

Chapter 1

Petroleum

Summary Statistics from Tables/Figures in this Chapter

Source			
Table 1.2	World Oil Production, 2000		
	<i>U.S. Oil Production (million barrels per day)</i>		5.8
	<i>U.S. Share</i>		8.6%
Table 1.3	World Oil Consumption, 1999		
	<i>U.S. Oil Consumption (million barrels per day)</i>		19.5
	<i>U.S. Share</i>		26.1%
Figure 1.2	Average refinery yield, 2000	OECD Europe	North America
	<i>Gasoline</i>	20.6%	40.5%
	<i>Diesel fuel</i>	35.4%	22.7%
	<i>Residual fuel</i>	16.9%	7.5%
	<i>Kerosene</i>	6.4%	9.0%
	<i>Other</i>	20.7%	20.3%
Table 1.9	U.S. transportation oil use as a percent of U.S. oil production, 2000		150%
Table 1.9	Net imports as a percentage of U.S. oil consumption, 2000		52%
Table 1.10	Transportation share of oil consumption, 2000		68%

Although the world has consumed about 40% of estimated conventional oil resources, the total fossil fuel potential is huge. Methane hydrates—a potential source of natural gas—are included in the “additional occurrences” of unconventional natural gas, and constitute the largest resource.

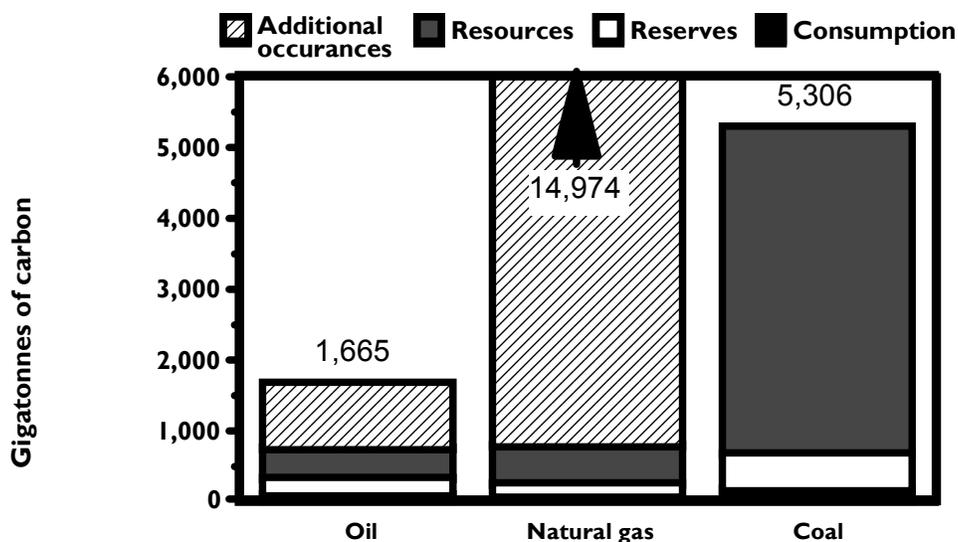
Table 1.1
World Fossil Fuel Potential
(gigatonnes of carbon)

	Consumption (1860–1998)	Reserves	Resources	Additional occurrences
<i>Oil</i>				
Conventional	97	120	121	0
Unconventional	6	102	305	914
<i>Natural Gas</i>				
Conventional	36	83	170	0
Unconventional	1	144	364	14,176
<i>Coal</i>	155	533	4,618	^a

Source:

Rogner, H.H., *World Energy Assessment: Energy and the Challenge of Sustainability, Part II*, Chapter 5, 2000, p. 149.

Figure 1.1. World Fossil Fuel Potential



Source: See Table 1.1.

^a Data are not available

In 2000, OPEC accounted for 43% of world oil production. Responding to low oil prices early that year, Mexico, Norway, Russia, and Oman joined OPEC in cutting production. This group of oil countries, referred to here as OPEC+, account for 62% of world oil production.

