

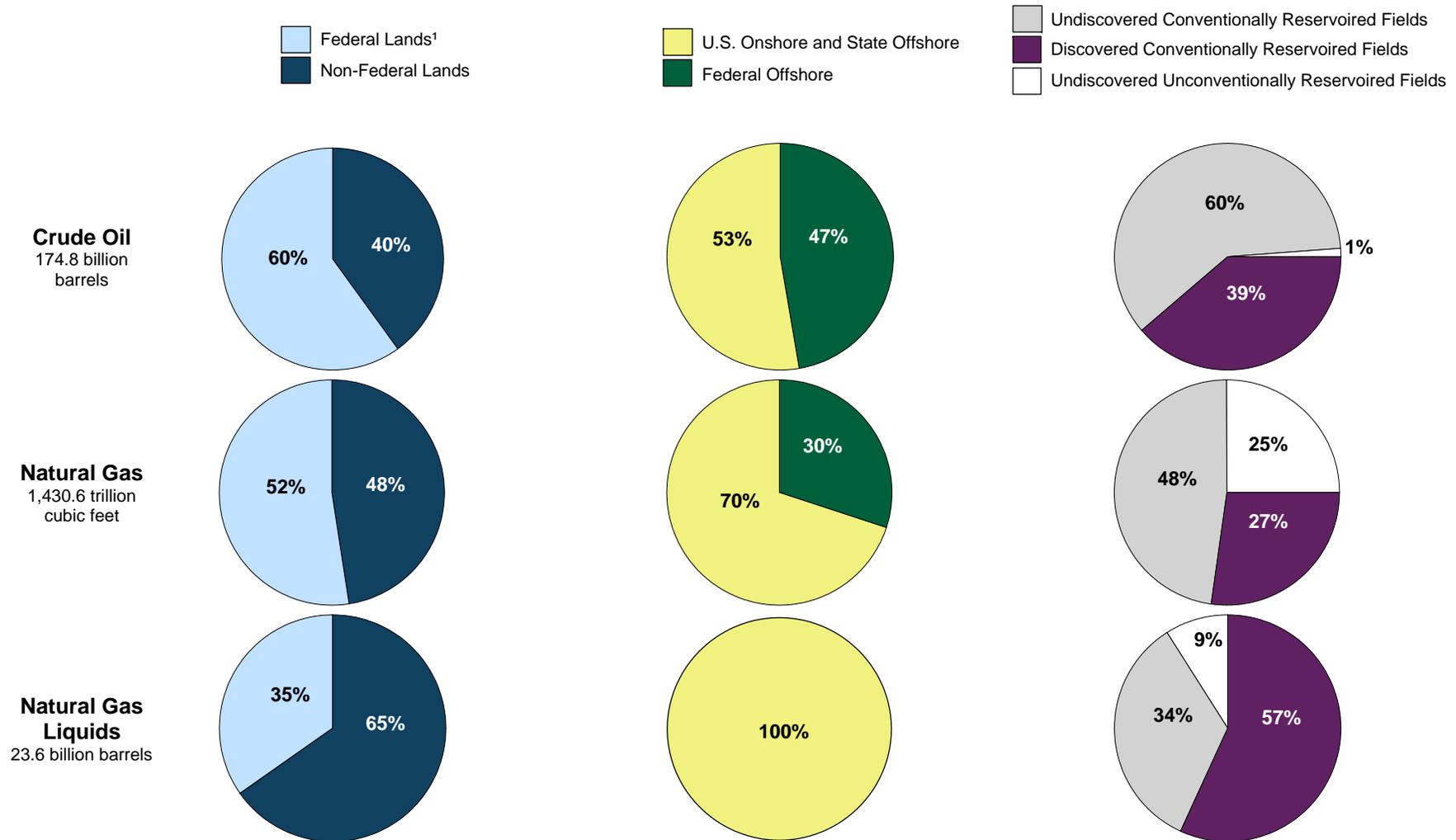
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Energy Resources



Semisubmersible drilling rig in the Gulf of Mexico. Source: U.S. Department of Energy.

Figure 4.1 Technically Recoverable Crude Oil, Natural Gas, and Natural Gas Liquids Resource Estimates, 2003



¹ Lands owned or under the jurisdiction of the Federal government.

Source: Table 4.1.

