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ABSTRACT

This booklet is a compilation of energy data providing a reference to a much broader range of domestic and international energy data. It is designed especially as a quick reference to major facts about energy. The data includes information for 1976 through 1988, except for international energy data, which is for 1977 through 1987. Graphs, charts, and illustrations portray trends, shares and locations of various energy sources and uses. The energy data have been selected from several Energy Information Administration publications. It is noted that although demand for all major categories of petroleum products increased in 1988 over the 1987 level, domestic crude oil production was down for the third consecutive year. Weak oil prices and low drilling activity were the two factors most responsible for the decline in production. All other major forms of energy, except hydroelectricity, increased production while a favorable economy and adverse weather conditions boosted United States energy consumption to a new high. Provides a glossary of energy terms, an energy conversion chart, and a listing of federal agencies for energy information assistance. (MVL)

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Preface

Although demand for all major categories of petroleum products increased in 1988 over the 1987 level, domestic crude oil production was down for the 3rd consecutive year. Weak oil prices and low drilling activity were the two factors most responsible for the decline in production. All other major forms of energy, except hydroelectricity, increased production, while a favorable economy and adverse weather conditions boosted U S energy consumption to a new high.

Energy Facts, organized by energy source, is a compilation of energy data providing a reference to a much broader range of domestic and international energy data, for the general public as well as the technical community. It is designed especially for the business person, government worker, or student who needs a quick reference to major facts about energy.

The data cover 1976 through 1988, except for international energy data which cover 1977 through 1987. Graphs, charts, and illustrations portray trends, shares, and locations of various energy sources and uses.

The energy data have been selected from several Energy Information Administration publications. For detailed and complete information on these tables and graphs, refer to the source publications. For other energy data, see the publications listed on the inside back cover. Specific energy information questions can be answered by the National Energy Information Center specialists (see page 55).

Energy Facts is designed to make energy information more accessible to you. Though this is the fifth edition, we continue to strive to improve it--both in content and format. If you have an opportunity to call or write to us at the Center to say what you think of this publication or how you would improve it, we would be pleased to hear from you.

H. A. Merklein

Dr. H. A. Merklein
Administrator
Energy Information Administration

Contents

U.S. Overview

- Total U S energy production in 1988 was 66 quadrillion Btu, an increase of 1 percent from the 1987 level.
- U S consumption of all forms of energy combined rose to nearly 80 quadrillion Btu in 1988, a 4-percent increase from the previous year's consumption.
- U S net energy imports increased by 5 percent, totaling 13 quadrillion Btu in 1988.
- Petroleum net imports rose 7 percent, natural gas net imports rose 30 percent, while coal net exports increased by 19 percent from 1987 levels.
- The decline in oil prices contributed to a decrease in the 1988 U S energy trade deficit, which fell to $32.9 billion, a $3.6-billion decrease from the 1987 deficit.

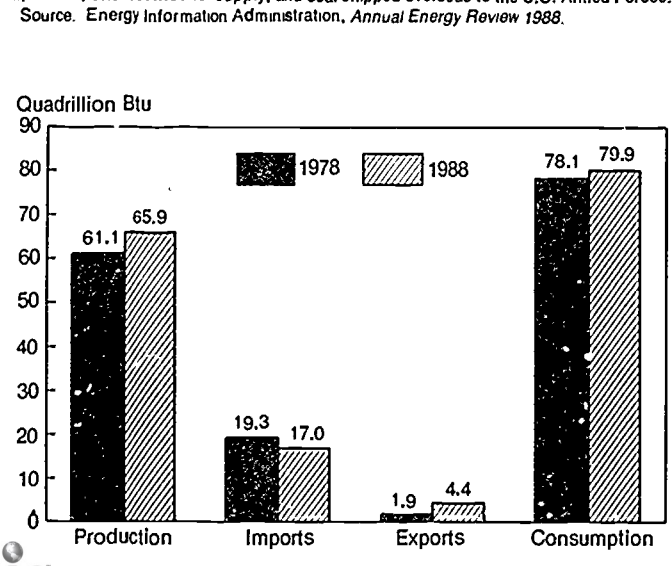
U.S. Energy Balance
(Quadrillion Btu)

Year	Production	Imports	Exports	Consumption
1976	59 9	16 8	2 2	74.4
1977	60 2	20 1	2.1	76 3
1978	61 1	19 3	1.9	78.1
1979	63 8	19.6	2.9	78.9
1980	64 8	16 0	3.7	76 0
1981	64 4	14 0	4 3	74.0
1982	63.9	12 1	4.6	70.9
1983	61.2	12 0	3.7	70.5
1984	65 9	12 8	3 8	74.1
1985	64 8	12 1	4 2	74.0
1986	64.2	14.4	4.1	74.2
1987	64.8	15 8	3.9	76 8
1988P	65.9	17.0	4.4	79 9

P = Preliminary data.

Note. The sum of "Production" and "Imports" less "Exports" does not equal "Consumption" due to stock changes, losses, refinery gains, miscellaneous blending components, unaccounted for supply, and coal shipped overseas to the U.S. Armed Forces.

Source. Energy Information Administration, *Annual Energy Review 1988*.



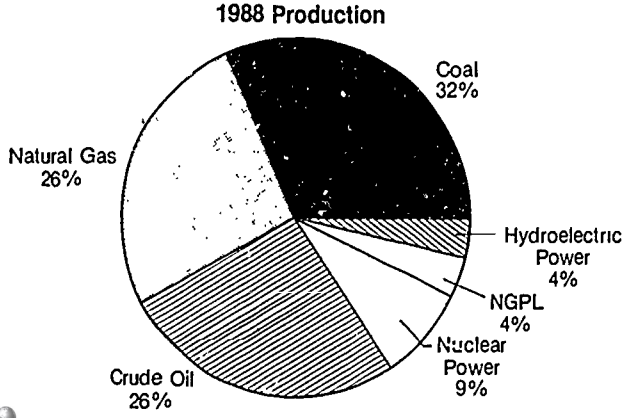
U.S. Production by Energy Source
(Quadrillion Btu)

Year	Coal	Natural Gas	Crude Oil	NGPL	Hydro-electric Power	Nuclear Power	Other	Total*
1976	15.7	19 5	17.3	2.3	3 0	2.1	0.1	59.9
1977	15 8	19 6	17.5	2.3	2.3	2.7	.1	60.2
1978	14.9	19 5	18.4	2.3	2.9	3.0	.1	61.1
1979	17.5	20.1	18.1	2.3	2.9	2.8	.1	63.8
1980	18 6	19.9	18.3	2.3	2.9	2.7	.1	64.8
1981	18.4	19.7	18.2	2.3	2.8	3.0	.1	64.4
1982	18 6	18.3	18.3	2 2	3.3	3.1	.1	63.9
1983	17.3	16 5	18 4	2.2	3.5	3.2	.1	61.2
1984	19.7	17.9	18 9	2.3	3.4	3.6	.2	65.9
1985	19 3	16.9	19.0	2.2	2.9	4.2	.2	64.8
1986	19 5	16.5	18.4	2.2	3.0	4.5	.2	64.2
1987	20.1	17.1	17.7	2.2	2.6	4.9	.3	64.8
1988P	20.9	17.2	17.3	2.3	2.3	5.7	.2	65.9

*"Total" may not equal sum of components due to independent rounding and excludes such energy sources as wood, solar, wind, and waste energy, except that consumed at electric utilities.
P = Preliminary data.

Note: "Natural Gas" is dry "NGPL" is natural gas plant liquids "Other" is electricity produced from geothermal, wood, waste, wind, photovoltaic, and solar thermal energy sources connected to electric utility distribution systems.

Source: Energy Information Administration, *Annual Energy Review 1988.*



U.S. Energy Consumption by Sector
(Quadrillion Btu)

Year	Residential/ Commercial	Industrial	Transportation	Electric Utilities	Total*
1976	25 0	30.2	19.1	21.6	74.4
1977	25 4	31.1	19.8	22.7	76.3
1978	26.1	31.4	20 6	23.7	78.1
1979	25 8	32.6	20.5	24.1	78.9
1980	25.7	30 6	19.7	24.5	76.0
1981	25 2	29.2	19.5	24 8	74.0
1982	25 6	26.1	19.1	24.3	70.9
1983	25 6	25.8	19.1	25.0	70.5
1984	26 5	27.7	19.9	26.0	74.1
1985	26.8	27.1	20.1	26.5	74.0
1986	27.0	26.5	20 8	26.6	74.2
1987	27 7	27.7	21.4	27.6	76.8
1988P	29.1	29.0	21.9	28.6	79.9

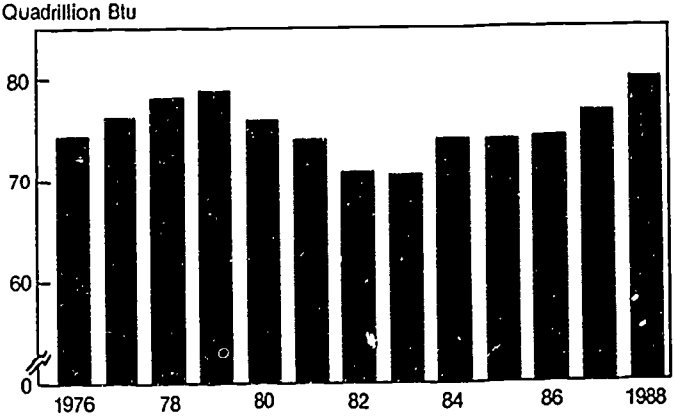
*"Total" is the sum of "Residential/Commercial," "Industrial," and "Transportation." Consumption by "Electric Utilities" has been allocated to each end-use sector according to electric utility sales to that sector. "Total" may not equal sum of components due to independent rounding.

P = Preliminary data.

Source. Energy Information Administration, *Annual Energy Review 1988.*

Total Consumption

Quadrillion Btu

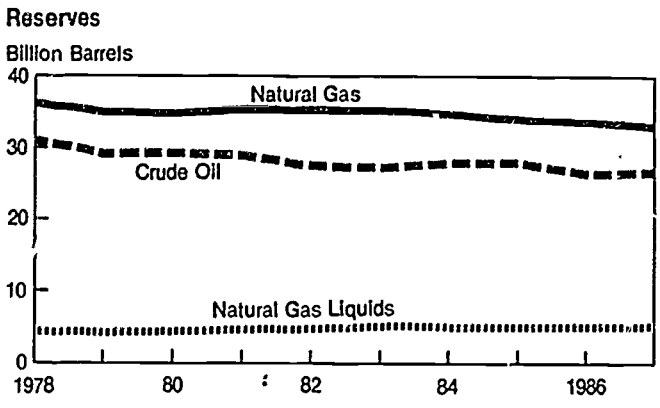


U.S. Proved Reserves of Liquid and Gaseous Hydrocarbons, End of Year

Year	Crude Oil (billion barrels)	Natural Gas (billion barrels COE)*	Natural Gas Liquids (billion barrels COE)*	Total (billion barrels COE)*
1978	31.4	36.5	4.9	72.8
1979	29.8	35.4	4 8	70.0
1980	29.8	35.2	4 9	69.9
1981	29.4	35.7	5.2	70.3
1982	27.9	35.7	5.2	68.8
1983	27.7	35.6	5 7	69.0
1984	28.4	35.1	5.5	69.0
1985	28.4	34.4	5.6	68.5
1986	26.9	34 0	5.7	66.6
1987	27.3	33 3	5 8	66.3

*COE = Crude Oil Equivalent. Natural gas and natural gas liquids were first converted to Btu, based on annual average conversion factors, and then from Btu to COE

Source. Energy Information Administration, *Annual Energy Review 1988.*



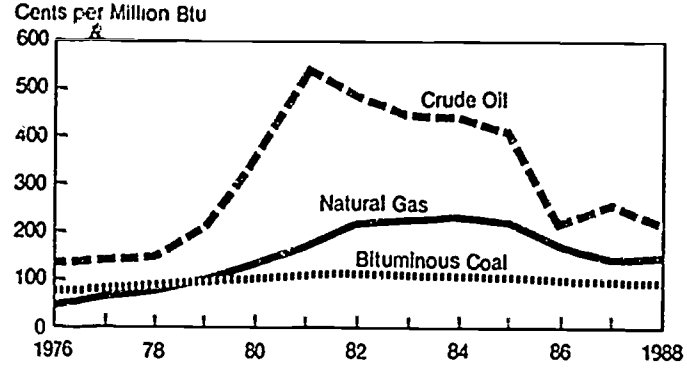
U.S. Fossil Fuel Prices
(Cents per Million Btu)

Year	Crude Oil	Natural Gas	Coal		Weighted Average
			Bituminous	Anthracite	
1976	141 2	53 1	85 0	153 9	90.2
1977	147 8	72.3	87 7	153 8	100.8
1978	155 2	83 6	97 9	152 7	111.6
1979	217 9	108.1	105 3	177 2	141.7
1980	372.2	144 8	109 4	185.9	204.2
1981	547.8	179 5	117 9	190 1	274.5
1982	491 7	222 2	122 1	214.0	275.8
1983	451 6	232.3	117 2	230 0	270.1
1984	446 2	239 9	115 9	208.7	264.6
1985	415 3	225 7	114 8	204.2	251.2
1986	215 7	174 8	108 2	191 1	165.3
1987	265 5	150 2	104 9	188.9	170.0
1988P	216 7	153.8	100 8	181 8	153.5

P = Preliminary data.