Table 1.2
World Crude Oil Production, 1960-2000^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
1975	8.37	15.8%	26.77	50.7%	37.56	71.1%	26.06	18.93	52.83
1980	8.60	14.4%	26.61	44.6%	41.07	68.9%	32.99	17.96	59.60
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%	26.46	41.5%	39.15	61.5%	37.25	17.37	63.71
1997	6.45	9.8%	27.71	42.2%	40.69	61.9%	37.98	18.10	65.69
1998	6.25	9.3%	28.77	43.0%	41.61	62.1%	38.19	19.34	66.96
1999	5.88	8.9%	27.58	41.9%	40.48	61.4%	38.29	18.67	65.87
2000	5.83	8.6%	29.11	42.8%	42.74	62.9%	38.87	19.94	67.98
<i>Average annual percentage change</i>									
1960–2000	-0.5%		3.1%		3.2%		2.9%	3.4%	3.0%
1970–2000	-1.7%		0.7%		1.1%		1.8%	1.3%	1.3%
1990–2000	-2.3%		2.3%		0.9%		0.4%	2.7%	1.2%

Source:

U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2000*, Washington, DC, July 2001, 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.

The United States has accounted for approximately one-quarter of the world's oil consumption for the last two decades. 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, 1960–99
(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
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	25.05	65.97
1991	16.71	25.1%	41.40	25.16	66.56
1992	17.03	25.5%	42.42	24.34	66.76
1993	17.24	25.7%	42.98	24.02	67.00
1994	17.72	25.9%	44.17	24.12	68.29
1995	17.72	25.4%	44.96	24.92	69.88
1996	18.31	25.6%	46.07	25.34	71.41
1997	18.62	25.5%	46.83	26.23	73.06
1998	18.92	25.7%	46.93	26.71	73.64
1999	19.52	26.1%	47.61	27.30	74.91
<i>Average annual percentage change</i>					
1960–99	1.8%		2.9%	4.2%	3.3%
1970–99	1.0%		1.1%	2.8%	1.6%
1988–99	1.2%		1.5%	0.9%	1.3%

Source:

U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2000*, Washington, DC, July 2001, Table 11.9.

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

The United States increased its petroleum stocks by 51% from 1973 to 1985; but U.S. stocks remained relatively constant from 1985 to 1998. Data for 1999 and 2000 indicate that U.S. stocks are declining. Petroleum demand, however, continues to increase (see Table 1.3). The Strategic Petroleum Reserve accounted for 37% of total U.S. stocks at the end of 2000.

Table 1.4
Petroleum Stocks in OECD Countries, End of Year 1973–2000^a
(million barrels)

Year	OECD ^b Europe	Canada	Japan	U.S. Strategic Petroleum Reserve	United States total	Other OECD ^c	OECD ^b	Share of U.S. stocks to U.S. oil consumption	Share of OECD stocks to OECD oil consumption
1973	1,070	140	303	^d	1,008	67	2,588	16.0%	17.1%
1975	1,154	174	375	^d	1,133	67	2,903	19.1%	20.5%
1980	1,464	164	495	108	1,392	72	3,587	22.4%	23.8%
1985	1,092	113	494	493	1,519	66	3,284	26.5%	24.2%
1990	1,163	121	590	586	1,621	73	3,568	26.2%	24.0%
1991	1,181	119	606	569	1,617	65	3,588	26.6%	23.8%
1992	1,219	107	603	575	1,592	67	3,588	25.7%	23.2%
1993	1,221	105	618	587	1,647	69	3,661	26.2%	23.4%
1994	1,240	119	645	592	1,653	69	3,726	25.6%	23.2%
1995	1,228	109	630	592	1,563	71	3,601	24.2%	22.0%
1996	1,256	103	651	566	1,507	74	3,591	22.6%	21.4%
1997	1,255	115	685	563	1,560	74	3,689	23.0%	21.7%
1998	1,303	118	649	571	1,647	66	3,784	23.9%	22.2%
1999	1,232	108	629	567	1,493	69	3,530	21.0%	20.4%
2000	1,259	112	634	541	1,468	70	3,542	^e	^e
<i>Average annual percentage change</i>									
1973–2000	0.6%	-0.8%	2.8%	^e	1.4%	0.2%	1.2%		
1990–2000	0.8%	-0.8%	0.7%	-0.4%	-1.0%	-0.4%	-0.1%		

Source:

Country stocks - U.S. Department of Energy, Energy Information Administration, *International Petroleum Statistics Report*, Washington, DC, July 2001, Table 4.5.