Table 4.1 Technically Recoverable Crude Oil, Natural Gas, and Natural Gas Liquids Resource Estimates, 2003

Region	Crude Oil (billion barrels)			Natural Gas (Dry) (trillion cubic feet)			Natural Gas Liquids (billion barrels)		
	Federal Lands ¹	Non-Federal Lands	Total	Federal Lands ¹	Non-Federal Lands	Total	Federal Lands ¹	Non-Federal Lands	Total
Undiscovered Conventionally Reservoired Fields ²	82.54	22.51	105.05	420.14	261.78	681.92	1.80	6.25	8.05
Alaska Onshore and State Offshore ³	3.75	4.68	8.43	33.97	95.37	129.34	0.54	0.61	1.15
Alaska Federal Offshore ⁴	24.90	—	24.90	122.60	—	122.60	0.00	—	0.00
48 States Onshore and State Offshore ³	3.79	17.83	21.62	23.97	166.41	190.38	1.26	5.64	6.90
48 States Federal Offshore ⁴	50.10	—	50.10	239.60	—	239.60	0.00	—	0.00
Discovered Conventionally Reservoired Fields ²									
(Ultimate Recovery Appreciation) ⁵	22.03	45.67	67.70	186.70	203.30	390.00	4.94	8.46	13.40
U.S. Onshore and State Offshore ³	14.33	45.67	60.00	118.70	203.30	322.00	4.94	8.46	13.40
U.S. Federal Offshore ⁴	7.70	—	7.70	68.00	—	68.00	0.00	—	0.00
Undiscovered Unconventionally Reservoired Fields ⁶									
(Continuous-Type Deposits (all onshore))	0.32	1.75	2.07	143.16	215.55	358.71	1.45	0.67	2.12
U.S. Total	104.89	69.93	174.82	750.00	680.63	1,430.63	8.19	15.38	23.57
U.S. Onshore and State Offshore ³	22.19	69.93	92.12	319.80	680.63	1,000.43	8.19	15.38	23.57
Federal Offshore ⁴	82.70	—	82.70	430.20	—	430.20	0.00	—	0.00

¹ Lands owned or under the jurisdiction of the Federal government, excluding Indian and Native lands even when Federally managed in trust.

² Conventionally reservoired deposits are discrete subsurface accumulations of crude oil or natural gas usually defined, controlled, or limited by hydrocarbon/water contacts.

³ Onshore (Federal and State) plus State offshore waters (near-shore, shallow-water areas under State jurisdiction).

⁴ Federal offshore jurisdictions (Outer Continental Shelf and deeper water areas seaward of State offshore).

⁵ "Proved Reserves" (see Table 4.2) are not included in these estimates. Ultimate recovery appreciation (reserve growth) is the volume by which the estimate of total recovery from a known crude oil or natural gas reservoir or aggregation of such reservoirs is expected to increase during the time between discovery and permanent abandonment. The estimates of ultimate recovery appreciation for onshore and State offshore lands were imputed by assuming that the total estimates reported by the U.S. Geological Survey could be apportioned according to the ratio of 1996 production from onshore Federal lands to total U.S. production.

⁶ Unconventionally reservoired deposits (continuous-type accumulations) are geographically extensive subsurface accumulations of crude oil or natural gas that generally lack well-defined hydrocarbon/water contacts. Examples include coalbed methane, "tight gas," and auto-sourced oil- and gas-shale reservoirs.