Note All fuel prices are taken as closely as possible to the point of production Bituminous Coal" includes subbituminous coal and lignite

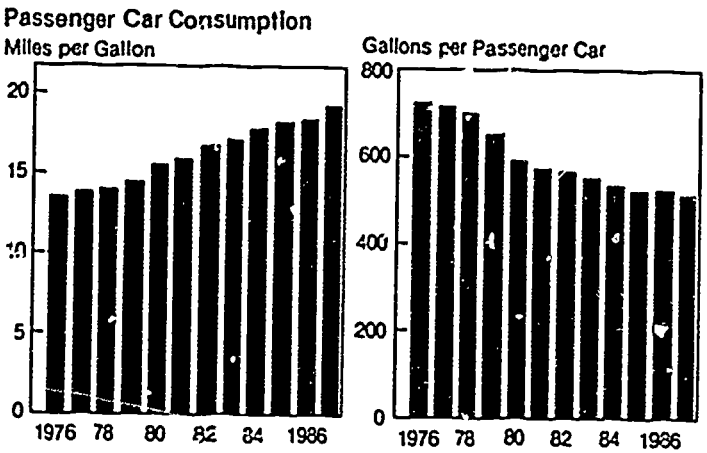
Source Energy Information Administration, *Annual Energy Review 1988.*



U.S. Average Annual Mileage and Fuel Consumption of Motor Vehicles

Year	Passenger Cars*			All Motor Vehicles*	
	Mileage (thousand miles)	Fuel Consumption (gallons)	Mileage per Gallon	Mileage (thousand miles)	Fuel Consumption (gallons)
1976	9.8	723	13.5	9.7	806
1977	9.9	716	13.8	10.0	814
1978	9.8	701	14.0	10.1	816
1979	9.4	653	14.4	9.7	776
1980	9.1	591	15.5	9.5	712
1981	9.2	576	15.9	9.5	697
1982	9.4	566	16.7	9.6	683
1983	9.5	553	17.1	9.8	686
1984	9.6	536	17.8	10.0	691
1985	9.6	525	18.2	10.0	685
1986	9.6	526	18.3	10.1	690
1987P	9.9	515	19.2	10.5	695

*Mileage, fuel consumption, and mileage per gallon are on a per-vehicle basis
P = Preliminary data.
Source: Energy Information Administration, *Annual Energy Review 1988*



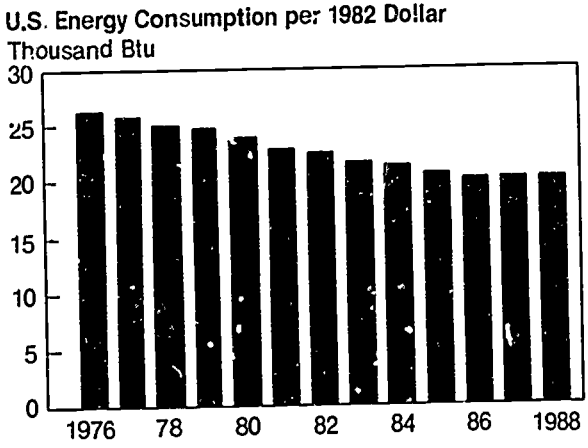
U.S. Gross National Product, Population, and Energy Consumption

Year	Gross National Product (billion 1982 dollars)	Population (millions)	Energy Consumption* Total	Per 1982 Dollar of GNP	Per Person
1976	2,826.7	217.6	74.4	26 31	342
1977	2,958.6	219.8	76.3	25.79	347
1978	3,115.2	222.1	78.1	25.07	352
1979	3,192.4	224.6	78.9	24.71	351
1980	3,187.1	226.5	76.0	23.83	335
1981	3,248 8	229.6	74.0	22.77	322
1982	3,166.0	232.0	70.9	22.38	305
1983	3,279.1	234.3	70.5	21.51	3(
1984	3,501.4	238.5	74.1	21.16	313
1985	3,618.7	238.7	74.0	20.43	310
1986	3,721.7	241.1	74.2	19.95	308
1987	3,847.0	243.4	76.8	19 96	315
1988P	3,996.1	245.8	79.9	20.00	325

*Total energy consumption is in quadrillion Btu, consumption per 1982 dollar c' GNP is in thousand Btu, and consumption per person is in million Btu.

P = Preliminary data.

Source: Population data from U.S. Department of Commerce, Bureau of the Census; all other data from Energy Information Administration, *Annual Energy Review 1988*



U.S. Household Consumption, 1987

- In 1987, households had higher indoor temperatures in the winter, longer operating hours for air conditioners in the summer, and used more energy intensive appliances such as heated waterbeds and refrigerators, than in 1984.

- Approximately 20 percent of all homes and 56 percent of new homes (constructed from 1985 through 1987) used electricity as the main heating fuel.

- Approximately 32 percent of homes constructed from 1985 through 1987 used a heat pump as the main type of heating equipment.

- Air-conditioning was found in approximately 64 percent of all homes.

- Sixty one percent of all households used a microwave oven for cooking. Microwave ovens were used by 81 percent of households with annual incomes greater than $35,000 and by 34 percent of households with incomes less than $10,000.

Distribution of Main Heating Fuel 1984 and 1987
(Percent of Households)

Fuel	1984	1987
Natural Gas	55.4	55.2
Electricity	16 8	19.8
Fuel Oil	12.4	12.0
Kerosene	1.7	1.4
Liquefied Petroleum Gases	4.5	4.6
Wood	7.5	5 6

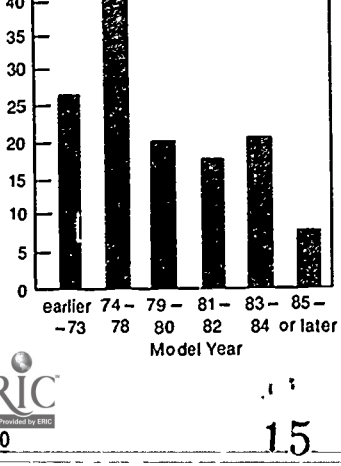
Note: Household is a primary residence.

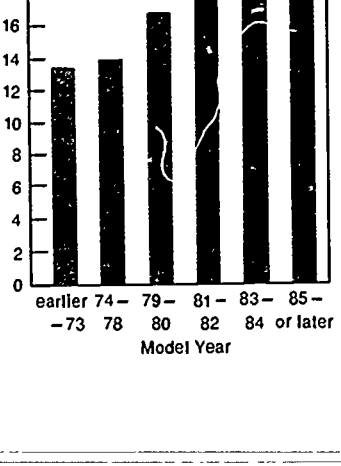
Source. Energy Information Administration, *Residential Energy Consumption Survey. Housing Characteristics 1984* and *1987.*

U.S. Motor Fuel Consumption and Expenditures, 1985

Household Characteristics	Number of Households with Vehicles (millions)	Vehicles per House-hold	Annual Average per Household		
			Gallons Consumed	Miles Driven	Expenditures (dollars)
Total	77.7	1.8	1,079	17,402	1,274
Family Income 1985					
Less than $5,000	3.7	1.2	645	9,176	749
$5,000 - $9,999	9.7	1.3	694	10,094	811
$10,000 - $14,999	10.7	1.5	912	13,848	1,068
$15,000 - $19,999	9.7	1.6	929	14,599	1,085
$20,000 - $24,999	9.5	1.8	1,091	17,411	1,286
$25,000 - $34,999	14.7	1.9	1,217	19,741	1,434
$35,000 or more	19.8	2.2	1,406	24,069	1,679

Source. Energy Information Administration. *Residential Transportation Energy Consumption Survey. Consumption Patterns of Household Vehicles. 1985*





Manufacturing Sector Primary Energy Consumption for All Purposes, 1985

(Estimates in Trillion Btu)

SIC Code	Industry Group	All Energy Sources*	Net Electricity**	Fuel Oil***	Natural Gas	Coal
20	Food	949	152	65	479	123
21	Tobacco	19	4	2	3	9
22	Textiles	248	87	13	92	36
23	Apparel	31	14	3	11	2
24	Lumber	325	47	29	24	W
25	Furniture	48	14	3	19	2
26	Paper	2,211	177	167	406	309
27	Printing & publishing	76	38	2	32	1
28	Chemicals	3,567	408	130	1,680	332
29	Petroleum	5,123	113	136	717	8
30	Rubber & plastics	213	88	15	97	7
31	Leather	13	4	3	5	1
32	Stone, clay, & glass	895	105	49	386	323
33	Primary metals	2,626	479	53	693	1,131
34	Metal products	302	91	15	178	7
35	Nonelectric machinery	240	98	15	105	16
36	Electrical equip.	211	105	9	83	8
37	Trans. equip.	321	112	26	128	41
38	Instruments	73	26	1	21	W
39	Misc.	31	11	3	14	1
	Total	17,122	2,173	755	5,172	2,375

*Includes the individual sources shown and all other sources consumed for heat and power and feedstocks but excludes byproduct fuels.

**Includes purchases, plus transfers in, plus generation from noncombustible renewable resources, minus quantities sold and transferred out. Not included is electricity generated onsite.

***Includes distillate and residual.

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

Note. Column totals may not equal sum of components due to independent rounding

Source. Energy Information Administration, *Manufacturing Energy Consumption Survey. Consumption of Energy 1985.*

Petroleum Overview

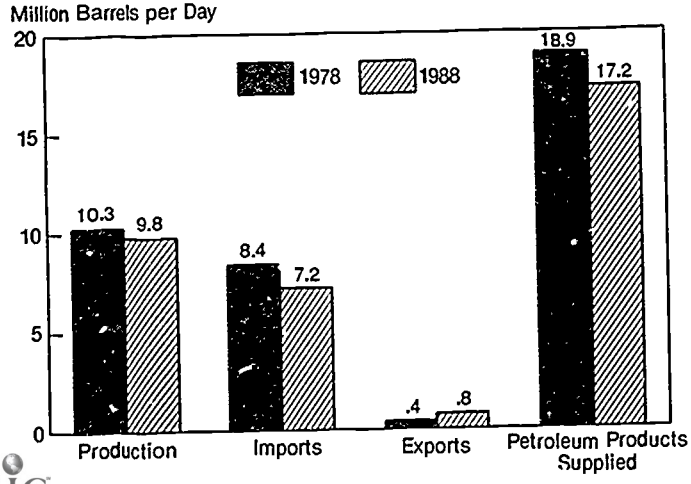
- In 1988 the domestic production of petroleum (crude oil, lease condensate, and natural gas plant liquids) was 20 quadrillion Btu, the lowest production level since 1965.
- Arab OPEC supplied petroleum net imports equivalent to 11 percent of U.S. petroleum consumption, compared to 8 percent in 1987.
- Total U.S. demand for petroleum products averaged 17.2 million barrels per day in 1988. This was 505,000 barrels per day (3.0 percent) above the 1987 demand, the highest level since 1979.
- Motor gasoline demand increased for the 6th consecutive year to 7.3 million barrels per day in 1988.
- An increase in U.S. commercial air traffic boosted demand for jet fuel by 4.5 percent between 1987 and 1988.
- Inventories of crude oil and petroleum products at the end of 1988 were relatively unchanged from the 1987 level of 1.6 billion barrels.

