,366	3,495
1969	2,181	1,421	3,602
1970	2,326	1,678	4,004
1971	2,485	1,840	4,325
1972	2,751	1,729	4,480
1973	2,864	2,034	4,898
1974	2,912	2,050	4,962
1975	3,162	2,212	5,374
1976	3,323	1,926	5,250
1977	3,391	2,475	5,866
1978	3,473	2,547	6,020
1979	3,553	2,753	6,306
1980	3,642	2,655	6,297
1981	3,752	2,817	6,569
1982	3,808	3,071	6,879
1983	3,845	2,596	6,441

[1] Includes native gas.
NA = Not available.
Note: Sum of components may not equal total due to independent rounding.
Note: Beginning with 1965 data, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60 degrees F. For prior years, the pressure base is 14.65 p.s.i.a. at 60 degrees F.
Sources: •1954 through 1974—American Gas Association, *Gas Facts*. •1975 and 1976—Federal Energy Administration, Form G 318-M-O and Federal Power Commission, Form 8, "Underground Gas Storage Report." •1977 through 1978— Energy Information Administration, and Federal Energy Administration, Form G 318-M-O and Federal Power Commission, Form 8, "Underground Gas Storage Report." •1979 through 1983—Energy Information Administration, EIA Form 191 and Federal Energy Regulatory Commission, FPC Form 8, "Underground Gas Storage Report."

Figure 72. International Supply and Disposition of Natural Gas, 1981
(Trillion Cubic Feet)

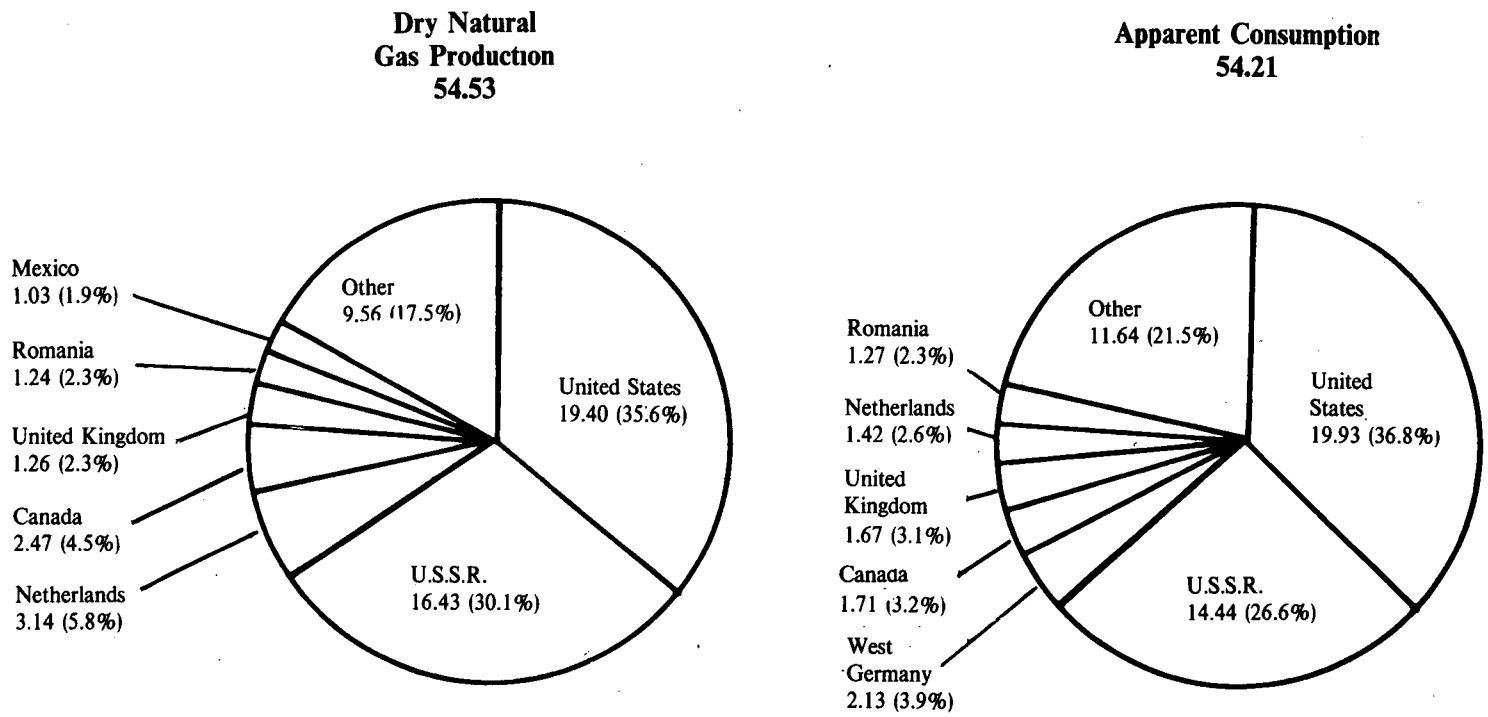


Table 69. International Supply and Disposition of Natural Gas, 1981
(Billion Cubic Feet)

Area and Country	Supply		Disposition	
	Dry Natural Gas Production	Imports	Apparent Consumption	Exports
North, Central, and South America				
Argentina	285	77	362	0
Canada	2,470	0	1,708	762
Mexico	1,032	(1)	930	105
United States	19,403	904	[2] 19,930	59
Venezuela	572	0	572	0
Other	454	0	377	77
Total	24,216	984	23,879	1,003
Western Europe				
France	216	780	996	0
Germany, West	682	1,578	2,133	127
Italy	490	493	983	0
Netherlands	3,141	104	1,421	1,824
Norway	890	0	0	890
United Kingdom	1,264	407	1,671	0
Other	239	785	1,019	5
Total	6,922	4,147	8,223	2,846
Eastern Europe and U.S.S.R.				
Czechoslovakia	23	302	325	0
Germany, East	350	221	571	0
Hungary	212	141	353	0
Poland	218	186	404	0
Romania	1,239	35	1,267	7
U.S.S.R.	16,430	110	14,440	2,100
Other	15	162	177	0
Total	18,486	1,157	17,536	2,107
Middle East and Africa				
Algeria	593	0	346	247
Iran	170	0	155	15
Kuwait	100	0	100	0
Saudi Arabia	460	0	460	0
Other	925	0	800	125
Total	2,248	0	1,861	387
Far East and Oceania				
Australia	378	0	378	0
Brunei	343	0	62	281
China	450	0	450	0
Indonesia	656	0	232	424
Japan	54	832	887	0
Pakistan	316	0	316	0
Other	462	23	390	95
Total	2,659	855	2,714	800
World Total	54,531	7,144	54,213	7,144

[1] Less than 0.5 billion cubic feet.
[2] Actual consumption.
Note: Sum of components may not equal total due to independent rounding.
Source: Energy Information Administration, *1982 International Energy Annual.*

Figure 73. International Natural Gas Flow, 1981
(Billion Cubic Feet)

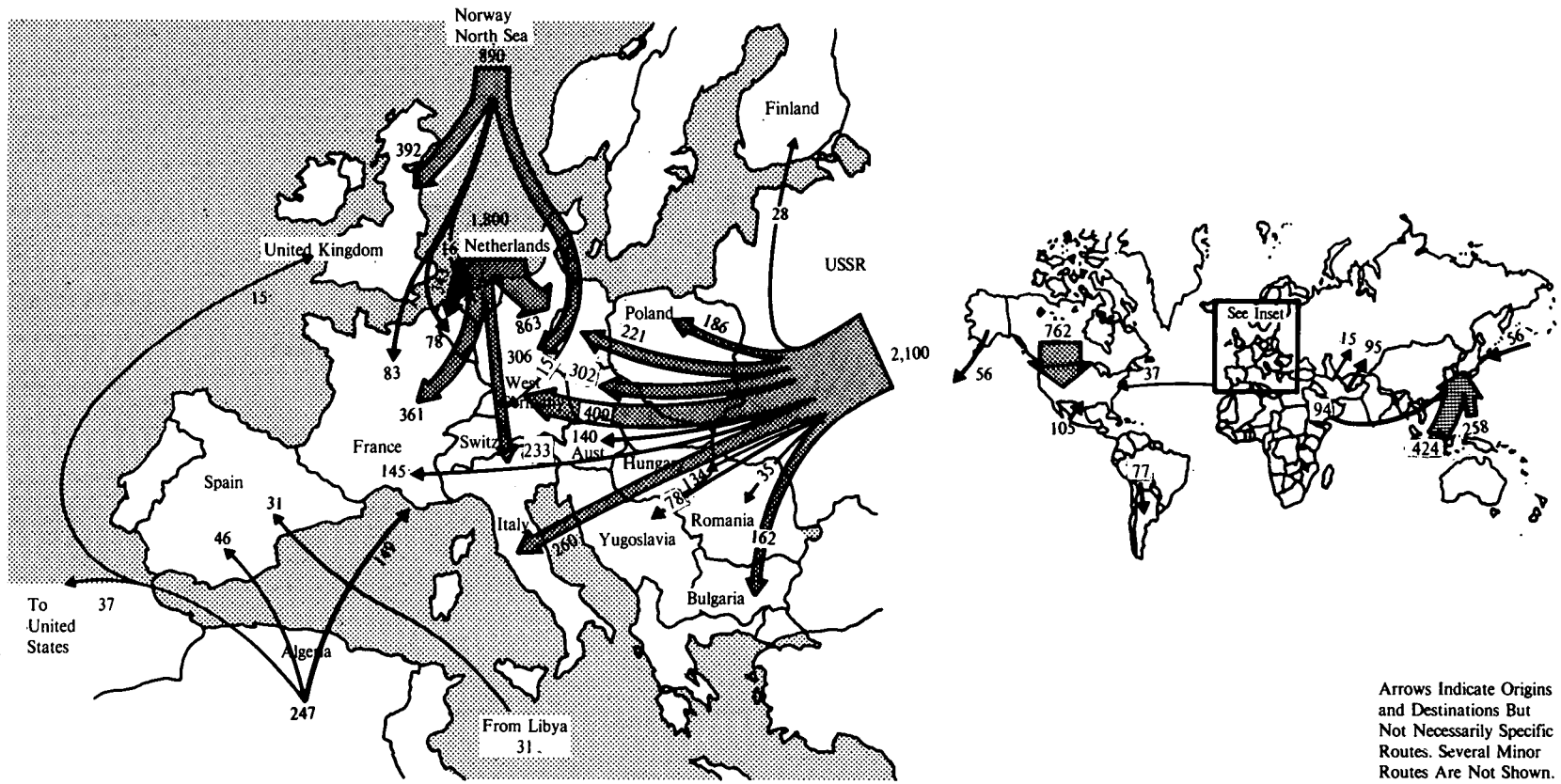


Table 70. International Natural Gas Flow, 1981

(Billion Cubic Feet)

Importing Area and Country	Exporting Area or Country													
	North and South America			Western Europe			Eastern Europe			Africa		Far East and Oceania		
	Canada	United States	Other	Netherlands	Norway	Other [1]	U.S.S.R.	Other	Middle East	Algeria	Libya	Indonesia	Other	Total
North America														
Mexico	0	3	0	0	0	0	0	0	0	0	0	0	0	3
United States	762	—	[2] 105	0	0	0	0	0	0	[3] 37	0	0	0	904
Central and South America														
Argentina	0	0	[4] 77	0	0	0	0	0	0	0	0	0	0	77
Western Europe														
Austria	0	0	0	0	0	1	140	0	0	0	0	0	0	141
Belgium and Luxembourg	0	0	0	343	78	0	0	0	0	0	0	0	0	421
Finland	0	0	0	0	0	0	28	0	0	0	0	0	0	28
France	0	0	0	361	83	42	145	0	0	[3] 149	0	0	0	780
Germany, West	0	0	0	863	306	0	409	0	0	0	0	0	0	1,578
Italy	0	0	0	233	0	0	260	0	0	0	0	0	0	493
Netherlands	0	0	0	—	16	88	0	0	0	0	0	0	0	104
Spain	0	0	0	0	0	0	0	0	0	[3] 46	[3] 31	0	0	77
Switzerland	0	0	0	24	15	1	0	0	0	0	0	0	0	40
United Kingdom	0	0	0	0	392	0	0	0	0	[3] 15	0	0	0	407
Yugoslavia	0	0	0	0	0	0	78	0	0	0	0	0	0	78
Eastern Europe and U.S.S.R.														
Bulgaria	0	0	0	0	0	0	162	0	0	0	0	0	0	162
Czechoslovakia	0	0	0	0	0	0	302	[5]	0	0	0	0	0	302
Germany, East	0	0	0	0	0	0	221	0	0	0	0	0	0	221
Hungary	0	0	0	0	0	0	134	[6] 7	0	0	0	0	0	141
Poland	0	0	0	0	0	0	186	0	0	0	0	0	0	186
Romania	0	0	0	0	0	0	35	0	0	0	0	0	0	35
U.S.S.R.	0	0	0	0	0	0	—	[5]	[7] 15	0	0	0	[8] 95	110
Far East and Oceania														
Japan	0	[3] 56	0	0	0	0	0	0	[9] 94	0	0	[3] 424	[10] 258	832
Malaysia	0	0	0	0	0	0	0	0	0	0	0	0	[11] 23	23
World Total	762	59	182	1,824	890	132	2,100	7	109	247	31	424	376	7,144

[1] Primarily exports from West Germany.
[2] Exports from Mexico.
[3] Liquefied natural gas (LNG).
[4] Exports from Bolivia.
[5] Less than 0.5 billion cubic feet.
[6] Exports from Romania.
[7] Estimated exports from Iran.
[8] Estimated exports from Afghanistan.
[9] LNG exports from United Arab Emirates.
[10] LNG exports from Brunei.
[11] Exports from Brunei.

Note: Sum of components may not equal total due to independent rounding.

Source: Energy Information Administration, *1982 International Energy Annual.*

Figure 74. Natural Gas Wellhead and Import Prices

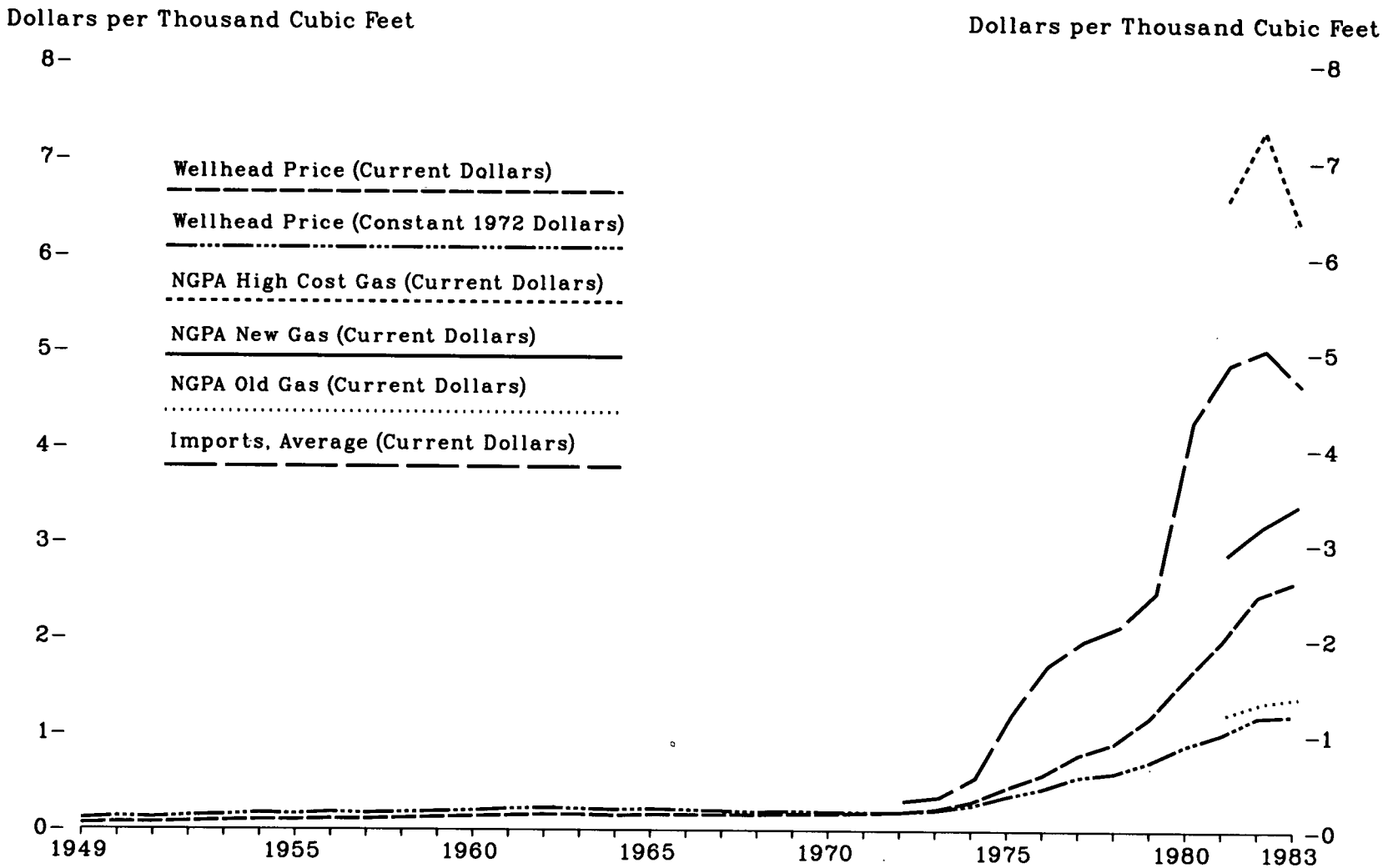


Table 71. Natural Gas Wellhead and Import Prices, 1949-1983

(Dollars per Thousand Cubic Feet)

Year	Wellhead [2]		Purchases by NGPA Categories [1]			Imports		
			Old Gas [3]	New Gas [4]	High-Cost Gas [5]	Pipeline	Other [6]	Average
	Current	Constant [7]	Current	Current	Current	Current	Current	Current
1949	0.06	0.11						
1950	0.07	0.13						
1951	0.07	0.12						
1952	0.08	0.14						
1953	0.09	0.15						
1954	0.10	0.17						
1955	0.10	0.16						
1956	0.11	0.18						
1957	0.11	0.17						
1958	0.12	0.18						
1959	0.13	0.19						
1960	0.14	0.20						
1961	0.15	0.22						
1962	0.16	0.23						
1963	0.16	0.22						
1964	0.15	0.21						
1965	0.16	0.22						
1966	0.16	0.21						
1967	0.16	0.20						
1968	0.16	0.19						
1969	0.17	0.20						
1970	0.17	0.19						
1971	0.18	0.19						
1972	0.19	0.19						
1973	0.22	0.21						
1974	0.30	0.26						
1975	0.45	0.36						
1976	0.58	0.44						
1977	0.79	0.56						
1978	0.91	0.60						
1979	1.18	0.72						
1980	1.59	0.89						
1981	1.98	1.01	1.22	2.89	6.58			
1982	2.46	1.19	1.34	3.19	7.32			
1983[9]	2.60	1.21	1.39	3.41	6.36			

Not Applicable

Not Available

0.31	1.38	0.31
0.35	1.05	0.35
0.55	(8)	0.55
1.21	0.74	1.21
1.73	0.77	1.72
1.99	1.07	1.98
2.19	1.53	2.13
2.61	2.03	2.49
4.33	3.77	4.28
4.85	5.54	4.88
4.98	5.82	5.03
4.40	6.25	4.66

[1] Projected natural gas wellhead purchase prices by major interstate pipeline companies by National Gas Policy Act of 1978 categories.
[2] See Glossary for definition of Natural Gas Wellhead Price.
[3] Includes natural gas dedicated to interstate commerce and natural gas purchased under existing interstate or rollover contracts (Section NGPA 104, 105, and 106).
[4] Includes new natural gas and certain natural gas produced from the Outer Continental Shelf, stripper well gas, and other new gas categories (Section NGPA 102, 103, 108, and 109).
[5] Includes natural gas from deep wells and low permeability (tight) reservoirs and unregulated natural gas (Section 107).
[6] Primarily liquefied natural gas from Algeria.
[7] Constant 1972 prices calculated using the GNP implicit price deflators, 1972 = 100. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.
[8] Not applicable. All imports were by pipeline.
[9] Estimated.

Sources: **Wellhead:** •1949 through 1975—Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. •1976 through 1978—Energy Information Administration, Energy Data Reports, *Natural Gas, Annual.* •1979—Energy Information Administration, *Natural Gas Production and Consumption 1979.* •1980 through 1982—Energy Information Administration, *Natural Gas Annual.* •1983—Energy Information Administration, *Natural Gas Monthly.* **Purchases by NGPA Categories:** • 1981 through 1983—Energy Information Administration, *Natural Gas Monthly.* **Imports:** • 1972 and 1973—Federal Power Commission, *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG.* •1974 through 1977—Federal Power Commission, *United States Imports and Exports of Natural Gas,* annual. •1978 through 1981—Energy Information Administration, *U.S. Imports and Exports of Natural Gas,* annual. •1982—Energy Information Administration, *Natural Gas Monthly,* July 1983 issue. •1983— EIA estimate.

Figure 75. Average Price of Natural Gas Consumed by End-Use Sector

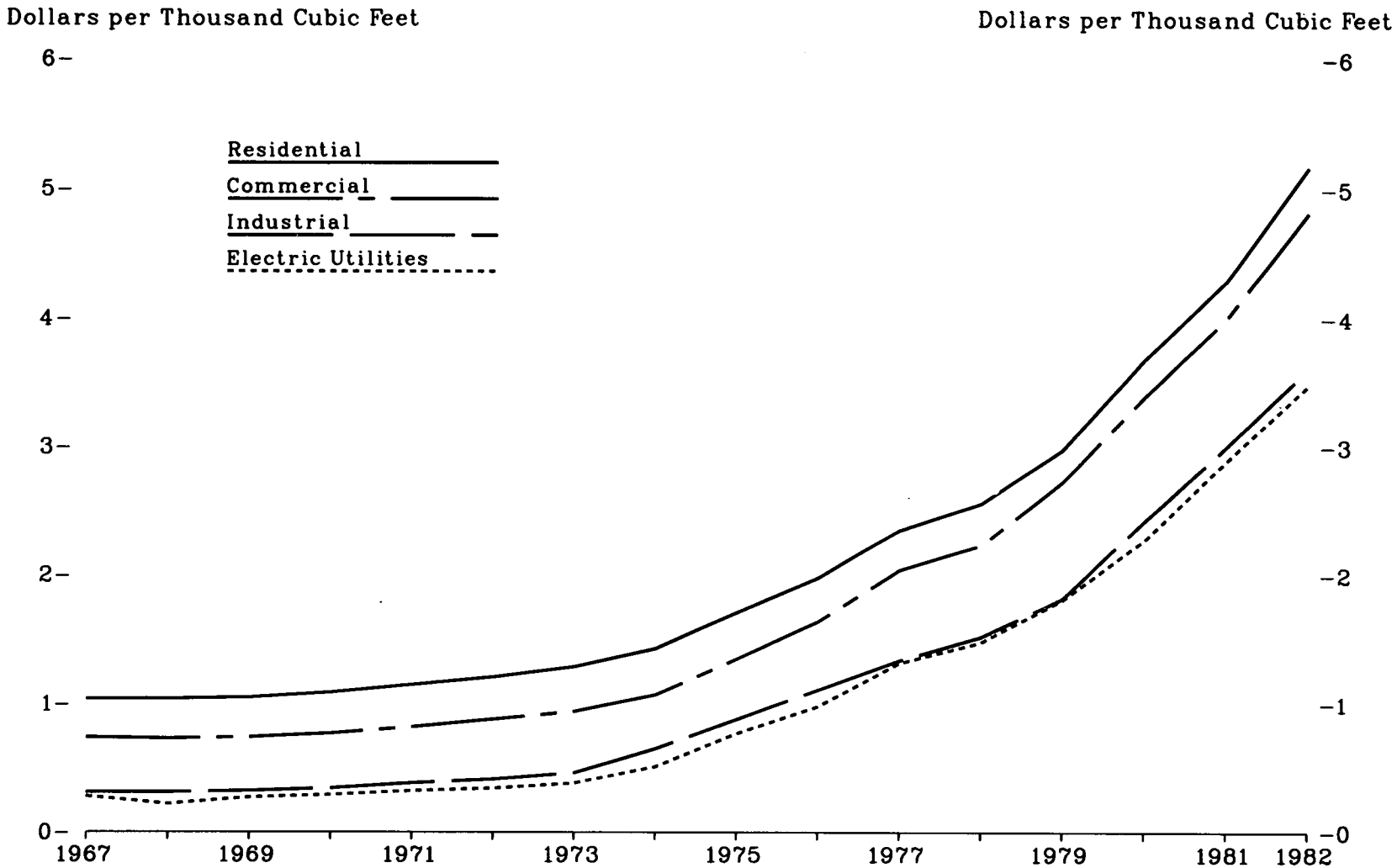


Table 72. Average Price of Natural Gas [1] Consumed by End-Use Sector, 1967-1982

(Dollars per Thousand Cubic Feet)

Year	Residential	Commercial [2]	Industrial			Electric Utilities	Transportation [3]	Total
			Lease and Plant Fuel	Other Industrial	Total Industrial			
1967	1.04	0.74	0.15	0.34	0.31	0.28	0.20	0.53
1968	1.04	0.73	0.16	0.34	0.31	0.22	0.20	0.51
1969	1.05	0.74	0.18	0.35	0.32	0.27	0.21	0.53
1970	1.09	0.77	0.18	0.37	0.34	0.29	0.21	0.55
1971	1.15	0.82	0.19	0.41	0.38	0.32	0.22	0.59
1972	1.21	0.88	0.20	0.45	0.41	0.34	0.23	0.63
1973	1.29	0.94	0.21	0.50	0.46	0.38	0.25	0.68
1974	1.43	1.07	0.51	0.67	0.65	0.51	0.30	0.84
1975	1.71	1.35	0.47	0.96	0.88	0.77	0.40	1.12
1976	1.98	1.64	0.57	1.24	1.11	1.06	0.51	1.38
1977	2.35	2.04	0.71	1.50	1.34	1.32	0.77	1.66
1978	2.56	2.23	0.79	1.70	1.52	1.48	0.90	1.85
1979	2.98	2.73	1.06	1.99	1.82	1.81	1.32	2.21
1980	3.68	3.39	1.43	2.56	2.42	2.27	1.85	2.80
1981	4.29	4.00	1.93	3.14	3.00	2.89	2.39	3.39
1982	5.17	4.82	2.23	3.87	3.61	3.48	2.97	4.15

[1] Includes supplemental gaseous fuels.
[2] Includes deliveries to municipalities and public authorities for institutional heating and other purposes.
[3] Pipeline fuel.

Note: The average for each end-use sector is calculated by dividing the total value of the gas consumed by each sector by the total quantity consumed. See Explanatory Note 9.

Sources: **Electric Utilities:** •1967 through 1972 —Federal Power Commission, Form 4, "Monthly Power Plant Report." •1973 through 1976—Federal Power Commission, FPC Form 4, "Monthly Power Plant Report" and FPC Form 423, " Monthly Report of Cost and Quality of Fuels for Electric Plants." •1977—Federal Energy Regulatory Commission, FPC Form 4, "Monthly Power Plant Report" and FPC Form 423, "Monthly Report of Cost and Quality of Fuels for Electric Plants." •1978 through 1982—Energy Information Administration, FPC Form 4, "Monthly Power Plant Report" and FPC Form 423, "Monthly Report of Cost and Quality of Fuels for Electric Plants." **All Other Data:** •1967 through 1975—Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. •1976 through 1978—Energy Information Administration, Energy Data Reports, *Natural Gas, Annual.* •1979—Energy Information Administration, *Natural Gas Production and Consumption 1979.* • 1980 through 1982—Energy Information Administration, *Natural Gas Annual.*

Section 5. Coal Supply and Disposition

This section presents data on the supply and disposition of coal—bituminous coal (including subbituminous coal), lignite, and anthracite. The section also includes data on labor productivity in coal mining, coal prices, the supply and demand for coke, and international coal reserves and production.

Production. Commercial quantities of coal are produced in 26 States from some 5,600 active mines; 15 percent of these mines provide about 80 percent of total coal output. The mines are controlled by approximately 3,500 companies, the majority of which are small. During recent years, the trend has been to develop larger mines and to consolidate operations for greater efficiency. In 1983, production totaled 785 million short tons, down 6.4 percent from the record high production of 838 million tons produced in 1982 (see Table 73).

Productivity. Average output per man-day, which declined markedly during the early 1970's, began to increase near the end of that decade. By 1983 the average had risen to 18.0 short tons, from 14.3 short tons in 1976. Much of the increase reflected the growing importance of surface coal production, for which productivity is the highest (see Table 79).

Exports. Coal exports, which reached a record high of 113 million short tons in 1981, fell in 1982 and 1983, a reflection of reduced international industrial demand. Exports, which totaled 78 million short tons in 1983, were shipped principally to Japan, Canada, and Western Europe (see Table 76).

Consumption. Domestic consumption of coal during 1983 was 735 million short tons, 4.0 percent above the 1982 level. The leading consumer of coal continued to be electric utilities. In 1983, coal consumption by utilities rose to 626 million short tons (see Table 75). There is little seasonal variation in the use of coal. Decreases in the demand for coal after the heating season are generally offset by increases in the demand for coal by utilities to meet electric power requirements for air conditioning. There are, however, considerable variations in the supply of coal. Therefore, large stockpiles are usually maintained at powerplants and coke plants to compensate for production losses due to strikes, bad weather, and other emergencies. For example, during the 1981 strike, which ended in June 1981, 50 million short tons of coal were drawn from inventories, approximately 30 percent of total stocks available. By year-end 1981, 24 million short tons of coal had been added to the depleted inventories. The especially high year-end 1982 stocks of 232 million short tons were drawn down by over 30 million short tons in 1983 (see Table 77).

Resources. The U.S. Geological Survey has identified U.S. coal resources of more than 1,700 billion short tons at depths of less than 3,000 feet. The Survey also estimated the existence of additional coal resources of more than 2,200 billion short tons to depths of 6,000 feet. The Energy Information Administration estimated that approximately 483 billion short tons of coal were in the Demonstrated Reserve Base as of January 1, 1982 (see Table 80). Although site-specific recovery rates range from 40 percent in some underground mines to more than 90 percent at some surface mines, it is estimated that on a national basis at least half of the coal in the Demonstrated Reserve Base can be recovered.

International Production. World coal production rose from 3.7 billion short tons in 1975 to 4.4 billion short tons in 1982, an average growth rate of 2.6 percent per year. The United States, the U.S.S.R., and China together accounted for about 54 percent of the world's coal production during 1982 (see Table 81).

International Reserves. In a 1982 report by the World Energy Conference, world recoverable coal reserves were estimated to be 987 billion short tons, in 1980, 25 percent higher than in 1978. The United States, the U.S.S.R., China, Australia, and West Germany accounted for 81 percent of the world's estimated recoverable reserves of coal (see Table 82).

Prices. Domestic coal prices increased nominally in 1983, continuing a long-term upward trend. The price of bituminous coal and lignite at the mine-mouth averaged $28.00 per short ton and at electric utility powerplants, $35.50 per ton; the price of anthracite at preparation plants was up to $53.00 per ton (see Table 83).

Figure 76. Coal Flow Diagram, 1983

Million Short Tons

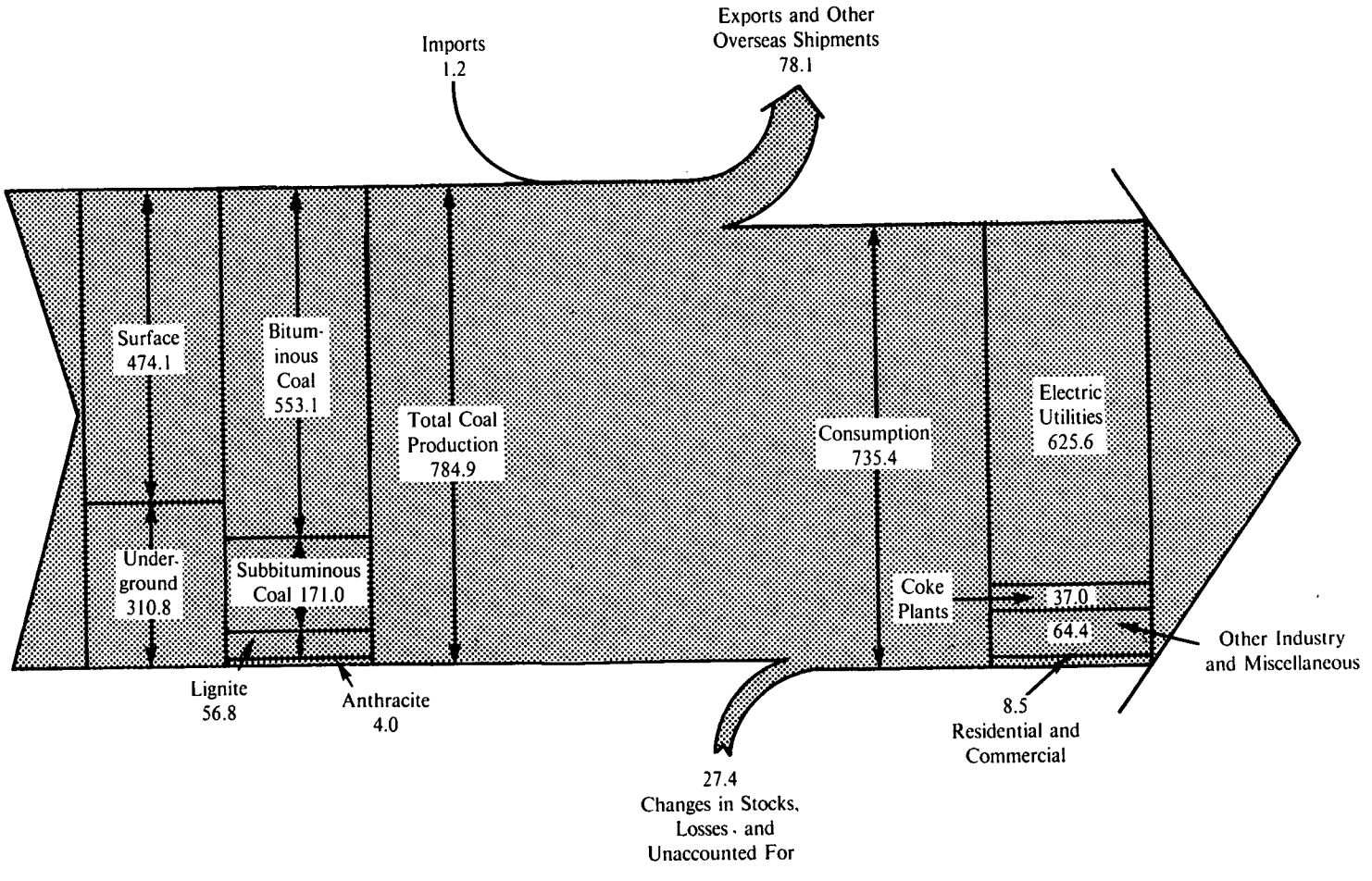


Figure 77. Coal Supply and Disposition

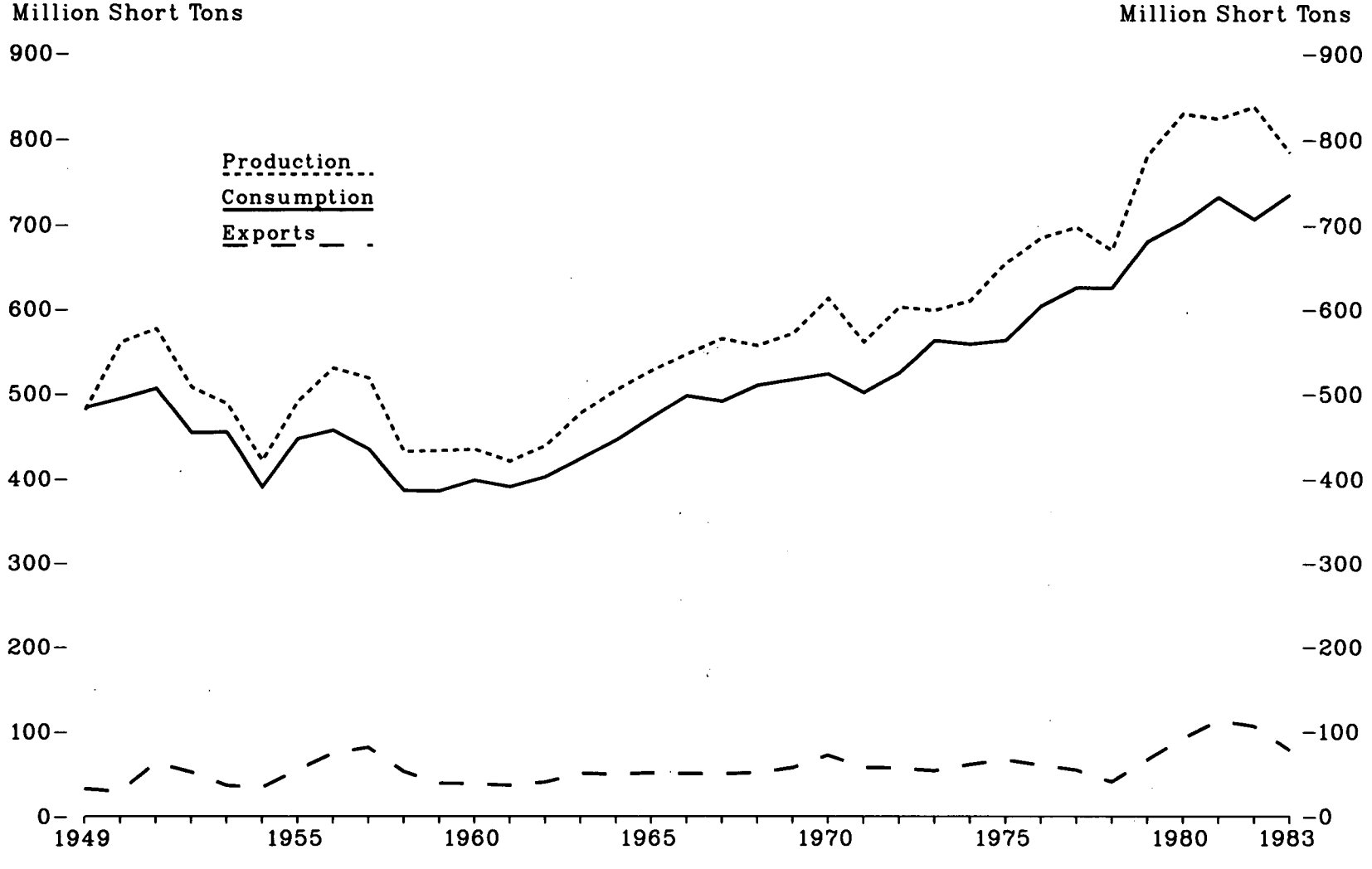


Table 73. Coal Supply and Disposition, 1949-1983

(Million Short Tons)

Year	Supply				Disposition			
	Production	Imports	Change in Stocks, Losses, and Unaccounted for [1]	Total	Exports	Anthracite Shipped Overseas to U.S. Armed Forces	Consumption	Total
1949	480.6	0.3	35.1	516.0	32.8	0	483.2	516.0
1950	560.4	0.4	-37.3	523.5	29.4	0	494.1	523.5
1951	576.3	0.3	-8.1	568.6	62.7	0	505.9	568.6
1952	507.4	0.3	-1.4	506.3	52.2	0	454.1	506.3
1953	488.2	0.3	2.8	491.3	36.5	0	454.8	491.3
1954	420.8	0.2	2.8	423.8	33.9	0	389.9	423.8
1955	490.8	0.3	10.3	501.4	54.4	0	447.0	501.4
1956	529.8	0.4	0.5	530.7	73.8	0	456.9	530.7
1957	518.0	0.4	-3.2	515.3	80.8	0	434.5	515.3
1958	431.6	0.3	6.4	438.3	52.6	0	385.7	438.3
1959	432.7	0.4	-9.0	424.1	39.0	0	385.1	424.1
1960	434.3	0.3	1.5	436.1	38.0	0	398.1	436.1
1961	420.4	0.2	6.2	426.8	36.4	0	390.4	426.8
1962	439.0	0.2	4.1	443.4	40.2	0.95	402.3	443.4
1963	477.2	0.3	-2.7	474.8	50.4	0.86	423.5	474.8
1964	504.2	0.3	-7.9	496.6	49.5	1.36	445.7	496.6
1965	527.0	0.2	-3.0	524.1	51.0	1.13	472.0	524.1
1966	546.8	0.2	1.6	548.6	50.1	0.77	497.7	548.6
1967	564.9	0.2	-22.7	542.4	50.1	0.83	491.4	542.4
1968	556.7	0.2	4.9	561.8	51.2	0.82	509.8	561.8
1969	571.0	0.1	3.2	574.3	56.9	1.04	516.4	574.3
1970	612.7	(2)	-17.0	595.6	71.7	0.69	523.2	595.6
1971	560.9	0.1	-1.4	559.6	57.3	0.72	501.6	559.6
1972	602.5	(2)	-21.1	581.5	56.7	0.45	524.3	581.5
1973	598.6	0.1	17.9	616.6	53.6	0.44	562.6	616.6
1974	610.0	2.1	7.4	619.5	60.7	0.43	558.4	619.5
1975	654.6	0.9	-26.2	629.4	66.3	0.46	562.6	629.4
1976	684.9	1.2	-21.7	664.4	60.0	0.57	603.8	664.4
1977	697.2	1.6	-18.8	680.0	54.3	0.40	625.3	680.0
1978	670.2	3.0	-6.9	666.2	40.7	0.28	625.2	666.2
1979	781.1	2.1	-36.3	746.9	66.0	0.37	680.5	746.9
1980	829.7	1.2	-36.1	794.8	91.7	0.34	702.7	794.8
1981	823.8	1.0	20.7	845.5	112.5	0.37	732.6	845.5
1982	838.1	0.7	-25.3	813.5	106.3	0.34	706.9	813.5
1983[3]	784.9	1.3	27.4	813.6	77.8	0.36	735.4	813.6

[1] Includes changes in stocks at electric utilities, coke plants, other industries, retail dealers, and producers/distributors and the balancing item of losses and unaccounted for. Net additions to stocks are considered as negative numbers. Net withdrawals from stocks are considered as positive numbers.