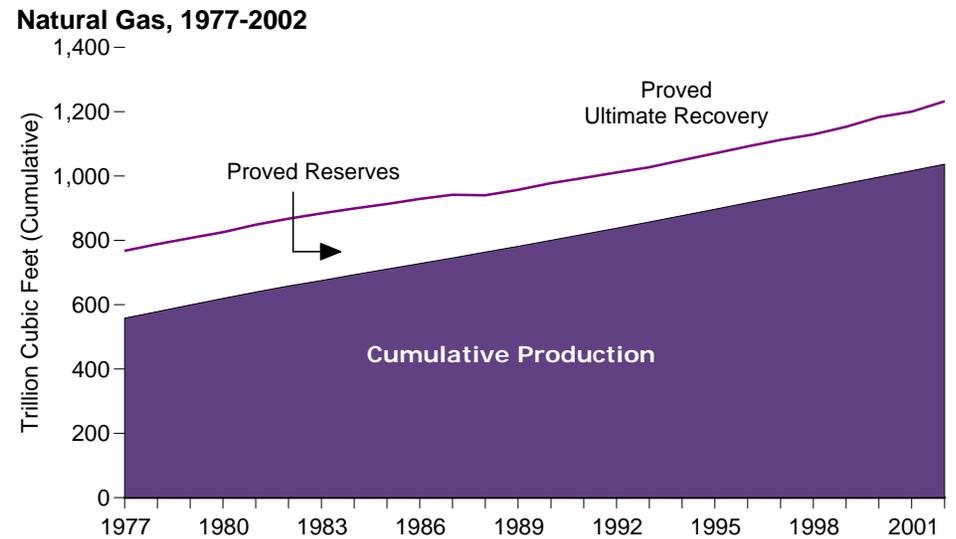
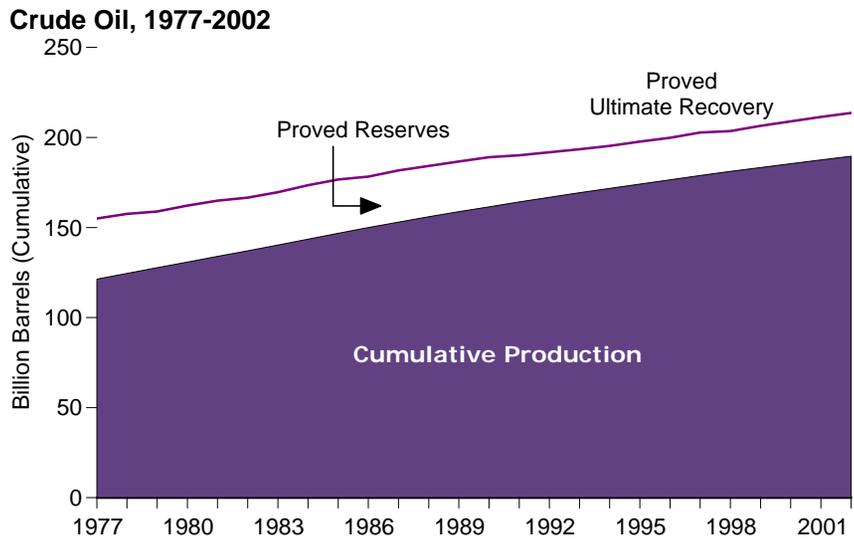
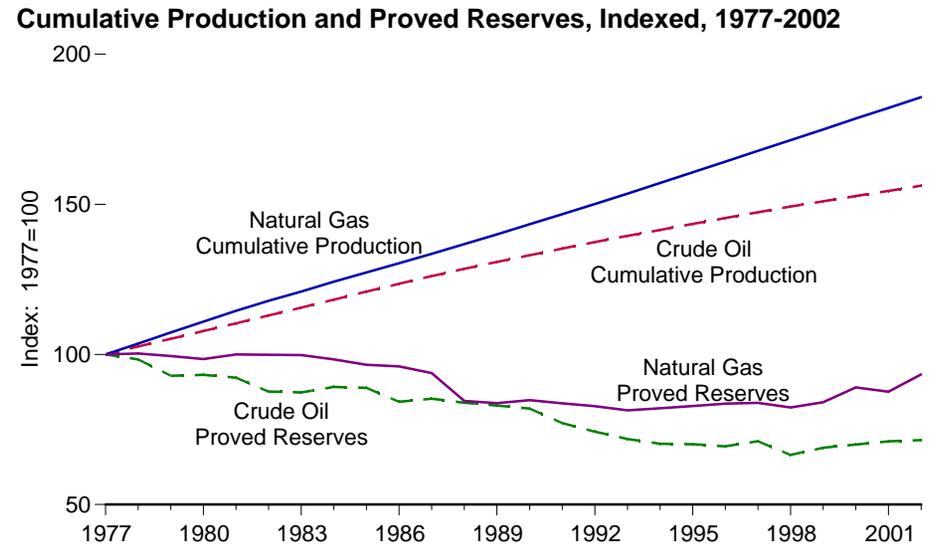
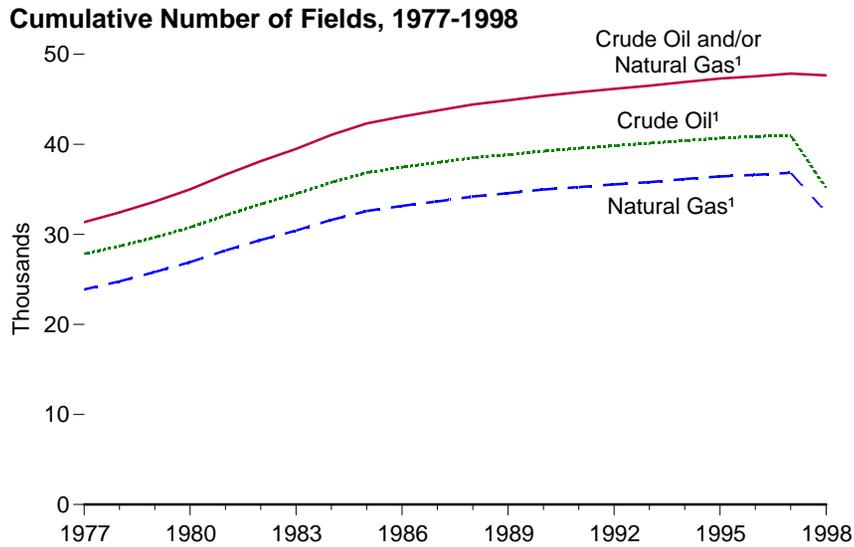
— = Not applicable.

Notes: • Resource estimates are as of the latest estimates generated by the U.S. Department of the Interior, U.S. Geological Survey (USGS) and the Minerals Management Service (MMS). They were not necessarily generated in the current year. • For purposes of comparison, the Potential Gas Committee, an industry-sponsored group of experts, biennially provides another geologically-based estimate of the Nation's natural gas resources. The latest mean estimate, published in "Potential Supply of Natural Gas in the United States," December 31, 2002, is 1,127 trillion cubic feet. This volume includes undiscovered conventionally reservoired deposits, expected ultimate recovery appreciation, coalbed methane, and tight gas where it is believed to be technically recoverable and marketable at reasonable costs. • A value of zero indicates either that none exists in this area or that no estimate of this resource has been made for this area. • "48 States" is the United States excluding Alaska and Hawaii.

