

Chapter 1

Petroleum

Summary Statistics from Tables/Figures in this Chapter

Source			
Table 1.2	World Oil Production, 1998		
	<i>U.S. Oil Production (million barrels per day)</i>		6.2
	<i>U.S. Share</i>		9.3%
Table 1.3	World Oil Consumption, 1997		
	<i>U.S. Oil Consumption (million barrels per day)</i>		18.6
	<i>U.S. Share</i>		25.5%
Figure 1.2	Refinery yield, 1999	OECD Europe	North America
	<i>Gasoline</i>	21.3%	40.8%
	<i>Diesel fuel</i>	34.9%	22.0%
	<i>Residual fuel</i>	17.0%	7.6%
	<i>Kerosene</i>	6.7%	8.9%
	<i>Other</i>	20.1%	20.7%
Table 1.9	U.S. transportation oil use as a percent of U.S. oil production, 1999		146%
Table 1.9	Net imports as a percentage of U.S. oil consumption, 1999		50%
Table 1.10	Transportation share of oil consumption, 1999		67%

Although the world has consumed about one-third of estimated conventional oil resources, the total fossil fuel potential is huge. Methane hydrates—a potential source of natural gas—are not shown in the graph below, but constitute the largest resource at 137.5 trillion barrels of oil equivalent.

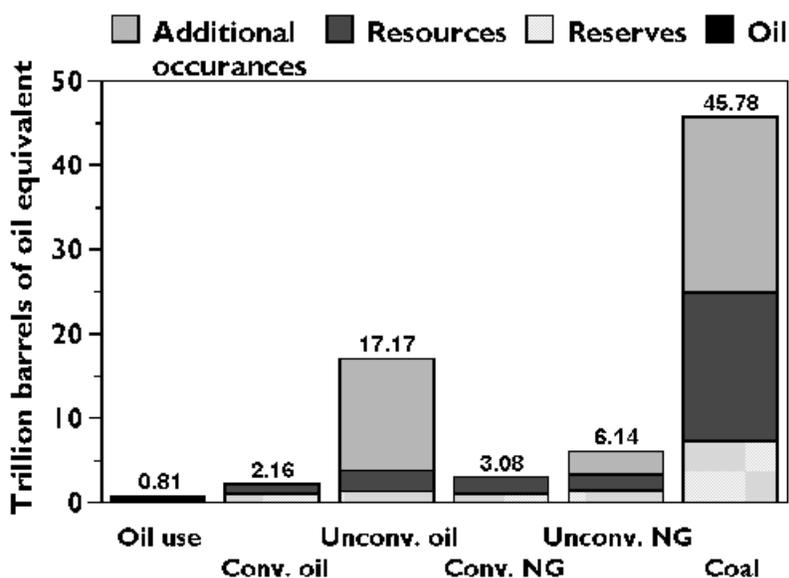
Table 1.1
World Fossil Fuel Potential
(trillion barrels of oil equivalent)

	Oil	Reserves	Resources	Additional occurrences
<i>Oil</i>				
Use to Date	0.81			
Conventional		1.10	1.06	0.00
Unconventional		1.34	2.46	13.37
<i>Natural Gas</i>				
Conventional		1.03	2.05	0.00
Unconventional		1.41	1.89	2.84
Methane hydrates		0.00	0.00	137.50
<i>Coal</i>				
		7.35	17.57	20.86

Source:

H.H. Rogner, "An Assessment of World Hydrocarbon Resources," *Annual Review of Energy and Environment*, 1997, p. 249.

Figure 1.1. World Fossil Fuel Potential



Source:

See Table 1.1.

Table 1.2
World Crude Oil Production, 1960-98^a
(million barrels per day)

Year	United States	U.S. Share	Total OPEC ^b	OPEC Share	OPEC + ^c	OPEC + ^c Share	Total Non-OPEC	Persian Gulf nations ^d	World
1960	7.04	33.5%	8.70	41.4%	12.25	58.3%	12.29	5.27	20.99
1965	7.80	25.7%	14.35	47.3%	19.83	65.4%	15.98	8.37	30.33
1970	9.64	21.0%	23.30	50.8%	31.16	67.9%	22.59	13.39	45.89
1971	9.46	19.5%	25.21	52.0%	33.58	69.2%	23.31	15.77	48.52
1972	9.44	18.5%	26.89	52.6%	35.69	69.8%	24.25	17.54	51.14
1973	9.21	16.5%	30.63	55.0%	39.82	71.5%	25.05	20.67	55.68
1974	8.77	15.7%	30.35	54.5%	40.24	72.2%	25.37	21.28	55.72
1975	8.37	15.8%	26.77	50.7%	37.56	71.1%	26.06	18.93	52.83
1976	8.13	14.2%	30.33	52.9%	41.87	73.0%	27.01	21.51	57.34
1977	8.24	13.8%	30.89	51.7%	43.09	72.2%	28.82	21.73	59.71
1978	8.71	14.5%	29.46	49.0%	42.46	70.6%	30.70	20.61	60.16
1979	8.55	13.6%	30.58	48.8%	44.12	70.4%	32.09	21.07	62.67
1980	8.60	14.4%	26.61	44.6%	41.07	68.9%	32.99	17.96	59.60
1981	8.57	15.3%	22.48	40.1%	37.46	66.8%	33.60	15.25	56.08
1982	8.65	16.2%	18.78	35.1%	34.28	64.1%	34.70	12.16	53.48
1983	8.69	16.3%	17.50	32.9%	33.15	62.2%	35.76	11.08	53.26
1984	8.88	16.3%	17.44	32.0%	33.19	60.9%	37.05	10.78	54.49
1985	8.97	16.6%	16.18	30.0%	31.81	58.9%	37.80	9.63	53.98
1986	8.68	15.4%	18.28	32.5%	34.05	60.6%	37.95	11.70	56.23
1987	8.35	14.7%	18.52	32.7%	34.72	61.3%	38.15	12.10	56.67
1988	8.14	13.9%	20.32	34.6%	36.66	62.4%	38.42	13.46	58.74
1989	7.61	12.7%	22.07	36.9%	38.50	64.3%	37.79	14.84	59.86
1990	7.36	12.2%	23.20	38.3%	39.12	64.6%	37.37	15.28	60.57
1991	7.42	12.3%	23.27	38.6%	38.53	64.0%	36.94	14.74	60.21
1992	7.17	11.9%	24.40	40.5%	37.67	62.6%	35.81	15.97	60.21
1993	6.85	11.4%	25.12	41.7%	37.65	62.5%	35.12	16.71	60.24
1994	6.66	10.9%	25.51	41.8%	37.67	61.8%	35.48	16.96	60.99
1995	6.56	10.5%	26.00	41.7%	38.24	61.4%	36.33	17.21	62.33
1996	6.46	10.1%	26.76	41.8%	39.45	61.6%	37.29	17.37	64.05
1997	6.45	9.7%	28.36	42.8%	41.31	62.3%	37.96	18.50	66.32
1998	6.24	9.3%	28.76	43.0%	41.69	62.3%	38.11	19.33	66.87
<i>Average annual percentage change</i>									
1960-98	-0.3%		3.2%		3.3%		3.0%	3.5%	3.1%
1970-98	-1.5%		0.8%		1.0%		1.9%	1.3%	1.4%
1988-98	-2.6%		3.5%		1.3%		-0.1%	3.7%	1.3%