U.S. Petroleum Energy Balance

(Million Barrels per Day)

Year	Production	Imports	Exports	Petroleum Products Supplied
1976	9.7	7.3	0.2	17.5
1977	9.9	8.8	.2	18.4
1978	10.3	8.4	.4	18.9
1979	10.1	8 5	.5	18.5
1980	10.2	6 9	.5	17.1
1981	10.2	6 0	.6	16.1
1982	10.2	5.1	.8	15.3
1983	10.3	5.1	.7	15.2
1984	10.5	5.4	.7	15.7
1985	10.6	5.1	.8	15.7
1986	10 2	6.2	.8	16.3
1987	9.9	6.7	.8	16.7
1988P	9.8	7.2	.8	17.2

P = Preliminary data.
Note. "Production" includes output of natural gas plant liquids
Source. Energy Information Administration, *Annual Energy Review 1988*

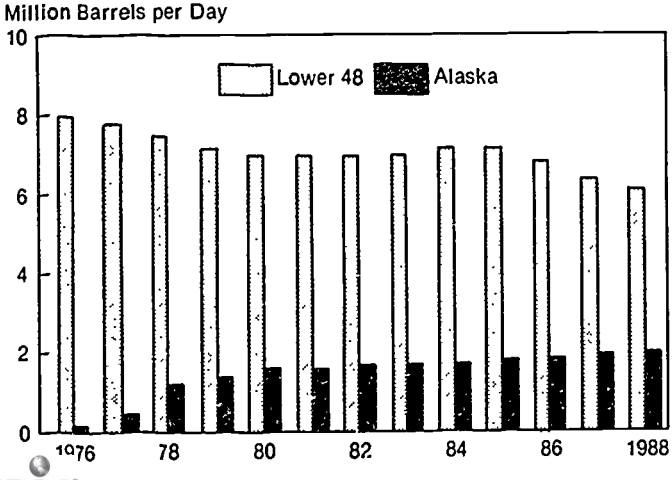


U.S. Crude Oil Production

(Thousand Barrels per Day, Except as Noted)

Year	Location		Site		Total Crude Oil Production	Average Productivity*
	Lower 48	Alaska	Onshore	Offshore		
1976	7,958	173	6,868	1,264	8,132	16.3
1977	7,781	464	7,069	1,176	8,245	16.4
1978	7,478	1,229	7,571	1,136	8,707	17.0
1979	7,151	1,401	7,485	1,067	8,552	16.3
1980	6,980	1,617	7,562	1,034	8,597	15.9
1981	6,962	1,609	7,537	1,034	8,572	15.4
1982	6,953	1,696	7,538	1,110	8,649	14.9
1983	6,974	1,714	7,492	1,196	8,688	14.4
1984	7,157	1,722	7,596	1,283	8,879	14.3
1985	7,146	1,825	7,722	1,250	8,971	13.9
1986	6,814	1,867	7,426	1,254	8,680	13.9
1987	6,387	1,962	7,153	1,196	8,349	13.5
1988P	6,112	2,017	6,960	1,168	8,129	13.3

*Barrels per day, per well.
P = Preliminary data.
Note. Crude oil production includes lease condensate production
Source. Energy Information Administration, *Annual Energy Review 1988*



U.S. Imports, Exports, and Net Imports of Crude Oil and Petroleum Products

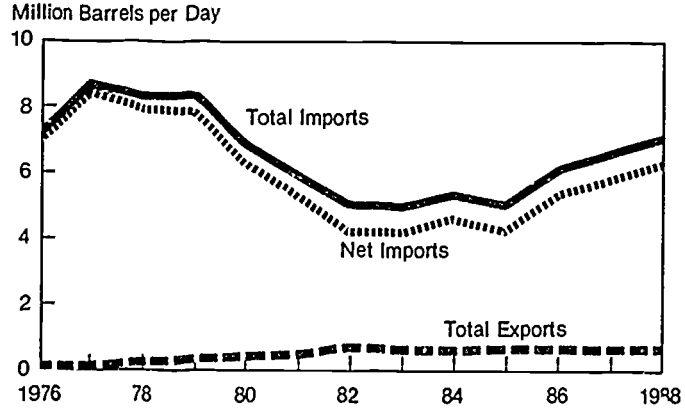
(Thousand Barrels per Day)

Year	OPEC		Non-OPEC			Total	Total	Net
	Arab	Total	Canada	Mexico	Total	Imports	Exports	Imports
1976	2,424	5,066	599	87	2,247	7,313	223	7,090
1977	3,185	6,193	517	179	2,614	8,807	243	8,565
1978	2,963	5,751	467	318	2,612	8,363	362	8,002
1979	3,056	5,637	538	439	2,819	8,456	471	7,985
1980	2,551	4,300	455	533	2,609	6,909	544	6,365
1981	1,848	3,323	447	522	2,673	5,996	595	5,401
1982	954	2,146	482	685	2,967	5,113	815	4,298
1983	632	1,862	547	826	3,189	5,051	739	4,312
1984	819	2,049	630	748	3,388	5,437	722	4,715
1985	472	1,830	770	816	3,237	5,067	781	4,286
1986	1,162	2,837	807	699	3,387	6,224	765	5,439
1987	1,274	3,060	848	655	3,618	6,678	764	5,914
1988P	1,828	3,428	976	740	3,744	7,172	819	6,353

P = Preliminary data.

Note. "Net Imports" may not equal difference between "Total Imports" and "Total Exports" due to independent rounding.

Source. Energy Information Administration, *Annual Energy Review 1988*.



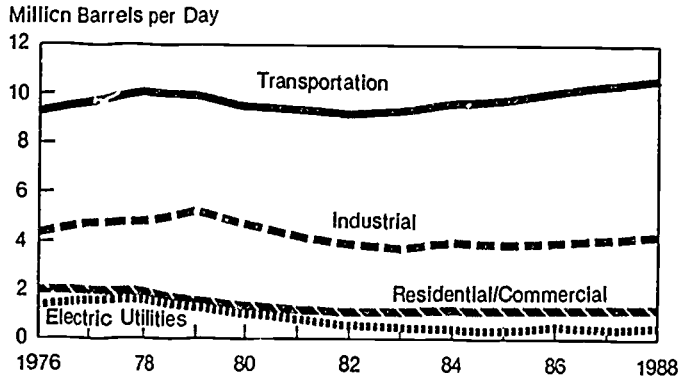
U.S. Petroleum Products Supplied to End-Use Sectors

(Million Barrels per Day)

Year	Residential/ Commercial	Industrial	Transportation	Electric Utilities	Total
1976	2.12	4.45	9.37	1.52	17.46
1977	2.14	4.82	9 76	1.71	18.43
1978	2.07	4.87	10.16	1.75	18.85
1979	1.73	5.34	10.01	1.44	18.51
1980	1.52	4.84	9.55	1.15	17.06
1981	1.33	4.27	9.49	.96	16.06
1982	1.24	4.06	9 31	.69	15.30
1983	1.29	3 86	9.40	.68	15.23
1984	1.34	4.11	9.71	.56	15.73
1985	1.35	4.02	9.87	.48	15.73
1986	1.35	4.08	10.22	.64	16.28
1987	1.37	4.24	10.51	.55	16.67
1988P	1.41	4.37	10 71	.68	17.17

P = Preliminary data.

Source. Energy Information Administration, *Annual Energy Review 1988.*



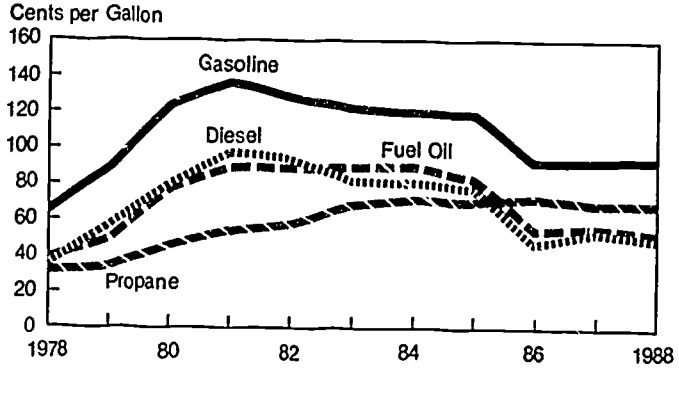
U.S. Average Prices of Selected Petroleum Products

(Cents per Gallon)

Year	U.S. City Average Unleaded Regular Gasoline (includes tax)	Refiner and Gas Plant Operator Sales Prices to End Users (excludes tax)			
		Kerosene	No.2 Fuel Oil	No.2 Diesel	Propane
1978	67.0	42.1	40.0	37.7	33.5
1979	90.3	58.5	51.6	58.5	35.7
1980	124.5	90.2	78.8	81.8	48.2
1981	137.8	112.3	91.4	99.5	56.5
1982	129.6	108.9	90.5	94.2	59.2
1983	124.1	96.1	91.6	82.6	70.9
1984	121.2	103.6	91.6	82.3	73.7
1985	120.2	103.0	84.9	78.9	71.7
1986	92.7	79.0	56.0	47.8	74.5
1987	94.8	77.0	58.1	55.1	70.1
1988	94.6	73.8	54.3	50.0	71.3

Note: Gasoline prices include all Federal, State, and local taxes paid at time of sale. Sales to end users are made directly to the ultimate consumer, including such bulk customers as agriculture, industry, and utilities, as well as residential and commercial customers. Propane is consumer grade

Source: "U.S. City Average Unleaded Gasoline" data from Energy Information Administration, *Monthly Energy Review*, December 1988. All other data from *Petroleum Marketing Monthly*, December 1988.



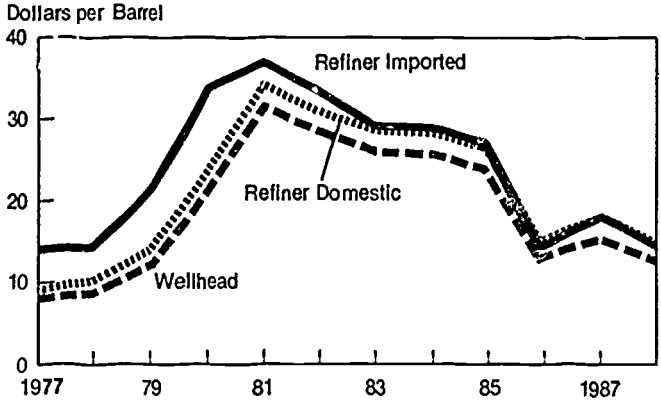
U.S. Crude Oil Price Summary

(Dollars per Barrel)

Year	Domestic First Purchase Price	Refiner Acquistion Cost		
		Domestic	Imported	Composite
1977	8.57	9.55	14.53	11.96
1978	9.00	10.61	14.57	12.46
1979	12.64	14.27	21.67	17.72
1980	21.59	24.23	33.89	28.07
1981	31.77	34.33	37.05	35.24
1982	28.52	31.22	33.55	31.87
1983	26.19	28.87	29.30	28.99
1984	25.88	28.53	28.88	28.63
1985	24.09	26.66	26.99	26.75
1986	12.51	14.82	14.00	14.55
1987	15.40	17.76	18.13	17.90
1988P	12.57	14.76	14.64	14.71

P = Preliminary data.

Source. Energy Information Administration, *Monthly Energy Review*, December 1988.