Web Page: See http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html for related information.

Source: Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 2002 Annual Report* (December 2003), Table G1, which in turn is based on the latest resource estimates generated by the U.S. Department of the Interior, U.S. Geological Survey and the Minerals Management Service.

Figure 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Proved Ultimate Recovery



¹ There is a discontinuity in this time series between 1997 and 1998 due to the absence of updates for a subset of the data used in the past.

Notes: • Data are at end of year. • Crude oil includes lease condensate. • Natural gas is wet, after lease separation.
Source: Table 4.2.

Table 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Proved Ultimate Recovery, 1977-2002

Year	Cumulative Number of Fields with Crude Oil and/or Natural Gas	Cumulative Number of Fields with Crude Oil	Crude Oil and Lease Condensate (billion barrels)			Cumulative Number of Fields with Natural Gas	Natural Gas ¹ (trillion cubic feet)		
			Cumulative Production	Proved Reserves	Proved Ultimate Recovery		Cumulative Production	Proved Reserves	Proved Ultimate Recovery
1977	31,360	27,835	121.4	33.6	155.0	23,883	558.3	209.5	767.8
1978	32,430	28,683	124.6	33.1	157.6	24,786	578.4	210.1	788.5
1979	33,644	29,671	127.7	31.2	158.9	25,823	599.1	208.3	807.4
1980	34,999	30,766	130.8	31.3	162.2	26,919	619.4	206.3	825.6
1981	36,621	32,111	133.9	31.0	165.0	28,213	639.4	209.4	848.9
1982	38,123	33,375	137.1	29.5	166.6	29,375	658.1	209.3	867.4
1983	39,489	34,495	140.3	29.3	169.6	30,419	675.1	209.0	884.1
1984	41,038	35,784	143.5	30.0	173.5	31,595	693.5	206.0	899.5
1985	42,317	36,849	146.8	29.9	176.7	32,595	710.9	202.2	913.1
1986	43,076	37,464	150.0	28.3	178.3	33,151	727.8	201.1	928.9
1987	43,742	37,982	153.0	28.7	181.7	33,657	745.4	196.4	941.8
1988	44,414	38,506	156.0	28.2	184.2	34,196	763.4	177.0	940.4
1989	44,883	38,858	158.8	27.9	186.7	34,579	781.7	175.4	957.1
1990	45,385	39,244	161.5	27.6	189.0	34,975	800.4	177.6	978.0
1991	45,776	39,558	164.2	25.9	190.1	35,254	819.1	175.3	994.4
1992	46,149	39,843	166.8	25.0	191.8	35,539	838.0	173.3	1,011.3
1993	46,513	40,124	169.3	24.1	193.4	35,798	857.2	170.5	1,027.7
1994	46,922	40,417	171.7	23.6	195.3	36,142	877.1	171.9	1,049.1
1995	47,296	40,694	174.1	23.5	197.7	36,433	896.9	173.5	1,070.4
1996	47,557	40,875	176.5	23.3	199.8	36,612	917.0	175.1	1,092.1
1997	47,854	40,977	178.9	23.9	202.8	36,830	937.1	175.7	1,112.8
1998	² 47,664	² 35,143	181.2	22.4	203.5	² 32,458	957.0	172.4	1,129.4
1999	NA	NA	183.3	23.2	206.5	NA	976.8	176.2	1,153.0
2000	NA	NA	185.4	23.5	208.9	NA	997.0	186.5	1,183.5
2001	NA	NA	^R 187.5	^R 23.9	^R 211.4	NA	1,016.7	183.5	1,200.2
2002	NA	NA	189.6	24.0	213.6	NA	1,036.9	195.6	1,232.5

¹ Wet, after separation of lease condensate.

² There is a discontinuity in this time series between 1997 and 1998 due to the absence of updates for a subset of the data used in the past.

R=Revised. NA=Not available.