[2] Less than 0.05 million short tons.

[3] Preliminary.

Note: Sum of components may not equal total due to independent rounding.

Sources: •1949 through 1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. •1976—Energy Information Administration, Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976*. •1977 and 1978—Energy Information Administration, Energy Data Reports, *Bituminous Coal and Lignite Production and Mine Operations-1977;....1978* and *Coal-Pennsylvania Anthracite 1977;....1978*. • 1979 through 1980—Energy Information Administration, Energy Data Report, *Weekly Coal Report*. •1981 through 1983—Energy Information Administration, *Weekly Coal Production*.

Figure 78. Coal Production

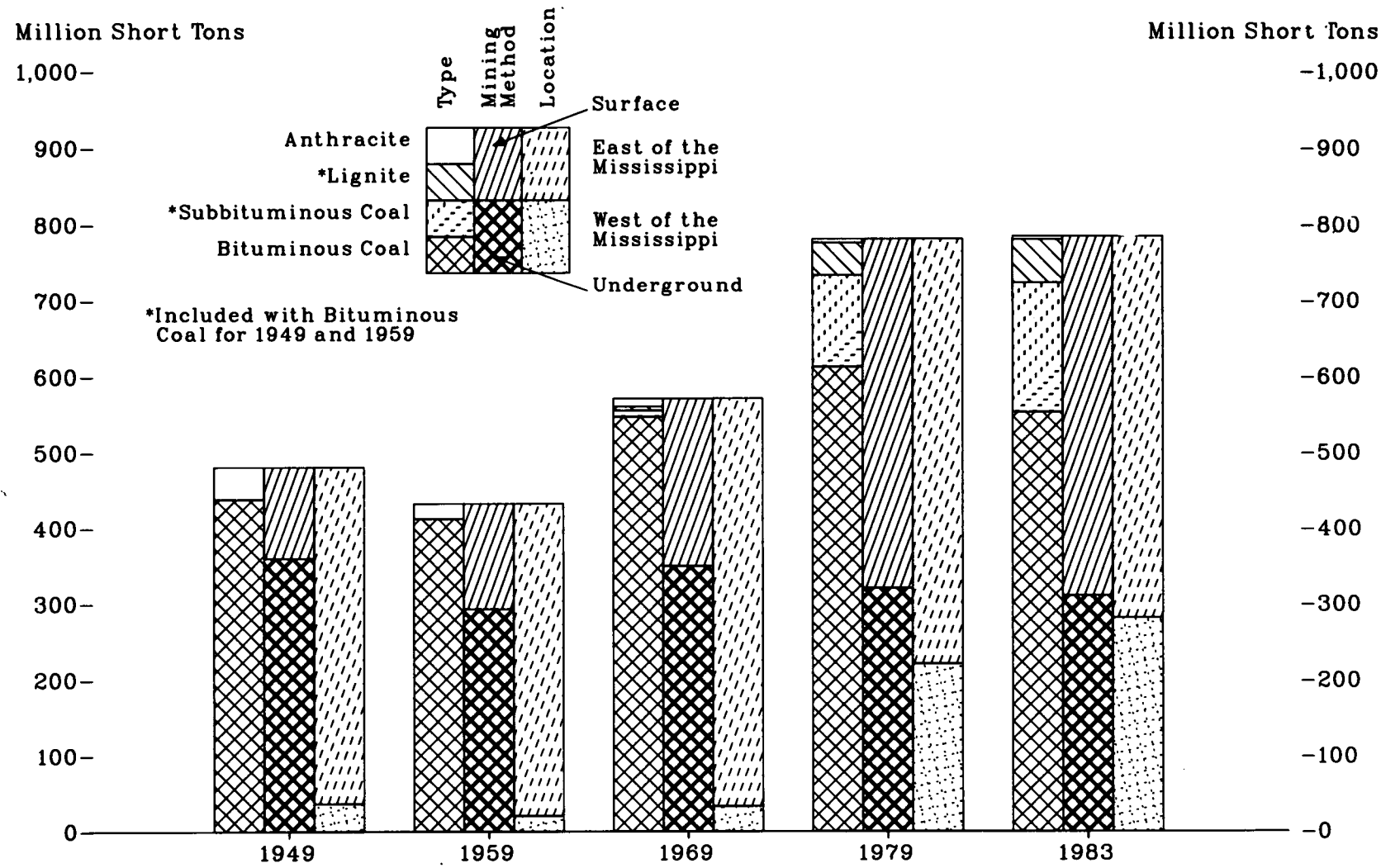


Table 74. Coal Production, 1949-1983

(Million Short Tons)

Year	Type				Method of Mining		Location		Total
	Bituminous Coal	Subbituminous Coal	Lignite	Anthracite	Underground	Surface	West of the Mississippi	East of the Mississippi	
1949	437.9	(1)	(1)	42.7	358.9	121.7	36.4	444.2	480.6
1950	516.3	(1)	(1)	44.1	421.0	139.4	36.0	524.4	560.4
1951	533.7	(1)	(1)	42.7	442.2	134.2	34.6	541.7	576.3
1952	466.8	(1)	(1)	40.6	381.2	126.3	32.7	474.8	507.4
1953	457.3	(1)	(1)	30.9	367.4	120.8	30.6	457.7	488.2
1954	391.7	(1)	(1)	29.1	306.0	114.8	25.4	395.4	420.8
1955	464.6	(1)	(1)	26.2	358.0	132.9	26.6	464.2	490.8
1956	500.9	(1)	(1)	28.9	380.8	148.9	25.8	504.0	529.8
1957	492.7	(1)	(1)	25.3	373.6	144.5	24.7	493.4	518.0
1958	410.4	(1)	(1)	21.2	297.6	134.0	20.3	411.3	431.6
1959	412.0	(1)	(1)	20.6	292.8	139.8	20.3	412.4	432.7
1960	415.5	(1)	(1)	18.8	292.6	141.7	21.3	413.0	434.3
1961	403.0	(1)	(1)	17.4	279.6	140.9	21.8	398.6	420.4
1962	422.1	(1)	(1)	16.9	287.9	151.1	21.4	417.6	439.0
1963	458.9	(1)	(1)	18.3	309.0	168.2	23.7	453.5	477.2
1964	487.0	(1)	(1)	17.2	327.7	176.5	25.7	478.5	504.2
1965	512.1	(1)	(1)	14.9	338.0	189.0	27.4	499.5	527.0
1966	533.9	(1)	(1)	12.9	342.6	204.2	28.0	518.8	546.8
1967	552.6	(1)	(1)	12.3	352.4	212.5	28.9	536.0	564.9
1968	545.2	(1)	(1)	11.5	346.6	210.1	29.7	527.0	556.7
1969	547.2	8.3	5.0	10.5	349.2	221.7	33.3	537.7	571.0
1970	578.5	16.4	8.0	9.7	340.5	272.1	44.9	567.8	612.7
1971	521.3	22.2	8.7	8.7	277.2	283.7	51.0	509.9	560.9
1972	556.8	27.5	11.0	7.1	305.0	297.4	64.3	538.2	602.5
1973	543.5	33.9	14.3	6.8	300.1	298.5	76.4	522.1	598.6
1974	545.7	42.2	15.5	6.6	278.0	332.1	91.9	518.1	610.0
1975	577.5	51.1	19.8	6.2	293.5	361.2	110.9	543.7	654.6
1976	588.4	64.8	25.5	6.2	295.5	389.4	136.1	548.8	684.9
1977	581.0	82.1	28.2	5.9	266.6	430.6	163.9	533.3	697.2
1978	534.0	96.8	34.4	5.0	242.8	427.4	183.0	487.2	670.2
1979	612.3	121.5	42.5	4.8	320.9	460.2	221.4	559.7	781.1
1980	628.8	147.7	47.2	6.1	337.5	492.2	251.0	578.7	829.7
1981	608.0	159.7	50.7	5.4	316.5	507.3	269.9	553.9	823.8
1982	620.2	160.9	52.4	4.6	339.2	499.0	273.9	564.3	838.1
1983[2]	553.1	171.0	56.8	4.0	310.8	474.1	281.8	503.0	784.9

[1] Included in bituminous coal.
[2] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 through 1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. •1976—Energy Information Administration, Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976*. •1977 and 1978—Energy Information Administration, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977; ...1978* and *Coal-Pennsylvania Anthracite 1977; ...1978*. •1979 through 1980—Energy Information Administration, Energy Data Report, *Weekly Coal Report*. •1981 through 1983—Energy Information Administration, *Weekly Coal Production*.

Figure 79. Coal Consumption by End-Use Sector

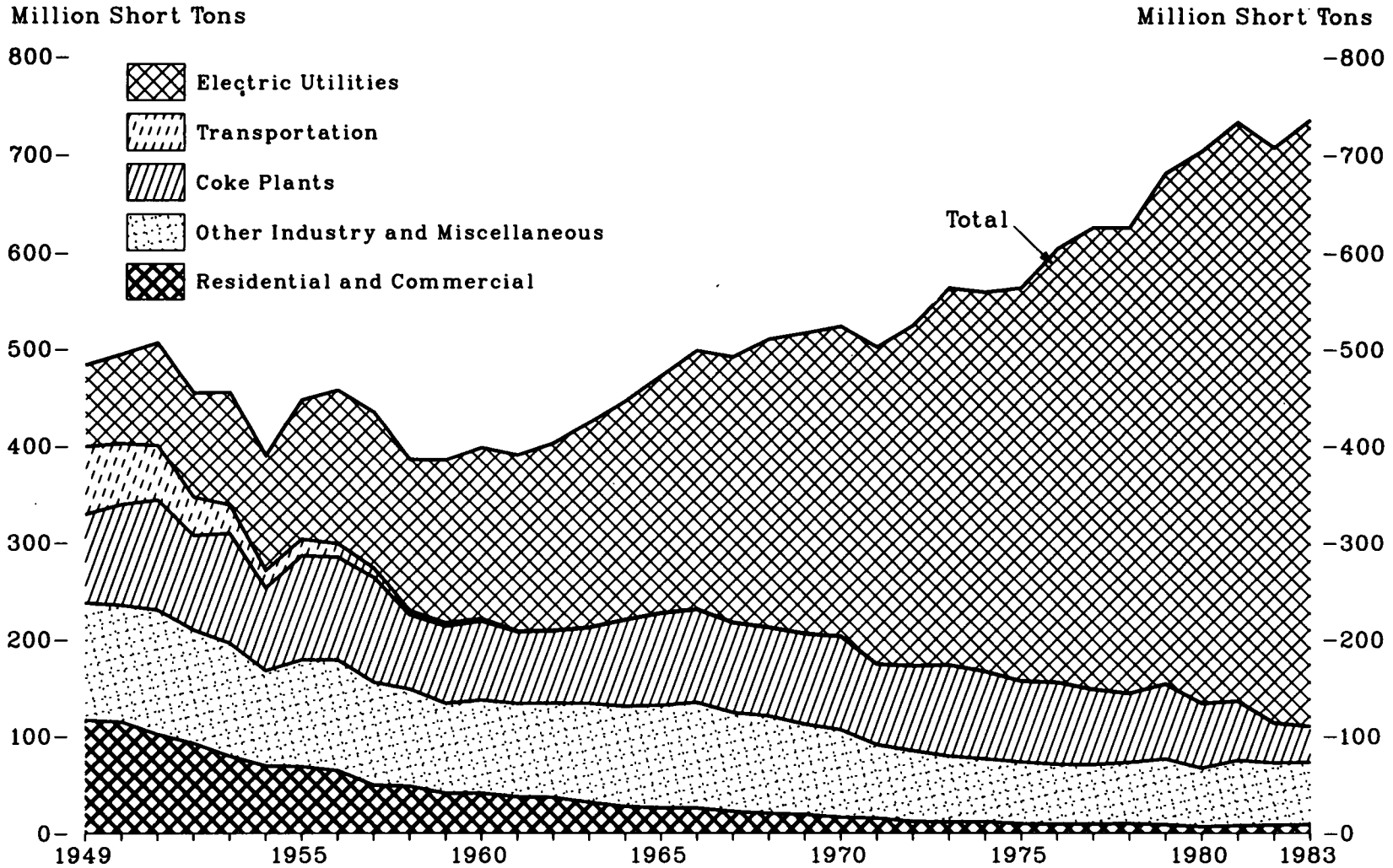


Table 75. Coal Consumption by End-Use Sector,[1] 1949-1983
(Million Short Tons)

Year	Electric Utilities	Industry and Miscellaneous			Transportation	Residential and Commercial	Total
		Coke Plants	Other Industry and Miscellaneous	Total			
1949	84.0	91.4	121.2	212.6	70.2	116.5	483.2
1950	91.9	104.0	120.6	224.6	63.0	114.6	494.1
1951	105.8	113.7	128.7	242.4	56.2	101.5	505.9
1952	107.1	97.8	117.1	214.9	39.8	92.3	454.1
1953	115.9	113.1	117.0	230.1	29.6	79.2	454.8
1954	118.4	85.6	98.2	183.9	18.6	69.1	389.9
1955	143.8	107.7	110.1	217.8	17.0	68.4	447.0
1956	158.3	106.3	114.3	220.6	13.8	64.2	456.9
1957	160.8	108.4	106.5	214.9	9.8	49.0	434.5
1958	155.7	76.8	100.5	177.4	4.7	47.9	385.7
1959	168.4	79.6	92.7	172.3	3.6	40.8	385.1
1960	176.7	81.4	96.0	177.4	3.0	40.9	398.1
1961	182.2	74.2	95.9	170.1	0.8	37.3	390.4
1962	193.3	74.7	97.1	171.7	0.7	36.5	402.3
1963	211.3	78.1	101.9	180.0	0.7	31.5	423.5
1964	225.4	89.2	103.1	192.4	0.7	27.2	445.7
1965	244.8	95.3	105.6	200.8	0.7	25.7	472.0
1966	266.5	96.4	108.7	205.1	0.6	25.6	497.7
1967	274.2	92.8	101.8	194.6	0.5	22.1	491.4
1968	297.8	91.3	100.4	191.6	0.4	20.0	509.8
1969	310.6	93.4	93.1	186.6	0.3	18.9	516.4
1970	320.2	96.5	90.2	186.6	0.3	16.1	523.2
1971	327.3	83.2	75.6	158.9	0.2	15.2	501.6
1972	351.8	87.7	72.9	160.6	0.2	11.7	524.3
1973	389.2	94.1	68.0	162.1	0.1	11.1	562.6
1974	391.8	90.2	64.9	155.1	0.1	11.4	558.4
1975	406.0	83.6	63.6	147.2	(2)	9.4	562.6
1976	448.4	84.7	61.8	146.5	(2)	8.9	603.8
1977	477.1	77.7	61.5	139.2	(2)	9.0	625.3
1978	481.2	71.4	63.1	134.5	(2)	9.5	625.2
1979	527.1	77.4	67.7	145.1	(2)	8.4	680.5
1980	569.3	66.7	60.3	127.0	(2)	6.5	702.7
1981	596.8	61.0	67.4	128.4	(2)	7.4	732.6
1982	593.7	40.9	64.1	105.0	(2)	8.2	706.9
1983[3]	625.6	37.0	64.4	101.4	(2)	8.5	735.4

[1] See Explanatory Note 10.
[2] Less than 0.05 million short tons. Quantities are included in the Other Industry and Miscellaneous category.
[3] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 through 1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. •1976—Energy Information Administration, Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976*. •1977 and 1978—Energy Information Administration, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977;....1978* and *Coal-Pennsylvania Anthracite 1977;....1978*. • 1979 through 1980—Energy Information Administration, Energy Data Report, *Weekly Coal Report*. •1981 through 1983—Energy Information Administration, *Weekly Coal Production*.

Figure 80. Coal Exports by Country of Destination

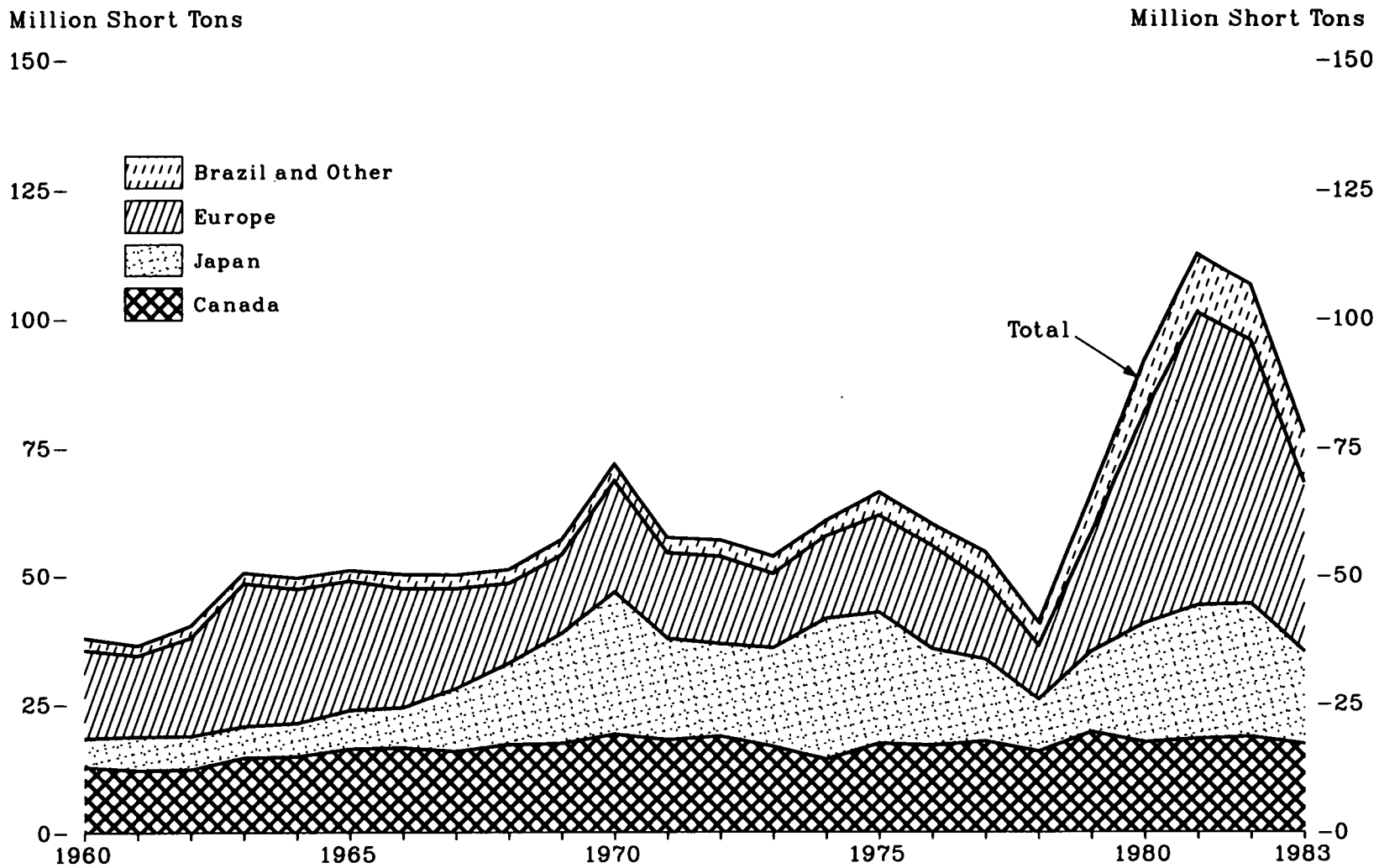


Table 76. Coal Exports[1] by Country of Destination, 1960-1983

(Million Short Tons)

Year	Canada	Brazil	Europe										Japan	Other	Total
			Belgium/ Luxem-bourg	Denmark	France	West Germany	Italy	Nether-lands	Spain	United Kingdom	Other	Total			
1960	12.8	1.1	1.1	0.1	0.8	4.6	4.9	2.8	0.3	0	2.4	17.1	5.6	1.3	38.0
1961	12.1	1.0	1.0	0.1	0.7	4.3	4.8	2.6	0.2	0	2.0	15.7	6.6	1.0	36.4
1962	12.3	1.3	1.3	(2)	0.9	5.1	6.0	3.3	0.8	(2)	1.8	19.1	6.5	1.0	40.2
1963	14.6	1.2	2.7	(2)	2.7	5.6	7.9	5.0	1.5	(2)	2.4	27.7	6.1	0.9	50.4
1964	14.8	1.1	2.3	(2)	2.2	5.2	8.1	4.2	1.4	(2)	2.6	26.0	6.5	1.1	49.5
1965	16.3	1.2	2.2	(2)	2.1	4.7	9.0	3.4	1.4	(2)	2.3	25.1	7.5	0.9	51.0
1966	16.5	1.7	1.8	(2)	1.6	4.9	7.8	3.2	1.2	(2)	2.5	23.1	7.8	1.0	50.1
1967	15.8	1.7	1.4	0	2.1	4.7	5.9	2.2	1.0	0	2.1	19.4	12.2	1.0	50.1
1968	17.1	1.8	1.1	(2)	1.5	3.8	4.3	1.5	1.5	(2)	1.9	15.5	15.8	0.9	51.2
1969	17.3	1.8	0.9	0	2.3	3.5	3.7	1.6	1.8	(2)	1.3	15.2	21.4	1.2	56.9
1970	19.1	2.0	1.9	(2)	3.6	5.0	4.3	2.1	3.2	(2)	1.8	21.8	27.6	1.2	71.7
1971	18.0	1.9	0.8	0	3.2	2.9	2.7	1.6	2.6	1.7	1.1	16.6	19.7	1.1	57.3
1972	18.7	1.9	1.1	(2)	1.7	2.4	3.7	2.3	2.1	2.4	1.1	16.9	18.0	1.2	56.7
1973	16.7	1.6	1.2	0	2.0	1.6	3.3	1.8	2.2	0.9	1.3	14.4	19.2	1.6	53.6
1974	14.2	1.3	1.1	0	2.7	1.5	3.9	2.6	2.0	1.4	0.9	16.1	27.3	1.8	60.7
1975	17.3	2.0	0.6	0	3.6	2.0	4.5	2.1	2.7	1.9	1.6	19.0	25.4	2.6	66.3
1976	16.9	2.2	2.2	(2)	3.5	1.0	4.2	3.5	2.5	0.8	2.1	19.9	18.8	2.1	60.0
1977	17.7	2.3	1.5	0.1	2.1	0.9	4.1	2.0	1.6	0.6	2.1	15.0	15.9	3.5	54.3
1978	15.7	1.5	1.1	0	1.7	0.6	3.2	1.1	0.8	0.3	1.8	10.5	10.1	3.0	40.7
1979	19.5	2.8	3.2	0.2	3.9	2.6	5.0	2.0	1.4	1.4	3.6	23.1	15.7	4.9	66.0
1980	17.5	3.2	4.6	1.6	7.8	2.5	7.1	4.7	3.4	4.1	5.1	41.0	23.1	6.9	91.7
1981	18.2	2.7	4.3	3.9	9.7	4.3	10.5	6.8	6.4	2.3	8.8	57.0	25.9	8.7	112.5
1982	18.6	3.1	4.8	2.8	9.0	2.3	11.3	5.9	5.6	2.0	7.6	51.3	25.8	7.5	106.3
1983	17.2	3.6	2.5	1.7	4.2	1.5	8.1	4.2	3.3	1.2	6.4	33.1	17.9	6.1	77.8

[1] Excludes overseas shipments of anthracite to U.S. Armed Forces.
[2] Less than 50,000 tons.
Note: Sum of components may not equal total due to independent rounding.
Source: Bureau of the Census, *U.S. Exports by Schedule B Commodities*, EM 522.

Figure 81. Stocks of Coal by End-Use Sector, Year-End

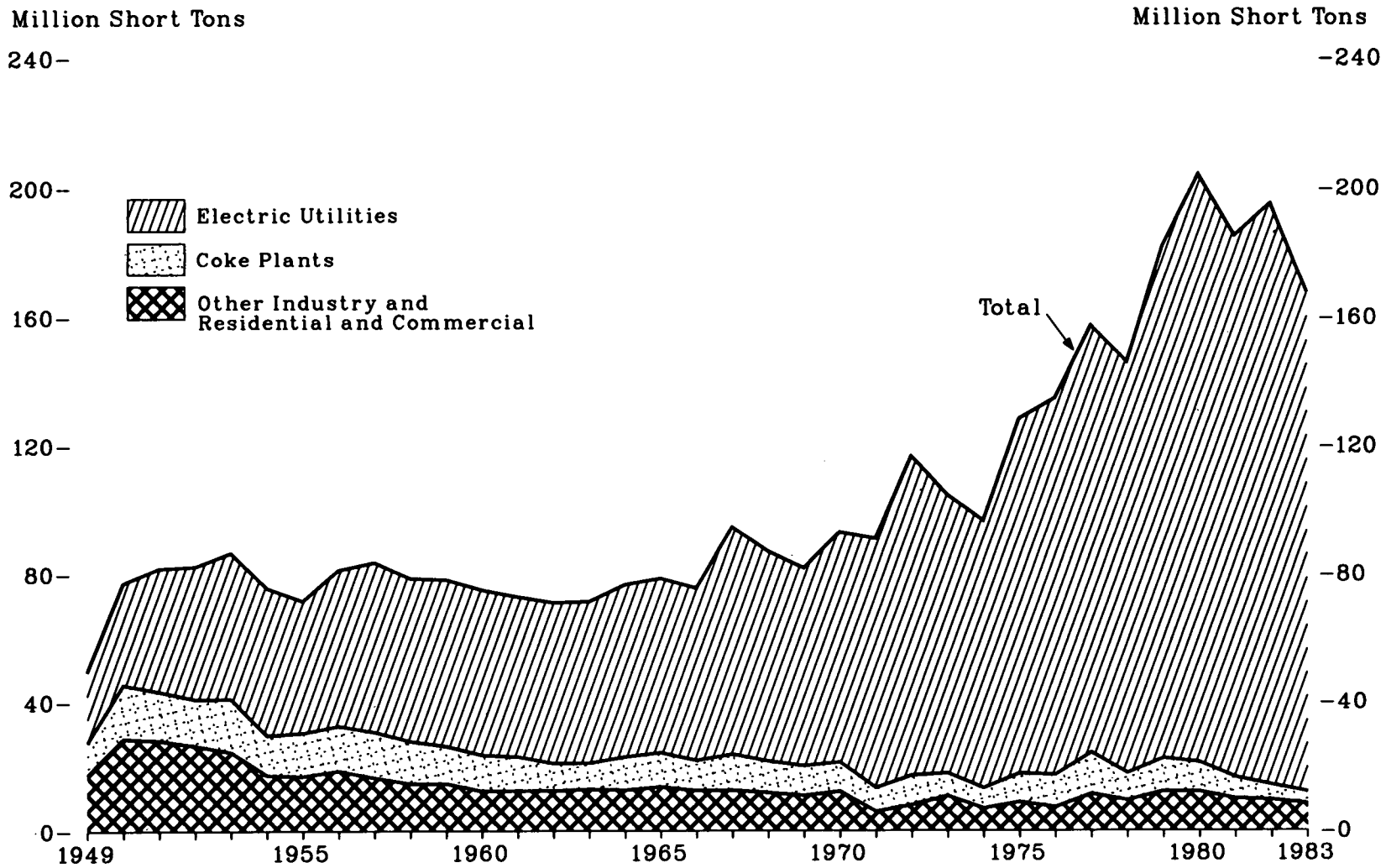


Table 77. Stocks of Coal by End-Use Sector, Year-End 1949-1983

(Million Short Tons)

Year	Coal Consumers					Coal Producers and Distributors	Total
	Electric Utilities	Coke Plants	Other Industry [1]	Residential [2] and Commercial	Total		
1949	22.1	10.0	16.1	1.4	49.5	NA	49.5
1950	31.8	16.8	26.2	2.5	77.3	NA	77.3
1951	38.5	15.3	26.2	1.8	81.8	NA	81.8
1952	41.5	14.5	24.7	1.7	82.4	NA	82.4
1953	45.6	16.6	22.8	1.5	86.6	NA	86.6
1954	46.1	12.4	16.4	0.8	75.7	NA	75.7
1955	41.4	13.4	15.9	1.0	71.7	NA	71.7
1956	48.8	14.0	17.4	1.1	81.3	NA	81.3
1957	53.1	14.2	15.5	0.9	83.7	NA	83.7
1958	51.0	13.1	13.7	0.9	78.6	NA	78.6
1959	52.1	11.6	13.6	1.0	78.4	NA	78.4
1960	51.7	11.1	11.6	0.7	75.2	NA	75.2
1961	50.1	10.5	11.9	0.5	73.0	NA	73.0
1962	50.4	8.4	12.0	0.5	71.3	NA	71.3
1963	50.6	8.1	12.3	0.5	71.5	NA	71.5
1964	53.9	10.2	12.2	0.4	76.7	NA	76.7
1965	54.5	10.6	13.1	0.4	78.6	NA	78.6
1966	53.9	9.3	12.2	0.2	75.6	NA	75.6
1967	71.0	11.1	12.3	0.2	94.6	NA	94.6
1968	65.5	9.7	11.7	0.2	87.0	NA	87.0
1969	61.9	9.1	10.8	0.2	81.9	NA	81.9
1970	71.9	9.0	11.8	0.3	93.0	NA	93.0
1971	77.8	7.3	5.6	0.3	91.0	NA	91.0
1972	99.7	9.1	7.6	0.3	116.8	NA	116.8
1973	87.0	7.0	10.4	0.3	104.6	NA	104.6
1974	83.5	6.2	6.6	0.3	96.6	NA	96.6
1975	110.7	8.8	8.5	0.2	128.3	NA	128.3
1976	117.4	9.9	7.1	0.2	134.7	NA	134.7
1977	133.2	12.8	11.1	0.2	157.3	NA	157.3
1978	128.2	8.3	9.0	0.4	145.9	NA	145.9
1979	159.7	10.2	11.8	0.3	182.0	20.8	202.8
1980	183.0	9.1	12.0	NA	204.0	24.4	228.4
1981	168.9	6.5	9.9	NA	185.3	24.2	209.4
1982	181.1	4.6	9.5	NA	195.3	36.8	232.0
1983[3]	155.6	3.6	8.4	NA	167.6	33.5	201.1

[1] Includes transportation sector.
[2] Stocks at retail dealers.
[3] Estimated.
NA = Not available.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 through 1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. •1976—Energy Information Administration, Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976.* •1977 and 1978—Energy Information Administration, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977;....1978* and *Coal-Pennsylvania Anthracite 1977;....1978.* •1979 through 1980—Energy Information Administration, Energy Data Report, *Weekly Coal Report.* •1981 through 1983—Energy Information Administration, *Weekly Coal Production.*

Figure 82. Coke Supply and Disposition

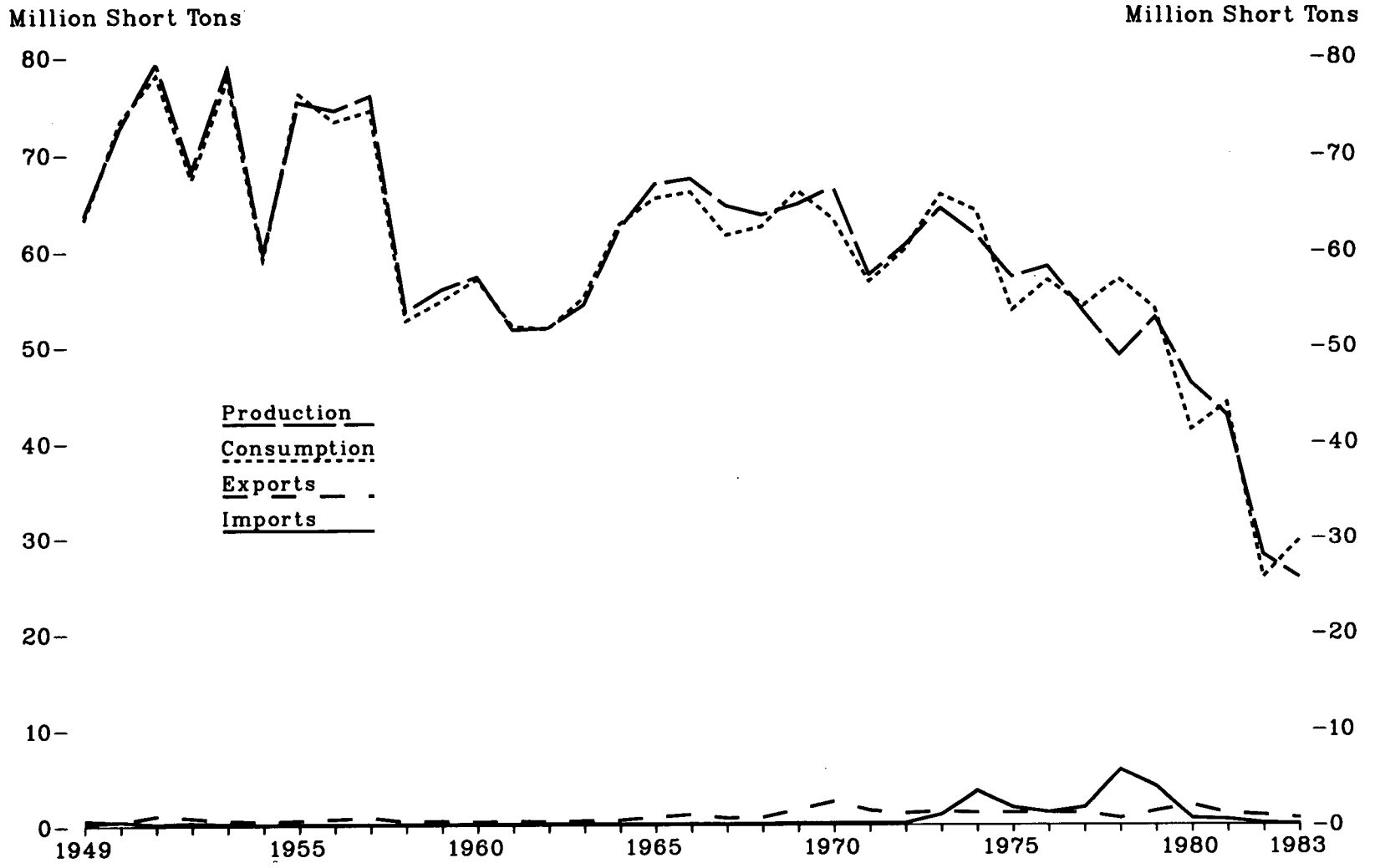


Table 78. Coke Supply and Disposition, 1949-1983

(Million Short Tons)

Year	Supply				Disposition		
	Production	Imports	Stock Change [1]	Total	Exports	Consumption	Total
1949	63.64	0.28	- 0.18	63.74	0.55	63.19	63.74
1950	72.72	0.44	0.66	73.82	0.40	73.42	73.82
1951	79.33	0.16	- 0.37	79.12	1.03	78.09	79.12
1952	68.25	0.31	- 0.42	68.15	0.79	67.36	68.15
1953	78.84	0.16	- 0.78	78.22	0.52	77.70	78.22
1954	59.66	0.12	- 0.27	59.51	0.39	59.12	59.51
1955	75.30	0.13	1.25	76.68	0.53	76.14	76.68
1956	74.48	0.13	- 0.63	73.98	0.66	73.32	73.98
1957	75.95	0.12	- 0.81	75.26	0.82	74.43	75.26
1958	53.60	0.12	- 0.68	53.05	0.39	52.66	53.05
1959	55.86	0.12	- 0.86	55.13	0.46	54.67	55.13
1960	57.23	0.13	- 0.06	57.30	0.35	56.95	57.30
1961	51.71	0.13	0.70	52.53	0.44	52.09	52.53
1962	51.91	0.14	0.14	52.19	0.36	51.82	52.19
1963	54.28	0.15	1.02	55.45	0.45	55.00	55.45
1964	62.14	0.10	0.91	63.16	0.52	62.64	63.16
1965	66.85	0.09	- 0.73	66.21	0.83	65.38	66.21
1966	67.40	0.10	- 0.38	67.12	1.10	66.02	67.12
1967	64.58	0.09	- 2.39	62.28	0.71	61.57	62.28
1968	63.65	0.09	- 0.52	63.23	0.79	62.44	63.23
1969	64.76	0.17	2.86	67.80	1.63	66.17	67.80
1970	66.52	0.15	- 0.99	65.68	2.48	63.21	65.68
1971	57.44	0.17	0.59	58.20	1.51	56.69	58.20
1972	60.51	0.18	0.59	61.28	1.23	60.05	61.28
1973	64.32	1.08	1.76	67.16	1.40	65.76	67.16
1974	61.58	3.54	0.25	65.37	1.28	64.09	65.37
1975	57.21	1.82	- 4.06	54.96	1.27	53.69	54.96
1976	58.33	1.31	- 1.50	58.15	1.32	56.83	58.15
1977	53.51	1.83	0.05	55.38	1.24	54.14	55.38
1978	49.01	5.72	2.91	57.64	0.69	56.95	57.64
1979	52.94	3.97	- 1.65	55.27	1.44	53.83	55.27
1980	46.13	0.66	- 3.44	43.35	2.07	41.28	43.35
1981	42.79	0.53	1.90	45.22	1.17	44.05	45.22
1982	28.12	0.12	- 1.47	26.77	0.99	25.78	26.77
1983[2]	25.78	0.04	4.49	30.31	0.66	29.64	30.31

[1] Negative numbers denote a net addition to stocks or a reduction in supply. Positive numbers denote a net withdrawal from stocks or an addition to supply.