U.S. Strategic Petroleum Reserve - U.S. Department of Energy, Energy Information Administration, *Annual Energy Review, 2000*, Washington, DC, July 2001, Table 5.15.

Oil consumption - See Table 1.3.

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

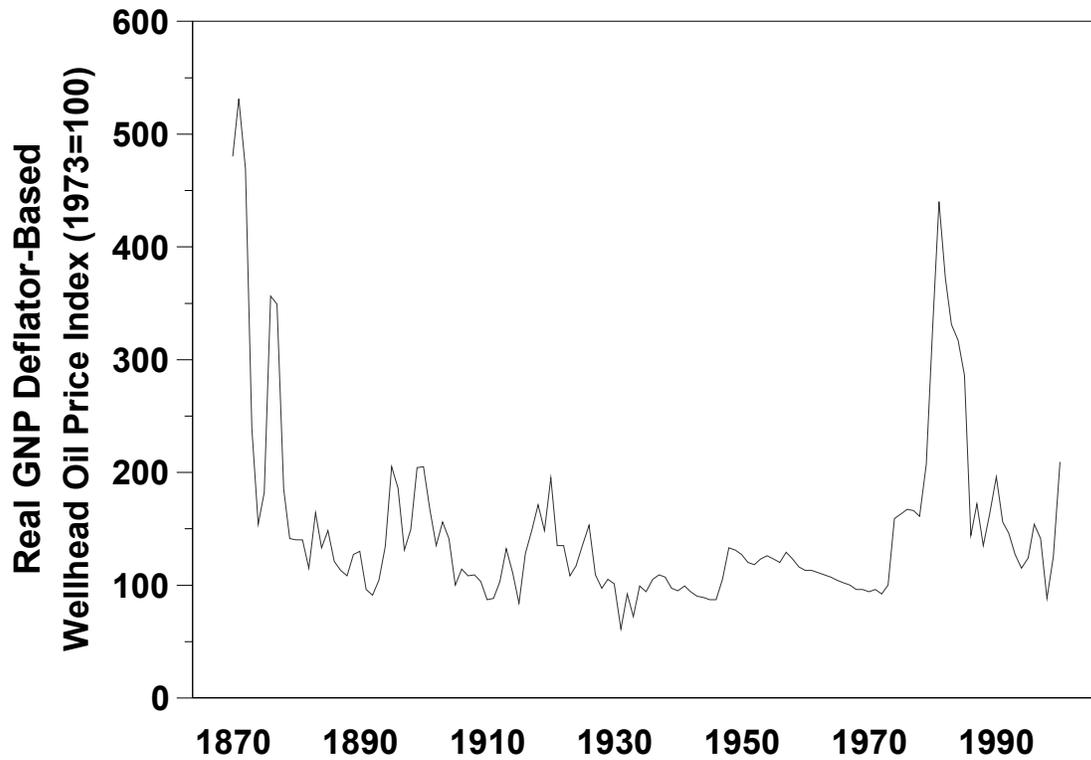
^c Australia, New Zealand, and United States Territories. Data for Mexico, which joined the OECD on May 18, 1994, are not available.

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

^e Data are not available.

This chart shows the volatility of crude oil prices since 1870. Given this volatility, it is difficult for anyone to predict future crude oil prices with any certainty.

Figure 1.2. Crude Oil Prices, 1870–2000



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 1994–2000 data updates.

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, while total imports reached 50% for the first time in 1993. OPEC share of net imports has been around 50% for the last five years.