Source:

U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1998*, Washington, DC, July 1999, Table 11.4.

^aIncludes lease condensate. Excludes natural gas plant liquids.

^bOrganization of Petroleum Exporting Countries. See Glossary for membership.

^cOPEC includes all OPEC nations plus Russia, Mexico, Norway and Oman.

^dSee Glossary for Persian Gulf nations.

These data are the latest available; oil consumption data generally lags behind production data (previous table) by one year.

Table 1.3
World Oil Consumption, 1960–97
(million barrels per day)

Year	United States	U.S. Share	Total OECD ^a	Total Non-OECD	World
1960	9.80	45.9%	15.78	5.56	21.34
1965	11.51	37.0%	22.81	8.33	31.14
1970	14.70	31.4%	34.49	12.32	46.81
1971	15.21	30.8%	36.07	13.35	49.42
1972	16.37	30.8%	38.74	14.35	53.09
1973	17.31	30.2%	41.53	15.71	57.24
1974	16.65	29.4%	40.12	16.56	56.68
1975	16.32	29.0%	38.82	17.38	56.20
1976	17.46	29.3%	41.39	18.28	59.67
1977	18.43	29.8%	42.43	19.40	61.83
1978	18.85	29.4%	43.62	20.54	64.16
1979	18.51	28.4%	44.01	21.21	65.22
1980	17.06	27.0%	41.41	21.66	63.07
1981	16.06	26.4%	39.14	21.76	60.90
1982	15.30	25.7%	37.45	22.05	59.50
1983	15.23	25.9%	36.59	22.15	58.74
1984	15.73	26.3%	37.43	22.41	59.84
1985	15.73	26.2%	37.23	22.87	60.10
1986	16.28	26.4%	38.28	23.48	61.76
1987	16.67	26.5%	38.96	24.04	63.00
1988	17.28	26.7%	40.24	24.58	64.82
1989	17.33	26.3%	40.88	25.04	65.92
1990	16.99	25.8%	40.92	25.06	65.98
1991	16.71	25.1%	41.40	25.17	66.57
1992	17.03	25.5%	42.41	24.33	66.74
1993	17.24	25.7%	42.98	24.01	66.99
1994	17.72	25.9%	44.17	24.13	68.30
1995	17.72	25.4%	44.95	24.94	69.89
1996	18.31	25.7%	46.07	25.25	71.32
1997	18.62	25.5%	46.67	26.34	73.01
<i>Average annual percentage change</i>					
1960–97	1.7%		3.0%	4.3%	3.4%
1970–97	0.9%		1.1%	2.9%	1.7%
1987–97	1.1%		1.8%	0.9%	1.5%

Source:

U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1998*, Washington, DC, July 1999, Table 11.9.

^a Organization for Economic Cooperation and Development. See Glossary for membership.

The United States has increased its petroleum stocks by 55% from 1973 to 1984; there has been no significant change in the stocks since 1984. Petroleum demand, however, has increased 87% in that same time period (see Table 1.3). The Strategic Petroleum Reserve accounted for 35% of total U.S. stocks at the end of 1998.

Table 1.4
Petroleum Stocks in OECD Countries, End of Year 1973–98^a
(million barrels)

Year	France	Germany ^b	Italy	United Kingdom	Other OECD ^c Europe	OECD ^c Europe	Canada	Japan	U.S. Strategic Petroleum Reserve	United States total	Other OECD ^d	OECD ^e
1973	201	181	152	156	380	1,070	140	303	°	1,008	67	2,588
1975	225	187	143	165	434	1,154	174	375	°	1,133	67	2,903
1980	243	319	170	168	564	1,464	164	495	108	1,392	72	3,587
1981	214	297	167	143	516	1,337	161	482	230	1,484	67	3,531
1982	193	272	179	125	489	1,258	136	484	294	1,430	68	3,376
1983	153	249	149	118	473	1,142	121	470	379	1,454	68	3,255
1984	152	239	159	112	468	1,130	128	479	451	1,556	69	3,362
1985	139	233	157	123	440	1,092	113	494	493	1,519	66	3,284
1986	127	252	155	124	475	1,133	111	509	512	1,593	72	3,418
1987	127	259	169	121	454	1,130	126	540	541	1,607	71	3,474
1988	140	266	155	112	445	1,118	116	538	560	1,597	71	3,440
1989	138	271	164	118	442	1,133	114	577	580	1,581	71	3,476
1990	140	265	172	112	474	1,163	121	590	586	1,621	73	3,568
1991	153	288	160	119	461	1,181	119	606	569	1,617	65	3,588
1992	146	310	174	113	476	1,219	107	603	575	1,592	67	3,588
1993	158	309	163	118	475	1,221	105	618	587	1,647	69	3,661
1994	158	312	164	115	490	1,240	119	645	592	1,653	69	3,726
1995	159	301	162	107	499	1,228	109	630	592	1,563	71	3,601
1996	158	300	152	108	538	1,256	103	651	566	1,507	74	3,591
1997	164	298	147	105	542	1,256	115	685	563	1,560	74	3,689
1998	161	321	153	108	561	1,304	118	649	571	1,647	66	3,784
<i>Average annual percentage change</i>												
1973–98	-0.9%	2.3%	0.0%	-1.5%	1.6%	0.8%	-0.7%	3.1%	°	2.0%	-0.1%	1.5%
1988–98	1.4%	1.9%	-0.1%	-0.4%	2.3%	1.6%	0.2%	1.9%	0.2%	0.3%	-0.7%	1.0%