[2] Preliminary.

Note: Sum of components may not equal total due to independent rounding.

Sources: •1949 through 1975—Bureau of Mines, *Minerals Yearbook*, "Coke and Coal Chemicals" chapter. •1976 through 1980—Energy Information Administration, Energy Data Report, *Coke and Coal Chemicals*, annual. •1981—Energy Information Administration, Energy Data Report, *Coke Plant Report*, quarterly. •1982 and 1983—Energy Information Administration, *Quarterly Coal Report*.

Figure 83. Labor Productivity in Coal Mining

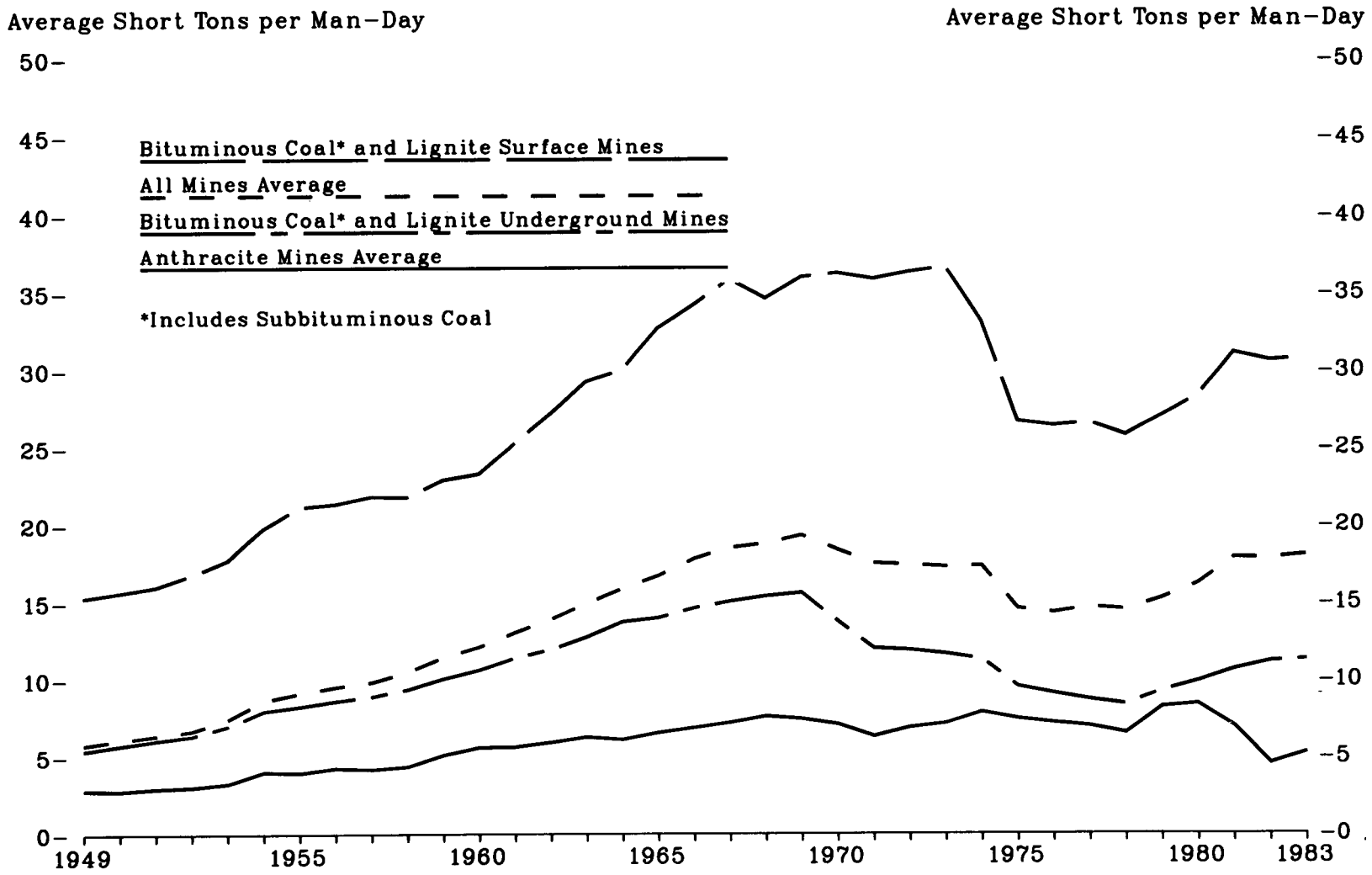


Table 79. Labor Productivity in Coal Mining, 1949-1983

(Average Short Tons per Man-Day)

Year	Bituminous Coal [1] and Lignite Mines			Anthracite Mines Average	All Mines Average
	Underground	Surface	Average		
1949	5.42	15.33	6.43	2.87	5.79
1950	5.75	15.66	6.77	2.83	6.10
1951	6.08	16.02	7.04	2.97	6.39
1952	6.37	16.81	7.47	3.06	6.70
1953	7.01	17.73	8.17	3.28	7.46
1954	7.99	19.80	9.47	4.02	8.66
1955	8.28	21.17	9.84	3.96	9.12
1956	8.62	21.37	10.28	4.25	9.54
1957	8.91	21.87	10.59	4.18	9.85
1958	9.38	21.84	11.33	4.36	10.51
1959	10.08	22.94	12.22	5.12	11.46
1960	10.64	23.31	12.83	5.60	12.15
1961	11.41	25.29	13.87	5.63	13.08
1962	11.97	27.22	14.72	5.92	13.92
1963	12.78	29.30	15.83	6.27	14.96
1964	13.74	30.05	16.84	6.11	15.89
1965	14.00	32.76	17.52	6.55	16.73
1966	14.64	34.23	18.52	6.87	17.81
1967	15.07	35.87	19.17	7.21	18.50
1968	15.40	34.64	19.37	7.62	18.77
1969	15.61	36.00	19.90	7.45	19.31
1970	13.76	36.26	18.84	7.10	18.36
1971	12.03	35.88	18.02	6.30	17.51
1972	11.91	36.33	17.74	6.88	17.42
1973	11.66	36.67	17.58	7.15	17.29
1974	11.31	33.16	17.58	7.87	17.35
1975	9.54	26.69	14.74	7.45	14.60
1976	9.10	26.40	14.46	7.19	14.33
1977	8.69	26.59	14.84	6.97	14.70
1978	8.38	25.78	14.68	6.51	14.54
1979	9.24	27.03	15.33	8.21	15.23
1980	9.86	28.32	16.32	8.38	16.18
1981	10.62	31.11	18.08	6.94	17.87
1982	11.16	30.60	18.13	4.52	17.84
1983[2]	11.30	30.75	18.25	5.25	18.02

[1] Includes subbituminous coal.
[2] Preliminary.

Note: Average output per man per day for each mining method and all mining methods is derived by dividing the sum of production of each mine (over 1,000 short tons per year) by the sum of the number of man-days expended by production workers (miners) at each mine to produce the coal.

Sources: •1949 through 1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. •1976—Energy Information Administration, Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976*. •1977 and 1978—Energy Information Administration, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977; ....1978* and *Coal-Pennsylvania Anthracite 1977; ....1978*. •1979—Energy Information Administration, Energy Data Report, *Coal Production-1979*. •1980—Energy Information Administration, *Coal Production—1980*. •1981 through 1983—Energy Information Administration, *Weekly Coal Production*.

Figure 84. Demonstrated Reserve Base of Coal, January 1, 1982 (Billion Short Tons)

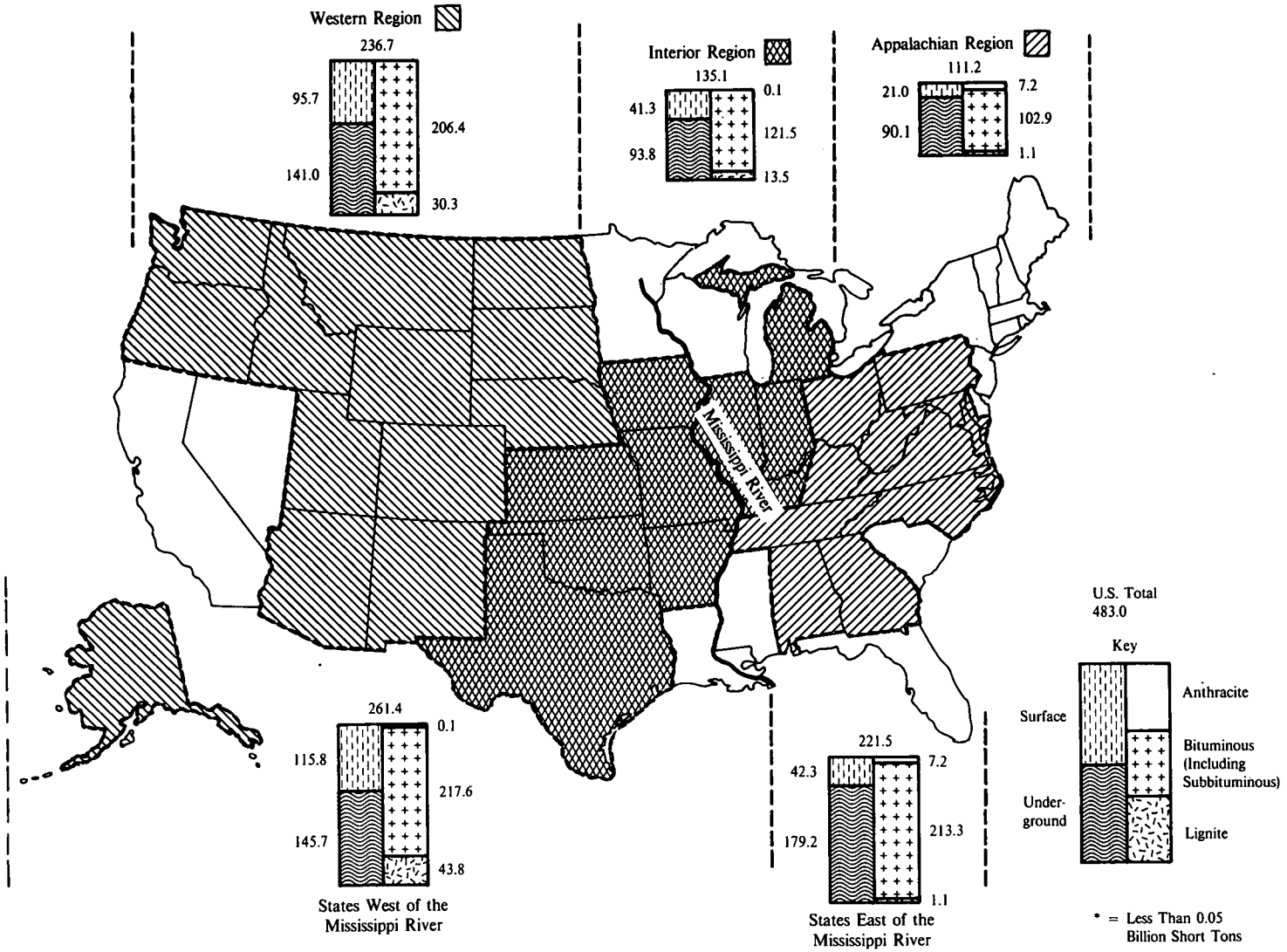


Table 80. Demonstrated Reserve Base of Coal,[1] January 1, 1982

(Billion Short Tons)

Region and State	Anthracite	Bituminous Coal[2]		Lignite	Total		
	Underground and Surface[3]	Underground	Surface	Surface[4]	Underground	Surface	Total
Appalachian							
Alabama	7.0	1.7	2.4	1.1	1.7	3.5	5.2
Kentucky, Eastern	0	8.5	4.1	0	8.5	4.1	12.6
Ohio	0	13.0	5.9	0	13.0	5.9	18.9
Pennsylvania	7.1	21.9	1.1	0	28.8	1.2	30.0
Virginia	0.1	2.4	0.8	0	2.5	0.8	3.3
West Virginia	0	34.2	5.1	0	34.2	5.1	39.3
Other[5]	0	1.4	0.4	0	1.4	0.4	1.8
Total	7.2	83.1	19.8	1.1	90.1	21.0	111.2
Interior							
Illinois	0	63.1	15.7	0	63.1	15.7	78.8
Indiana	0	8.9	1.6	0	8.9	1.6	10.5
Iowa	0	1.7	0.5	0	1.7	0.5	2.2
Kentucky, Western	0	16.9	4.0	0	16.9	4.0	20.9
Missouri	0	1.5	4.6	0	1.5	4.6	6.1
Oklahoma	0	1.2	0.4	0	1.2	0.4	1.6
Texas	0	0	0	13.5	0	13.5	13.5
Other[6]	0.1	0.3	1.1	[7]	0.4	1.1	1.5
Total	0.1	93.7	27.8	13.5	93.8	41.3	135.1
Western							
Alaska	0	5.4	0.7	[7]	5.4	0.7	6.2
Colorado	[7]	12.3	0.8	4.2	12.3	5.0	17.2
Montana	0	71.0	33.6	15.8	71.0	49.4	120.3
New Mexico	[7]	2.1	2.6	0	2.1	2.6	4.7
North Dakota	0	0	0	9.9	0	9.9	9.9
Utah	0	6.2	0.3	0	6.2	0.3	6.4
Washington	0	1.3	0.1	[7]	1.3	0.1	1.5
Wyoming	0	42.6	27.1	0	42.6	27.1	69.7
Other[8]	0	0.1	0.3	0.4	0.1	0.6	0.8
Total	[7]	141.0	65.5	30.3	141.0	95.7	236.7
U.S. Total	7.3	317.7	113.1	44.8	324.9	158.0	483.0
States East of the Mississippi River	7.2	172.2	41.1	1.1	179.2	42.3	221.5
States West of the Mississippi River	0.1	145.6	72.0	43.8	145.7	115.8	261.4

[1] Includes measured and indicated resource categories representing 100 percent of the coal in place. Recoverability varies between 40 and 90 percent for individual deposits. About one-half of the demonstrated reserve base of coal in the United States is estimated to be recoverable.
[2] Includes subbituminous coal.
[3] Includes 133.9 million short tons of surface mine reserves, of which 118.3 million tons are in Pennsylvania and 15.5 million tons are in Arkansas.
[4] There are no underground demonstrated coal reserves of lignite.
[5] Includes Georgia, Maryland, North Carolina, and Tennessee.
[6] Includes Arkansas, Kansas, and Michigan.
[7] Less than 0.05 billion short tons.
[8] Includes Arizona, Idaho, Oregon, and South Dakota.
Note: Sum of components may not equal total due to independent rounding.
Source: Energy Information Administration, *Coal Production-1982*, September 1983.

Figure 85. International Coal Production
(Million Short Tons)

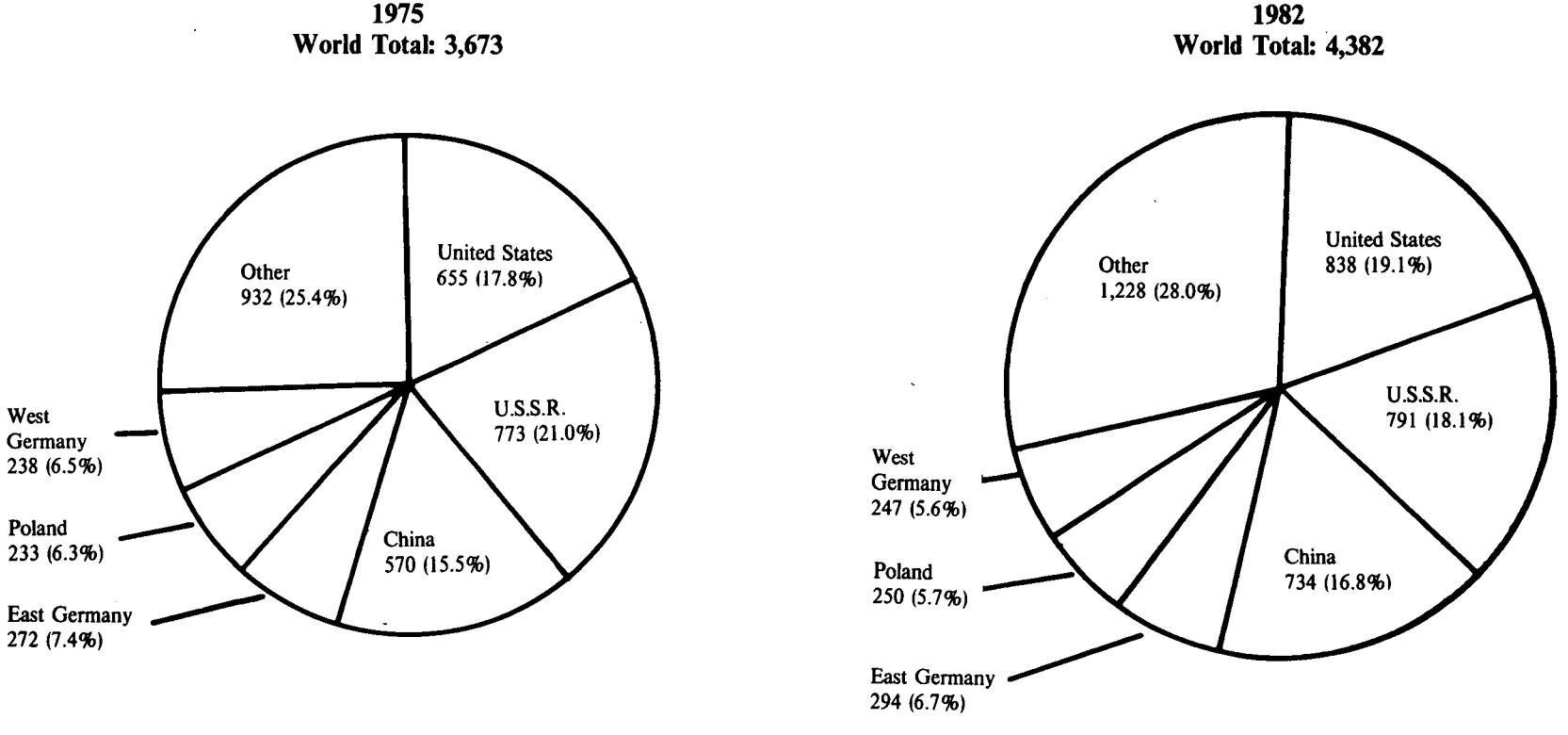


Table 81. International Coal Production, 1975-1982

(Million Short Tons)

Area and Country	1975	1976	1977	1978	1979	1980	1981	1982 [1]
North, Central, and South America								
Canada	28	28	32	34	33	40	44	47
United States	655	685	697	670	781	830	824	838
Other	15	16	17	17	24	24	22	22
Total	697	729	746	721	838	894	890	907
Western Europe								
Germany, West	238	247	229	228	239	239	241	247
Spain	15	16	19	22	24	32	38	47
Turkey	12	11	13	15	22	18	19	19
United Kingdom	142	137	135	136	135	141	138	134
Yugoslavia	39	41	43	44	46	52	58	60
Other	63	66	67	64	63	61	68	67
Total	509	518	506	509	529	543	562	574
Eastern Europe and U.S.S.R.								
Bulgaria	31	28	28	28	31	33	32	35
Czechoslovakia	127	130	134	136	137	136	137	138
Germany, East	272	273	280	279	282	285	294	294
Poland	233	241	250	258	264	254	219	250
U.S.S.R.	773	784	796	798	792	790	776	791
Other	61	57	58	61	65	68	72	72
Total	1,494	1,513	1,546	1,560	1,571	1,566	1,529	1,581
Africa								
South Africa, Republic of	77	85	94	100	114	127	144	154
Other	6	6	6	5	7	6	5	7
Total	82	91	100	105	120	133	149	161
Middle East, Far East, and Oceania								
Australia	105	117	119	124	139	140	159	161
China	570	586	606	681	698	684	683	734
India	109	116	115	116	118	125	142	146
Other	105	102	103	105	108	111	114	118
Total	890	921	942	1,026	1,063	1,061	1,098	1,159
World Total	3,673	3,772	3,840	3,921	4,121	4,197	4,228	4,382

[1] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Source: Energy Information Administration, *1982 International Energy Annual.*

Figure 86. Estimated International Recoverable Reserves of Coal, 1980 (Billion Short Tons)

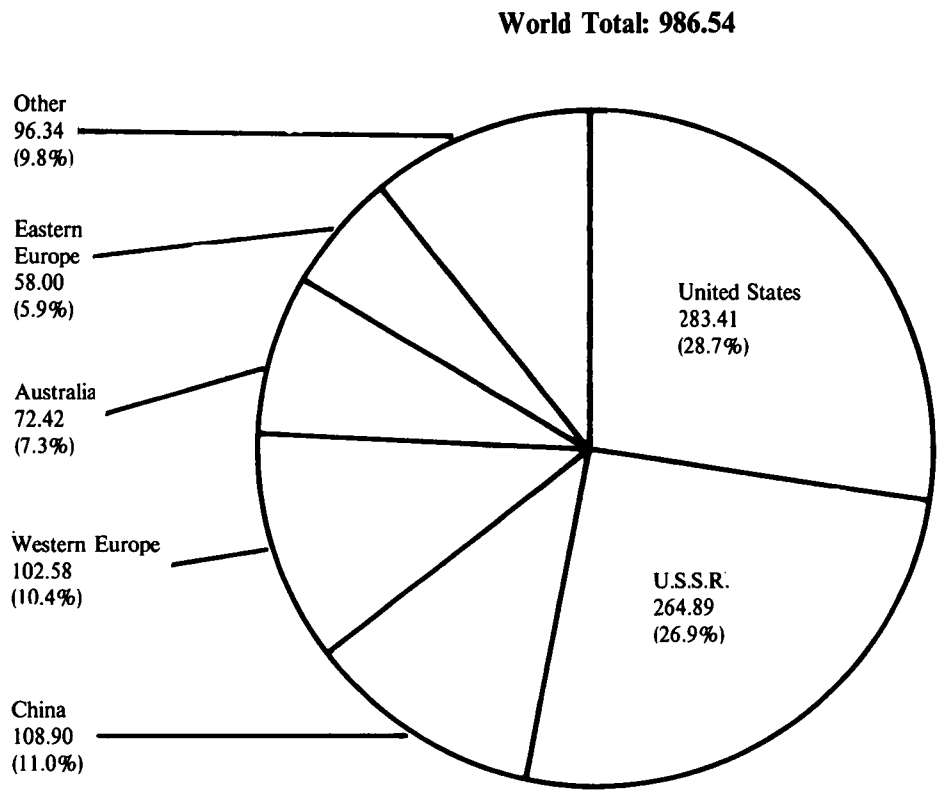


Table 82. Estimated International Recoverable Reserves of Coal, 1980 [1]

(Billion Short Tons)

Area and Country	Anthracite and Bituminous Coal [2]			Lignite		Total Recoverable
	Recoverable	Portion Surface Minable	Portion Coking Quality	Recoverable	Portion Surface Minable	
North, Central, and South America						
Canada	4.18	NA	1.38	2.33	2.33	6.51
United States	248.16	89.28	NA	35.25	35.25	283.41
Other	19.26	1.79	2.74	0.02	[3]	19.28
Total	271.59	[4] 91.07	[4] 4.12	37.61	37.59	309.19
Western Europe						
Germany, West	32.98	NA	19.78	38.67	38.67	71.65
Turkey	0.21	NA	NA	1.91	NA	2.11
United Kingdom	5.06	NA	2.23	0	0	5.06
Yugoslavia	1.73	0.06	NA	16.50	NA	18.23
Other	3.20	[4] 0.67	[4] 1.03	2.24	0.07	5.53
Total	43.26	[4] 0.72	[4] 23.04	59.31	[4] 38.74	102.58
Eastern Europe and U.S.S.R.						
Bulgaria	0.03	NA	0.02	4.00	2.65	4.03
Czechoslovakia	3.00	NA	NA	3.15	NA	6.15
Hungary	0.23	NA	NA	4.40	NA	4.63
Poland	30.00	0	6.00	13.20	13.20	43.20
U.S.S.R.	166.67	34.88	60.00	98.22	97.23	264.89
Other	0	0	0	NA	NA	NA
Total	199.93	[4] 34.88	[4] 66.02	122.96	[4] 113.08	322.89
Africa						
Botswana	3.80	NA	NA	0	0	3.80
South Africa, Republic of	57.04	NA	NA	0	0	57.04
Swaziland	2.00	NA	NA	0	0	2.00
Other	2.37	0.27	0.11	[3]	[3]	2.37
Total	65.20	[4] 0.27	[4] 0.11	[3]	[3]	65.21
Middle East, Far East, and Oceania						
Australia	32.52	7.00	13.01	39.90	39.90	72.42
China	108.90	10.91	40.29	[5]	[5]	108.90
India	NA	NA	NA	1.74	1.65	1.74
Other	3.02	[4] 0.07	[4] 0.68	0.59	0.99	3.61
Total	144.44	[4] 17.98	[4] 53.98	42.23	[4] 42.06	186.67
World Total	724.42	[4] 144.93	[4] 147.27	262.11	[4] 231.47	986.54

[1] The reference year for most of the reserves data in the source report is 1980.
[2] Includes subbituminous coal.
[3] Less than 5 million tons.
[4] Not all countries in this group reported under this category.
[5] May be included with anthracite and bituminous coal.
NA = Not available.
Source: World Energy Conference, New Delhi, India, *World Energy Conference of Energy Resources 1983*, London, 1983.

Figure 87. Coal and Coal Coke Prices

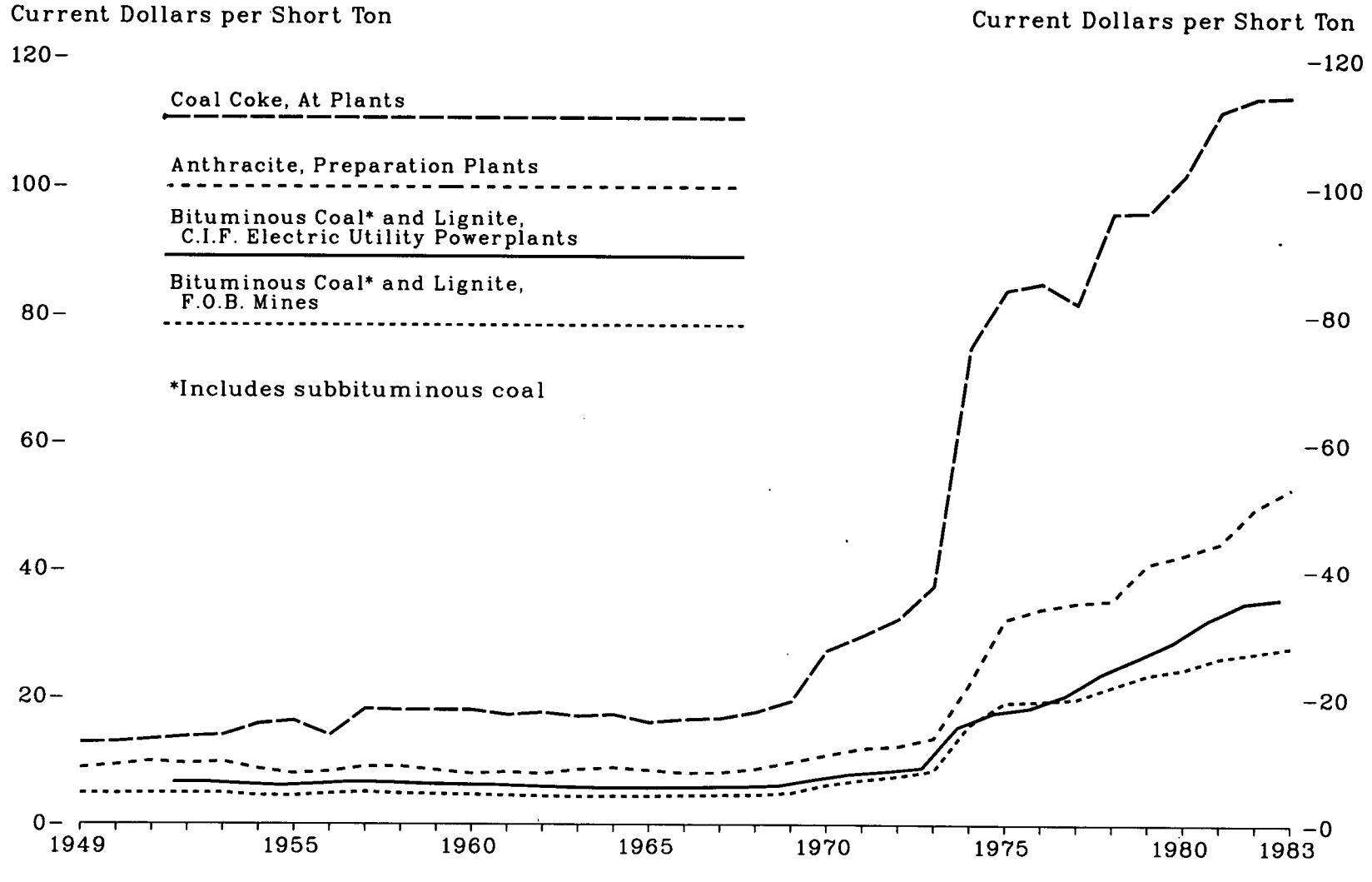


Table 83. Coal and Coal Coke Prices, 1949-1983

(Dollars per Short Ton)

Year	Bituminous Coal [1] and Lignite				Anthracite		Coal Coke	
	F.O.B.[2] Mines		C.I.F.[3] Electric Utility Powerplants		At Preparation Plants		At Blast Furnaces	
	Current	Constant[4]	Current	Constant[4]	Current	Constant[4]	Current	Constant[4]
1949	4.88	9.30	NA	NA	8.90	16.96	12.90	24.58
1950	4.84	9.04	NA	NA	9.34	17.44	12.96	24.20
1951	4.92	8.62	NA	NA	9.94	17.41	13.36	23.40
1952	4.90	8.46	6.61	11.41	9.58	16.54	13.81	23.84
1953	4.92	8.36	6.61	11.24	9.87	16.78	14.03	23.85
1954	4.52	7.59	6.31	10.60	8.76	14.71	15.82	26.57
1955	4.50	7.40	6.07	9.98	8.00	13.15	16.29	26.78
1956	4.82	7.68	6.32	10.07	8.33	13.27	14.03	22.34
1957	5.08	7.82	6.64	10.23	9.11	14.03	18.15	27.95
1958	4.86	7.36	6.58	9.96	9.14	13.84	17.98	27.23
1959	4.77	7.06	6.37	9.42	8.55	12.65	18.01	26.64
1960	4.69	6.83	6.26	9.11	8.01	11.66	18.02	26.23
1961	4.58	6.61	6.20	8.94	8.26	11.91	17.27	24.91
1962	4.48	6.34	6.02	8.53	7.99	11.32	17.64	24.98
1963	4.39	6.13	5.86	8.18	8.64	12.06	17.06	23.80
1964	4.45	6.12	5.74	7.89	8.93	12.27	17.30	23.77
1965	4.44	5.97	5.71	7.68	8.51	11.44	16.11	21.66
1966	4.54	5.91	5.76	7.50	8.08	10.53	16.56	21.57
1967	4.62	5.84	5.85	7.40	8.15	10.31	16.74	21.17
1968	4.67	5.66	5.93	7.18	8.78	10.64	17.72	21.47
1969	4.99	5.75	6.13	7.06	9.91	11.42	19.42	22.38
1970	6.26	6.85	7.13	7.80	11.03	12.06	27.43	29.99
1971	7.07	7.36	8.00	8.33	12.08	12.58	29.73	30.97
1972	7.66	7.66	8.44	8.44	12.40	12.40	32.33	32.33
1973	8.53	8.07	9.01	8.52	13.65	12.91	37.42	35.39
1974	15.75	13.69	15.46	13.43	22.19	19.28	75.00	65.17
1975	19.23	15.29	17.63	14.02	32.26	25.65	84.03	66.80
1976	19.43	14.68	18.38	13.89	33.92	25.63	85.09	64.30
1977	19.82	14.15	20.37	14.54	34.86	24.89	81.91	58.49
1978	21.78	14.48	23.75	15.79	35.25	23.43	95.95	63.79
1979	23.65	14.47	26.15	16.00	41.06	25.13	96.11	58.81
1980	24.52	13.74	28.76	16.12	42.51	23.83	101.93	57.13
1981	26.29	13.47	32.31	16.56	44.28	22.69	111.79	57.29
1982	27.14	13.12	34.90	16.87	49.85	24.10	113.91	55.06
1983[5]	28.00	12.98	35.50	16.46	53.00	24.57	114.10	52.90

[1] Includes subbituminous coal.
[2] Free on board (see Glossary).
[3] Cost, Insurance, and Freight (see Glossary).
[4] Constant 1972 prices calculated using GNP implicit price deflators, 1972 = 100. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.
[5] Preliminary.
NA = Not available.

Note: During certain years, the average F.O.B. mine price exceeded the average C.I.F. electric utility price. This reflected long-term contract buying and occurred during a period of rapid and steep F.O.B. mine price increases.

Sources: **Bituminous Coal and Lignite, F.O.B. Mines** •1949 through 1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" chapter. •1976—Energy Information Administration, Energy Data Report, *Coal-Bituminous and Lignite in 1976*. •1977 and 1978—Energy Information Administration, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977; ....1978*. •1979 through 1981—Energy Information Administration, Energy Data Report, *Weekly Coal Reports*. •1982 and 1983—Energy Information Administration, *Weekly Coal Production*. **Bituminous Coal and Lignite, C.I.F. Electric Utility Powerplants** •1949 through 1972—National Coal Association, *Steam Electric Plant Factors*. •1973 through September 1977—Federal Power Commission Form 423. "Monthly Report of Cost and Quality of Fuels for Electric Plants." •October 1977 through 1983—Federal Energy Regulatory Commission, FPC Form 423, "Monthly Report of Cost and Quality of Fuel for Electric Plants." **Anthracite** •1949 through 1976—Bureau of Mines, *Minerals Yearbook*, "Coal-Pennsylvania Anthracite" chapter. •1977 and 1978—Energy Information Administration, Energy Data Report, *Coal-Pennsylvania Anthracite 1977; ....1978*. •1979—Energy Information Administration, Energy Data Report, *Coal Production-1979*. •1980—Energy Information Administration, *Coal Production-1980*. •1981 through 1983—Energy Information Administration, *Weekly Coal Production*. **Coal Coke** •1949 through 1975— Bureau of Mines, *Minerals Yearbook*, "Coke and Coal Chemicals" chapter. •1976 through 1980—Energy Information Administration, Energy Data Report, *Coke and Coal Chemicals*, annual. •1981—Energy Information Administration, Energy Data Report, *Coke Plant Report*, quarterly. •1982 and 1983— Energy Information Administration, *Quarter Coal Report*.

Section 6. Electricity Supply and Disposition

This section covers physical and financial data on the production and marketing of electricity by the electric utility industry. Topics covered include generating capacity, production, sales, prices, the amount of hydrocarbon fuels consumed to produce electricity, and the amount of fuel stocks at electric utility plants.

Electricity output (generation) is measured in watt-hours and for convenience is recorded in kilowatt-hours (1,000 watt-hours). For example, a 1,000-kilowatt generator running at full load for an entire year would produce 8,760,000 kilowatt-hours of electricity (1,000 times 24 hours per day times 365 days per year). However, all generators must operate less than 100 percent of the time during a year, if only to allow for routine maintenance. The load curve for electricity is variable throughout the day and year. Utilities develop a mix of generating capacity to satisfy steady or "base load" demand, as well as variable or "peaking" demand.

Usually, conventional steam plants, nuclear plants, and some hydropower plants in western States (Oregon and Washington) are used for base-load electricity requirements. Gas turbine plants, internal combustion plants, and most hydropower plants are generally used for peaking (short periods of high demand) purposes and are operated less than base-load plants.

Capacity. From 1949 through 1983, installed generating capacity at electric utilities increased each year to meet the growing demand for electricity. However, the 1983 year-end capacity of 657 million kilowatts was only 1.1 percent greater than that for 1982. This was the smallest increase since 1956. Conventional steam generating plants in 1983 accounted for 69 percent of the total electric utility capacity; hydropower plants, 12 percent; and nuclear plants, 10 percent (see Table 90).

Domestic Generation. After declining in 1982 for the first time since World War II, electricity generation increased in 1983 to a record high of 2.31 trillion kilowatt-hours. Conventional steam generation, consistently the major source of electricity, accounted for 72 percent of the total output in 1983. Generation by both hydropower and nuclear power reached record levels in 1983, and together totaled an all-time high of 27 percent of production (see Table 86).

Fossil Fuel Consumption. The mix of fossil fuels used to produce electricity shifted over the past 30 years. During the 1950's and 1960's, petroleum and natural gas produced increasing shares of electricity. However, from 1972 through 1983, the combined petroleum and natural gas share fell from 37 to 18 percent of total generation, while the coal portion rose from 44 to 55 percent (see Table 85).