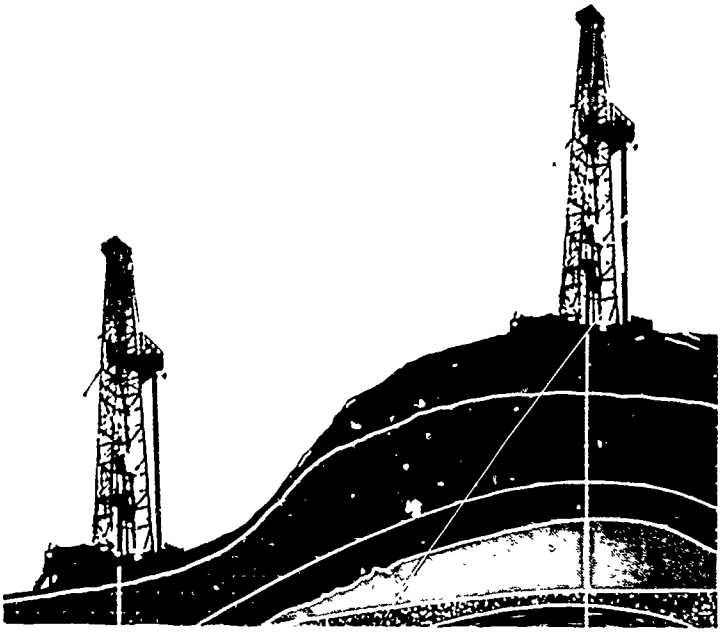


Operable Petroleum Refineries as of January 1, 1988

none
1 to 4
5 to 9
over 9

Source: Energy Information Administration, *Petroleum Supply Annual 1987.*

Natural Gas Overview



- Natural gas consumption in 1988 totaled 19 quadrillion Btu, an increase of 5 percent over 1987 consumption.
- Offshore natural gas production accounted for about 1.6 trillion cubic feet, or 15 percent of the total flowing volumes in 1988.
- The price of natural gas to local distribution companies averaged $2.88 per thousand cubic feet in 1988, a 0.3-percent increase from the average 1987 price.
- Total natural gas in underground storage reservoirs in the United States as of December 31, 1988, was 6,672 billion cubic feet, 1.9 percent above the total in storage at the end of December 1987.

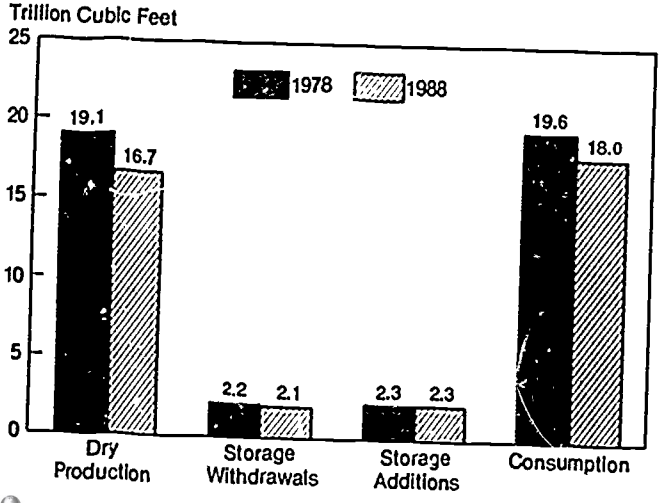
U.S. Natural Gas Energy Balance
(Trillion Cubic Feet)

Year	Dry Production	Storage Withdrawals	Storage Additions	Consumption
1976	19.1	1.9	1.8	20.0
1977	19.2	1.8	2.3	19.5
1978	19.1	2.2	2.3	19.6
1979	19.7	2.1	2.3	20.2
1980	19.4	2.0	2.0	19.9
1981	19.2	1.9	2.2	19.4
1982	17.8	2.2	2.5	18.0
1983	16.0	2.3	1.8	16.8
1984	17.4	2.1	2.3	18.0
1985	16.4	2.4	2.2	17.4
1986	16.0	1.8	2.0	16.2
1987	16.5	1.9	1.9	17.1
1988P	16.7	2.1	2.3	18.0

P = Preliminary data.

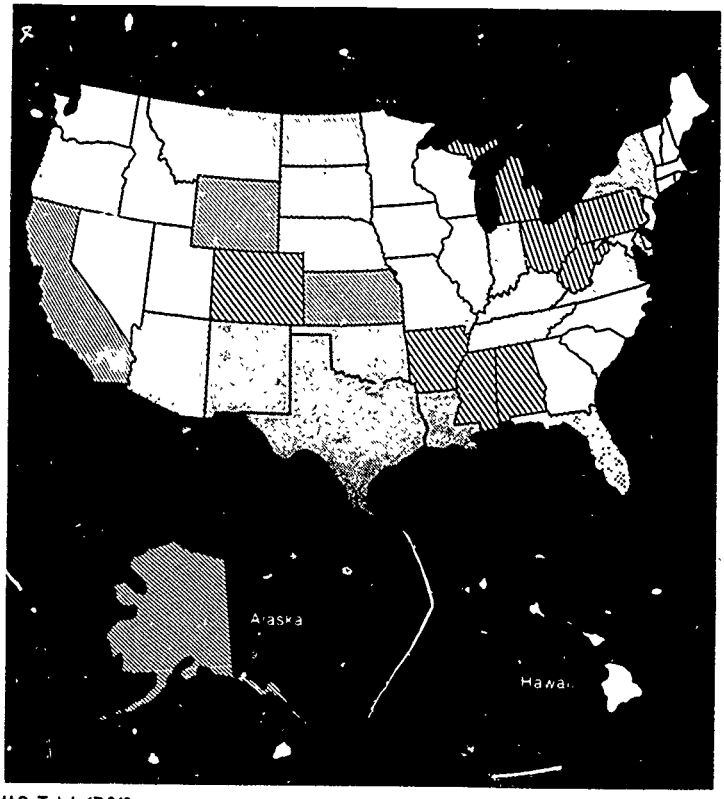
Note: The sum of "Dry Production" and "Storage Withdrawals" less "Storage Additions" does not equal "Consumption" due to imports, supplemental gaseous fuels, exports, and lost and unaccounted for gas. During the 1976 - 1988 interval, average imports were 1 trillion cubic feet, and average exports were less than 60 billion cubic feet.

Source: Energy Information Administration, *Annual Energy Review 1988*.



Marketed Production of Natural Gas, 1987

(Billion Cubic Feet)



U.S. Total: 17,349

- none
- .001 to 14
- 15 to 99
- 100 to 199
- 200 to 500
- over 500

gy Information Administration, *Natural Gas Annual 1987.*

U.S. Natural Gas Consumption

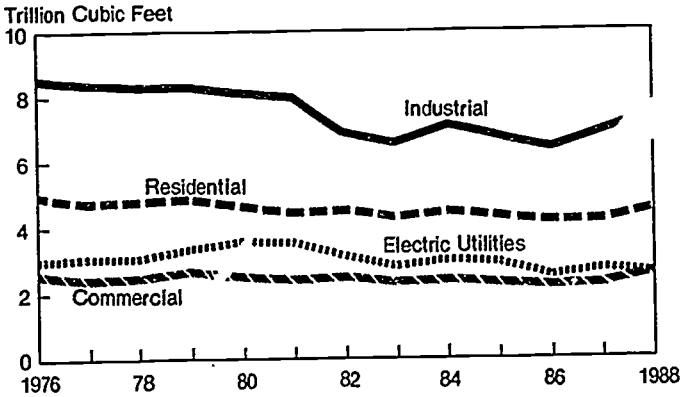
(Trillion Cubic Feet)

Year	Residential	Commercial	Industrial	Electric Utilities	Trans-portation	Total
1976	5.05	2.67	8.60	3.08	0.55	19.95
1977	4.82	2.50	8.47	3.19	.53	19.52
1978	4.90	2.60	8 40	3.19	.53	19.63
1979	4.97	2.79	8.40	3 49	.60	20.24
1980	4.75	2.61	8.20	3.68	.63	19.88
1981	4.55	2.52	8.06	3.64	.64	19.40
1982	4.63	2.61	6.94	3 23	.60	18.00
1983	4.38	2.43	6.62	2.91	.49	16.83
1984	4.56	2.52	7.23	3.11	.53	17.95
1985	4.43	2.43	6.87	3.04	.50	17.28
1986	4.31	2.32	6.50	2.60	.49	16.22
1987	4.32	2.41	7.04	2.84	.52	17.14
1988P	4.64	2.67	7.55	2.63	.54	18.04

P = Preliminary data.

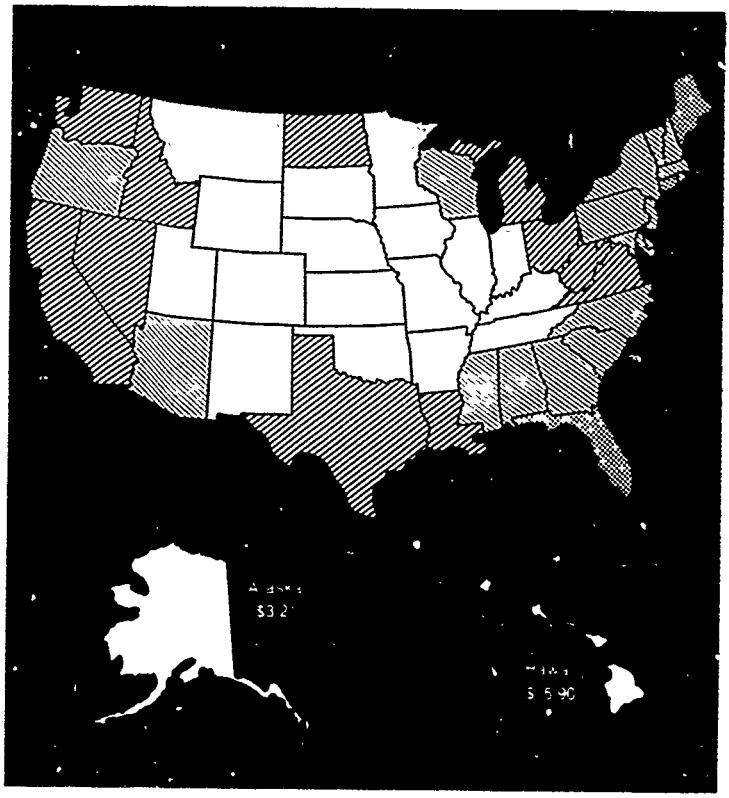
Note: "Total" may not equal sum of components due to independent rounding

Source: Energy Information Administration, *Annual Energy Review 1988*



Average Price of Natural Gas to Residential Consumers in 1987

(Dollars per Thousand Cubic Feet)



U.S. Average: $5.54

- $4.01 to $5.00
- $5.01 to $6.00
- $6.01 to $7.00
- $7.01 to $6.21

Source: Energy Information Administration, *Natural Gas Annual 1987.*

U.S. Average Price of Natural Gas to End Users

(Dollars per Thousand Cubic Feet)

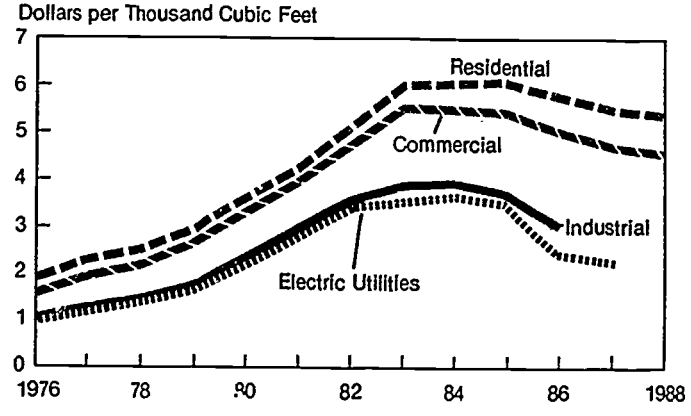
Year	Residential	Commercial*	Industrial	Electric Utilities	Average**
1976	1.98	1.64	1.11	1.06	1.38
1977	2.35	2.04	1.34	1.32	1.66
1978	2.56	2.23	1.52	1.48	1.85
1979	2.98	2.73	1.82	1.81	2.21
1980	3.68	3.39	2.42	2.27	2.80
1981	4.29	4.00	3.00	2.89	3.39
1982	5.17	4.82	3.61	3.48	4.15
1983	6.06	5.59	3.94	3.58	4.64
1984	6.12	5.55	3.99	3.70	4.67
1985	6.12	5.50	3.73	3.55	4.54
1986	5.83	5.08	3.06	2.43	3.96
1987	5.54	4.78	NA	2.32	2.96
1988P	5.46	4.63	NA	NA	NA

*Includes deliveries to municipalities and public authorities for institutional heating and other purposes.