Table 1.5
U.S. Petroleum Imports by World Region of Origin, 1960–2000
 (thousand barrels per day)

Year	Net OPEC ^a imports	Net OPEC share	Net Persian Gulf nation ^b imports	Net Persian Gulf share	Net imports	Net imports as a share of U.S. consumption	Total imports
1960	1,311	81.3%	c	c	1,613	c	1,815
1965	1,475	64.7%	c	c	2,281	c	2,468
1970	1,343	42.5%	c	c	3,161	c	3,419
1975	3,599	61.6%	c	c	5,846	35.8%	6,056
1980	4,293	67.5%	c	c	6,365	37.3%	6,909
1981	3,315	61.4%	1,215	22.5%	5,401	33.6%	5,996
1982	2,136	49.7%	692	16.1%	4,298	28.1%	5,113
1983	1,843	42.7%	439	10.2%	4,312	28.3%	5,051
1984	2,037	43.2%	502	10.6%	4,715	30.0%	5,437
1985	1,821	42.5%	309	7.2%	4,286	27.3%	5,067
1986	2,828	52.0%	909	16.7%	5,439	33.4%	6,224
1987	3,055	51.7%	1,074	18.2%	5,914	35.5%	6,678
1988	3,513	53.3%	1,529	23.2%	6,587	38.1%	7,402
1989	4,124	57.3%	1,858	25.8%	7,202	41.6%	8,061
1990	4,285	59.8%	1,962	27.4%	7,161	42.2%	8,018
1991	4,065	61.3%	1,833	27.7%	6,626	39.6%	7,627
1992	4,071	58.7%	1,773	25.6%	6,938	40.7%	7,888
1993	4,253	55.8%	1,774	23.3%	7,618	44.2%	8,620
1994	4,233	52.6%	1,723	21.4%	8,054	45.5%	8,996
1995	3,980	50.5%	1,563	19.8%	7,886	44.5%	8,835
1996	4,193	49.3%	1,596	18.8%	8,498	46.4%	9,478
1997	4,542	49.6%	1,747	19.1%	9,158	49.2%	10,162
1998	4,880	50.0%	2,132	21.8%	9,764	51.6%	10,708
1999	4,934	49.8%	2,459	24.8%	9,912	50.8%	10,852
2000	5,115	50.9%	2,463	24.5%	10,053	51.6%	11,093
			<i>Average annual percentage change</i>				
1960–2000	3.5%		c		4.7%		4.6%
1970–2000	4.6%		c		3.9%		4.0%
1990–2000	1.8%		2.3%		3.5%		3.3%

Source:

U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2000*, Washington, DC, July 2001, Tables 5.4 and 5.7.

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

^b See Glossary for Persian Gulf nations.

^c Data are not available.

The Costs of Oil Dependence

In the *Costs of Oil Dependence: A 2000 Update*, authors Greene and Tishchishyna indicate that the oil market upheavals caused by the OPEC cartel over the last 30 years have cost the U.S. in the vicinity of \$7 trillion (present value 1998 dollars) in total economic costs, which is about as large as the sum total of payment on the national debt over the same period.