Sales. Electricity sales, after having declined in 1982 for the first time since 1974, rose in 1983 to a record 2,149 billion kilowatt-hours. Of the three major end-use sectors, the industrial sector accounted for the largest increase in sales (see Table 87).

International Generation. World hydroelectric power production rose from 1.30 trillion kilowatt-hours in 1973 to 1.84 trillion kilowatt-hours in 1982, an average annual growth rate of 4.0 percent. The major producers in 1982, in order, were the United States, Canada, the U.S.S.R., and Brazil. These countries accounted for 48 percent of the total hydroelectric power production (see Table 91).

Prices. During 1983, weighted average monthly electric bills increased for each consumer group. The average monthly electric bill for residential consumers who consume 750 kilowatt-hours increased from $50.07 in 1982 to $52.74 in 1983 (see Table 92). The average price of electricity sold by electric utilities reached 6.29 cents per kilowatt-hour in 1983, 2.6 percent over the 1982 price. These nominal price increases were slower than the rate of overall inflation. As a consequence, electricity became less expensive in relative terms in 1983 (see Table 93).

Figure 88. Electric Utility Electricity Flow Diagram, 1983

Billion Kilowatt-Hours

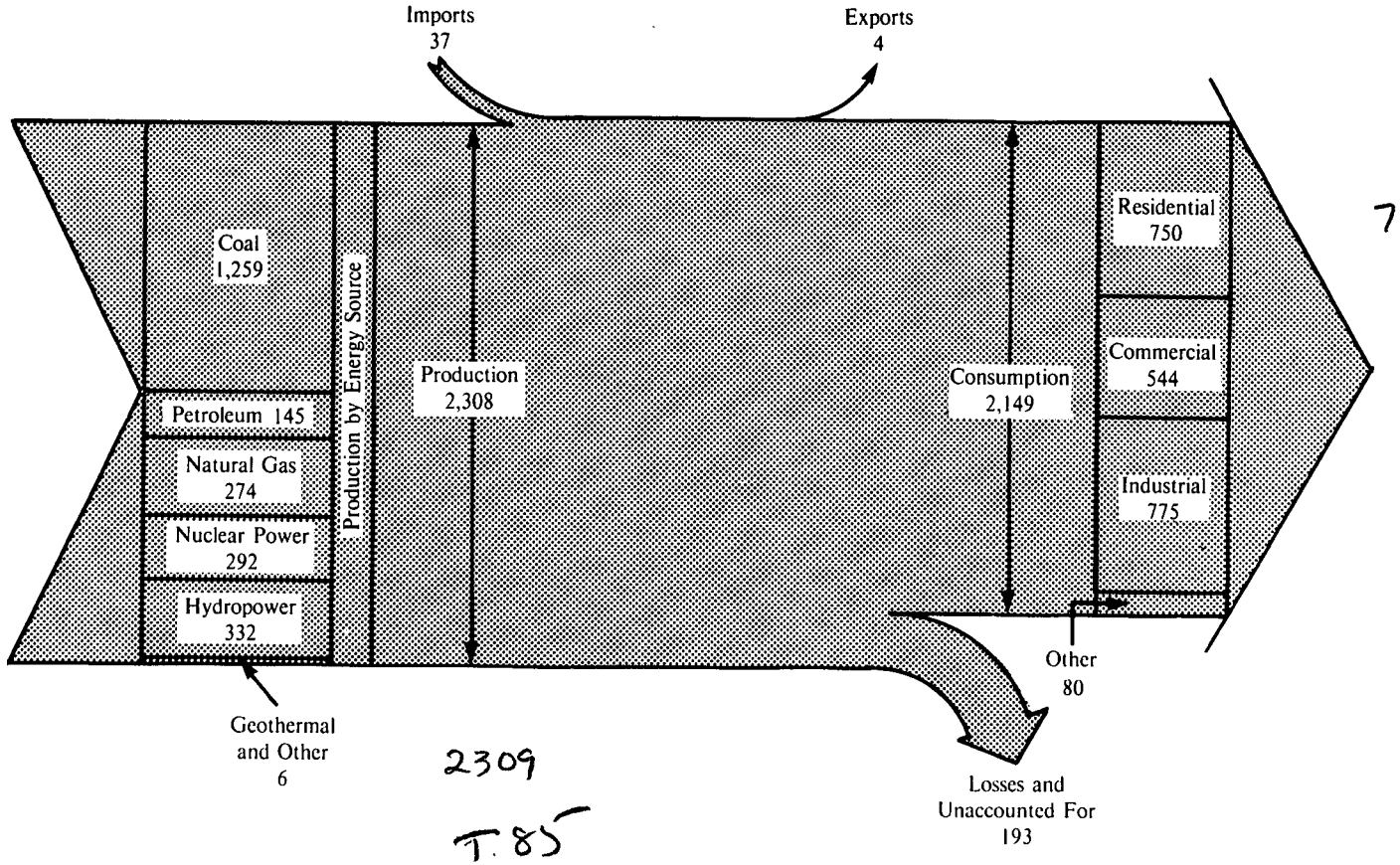


Figure 89. Electric Utility Industry Supply and Disposition

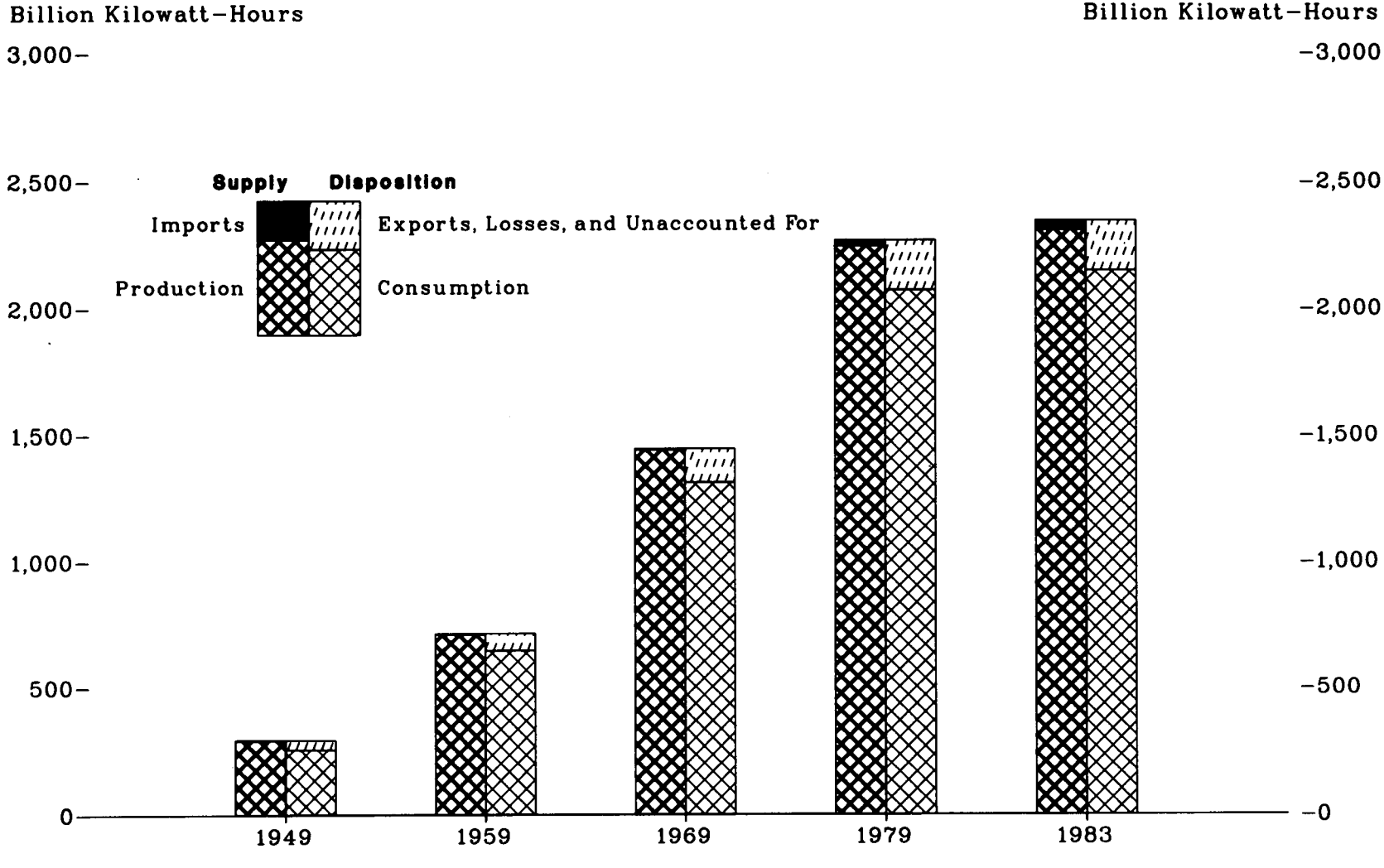


Table 84. Electric Utility Industry Supply and Disposition, 1949-1983

(Billion Kilowatt-Hours)

Year	Supply			Disposition			
	Production	Imports [1]	Total	Exports [1]	Consumption	Losses and Unaccounted for [2]	Total
1949	291	2	293	([3])	255	38	293
1950	329	2	331	([3])	291	39	331
1951	371	2	373	([3])	330	43	373
1952	399	3	402	([3])	356	45	402
1953	443	2	445	([3])	396	48	445
1954	472	3	474	([3])	424	50	474
1955	547	5	552	([3])	497	54	552
1956	601	5	606	1	546	59	606
1957	632	5	636	1	576	59	636
1958	645	4	649	1	588	61	649
1959	710	4	714	1	647	67	714
1960	756	5	761	1	688	72	761
1961	794	3	797	1	722	74	797
1962	855	2	857	2	778	77	857
1963	917	2	919	2	833	84	919
1964	984	6	990	4	896	90	990
1965	1,055	4	1,059	4	954	101	1,059
1966	1,144	4	1,149	3	1,035	110	1,149
1967	1,214	4	1,218	4	1,099	115	1,218
1968	1,329	4	1,333	4	1,203	126	1,333
1969	1,442	5	1,447	4	1,314	129	1,447
1970	1,532	6	1,538	4	1,392	142	1,538
1971	1,613	7	1,620	4	1,470	147	1,620
1972	1,750	10	1,760	3	1,595	162	1,760
1973	1,861	17	1,878	3	1,713	162	1,878
1974	1,867	15	1,883	3	1,706	174	1,883
1975	1,918	11	1,929	5	1,747	177	1,929
1976	2,038	11	2,049	2	1,855	191	2,049
1977	2,124	20	2,144	3	1,948	193	2,144
1978	2,206	21	2,228	1	2,018	208	2,228
1979	2,247	23	2,270	2	2,071	197	2,270
1980	2,286	25	2,311	4	2,094	213	2,311
1981	2,295	36	2,331	3	2,147	181	2,331
1982	2,241	34	2,275	4	2,086	186	2,275
1983	[4] 2,309	[5] 37	[4] 2,346	[5] 4	[4] 2,149	[4] 193	[4] 2,346

[1] Small amounts of electricity are transmitted across U.S. borders with Canada and Mexico.
[2] Balancing item, mainly transmission losses.
[3] Less than 0.5 billion kilowatt-hours.
[4] Preliminary.
[5] Projections based on 1982 quantities.
Note: Sum of components may not equal total due to independent rounding.
Sources: **Production:** •1949 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 and 1983—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report." **Consumption:** •1949 through September 1977—Federal Power Commission, Form 5, "Monthly Statement of Electric Operating Revenue and Income." •October 1977 through February 1980—Federal Energy Regulatory 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—Energy Information Administration, Form EIA-826, "Electric Utility Company Monthly Statement." **Imports and Exports:** •1949 through September 1977—unpublished Federal Power Commission data; •October 1977 through 1983—unpublished Economic Regulatory Administration data.

Figure 90. Production of Electricity by the Electric Utility Industry by Type of Energy Source

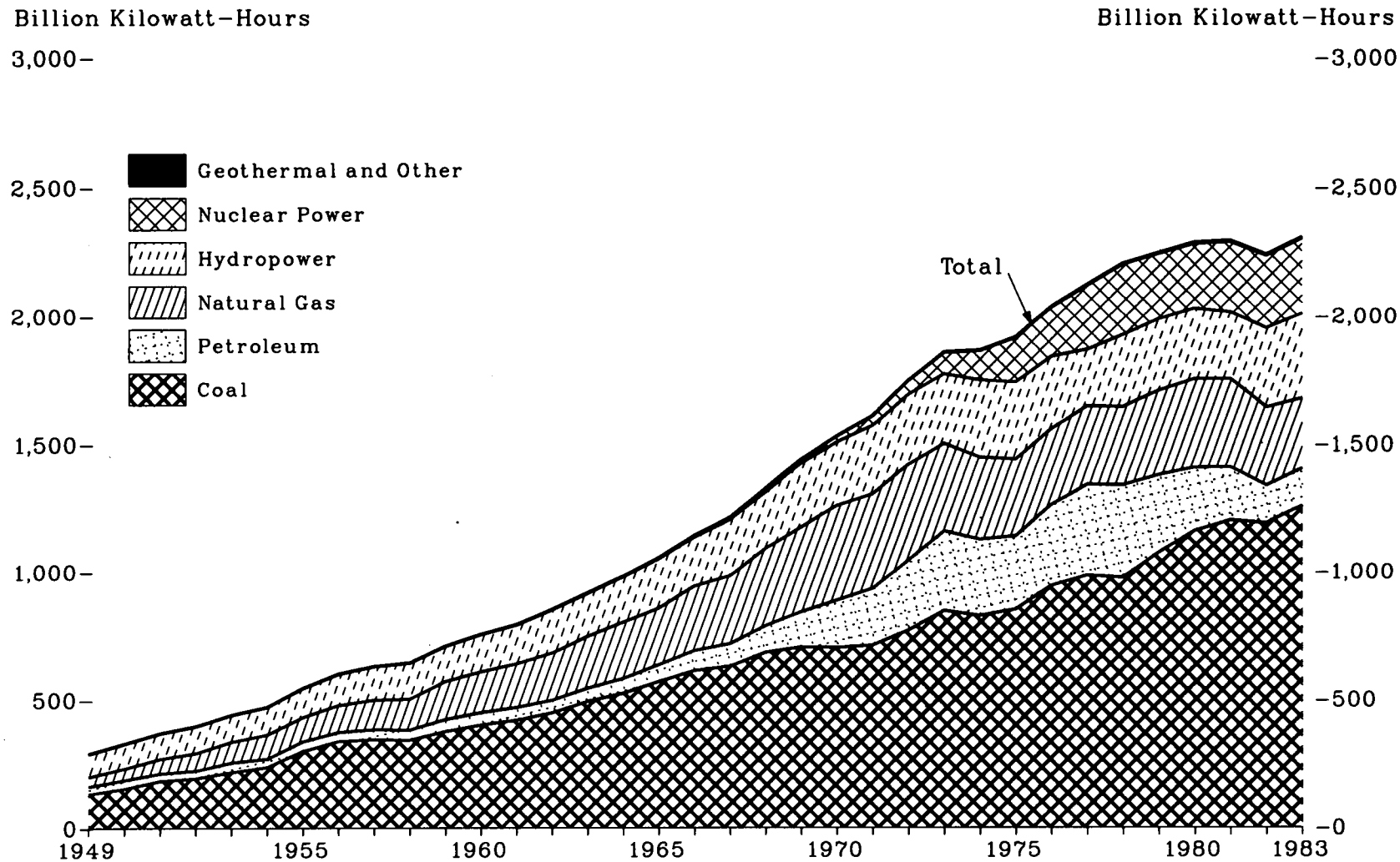


Table 85. Production of Electricity [1] by the Electric Utility Industry by Type of Energy Source, 1949-1983

(Billion Kilowatt-Hours)

Year	Coal	Petroleum [2]	Natural Gas	Nuclear Power	Hydropower	Geothermal and Other [3]	Total
1949	135	29	37	0	90	(4)	291
1950	155	34	45	0	96	(4)	329
1951	185	29	57	0	100	(4)	371
1952	195	30	68	0	105	(4)	399
1953	219	38	80	0	105	(4)	443
1954	239	32	94	0	107	(4)	472
1955	301	37	95	0	113	(4)	547
1956	339	36	104	0	122	(4)	601
1957	346	40	114	(4)	130	(4)	632
1958	344	40	120	(4)	140	(4)	645
1959	378	47	147	(4)	138	(4)	710
1960	403	48	158	1	146	(4)	756
1961	422	49	169	2	152	(4)	794
1962	450	49	184	2	169	(4)	855
1963	494	52	202	3	166	(4)	917
1964	526	57	220	3	177	(4)	984
1965	571	65	222	4	194	(4)	1,055
1966	613	79	251	6	195	1	1,144
1967	630	89	265	8	222	1	1,214
1968	685	104	304	13	222	1	1,329
1969	706	138	333	14	250	1	1,442
1970	704	184	373	22	248	1	1,532
1971	713	220	374	38	266	1	1,613
1972	771	274	376	54	273	2	1,750
1973	848	314	341	83	272	2	1,861
1974	828	301	320	114	301	3	1,867
1975	853	289	300	173	300	3	1,918
1976	944	320	295	191	284	4	2,038
1977	985	358	306	251	220	4	2,124
1978	976	365	305	276	280	3	2,206
1979	1,075	304	329	255	280	4	2,247
1980	1,162	246	346	251	276	6	2,286
1981	1,203	206	346	273	261	6	2,295
1982	1,192	147	305	283	309	5	2,241
1983[5]	1,259	145	274	292	332	6	2,309

[1] See Explanatory Note 6.
[2] Includes distillate fuel oil, residual fuel oil (including crude oil burned as fuel), jet fuel, and petroleum coke.
[3] Includes production from plants which consume wood, refuse, and other vegetal fuels.
[4] Less than 0.5 billion kilowatt-hours.
[5] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 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 and 1983—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Figure 91. Production of Electricity by the Electric Utility Industry by Type of Generation

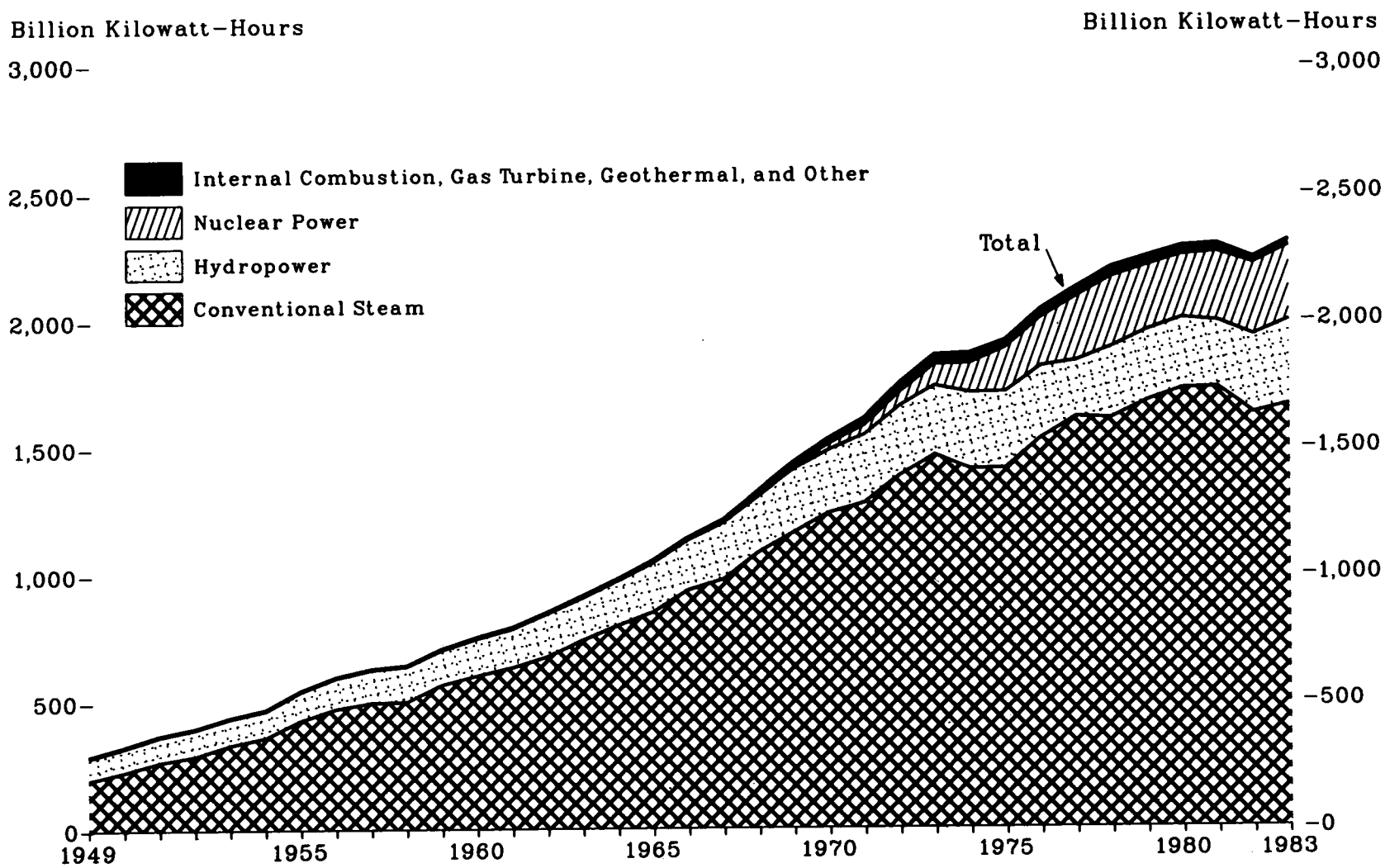


Table 86. Production of Electricity[1] by the Electric Utility Industry by Type of Generation, 1949-1983

(Billion Kilowatt-Hours)

Year	Conventional Steam [2]	Internal Combustion	Gas Turbine	Nuclear Power	Hydropower	Geothermal and Other [3]	Total
1949	197	3	0	0	90	(4)	291
1950	229	4	0	0	96	(4)	329
1951	267	4	0	0	100	(4)	371
1952	290	4	0	0	105	(4)	399
1953	333	4	0	0	105	(4)	443
1954	361	4	0	0	107	(4)	472
1955	430	4	0	0	113	(4)	547
1956	474	4	0	0	122	(4)	601
1957	497	4	0	(4)	130	(4)	632
1958	500	4	0	(4)	140	(4)	645
1959	567	4	0	(4)	138	(4)	710
1960	603	4	0	1	146	(4)	756
1961	634	5	0	2	152	(4)	794
1962	677	5	0	2	169	(4)	855
1963	742	5	(4)	3	166	(4)	917
1964	798	5	1	3	177	(4)	984
1965	851	5	1	4	194	(4)	1,055
1966	938	5	NA	6	195	1	1,144
1967	980	5	NA	8	222	1	1,214
1968	1,084	5	4	13	222	1	1,329
1969	1,163	6	8	14	250	1	1,442
1970	1,240	6	16	22	248	1	1,532
1971	1,279	6	22	38	266	1	1,613
1972	1,385	7	29	54	273	2	1,750
1973	1,467	7	30	83	272	2	1,861
1974	1,411	6	32	114	301	3	1,867
1975	1,414	6	22	173	300	3	1,918
1976	1,530	5	24	191	284	4	2,038
1977	1,615	5	29	251	220	4	2,124
1978	1,610	5	31	276	280	3	2,206
1979	1,676	4	28	255	280	4	2,247
1980	1,726	4	24	251	276	6	2,286
1981	1,730	3	22	273	261	6	2,295
1982	1,628	2	14	283	309	5	2,241
1983[5]	1,662	2	14	292	332	6	2,309

[1] See Explanatory Note 1.
[2] Excludes geothermal and other.
[3] Includes production from plants which consume wood, refuse, and other vegetal fuels.
[4] Less than 0.5 billion kilowatt-hours.
[5] Preliminary.
NA = Not available.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 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 and 1983—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Figure 92. Sales of Electric Utility Electricity to End-Use Sectors

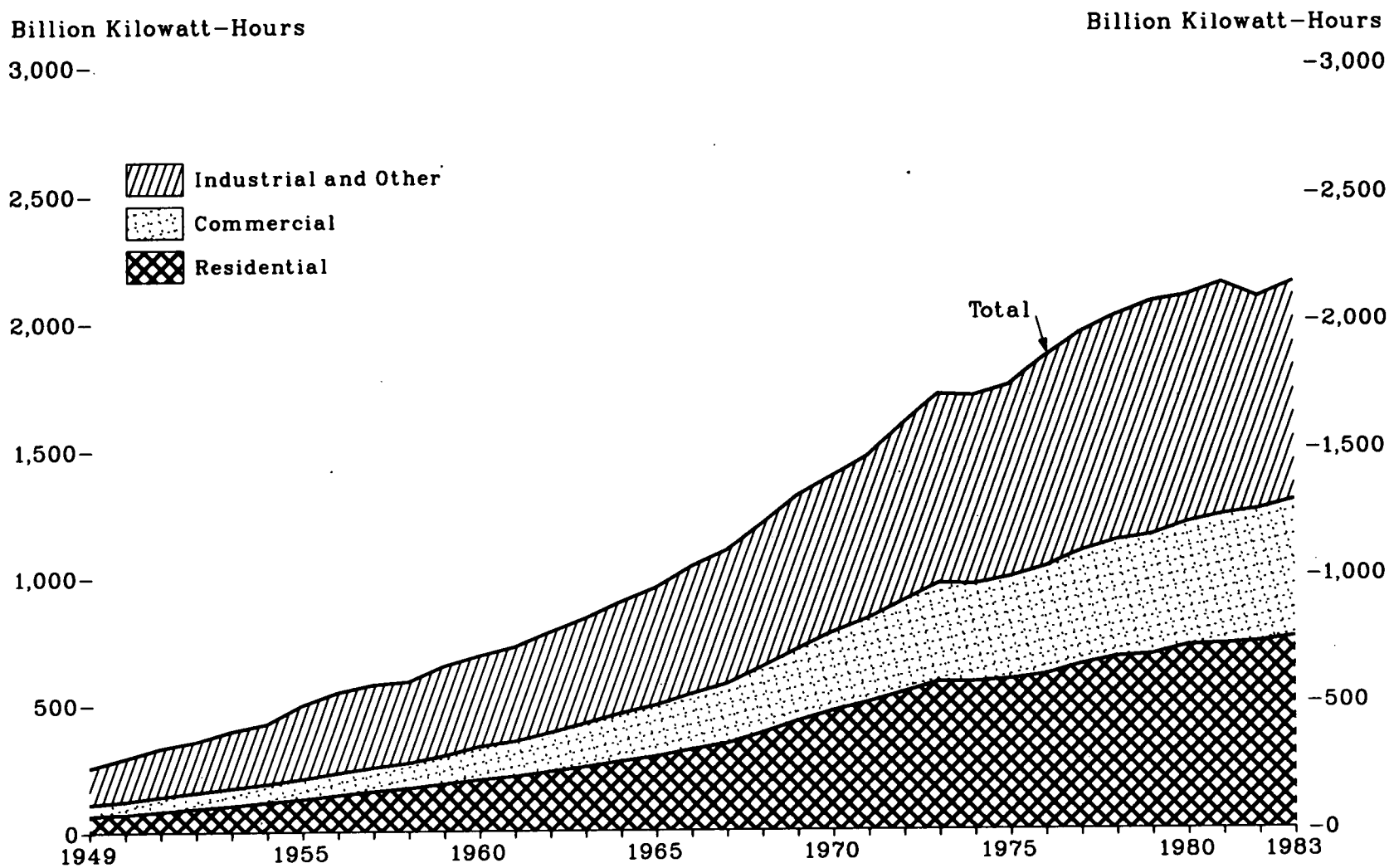


Table 87. Sales of Electric Utility Electricity to End-Use Sectors,[1] 1949-1983
(Billion Kilowatt-Hours)

Year	Residential	Commercial	Industrial	Other	Total
1949	67	45	123	20	255
1950	72	51	146	22	291
1951	83	57	166	24	330
1952	94	62	176	24	356
1953	104	67	199	26	396
1954	116	72	208	27	424
1955	128	79	260	29	497
1956	143	87	286	30	546
1957	157	94	294	31	576
1958	169	100	287	32	588
1959	185	112	315	36	647
1960	201	131	324	32	688
1961	214	138	337	32	722
1962	233	153	360	32	778
1963	251	171	377	34	833
1964	272	187	405	32	896
1965	291	200	429	34	954
1966	317	218	464	37	1,035
1967	340	234	485	40	1,099
1968	382	258	521	42	1,203
1969	427	282	559	46	1,314
1970	466	307	571	48	1,392
1971	500	329	589	51	1,470
1972	539	359	641	56	1,595
1973	579	388	686	59	1,713
1974	578	385	685	58	1,706
1975	588	403	688	68	1,747
1976	606	425	754	70	1,855
1977	645	447	786	71	1,948
1978	674	461	809	73	2,018
1979	683	473	842	73	2,071
1980	717	488	815	74	2,094
1981	722	514	826	85	2,147
1982	730	526	745	86	2,086
1983[2]	749	544	776	80	2,149

[1] See Explanatory Note 11.
[2] Estimated.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 through September 1977—Federal Power Commission, FPC Form 5, "Monthly Statement of Electric Operating Revenue and Income." •October 1977 through February 1980—Federal Energy Regulatory Commission, FPC Form 5, "Monthly Statement of Electric Operating Revenue and Income." March 1980 through 1982—Federal Energy Regulatory Commission, FPC Form 5, "Electric Utility Company Monthly Statement." •1983—Energy Information Administration, Form EIA-826, "Electric Utility Company Monthly Statement."

Table 88. Fossil Fuels Consumed by the Electric Utility Industry to Produce Electricity, 1949-1983

Year	Coal			Petroleum [1]		Natural Gas
	Anthracite	Bituminous Coal [2] and Lignite	Total	Oil	Petroleum Coke	
	(million short tons)			(million barrels)	(million short tons)	(billion cubic feet)
1949	3.4	80.6	84.0	66.3	NA	550
1950	3.6	88.3	91.9	75.4	NA	629
1951	3.9	101.9	105.8	63.9	NA	764
1952	3.8	103.3	107.1	67.2	NA	910
1953	3.6	112.3	115.9	82.2	NA	1,034
1954	3.2	115.2	118.4	66.7	NA	1,165
1955	3.2	140.5	143.8	75.3	NA	1,153
1956	3.3	155.0	158.3	72.7	NA	1,239
1957	3.4	157.4	160.8	79.7	NA	1,336
1958	2.8	152.9	155.7	77.7	NA	1,373
1959	2.6	165.8	168.4	88.3	NA	1,629
1960	2.8	173.9	176.7	88.2	NA	1,725
1961	2.5	179.7	182.2	88.9	NA	1,825
1962	2.3	191.0	193.3	89.3	NA	1,966
1963	2.1	209.2	211.3	93.3	NA	2,144
1964	2.2	223.2	225.4	101.1	NA	2,323
1965	2.2	242.6	244.8	115.2	NA	2,321
1966	2.2	264.3	266.5	140.9	NA	2,610
1967	2.2	272.0	274.2	161.3	NA	2,746
1968	2.2	295.6	297.8	188.6	NA	3,148
1969	1.9	308.8	310.6	251.0	NA	3,488
1970	1.9	318.3	320.2	335.5	0.6	3,932
1971	1.6	325.7	327.3	396.5	0.6	3,976
1972	1.6	350.2	351.8	493.8	0.6	3,977
1973	1.4	387.8	389.2	560.2	0.5	3,660
1974	1.5	390.3	391.8	536.3	0.6	3,443
1975	1.5	404.5	406.0	506.1	0.1	3,158
1976	1.3	447.0	448.4	555.9	0.1	3,081
1977	1.4	475.7	477.1	623.7	0.1	3,191
1978	1.1	480.2	481.2	635.8	0.4	3,188
1979	1.0	526.0	527.1	523.3	0.3	3,491
1980	1.0	568.3	569.3	420.2	0.2	3,682
1981	1.2	595.6	596.8	351.1	0.1	3,640
1982	1.1	592.6	593.7	249.8	0.1	3,226
1983[3]	1.0	624.5	625.6	245.3	0.3	2,912

[1] These data are petroleum consumed by electric utilities and do not equate to petroleum supplied to (or delivered to) electric utilities. Oil includes residual fuel oil (including crude oil burned as fuel), distillate fuel oil, and jet fuel.
[2] Includes subbituminous coal.
[3] Preliminary.
NA = Not available.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 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 and 1983—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Table 89. Coal and Petroleum Stocks at Electric Utilities, Year-End 1949-1983

Year	Coal			Petroleum	
	Anthracite	Bituminous Coal [1] and Lignite	Total	Oil [2]	Petroleum Coke
	(million short tons)			(million barrels)	(million short tons)
1949	4.5	17.8	22.1	8.6	NA
1950	4.7	27.1	31.8	10.2	NA
1951	5.1	33.4	38.5	12.8	NA
1952	5.6	35.9	41.5	13.7	NA
1953	5.9	39.8	45.6	15.0	NA
1954	6.4	39.7	46.1	15.9	NA
1955	3.2	38.2	41.4	13.7	NA
1956	2.8	46.0	48.8	17.3	NA
1957	2.8	50.3	53.1	20.1	NA
1958	2.2	48.8	51.0	20.8	NA
1959	2.0	50.1	52.1	18.5	NA
1960	1.8	49.9	51.7	19.6	NA
1961	1.5	48.6	50.1	22.0	NA
1962	1.4	49.0	50.4	23.8	NA
1963	1.3	49.3	50.6	24.9	NA
1964	1.2	52.7	53.9	22.4	NA
1965	1.1	53.4	54.5	25.6	NA
1966	1.0	52.9	53.9	27.4	NA
1967	1.3	69.7	71.0	26.7	NA
1968	1.3	64.2	65.5	28.7	NA
1969	1.3	60.6	61.9	35.3	NA
1970	1.1	70.8	71.9	38.0	0.2
1971	1.1	76.7	77.8	49.6	0.3
1972	0.9	98.8	99.7	57.7	0.3
1973	1.1	85.9	87.0	89.2	0.3
1974	0.9	82.6	83.5	112.9	(3)
1975	1.0	109.7	110.7	125.3	(3)
1976	1.0	116.4	117.4	121.7	(3)
1977	2.3	130.9	133.2	144.0	(3)
1978	2.2	126.0	128.2	118.8	0.2
1979	3.3	156.4	159.7	131.4	0.2
1980	4.7	178.3	183.0	135.4	0.1
1981	5.5	163.4	168.9	128.1	(3)
1982	6.1	175.1	181.1	118.9	(3)
1983[4]	6.5	149.1	155.6	89.4	0.1

[1] Includes subbituminous coal.
[2] Includes residual fuel oil (including crude oil burned as fuel), distillate fuel oil, and jet fuel.
[3] Less than 0.05 million short tons.
[4] Preliminary.
NA = Not available.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 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 and 1983—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Figure 93. Installed Generating Capacity of the Electric Utility Industry, Year-End

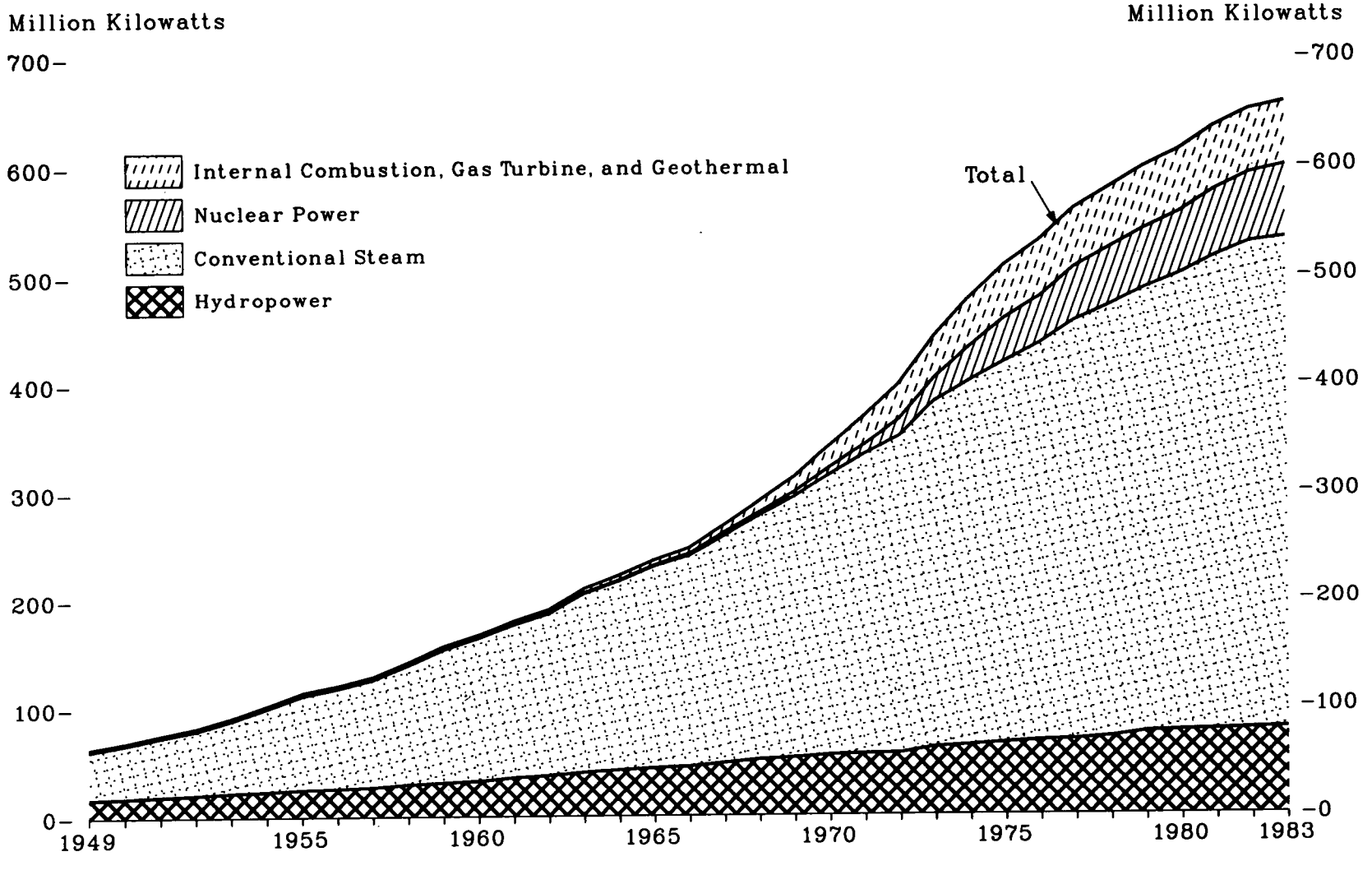


Table 90. Installed Generating Capacity of the Electric Utility Industry, Year-End 1949-1983
(Million Kilowatts)