Source:

Country stocks - U.S. Department of Energy, Energy Information Administration, *International Petroleum Statistics Report*, Washington, DC, January 2000, Table 4.5.

U.S. Strategic Petroleum Reserve - U.S. Department of Energy, Energy Information Administration, *Annual Energy Review, 1998*, Washington, DC, July 1999, Table 5.15.

^a Includes crude oil (including strategic reserves), lease condensate, natural gas plant liquids, unfinished oils, and finished petroleum products. Oil stocks include all non-military stocks held by importers, refiners, Governments, major non-importing final consumers and by foreign entities in certain facilities. See *Stocks* in Glossary for details.

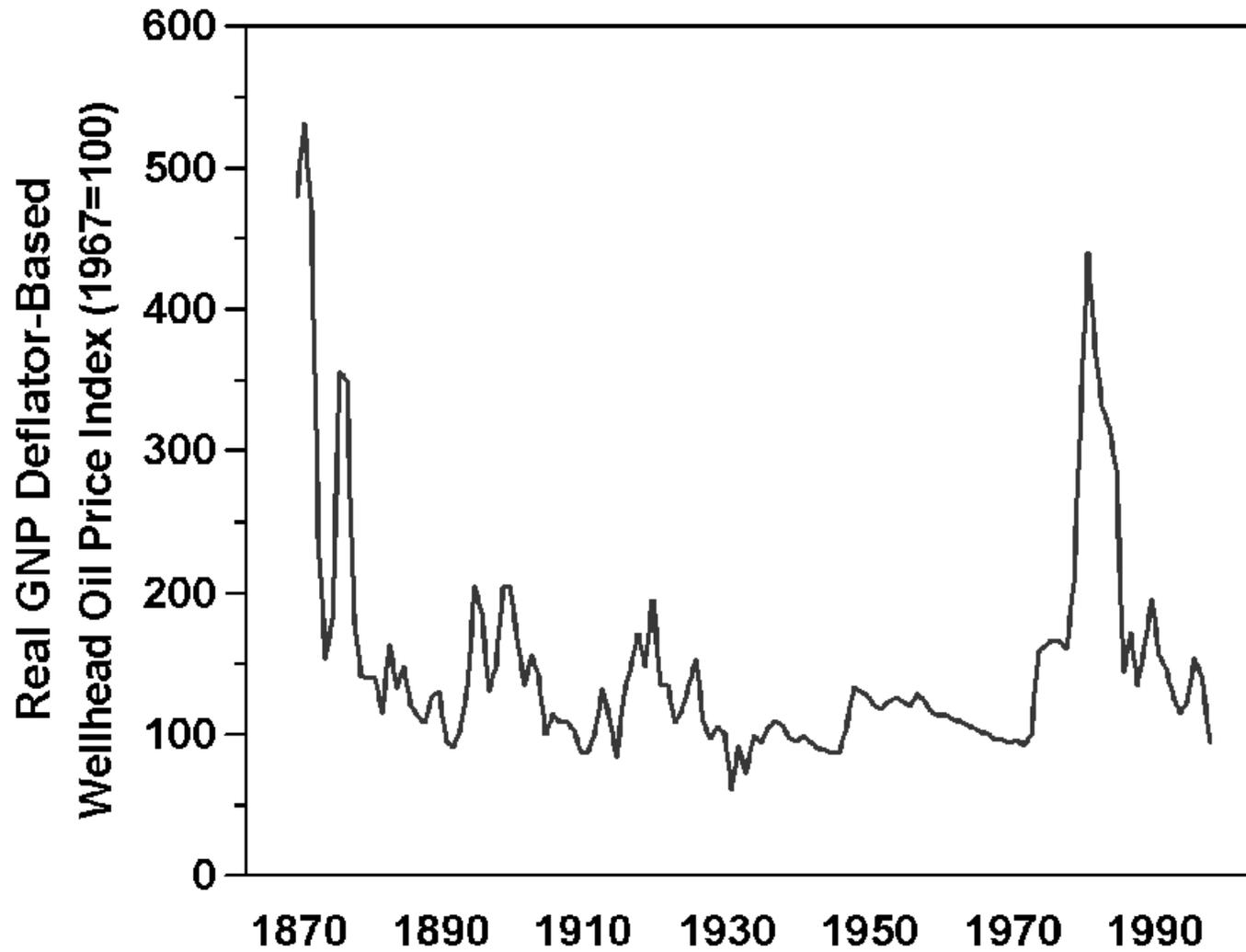
^b Through 1990, the data for Germany are for the former West Germany only. Beginning in 1991, the data for Germany are for the unified Germany, i.e., the former East Germany and West Germany.

^c Organization for Economic Cooperation and Development (OECD). See Glossary for membership.

^d Australia, New Zealand, and United States Territories. Data for Mexico, which joined the OECD on May 18, 1994, are not available.

^e Data are not available. The Energy Policy and Conservation Act, effective February 1976, authorized the establishment of the U.S. Strategic Petroleum Reserve.

Figure 1.2. Crude Oil Prices, 1870–98

**Source:**

Santini, Danilo J., "An Assessment of Oil Supply and Its Implications for Future Prices," *Nonrenewable Resources*, Vol. 7, No. 2, 1998, pp. 101-121, and 1994–98 data update.