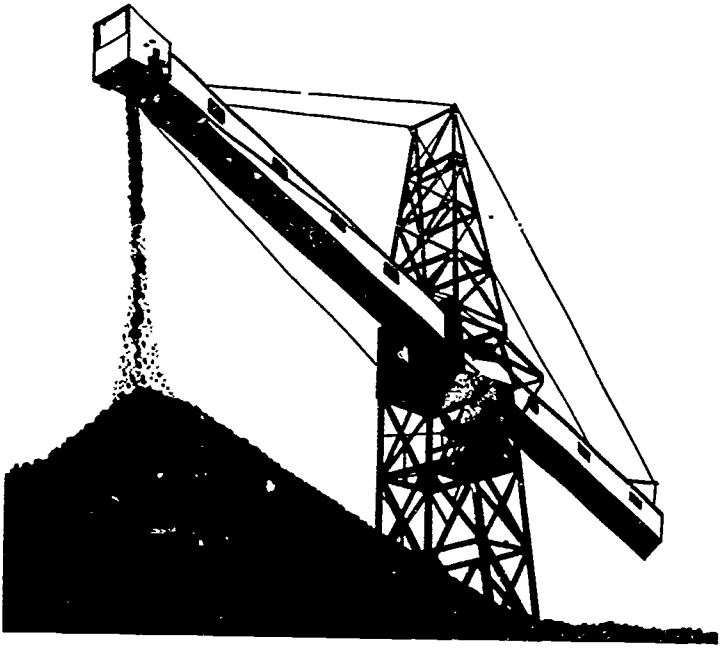
**Includes prices paid within the transportation sector for pipeline fuel.

P = Preliminary data. NA = Not available.

Source: Energy Information Administration, *Annual Energy Review 1988.*



Coal Overview



- The 959 million short tons of coal produced in 1988 surpassed the record high of 1987 by 4 percent.
- Coal was used to generate 57 percent of the net electric power that was produced by electric utilities in 1988, an increase of 5 percent over last year's generation.
- Railroad coal transportation was at a 5-year high due partly to drought conditions which interfered with water transportation.
- The level of producer/distributor coal stocks ended the year at 30 million short tons, only slighty above the level at the beginning of the year.
- U S coal distributed to foreign countries in 1988 totaled 95 million short tons (76 million to overseas destinations and 19 million to Canada).

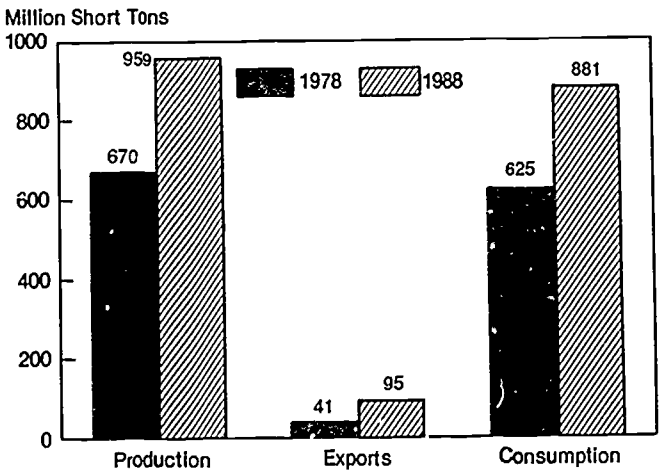
U.S. Coal Energy Balance
(Million Short Tons)

Year	Production	Imports	Exports	Consumption
1976	684.9	1.2	0	603.8
1977	697.2	1.6	3	625 3
1978	670.2	3 0		625.2
1979	781.1	2.1	96.0	680.5
1980	829.7	1.2	91.7	702.7
1981	823 8	1.0	112.5	732.6
1982	838.1	.7	106.3	706.9
1983	782.1	1.3	77.8	736.7
1984	895.9	1.3	81.5	791.3
1985	883.6	2.0	92.7	818.0
1986	890 3	2.2	85.5	804.3
1987	918.8	1.7	79.6	836.9
1988P	958.9	2.1	95.0	881.4

P = Preliminary data.

Note: The sum of "Production" and "Imports" less "Exports" does not equal "Consumption" due to changes in stocks, losses, unaccounted for coal, and small quantities of anthracite shipped overseas to the U.S. Armed Forces.

Source: Energy Information Administration, *Annual Energy Review 1988*

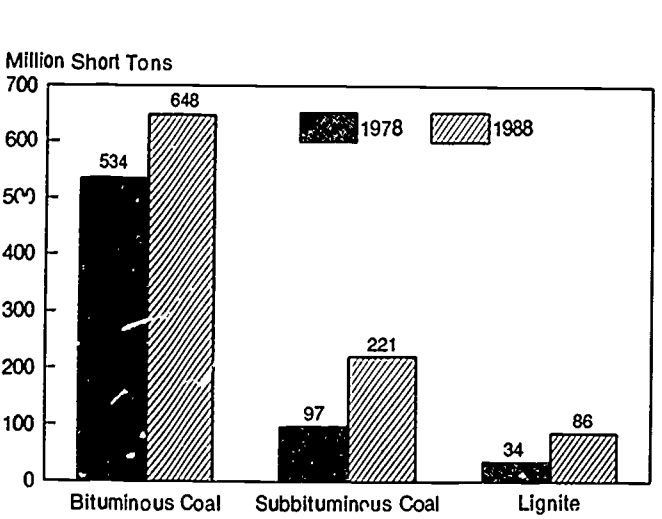


Note. Imports in 1978 and 1988 were too small to be graphically represented

U.S. Coal Production
(Million Short Tons)

Year	Bituminous Coal	Subbituminous Coal	Lignite	Anthracite	Total
1976	588.4	64.8	25.5	6.2	684.9
1977	581.0	82.1	28.2	5.9	697.2
1978	534.0	96 8	34.4	5.0	670.2
1979	612.3	121.5	42.5	4.8	781.1
1980	628.8	147.7	47.2	6.1	829.7
1981	608.0	159.7	50.7	5.4	823.8
1982	620.2	160.9	52.4	4.6	838.1
1983	568.6	151.0	58.3	4.1	782.1
1984	649.5	179.2	63.1	4.2	895.9
1985	613.9	192.7	72.4	4.7	883.6
1986	620.1	189.6	76.4	4.3	890.3
1987	636.6	200.2	78.4	3.6	918.8
1988P	647.9	221.4	86.1	3.5	958.9

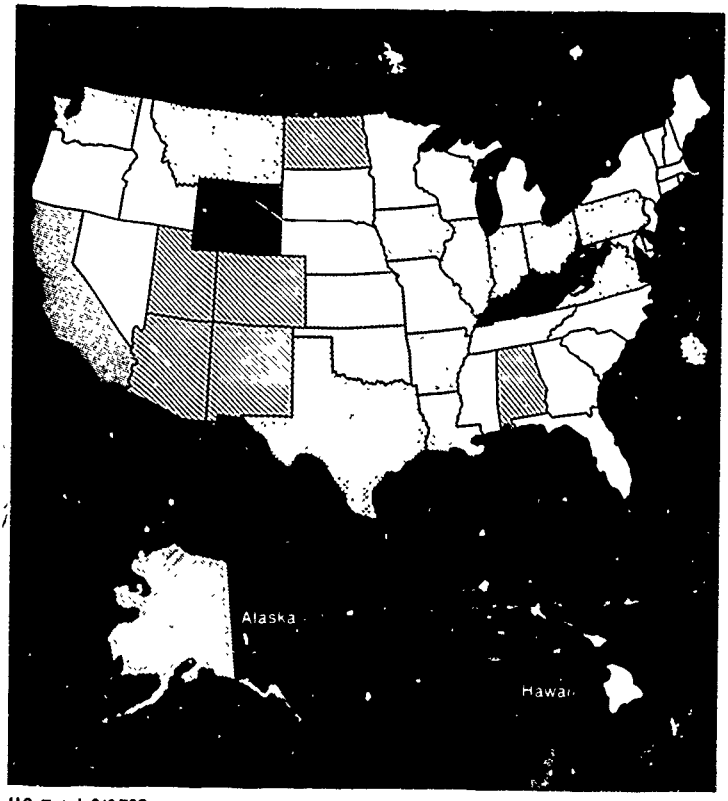
P = Preliminary data.
Note. "Total" may not equal sum of components due to independent rounding.
Source. Energy Information Administration, *Annual Energy Review 1988.*



Note: Anthracite production in 1978 and 1988 was too small to be graphically represented.

Coal Production in 1987

(Thousand Short Tons)



U.S. Total: 918,762

- none
- 1 to 999
- 1,000 to 9,999
- 10,000 to 29,999
- 30,000 to 99,999
- 100,000 or over

rgy Information Administration, *Coal Production 1987.*

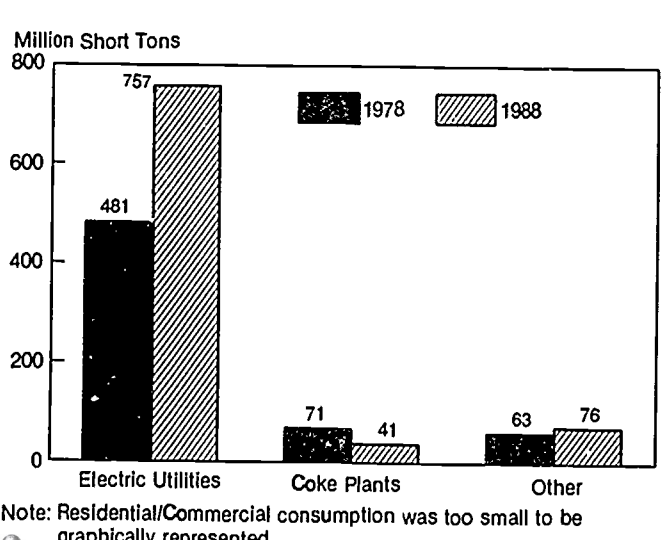
U.S. Coal Consumption by End-Use Sector
(Million Short Tons)

Year	Electric Utilities	Industrial: Coke Plants	Industrial: Other*	Residential/ Commercial	Total
1976	448.4	84.7	61 8	8.9	603.8
1977	477.1	77.7	61.5	9.0	625.3
1978	481.2	71.4	63.1	9.5	625.2
1979	527.1	77.4	67.7	8.4	680.5
1980	569.3	66.7	60.3	6.5	702.7
1981	596.8	61.0	67.4	7.4	732.6
1982	593.7	40.9	64.1	8.2	706.9
1983	625.2	37.0	66.0	8.4	736.7
1984	664.4	44.0	73.7	9.1	791.3
1985	693.8	41.1	75.4	7.8	818.0
1986	685.1	36.0	75.6	7.7	804.3
1987	717.9	37.0	75.2	6.9	836.9
1988P	756.8	41.0	75.9	7.7	881.4

*"Other Industrial" includes transportation and miscellaneous.

P = Preliminary data.

Source: Energy Information Administration, *Annual Energy Review 1988*.

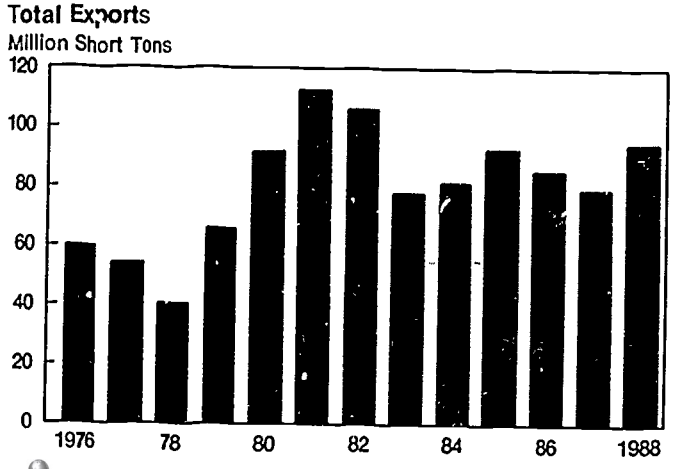


Note: Residential/Commercial consumption was too small to be graphically represented.