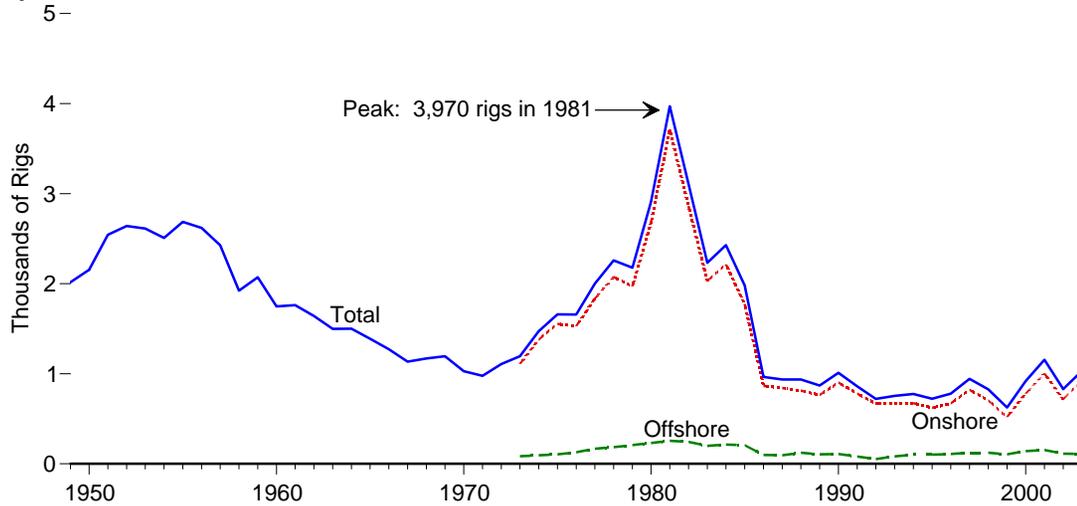
Notes: • Data are at end of year. • See "Proved Reserves, Crude Oil," "Proved Reserves, Lease Condensate," "Proved Reserves, Natural Gas," and "Proved Reserves, Natural Gas Liquids" in Glossary.

Web Pages: See http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html and http://www.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html for related information.

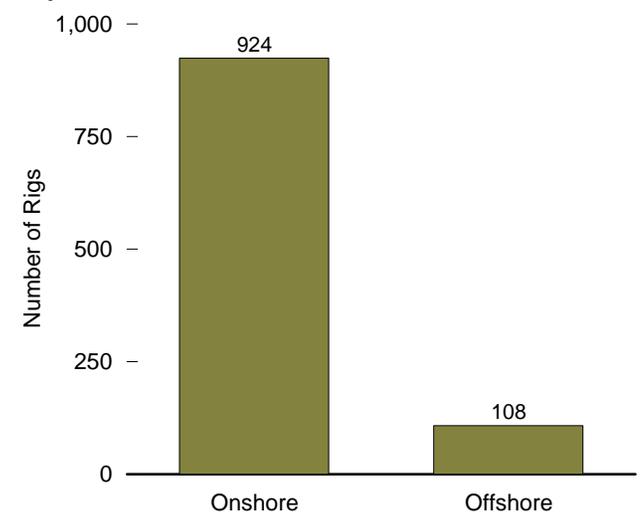
Sources: **Cumulative Number of Fields:** Energy Information Administration (EIA), *Oil and Gas Field Code Master List*, annual reports, and EIA, Office of Oil and Gas, Oil and Gas Integrated Field File. **Cumulative Production:** Calculated from EIA, *Petroleum Supply Annual*, annual reports and *Natural Gas Annual*, annual reports. **Proved Reserves:** • 1977-2001—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, annual reports. • 2002—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 2002 Annual Report* (December 2003), Tables 6, 9, and 15. **Proved Ultimate Recovery:** Calculated as the sum of cumulative production and proved reserves.