The share of petroleum imported to the U.S. can be calculated using total imports or net imports. Net imports, which is the preferred data, rose to 50% of U.S. petroleum consumption for the first time in 1998 (see Table 1.9), while total imports reached 50% for the first time in 1993. OPEC share of net imports has been around 50-60% for the last ten years.

Table 1.5
U.S. Petroleum Net Imports by World Region of Origin, 1960–98
(thousand barrels per day)

Year	Net imports	Total OPEC ^a	OPEC share	Persian Gulf nations ^b	Persian Gulf share
1960	1,613	1,311	81.3%	c	c
1965	2,281	1,475	64.7%	c	c
1970	3,161	1,343	42.5%	c	c
1971	3,701	1,671	45.2%	c	c
1972	4,519	2,061	45.6%	c	c
1973	6,025	2,991	49.6%	c	c
1974	5,892	3,277	55.6%	c	c
1975	5,846	3,599	61.6%	c	c
1976	7,090	5,063	71.4%	c	c
1977	8,565	6,190	72.3%	c	c
1978	8,002	5,747	71.8%	c	c
1979	7,985	5,633	70.5%	c	c
1980	6,365	4,293	67.5%	c	c
1981	5,401	3,315	61.4%	1,215	22.5%
1982	4,298	2,136	49.7%	692	16.1%
1983	4,312	1,843	42.7%	439	10.2%
1984	4,715	2,037	43.2%	502	10.6%
1985	4,286	1,821	42.5%	309	7.2%
1986	5,439	2,828	52.0%	909	16.7%
1987	5,914	3,055	51.7%	1,074	18.2%
1988	6,587	3,513	53.3%	1,529	23.2%
1989	7,202	4,124	57.3%	1,858	25.8%
1990	7,161	4,285	59.8%	1,962	27.4%
1991	6,626	4,065	61.3%	1,833	27.7%
1992	6,938	4,071	58.7%	1,773	25.6%
1993	7,618	4,253	55.8%	1,774	23.3%
1994	8,054	4,233	52.6%	1,723	21.4%
1995	7,886	3,980	50.5%	1,563	19.8%
1996	8,498	4,193	49.3%	1,596	18.8%
1997	9,158	4,542	49.6%	1,747	19.1%
1998	9,452	4,789	50.7%	2,091	22.1%
<i>Average annual percentage change</i>					
1960–98	4.8%	3.5%		c	
1970–98	4.0%	4.6%		c	
1988–98	3.7%	3.1%		3.2%	

Source:

U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1998*, Washington, DC, July 1999, Table 5.7.

^a Organization of Petroleum Exporting Countries. See Glossary for membership.

^b See Glossary for Persian Gulf nations.

^c Data are not available.

Estimates of 1996 military expenditures for defending oil supplies in the Middle East range from \$6 to \$60 billion per year. This wide range in estimates reflects the difficulty in assigning a precise figure to the military cost of defending the U.S. interests in the Middle East. The two main reasons for the difficulty are 1) the Department of Defense does not divide the budget into regional defense sectors and 2) it is difficult to determine how much of the cost is attributable to defending Persian Gulf oil.

Table 1.6
Summary of 1996 Military Expenditures for Defending Oil Supplies from the Middle East

Source	Original estimates (billion dollars)	Year of original estimate	1996 estimate (constant 1996 billion dollars)
General Accounting Office [1]	\$33	1990	\$28 ^a
Congressional Research Service [2]	\$6.4	1990	\$6 ^a
Greene and Leiby [3]	\$14.3	1990	\$12 ^a
Ravenal [4]	\$50	1992	\$60 ^b
Kaufmann and Steinbruner [5]	\$64.5	1990	\$55 ^b
Delucchi and Murphy ^c [6]	\$20–40	1996	\$20–40 ^b

Average estimate is \$32 billion, with a standard deviation of \$22 billion.

- [1] U.S. General Accounting Offices, *Southwest Asia: Cost of Protecting U.S. Interests*, GAO/NSIAD-91-250, Washington, DC, August 1991.
- [2] Congressional Research Service, *The External Costs of Oil Used in Transportation*, prepared for the U.S. Alternative Fuels Council, Washington, DC, June 1992.
- [3] Greene, D.L., and P. Leiby, *The Social Costs to the U.S. of Monopolization of the World Oil Market, 1972-1991*, ORNL-6744, Oak Ridge National Laboratory, Oak Ridge, TN, March 1993.
- [4] Ravenal, E.C., *Designing Defense for a New World Order: The Military Budget in 1992 and Beyond*, Cato Institute, Washington, DC, 1991.
- [5] Kaufmann, W.W., and J.D. Steinbruner, *Decisions for Defense: Prospects for a New Order*, The Brookings Institution, Washington, DC, 1991.
- [6] Delucchi, M.A., and J. Murphy, *U.S. Military Expenditures to Protect the Use of Persian-Gulf Oil for Motor Vehicles*, UCD-ITS-RR-96-3 (15), University of California, Davis, California, April 1996.

Source:

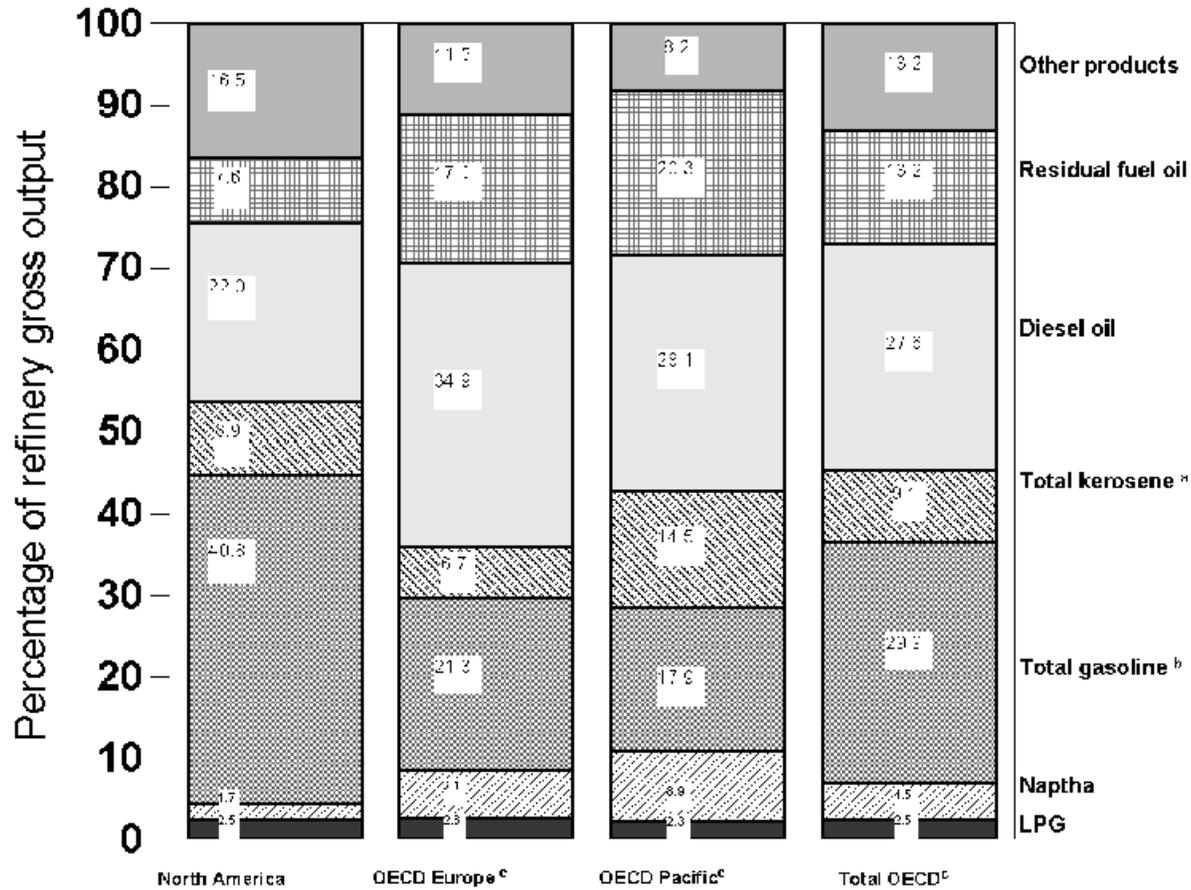
Hu, P.S., "Estimates of 1996 U.S. Military Expenditures on Defending Oil Supplies from the Middle East: A Literature Review," Oak Ridge National Laboratory, Oak Ridge, TN, March 1996.

^aEstimated based on a 3% annual inflation rate and a decrease of 30% in the total Defense budget from 1990 to 1996.

^bProvided by the author(s); thus, assumptions used for the projection are different from those used in the other estimates.

^cAnnual cost to defend all U.S. interests in the Persian Gulf.

Figure 1.3. Refinery Gross Output by World Region, 1999



Source:

International Energy Agency, *Monthly Oil Survey*, January 2000, Paris, France, Table 7.

^a Includes jet kerosene and other kerosene.

^b Includes motor gasoline, jet gasoline, and aviation gasoline.

^c Organization for Economic Cooperation and Development. See Glossary for membership.

Oxygenate refinery input increased significantly in 1995, most certainly due to the Clean Air Act Amendments of 1990 which mandated the sale of reformulated gasoline in certain areas beginning in January 1995.

Table 1.7
U.S. Refinery Input of Crude Oil and Petroleum Products, 1987–98
(thousand barrels)

Year	Crude oil	Oxygenates					Other hydrocarbons ^c	Other liquids	Total input to refineries
		Natural gas liquids	Fuel ethanol	Methanol	MTBE ^a	Other oxygenates ^b			
1987	4,691,783	280,889	d	d	d	d	23,304	220,296	5,105,392
1988	4,848,175	304,566	d	d	d	d	19,515	203,794	5,258,386
1989	4,891,381	182,109	d	d	d	d	21,757	202,040	5,297,287
1990	4,894,379	170,589	d	d	d	d	28,642	231,466	5,325,076
1991	4,855,016	172,306	d	d	d	d	31,574	248,691	5,307,587
1992	4,908,603	171,701	d	d	d	d	47,918	224,758	5,352,980
1993	4,968,641	179,213	3,351	782	49,393	1,084	15,543	264,531	5,482,538
1994	5,061,111	169,868	3,620	242	52,937	1,676	14,130	179,678	5,483,262
1995	5,100,317	172,026	9,055	246	79,396	3,876	14,668	175,743	5,555,327
1996	5,195,265	164,552	11,156	126	79,407	3,444	20,587	193,695	5,668,232
1997	5,351,466	151,769	11,803	496	86,240	3,750	22,976	178,292	5,806,792
1998	5,434,383	146,921	11,722	675	89,362	3,363	22,759	183,376	5,892,561
<i>Average annual percentage change</i>									
1988-98	1.3%	-5.7%	e	e	e	e	-0.2%	-1.7%	1.3%
1993-98	1.8%	-3.9%	28.5%	-2.9%	12.6%	25.4%	7.9%	-7.1%	1.5%

Source:

U.S. Department of Energy, Energy Information Administration, *Petroleum Supply Annual, 1998*, Vol. 1, June 1999, Table 16, and annual.
(Additional resources: www.eia.doe.gov)

^aMethyl tertiary butyl ether (MTBE).

^bIncludes ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), tertiary butyl alcohol (TBA), and other aliphatic alcohols and ethers intended for motor gasoline blending.

^cFor 1987-92, includes other hydrocarbons/hydrogen/oxygenates. For 1993-on, includes other hydrocarbons/hydrogen.

^dReported in "Other hydrocarbons" category in this year.

^eData are not available.

When crude oil and other hydrocarbons are processed into products that are, on average, less dense than the input, a processing volume gain occurs. Due to this gain, the product yield from a barrel of crude oil is more than 100%. The processing volume gain has been growing over the years.