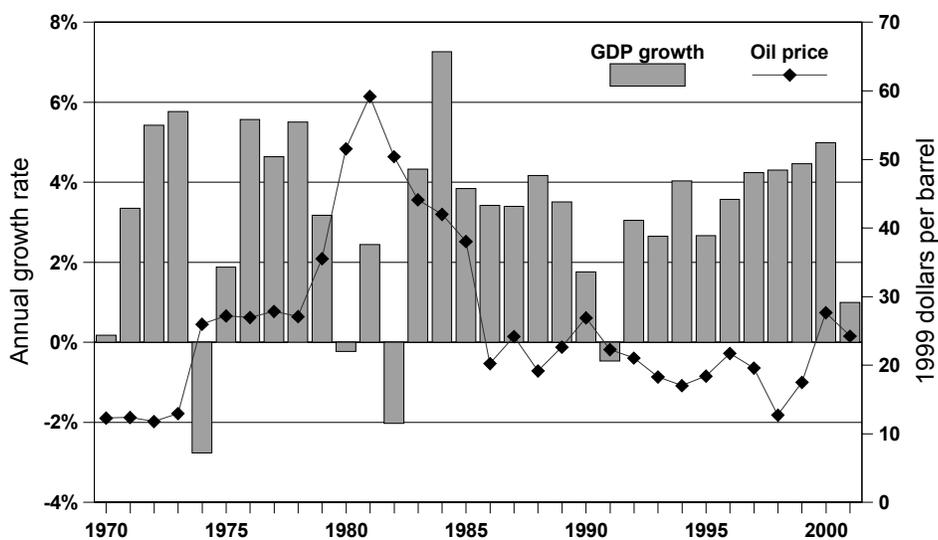
Oil dependence is the product of (1) a noncompetitive world oil market strongly influenced by the OPEC cartel, (2) high levels of U.S. oil imports, (3) oil's critical role in the U.S. economy, and (4) the absence of economical and readily available substitutes for oil. Transportation is key to the problem because transportation vehicles account for 68% of U.S. oil consumption and nearly all of the high-value light products that drive the market.

Oil consuming economies incur three types of costs when monopoly power is used to raise prices above competitive market levels:

- *Loss of potential gross domestic product (GDP)* - the economy's ability to produce is reduced because a key factor of production is more expensive;
- *Macroeconomic Adjustment Costs* - sudden changes in oil prices increase unemployment, further reducing economic output; and
- *Transfer of Wealth* - some of the wealth of oil consuming states is appropriated by foreign oil producers.

Major oil price shocks have disrupted world energy markets four times in the past 30 years (1973-74, 1979-80, 1990-91, 1999-2000). Each of the first three oil price shocks was followed by an economic recession in the U.S.

Figure 1.3. Oil Price and Economic Growth, 1970–2001^a



Source:

Greene, D.L. and N. I. Tishchishyna, *Costs of Oil Dependence: A 2000 Update*, Oak Ridge National Laboratory, ORNL/TM-2000/152, Oak Ridge, TN, 2000, and data updates, 2001.
(Additional resources: www-cta.ornl.gov/publications)

^aFirst two quarters of 2001.

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.

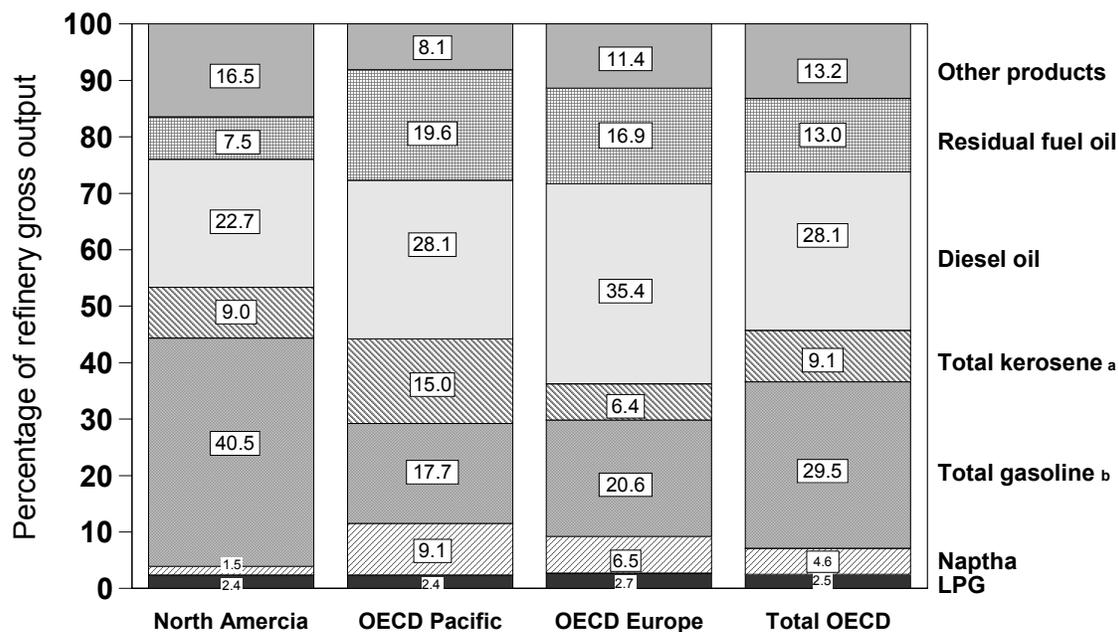
^aEstimated based on a 3% annual inflation rate and a decrease of 30% in the total Defense budget from 1990 to 1996.