Figure 4.3 Crude Oil and Natural Gas Rotary Rigs in Operation

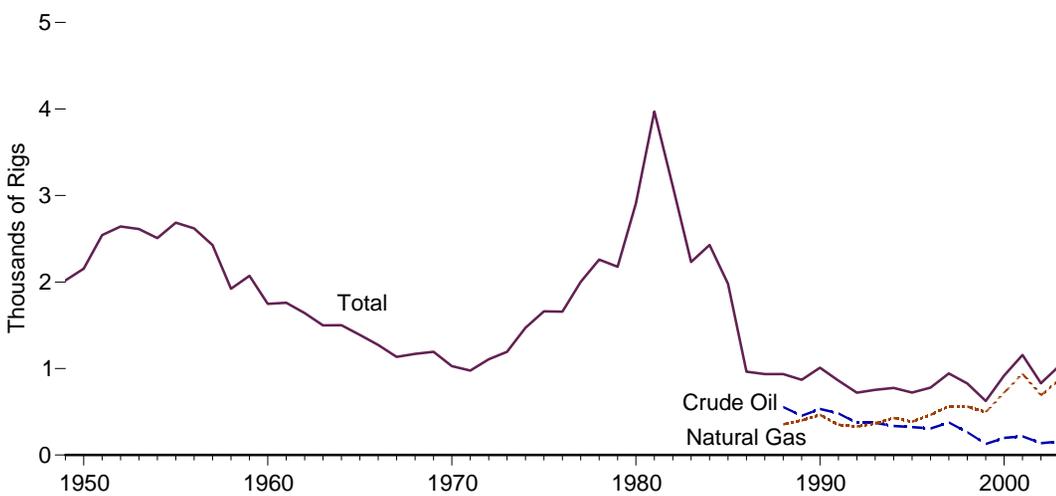
By Site, 1949-2003



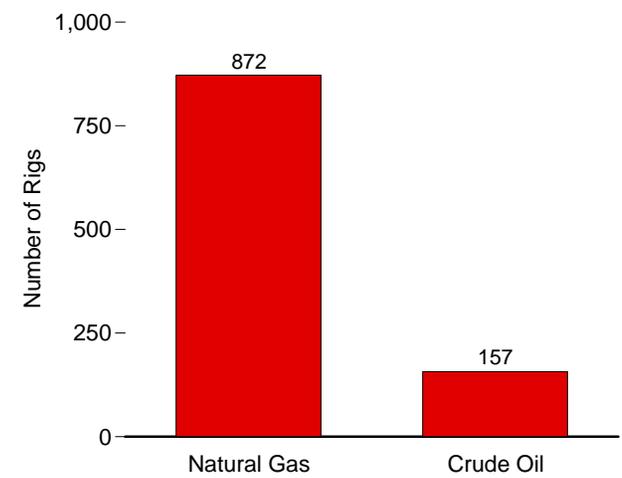
By Site, 2003



By Type, 1949-2003



By Type, 2003



Source: Table 4.3.

Table 4.3 Crude Oil and Natural Gas Rotary Rigs in Operation, Selected Years, 1949-2003

Year	By Site		By Type		Total ¹
	Onshore	Offshore	Crude Oil	Natural Gas	
1949	NA	NA	NA	NA	2,017
1950	NA	NA	NA	NA	2,154
1955	NA	NA	NA	NA	2,686
1960	NA	NA	NA	NA	1,748
1965	NA	NA	NA	NA	1,388
1970	NA	NA	NA	NA	1,028
1971	NA	NA	NA	NA	976
1972	NA	NA	NA	NA	1,107
1973	1,110	84	NA	NA	1,194
1974	1,378	94	NA	NA	1,472
1975	1,554	106	NA	NA	1,660
1976	1,529	129	NA	NA	1,658
1977	1,834	167	NA	NA	2,001
1978	2,074	185	NA	NA	2,259
1979	1,970	207	NA	NA	2,177
1980	2,678	231	NA	NA	2,909
1981	3,714	256	NA	NA	3,970
1982	2,862	243	NA	NA	3,105
1983	2,033	199	NA	NA	2,232
1984	2,215	213	NA	NA	2,428
1985	1,774	206	NA	NA	1,980
1986	865	99	NA	NA	964
1987	841	95	NA	NA	936
1988	813	123	554	354	936
1989	764	105	453	401	869
1990	902	108	532	464	1,010
1991	779	81	482	351	860
1992	669	52	373	331	721
1993	672	82	373	364	754
1994	673	102	335	427	775
1995	622	101	323	385	723
1996	671	108	306	464	779
1997	821	122	376	564	943
1998	703	123	264	560	827
1999	519	106	128	496	625
2000	778	140	197	720	918
2001	1,003	153	217	939	1,156
2002	717	113	137	691	830
2003	924	108	157	872	1,032

¹ Sum of rigs drilling for crude oil, rigs drilling for natural gas, and other rigs (not shown) drilling for miscellaneous purposes such as service wells, injection wells, and stratigraphic tests.

NA=Not available.

Notes: • Data are not for the exact calendar year but are an average for the 52 or 53 consecutive whole

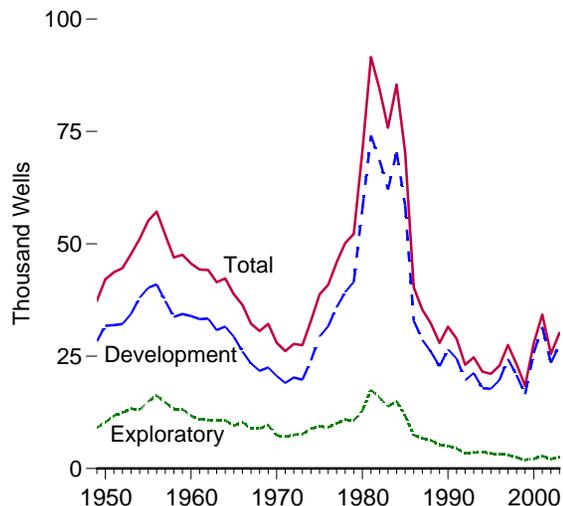
weeks that most nearly coincide with the calendar year. • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding.

Web Page: For data not shown for 1951-1969, see <http://www.eia.doe.gov/emeu/aer/resource.html>.

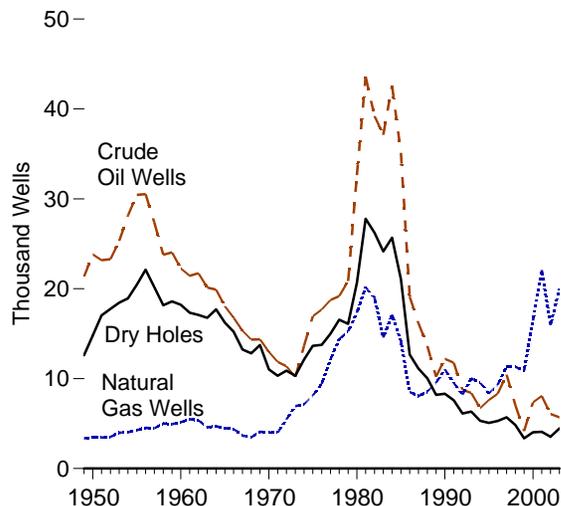
Source: Baker Hughes, Inc., Houston, Texas, *Rotary Rigs Running—By State*.