Table 1.8
Refinery Yield of Petroleum Products from a Barrel of Crude Oil, 1978–98
(percentage)

Year	Motor gasoline	Distillate fuel oil	Jet fuel	Liquified petroleum gas	Other ^a	Total ^b
1978	44.1	21.4	6.6	2.3	29.6	104.0
1979	43.0	21.5	6.9	2.3	30.3	104.0
1980	44.5	19.7	7.4	2.4	30.0	104.0
1981	44.8	20.5	7.6	2.4	28.7	104.0
1982	46.4	21.5	8.1	2.2	26.2	104.4
1983	47.6	20.5	8.5	2.7	24.8	104.1
1984	46.7	21.5	9.1	2.9	24.2	104.4
1985	45.6	21.6	9.6	3.1	24.6	104.5
1986	45.7	21.2	9.8	3.2	24.8	104.7
1987	46.4	20.5	10.0	3.4	24.5	104.8
1988	46.0	20.8	10.0	3.6	24.4	104.8
1989	45.7	20.8	10.1	4.0	24.2	104.8
1990	45.6	20.9	10.7	3.6	24.1	104.9
1991	45.7	21.3	10.3	3.8	24.1	105.2
1992	46.0	21.2	9.9	4.3	24.0	105.4
1993	46.1	21.9	10.0	4.1	23.3	105.4
1994	45.5	22.3	10.1	4.2	23.2	105.3
1995	46.4	21.8	9.7	4.5	22.9	105.3
1996	45.7	22.7	10.4	4.5	22.4	105.7
1997	45.7	22.5	10.3	4.6	22.5	105.6
1998	46.2	22.3	10.4	4.4	22.5	105.8

Source:

Department of Energy, Energy Information Administration, *Petroleum Supply Annual 1998*, Vol. 1, June 1999, Table 19 and annual. (Additional resources: www.eia.doe.gov)

^a Includes aviation gasoline, kerosene, naphtha and other oils for petrochemical feedstock use, special naphthas, lubricants, waxes, petroleum coke, asphalt and road oil, still gas, and miscellaneous products.

^b Products sum greater than 100% due to processing gain. The processing gain for years 1978 to 1980 is assumed to be 4%.

Table 1.9
United States Petroleum Production and Consumption, 1973–99
(million barrels per day)

Year	Domestic crude oil production	Net imports			Exports		U.S. petroleum consumption ^a	World petroleum consumption	Net imports as a percentage of U.S. petroleum consumption	U.S. petroleum consumption as a percentage of world consumption	Transportation petroleum use as a percentage of domestic production ^b
		Crude oil	Petroleum products	Total	Crude oil	Petroleum products					
1973	9.21	3.24	2.78	6.03	0.00	0.23	17.31	56.39	34.8%	30.7%	76.7%
1974	8.77	3.47	2.42	5.89	0.00	0.22	16.65	55.91	35.4%	29.8%	78.3%
1975	8.37	4.10	1.75	5.85	0.00	0.20	16.32	55.48	35.8%	29.4%	82.8%
1976	8.13	5.28	1.81	7.09	0.00	0.22	17.46	58.74	40.6%	29.7%	89.5%
1977	8.25	6.57	2.00	8.57	0.05	0.19	18.43	61.63	46.5%	29.9%	91.7%
1978	8.71	6.20	1.80	8.00	0.16	0.20	18.85	63.30	42.5%	29.8%	91.7%
1979	8.55	6.28	1.70	7.99	0.24	0.24	18.51	65.17	43.1%	28.4%	92.0%
1980	8.60	4.98	1.39	6.37	0.29	0.26	17.06	63.07	37.3%	27.0%	87.9%
1981	8.57	4.17	1.23	5.40	0.23	0.37	16.06	60.87	33.6%	26.4%	86.9%
1982	8.65	3.25	1.05	4.30	0.24	0.58	15.30	59.50	28.1%	25.7%	84.9%
1983	8.69	3.17	1.15	4.31	0.16	0.58	15.23	58.74	28.3%	25.9%	85.3%
1984	8.88	3.25	1.47	4.72	0.18	0.54	15.73	59.84	30.0%	26.3%	86.0%
1985	8.97	3.00	1.29	4.29	0.20	0.58	15.73	60.10	27.3%	26.2%	86.6%
1986	8.68	4.02	1.41	5.44	0.15	0.63	16.28	61.76	33.4%	26.4%	93.1%
1987	8.35	4.52	1.39	5.91	0.15	0.61	16.67	63.00	35.5%	26.5%	98.5%
1988	8.14	4.95	1.63	6.59	0.16	0.66	17.28	64.82	38.1%	26.7%	104.1%
1989	7.61	5.70	1.50	7.20	0.14	0.72	17.33	65.92	41.6%	26.3%	112.1%
1990	7.36	4.79	1.38	7.16	0.11	0.75	16.99	65.98	42.2%	25.8%	114.5%
1991	7.42	5.67	0.96	6.63	0.12	0.89	16.71	66.57	39.6%	25.1%	110.6%
1992	7.17	5.99	0.94	6.94	0.09	0.86	17.03	66.76	40.7%	25.5%	114.5%
1993	6.85	6.69	0.93	7.62	0.10	0.90	17.24	67.00	44.2%	25.7%	118.7%
1994	6.66	6.96	1.09	8.05	0.10	0.84	17.72	68.30	45.5%	25.9%	124.4%
1995	6.56	7.14	0.75	7.89	0.10	0.86	17.73	69.87	44.5%	25.4%	127.0%
1996	6.47	7.40	1.10	8.50	0.11	0.87	18.31	71.40	46.4%	25.6%	130.3%
1997	6.45	8.12	1.04	9.16	0.11	0.90	18.62	73.13	49.2%	25.5%	131.7%
1998	6.25	8.60	1.17	9.76	0.11	0.84	18.92	73.64	51.6%	25.7%	138.7%
1999	5.95	8.47	1.14	9.61	0.11	0.82	19.39	^c	49.6%	^c	146.2%
<i>Average annual percentage change</i>											
1973–99	-1.7%	3.8%	-3.4%	1.8%	^c	5.0%	0.4%	1.1% ^d			
1989–99	-2.4%	4.0%	-2.7%	2.9%	-2.4%	1.3%	1.1%	1.2% ^d			

Source:

U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, March 2000, Washington, DC, 2000, pp. 42–47.