^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.

Other parts of the world refine crude oil to produce more diesel fuel and less gasoline than does North America. The OECD Pacific countries produce the lowest share of gasoline.

Figure 1.4. Refinery Gross Output by World Region, 2000



Source:

International Energy Agency, *Monthly Oil Survey*, February 2001, 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, 1987–2000
 (thousand barrels)

Year	Crude oil	Natural gas liquids	Oxygenates				Other hydrocarbons ^c	Other liquids	Total input to refineries
			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
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
1999	5,403,450	135,756	13,735	813	94,784	3,334	21,447	204,332	5,877,651
2000	5,514,395	138,921	15,268	854	90,288	3,151	24,488	176,647	5,964,012
<i>Average annual percentage change</i>									
1987-2000	1.3%	-5.3%	e	e	e	e	0.4%	-1.7%	1.2%
1993-2000	1.5%	-3.6%	24.2%	1.3%	9.0%	16.5%	6.7%	-5.6%	1.2%

Source: U.S. Department of Energy, Energy Information Administration, *Petroleum Supply Annual, 2000*, Vol. 1, June 2001, 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, 1978–2000
(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
1999	46.5	22.3	10.2	4.5	22.3	105.8
2000	46.2	23.1	10.3	4.5	22.0	106.1

Source:

Department of Energy, Energy Information Administration, *Petroleum Supply Annual 2000*, Vol. 1, June 2001, 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%.

The U.S. does not produce enough oil to meet the nation's demand. Since 1998, the net amount of oil imported has been more than half the U.S. consumption. The U.S. does export a small amount of petroleum, mainly to Canada and Mexico.

Table 1.9
United States Petroleum Production and Consumption, 1973–2000
 (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%
1975	8.37	4.10	1.75	5.85	0.00	0.20	16.32	55.48	35.8%	29.4%	82.8%
1980	8.60	4.98	1.39	6.37	0.29	0.26	17.06	63.07	37.3%	27.0%	87.9%
1985	8.97	3.00	1.29	4.29	0.20	0.58	15.73	60.10	27.3%	26.2%	86.6%
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	5.88	8.47	1.14	9.91	0.12	0.82	19.52	74.91	50.8%	26.1	148.5%
2000	5.83	8.88	1.17	10.05	0.05	0.99	19.48	^c	51.6%	^c	150.2%
<i>Average annual percentage change</i>											
1973–2000	-1.7%	3.8%	-3.2%	1.9%	^c	5.6%	0.4%	1.1% ^d			
1990–2000	-2.3%	6.4%	-1.6%	2.9%	-7.6%	2.8%	1.4%	1.3% ^d			

Source:

U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, March 2001, Washington, DC, 2001, Table 3.1a.

World petroleum consumption - U.S. Department of Energy, Energy Information Administration, *International Energy Annual 1999*, February 2001, 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 natural gas plant liquids, refinery processing gains and stock changes.