Figure 4.4 Crude Oil and Natural Gas Exploratory and Development Wells

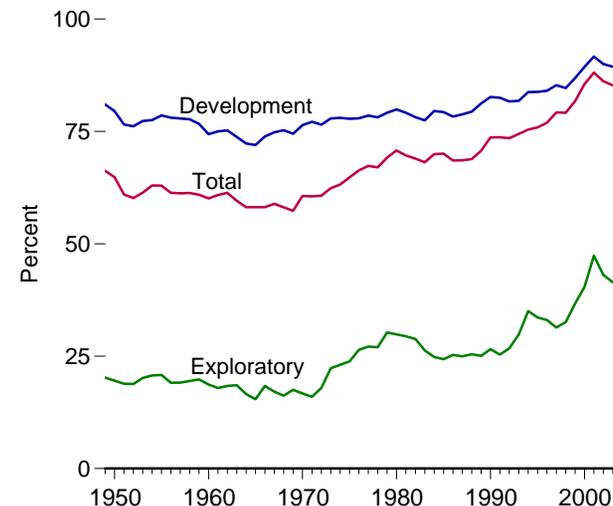
Total Wells Drilled, 1949-2003



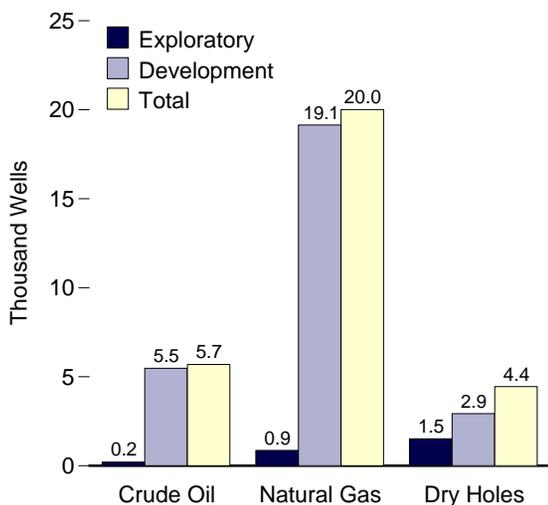
Total Wells Drilled by Type, 1949-2003



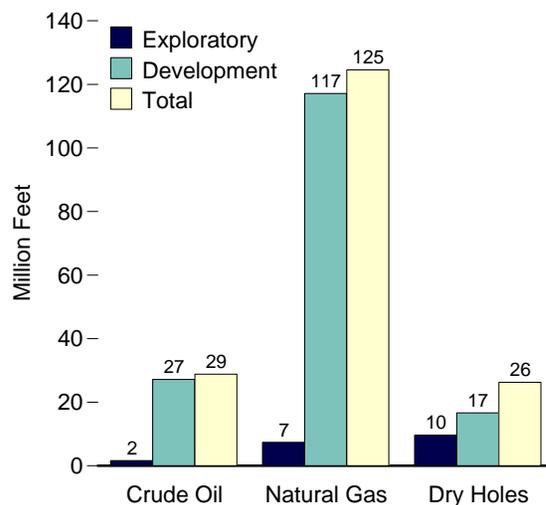
Successful Wells, 1949-2003



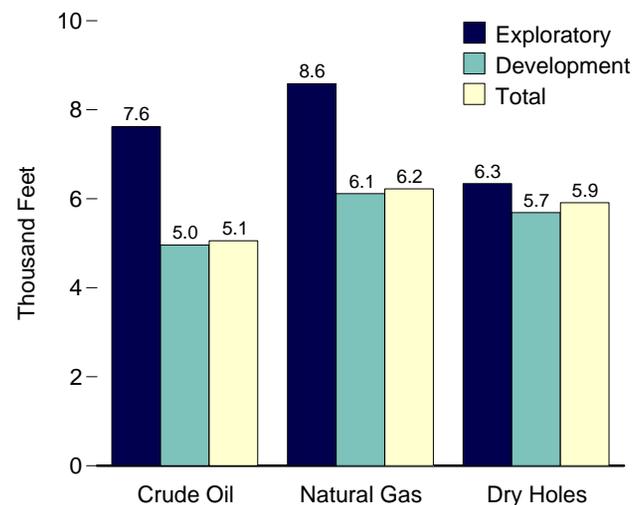
Wells Drilled, 2003



Footage Drilled, 2003



Average Depth, 2003



Sources: Tables 4.4-4.6.