U.S. Coal Exports by Destination
(Million Short Tons)

Year	Canada	Western Europe	Japan	Other	Total
1976	16.9	19.9	18.8	4.3	60.0
1977	17.7	15.0	15.9	5.8	54.3
1978	15.7	11.0	10.1	4.0	40.7
1979	19.5	23.9	15.7	6.9	66.0
1980	17.5	41.9	23.1	9.3	91.7
1981	18.2	57.0	25.9	11.4	112.5
1982	18.6	51.3	25.8	10.6	106.3
1983	17.2	33.1	17.9	9.7	77.8
1984	20.4	32.8	16.3	11.9	81.5
1985	16.4	45.1	15.4	15.8	92.7
1986	14.5	42.6	11.4	17.1	85.5
1987	16.2	34.2	11.1	18.1	79.6
1988	19.2	45.1	14.1	16.6	95.0

Note: Excludes overseas shipments of anthracite to U.S. Armed Forces. "Total" may not equal sum of components due to independent rounding.
Source: Energy Information Administration, *Annual Energy Review 1988.*



Demonstrated Coal Reserve Base, January 1, 1988

(Million Short Tons)

U.S. Total: 474,524

- none
- 1 to 999
- 1,000 to 9,999
- 10,000 to 99,999
- 100,000 or over

Source: Energy Information Administration, *Coal Production 1987*.

U.S. Average Coal and Coke Prices

(Dollars per Short Ton)

Year	Bituminous Coal* F.O.B. Mines	All Coal CIF Electric Utilities	Anthracite at Plants/ Mines**	Coal Coke at Blast Furnaces
1976	19.43	18.38	33.92	85.09
1977	19.82	20.37	34.86	81.91
1978	21.78	23.75	35.25	95.95
1979	23.65	26.15	41.06	96.11
1980	24.52	28.76	42.51	101.93
1981	26.29	32.31	44.28	111.79
1982	27.14	34.90	49.85	113.91
1983	25.85	35.50	52.29	113.55
1984	25.51	35.12	48.22	102.34
1985	25.10	34.53	45.60	101.16
1986	23.70	33.30	44.12	NA
1987	23.00	31.83	43.65	NA
1988P	22.00	30.60	42.00	NA

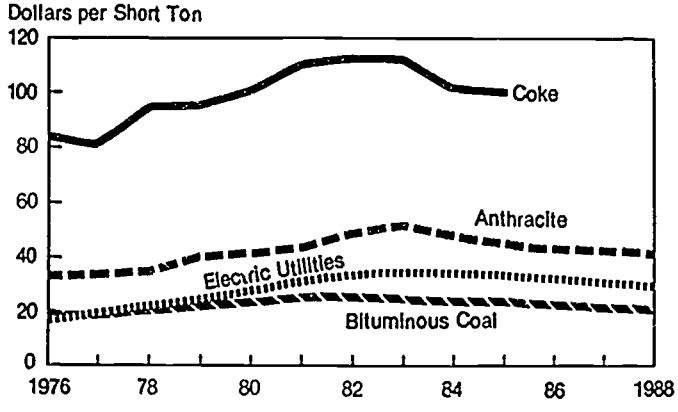
*"Bituminous Coal" includes subbituminous coal and lignite.

**1976 through 1978 prices are f.o.b. preparation plants. For 1979 forward, prices are f.o.b. mines.

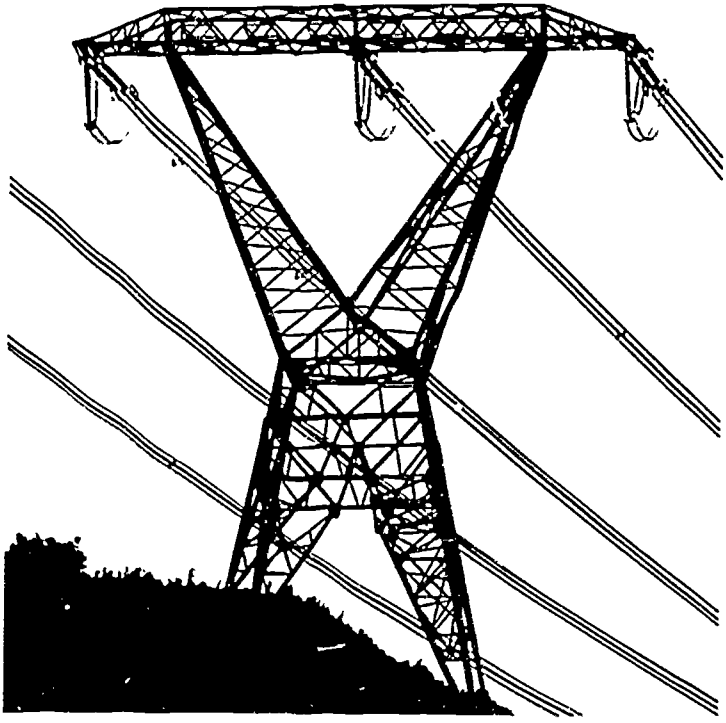
NA = Not available. P = Preliminary data.

Note: See the glossary for a definition of "f.o.b." and "CIF."

Source: Energy Information Administration, *Annual Energy Review 1988.*



Electricity Overview



- During 1988, a new record amount of electricity was generated when 2,700,924 gigawatthours were produced, a 5-percent increase over last year's level.
- At 6.3 cents per kilowatthour, the average retail price of electricity to all consumers in 1988 was down 0.5 percent from the 1987 price.
- Because of 2 consecutive years of drought, hydroelectric generation decreased 11 percent in 1988, resulting in the lowest level of hydropower generated in 11 years.
- Generation from gas-fired plants declined 7 percent from last year's rate to the lowest annual level in over 18 years.
- On a dollar-per-Btu basis, electricity remained one of the most expensive sources of energy.

U.S. Electricity Energy Balance

(Billion Kilowatthours)

Year	Net Generation	Imports*	Exports*	Consumption
1976	2,038	11	2	1,855
1977	2,124	20	3	1,948
1978	2,206	21	1	2,018
1979	2,247	23	2	2,071
1980	2,286	25	4	2,094
1981	2,295	36	3	2,147
1982	2,241	33	4	2,086
1983	2,310	39	3	2,151
1984	2,416	42	3	2,285
1985	2,470	46	5	2,326
1986	2,487	41	5	2,351
1987	2,572	52	6	2,455
1988P	2,701	35	6	2,566

*Electricity transmitted across U.S borders with Canada and Mexico.

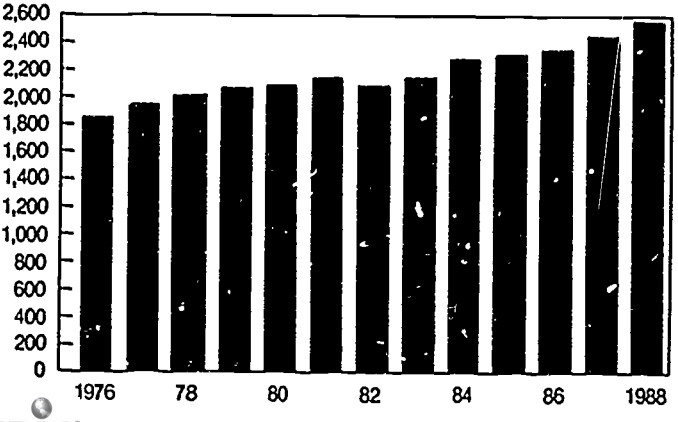
P = Preliminary data.

Note: The sum of "Net Generation" and "Imports" less "Exports" does not equal "Consumption" due to transmission losses and unaccounted for electricity.

Source: Energy Information Administration, *Annual Energy Review 1988.*

Total Consumption

Billion Kilowatthours



U.S. Net Electricity Generation by Energy Source

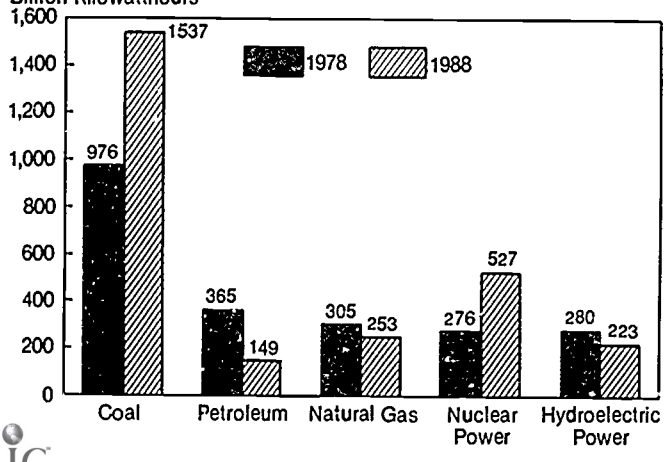
(Billion Kilowatthours)

Year	Coal	Petroleum	Natural Gas	Nuclear Power	Hydro-electric Power	Other	Total
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	1,259	144	274	294	332	6	2,310
1984	1,342	120	297	328	321	9	2,416
1985	1,402	100	292	384	281	11	2,470
1986	1,386	137	249	414	291	12	2,487
1987	1,464	118	273	455	250	12	2,572
1988P	1,537	149	253	527	223	12	2,701

P = Preliminary data.

Note "Other" energy sources include geothermal, wood, wind, waste, and solar. "Total" may not equal sum of components due to independent rounding.

Source. Energy Information Administration, *Annual Energy Review 1988.*



U.S. Sales of Electricity by End – Use Sector

(Billion Kilowatthours)

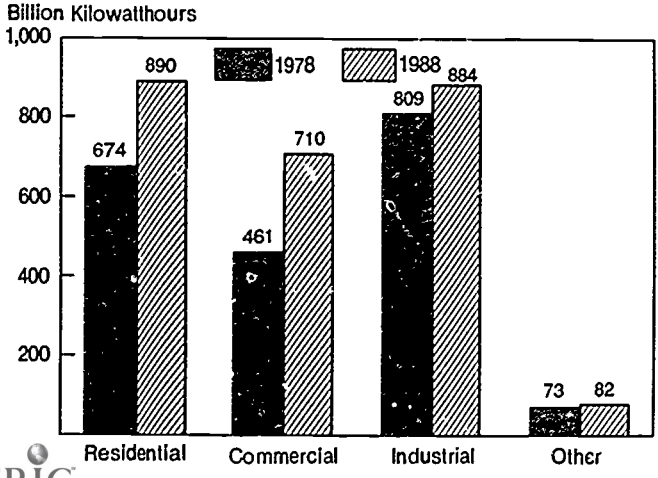
Year	End – Use Sector			Other*	Total
	Residential	Commercial	Industrial		
1976	606	425	754	70	1,855
1977	645	447	786	71	1,948
1978	674	461	809	73	2,018
1979	683	473	842	73	2,071
1980	717	488	815	74	2,094
1981	722	514	826	85	2,147
1982	730	526	745	86	2,086
1983	751	544	776	80	2,151
1984	778	578	841	82	2,278
1985	791	609	825	85	2,310
1986	818	641	808	83	2,351
1987	850	674	845	87	2,455
1988P	890	710	884	82	2,566

*"Other" sales include public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

P = Preliminary data.

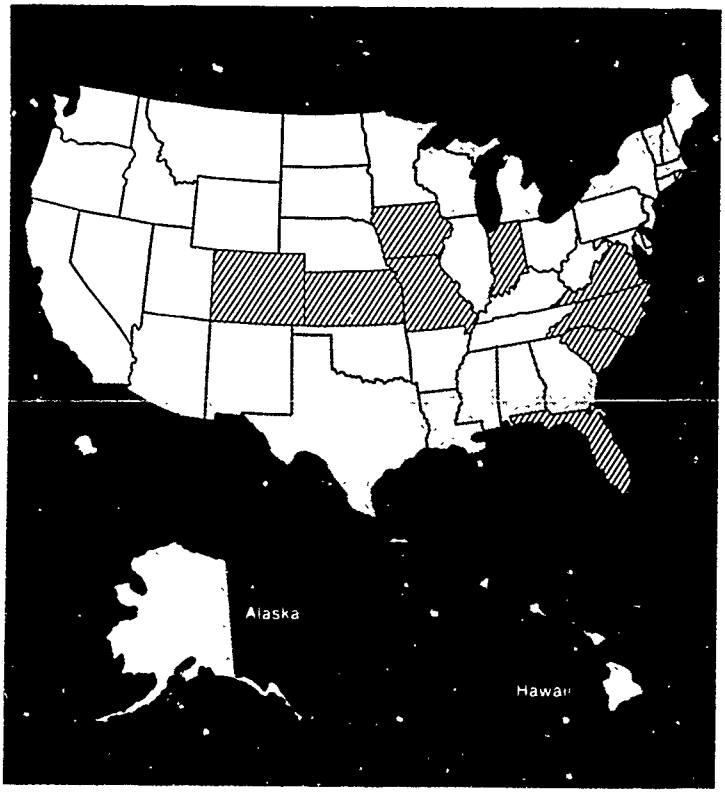
Note Beginning January 1, 1986, electricity sales estimates are based on a new sample and new expansion factors.