World petroleum consumption - U.S. Department of Energy, Energy Information Administration, *International Energy Annual 1998*, January 2000, Table 1.1.

(Additional resources: www.eia.doe.gov)

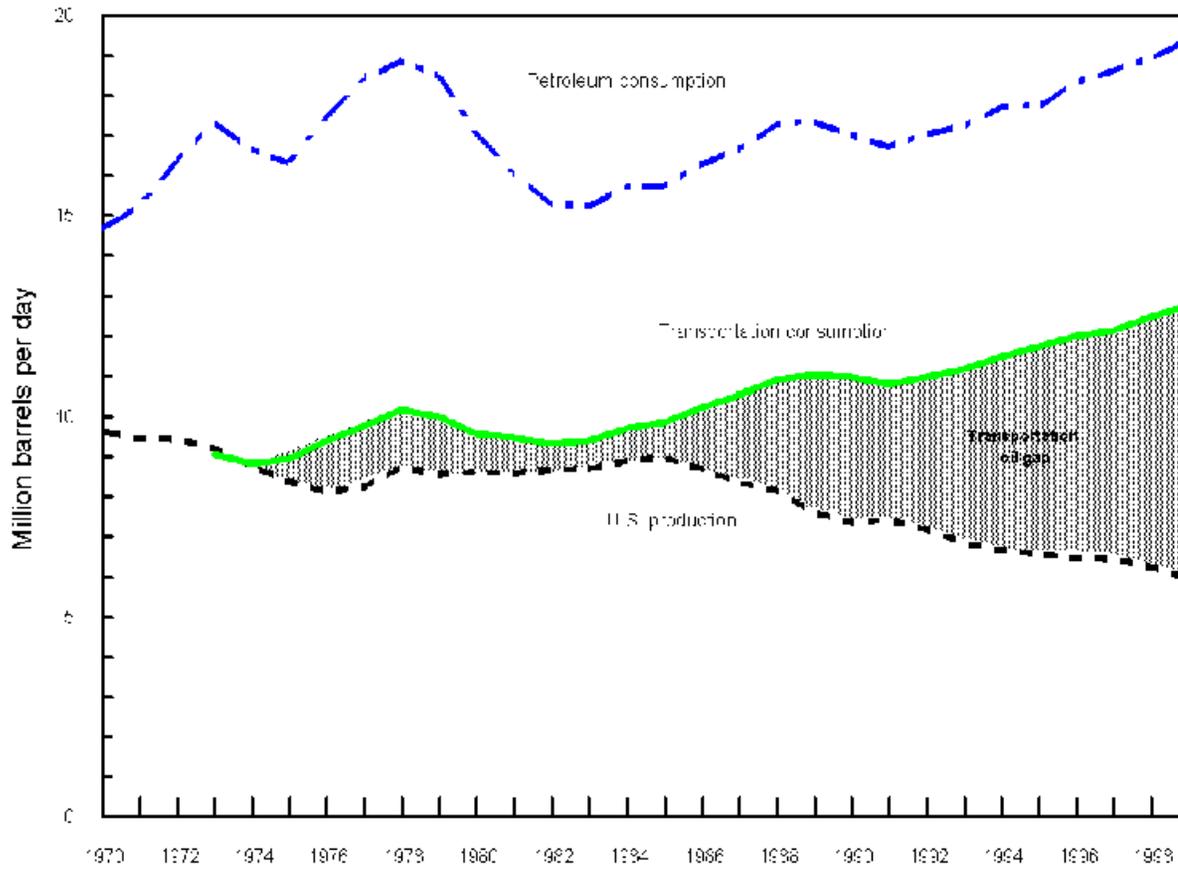
^a Best estimate for U.S. petroleum consumption is the amount of petroleum products supplied to the U.S. in a given year. This is not the sum of crude oil production and net imports due to processing gain and stock changes.

^b Transportation petroleum use can be found on Table 1.10. This column has been revised to include domestic production of crude oil, natural gas plant liquids, and other hydrocarbons/hydrogen/oxygenates as shown in the *Monthly Energy Review*, Table 3.1a.

^c Data are not available.

^d Average annual percentage change is to the latest possible year.

Figure 1.4. United States Petroleum Production and Consumption, 1973–99



Source: See Tables 1.9 and 1.10.

Table 1.10
Consumption of Petroleum by End-Use Sector, 1973–99
(quadrillion Btu)