Year	Conventional Steam [1]	Internal Combustion	Gas Turbine	Nuclear Power	Hydropower	Geothermal	Total
1949	44.6	1.8	0	0	16.7	0	63.1
1950	49.3	1.9	0	0	17.7	0	68.9
1951	54.9	2.0	0	0	18.9	0	75.8
1952	59.7	2.1	0	0	20.4	0	82.2
1953	67.2	2.2	0	0	22.0	0	91.5
1954	77.1	2.3	0	0	23.2	0	102.6
1955	87.1	2.4	0	0	25.0	0	114.5
1956	92.6	2.5	0	0	25.7	0	120.7
1957	99.4	2.5	0	0.1	27.0	0	129.1
1958	110.5	2.6	0	0.1	29.4	0	142.6
1959	123.0	2.7	0	0.1	31.1	0	156.8
1960	132.1	2.8	0	0.3	32.4	[2]	168.0
1961	141.8	3.0	0	0.4	35.5	[2]	180.7
1962	150.0	3.0	0	0.7	37.3	[2]	191.1
1963	165.7	3.2	0.6	0.7	40.2	[2]	210.5
1964	175.0	3.3	0.9	0.9	42.2	[2]	222.3
1965	186.6	3.4	1.4	0.9	43.8	[2]	236.1
1966	195.4	3.5	2.0	1.9	45.0	[2]	247.8
1967	211.1	3.8	3.3	2.9	48.1	0.1	269.3
1968	226.8	4.0	6.2	2.8	51.2	0.1	291.1
1969	242.2	4.2	10.1	4.0	52.8	0.1	313.3
1970	260.0	4.4	15.5	6.5	55.1	0.1	341.6
1971	277.8	4.5	21.9	8.7	55.9	0.2	368.9
1972	294.1	4.8	27.7	15.3	56.4	0.3	398.6
1973	320.6	5.0	33.4	21.0	62.0	0.4	442.4
1974	337.3	5.0	39.6	31.6	63.6	0.4	477.6
1975	352.9	5.1	44.1	39.8	65.9	0.6	508.3
1976	367.9	5.3	46.6	42.9	67.7	0.6	531.0
1977	387.8	5.3	47.9	49.9	68.7	0.6	560.2
1978	399.5	5.5	49.0	53.5	71.0	0.6	579.2
1979	411.6	5.5	50.6	54.6	75.3	0.7	598.3
1980	423.5	5.5	50.6	56.5	76.4	1.0	613.5
1981	438.9	5.6	51.4	60.8	77.1	1.0	634.8
1982	450.9	5.1	51.8	63.0	78.1	1.1	650.1
1983[3]	454.1	5.0	51.6	66.0	79.0	1.3	657.0

[1] Excludes capacity of geothermal plants; includes capacity at plants that produce steam from coal, petroleum, natural gas, and biomass.
[2] Less than 0.05 million kilowatts.
[3] Preliminary.
Note: Sum of components may not equal total due to independent rounding.
Sources: •1949 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 and 1983—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Figure 94. International Hydroelectric Power Production
(Billion Kilowatt-Hours)

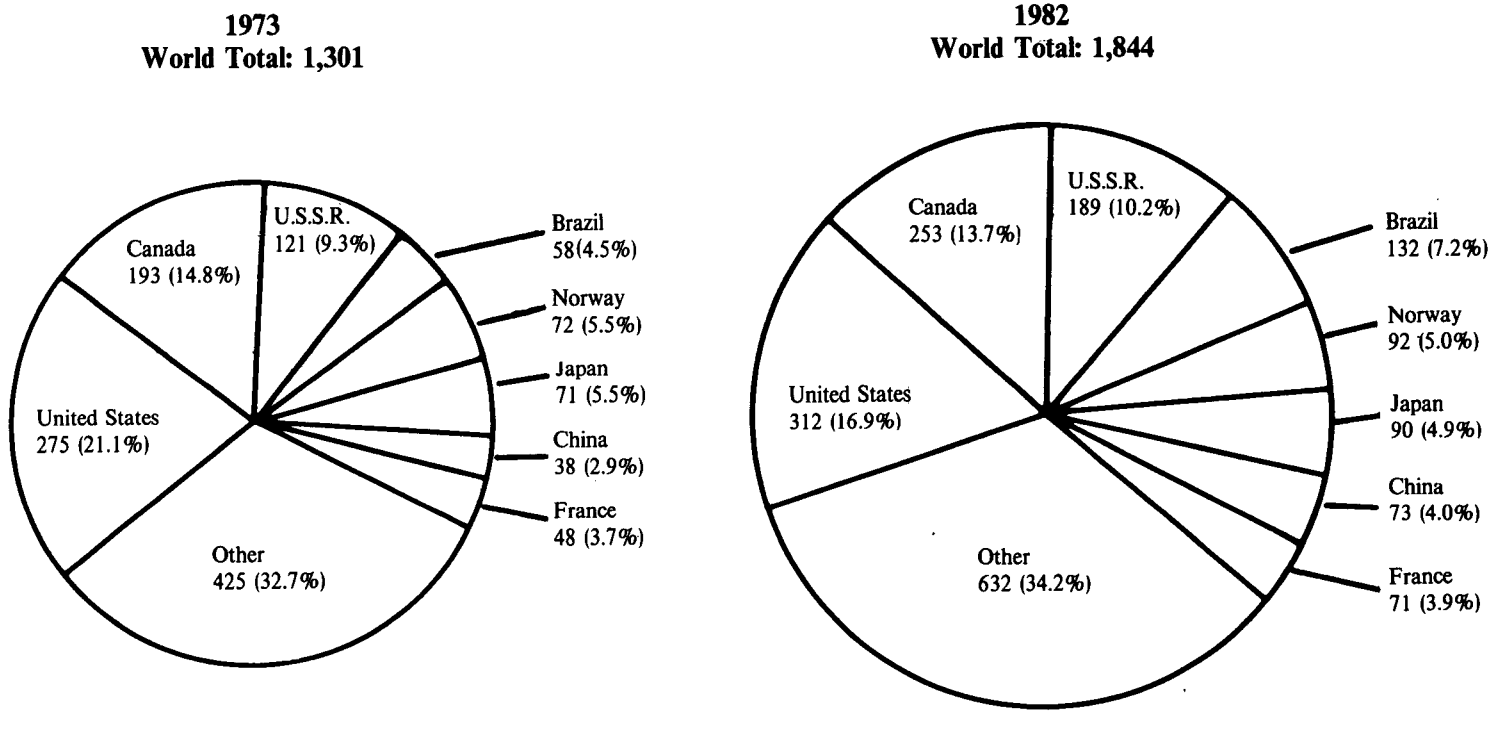


Table 91. International Hydroelectric Power Production,[1] 1973-1982

(Billion Kilowatt-Hours)

Area and Country	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982[2]
North, Central, and South America										
Argentina	3	5	5	5	6	8	11	15	15	14
Brazil	58	66	74	82	94	103	115	127	129	132
Canada	193	211	202	213	220	234	243	251	263	253
Colombia	8	9	10	10	11	12	13	15	16	18
Mexico	16	17	15	17	19	16	18	17	25	36
United States	275	304	303	287	224	284	283	279	264	312
Venezuela	6	7	9	11	12	12	13	15	15	15
Other	17	19	19	20	21	23	24	28	29	30
Total	577	637	638	645	605	691	720	746	755	811
Western Europe										
Austria	19	22	24	20	25	25	28	29	31	32
Finland	10	13	12	9	12	10	11	10	13	18
France	48	57	60	49	76	69	67	69	73	71
Germany, West	15	18	17	14	17	18	18	21	20	19
Italy	39	39	42	41	53	47	48	49	46	44
Norway	72	76	77	81	72	80	88	83	92	92
Portugal	7	8	6	5	10	11	12	8	5	3
Spain	29	31	26	22	40	41	47	31	23	17
Sweden	59	57	57	54	53	57	60	59	60	60
Switzerland	29	29	34	27	36	33	32	34	36	39
Yugoslavia	16	21	19	20	24	25	26	28	25	22
Other	14	15	17	19	20	22	24	25	26	26
Total	358	384	391	362	437	436	461	444	448	444
Eastern Europe and U.S.S.R.										
Romania	8	8	9	8	9	11	11	13	13	13
U.S.S.R.	121	131	125	134	146	168	170	182	185	189
Other	9	11	11	11	13	13	13	15	16	17
Total	137	150	145	154	168	191	195	210	214	218
Middle East and Africa										
Egypt	5	6	7	8	9	9	9	10	10	10
Zambia	5	6	6	7	9	8	9	9	9	9
Other	27	29	30	34	37	39	46	50	41	43
Total	37	40	43	49	54	56	64	68	60	62
Far East and Oceania										
Australia	12	14	15	15	14	15	16	17	18	18
China	38	43	45	51	47	44	50	58	65	73
India	29	28	33	35	38	47	45	46	49	52
Japan	71	84	85	88	76	74	84	91	90	90
Korea, North	12	14	16	17	17	19	20	22	23	23
New Zealand	14	14	17	15	14	16	15	16	19	21
Other	16	17	19	21	20	21	27	28	30	33
Total	191	213	230	241	226	236	257	278	293	310
World Total	1,301	1,425	1,445	1,450	1,491	1,611	1,697	1,746	1,770	1,844

[1] See Explanatory Note 1.
[2] Preliminary.
Note: Data include industrial and utility production of hydroelectric power.
Note: Sum of components may not equal total due to independent rounding.
Source: Energy Information Administration, *1982 International Energy Annual.*

Figure 95. Residential Weighted Average Monthly Electric Bill, January 1

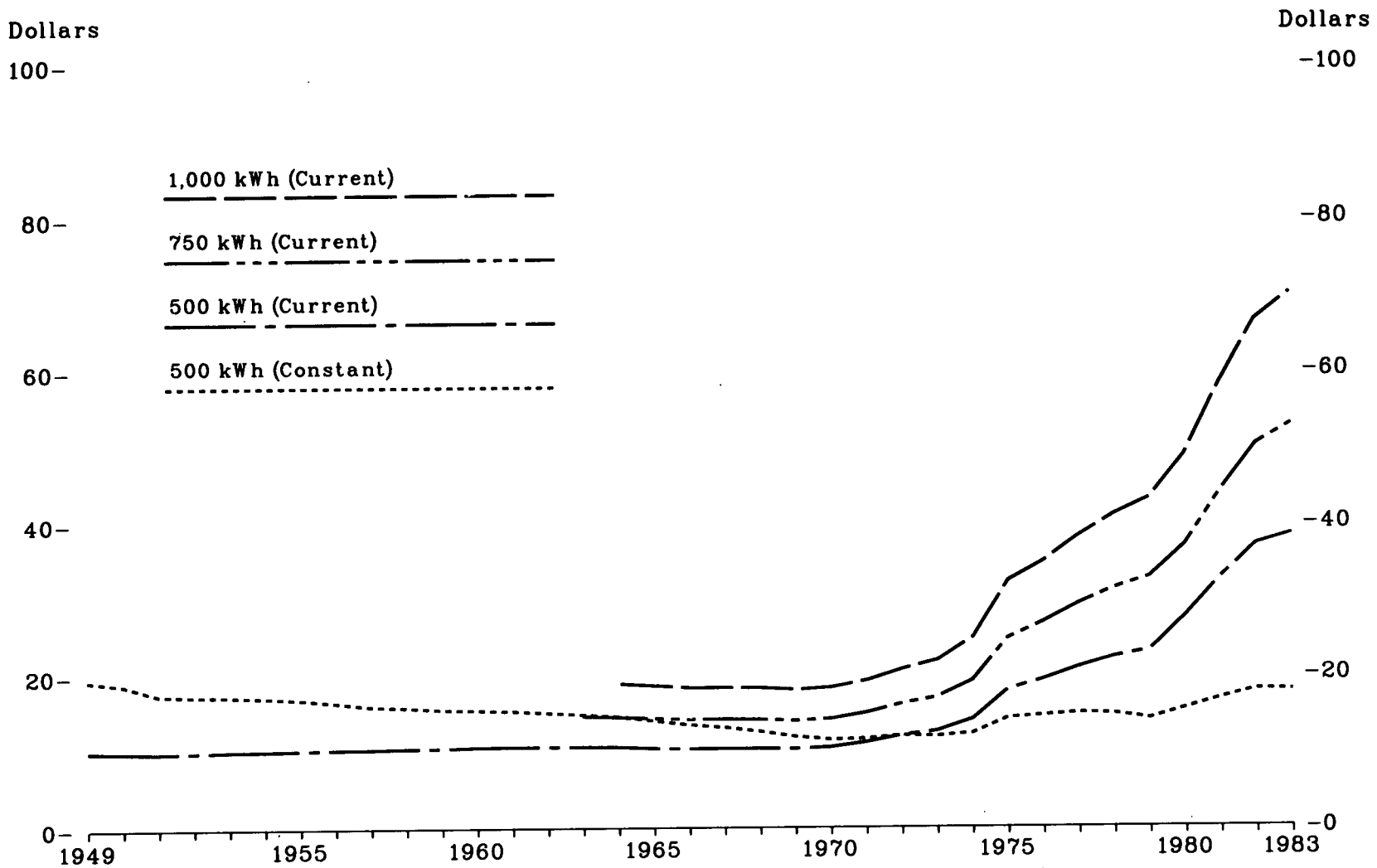


Table 92. Residential Weighted Average Monthly Electric Bill, January 1, 1949-1983

(Dollars per Month)

Year	500 kWh [1]		750 kWh [2]		1000 kWh [3]	
	Current	Constant [4]	Current	Constant [4]	Current	Constant [4]
1949	10.22	19.47	NA	NA	NA	NA
1950	10.11	18.88	NA	NA	NA	NA
1951	10.02	17.55	NA	NA	NA	NA
1952	10.08	17.40	NA	NA	NA	NA
1953	10.20	17.34	NA	NA	NA	NA
1954	10.23	17.18	NA	NA	NA	NA
1955	10.30	16.93	NA	NA	NA	NA
1956	10.36	16.50	NA	NA	NA	NA
1957	10.39	16.00	NA	NA	NA	NA
1958	10.47	15.85	NA	NA	NA	NA
1959	10.51	15.55	NA	NA	NA	NA
1960	10.62	15.46	NA	NA	NA	NA
1961	10.64	15.35	NA	NA	NA	NA
1962	10.66	15.10	NA	NA	NA	NA
1963	10.64	14.85	14.65	20.44	NA	NA
1964	10.61	14.58	14.51	19.94	18.86	25.92
1965	10.41	14.00	14.34	19.28	18.59	25.00
1966	10.34	13.47	14.19	18.49	18.32	23.87
1967	10.37	13.12	14.21	17.97	18.32	23.17
1968	10.37	12.56	14.16	17.16	18.27	22.13
1969	10.32	11.89	13.97	16.10	18.03	20.77
1970	10.51	11.49	14.22	15.55	18.31	20.02
1971	11.13	11.59	14.99	15.61	19.24	20.04
1972	11.99	11.99	16.14	16.14	20.70	20.70
1973	12.56	11.88	16.96	16.04	21.85	20.66
1974	14.10	12.25	19.14	16.63	24.85	21.59
1975	17.93	14.25	24.72	19.65	32.29	25.67
1976	19.26	14.55	26.78	20.24	34.85	26.33
1977	20.86	14.89	29.22	20.86	38.15	27.24
1978	22.19	14.75	31.23	20.76	40.98	27.24
1979	23.05	14.10	32.72	20.02	43.12	26.39
1980	27.50	15.41	36.93	20.70	48.79	27.35
1981	32.61	16.71	43.99	22.54	58.16	29.80
1982[5]	36.96	17.87	50.07	24.20	66.39	32.09
1983	38.35	17.78	52.74	24.45	69.96	32.44

[1] Weighted average monthly bill of residential consumers of 500 kilowatt-hours.
[2] Weighted average monthly bill of residential consumers of 750 kilowatt-hours.
[3] Weighted average monthly bill of residential consumers of 1000 kilowatt-hours.
[4] Constant 1972 dollars calculated using GNP implicit price deflators, 1972 = 100. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.
[5] Revised, based on U.S. Bureau of the Census, *Census of Population, 1980* data.
NA = Not available.

Note: The U.S. average is calculated by multiplying the bill for each city included in the typical bill report by the city's population and dividing the sum of the products for all cities by the sum of their populations. Bills are based on rates, fuel adjustments, and taxes in effect January 1 of each year.

Sources: •1949 through September 1977—Federal Power Commission, Form 3, "Typical Net Monthly Bills." •October 1977 through June 1979—Federal Energy Regulatory Commission, FPC Form 3, "Typical Net Monthly Bills." •July 1979 through 1983—Energy Information Administration, Form 213, "Typical Net Monthly Bills."

Figure 96. Average Price of Electricity Sold by the Electric Utility Industry to End-Use Sectors

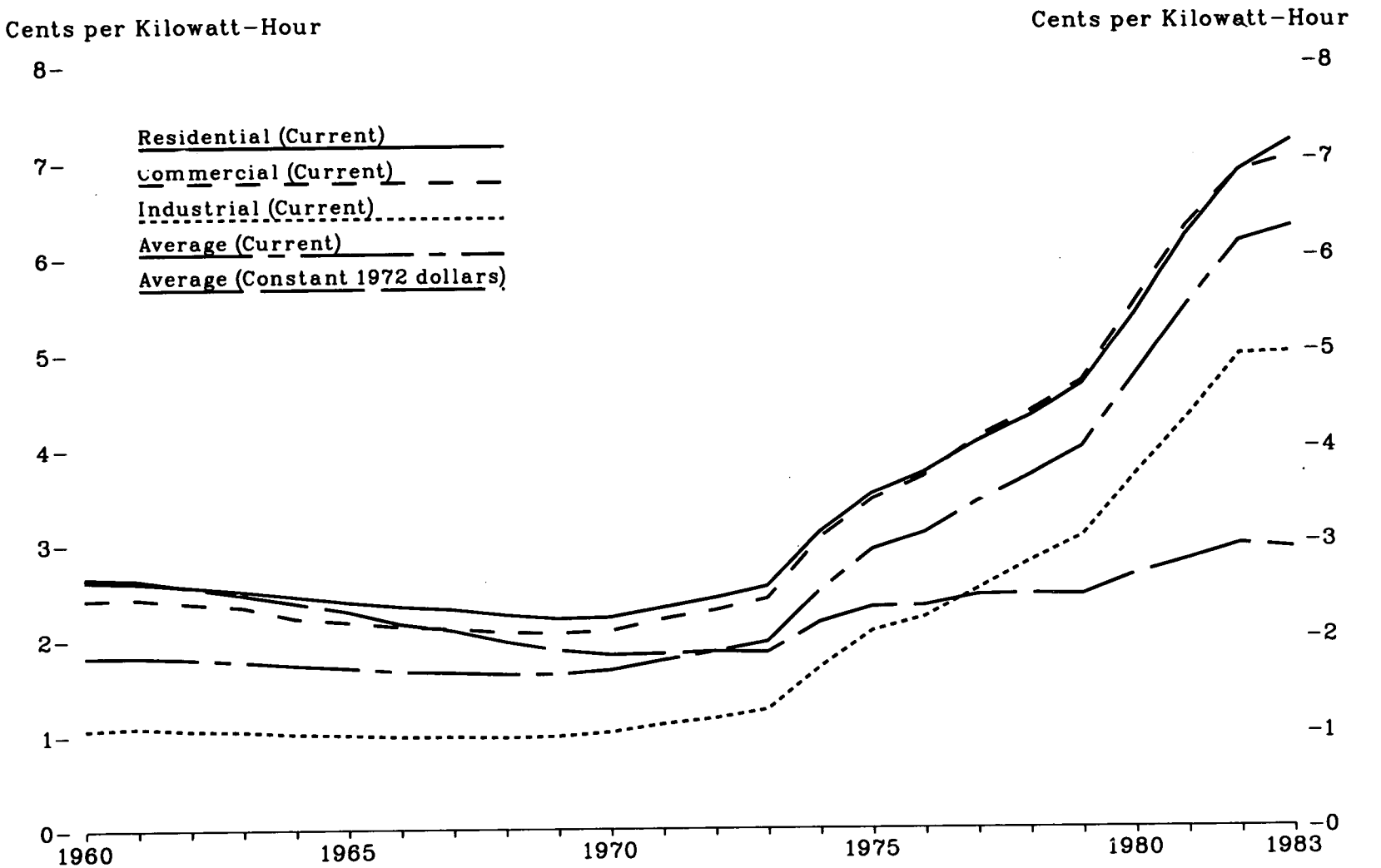


Table 93. Average Price of Electricity Sold by the Electric Utility Industry[1] to End-Use Sectors, 1960-1983

(Cents per Kilowatt-Hour)

Year	Residential		Commercial		Industrial		Other		Weighted Average	
	Current	Constant[2]	Current	Constant[2]	Current	Constant[2]	Current	Constant[2]	Current	Constant[2]
1960	2.62	3.81	2.42	3.52	1.06	1.54	1.91	2.78	1.82	2.65
1961	2.60	3.75	2.43	3.50	1.08	1.56	1.83	2.64	1.82	2.63
1962	2.56	3.63	2.38	3.37	1.05	1.49	1.86	2.63	1.80	2.55
1963	2.51	3.50	2.34	3.26	1.04	1.45	1.83	2.55	1.77	2.47
1964	2.45	3.37	2.22	3.05	1.01	1.39	1.83	2.51	1.73	2.38
1965	2.39	3.21	2.18	2.93	1.00	1.34	1.82	2.45	1.70	2.29
1966	2.34	3.05	2.13	2.77	0.98	1.28	1.80	2.34	1.66	2.16
1967	2.31	2.92	2.11	2.67	0.98	1.24	1.76	2.23	1.65	2.09
1968	2.25	2.73	2.07	2.51	0.97	1.18	1.76	2.13	1.63	1.97
1969	2.21	2.55	2.06	2.37	0.98	1.13	1.74	2.00	1.63	1.88
1970	2.22	2.43	2.08	2.27	1.02	1.12	1.80	1.97	1.67	1.83
1971	2.32	2.42	2.20	2.29	1.10	1.15	1.91	1.99	1.77	1.84
1972	2.42	2.42	2.29	2.29	1.16	1.16	1.98	1.98	1.86	1.86
1973	2.54	2.40	2.41	2.28	1.25	1.18	2.10	1.99	1.96	1.85
1974	3.10	2.69	3.04	2.64	1.69	1.47	2.75	2.39	2.49	2.16
1975	3.51	2.79	3.45	2.74	2.07	1.65	3.08	2.45	2.92	2.32
1976	3.73	2.82	3.69	2.79	2.21	1.67	3.27	2.47	3.09	2.33
1977	4.05	2.89	4.09	2.92	2.50	1.79	3.51	2.51	3.42	2.44
1978	4.31	2.87	4.36	2.90	2.79	1.85	3.62	2.41	3.69	2.45
1979	4.64	2.84	4.68	2.86	3.05	1.87	3.96	2.42	3.99	2.44
1980	5.36	3.00	5.48	3.07	3.69	2.07	4.76	2.67	4.73	2.65
1981	6.20	3.18	6.29	3.22	4.29	2.20	5.28	2.71	5.46	2.80
1982	6.86	3.32	6.86	3.32	4.95	2.39	5.92	2.86	6.13	2.96
1983[3]	7.18	3.33	7.01	3.25	4.97	2.30	6.36	2.95	6.29	2.92

[1] Data 1979 and earlier are for Classes A and B privately-owned electric utilities only. Data 1980 forward are for selected Class A utilities whose electric operating revenues were $100 million or more during the previous year.

[2] Constant 1972 dollars using GNP implicit price deflator, 1972=100. See Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents section.

[3] Estimated.

Sources: •1960 through September 1977—Federal Power Commission, Form 5, "Monthly Statement of Electric Operating Revenues and Income." •October 1977 through February 1980—Federal Energy Regulatory Commission, FPC Form 5, "Monthly Statement of Electric Operating Revenues and Income." •March 1980 through 1982—Federal Energy Regulatory Commission, Form 5, "Electric Utility Company Monthly Statement." •1983—Energy Information Administration, Form EIA-826, "Electric Utility Company Monthly Statement."

Section 7. Nuclear Energy Supply and Disposition

This section presents information on the nuclear energy industry in the United States and in 18 other non-Communist countries. Included are data on nuclear powerplants, including operating or construction status, generating capacity, and output, and data on uranium resources, production, imports, and exports.

Uranium Supply. As of mid-1983, there were an estimated 105 mines in operation in the United States, down about 48 percent from year-end 1982. Most were located in the West and Southwest. Of the total, 73 were underground, 16 were open pit, 10 involved solution mining, and 6 involved other types of extraction. Production from these mines and other sources totaled 10,600 short tons of uranium oxide (U_3O_8), down 21 percent from the 1982 level. Mined ores contain about 0.05 to 0.3 percent by weight of uranium and are processed into high-purity U_3O_8, or 'yellowcake,' at uranium 'mills.' Of the 23 conventional uranium mills, only 12 were in operation at the end of 1983. Estimated 1983 U_3O_8 imports and exports were 950 and 3,400 short tons, respectively (see Table 97).

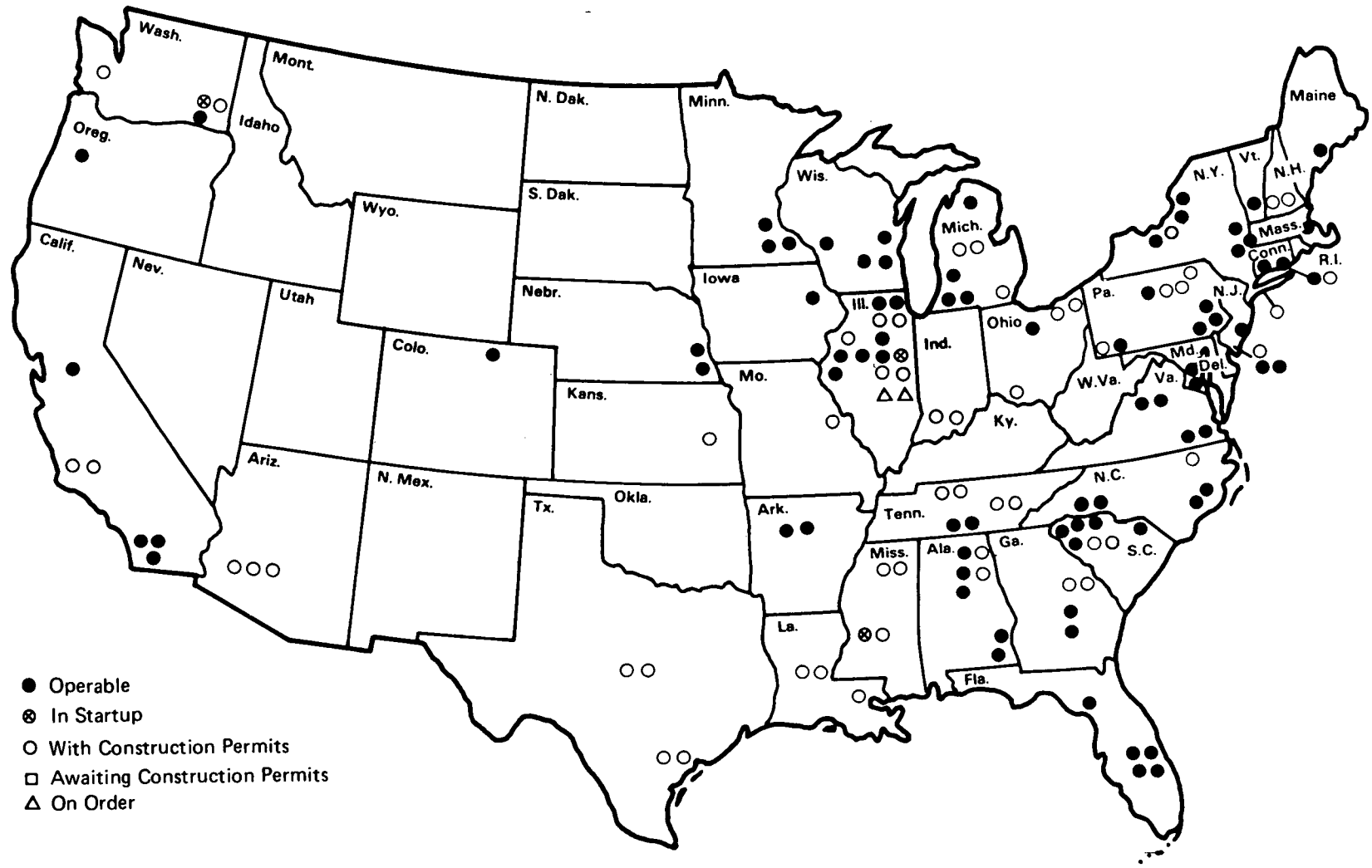
Uranium resources with 'forward' costs of $50 or less per pound of U_3O_8, as of January 1, 1983, were estimated to be 2.6 million short tons, essentially unchanged from those for January 1, 1982. About 0.6 million short tons of the resources in this cost category were classified as 'reserves' and the remaining 2 million short tons as 'potential resources' (see Table 96). Resources in the $100-per-pound-forward-cost category increased to 4.3 million short tons from 4.1 million short tons on January 1, 1982.

Nuclear Reactors. Six domestic reactors were granted low-power licenses by the Nuclear Regulatory Commission in 1983, two of which also received full-power operating licenses during the year. In a separate action, a 65,000-net-kilowatt unit that had been out of service since 1978 was permanently shut down in 1983. On December 31, 1983, there were 80 operable nuclear powerplants with a combined capacity of 62.8 million net kilowatts, both up from their respective 1982 levels (see Table 95). In contrast, six units in various stages of planning or construction, with a collective potential capacity of 6 million net kilowatts, were cancelled in 1983. Overall in 1983, the total number of domestic reactors in all stages of planning, construction, or operation fell to 138 units, with a total rated capacity of 128 million net kilowatts (see Table 94).

Nuclear Power Generation. During 1983, operable U.S. nuclear power reactors generated a record 292.1 billion net kilowatt-hours of electricity, up 3.3 percent from the 1982 total. The 1983 nuclear output was 12.6 percent of total U.S. net electricity generation, essentially unchanged from the record set in 1982 (see Tables 85 and 95).

Nuclear-based electricity generation by the non-Communist nations was 883 billion gross kilowatt-hours in 1983, up 12 percent from the 1982 level. Approximately 35 percent of this generation was in the United States. Other major producing countries were France, 16 percent; Japan, 12 percent; and West Germany, 7 percent (see Table 98).

Figure 97. Status of Nuclear Reactor Units, December 31, 1983



Due to space limitations, symbols do not represent actual locations.

Table 94. Status of Nuclear Reactor Units, December 31, 1983

Status	Number of Reactors[1]				Capacity[1] (thousand net kilowatts)	
	Boiling Water Reactors	Pressurized Water Reactors	Other[2]	Total	Total	Average[3] (per reactor)
Operable[4]	26	52	2	80	62,809	785
In Startup	3	0	0	3	3,431	1,144
Construction Permits Granted	16	37	0	53	59,064	1,114
Construction Permits Pending	0	0	0	0	0	—
Units on Order	0	2	0	2	2,240	1,120
Total	45	91	2	138	127,544	924

[1] The capacity for operable units is net Maximum Dependable Capacity (MDC). For other units the capacity is net Design Electrical Rating (DER). See Explanatory Note 12.
[2] Includes one graphite-moderated and one gas-cooled (HGTR) reactor in full operation.
[3] Based on the net Design Electrical Rating (DER).
[4] Includes units with "full power" or "operating license" units (units in power ascension or in commercial operation). Excludes the following previously licensed units which have been inoperative for at least 4 years: Humboldt Bay; Dresden-1; and Three Mile Island-2. Three Mile Island-1 is considered operable although it has not been permitted to operate since March 1979.

Sources: Compiled by the Energy Information Administration from various sources, but primarily from the Nuclear Regulatory Commission Report, NUREG-0871, *Summary Information Report*, Quarterly.

Figure 98. Nuclear Powerplant Capacity and Electricity Production

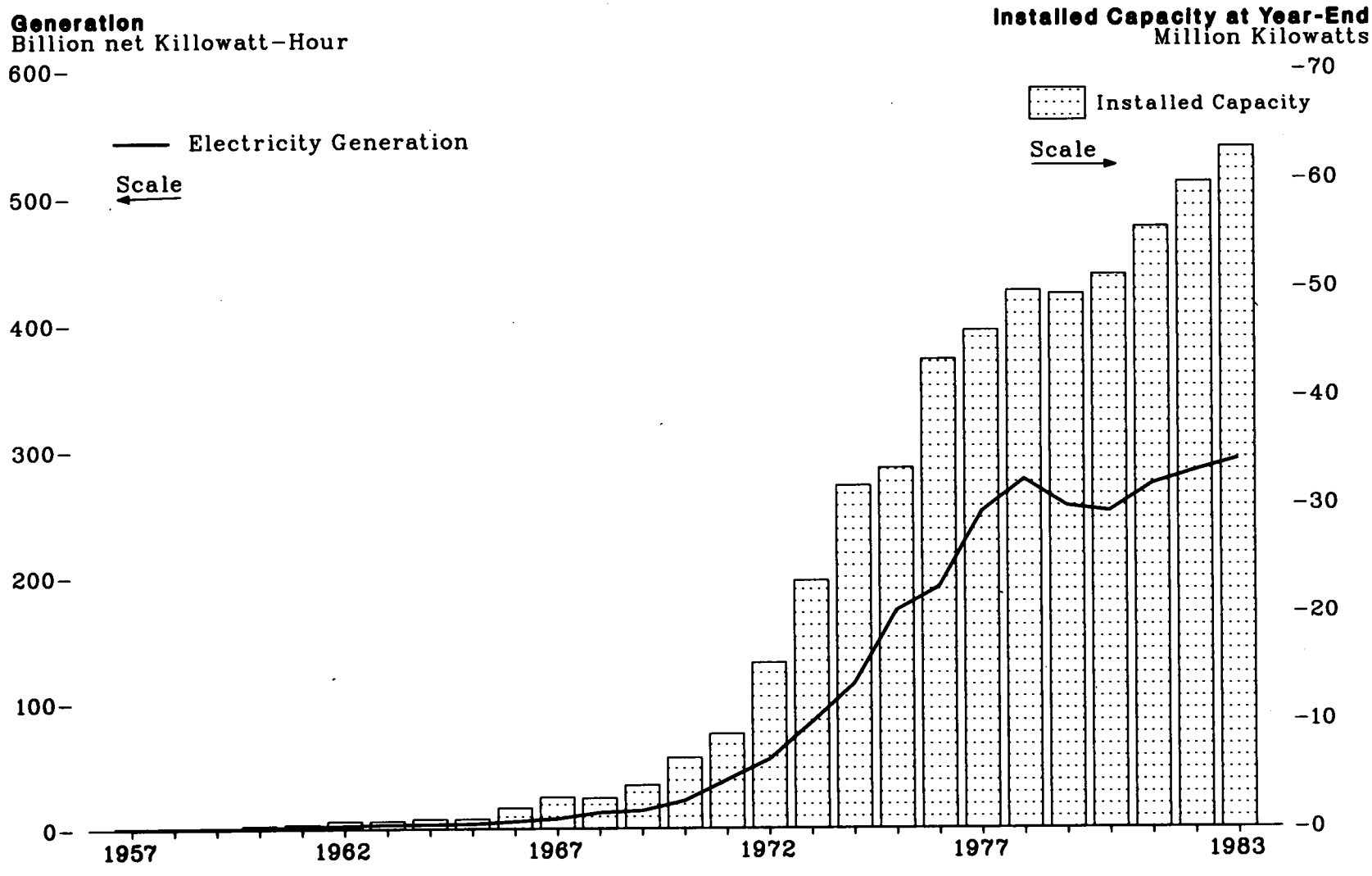


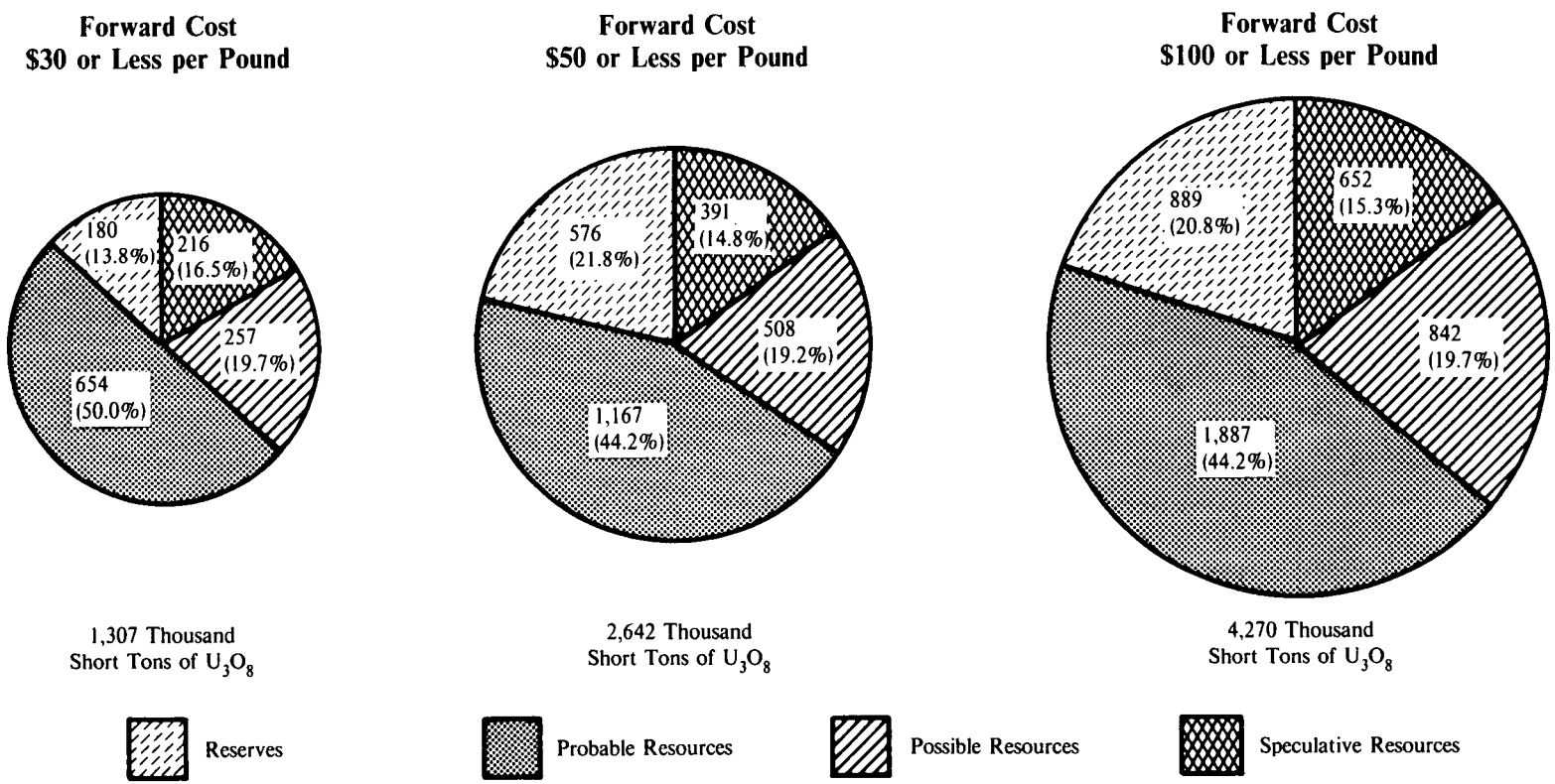
Table 95. Nuclear Powerplant Capacity and Electricity Production, 1957-1983

Year	Year-End Operable Reactors[1]	Year-End Operable Capacity (million kilowatts)[1]	Electricity Generation (billion net kilowatt-hours)	Electricity Generation (percent of total U.S. generation)
1957	1	0.1	[2]	[2]
1958	1	0.1	0.2	[2]
1959	1	0.1	0.2	[2]
1960	2	0.3	0.5	0.1
1961	3	0.4	1.7	0.2
1962	4	0.7	2.3	0.3
1963	7	0.7	3.2	0.4
1964	9	0.9	3.3	0.3
1965	10	0.9	3.7	0.4
1966	11	1.9	5.5	0.5
1967	10	2.9	7.7	0.6
1968	10	2.8	12.5	0.9
1969	13	4.0	13.9	1.0
1970	19	6.5	21.8	1.4
1971	21	8.7	38.1	2.4
1972	29	15.3	54.1	3.1
1973	39	22.9	83.5	4.5
1974	48	31.7	114.0	6.1
1975	54	33.3	172.5	9.0
1976	60	43.3	191.1	9.4
1977	65	46.0	250.9	11.8
1978	70	49.6	276.4	12.5
1979	68	49.3	255.2	11.4
1980	70	51.1	251.1	11.0
1981	74	55.5	272.7	11.9
1982	77	59.6	282.8	12.6
1983[4]	80	62.8	292.1	12.6

[1] See Explanatory Note 12.
[2] Less than 0.05 billion kilowatt-hours.
[3] Less than 0.05 percent.
[4] Preliminary.