Source. Energy Information Administration, *Annual Energy Review 1988.*



Typical Monthly Residential Electric Bills for 750 Kilowatthour Service on January 1, 1988

(Dollars)



U.S. Average: $57.39

- under $46.00
- $46.01 to $52.00
- $52.01 to $60.00
- Over $60.00

Source: Energy Information Administration, *Typical Electric Bills 1988.*

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Retail Prices of Electricity Sold by Electric Utilities

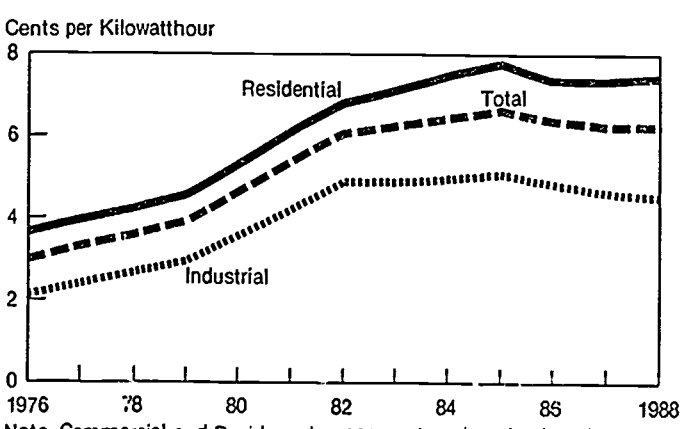
(Cents per Kilowatthour)

Year	End – Use Sector				
	Residential	Commercial	Industrial	Other	Total
1976	3.73	3.60	2.21	3.27	3.09
1977	4.05	4.09	2.50	3.51	3.42
1978	4.31	4 36	2.79	3.62	3 69
1979	4.64	4.68	3.05	3.95	3.99
1980	5 36	5.48	3 69	4.76	4.73
1981	6 20	6.29	4.29	5.28	5.46
1982	6.86	6.86	4.95	5.92	6.13
1983	7.18	7.02	4.96	6.36	6.30
1984	7.54	7.33	5.04	6.78	6.52
1985	7.79	7.47	5.16	6.96	6.71
1986	7.41	7.13	4.90	6.64	6.42
1987	7.41	7.01	4.72	6.64	6 32
1088P	7.50	7.00	4.61	6.06	6 29

P = Preliminary Data.

Note. Prior to January 1986, national price estimates were based on a sample of only privately owned electric utilities. Beginning with 1986, national price estimates are based on a statistically derived sample of both publicly and privately owned electric utilities.

Source. Energy Information Administration, *Annual Energy Review 1988*.



Note. Commercial and Residential prices are too close to show both.

Nuclear Overview

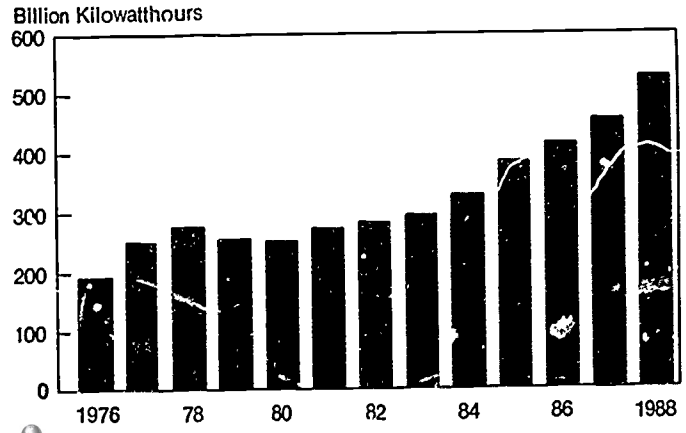
In 1988, nuclear-powered generating units produced 19 5 percent of the total U.S. net electricity, breaking the record level set in 1987.

- Nuclear units operating at a higher capacity factor (64 percent in 1988, compared to 57 percent in 1987) and the addition of two new units during the year contributed to the growth in U.S. nuclear power.
- The 69,166 gigawatthours of nuclear power produced in Illinois during 1988 represented 13 percent of the total U.S. generation from nuclear power.
- The two other States that produced large amounts of electricity from nuclear power were South Carolina (40,746 gigawatthours) and Pennsylvania (37,862).
- Arizona increased its generation of electricity from nuclear powered units in 1988 by 70 percent over its 1987 level The second largest percentage difference between 1987 and 1988 occurred in Oregon (45 8-percent increase).

U.S. Nuclear Power Plant Net Summer Capability and Net Generation

Year	End-of-Year Operable Reactors		Net Generation of Electricity	
	Number	Capability*	(billion kilowatthours)	(percent of total U.S.)
1976	61	43.7	191.1	9.4
1977	65	46.2	250.9	11.8
1978	70	50.7	276.4	12.5
1979	68	49.6	255.2	11.4
1980	70	51.7	251.1	11.0
1981	74	55.9	272.7	11.9
1982	77	59.9	282.8	12.6
1983	80	63.0	293.7	12.7
1984	86	69.7	327.6	13.6
1985	95	79.4	383.7	15.5
1986	100	85.2	414.0	16.6
1987	107	93.6	455.3	17.7
1988P	108	95.1	526.9	19.5

*Net summer capability in million kilowatts.
P = Preliminary data.
Source. Energy Information Administration, *Annual Energy Review 1988*



Percent of Net Electricity Generated in Each State by Nuclear Power in 1987

U.S. Average: 17.7%

- none
- 0.03 to 9.9
- 10.0 to 19.9
- 20.0 to 29.9
- 30.0 to 49.9
- 50.0 or over

Energy Information Administration, *Electric Power Annual 1987.*

47.0

U.S. Uranium Production, Exports, and Imports

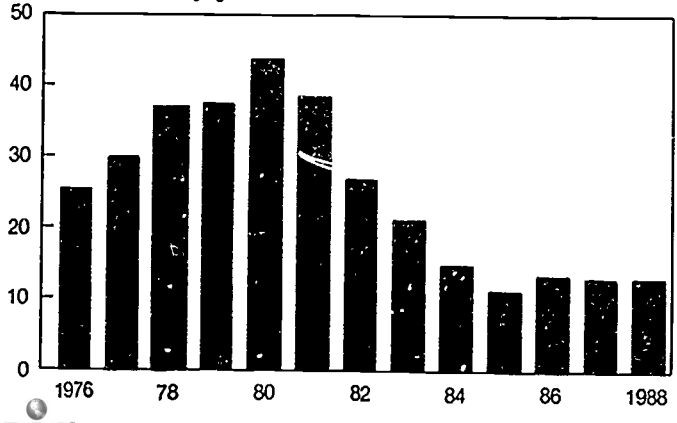
(Million Pounds of U_3O_8)

Year	Domestic Production	Imports	Exports
1976	25.5	3 6	1.2
1977	29.9	5.6	4.0
1978	37.0	5.2	6 8
1979	37.5	3 0	6 2
1980	43.7	3 6	5.8
1981	38.5	6.6	4.4
1982	26.9	17.1	6 2
1983	21.2	8 2	3.3
1984	14.9	12.5	2.2
1985	11 3	11.7	5.3
1986	13.5	13 5	1.6
1987	13.0	14.8	1.0
1988P	13.0	14 4	2.1

P = Preliminary data.
Note. See the glossary for a complete definition of uranium.
Source Energy Information Administration, *Annual Energy Review 1988.*

Total Production

Million Pounds of U_3O_8

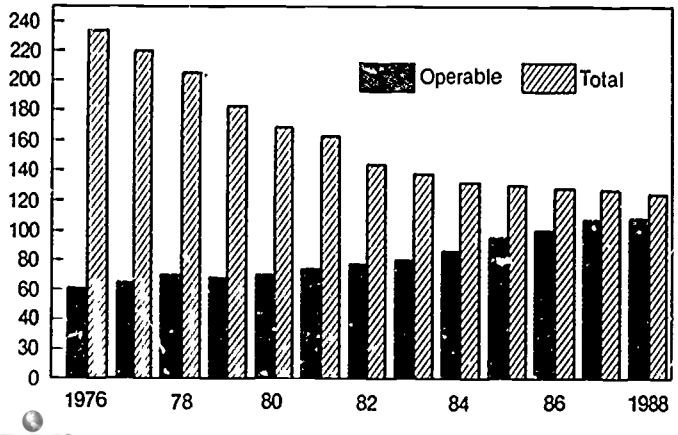


U.S. Nuclear Reactor Units, End – of – Year Status

Year	Operable	In Startup	Construction Permits Granted	Construction Permits Pending	On Order	Announced	Total
1976	61	0	72	66	16	19	234
1977	65	1	80	52	13	9	220
1978	70	0	90	32	9	4	205
1979	68	0	91	21	3	0	183
1980	70	2	82	12	3	0	169
1981	74	0	75	11	3	0	163
1982	77	2	60	3	2	0	144
1983	80	3	53	0	2	0	138
1984	86	6	38	0	2	0	132
1985	95	3	30	0	2	0	130
1986	100	7	19	0	2	0	128
1987	107	4	14	0	2	0	127
1988	108	3	13	0	0	0	124

Source. Energy Information Administration, *Monthly Energy Review*, December 1988.

Operable and Total Units



World Overview

- World primary energy production attained a new high in 1987, exceeding 321 quadrillion Btu, an increase of more than 7 quadrillion Btu over 1986 production levels.
- The largest producers of crude oil and natural gas liquids in 1987 were the U.S.S.R., the United States, and Saudi Arabia.
- Two-thirds of all the dry natural gas produced in the world in 1987 came from the U.S.S.R. and the United States.
- China was the world's leading coal producer in 1987, with production reported at 1,014 million short tons, followed by the United States, with 919 million short tons.
- The major producers of nuclear electric power in 1987 were the United States (455.3 billion kilowatthours), France (252.2), Japan (176.9), U.S.S.R. (160.0), and West Germany (124.0).
- The major producers of hydroelectric power in 1987 were Canada (313.2 billion kilowatthours), the United States (252.9), U.S.S.R. (215.0), Brazil (185.0), and Norway (102.8).

World Primary Energy Production by Region
(Quadrillion Btu)

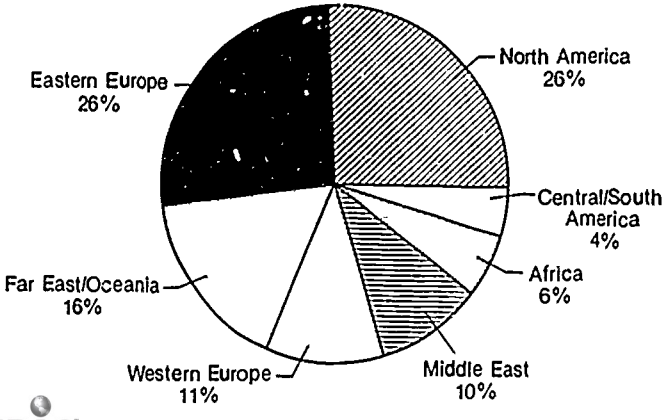
Year	North America	Central/ South America	Europe West	Europe Eas	Middle East	Africa	Far East/ Oceania	Total
1977	72.3	10.9	23.9	63.0	49.8	16.4	32.1	268.4
1978	73.9	11.2	24.8	65.4	47.3	16.7	34.5	273.9
1979	78.2	12.2	27.4	67.5	48.7	18.3	36.0	288.3
1980	80.5	12.2	28.7	69.2	42.1	17.4	36.5	286.5
1981	80.8	12.1	29.7	69.7	36.7	15.1	37.5	281.7
1982	81.3	12.0	30.7	72.2	29.5	15.4	38.9	280.0
1983	78.9	12.2	31.9	74.2	27.3	16.1	41.5	282.1
1984	84.5	13.1	32.3	76.5	27.7	17.5	45.1	296.8
1985	84.1	13.4	34.9	78.6	25.7	18.4	49.0	304.1
1986	82.8	14.1	35.8	81.5	30.6	18.2	51.1	314.1
1987P	83.9	14.1	36.7	83.8	31.5	18.3	53.0	321.3

P = Preliminary data.