Year	Transportation	Percentage	Residential and commercial	Percentage	Industrial	Percentage	Electric utilities	Percentage	Total	Total in million barrels per day ^a
1973	17.83	51.2%	4.39	12.6%	9.10	26.1%	3.52	10.1%	34.84	17.31
1974	17.40	52.0%	4.00	12.0%	8.69	26.0%	3.37	10.1%	33.46	16.66
1975	17.61	53.8%	3.81	11.6%	8.15	24.9%	3.17	9.7%	32.74	16.33
1976	18.51	52.6%	4.18	11.9%	9.01	25.6%	3.48	9.9%	35.18	17.51
1977	19.24	51.8%	4.21	11.3%	9.77	26.3%	3.90	10.5%	37.12	18.43
1978	20.04	52.8%	4.07	10.7%	9.87	26.0%	3.99	10.5%	37.97	18.85
1979	19.83	53.4%	3.45	9.3%	10.57	28.5%	3.28	8.8%	37.13	18.52
1980	19.01	55.6%	3.04	8.9%	9.53	27.9%	2.63	7.7%	34.21	17.11
1981	18.81	58.9%	2.63	8.2%	8.29	26.0%	2.20	6.9%	31.93	16.06
1982	18.42	60.9%	2.45	8.1%	7.79	25.8%	1.57	5.2%	30.23	15.29
1983	18.59	61.9%	2.50	8.3%	7.42	24.7%	1.54	5.1%	30.05	15.23
1984	19.22	61.9%	2.54	8.2%	8.01	25.8%	1.29	4.2%	31.06	15.77
1985	19.50	63.1%	2.52	8.2%	7.81	25.3%	1.09	3.5%	30.92	15.73
1986	20.27	63.0%	2.56	8.0%	7.92	24.6%	1.45	4.5%	32.20	16.28
1987	20.87	63.5%	2.59	7.9%	8.15	24.8%	1.26	3.8%	32.87	16.67
1988	21.63	63.2%	2.60	7.6%	8.43	24.6%	1.56	4.6%	34.22	17.33
1989	21.87	63.9%	2.53	7.4%	8.13	23.8%	1.69	4.9%	34.22	17.33
1990	21.81	65.0%	2.17	6.5%	8.32	24.8%	1.25	3.7%	33.55	16.99
1991	21.46	65.3%	2.15	6.5%	8.06	24.5%	1.18	3.6%	32.85	16.72
1992	21.81	65.0%	2.13	6.4%	8.64	25.8%	0.95	2.8%	33.53	17.08
1993	22.20	65.6%	2.14	6.3%	8.45	25.0%	1.05	3.1%	33.84	17.24
1994	22.76	65.6%	2.09	6.0%	8.85	25.5%	0.97	2.8%	34.67	17.72
1995	23.20	67.1%	2.08	6.0%	8.62	24.9%	0.66	1.9%	34.56	17.73
1996	23.74	66.4%	2.20	6.2%	9.10	25.4%	0.73	2.0%	35.77	18.37
1997	24.00	66.2%	2.14	5.9%	9.31	25.7%	0.82	2.3%	36.27	18.62
1998	24.64	66.7%	1.97	5.3%	9.15	24.8%	1.17	3.2%	36.93	18.92
1999	25.21	66.9%	2.07	5.5%	9.45	25.1%	0.97	2.6%	37.70	19.39
<i>Average annual percentage change</i>										
1973–99	1.3%		-2.9%		0.1%		-4.8%		0.3%	0.4%
1989–99	1.4%		-2.0%		1.5%		-5.4%		1.0%	1.1%

Source:

U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, March 2000, pp. 27, 29, 31, 33.
 (Additional resources: www.eia.doe.gov)

^a Calculated from Total column using Table A.3. Approximate Heat Content of Petroleum Products, Weighted Average, from the *Monthly Energy Review*, March 2000.

Table 1.11
Transportation of Petroleum and Petroleum Products in the U.S. by Mode, 1975–98

Year	Pipelines ^a		Water carriers		Motor carriers ^b		Railroads		Total	
	(billion ton-miles)	(percent)	(billion ton-miles)	(percent)	(billion ton-miles)	(percent)	(billion ton-miles)	(percent)	(billion ton-miles)	
1975	507.0	59.88%	298.0	35.20%	27.6	3.26%	14.1	1.66%	846.7	
1976	515.0	59.35%	306.9	35.37%	32.5	3.75%	13.3	1.53%	867.7	
1977	546.0	59.13%	333.3	36.09%	29.6	3.21%	14.5	1.57%	923.4	
1978	585.8	50.49%	530.6	45.73%	30.6	2.65%	13.2	1.14%	1,160.2	
1979	608.3	51.78%	522.9	44.51%	30.1	2.56%	13.5	1.15%	1,174.8	
1980	588.2	47.24%	617.8	49.61%	26.8	2.15%	12.5	1.00%	1,245.3	
1981	563.7	46.27%	617.2	50.66%	24.9	2.04%	12.6	1.03%	1,218.4	
1982	565.7	46.44%	616.9	50.64%	22.7	1.86%	12.9	1.06%	1,218.2	
1983	556.1	45.45%	630.5	51.53%	25.1	2.05%	11.8	0.97%	1,223.5	
1984	568.1	48.14%	570.7	48.36%	29.2	2.47%	12.2	1.03%	1,180.2	
1985	564.3	47.20%	590.4	49.39%	28.7	2.40%	12.1	1.01%	1,195.5	
1986	577.9	48.65%	568.1	47.83%	29.7	2.50%	12.1	1.02%	1,187.8	
1987	586.8	49.08%	566.5	47.37%	30.4	2.54%	12.1	1.01%	1,195.8	
1988	601.1	50.59%	543.7	45.76%	30.5	2.57%	12.8	1.08%	1,188.1	
1989	584.2	53.39%	466.2	42.61%	30.4	2.78%	13.4	1.22%	1,094.2	
1990	584.1	54.24%	449.0	41.70%	29.7	2.76%	14.0	1.30%	1,076.8	
1991	578.5	53.27%	465.0	42.81%	28.8	2.65%	13.8	1.27%	1,086.1	
1992	588.8	53.93%	459.3	42.07%	28.8	2.64%	14.8	1.36%	1,091.7	
1993	592.9	57.31%	401.7	38.82%	24.8	2.40%	15.2	1.47%	1,034.6	
1994	591.4	56.50%	411.4	39.31%	28.1	2.68%	15.8	1.51%	1,046.7	
1995	601.1	57.53%	400.9	38.37%	26.3	2.51%	16.6	1.59%	1,044.9	
1996	619.2	60.58%	356.5	34.88%	29.7	2.90%	16.8	1.64%	1,022.2	
1997	616.5	64.45%	295.6	30.90%	27.7	2.90%	16.7	1.75%	956.5	
1998	619.8	66.66%	265.0	28.50%	28.3	3.04%	16.7	1.80%	929.8	
			<i>Average annual percentage change</i>							
1975–98	0.9%		-0.5%		0.1%		0.7%		0.4%	
1988–98	0.1%		-3.1%		-0.3%		1.2%		-1.1%	

Source:

Association of Oil Pipelines, *Shifts in Petroleum Transportation*, Washington, DC, April 2000, Table 1.

^a The amounts carried by pipeline are based on ton-miles of crude and petroleum products for Federally regulated pipelines (84 percent) plus an estimated breakdown of crude and petroleum products of the ton-miles for pipelines not Federally regulated (16 percent).

^b The amounts carried by motor carriers are estimated.