Sources: **Year-End Operable Reactors:** •1957 through 1972—Federal Power Commission, Form 4, "Monthly Power Plant Report." •1973 through 1983—Nuclear Regulatory Commission, Report NUREG-0020, *Licensed Operating Reactors*, monthly. **Year-End Operable Capacity:** •1957 through 1972—Federal Power Commission, Form 4, "Monthly Power Plant Report." •1973 through 1983 Nuclear Regulatory Commission, Report NUREG-0020, *Licensed Operating Reactors*. **Electricity Generation.** •1957 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 and 1983—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Figure 99. Uranium Resources, January 1, 1983



Note: Quantities scaled in proportion to area.

Table 96. Uranium Resources, January 1, 1983

(Thousand Short Tons, U_3O_8)

Class	Forward Cost (dollars per pound) [1]		
	$30 or Less	$50 or Less	$100 or Less
Reserves [2,3]	180	576	889
Potential Resources [3]	1,127	2,066	3,381
Probable	654	1,167	1,887
Possible	257	508	842
Speculative	216	391	652
Total	1,307	2,642	4,270

[1] Forward costs are those costs yet to be expended, and, therefore, do not represent prices at which U_3O_8 will be sold.
[2] Does not include 140,000 tons of U_3O_8 estimated to be available as a by-product of phosphate and copper production during the 1980-2010 time period.
[3] See Glossary.
Sources: U.S. Department of Energy, Grand Junction Area Office, Colorado. *Statistical Data of the Uranium Industry*, Report No. GJO-100(83), January 1, 1983.

Figure 100. Uranium Production, Exports, and Imports

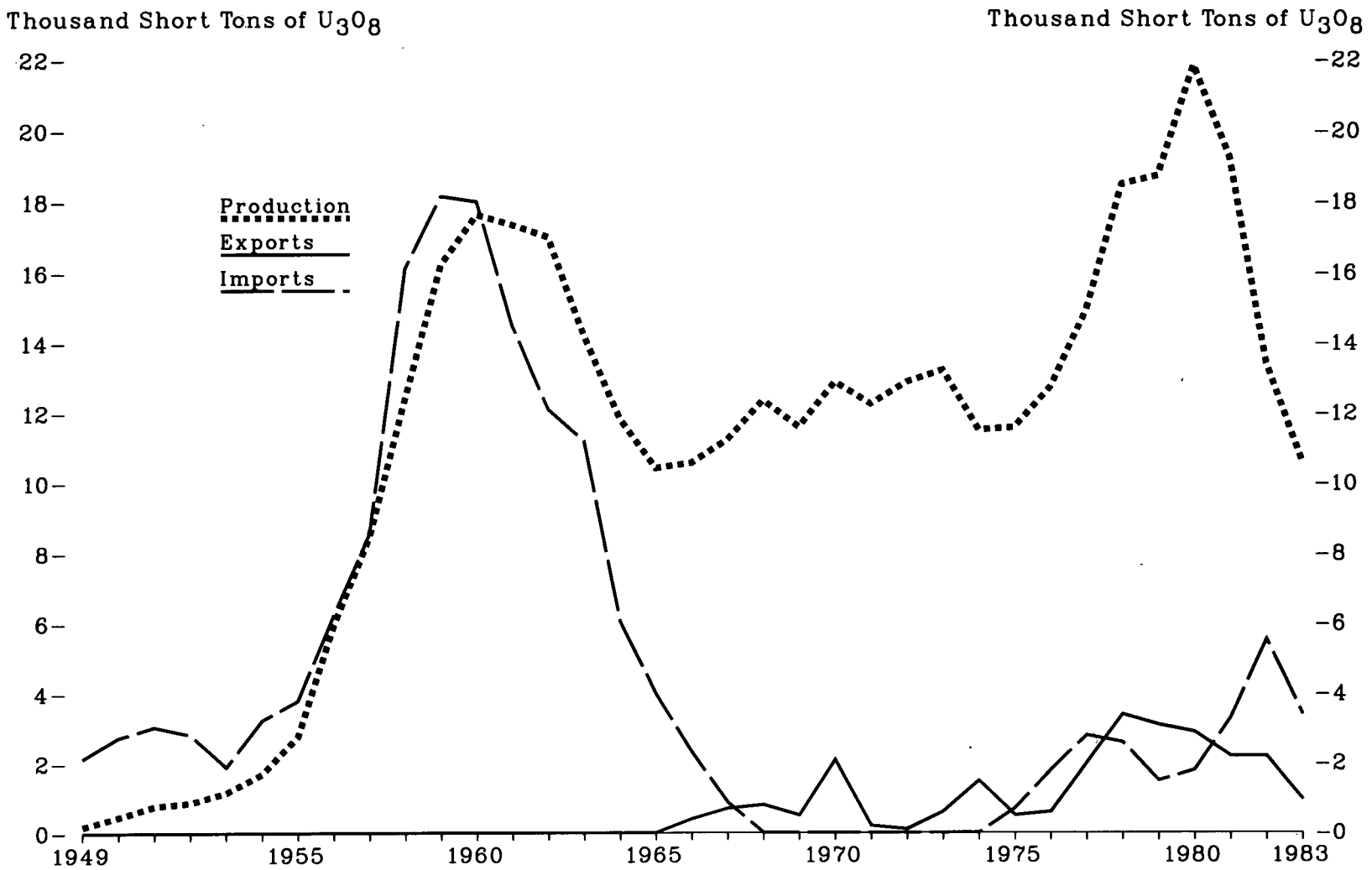


Table 97. Uranium Production, Exports, and Imports, 1949-1983

(Thousand Short Tons of U_3O_8)

Year	Domestic Production	Exports	Imports [1]
1949	0.18	0	2.13
1950	0.46	0	2.74
1951	0.77	0	3.05
1952	0.87	0	2.83
1953	1.16	0	1.90
1954	1.70	0	3.24
1955	2.78	0	3.80
1956	5.96	0	6.24
1957	8.48	0	8.57
1958	12.44	0	16.13
1959	16.24	0	18.16
1960	17.64	0	18.01
1961	17.35	0	14.50
1962	17.01	0	12.11
1963	14.22	0	11.22
1964	11.85	0	6.07
1965	10.44	0	4.00
1966	10.59	0.40	2.32
1967	11.25	0.70	0.88
1968	12.37	0.80	0
1969	11.61	0.50	0
1970	12.90	2.10	0
1971	12.27	0.20	0
1972	12.90	0.10	0
1973	13.24	0.60	0
1974	11.53	1.50	0
1975	11.60	0.50	0.70
1976	12.75	0.60	1.80
1977	14.94	2.00	2.80
1978	18.49	3.40	2.60
1979	18.73	3.10	1.50
1980	21.85	2.90	1.80
1981	19.24	2.20	3.30
1982	13.43	2.20	5.55
1983[2]	10.60	0.95	3.40

[1] Import quantities through 1970 are reported for fiscal years. Until 1971 the Atomic Energy Commission was the sole purchaser of all imported U_3O_8.

[2] Preliminary.

Note: Import and export data are for transactions conducted by uranium suppliers only. Excluded are data on uranium buyer (consumer) transactions. These data are available only for 1982 when buyer imports totalled 3,000 short tons of U_3O_8 and buyer exports totalled 950 short tons of U_3O_8. Buyer imports and exports in earlier years are believed to be small.

Sources: **Domestic Production:** •1949 through 1981—U.S. Department of Energy, Grand Junction Area Office, Colorado, *Statistical Data of the Uranium Industry*, Report No. GJO-100, annual. •1982 and 1983—Energy Information Administration, *1982 Survey of United States Uranium Marketing Activity*, September 1983. **Imports and Exports:** •1949 through 1981—U.S. Department of Energy, Grand Junction Area Office, Colorado, *Statistical Data of the Uranium Industry*, Report No. GJO-100, annual. •1982 and 1983—Energy Information Administration, *1982 Survey of United States Uranium Marketing Activity* September 1983.

Figure 101. Nuclear Electricity Production by Non-Communist Countries

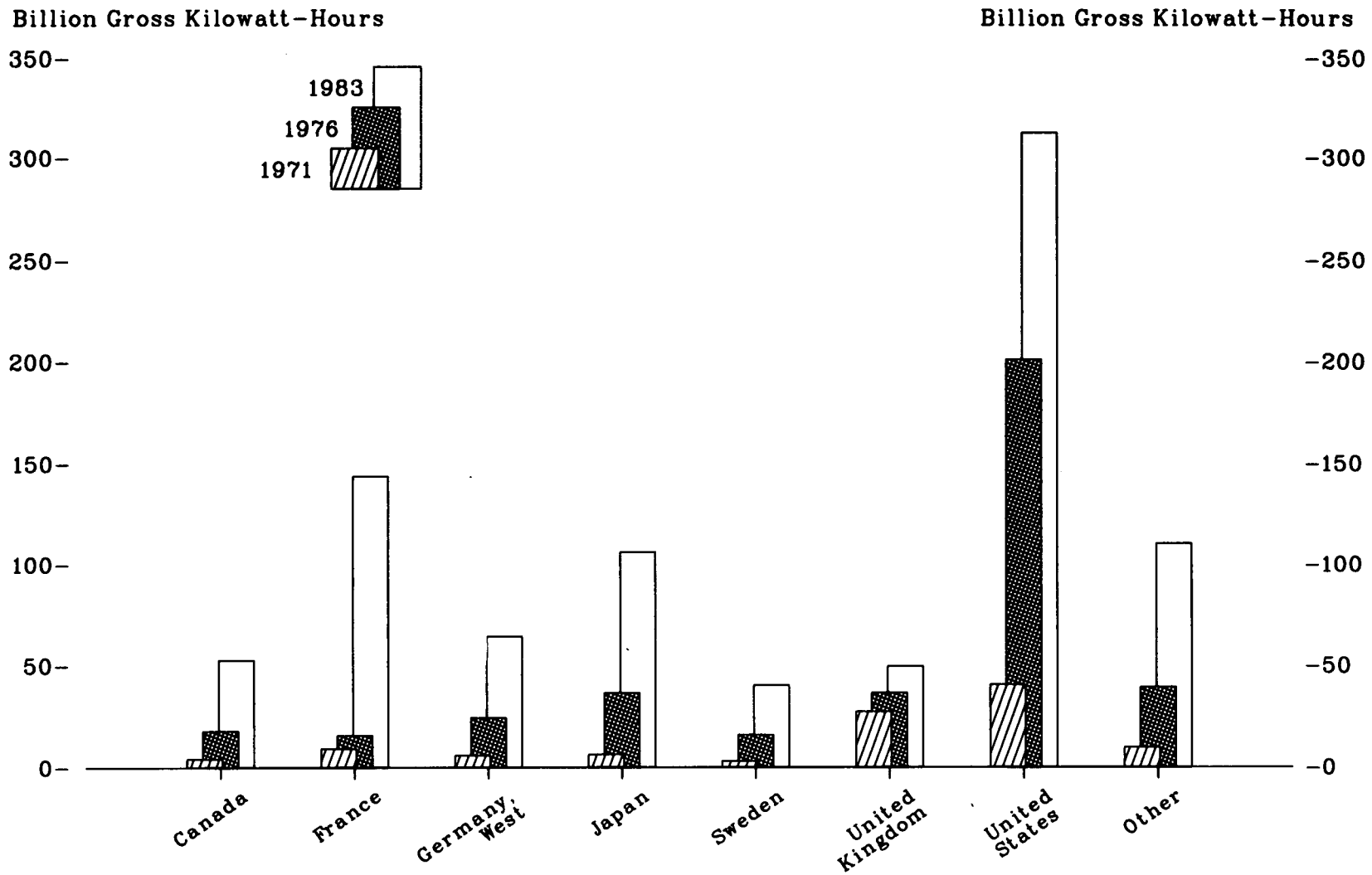


Table 98. Nuclear Electricity Production[1] by Non-Communist Countries, 1971-1983

(Billion Gross Kilowatt-Hours)

Country	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
North America													
Canada	4.2	3.5	18.3	15.4	13.2	18.0	26.8	32.9	38.4	40.4	43.3	42.6	53.0
United States	40.8	57.6	88.0	104.5	181.7	201.8	263.3	292.7	270.6	265.4	288.5	298.6	313.6
Total	44.9	61.1	106.2	119.9	195.0	219.8	290.1	325.6	309.0	305.8	331.8	341.2	366.6
Central and South America													
Argentina and Brazil[2]	0	0	0	1.0	2.5	2.6	1.6	2.9	2.7	2.3	2.8	1.9	2.7
Western Europe													
Belgium	0	0	0	0.1	6.8	10.0	11.9	12.5	11.4	12.5	12.8	15.6	24.1
Finland	0	0	0	0	0	0	2.7	3.3	6.7	7.0	14.5	16.5	17.4
France	9.4	14.6	11.6	14.7	18.3	15.8	17.9	30.5	39.9	61.2	105.2	108.9	144.2
Germany, West	6.0	9.3	11.9	12.0	21.7	24.5	35.8	35.9	42.2	43.7	53.4	63.4	64.7
Italy	3.4	3.6	3.1	3.4	3.8	3.8	3.4	4.4	2.6	2.2	2.7	6.8	5.8
Netherlands	0.4	0.3	1.1	3.3	3.3	3.9	3.7	4.1	3.5	4.2	3.7	3.9	3.6
Spain	2.5	4.8	6.5	7.2	7.5	7.6	6.5	7.6	6.7	5.2	9.4	8.8	10.7
Sweden	0.1	1.5	2.1	1.6	12.0	16.0	19.9	23.8	21.0	26.7	37.7	38.8	40.5
Switzerland	1.9	4.9	6.2	7.0	7.7	7.9	8.1	8.3	11.8	14.3	15.2	15.0	15.5
United Kingdom	27.6	29.6	28.0	34.0	30.5	36.8	38.1	36.7	38.5	37.2	38.9	44.1	50.0
Total	51.3	68.6	70.6	83.5	111.7	126.2	147.9	167.1	184.3	214.2	293.4	321.8	376.4
Far East													
India	1.8	0.9	1.9	2.5	2.5	3.2	2.8	2.3	3.2	2.9	3.1	2.2	2.9
Japan	6.5	9.0	9.4	18.1	22.2	36.7	28.1	53.2	62.0	82.8	86.0	104.5	106.5
Pakistan	[3]	0.2	0.5	0.6	0.5	0.5	0.3	0.2	[3]	0.1	0.2	0.1	0.2
South Korea	0	0	0	0	0	0	0.1	2.3	3.2	3.5	2.9	3.8	9.0
Taiwan	0	0	0	0	0	0	0.1	2.7	6.3	8.2	10.7	13.1	18.9
Total	8.3	10.1	11.8	21.2	25.3	40.4	31.4	60.7	74.7	97.4	102.9	123.6	137.5
Total	104.5	139.8	188.7	225.6	334.4	389.1	471.0	556.3	570.7	619.8	730.9	788.5	883.3

[1] See Explanatory Note 1.
[2] Nuclear electricity production in Brazil began in 1982. Quantities produced amounted to 54,113,000 kilowatt-hours and 183,730,000 kilowatt-hours in 1982 and 1983, respectively.
[3] Less than 0.05 billion gross kilowatt-hours.
Note: Sum of components may not equal total due to independent rounding.
Note: These annual data are aggregated from monthly data.
Source: *Nucleonics Week*, McGraw-Hill Publishing Co., Inc.

Section 8. Geothermal and Solar Energy

The use of solar and geothermal energy is increasing and recently these emerging energy sources have begun to fill more of the Nation's energy needs. Solar energy collection systems are now commercially available nationwide. Geothermal energy is currently used for space heating and to produce electricity.

Solar Energy. Solar radiation is an inexhaustible source of energy. The Earth's share of solar radiation measures 3 million quadrillion ($3x10^{21}$) Btu per year. If all of this extraordinarily large amount of energy could be harnessed, the energy obtained during 1 day could satisfy the world's energy needs for approximately 30 years, at current rates of consumption. However, although solar radiation is universally available, it is a diffuse form of energy requiring a large collection area. The result is that only a small portion of the potential energy can be converted to useful energy.

The transformation of sunlight into usable energy is accomplished through both passive and active systems. Passive systems use natural processes to collect and transfer heat; south-facing windows and greenhouses are examples of passive solar applications. Active systems require mechanical means, such as motors, pumps, and valves, to carry heat from the collectors to storage and from storage to the point of use. Collectors consist of an absorbing plate that transfers the sun's heat to a working medium (either liquid or gas), a translucent cover plate that prevents the heat from radiating back into the atmosphere, and, in most cases, insulation on the back of the collector panel to further reduce heat losses. The storage medium is usually water for liquid systems and rocks for air systems.

Conversion of solar energy typically occurs at the site where it is used. Because there is no buyer-seller transaction for solar energy, it is difficult to measure the amount of solar energy converted. However, data on the quantity of collectors manufactured and shipped by producers, measured in square feet, are collected. Those data are provided in this section as indicators of the use of solar energy.

During 1982, there were 18.62 million square feet of solar collectors shipped, a 6.7-percent decrease from the 1981 level (see Table 100). The square footage of low-temperature collectors shipped fell to 40 percent of total collector area shipments, down from 43 percent in 1981. Shipments of medium-temperature, special, and other collectors accounted for the remaining 60 percent. Pool-heating and domestic hot water collectors accounted for 78 percent of all collectors during 1982. The residential sector was the dominant user of solar collectors, accounting for 74 percent of the manufacturers' shipments in 1982 (see Table 101).

Geothermal Energy. Geothermal energy, or heat from the Earth, is conducted and radiated from the hot mass of molten rock that forms the Earth's core. Most of the heat is too deep within the Earth to be extracted for practical use. However, in hot springs, geysers, and fumaroles, the Earth's heat is more readily available. Geothermal energy is most useful when geologic conditions concentrate heat energy into hot spots or thermal reservoirs. There are three types of thermal reservoirs: hydrothermal, geopressurized, and dry rock.

Hydrothermal are the most desirable for producing geothermal energy. These reservoirs consist of a heat source covered by a permeable formation in which the water circulates. There are two types of hydrothermal systems: vapor-dominated and hot water-dominated. The Geysers in California, a vapor-dominated system, is the only geothermal facility producing electricity in the United States.

A second type of geothermal reservoir is the geopressurized resource found, for example, in the Texas and Louisiana Gulf Coast area. These reservoirs consist of sedimentary formations containing hot water and methane. None is in use.

A third type of geothermal reservoir is the dry rock formation that can be found throughout the United States. The development of dry hot rock systems is in the early stages of experimentation. The use of these reservoirs requires fracturing the rock formation and injecting water to produce steam or hot water. These reservoirs are not expected to be used commercially until the end of this century.

Figure 102. Production of Electricity from Geothermal Sources

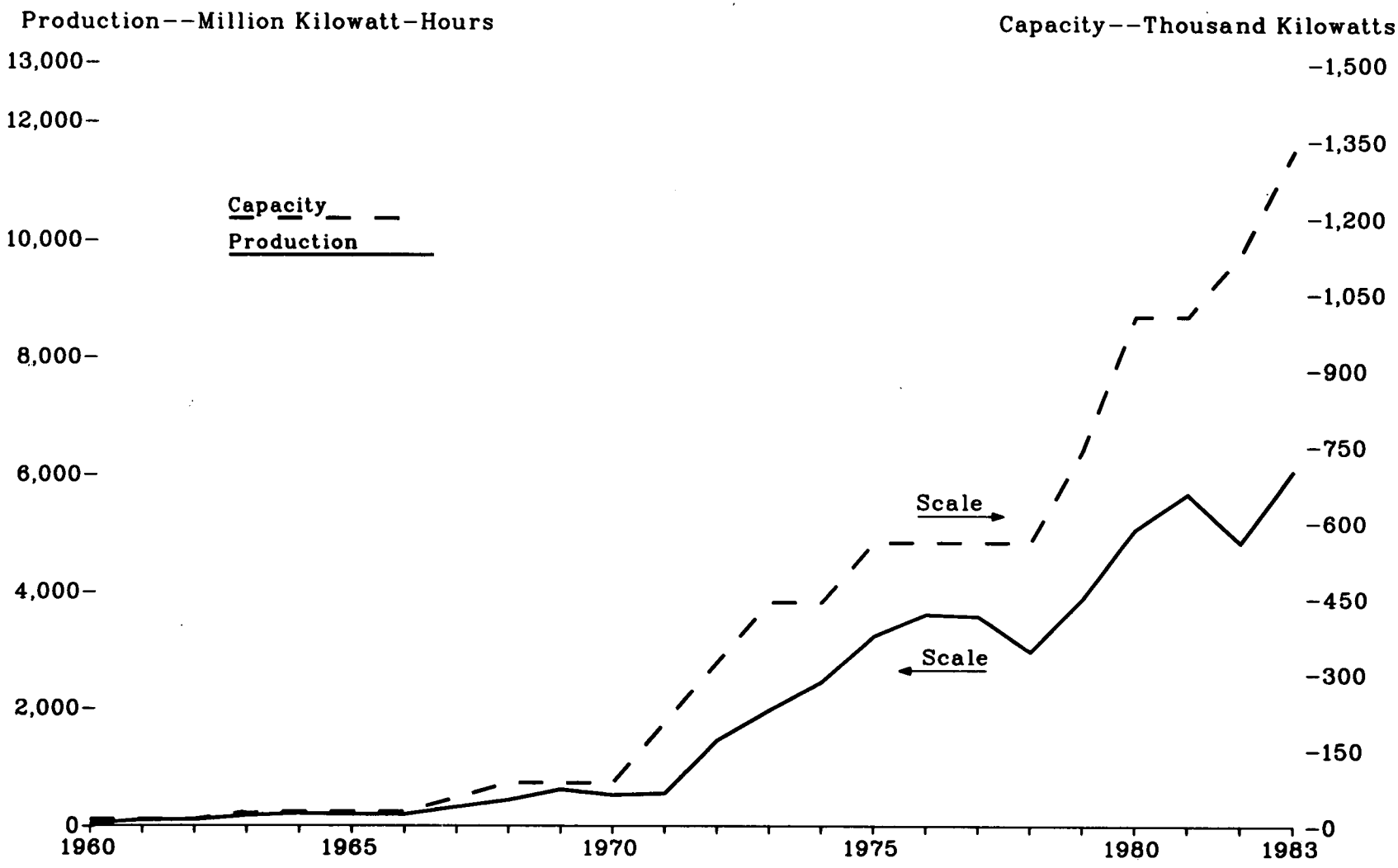


Table 99. Production of Electricity from Geothermal Sources, 1960-1983

Year	Year-End Capacity On Line (thousand kilowatts)	Production [1] (million kilowatt-hours)
1960	12	33
1961	12	94
1962	12	100
1963	27	168
1964	27	204
1965	27	189
1966	27	188
1967	55	316
1968	84	436
1969	84	615
1970	84	525
1971	203	548
1972	322	1,453
1973	441	1,966
1974	441	2,453
1975	559	3,246
1976	559	3,616
1977	559	3,582
1978	559	2,978
1979	742	3,889
1980	1,005	5,073
1981	1,005	5,686
1982	1,129	4,843
1983	1,331	6,075

[1] See Explanatory Note 1.

Sources: **Capacity on Line:** •1960 through September 1977—Federal Power Commission, Form 12, "Power Systems Statement." •October 1977 through 1982—Federal Energy Regulatory Commission, FPC Form 12, "Power Systems Statement." **Production:** • 1960 through 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 and 1983—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

Figure 103. Producer Shipments of Solar Collectors

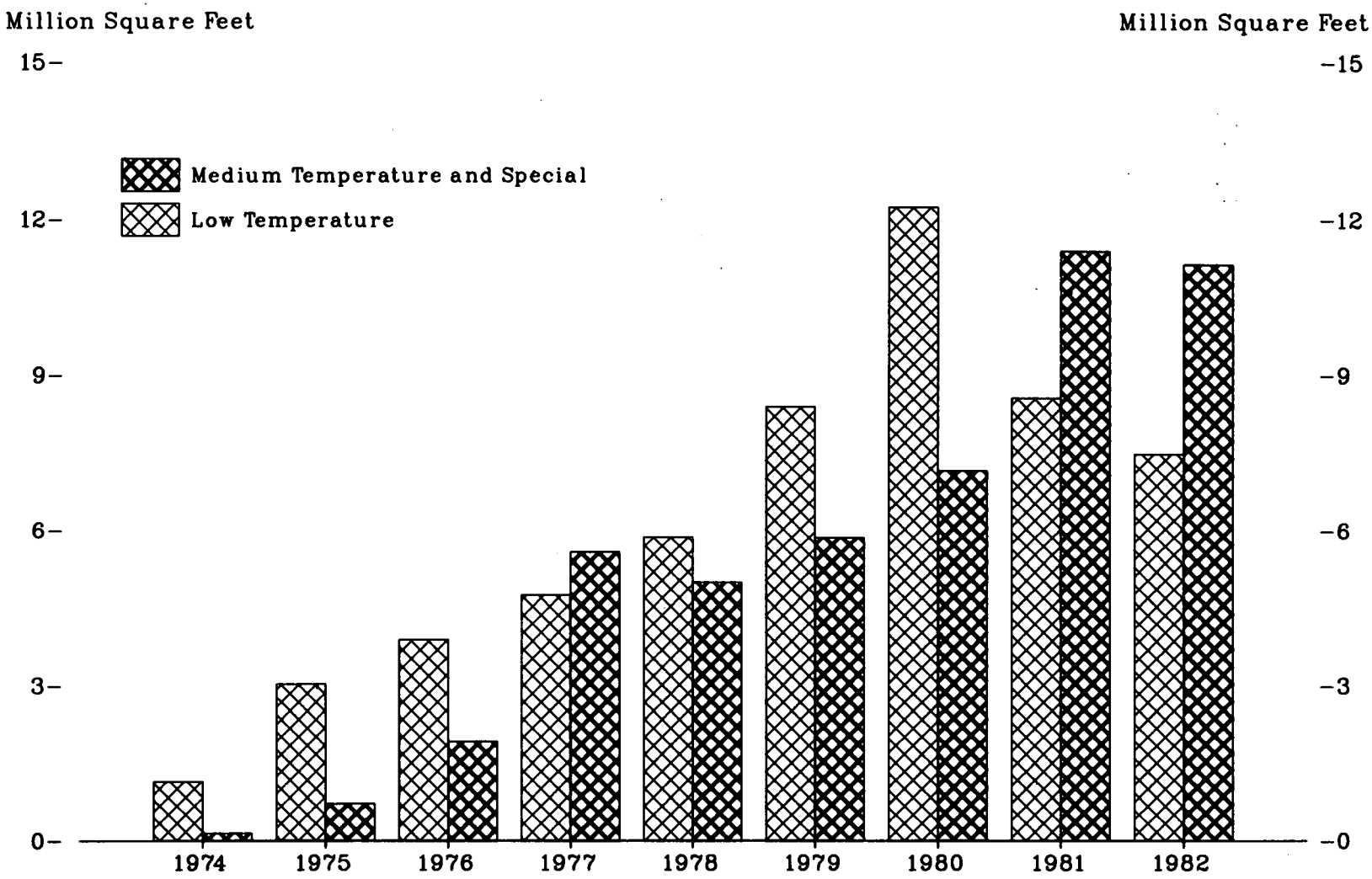


Table 100. Producer Shipments of Solar Collectors, 1974-1982

Year	Low-Temperature Collectors [1]		Medium-Temperature, Special, and Other Collectors [2]	
	Number of Manufacturers	Quantity Shipped (million square feet)	Number of Manufacturers	Quantity Shipped (million square feet)
1974	6	1.14	39	0.14
1975	13	3.03	118	0.72
1976	19	3.88	203	1.92
1977	52	4.74	297	5.57
1978	81	5.87	180	4.99
1979	74	8.39	250	5.86
1980	73	12.23	245	7.16
1981	75	8.56	267	11.39
1982	61	7.48	247	11.14

[1] Low-temperature collectors are used almost exclusively for swimming pool heating.
[2] Medium-temperature collectors are used primarily for space heating and domestic water heating. Special collectors include evacuated-tube collectors and concentrating collectors; uses include domestic water heating, space heating, and space cooling.
Note: Manufacturers producing more than one type of collector are accounted for in the respective listing.
Sources: •1974 through 1976—Federal Energy Administration, *Solar Collector Manufacturing Activity*, semi-annual • 1977 through 1981—Energy Information Administration, *Solar Collector Manufacturing Activity, July through December, 1981*. March 1982 (semi-annual), •1982—Energy Information Administration, *Solar Collector Manufacturing Activity, 1982*.

Figure 104. Producer Shipments of Solar Collectors by Type of Collector and Application, 1982

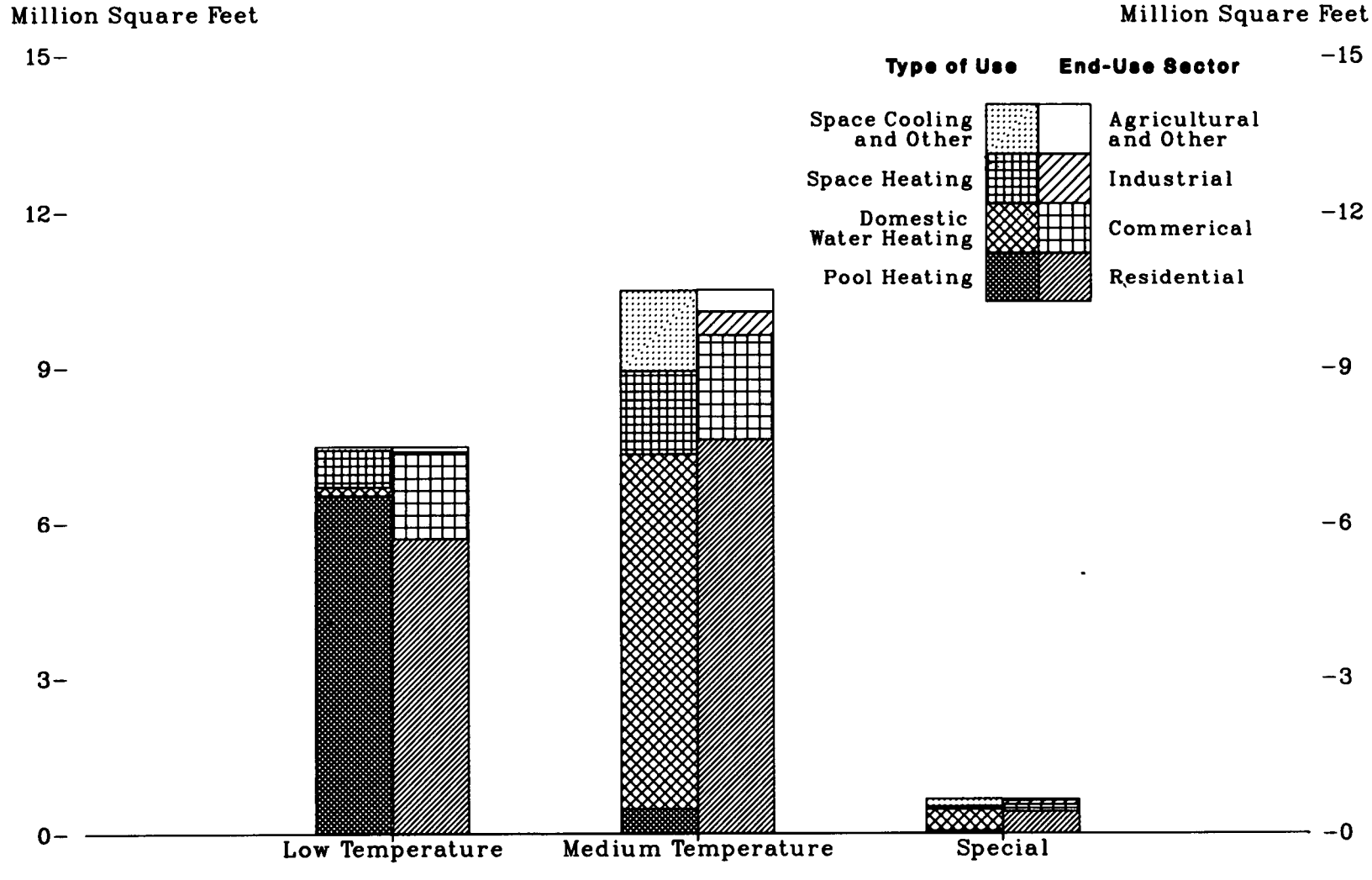


Table 101. Producer Shipments of Solar Collectors by Type of Collector and Application, 1982

(Million Square Feet)

Application	Type of Collector				
		Medium-Temperature			
	Low Temperature	Liquid	Air	Special and Other	Total
Type of Use					
Pool Heating	6.53	0.47	[1]	0.04	7.04
Domestic Hot Water	0.17	6.78	0.08	0.42	7.45
Space Heating	0.71	1.07	0.53	0.05	2.36
Space Cooling	0	0.02	[1]	0.05	0.07
Other	0.07	1.02	0.51	0.10	1.70
Total	7.48	9.36	1.13	0.65	18.62
End-Use Sector					
Residential	5.69	6.71	0.90	0.42	13.73
Commerical	1.66	1.81	0.20	0.13	3.79
Industrial	0.03	0.45	[1]	0.08	0.56
Agricultural	0.09	0.05	0.02	0	0.16
Other	0.01	0.34	0.01	0.02	0.38
Total	7.48	9.36	1.13	0.65	18.62

[1] Less than 0.005 million square feet.
Note: Sum of components may not equal total due to independent rounding.
Source: Energy Information Administration, *Solar Collector Manufacturing Activity, 1982.*

Glossary

Alcohol. The family name of a group of organic chemical compounds composed of carbon, hydrogen, and oxygen. The series of molecules vary in chain length and are composed of a hydrocarbon plus a hydroxyl group (CH–(CH)n–OH). Alcohol includes methanol and ethanol.

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. Includes meta-anthracite and semi-anthracite. Conforms to ASTM Specification D388 for anthracite.

Apparent Consumption, Natural Gas (International). The total of an individual nation's marketed natural gas production plus imports less exports.

Asphalt. A dark-brown-to-black cement-like material containing bitumens as the predominant constituents, obtained by petroleum processing. The definition includes crude asphalt as well as the following finished products: cements, fluxes, the asphalt content of emulsions (exclusive of water), and petroleum distillates blended with asphalt to make cutback asphalts.

ASTM. The acronym for the American Society for Testing and Materials.

Aviation Gasoline, Finished. All special grades of gasoline for use in aviation reciprocating engines, as given in ASTM Specification D910. Excludes blending components that will be used in blending or compounding into finished aviation gasoline.

Aviation Gasoline Blending Components. Finished components in the gasoline range that will be used for blending or compounding into finished aviation gasoline.

Base Gas. The total volume of natural gas in underground storage reservoirs that will maintain the required rate of delivery during an output cycle.

Base Production Control Level. (1) Prior to February 1, 1976: the total number of barrels of domestic crude oil produced and sold from a particular property in the corresponding month of 1972. If domestic crude oil was not produced and sold from that property in every month of 1972, an estimate is derived by dividing the annual total by 12. (2)Effective February 1, 1976: the total number of barrels of crude oil produced and sold from the property during calendar year 1975, divided by 365, and multiplied by the number of days in the particular month during 1975. A producer may elect to use the total number of barrels of crude oil produced and sold from the property during calendar year 1972, divided by 366, and multiplied by the number of days in the particular month during 1972.

Bituminous Coal. A coal that is high in carbonaceous matter having a volatility greater than anthracite and a calorific value greater than lignite. Often referred to in the United States as soft coal. Conforms to ASTM Specification D388 for bituminous coal. It is used primarily to generate electricity, to make coal coke, and for 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 IT (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 straight-chain or branch-chain hydrocarbon (C_4H_{10}). It is extracted from natural gas or refinery gas streams. It includes isobutane and normal butane and is covered by ASTM Specification D1835 and Gas Processors Association Specifications for commercial butane. It is used primarily for blending into motor gasoline, for residential and commercial heating, and for industrial purposes, especially the manufacture of chemicals and synthetic rubber.

Class A Electric Utility. A utility having annual electric operating revenues of $2.5 million or more.

Class B Electric Utility. A utility having annual electric operating revenues of $1.0 million or more but less than $2.5 million.

Coal. Includes all ranks of coal—anthracite, bituminous coal (including subbituminous coal), and lignite—conforming to ASTM Specification D388.

Coal Coke. Bituminous coal from which constituents have been driven off by heat so that the fixed carbon and the ash are fused together. It is used primarily in blast furnaces for smelting ores, especially iron ore.