Notes: "Total" may not equal sum of components due to independent rounding. Eastern Europe includes U.S.S.R.

Source: Energy Information Administration, *International Energy Annual 1987*.

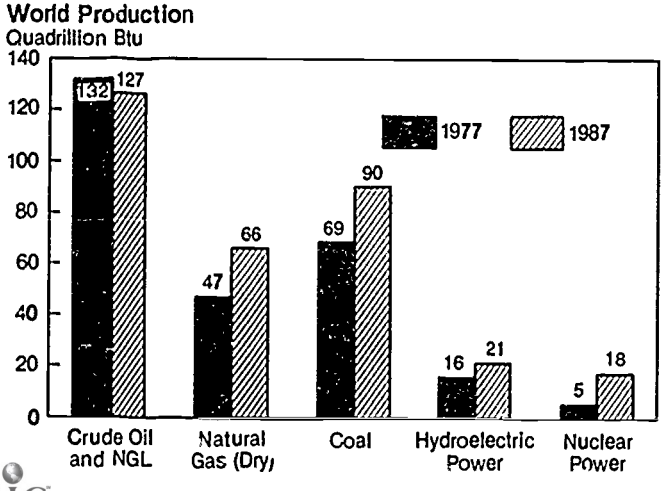
1987 World Energy Production



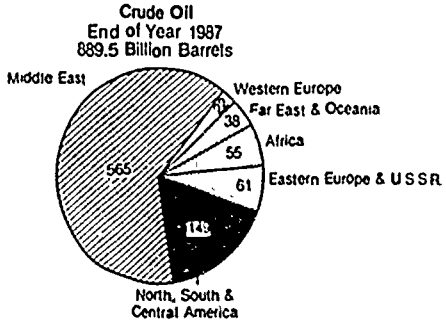
World Primary Energy Production by Source
(Quadrillion Btu)

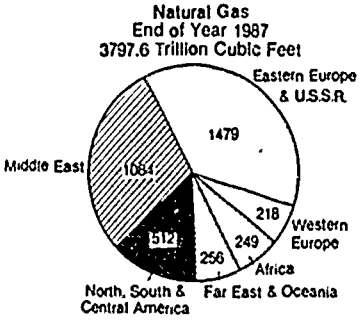
Year	Crude Oil and NGL*	Natural Gas (Dry)	Coal	Hydro-electric Power	Nuclear Power	Total
1977	132.1	46 9	69.5	15.6	5.4	268.4
1978	132.9	48.2	69.5	16.8	6.4	273.9
1979	138.6	51.6	73.6	17.7	6.7	288.3
1980	133.1	52.8	75.0	18.2	7.5	286.5
1981	125 3	54.2	75.2	18.5	8.5	281.7
1982	119.7	53.7	78.4	18.9	9.3	280.0
1983	119.1	54.0	76.5	19.9	10.6	282.1
1984	122.4	59.0	82.2	20.5	12.8	296.8
1985	120.9	61.3	86.1	20.8	15.1	304.1
1986	126.1	62.5	88.3	21.0	16.2	314.1
1987P	126.6	65.9	90.2	21.2	17.5	321.3

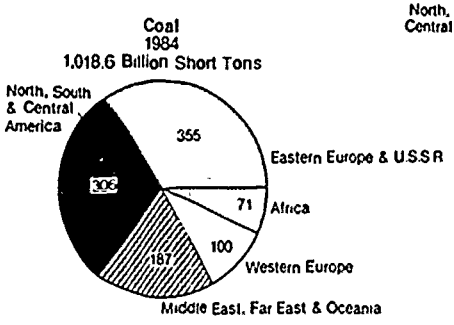
*NGL = Natural gas liquids.
P = Preliminary data.
Note "Total" may not equal sum of components due to independent rounding.
Source Energy Information Administration, *International Energy Annual 1987.*



World Fossil Fuel Reserves







Source: Energy Information Administration, *Annual Energy Review 1988*

Glossary

Anthracite: A hard, jet black, solid fossil fuel with a high luster. It is the highest rank of coal and is mined primarily in northeast Pennsylvania.

Barrel: A liquid measure defined as 42 U.S. gallons.

Bituminous Coal. Most common type of solid fossil fuel. It is soft, dense, and black with well defined bands of bright and dull material. It is mined chiefly in Kentucky, Pennsylvania, Illinois, and West Virginia.

Btu (British thermal unit). A standard unit for measuring the quantity of heat required to raise the temperature of 1 pound of water by 1 degree Fahrenheit.

CIF (Cost, Insurance, and Freight). Used in sales price contracts. CIF generally includes the cost of goods, freight charges to a named destination, and the insurance charges on the goods shipped.

Coal. A black or brownish-black solid combustive substance formed by the partial decomposition of vegetable matter without free access to air.

Coal Coke. A hard, porous product made from baking bituminous coal in ovens at temperatures as high as 2,000 degrees. It is used both as a fuel and as a reducing agent in smelting iron ore in a blast furnace.

Crude Oil. A mixture of hydrocarbons that existed in a liquid phase in underground reservoirs and remains liquid after passing through processing facilities at the surface.

Dry Natural Gas Production. Gross withdrawals from production reservoirs less gas used in reservoir repressuring, amounts vented and flared, nonhydrocarbons removed, and various natural gas constituents, such as ethane, propane, and butane removed at natural gas processing plants.

F.O.B. (free on board). Used in sales price quotations, the f.o.b. price involves sellers assuming all responsibility and costs up to the specific point of delivery and buyers taking responsibility at that point.

Fossil Fuel. Any naturally occurring fuel of organic nature, such as petroleum, coal, and natural gas.

Geothermal Power. Electricity generated at a conventional steam electric plant where turbines are driven either by steam produced from hot water or by natural steam trapped below the surface of the earth's crust.

Hydroelectric Power. Electricity generated by an electric power plant whose turbines are driven by falling water.

Kilowatthour: One thousand watthours.

Lignite. The lowest rank of coal, which is brownish black and has a high moisture content. Used mainly to generate electricity. It is mined primarily in North Dakota, Montana, and Texas.

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 Liquids. Hydrocarbons in natural gas that are separated as a liquid from the gas at lease separators, field facilities, and natural gas processing plants.

Net Generation. Total amount of electrical energy produced less the electrical energy consumed at the generating station for station use.

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

Nuclear Power. Electricity generated by an electric power plant whose turbines are driven by steam produced in a reactor by heat from the fissioning of nuclear fuel.

OPEC (Organization of Petroleum Exporting Countries). Arab OPEC countries are Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates. Non-Arab OPEC countries are Ecuador, Gabon, Indonesia, Iran, Nigeria, and Venezuela.

Petroleum. A term applied to oil and oil products in all forms including, crude oil, lease condensate, unfinished oils, petroleum products, and natural gas plant liquids.

Petroleum Products. Ready for consumption products obtained through the processing of crude oil and natural gas. Refined products include liquefied petroleum gases, aviation gasoline, motor gasoline, jet fuel, kerosene, distillate fuel oil, residual fuel oil, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt, road oil, still gas, and miscellaneous products.

Proved Reserves, Liquid and Gaseous Hydrocarbons. The estimated quantities of crude oil, natural gas, and natural gas liquids in the ground that geological data demonstrate with reasonable certainty to be recoverable in future years under existing economic and operating conditions.

Short Ton: A unit of weight equal to 2,000 pounds.

Subbituminous Coal. A dull black coal often referred to as black lignite, used for generating electricity and space heating. It ranks between bituminous and lignite and is mined primarily in Wyoming and Montana.

Uranium. A heavy, radioactive element containing two isotopes, uranium 235, and uranium 238. Uranium 235 is indispensable to the nuclear industry as it is the only naturally occurring isotope that can undergo fission.

Watt. The electrical unit of power or rate of doing work or the rate of energy transfer equivalent to 1 ampere flowing under the pressure of 1 volt. Watt is analogous to horsepower (i.e., 1 horsepower is equivalent to approximately 746 watts).

Units of Measure and Energy Equivalents

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 of wood 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

Energy Equivalents

One Btu equals approximately
- 1 blue-tip kitchen match

One thousand Btu equals approximately
- 1 average candy bar (250 kilocalories or food calories)
- 1 hour of bicycling
- 4/5 of one peanut butter and jelly sandwich
- 2 glasses of table wine (5 fluid ounces each)

One million Btu equals approximately
- 90 pounds of U.S. coal
- 120 pounds of oven-dried hardwood
- 8 gallons of motor gasoline or the amount it took in 1987 to move the average passenger car in the United States about 154 miles
- 10 therms of dry natural gas
- 11 gallons of propane
- 1.2 days of energy consumption per person (U.S.-1984)
- 2 months of dietary intake of a laborer

One million Btu of fossil fuels burned at electric utilities can generate about 100 kilowatthours of electricity, while about 300 kilowatthours of electricity generated at electric utilities can produce about 1 million Btu of heat.

One Quadrillion Btu of heat equals approximately
- 45 million short tons of coal
- 60 million short tons of oven-dried hardwood
- 1 trillion cubic feet of dry natural gas
- 171 million barrels of crude oil
- 470 thousand barrels per day of crude oil for 1 year
- 25 days of petroleum imports into the United States
- 26 days of U.S. motor gasoline usage
- [illegible] of world energy consumption (1987)

One barrel of crude oil equals approximately

14 days of petroleum consumption per person (U.S.-1988)
5.6 thousand cubic feet of dry natural gas
0.26 short tons (or 520 pounds) of coal production
1,700 kilowatthours of electricity consumed.

One short ton of coal equals approximately

166 days of coal consumption per person (U.S.-1988)
3.8 barrels of crude oil
21 thousand cubic feet of dry natural gas
6,500 kilowatthours of electricity consumed

One thousand cubic feet of natural gas equals approximately

4.9 days of natural gas use per person (U.S.-1988)
0.18 barrels (or 7.4 gallons) of crude oil
0.047 short tons (or 93 pounds) of coal
300 kilowatthours of electricity consumed

One thousand kilowatthours (kWh) of electricity equals approximately

35 days of electricity use per person (U.S.-1988)
0.59 barrels of crude oil (although it takes abut 1.8 barrels of oil to produce 1,000 kWh)
0.15 short tons (or 310 pounds) of coal (although it takes about 0.47 short tons to produce 1,000 kWh)
3,300 cubic feet of dry natural gas (although it takes about 10,000 cubic feet to produce 1,000 kWh)

Energy Information Assistance

NEIC
202/586-8800
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Statistical and analytical energy data, information, and referral assistance to government, private organizations, and individuals are available from the

National Energy Information Center
Energy Information Administration
Forrestal Building
Washington, DC 20585
202/586-8800
TDD 202/586-1181

Subject information specialists for specific energy sources provide personalized service in responding to energy inquiries at the National Energy Information Center.

Information on renewable energy and energy conservation, including active/passive solar, solar thermal, photovoltaic, wind, biomass, alcohol fuels, hydroelectric, geothermal, and ocean thermal energy, is available from the

Conservation and Renewable Energy Inquiry and Referral Service (CAREIRS)
P.O. Box 8900
Silver Spring, MD 20907
(800)523-2929 (Continental United States)
(800)462-4983 (Pennsylvania only)
(800)233-3071 (Alaska and Hawaii)

Engineering/scientific technical assistance and commercialization technical assistance for developing energy-saving appropriate technology are available from the

National Appropriate Technology Assistance Service (NATAS)
U.S. Department of Energy
P.O. Box 2525
Butte, MT 59702-2525
(800)428-2525
(800)428-1718 (Montana only)

*Telecommunications device for the deaf.

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(0219) *International Energy Annual*
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(0131) *Natural Gas Annual*
(0216) *U S Crude Oil, Natural Gas and Natural Gas Liquids Reserves* (annual)

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(0474) *Annual Outlook for U S Electric Power*

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