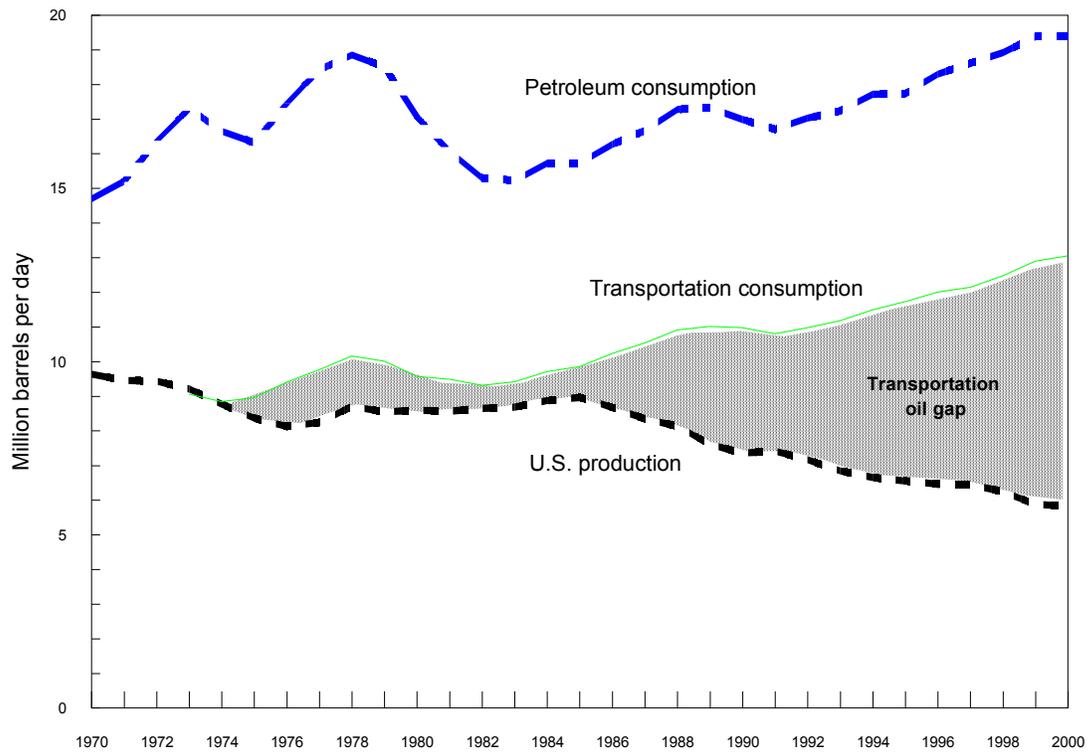
^b Transportation petroleum use can be found on Table 1.10. This column has been revised to include domestic production of crude oil, natural gas plant liquids, and other hydrocarbons/hydrogen/oxygenates as shown in the *Monthly Energy Review*, Table 3.1a.

^c Data are not available.

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

The transportation oil gap is the difference between the amount of oil the U.S. produces and the amount of oil used by the transportation sector. This gap has been getting wider not only due to increasing transportation demand, but also due to decreasing U.S. oil production.

Figure 1.5. United States Petroleum Production and Consumption, 1973–2000



Source: See Tables 1.9 and 1.10.

Transportation accounts for more than two-thirds of the U.S. petroleum use. The residential sector and the commercial sector data which were previously combined are now available separately.

Table 1.10
Consumption of Petroleum by End-Use Sector, 1973–2000
(quadrillion Btu)