Cost, Insurance, and Freight (C.I.F.). A term used in sales price contracts for both domestic and export sales. In general, the sales price includes the cost of the goods, the freight charges to a named destination, and the insurance charges on the goods shipped. The seller may waive insurance and choose to assume responsibility for any loss or damage. Regarding domestic coal sales, the sales price includes all charges for delivering the coal to the electric power utility excluding demurrage at the plant and unloading charges. Federal Power Commission Form 423, on which these data are collected, refers to this price as "FOB plant" price.

Crude Oil (Including Lease Condensate). A mixture of hydrocarbons that existed 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 likewise excluded where identifiable.

Crude Oil Refinery Input. Total crude oil (including lease condensate) input to crude oil distillation units and other units for processing.

Crude Oil Stocks. Stocks of crude oil and lease condensate held at refineries, in pipelines, at pipeline terminals, and on leases.

Crude Oil Wellhead Price. Composite average price per barrel of first purchases of domestic crude oil, including sales of lower tier, upper tier, stripper, Alaskan North Slope, Naval Petroleum Reserves, incremental tertiary, newly discovered, marginal property, heavy crude, tertiary incentive, and other decontrolled oil. Since January 1981, prices by sales group have not been available.

Demonstrated Reserve Base of Coal. Known in-place coals of all rank that are technically and economically minable at the time of evaluation. It includes measured and indicated coal resources. It is estimated that at least one-half of the in-place coals can be recovered. (See **Indicated Resources, Coal; and Measured Resources, Coal.**)

Distillate Fuel Oil. A general classification for one of the petroleum fractions produced in conventional distillation operations. Included are products known as No. 1 and No. 2 heating oils, diesel fuels, and No. 4 fuel oil, which conform to either ASTM Specification D396 or D975. These products are used primarily for space heating, on- and off-highway diesel engine fuel (including railroad engine fuel), and electric power generation.

Dry Hole. An exploratory or development well found to be incapable of producing either oil or gas in sufficient quantities to justify completion as an oil or gas well.

Dry Natural Gas Production. Derived by subtracting extraction loss from "marketed production." It represents the amount of domestic gas production that is available to be marketed and consumed as a gas.

Eliminations. Revenues and expenses resulting from transactions between segments. Consolidated company accounts do not include intersegment revenues and expenses. Therefore, such intersegment transactions must be eliminated.

Ethane. A normally gaseous, colorless, straight-chain hydrocarbon (C_2H_6) extracted from natural gas or refinery gas streams. It is used primarily as petrochemical feedstock for eventual production of chemicals and plastic materials.

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 from the 50 States and the District of Columbia to foreign countries, Puerto Rico, the Virgin Islands, and other U.S. possessions and territories.

Extraction Loss. The reduction in volume of natural gas due to the removal of natural gas constituents, such as ethane, propane, and butane, at natural gas processing plants.

Federally Administered Lands. Includes all public lands (Federal), Indian lands, Naval Petroleum Reserve, National Petroleum Reserve (Alaska),

Outer Continental Shelf, and acquired lands (lands formerly held by the Department of Agriculture and now under the jurisdiction of the Department of the Interior).

Free Alongside Ship (F.A.S.). This represents the transaction value of imports at the foreign port of exportation. It is based on the purchase price, i.e., the actual transaction value, and generally includes all charges incurred in placing the merchandise alongside the carrier at the foreign port of exportation.

Free on Board (F.O.B.). A term used in sales price quotations meaning, in general, that the seller assumes all responsibility and costs up to the specific point of delivery and that the buyer takes over responsibility and costs at that same point.

Fuelwood. Wood and wood products used as fuel. It includes roundwood, limbwood, bark, charcoal, forest residues, sawdust, wood and pulp waste, and spent pulping liquor.

Gasohol. A blend of finished motor gasoline (leaded or unleaded) and alcohol (generally ethanol but sometimes methanol) in which 10 percent or more of the product is alcohol.

Gas Well. A well completed for the production of natural gas from one or more gas zones or reservoirs. Such wells have no completions for the production of crude oil.

Geothermal Power. Electricity generated at a conventional-type steam electric powerplant whose turbines are driven either by steam produced from hot water or by natural stream, both trapped below the surface of the earth's crust.

Household. A group of 12 persons or less that occupy the same housing unit (see **Housing Unit**) as their usual or permanent place of residence. Persons include babies, lodgers, boarders, and persons who live in the housing unit but are traveling or in a hospital. Excluded are persons who are away from home as college students or members of the Armed Services.

Housing Unit. A structure or part of a structure in which a household (see **Household**) lives or could live, with access to the outside of the building either directly or through a common hall. Housing units do not include group quarters, such as prisons, hospitals, dormitories, nursing homes, fraternity/sorority houses, or convents, in which 10 or more unrelated persons live. Hotels, motel rooms, mobile homes, and trailers are considered housing units if permanently occupied by a household.

Hydropower. Electricity generated by an electric powerplant whose turbines are driven by falling water.

Implicit GNP Price Deflator. A measure of the change in U.S. price levels, which is the ratio of the current value of goods and services to the base year value for the same goods and services.

Imports. Receipts into the 50 States and the District of Columbia of foreign goods (including goods from U.S. territories and U.S. Foreign Trade Zones) that are classified by customs officials as "imports for consumption" or "withdrawals from bonded warehouses for consumption," including withdrawals from bonded warehouses for military offshore use and for bunkering of vessels or aircraft engaged in international commerce. See also **Petroleum Imports.**

Indicated Resources, Coal. Coal resources for which estimates for the rank, quality, and quantity have been computed partly from sample analyses and measurements and partly from reasonable geologic projections (see **Demonstrated Reserve Base of Coal).**

International Bunkers. Fuel loaded on vessels and aircraft engaged in international commerce for use as fuel by the vessel or aircraft.

Isobutane. A normally colorless paraffinic branch-chain hydrocarbon ($(CH_3)_3CH$) extracted from natural gas or refinery gas streams.

Jet Fuel. Includes both naphtha-type and kerosene-type jet fuel meeting standards for use in aircraft turbine engines or meeting ASTM Specification D1655. Although most jet fuel is used in aircraft, some is used for other purposes, such as fuel for turbines to produce electricity.

Kerosene. A petroleum middle distillate having burning properties suitable for use as an illuminant when burned in wick lamps. Included are No. 1-K and No. 2-K recognized in ASTM Specification D3699 and grades of kerosene called range oil having properties similar to No. 1 fuel oil, and is used primarily in space heaters, cooking stoves, and water heaters.

Landed Cost of Imported Crude Oil. Includes the purchase price at the foreign port (or U.S. land border), transportation and insurance costs,

wharfage and demurrage, brokerage fees, import fees and duties, license (ticket) fees, and transportation costs to the refinery. Averages are computed based on major importers, which account for an estimated 90 to 95 percent of total crude oil imports. Coverage includes the United States and its territories.

Lease Condensate. A natural gas liquid recovered from gas-well gas (associated and non-associated) in lease separators or natural gas field facilities. Lease condensate consists primarily of pentanes and heavier hydrocarbons. 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.

Line Miles of Seismic Exploration. The distance along the earth's surface that is covered by seismic surveying.

Liquefied Gases. Propane, propylene, butane, butylene, ethane-propane mixtures, propane-butane mixtures, and isobutane produced at refineries or natural gas processing plants, including plants that fractionate raw natural gas plant liquids. Excludes ethane and ethylene.

Lower Tier Crude Oil. The total number of barrels of crude oil produced and sold from a property in a specific month up to the amount of base period production. Base period production equals the lesser of 1972 or 1975 production, with a downward adjustment to take account of depletion of the oilfield (see **Base Production Control Level**). Crude oil prices were decontrolled in January 1981.

Low-Temperature Solar Collector. A collector that generally operates in the temperature range below 110° F. Typically, it has no glazing or insulation and is made of plastic or rubber, although it may be made of metal.

Lubricants. Substances used to reduce friction between bearing surfaces. Petroleum lubricants may be produced either from distillates or residues. Other substances may be added to impart or improve certain required properties. Lubricants include all grades of lubricating oils from spindle oil to cylinder oil and those used in greases. The three categories include bright stock lubricants, and other lubricants, lubricating oil base stock used in finished lubricating oils and greases, including black, coastal, and red oils.

Marketed Production. This quantity is derived. It is gross withdrawals of natural gas from production reservoirs, less gas used for reservoir repressuring, quantities vented and flared, and nonhydrocarbon gases removed in treating and processing operations.

Maximum Dependable Capacity, Net. Represents the dependable main-unit net capacity of domestic nuclear powerplant reactors and generally varies throughout the year because the unit efficiency varies with seasonal cooling water temperature variations. Usually maximum dependable capacity is the highest net dependable output of the turbine generator during the most restrictive seasonal conditions (usually summer).

Measured Resources, Coal. Coal resources for which estimates of the quality and quantity have been computed within a margin of error of less than 20 percent, by analyzing measurements taken from closely spaced geologically well-known sample sites (see **Demonstrated Reserve Base of Coal**).

Medium-Temperature Solar Collector. A collector that generally operates in the temperature range of 140° F. to 180° F. Typically, it has one or two glazings, a metal frame, a metal absorption panel with integral flow channels or attached tubing (liquid collector) or with integral ducting (air collector), and insulation on the sides and back of the panel.

Metallurgical Coal. A high-quality bituminous coal suitable for making coal coke.

Metropolitan Area. A group of households located within Metropolitan Statistical Areas (MSA's) as defined in the 1980 Census. Except in New England, an MSA is a county or group of contiguous counties that contain at least one city of 50,000 inhabitants or more, or "twin cities" with a combined population of at least 50,000. The contiguous counties are included in an MSA if, according to certain criteria, they are essentially metropolitan in character and are socially and economically integrated with the central city. In New England, MSA's consist of towns and cities, rather than counties.

Miscellaneous Petroleum Products. Includes all finished products not classified elsewhere, such as petrolatum, absorption oils, ram-jet fuel, petroleum rocket fuels, synthetic natural gas feedstocks, specialty oils, and medicinal oils.

Motor Gasoline Blending Components. Finished components in the gasoline range that will be used for blending or compounding into finished motor gasoline. Pool gasoline (gasoline needing no processing other than blending) is included in this category.

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. Blendstock is excluded until blending has been completed. Alcohol that is to be used in the blending of gasohol is also excluded.

Motor Gasoline, Regular Grade. Finished motor gasoline (see above) that has an antiknock designation of 2 or less for unleaded motor gasoline and 3 or less for leaded motor gasoline.

Native Gas. The total volume of natural gas indigenous to the storage reservoir at the time the gas storage started.

Natural Gas. A mixture of hydrocarbons and small quantities of various nonhydrocarbons existing in the gaseous phase or in solution with crude oil in underground reservoirs.

Natural Gas, Dry. See **Dry Natural Gas Production.**

Natural Gas, End-Use Average Price. Average price per specified unit, including all taxes, at the point of consumption.

Natural Gas Gross Withdrawals. Full well stream volume of produced natural gas excluding condensate separated at the lease.

Natural Gas Liquids. Those hydrocarbons in natural gas that are separated as a liquid from the gas at lease separators, field facilities, and natural gas processing plants. Natural gas liquids include natural gas plant liquids and lease condensate.

Natural Gas Plant Liquids. Natural gas liquids recovered from natural gas processing plants, and in some situations, from natural gas field facilities. Natural gas liquids extracted by fractionators are also included. These liquids are defined according to the published specifications of the Gas Processors Association and the American Society for Testing and Materials 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 wellhead price of natural gas is calculated by dividing the total reported value at the wellhead by the total quantity produced as reported by the appropriate agencies of individual producing States and the U.S. Geological Survey. The price includes all costs prior to shipment from the lease including gathering and compression costs in addition to State production, severance, and/or similar charges.

Natural Gas, Wet. Natural gas prior to the extraction of liquids and other miscellaneous products.

Net Income. Operating income plus earnings from unconsolidated affiliates; gains from disposition of property, plant, and equipment; minority interest income; and foreign currency translation effects less income taxes, extraordinary items, and the cumulative effect of accounting changes.

Net Ownership Interest. The sum of net working interest and royalty interest (see **Net Working Interest** and **Royalty Interest**). Net ownership interest applies to both production and reserves.

Net Property, Plant, and Equipment. The original cost of property, plant, and equipment (PP&E), less accumulated depreciation.

Net Working Interest. A company's working interest, not including any basic royalty or overriding royalty interests (see **Working Interest**).

New Crude Oil. (See **Upper Tier Crude Oil.**)

Nonhydrocarbon Gases. Typical nonhydrocarbon gases which may be present in reservoir natural gas are carbon dioxide, helium, hydrogen sulfide, and nitrogen.

Nonmetropolitan Area. Households not located within Metropolitan Statistical Areas as defined in the 1980 Census.

Nontraceables. Those revenues, costs, assets, and liabilities that cannot be directly attributed to a type of business or that cannot be assigned to a type of business by use of a reasonable allocation method developed on the basis of operating-level realities.

Nuclear Power. Electricity generated at an electric powerplant 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.

Old Crude Oil. (See **Lower Tier Crude Oil.**)

Operating Income. Operating revenues less operating expenses. Excludes items of other revenue and expense such as equity in earnings of unconsolidated affiliates, dividends, interest income and expense, income taxes, extraordinary items, and cumulative effect of accounting charges.

Organization for Economic Cooperation and Development (OECD). Current membership includes: 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 membership includes: Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela. Data for Saudi Arabia and Kuwait include their share from the Partitioned Zone (formerly Neutral Zone).

Other Hydrocarbons (Petroleum). Other materials processed at refineries. Includes coal tar derivatives, hydrogen, gilsonite, and natural gas received by the refinery for reforming into hydrogen.

Paraffin Wax. A solid or semisolid material derived from petroleum distillates and residuals by chilling, dewaxing, precipitating with a solid, and de-oiling. When separated from solutions it is a lightly colored, more or less translucent, crystalline mass, slightly greasy to touch, and consists of a mixture of solid hydrocarbons in which the paraffin series predominates. Included are all marketable waxes whether crude scale or refined. Used primarily as industrial coatings for surface protection.

Pentanes Plus. A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas. Includes isopentane, natural gasoline, and plant condensate.

Petrochemical Feedstocks. Chemical feedstocks derived from petroleum, principally for the manufacture of chemicals, synthetic rubber, and a variety of plastics. The categories reported are "naphtha—less than 400° F. end-point" and "other oils over 400° F. end-point."

Petroleum. A generic term applied to oil and oil products in all forms, such as crude oil, lease condensate, unfinished oils, refined petroleum products, natural gas plant liquids, and nonhydrocarbon compounds blended into finished petroleum products.

Petroleum Coke. A solid residue; 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 marketed or catalyst petroleum coke.

Petroleum Imports. Imports of petroleum into the 50 States and the District of Columbia from foreign countries, U.S. territories, and the U.S. Foreign Trade Zones. 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. (See **Refined Petroleum Products.**)

Plant Condensate. One of the natural gas plant liquids, mostly pentanes and heavier hydrocarbons, recovered and separated as liquids at gas inlet separators or scrubbers in processing plants. Plant condensate is not suitable for blending into finished motor gasoline. It is usually blended with crude oil for distilling or processed at other refinery units.

Primary Stocks. (See **Refined Petroleum Product Stocks, Primary.**)

Processing Gain. Represents the amount by which the total volume of refinery output is greater than the volume of input for a given period of time. This difference is due to the processing of crude oil and other hydrocarbons into products the majority of which are less dense than the crude oil processed. Therefore, in terms of volume (barrels), the total output of products is greater than the input.

Propane. A normally colorless gaseous, straight-chain 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. It 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.

Property, Plant, and Equipment (PP&E), Additions to. The current year's expenditures on property, plant, and equipment. The amount is predicated upon each reporting company's accounting practices. That is, accounting practices with regard to capitalization of certain items may differ across companies, and therefore this figure is a function of each reporting company's policy.

Property, Plant, and Equipment (PP&E), Net. The original cost of property, plant, and equipment less accumulated depreciation.

Proved Reserves, Crude Oil. The estimated quantities of all liquids statistically defined as crude oil that geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

Proved Reserves, Natural Gas. The estimated quantities of natural gas that analysis of geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known crude oil and natural gas reservoirs under existing economic and operating conditions.

Proved Reserves, Natural Gas Liquids. Estimates include: (1) reserves of liquids that are expected to be recovered from associated and nonassociated gas produced from gas wells and processed through lease separators, and (2) reserves of liquids expected to be recovered from associated-dissolved and nonassociated gas when processed in field facilities or gas processing plants. Estimates of proved reserves of natural gas liquids are based on (1) proved reserves of natural gas at the time of estimation, and (2) rates at which liquids can be recovered from natural gas by using processing equipment of the type currently installed or planned at the time of estimation.

Refined 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.

Refined Petroleum Product 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. Primary Stocks excludes stocks of foreign origin that are held in bonded warehouse storage.

Refined Petroleum Products Supplied. See Explanatory Note 5.

Refiner Acquisition Cost. The cost of crude oil to the refiner, including transportation and fees. The composite cost is the average of domestic and imported crude oil costs and represents the amount of crude oil cost that refiners may pass on to their customers. Also see Explanatory Note 8.

Reservoir Repressuring. The injection of natural gas into oil and gas reservoir formations for pressure maintenance and cycling.

Residual Fuel Oil. The topped crude of refinery operations that includes No. 5 and No. 6 fuel oils as defined in ASTM Specification D396, Navy Special fuel oil, and Bunker C fuel oil. Residual fuel oil is used for the production of electric power, space heating, vessel bunkering, and for various industrial purposes. Imports of residual fuel oil include "imported crude oil burned as fuel."

Residue Gas. Natural gas from which natural gas processing plant liquid products and, in some cases, nonhydrocarbon components have been extracted.

Road Oil. Any heavy petroleum oil, including residual asphaltic oil used as a dust palliative and surface treatment on roads and highways. It is generally produced in six grades from O, the most liquid, to 5, the most viscous.

Rotary Rig. A machine, used for drilling wells, that employs a rotating tube attached to a bit for boring holes through rock.

Royalty Interest. An interest in a mineral property provided through a contractual arrangement that gives the owner of the interest the right to a fractional share of production or proceeds therefrom, that does not contain rights and obligations of operating a mineral property, and that is normally free and clear of exploration, development, and operating costs, except production taxes.

Special Naphthas. All finished products within the gasoline range, specially refined to a specified flash point and boiling range, for use as paint thinners, cleaners, and solvents, including commercial hexane conforming with ASTM Specification D1836, and cleaning solvent conforming to ASTM Specification D484. Excluded are naphthas to be blended or marketed as motor gasoline or aviation gasoline, or to be used as petrochemical and synthetic natural gas (SNG) feedstock.

Special Solar Collector. An evacuated tube collector or a concentrating (focusing) collector. Special collectors operate in the temperature range from just above ambient temperature (low concentration for pool heating) to several hundred degrees Fahrenheit (high concentration for air conditioning and specialized industrial processes).

Spot Price. A transaction price concluded "on the spot," that is, on a one-time, prompt basis; usually the transaction involves only one specific quantity of product. This contrasts with a term contract sale price, which obligates the seller to deliver a product at an agreed frequency and price over an extended period.

Startup Test Phase of Nuclear Powerplant. A nuclear powerplant that has been licensed by the Nuclear Regulatory Commission to operate, but that is in the initial testing phase during which production of electricity may not be continuous. In general, when the electric utility is satisfied with the plant's performance, it formally accepts the plant from the manufacturer, and places it in "commercial operation" status. A request is then submitted to the appropriate utility rate commission to include the powerplant in the rate base calculation.

Still Gas (Refinery Gas). Any form or mixture of gas produced in refineries by distillation, cracking, reforming, and other processes. The principal constituents are methane, ethane, ethylene, normal butane, butylene, propane, propylene, etc. It is used primarily as refinery fuel and petrochemical feedstock.

Strategic Petroleum Reserve (SPR). Petroleum stocks maintained by the Federal Government for use during periods of major supply interruption.

Stripper Well Property. A property whose average daily production of crude oil per well (excluding condensate recovered in nonassociated natural gas production) did not exceed an average of 10 barrels per day during any preceding consecutive 12-month period beginning after December 31, 1972.

Subbituminous Coal. A dull, black coal of rank intermediate between lignite and bituminous coal. Conforms to ASTM Specification D388 for subbituminous coal. Used almost exclusively for electric power generation.

Supplemental Gaseous Fuels. Other gaseous fuels, such as synthetic natural gas, propane-air, manufactured gas, biomass gas, coke oven gas, and refinery (still) gas, normally mixed with natural gas prior to distribution.

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.

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 crude oil imports less changes in crude oil stocks. Total disposition of crude oil is the sum of refinery input of crude oil, crude oil exports, crude oil burned as fuel, and crude oil losses.

Undiscovered Recoverable Resources (Crude Oil and Natural Gas). Those economic resources of crude oil and natural gas, yet undiscovered, that are estimated to exist in favorable geologic settings.

Unfinished Oil. Includes all oils requiring further refinery processing, except those requiring only mechanical blending.

Unfractionated Streams. Mixtures of unsegregated natural gas liquid components, excluding those in plant condensate. This product is extracted from natural gas.

United States. Unless otherwise noted, "United States" in this publication means the 50 States and the District of Columbia. U.S. exports

include shipments to U.S. Territories, and imports include receipts from U.S. Territories.

Upper Tier Crude Oil. (1) Prior to February 1, 1976: the total number of barrels of domestic crude oil produced and sold in a specific month, less the base production control level for that month and less the current cumulative deficiency. (2) February 1, 1976, through August 31, 1976: the total number of barrels of domestic crude oil produced and sold in a specific month, less the property's base production control level for that month and less the current cumulative deficiency since February 1, 1976. Includes new crude oil and crude oil produced from a stripper well property. (3) Since September 1, 1976: upper tier crude oil excludes crude oil produced from a stripper well property. Crude oil prices were decontrolled in January 1981.

Uranium Resources. Generally refers to natural uranium occurrences that are known or estimated to exist as a fuel base for nuclear power program development. Uranium resources are further categorized as either reserves or potential resources. Reserves are defined as uranium deposits that have been clearly established by detailed investigation of drill hole samples and other similar geologic procedures. Potential resources are less reliable and further categorized as probable, possible, and speculative resources. Probable potential resources comprise deposits estimated to exist adjacent to known deposits or areas with known potential. Possible potential resources are those estimated to occur in undiscovered or partly defined deposits in formations or geologic settings productive elsewhere within the same geologic province. Speculative potential resources are those estimated to occur in formations, geologic settings, or geologic provinces not previously productive.

Wax. A solid or semi-solid material derived from petroleum distillates or residues. It is light-colored, more-or-less translucent crystalline mass, slightly greasy to the touch, consisting of a mixture of solid hydrocarbons in which the paraffin series predominates. Includes all marketable wax whether crude scale or fully refined. The three grades included are microcrystalline, crystalline—fully refined, and crystalline—other.

Well. A hole drilled for the purpose of finding or producing crude oil or natural gas or providing services related to the production of crude oil or natural gas. Wells are classified as oil wells, gas wells, dry holes, stratigraphic or core tests, or service wells.

Wood and Waste (As Used at Electric Utilities). Wood chips, sawdust, hogged fuel, garbage, chemically inert gas, bagasse, and sewerage plant gas used for the generation of electricity.

Working Gas. The total volume of gas in a storage reservoir that is in excess of the base gas.

Working Interest. An interest in a mineral property that entitles the owner of that interest to all or a share of mineral production from the property, usually subject to a royalty.

Explanatory Notes

1. Production of Electricity. Data on the production of electricity in the United States represents gross electricity output measured at the generator terminals, minus powerplant use (net electricity generated). International nuclear electricity production data are gross electricity output.

2. Consumption of Primary Energy by End-Use Sector. Sector data are derived from the end-use sector table of each energy commodity. The "Other" sector in the Electric Utility Sales table is allocated to the Residential and Commercial Sector, except for the railways' portion of "Other," which is allocated to the Transportation Sector.

3. Primary Energy Production—International. Includes only crude oil and lease condensate, natural gas plant liquids, dry natural gas, coal, and electricity from hydropower and nuclear power. Crude oil production is measured at the wellhead and includes lease condensate. Natural gas plant liquids are products obtained from processing natural gas at natural gas processing plants, including natural gas plants, cycling plants, and fractionators. Dry natural gas production is that amount of natural gas production that is available to be marketed and consumed as a gas. Coal (anthracite, subanthracite, bituminous, subbituminous, lignite, and brown coal) production is the sum of sales, mine consumption, issues to miners, and issues to coking, briquetting, and other ancillary plants at mines. Coal production data include quantities extracted from surface and underground workings and normally exclude wastes removed at mines or associated preparation plants. The production of electricity from hydropower and nuclear power includes both electric utility and industrial production reported on a net basis, thus excluding electricity that is generally used by the electric powerplant for its own operating purposes or electricity losses in the transformers that are considered integral parts of the station.

4. Reclassified. Accurate calculation of the quantity of petroleum products supplied to the domestic market is complicated by the recycling of products at the refinery, the renaming of products involved in a transfer, and the receipt of products from outside of the primary supply system. Beginning in 1981, a single adjustment (always a negative quantity) is made to total product supplied to correct this accounting problem. The calculation of this adjustment, called "reclassified," involves only unfinished oils and gasoline blending components. It is the sum of their net changes in primary stocks (net withdrawals is a plus quantity, net additions is a minus quantity) plus imports minus net input to refineries.

5. Refined Petroleum Product Supplied. Total refined petroleum product supplied is the sum of all refined petroleum products supplied. For each product, the amount supplied is calculated by adding production, crude oil burned directly, and imports and subtracting changes in primary stocks (net withdrawals is a plus quantity; net additions is a minus quantity) and exports. This term is synonymous with the term "Refined Petroleum Product Consumption" in the Energy Overview Section. End-use sector data for petroleum products used in more than one sector are derived from surveys of sales to ultimate consumers by refiners, marketers, distributors, and dealers and from receipts at electric utilities. See Explanatory Notes 4 and 6.

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

7. Primary Oil Stocks—OECD. Oil stocks reported by the Organization for Economic Cooperation and Development (OECD) include those held at (or in) the following locations or facilities: leases, refineries, natural gas processing plants, bulk terminals, tanks associated with pipelines, barges, intercoastal tankers, ocean tankers in port, inland ship bunkers, major final consumers, and the strategic storage reserve. For an individual country, stocks include those held for the account of that country but located in another country. U.S. stocks include those held in the 50 States and the District of Columbia. "Other OECD" includes

stocks held in Puerto Rico and the Virgin Islands. The OECD definition of oil stocks excludes oil in pipelines, rail tank cars, tank trucks, oceangoing ship bunkers, service stations, retail stores, and tankers at sea. An exception is U.S. stocks which include oil in pipelines.

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

9. Natural Gas Consumption. Natural gas consumption statistics are compiled from a survey of natural gas production, transmission, and distribution companies and electric utility companies. Consumption by end-use sector from these surveys is compiled on a national and individual State basis and then balanced with national and individual State supply data. Included in end-use data are the following: Commercial Sector—consumption by manufacturing establishments, by municipalities for institutional heating and lighting, and those engaged in agriculture, forestry, and fishing; Electric Utility Sector—consumption by electric utilities for the generation of electric power; Industrial Sector—consumption by establishments engaged primarily in processing unfinished materials into another form of product (includes mining, petroleum refining, manufacturing, and natural gas industry use for lease and plant fuel); Residential Sector—consumption by private households for space heating, cooking, and other household uses; Transportation Sector—natural gas transmission (pipeline) fuel.

10. Coal Consumption. Data in this report on the consumption of bituminous coal (including subbituminous coal), lignite, and anthracite are generated primarily from consumption data reported in surveys. Included are data reported by all electric utilities companies and coke plant companies. Data on coal consumption by all industrial and manufacturing establishments and by the residential and commercial sector are based on distribution data obtained quarterly from coal companies. Included in end-use sector data are the following: Electric Utility Sector—consumption by privately- and publicly-owned establishments engaged in the generation and/or distribution of electric power primarily for sale or resale; Industrial and Miscellaneous Sector—consumption at manufacturing plants, large commercial establishments, coking plants, and by agriculture, mining (other than coal mining) and construction industries; Transportation Sector—sales to railroads and vessel bunker fuel; Residential and Commercial Sector—retail dealer sales to households and small commercial establishments.

11. Electricity Sales. Data on the sales of electric utility electricity represent gross electricity output measured at the generator terminals, minus powerplant use and transmission and distribution losses. Included in each end-use sector are the following: Commercial Sector—sales of electricity to businesses that generally require less than 1,000 kilowatts of service; Industrial Sector—sales of electricity to businesses that generally require more than 1,000 kilowatts of service; Residential Sector—sales of electricity to residences for household purposes; "Other" Sector—sales of electricity to Government, railways, street lighting authorities, and sales not elsewhere included.

12. Operable Reactors and Capacity. Prior to 1973, the number of "Year-End Operable Reactors" includes reactors that were in commercial operation by December 31 of the stated year. Units decommissioned or inoperative for extended periods were generally included. Also included are two U.S. Department of Energy (DOE)-operated plants that supply electricity to the commercial grid. A third DOE plant, which does not distribute electricity to the grid, is excluded. For 1973 and forward, the number of reactors includes units issued full-power or operating licenses and generally does not include units in long-term shut-down status. Prior to 1973, "Year-End Capacity" figures are gross kilowatts of installed capacity. For 1973 and forward, the capacity is net Maximum Dependable Capacity (MDC), except for some units in start-up testing for which the Design Electrical Rating (DER) value is used. Starting with 1973, the restricted capacity of "derated" units (i.e., units for which the Nuclear Regulatory Commission or the operating utility has imposed a "power limit") is used in place of either the MDC or DER capacity. This provides a more realistic estimate of available capacity.

13. Financial Reporting System (FRS) Companies. The structure of the FRS data system is designed to permit review of the functional performance of energy companies in total, as well as specific functions and geographic areas of operation. Domestic operations include Puerto Rico and the Virgin Islands. Foreign operations exclude these areas. The following are the FRS companies:

Amerada Hess Corporation
American Petrofina, Incorporated
Ashland Oil, Incorporated
Atlantic Richfield Company
Burlington Northern, Incorporated
Cities Service Oil Company
Conoco Incorporated
Exxon Corporation
Getty Oil Company
Gulf Oil Corporation
Kerr-McGee Corporation
Marathon Oil Company
Mobil Oil Corporation
Occidental Petroleum Corporation
Phillips Petroleum Company
Shell Oil Company
Standard Oil Company (an Indiana Corporation)
Standard Oil Company of California
Sun Company, Incorporated
Tenneco Incorporated
Texaco, Incorporated
The Coastal Corporation
The Standard Oil Company (an Ohio Corporation)
The Superior Oil Company
Union Oil Company of California
Union Pacific Corporation

Units of Measure, Conversion Factors, Price Deflators, and Energy Equivalents

Approximate Heat Content of Refined Petroleum Products (Million Btu per Barrel)

Asphalt	6.636
Aviation gasoline	5.048
Butane	4.326
Butane-propane mixture*	4.130
Distillate fuel oil	5.825
Ethane	3.082
Ethane-propane mixture**	3.308
Isobutane	3.974
Jet fuel—kerosene type	5.670
Jet fuel—naphtha type	5.355
Kerosene	5.670
Lubricants	6.065
Motor gasoline	5.253
Natural gasoline and Isopentane	4.620
Pentane Plus	4.620
Petrochemical feedstocks	
Naphtha 400° F or less	5.248
Other Oils over 400° F	5.825
Still gas	6.000
Petroleum coke	6.024
Plant condensate	5.418
Propane	3.836
Residual fuel oil	6.287
Road oil	6.636
Special naphtha	5.248
Still gas	6.000
Unfinished oils	5.825
Unfractionated stream	5.418
Wax	5.537
Miscellaneous	5.796

* 60 percent butane and 40 percent propane.
** 70 percent ethane and 30 percent propane.

Using Thermal Equivalent Conversion Factors

Btu conversion factors for hydrocarbon mixes are the weighted average of the Btu content of all hydrocarbons included in the mix. All final Btu factors are computed from *final* annual data. If the current year's final data are not available, preliminary Btu conversion factors are computed from the best available data.

Gross National Product (GNP) Implicit Price Deflators 1972=100

1949	52.49	1967	79.06
1950	53.56	1968	82.54
1951	57.09	1969	86.79
1952	57.92	1970	91.45
1953	58.82	1971	96.01
1954	59.55	1972	100.00
1955	60.84	1973	105.75
1956	62.79	1974	115.08
1957	64.93	1975	125.79
1958	66.04	1976	132.34
1959	67.60	1977	140.05
1960	68.70	1978	150.42
1961	69.33	1979	163.42
1962	70.61	1980	178.42
1963	71.67	1981	195.14
1964	72.77	1982	206.88
1965	74.36	1983	215.67
1966	76.76		

Source: U.S. Department of Commerce, Bureau of Economic Analysis

Weight

1 short ton	contains	2,000 pounds
1 metric ton	contains	1.102 short tons
1 long ton	contains	1.120 short tons

Volume

1 cubic foot	contains	0.028 cubic meters
1 cubic meter	contains	35.315 cubic feet
1 U.S. barrel	contains	42 U.S. gallons
1 Cord	contains	128 cubic feet

Conversion Factors for Crude Oil (Average Gravity)

1 U.S. barrel	weighs	0.136 metric tons
1 U.S. barrel	weighs	0.150 short tons
1 metric ton	contains	7.33 U.S. barrels
1 short ton	contains	6.65 U.S. barrels

Electricity Consumption ..... *3,412 Btu/kilowatt-hour*
Hardwood (Dry) ..... *8,000-9,000 Btu/pound*

Thermal Conversion Factors: Petroleum and Natural Gas Plant Liquids, 1949-1983

(Million Btu per Barrel)

Year	Petroleum Consumption				
	All Users	Residential and Commercial	Industrial	Transportation	Electric Utilities
1949	5.649	5.631	5.947	5.465	6.254
1950	5.649	5.626	5.940	5.461	6.254
1951	5.634	5.626	5.913	5.458	6.254
1952	5.621	5.621	5.905	5.442	6.254
1953	5.608	5.606	5.897	5.426	6.254
1954	5.595	5.603	5.883	5.412	6.254
1955	5.591	5.607	5.866	5.408	6.254
1956	5.585	5.601	5.856	5.406	6.254
1957	5.577	5.587	5.842	5.405	6.254
1958	5.567	5.582	5.832	5.393	6.254
1959	5.557	5.549	5.811	5.389	6.254
1960	5.555	5.570	5.799	5.388	6.267
1961	5.552	5.570	5.794	5.387	6.268
1962	5.545	5.555	5.783	5.386	6.267
1963	5.534	5.532	5.757	5.385	6.266
1964	5.528	5.517	5.727	5.389	6.267
1965	5.532	5.535	5.725	5.388	6.267
1966	5.532	5.523	5.717	5.390	6.266
1967	5.515	5.473	5.675	5.394	6.266
1968	5.504	5.450	5.638	5.398	6.263
1969	5.492	5.399	5.596	5.397	6.259
1970	5.503	5.404	5.598	5.395	6.252
1971	5.504	5.392	5.593	5.392	6.245
1972	5.500	5.368	5.559	5.390	6.233
1973	5.515	5.387	5.565	5.397	6.245
1974	5.504	5.377	5.537	5.394	6.238
1975	5.494	5.358	5.527	5.392	6.250
1976	5.504	5.383	5.536	5.396	6.251
1977	5.518	5.389	5.552	5.402	6.249
1978	5.519	5.382	5.546	5.407	6.251
1979	5.494	5.471	5.416	5.430	6.258
1980	5.479	5.468	5.376	5.440	6.254
1981	5.448	5.409	5.310	5.434	6.258
1982	5.415	5.392	5.262	5.423	6.258
1983[1]	5.410	5.361	5.279	5.412	6.254

[1] Preliminary.
Note: See Thermal Conversion Factor Documentation.

Thermal Conversion Factors: Petroleum and Natural Gas Plant Liquids, 1949-1983 (Continued)

(Million Btu per Barrel)

Year	Petroleum Production, Imports, and Exports							Natural Gas Plant Liquids
	Production of Crude Oil and Lease Condensate	Imports of Crude Oil and Petroleum Products	Imports of Crude Oil	Imports of Petroleum Products	Exports of Crude Oil and Petroleum Products	Exports of Crude Oil	Exports of Petroleum Products	Production
1949	5.8	6.059	5.952	6.261	5.692	5.8	5.651	4.544
1950	5.8	6.080	5.943	6.263	5.766	5.8	5.751	4.522
1951	5.8	6.075	5.938	6.265	5.762	5.8	5.753	4.495
1952	5.8	6.067	5.938	6.261	5.774	5.8	5.768	4.464
1953	5.8	6.052	5.924	6.268	5.742	5.8	5.732	4.450
1954	5.8	6.052	5.931	6.252	5.745	5.8	5.738	4.415
1955	5.8	6.040	5.924	6.234	5.768	5.8	5.765	4.406
1956	5.8	6.024	5.916	6.225	5.754	5.8	5.744	4.382
1957	5.8	6.023	5.918	6.219	5.780	5.8	5.774	4.369
1958	5.8	5.993	5.916	6.091	5.779	5.8	5.778	4.366
1959	5.8	6.020	5.916	6.142	5.829	5.8	5.830	4.311
1960	5.8	6.021	5.911	6.161	5.834	5.8	5.835	4.295
1961	5.8	5.991	5.900	6.102	5.832	5.8	5.833	4.283
1962	5.8	6.004	5.890	6.138	5.841	5.8	5.842	4.273
1963	5.8	6.002	5.894	6.126	5.840	5.8	5.841	4.264
1964	5.8	5.998	5.882	6.129	5.844	5.8	5.845	4.268
1965	5.8	5.997	5.872	6.123	5.743	5.8	5.742	4.264
1966	5.8	5.993	5.863	6.112	5.729	5.8	5.728	4.259
1967	5.8	5.999	5.838	6.128	5.777	5.8	5.758	4.232
1968	5.8	5.977	5.836	6.095	5.763	5.8	5.762	4.218
1969	5.8	5.974	5.825	6.093	5.714	5.8	5.713	4.170
1970	5.8	5.985	5.822	6.088	5.810	5.8	5.811	4.146
1971	5.8	5.961	5.824	6.062	5.775	5.8	5.775	4.117
1972	5.8	5.935	5.809	6.045	5.741	5.8	5.741	4.070
1973	5.8	5.897	5.817	5.983	5.752	5.8	5.752	4.049
1974	5.8	5.884	5.827	5.959	5.774	5.8	5.773	4.011
1975	5.8	5.858	5.821	5.935	5.748	5.8	5.747	3.984
1976	5.8	5.856	5.808	5.980	5.745	5.8	5.743	3.964
1977	5.8	5.834	5.810	5.908	5.797	5.8	5.796	3.941
1978	5.8	5.839	5.802	5.955	5.808	5.8	5.814	3.925
1979	5.8	5.810	5.810	5.811	5.832	5.8	5.864	3.955
1980	5.8	5.796	5.812	5.748	5.820	5.8	5.841	3.914
1981	5.8	5.775	5.818	5.659	5.821	5.8	5.837	3.930
1982	5.8	5.775	5.826	5.664	5.820	5.8	5.829	3.872
1983[1]	5.8	5.768	5.824	5.660	5.800	5.8	5.800	3.859

[1] Preliminary.
Note: See Thermal Conversion Factor Documentation.

Thermal Conversion Factors: Coal and Coal Coke, 1949-1983

(Million Btu per Short Ton)

Year	Bituminous Coal [1] and Lignite								Anthracite				
		Consumption								Consumption			
	Production	All Users	Residential and Commercial	Coke Plants	Other Industry [2]	Electric Utilities	Imports	Exports	Production	All Users	Electric Utilities	Non-Utility	Imports and Exports
1949	26.200	26.200	26.200	26.200	26.200	26.200	25.000	27.000	24.74	24.65	24.65	24.65	25.40
1950	26.200	26.200	26.200	26.200	26.200	26.200	25.000	27.000	24.90	24.84	24.84	24.84	25.40
1951	26.200	26.200	26.200	26.200	26.200	26.200	25.000	27.000	24.71	24.60	24.60	24.60	25.40
1952	26.200	26.200	26.200	26.200	26.200	26.200	25.000	27.000	24.65	24.54	24.54	24.54	25.40
1953	26.200	26.200	26.200	26.200	26.200	26.200	25.000	27.000	24.57	24.48	24.48	24.48	25.40
1954	26.200	26.200	26.200	26.200	26.200	26.200	25.000	27.000	24.62	24.55	24.55	24.55	25.40
1955	26.000	25.840	25.840	25.840	25.840	25.840	25.000	27.000	24.55	24.53	24.53	24.53	25.40
1956	25.980	25.740	25.740	25.740	25.740	25.740	25.000	27.000	24.34	24.13	24.13	24.13	25.40
1957	25.980	25.720	25.720	25.720	25.720	25.720	25.000	27.000	24.26	24.01	24.01	24.01	25.40
1958	25.980	25.540	25.540	25.540	25.540	25.540	25.000	27.000	24.52	24.42	24.42	24.42	25.40
1959	25.680	25.480	25.480	25.480	25.480	25.480	25.000	27.000	24.34	24.24	24.24	24.24	25.40
1960	24.829	24.595	24.054	26.000	24.604	24.030	25.000	27.000	24.28	24.20	24.20	24.20	25.40
1961	24.751	24.540	24.034	26.000	24.569	24.000	25.000	27.000	24.42	24.33	24.33	24.33	25.40
1962	24.735	24.518	24.027	26.000	24.558	23.990	25.000	27.000	24.39	24.20	24.20	24.20	25.40
1963	24.738	24.483	24.007	26.000	24.524	23.960	25.000	27.000	24.21	23.86	23.86	23.86	25.40
1964	24.739	24.490	23.988	26.000	24.490	23.930	25.000	27.000	24.13	23.89	23.89	23.89	25.40
1965	24.662	24.410	23.928	26.000	24.387	23.840	25.000	27.000	24.14	23.95	23.95	23.95	25.40
1966	24.522	24.275	23.836	26.000	24.227	23.700	25.000	27.000	23.95	23.75	23.75	23.75	25.40
1967	24.378	24.133	23.737	26.000	24.056	23.550	25.000	27.000	23.51	23.25	23.25	23.25	25.40
1968	24.354	24.084	23.724	26.000	24.034	23.530	25.000	27.000	23.35	23.06	23.06	23.06	25.40
1969	24.175	23.861	23.553	26.000	23.737	23.270	25.000	27.000	23.41	23.04	23.04	23.04	25.40
1970	23.729	23.310	23.111	26.000	22.973	22.600	25.000	27.000	23.40	23.04	23.04	23.04	25.40
1971	23.399	23.001	22.927	26.000	22.653	22.320	25.000	27.000	23.50	23.16	23.16	23.16	25.40
1972	23.279	22.911	22.861	26.000	22.539	22.220	25.000	27.000	23.42	23.02	23.02	23.02	25.40
1973	23.267	22.937	22.887	26.000	22.585	22.260	25.000	26.612	23.17	22.71	17.92	24.34	25.40
1974	22.970	22.564	22.523	26.000	22.420	21.800	25.000	26.716	22.56	21.95	17.20	23.75	25.40
1975	22.802	22.402	22.258	26.000	22.439	21.660	25.000	26.573	23.39	21.74	17.06	23.65	25.40
1976	22.849	22.393	22.819	26.000	22.528	21.690	25.000	26.613	22.77	22.15	17.53	23.84	25.40
1977	22.482	22.142	22.594	26.000	22.290	21.480	25.000	26.561	23.18	22.69	17.24	24.99	25.40
1978	22.157	21.921	22.078	26.000	22.175	21.280	25.000	26.501	23.52	22.97	17.10	25.17	25.40
1979	22.374	22.014	21.884	26.000	22.436	21.380	25.000	26.570	23.59	22.70	17.45	25.20	25.40
1980	22.343	21.874	22.488	26.000	22.690	21.300	25.000	26.404	23.35	22.16	17.65	23.74	25.40
1981	22.243	21.645	22.191	26.000	22.572	21.090	25.000	26.176	23.69	22.10	18.17	25.12	25.40
1982	22.188	21.624	22.373	26.000	22.694	21.200	25.000	26.231	23.69	23.00	18.16	25.37	25.40
1983[3]	22.015	21.547	22.300	26.000	22.650	21.160	25.000	26.300	23.75	22.80	18.15	25.20	25.40

[1] Including subbituminous coal.
[2] Includes transportation.
[3] Preliminary.
Note: See Thermal Conversion Factor Documentation.

Thermal Conversion Factors: Coal and Coal Coke, 1949-1983 (Continued)

(Million Btu per Short Ton)

Year	All Coal						Coal Coke
		Consumption					
	Production	All Users	Electric Utilities	Non-Utility	Imports	Exports	Imports and Exports
1949	26.07	26.08	26.14	26.07	25.00	26.76	26.00
1950	26.10	26.09	26.15	26.08	25.02	26.79	26.00
1951	26.09	26.08	26.14	26.08	25.03	26.85	26.00
1952	26.07	26.07	26.14	26.05	25.04	26.86	26.00
1953	26.10	26.09	26.14	26.04	25.05	26.88	26.00
1954	26.09	26.09	26.16	26.06	25.01	26.87	26.00
1955	25.92	25.77	25.81	26.09	25.00	26.91	26.00
1956	25.89	25.66	25.71	26.06	25.00	26.89	26.00
1957	25.90	25.64	25.68	26.06	25.00	26.92	26.00
1958	25.91	25.49	25.52	26.08	25.01	26.93	26.00
1959	25.62	25.42	25.52	26.05	25.01	26.93	26.00
1960	24.81	24.58	24.04	25.01	25.00	26.94	26.00
1961	24.74	24.53	24.00	24.99	25.00	26.94	26.00
1962	24.73	24.51	24.00	24.98	25.01	26.93	26.00
1963	24.72	24.46	23.96	24.96	25.01	26.89	26.00
1964	24.72	24.67	23.93	25.03	25.00	26.95	26.00
1965	24.65	24.40	23.84	24.95	25.00	26.97	26.00
1966	24.51	24.27	23.85	24.91	25.00	26.98	26.00
1967	24.36	24.11	23.55	24.82	25.00	26.98	26.00
1968	24.34	24.06	23.53	24.82	25.00	26.98	26.00
1969	24.30	23.85	23.27	24.72	25.00	26.98	26.00
1970	23.73	23.31	22.60	24.41	25.00	26.98	26.00
1971	23.40	23.00	22.33	24.28	25.00	26.98	26.00
1972	23.28	22.91	22.21	24.32	25.00	26.98	26.00
1973	23.27	22.94	22.24	24.48	25.00	26.59	26.00
1974	22.96	22.56	21.78	24.38	25.00	26.70	26.00
1975	22.81	22.39	21.64	24.35	25.00	26.56	26.00
1976	22.85	22.39	21.68	24.45	25.00	26.60	26.00
1977	22.49	22.14	21.47	24.33	25.00	26.55	26.00
1978	22.17	21.93	21.27	24.12	25.00	26.48	26.00
1979	22.38	22.01	21.37	24.23	25.00	26.55	26.00
1980	22.35	21.87	21.29	24.35	25.00	26.28	26.00
1981	22.25	21.65	21.08	24.15	25.00	26.08	26.00
1982	22.20	21.63	21.20	23.92	25.00	26.22	26.00
1983[1]	22.02	21.55	21.16	23.80	25.00	26.29	26.00

[1] Preliminary.
Note: See Thermal Conversion Factor Documentation.

Thermal Conversion Factors: Natural Gas, 1949-1983

(Btu per Cubic Foot)

Year	Dry Natural Gas						Wet Natural Gas Production
		Consumption					
	Production	All Users	Electric Utilities	Non-Utility	Imports	Exports	
1949	1,035	1,035	1,035	1,035	—	1,035	1,120
1950	1,035	1,035	1,035	1,035	—	1,035	1,119
1951	1,035	1,035	1,035	1,035	—	1,035	1,114
1952	1,035	1,035	1,035	1,035	1,035	1,035	1,115
1953	1,035	1,035	1,035	1,035	1,035	1,035	1,116
1954	1,035	1,035	1,035	1,035	1,035	1,035	1,115
1955	1,035	1,035	1,035	1,035	1,035	1,035	1,120
1956	1,035	1,035	1,035	1,035	1,035	1,035	1,116
1957	1,035	1,035	1,035	1,035	1,035	1,035	1,113
1958	1,035	1,035	1,035	1,035	1,035	1,035	1,110
1959	1,035	1,035	1,035	1,035	1,035	1,035	1,109
1960	1,035	1,035	1,035	1,035	1,035	1,035	1,107
1961	1,035	1,035	1,035	1,035	1,035	1,035	1,108
1962	1,035	1,035	1,035	1,035	1,035	1,035	1,107
1963	1,031	1,031	1,031	1,031	1,031	1,031	1,103
1964	1,032	1,032	1,032	1,032	1,032	1,032	1,102
1965	1,032	1,032	1,032	1,032	1,032	1,032	1,101
1966	1,033	1,033	1,033	1,033	1,033	1,033	1,103
1967	1,032	1,032	1,032	1,032	1,032	1,032	1,105
1968	1,031	1,031	1,031	1,031	1,031	1,031	1,115
1969	1,031	1,031	1,031	1,031	1,031	1,031	1,103
1970	1,031	1,031	1,031	1,031	1,031	1,031	1,102
1971	1,031	1,031	1,031	1,031	1,031	1,031	1,103
1972	1,027	1,027	1,027	1,027	1,027	1,027	1,100
1973	1,021	1,021	1,024	1,020	1,026	1,023	1,093
1974	1,024	1,024	1,022	1,024	1,027	1,016	1,097
1975	1,021	1,021	1,026	1,020	1,026	1,014	1,095
1976	1,020	1,020	1,023	1,019	1,025	1,013	1,093
1977	1,021	1,021	1,029	1,019	1,026	1,013	1,093
1978	1,019	1,019	1,034	1,016	1,030	1,013	1,088
1979	1,021	1,021	1,034	1,018	1,037	1,013	1,092
1980	1,026	1,026	1,034	1,024	1,022	1,013	1,098
1981	1,027	1,027	1,033	1,026	1,014	1,011	1,103
1982	1,028	1,028	1,035	1,026	1,018	1,011	1,107
1983[1]	1,028	1,028	1,035	1,026	1,018	1,011	1,107

[1] Preliminary.
Note: See Thermal Conversion Factor Documentation.

Thermal Conversion Factors: Hydropower, Nuclear Power, Geothermal Power, and Wood and Waste,[1] 1949-1983

(Thousand Btu per Kilowatt-Hour)

Year	Hydropower	Nuclear Power	Geothermal Power	Wood and Waste [1]
1949	15.033	(2)	(2)	15.033
1950	14.030	(2)	(2)	14.030
1951	13.641	(2)	(2)	13.641
1952	13.361	(2)	(2)	13.361
1953	12.889	(2)	(2)	12.889
1954	12.180	(2)	(2)	12.180
1955	11.699	(2)	(2)	11.699
1956	11.456	(2)	(2)	11.456
1957	11.365	11.629	(2)	11.365
1958	11.085	11.629	(2)	11.085
1959	10.970	11.629	(2)	10.970
1960	10.760	11.629	23.200	10.760
1961	10.650	11.629	23.200	10.650
1962	10.558	11.629	23.200	10.558
1963	10.482	11.877	22.184	10.482
1964	10.462	11.912	22.184	10.462
1965	10.453	11.804	22.184	10.453
1966	10.415	11.623	22.184	10.415
1967	10.432	11.555	21.770	10.432
1968	10.398	11.297	21.606	10.398
1969	10.447	11.037	21.606	10.447
1970	10.494	10.977	21.606	10.494
1971	10.478	10.837	21.655	10.478
1972	10.379	10.792	21.668	10.379
1973	10.389	10.903	21.674	10.389
1974	10.442	11.161	21.674	10.442
1975	10.406	11.013	21.611	10.406
1976	10.373	11.047	21.611	10.373
1977	10.435	10.769	21.611	10.435
1978	10.361	10.941	21.611	10.361
1979	10.353	10.879	21.545	10.353
1980	10.388	10.908	21.639	10.388
1981	10.453	11.030	21.639	10.453
1982[3]	10.470	11.015	21.594	10.470
1983[4]	10.470	11.015	21.594	10.470

[1] Consumed at electric utilities only.
[2] Not Applicable.
[3] Preliminary.
[4] Estimated.
Note: See Thermal Conversion Factor Documentation.

Energy Equivalents

One million Btu equals approximately:

- 90 pounds of coal production (1983)
- 125 pounds of oven-dried wood
- 8 gallons of motor gasoline or enough to move the average passenger car about 130 miles (1982 rate)
- 10 therms of natural gas (dry)
- 11 gallons of propane
- 1.2 days of per capita energy consumption in the United States (1983 rate)
- 2 months of dietary intake of a laborer
- 20 cases (240 bottles) of table wine

One million Btu of fossil fuels burned at electric utilities can generate about 100 kilowatt-hours of electricity, while about 300 kilowatt-hours of electricity generated at electric utilities can produce about one million Btu of heat.

One quadrillion Btu equals approximately:

- 45 million short tons of coal production
- 63 million short tons of oven-dried wood
- 1 trillion cubic feet of natural gas (dry)
- 170 million barrels of crude oil
- 500 thousand barrels per day of crude oil for one year
- 35 days of petroleum imports into the United States (1983 rate)
- 29 days of United States motor gasoline usage (1983 rate)

One barrel of crude oil equals approximately:

- 5.6 thousand cubic feet of natural gas (dry)
- 0.26 short tons (or 530 pounds) of coal production
- 1,700 kilowatt-hours of electricity consumed

One short ton of coal production equals about:

- 3.8 barrels of crude oil
- 21 thousand cubic feet of natural gas (dry)
- 6,500 kilowatt-hours of electricity consumed

One thousand cubic feet of natural gas equals approximately:

- 0.18 barrels (or 7.4 gallons) of crude oil
- 0.047 short tons (or 93 pounds) of coal production
- 300 kilowatt-hours of electricity consumed

One thousand kilowatt-hours of electricity equal approximately:

- 0.55 barrels of crude oil (although it takes about 1.8 barrels of oil to produce 1,000 kWh)
- 0.15 short tons (or 310 pounds) of coal production (although it takes about 0.48 short tons to produce 1,000 kWh)
- 3,300 cubic feet of natural gas—dry (although it takes about 10,000 cubic feet to produce 1,000 kWh)

U.S. Daily Per Capita Consumption of Types of Energy in 1973 and 1983

	Unit	1973	1983	Percent Change
Natural gas (dry), including consumption at electric utility powerplants	cubic feet	286	199	-30.5
Natural gas (dry), excluding consumption at electric utility powerplants	cubic feet	238	164	-31.0
Coal, including consumption at electric utility powerplants	pounds	15	17	18.1
Coal, excluding consumption at electric utility powerplants	pounds	4.5	2.6	-42.8
Hydropower electricity	kilowatt-hours	3.8	4.3	14.9
Nuclear power electricity	kilowatt-hours	1.1	3.4	216.0
Electricity, including hydropower and nuclear power electricity	kilowatt-hours	22	25	13.3
Refined petroleum products, including consumption at electric utility powerplants	gallons	3.4	2.7	-20.8
Refined petroleum products, excluding consumption at electric utility powerplants	gallons	3.1	2.6	-16.9
Motor gasoline	gallons	1.33	1.19	-10.4
Industrial Sector Energy (including electric losses distributed)	thousand Btu	408	304	-25.5
Total Energy	thousand Btu	962	825	-14.2

Thermal Conversion Factor Source Documentation

This section provides documentation and methodologies for developing the thermal conversion factors used in this report.

~~PETROLEUM AND NATURAL GAS PLANT LIQUIDS~~ Refined Petroleum Products

Asphalt. • 1949-1983: Energy Information Administration 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. • 1965-1983: Energy Information Administration 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. • 1949-1983: Energy Information Administration adopted the Bureau of Mines thermal conversion factor of 4.326 million Btu per barrel as published by the Gas Processors Suppliers Association/Gas Processors Association in the *Engineering Data Book,* Ninth Edition, 1972.

Butane–Propane Mixture. • 1949-1983: Energy Information Administration 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. • 1949-1983: Energy Information Administration 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. • 1959-1983: Energy Information Administration adopted the Bureau of Mines thermal conversion factor of 3.082 million Btu per barrel as published by the Gas Processors Suppliers Association/Gas Processors Association in the *Engineering Data Book,* Ninth Edition, 1972.

Ethane–Propane Mixture. • 1979-1983: Energy Information Administration calculation of 3.308 million Btu per barrel based on an assumed mixture of 70 percent ethane and 30 percent propane. See **Ethane** and **Propane.**

Isobutane. • 1949-1983: Energy Information Administration adopted the Bureau of Mines thermal conversion factor of 3.974 million Btu per barrel as published by the Gas Processors Suppliers Association/Gas Processors Association in the *Engineering Data Book,* Ninth Edition, 1972.

Jet Fuel, Kerosene Type. • 1952-1983: Energy Information Administration 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 Corporation in the report *Competition and Growth in American Energy Markets 1947-1985,* 1968.

Jet Fuel, Naphtha Type. • 1952-1983: Energy Information Administration 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. • 1949-1983: Energy Information Administration 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. • 1949-1983: Energy Information Administration adopted the thermal conversion factor of 6.065 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956.*

Motor Gasoline. • 1949-1983: Energy Information Administration adopted the Bureau of Mines thermal 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 • 1949-1983: Energy Information Administration 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.*

Petrochemical Feedstocks, Naphtha 400 degrees F or Less. • 1962-1983: Assumed by the Energy Information Administration to be 5.248 million Btu per barrel, equal to the thermal conversion factor for special naphtha. See **Special Naphtha.**

Petrochemical Feedstock, Over 400 degrees F. • 1962-1983: Assumed by the Energy Information Administration 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. • 1962-1983: Assumed by the Energy Information Administration to be 6.000 million Btu per barrel, equal to the thermal conversion factor for still gas. See **Still Gas.**

Petroleum Coke. • 1949-1983: Energy Information Administration adopted the thermal conversion factor of 6.024 million Btu per barrel as reported in Btu per short ton in the Bureau of Mines internal memorandum *Bureau of Mines Standard Average Heating Value of Various Fuels, adopted January 3, 1950.* 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. • 1949-1983: Estimated to be 5.418 million Btu per barrel by Energy Information Administration from data provided by McClanahan Consultants, Inc., Houston, Texas.

Propane. • 1949-1983: Energy Information Administration adopted the Bureau of Mines thermal conversion factor of 3.836 million Btu per barrel as published by the Gas Processors Suppliers Association/Gas Processors Association in the *Engineering Data Book,* Ninth Edition, 1972.

Residual Fuel Oil. • 1949-1983: Energy Information Administration 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. • 1949-1983: Energy Information Administration 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. • 1965-1983: Energy Information Administration 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. • 1949-1983: Energy Information Administration 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. • 1949-1983: Energy Information Administration 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. • 1979-1983: Energy Information Administration assumed the thermal conversion factor to be 5.418 million Btu per barrel or equal to that for natural gasoline (see **Natural Gasoline**) and first published in the *Annual Report to Congress, Volume 2, 1981.*

Wax. • 1949-1983: Energy Information Administration 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.*

Miscellaneous Products. • 1949-1983: Energy Information Administration adopted the thermal conversion factor of 5.796 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956.*

Consumption of All Petroleum Products by All Users. • 1949-1983: Calculated annually by Energy Information Administration as the average of the thermal conversion factors for all petroleum products consumed, weighted by the quantity of each petroleum product consumed.

Consumption of All Petroleum Products by Residential and Commercial Users Only. • 1949-1983: Calculated annually by Energy Information Administration 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. For 1960 and forward, the quantity of petroleum products consumed is estimated in the State Energy Data System as documented in the *State Energy Data Report.*

Consumption of All Petroleum Products by Industrial Users Only. • 1949-1983: Calculated annually by Energy Information Administration 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. For 1960 and forward, the quantity of petroleum products consumed is estimated in the State Energy Data System as documented in the *State Energy Data Report.*

Consumption of All Petroleum Products for Transportation Use Only. • 1949-1983: Calculated annually by Energy Information Administration 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. For 1960 and forward, the quantity of petroleum products consumed is estimated in the State Energy Data System as documented in the *State Energy Data Report.*

Consumption of All Petroleum Products by Electric Utilities Only. • 1949-1983: Calculated annually by Energy Information Administration 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. For 1960 and forward, the quantity of petroleum consumed is estimated in the State Energy Data System as documented in the *State Energy Data Report.*

Production of Crude Oil and Lease Condensate. • 1949-1983: Energy Information Administration 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.*

Imports of Crude Oil and Petroleum Products. • 1949-1983: Calculated annually by Energy Information Administration as the average of the thermal conversion factors for each petroleum product and each crude oil imported weighted by the quantity of each petroleum product and each type of crude oil imported. See **Imports of Crude Oil Only** and **Imports of Petroleum Products Only.**

Imports of Crude Oil Only. • 1949-1983: Calculated annually by Energy Information Administration 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.

Imports of Petroleum Products Only. • 1949-1983: Calculated annually by Energy Information Administration as the average of the thermal conversion factors for each petroleum product imported weighted by the quantity of each petroleum product imported.

Exports of Crude Oil and Refined Products. • 1949-1983: Calculated annually by Energy Information Administration 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 **Exports of Petroleum Products Only** and **Exports of Crude Oil Only.**

Exports of Crude Oil Only. • 1949-1983: Assumed by Energy Information Administration to be 5.800 million Btu per barrel or equal to the thermal conversion factor for crude oil produced in the United States. See **Production of Crude Oil and Lease Condensate.**

Exports of Petroleum Products Only. • 1949-1983: Calculated annually by Energy Information Administration as the average of the thermal conversion factors for each petroleum product weighted by the quantity of each petroleum product exported.

Natural Gas Plant Liquids. • 1949-1983: Calculated annually by Energy Information Administration as the average of the thermal conversion factors of each natural gas plant liquid produced weighted by the quantity of each natural gas plant liquid produced.

NATURAL GAS

Dry Natural Gas Production. • 1949-1983: Assumed by Energy Information Administration to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Dry Natural Gas, Consumption.**

Dry Natural Gas, Consumption. • 1949-1962: Energy Information Administration adopted the thermal conversion factor of 1,035 Btu per cubic feet as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956.* • 1963-1979: Energy Information Administration adopted the thermal conversion factor calculated annually by the American Gas Association (AGA) and published in *Gas Facts,* an AGA annual. • 1980-1982: Calculated annually by Energy Information Administration by dividing the total heat content of natural gas consumed by the total quantity of natural gas consumed. Heat content and quantity consumed are from Form EIA-176. • 1983: Estimated to be the same as 1982.

Dry Natural Gas, Consumption by Electric Utilities Only. • 1949-1972: Assumed by Energy Information Administration to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Dry Natural Gas, Consumption.** • 1973-1982: Calculated annually by Energy Information Administration by dividing the total heat content of natural gas consumed at electric utilities by the quantity consumed at electric utilities. The heat contents are from Form FPC-423 and the quantities consumed are from Form EIA-759 and predecessor forms. • 1983: Estimated to be the same as 1982.

Dry Natural Gas, Consumption by Non-Electric Utility Users Only. • 1949-1972: Assumed by Energy Information Administration to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Dry Natural Gas, Consumption.** • 1973-1982: Calculated annually by Energy Information Administration 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, FPC-423, EIA-759, and predecessor forms. • 1983: Estimated to be the same as 1982.

Dry Natural Gas, Imports. • 1949-1972: Assumed by Energy Information Administration to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Dry Natural Gas, Consumption.** • 1973-1982: Calculated annually by Energy Information Administration by dividing the heat content of imported natural gas by the quantity of natural gas imported, both reported on Form FPC-14. • 1983: Estimated to be the same as 1982.

Dry Natural Gas, Exports. • 1949-1972: Assumed by Energy Information Administration to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Dry Natural Gas, Consumption.** • 1973-1982: Calculated annually by Energy Information Administration by dividing the heat content of exported natural gas by the quantity of natural gas exported, both reported on Form FPC-14. • 1983: Estimated to be the same as 1982.

Wet Natural Gas Production. • 1949-1982: Calculated annually by Energy Information Administration 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. • 1983: Estimated to be the same as 1982.

Bituminous Coal and Lignite, Production. • 1949-1954: Energy Information Administration adopted the Bureau of Mines estimate of 26.20 million Btu per short ton, first reported in the Bureau of Mines publication *Average Heating Values of American Coal by Rank and by State,* Information Circular 7538, 1949. • 1955-1983: Calculated annually by Energy Information Administration by dividing the sum of the heat content of bituminous coal and lignite consumption, net exports, and stock changes by the sum of their respective tonnages.

Bituminous Coal and Lignite, Consumption. • 1949-1954: Energy Information Administration adopted the Bureau of Mines assumption that the thermal conversion factor was 26.20 million Btu per short ton, equal to that for bituminous coal and lignite production. See **Bituminous Coal and Lignite Production.** • 1955-1959: Energy Information Administration adopted the Bureau of Mines assumption that the thermal conversion factor was equal to that of bituminous coal and lignite consumption at electric utilities. See **Bituminous Coal and Lignite, Consumption at Electric Utilities Only.** • 1960-1983: Calculated annually by Energy Information Administration by dividing the sum of the heat content of bituminous coal and lignite consumed by electric utilities, coal coke plants, other industrial plants, and by the residential and commercial sector and the transportation sector by the sum of their respective tonnages.

Bituminous Coal and Lignite, Consumption by Electric Utilities. • 1949-1954: Energy Information Administration adopted the Bureau of Mines assumption that the thermal conversion factor was 26.20 million Btu per short ton, equal to that for bituminous coal and lignite production. See **Bituminous Coal and Lignite, Production.** • 1955-1972: Energy Information Administration adopted the average thermal conversion factor of the Bureau of Mines which used the National Coal Association average thermal conversion factor for electric utilities calculated from Form FPC-1 and published in *Steam Electric Plant Factors,* a National Coal Association annual report. • 1973-1983: Calculated annually by Energy Information Administration by dividing the total heat content of bituminous coal and lignite received at electric utilities by the total quantity consumed by electric utilities. Heat contents are from Form FPC-423 and quantities consumed are from Form EIA-759 and predecessor forms.

Bituminous Coal and Lignite, Consumption by Residential and Commercial Users. • 1949-1954: Energy Information Administration adopted the Bureau of Mines assumption that the thermal conversion factor was 26.20 million Btu per short ton, equal to that for bituminous coal and lignite production. See **Bituminous Coal and Lignite, Production.** • 1955-1959: Energy Information Administration adopted the Bureau of Mines assumption that the thermal conversion factor was equal to that of bituminous coal and lignite consumed at electric utilities. See **Bituminous Coal and Lignite, Consumption by Electric Utilities.** • 1960-1973: Calculated by Energy Information Administration 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. • 1974-1983: Calculated by Energy Information Administration 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 sum total of the heat value was divided by the total volume of deliveries.

Bituminous Coal and Lignite, Consumption by Coke Plants: • 1949-1954: Energy Information Administration adopted the Bureau of Mines assumption that the thermal conversion factor was 26.20 million Btu per short ton, equal to that for bituminous coal and lignite production. See **Bituminous Coal and Lignite Production.** • 1955-1959: Energy Information Administration adopted the Bureau of Mines assumption that the thermal conversion factor was equal to that of bituminous coal and lignite consumed at electric utilities. See **Bituminous Coal and Lignite, Consumption by Electric Utilities.** • 1960-1983: Estimated by Energy Information Administration to be 26.00 million Btu per short ton.

Bituminous Coal and Lignite, Consumption by Other Industrial Users. • 1949-1954: Energy Information Administration adopted the Bureau of Mines assumption that the thermal conversion factor was 26.20 million Btu per short ton, equal to that for bituminous coal and lignite produc-

60-72 Steam electric Plant Construction costs -FPC/FERC
73 + OK
55-59 ???

tion. See **Bituminous Coal and Lignite Production.** • 1955-1959: Energy Information Administration adopted the Bureau of Mines assumption that the thermal conversion factor was equal to that of bituminous coal and lignite consumed at electric utilities. See **Bituminous Coal and Lignite, Consumption by Electric Utilities.** • 1960-1973: Calculated by Energy Information Administration 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. • 1974-1983: Calculated by Energy Information Administration by 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 Transportation Users: • 1949-1983: Assumed by Energy Information Administration to be equal to the Btu conversion factor for **Bituminous Coal and Lignite, Consumption by Other Industrial Users.**

Bituminous Coal and Lignite, Imports. • 1949-1983: Energy Information Administration estimates the average thermal conversion factor to be 25.00 million Btu per short ton.

Bituminous Coal and Lignite, Exports. • 1949-1972: Assumed by Energy Information Administration to be all metallurgical coal and to have an average thermal content of 27.00 million Btu per short ton. • 1973-1983: Calculated annually by Energy Information Administration by the addition of the heat content of exported metallurgical coal (estimated to average 27.00 million Btu per short ton) plus the heat content of exported steam coal (estimated to have an average thermal content of 25.00 million Btu per short ton); and then dividing this accumulated heat content by the total quantity of bituminous coal and lignite exported.

Anthracite, Production. • 1949-1983: Calculated annually by Energy Information Administration by adding the heat content of freshly mined anthracite (estimated to have an average thermal content of 25.40 million Btu per short ton) and the heat content of anthracite recovered from culm banks (estimated to have a thermal content of 19.00 million Btu per short ton); and then dividing this sum by the total quantity of anthracite production.

Anthracite, Average Consumption by All Users. • 1949-1983: Calculated annually by Energy Information Administration by adding the heat content of anthracite production plus the heat content of anthracite imports less the heat content of anthracite exports, including shipments to U.S. Armed Forces overseas and dividing this total heat content by the total quantity of anthracite consumed.

Anthracite, Consumption by Electric Utilities. • 1949-1972: Energy Information Administration adopted the Bureau of Mines assumption that the average thermal conversion factor is equal to total for anthracite consumption (see **Anthracite, Average Consumption by All Users**). • 1973-1983: Calculated annually by Energy Information Administration by dividing the heat content of anthracite receipts at electric utilities by the quantity of anthracite consumed at electric utilities. The heat content of receipts are from Form FPC-423 and quantities consumed are from Form EIA-759 and predecessor forms.

Anthracite, Consumption by Non-Electric Utility Users. • 1949-1972: Energy Information Administration adopted the Bureau of Mines assumption that the heat content was equal to that of total anthracite consumption (see **Anthracite Average Consumption by All Users**). • 1973-1983: Calculated annually by Energy Information Administration by subtracting the total heat content of anthracite consumed at electric utilities from the total heat content of all anthracite consumed and dividing the resulting amount by the quantity of anthracite consumed by non-electric utility users.

Anthracite, Imports and Exports. • 1949-1983: Energy Information Administration assumed the anthracite imports and exports to be freshly mined anthracite having an estimated heat content of 25.40 million Btu per short ton.

All Coal, Production. • 1949-1983: Calculated by Energy Information Administration by dividing the sum of the total heat content of bituminous coal and lignite and anthracite production by the sum of their respective tonnages.

All Coal, Consumption by All Users. • 1949-1983: Calculated by Energy Information Administration by dividing the sum of the heat content of

bituminous coal and lignite and anthracite consumption by the sum of their respective tonnages.

All Coal, Consumption by Electric Utilities Only. • 1949-1983: Calculated by Energy Information Administration 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, consumed.

All Coal, Consumption by Non-Utility Users Only. • 1949-1983: Calculated by Energy Information Administration by dividing the sum of the heat content of bituminous coal and lignite and anthracite consumed by non-utility users by the sum of their respective tonnages.

All Coal, Imports. • 1949-1983: Calculated by Energy Information Administration by dividing the sum of the heat content of bituminous coal and lignite and anthracite imported by the sum of their respective tonnages.

All Coal, Exports. • 1949-1983: Calculated by Energy Information Administration by dividing the sum of the heat content of bituminous coal and lignite and anthracite exported by the sum of their respective tonnages.

Coal Coke, Imports and Exports. • 1949-1983: Estimated by Energy Information Administration to be 26.00 million Btu per short ton.

HYDROPOWER, NUCLEAR POWER, GEOTHERMAL POWER, AND WOOD AND WASTE

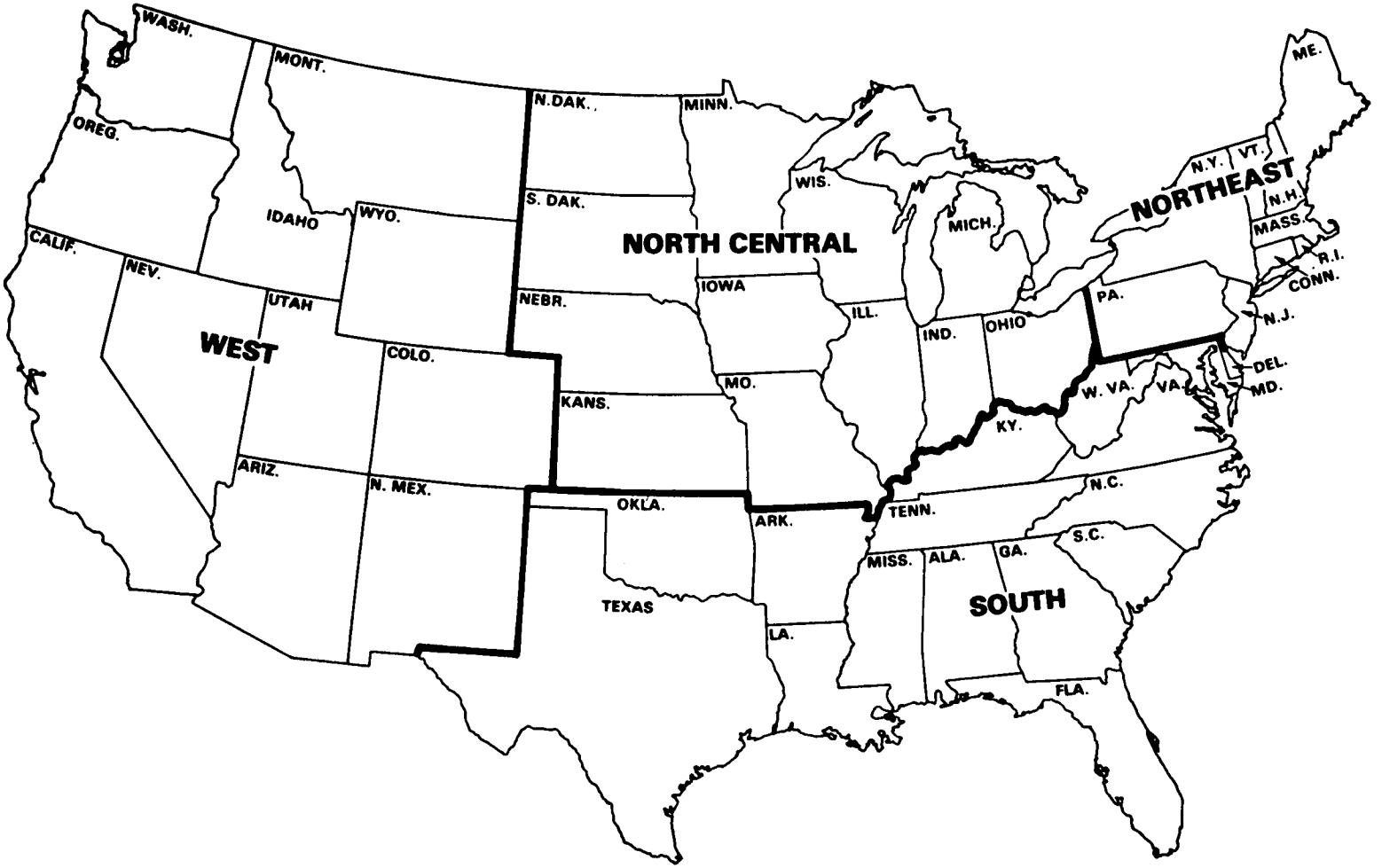
Hydropower. There is no generally accepted practice for measuring hydropower thermal conversion rates. Energy Information Administration has selected a rate that is equal to the prevailing heat rate factor at fossil fuel steam electric powerplants. By using the heat rate factor, it is possible to evaluate fossil fuel requirements for replacing hydropower production during periods of drought. Furthermore, it allows for better comparisons with certain other countries such as Norway where hydropower is the principal means for producing electricity. The heat content of a kilowatt-hour of electricity produced, regardless of the generation process, is 3,412 Btu per kilowatt-hour. • 1949-1981: Assumed by Energy Information Administration to be the weighted average annual heat rate for all fossil fuel steam-electric plants in the United States as published by Energy Information Administration in *Thermal-Electric Plant Construction Cost and Annual Production Expenses—1981* and *Steam-Electric Plant Construction Cost and Annual Production Expenses—1978.* • 1982: Energy Information Administration, Form FERC-1 and Form EIA-412. • 1983: Estimated to be the same as 1982.

Nuclear Power. • 1957-1982: Calculated annually by Energy Information Administration 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. • 1983: Estimated to be the same as 1982.

Geothermal Power. • 1960-1982: Calculated by Energy Information Administration by weighting the average annual heat rates of operating geothermal units by the installed nameplate capacities as reported on Form FPC-12. • 1983: Estimated to be the same as 1982.

Wood and Waste (Consumed at Electric Utilities Only). • 1949-1981: Assumed by Energy Information Administration to be the weighted average annual heat rate for all fossil fuel steam-electric plants in the United States as published by Energy Information Administration in *Thermal-Electric Plant Construction Cost and Annual Production Expenses—1981* and *Steam-Electric Plant Construction Cost and Annual Production Expenses—1978.* • 1982: Energy Information Administration, Form FERC-1 and EIA Form-412. • 1983: Estimated to be the same as 1982.

Appendix 1. Census Regions



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