Year	Transportation	Percentage	Residential	Commercial	Industrial	Electric utilities	Total	
1973	17.83	51.2%	2.83	1.57	9.10	3.52	34.84	
1974	17.40	52.0%	2.57	1.42	8.69	3.37	33.46	
1975	17.61	53.8%	2.50	1.31	8.15	3.17	32.74	
1976	18.51	52.6%	2.72	1.46	9.01	3.48	35.18	
1977	19.24	51.8%	2.70	1.51	9.77	3.90	37.12	
1978	20.04	52.8%	2.62	1.45	9.87	3.99	37.97	
1979	19.83	53.4%	2.11	1.33	10.57	3.28	37.13	
1980	19.01	55.6%	1.75	1.29	9.53	2.63	34.21	
1981	18.81	58.9%	1.54	1.09	8.29	2.20	31.93	
1982	18.42	60.9%	1.44	1.01	7.79	1.57	30.23	
1983	18.59	61.9%	1.36	1.14	7.42	1.54	30.05	
1984	19.22	61.9%	1.34	1.20	8.01	1.29	31.06	
1985	19.50	63.1%	1.48	1.04	7.81	1.09	30.92	
1986	20.27	63.0%	1.46	1.10	7.92	1.45	32.20	
1987	20.87	63.5%	1.51	1.08	8.15	1.26	32.87	
1988	21.63	63.2%	1.56	1.04	8.43	1.56	34.22	
1989	21.87	63.9%	1.56	0.97	8.13	1.69	34.22	
1990	21.81	65.0%	1.27	0.91	8.32	1.25	33.55	
1991	21.46	65.3%	1.29	0.86	8.06	1.18	32.85	
1992	21.81	65.0%	1.31	0.81	8.64	0.95	33.53	
1993	22.20	65.6%	1.39	0.75	8.45	1.05	33.84	
1994	22.76	65.6%	1.34	0.75	8.85	0.97	34.67	
1995	23.20	67.1%	1.36	0.72	8.62	0.66	34.56	
1996	23.74	66.4%	1.49	0.75	9.06	0.73	35.77	
1997	23.99	66.2%	1.45	0.71	9.29	0.82	36.26	
1998	24.65	66.7%	1.32	0.67	9.13	1.17	36.94	
1999	24.49	67.2%	1.45	0.67	9.40	0.94	37.95	
2000	25.84	68.1%	1.48	0.70	9.16	0.78	38.63	
			<i>Average annual percentage change</i>					
1973–2000	1.4%		-2.4%	-2.9%	0.0%	-5.4%	0.4%	
1990–2000	1.7%		1.5%	-2.6%	1.0%	-4.6%	1.4%	

Source:

U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, March 2001, Tables 2.2–2.6. (Additional resources: www.eia.doe.gov)

Pipelines accounted for two-thirds of the domestic movement of crude oil and petroleum products in 1999.

Table 1.11
Ton-Miles of Petroleum and Petroleum Products in the U.S. by Mode, 1975–99

Year	Pipelines ^a	Water carriers	Motor carriers ^b	Railroads	Total
		(percent)			(billion ton-miles)
1975	59.9%	35.2%	3.3%	1.7%	846.7
1976	59.4%	35.4%	3.8%	1.5%	867.7
1977	59.1%	36.1%	3.2%	1.6%	923.4
1978	50.5%	45.7%	2.7%	1.1%	1,160.2
1979	51.8%	44.5%	2.6%	1.2%	1,174.8
1980	47.2%	49.6%	2.2%	1.0%	1,245.3
1981	46.3%	50.7%	2.0%	1.0%	1,218.4
1982	46.4%	50.6%	1.9%	1.1%	1,218.2
1983	45.5%	51.5%	2.1%	1.0%	1,223.5
1984	48.1%	48.4%	2.5%	1.0%	1,180.2
1985	47.2%	49.4%	2.4%	1.0%	1,195.5
1986	48.7%	47.8%	2.5%	1.0%	1,187.8
1987	49.1%	47.4%	2.5%	1.0%	1,195.8
1988	50.6%	45.8%	2.6%	1.1%	1,188.1
1989	53.4%	42.6%	2.8%	1.2%	1,094.2
1990	54.2%	41.7%	2.8%	1.3%	1,076.8
1991	53.3%	42.8%	2.7%	1.3%	1,086.1
1992	53.9%	42.1%	2.6%	1.4%	1,091.7
1993	57.3%	38.8%	2.4%	1.5%	1,034.6
1994	56.5%	39.3%	2.7%	1.5%	1,046.7
1995	57.5%	38.4%	2.5%	1.6%	1,044.9
1996	60.6%	34.9%	2.9%	1.6%	1,022.2
1997	64.5%	30.9%	2.9%	1.8%	956.5
1998	66.7%	28.5%	3.0%	1.8%	929.8
1999	67.7%	27.1%	3.2%	2.1%	912.9
		<i>Average annual percentage change</i>			
1975–99					0.3%
1989–99					-1.8%

Source:

Association of Oil Pipelines, *Shifts in Petroleum Transportation*, Washington, DC, February 2001, 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.