Table 4.4 Crude Oil and Natural Gas Exploratory and Development Wells, Selected Years, 1949-2003

Year	Wells Drilled				Successful Wells (percent)	Footage Drilled ¹ (thousand feet)				Average Depth (feet per well)			
	Crude Oil ²	Natural Gas ³	Dry Holes ⁴	Total		Crude Oil ²	Natural Gas ³	Dry Holes ⁴	Total	Crude Oil ²	Natural Gas ³	Dry Holes ⁴	Total
1949	21,352	3,363	12,597	37,312	66.2	79,428	12,437	43,754	135,619	3,720	3,698	3,473	3,635
1950	23,812	3,439	14,799	42,050	64.8	92,695	13,685	50,977	157,358	3,893	3,979	3,445	3,742
1955	30,432	4,266	20,452	55,150	62.9	121,148	19,930	85,103	226,182	3,981	4,672	4,161	4,101
1960	22,258	5,149	18,212	45,619	60.1	86,568	28,246	77,361	192,176	3,889	5,486	4,248	4,213
1965	18,065	4,482	16,226	38,773	58.2	73,322	24,931	76,629	174,882	4,059	5,562	4,723	4,510
1970	12,968	4,011	11,031	28,010	60.6	56,859	23,623	58,074	138,556	4,385	5,860	5,265	4,943
1971	11,853	3,971	10,309	26,133	60.6	49,109	23,460	54,685	127,253	4,126	5,890	5,305	4,858
1972	11,378	5,440	10,891	27,709	60.7	49,269	30,006	58,556	137,831	4,330	5,516	5,377	4,974
1973	10,167	6,933	10,320	27,420	62.4	44,416	38,045	55,761	138,223	4,369	5,488	5,403	5,041
1974	13,647	7,138	12,116	32,901	63.2	52,025	38,449	62,899	153,374	3,812	5,387	5,191	4,662
1975	16,948	8,127	13,646	38,721	64.8	66,819	44,454	69,220	180,494	3,943	5,470	5,073	4,661
1976	17,688	9,409	13,758	40,855	66.3	68,892	49,113	68,977	186,982	3,895	5,220	5,014	4,577
1977	18,745	12,122	14,985	45,852	67.3	75,451	63,686	76,728	215,866	4,025	5,254	5,120	4,708
1978	19,181	14,413	16,551	50,145	67.0	77,041	75,841	85,788	238,669	4,017	5,262	5,183	4,760
1979	20,851	15,254	16,099	52,204	69.2	82,688	80,468	81,642	244,798	3,966	5,275	5,071	4,689
1980	32,639	17,333	20,638	70,610	70.8	124,350	91,484	98,820	314,654	3,810	5,278	4,788	4,456
1981	43,598	20,166	27,789	91,553	69.6	171,241	107,758	134,113	413,112	3,928	5,344	4,826	4,512
1982	39,199	18,979	26,219	84,397	68.9	148,881	106,627	122,787	378,295	3,798	5,618	4,683	4,482
1983	37,120	14,564	24,153	75,837	68.2	136,078	77,530	104,378	317,986	3,666	5,323	4,322	4,193
1984	42,605	17,127	25,681	85,413	69.9	161,770	90,578	119,044	371,392	3,797	5,289	4,635	4,348
1985	35,118	14,168	21,056	70,342	70.1	137,366	75,862	99,816	313,045	3,912	5,355	4,740	4,450
1986	19,097	8,516	12,678	40,291	68.5	76,622	44,727	60,507	181,856	4,012	5,252	4,773	4,514
1987	16,164	8,055	11,112	35,331	68.5	66,317	42,479	53,382	162,178	4,103	5,274	4,804	4,590
1988	13,636	8,555	10,041	32,232	68.8	58,660	45,320	52,375	156,354	4,302	5,297	5,216	4,851
1989	10,204	9,539	8,188	27,931	70.7	43,287	49,169	41,983	134,439	4,242	5,154	5,127	4,813
1990	12,198	11,044	8,313	31,555	73.7	54,480	55,869	43,352	153,701	4,466	5,059	5,215	4,871
1991	11,770	9,526	7,596	28,892	73.7	54,283	49,737	39,001	143,021	4,612	5,221	5,134	4,950
1992	8,757	8,209	6,118	23,084	73.5	44,183	45,728	31,213	121,124	5,045	5,571	5,102	5,247
1993	8,407	10,017	6,328	24,752	74.4	42,895	59,720	32,503	135,118	5,102	5,962	5,136	5,459
1994	6,721	9,538	5,307	21,566	75.4	36,090	59,412	29,306	124,809	5,370	6,229	5,522	5,787
1995	7,627	8,354	5,075	21,056	75.9	38,024	51,415	28,393	117,832	4,985	6,154	5,595	5,596
1996	8,314	9,302	5,282	22,898	76.9	40,849	58,062	30,133	129,045	4,913	6,242	5,705	5,636
1997	10,436	11,327	5,702	27,465	79.2	52,098	70,477	34,086	156,661	4,992	6,222	5,978	5,704
1998	7,064	^R 11,308	4,840	^R 23,212	^R 79.1	^R 37,576	^R 74,194	^R 31,683	143,454	5,321	6,672	6,512	6,224
1999 ^E	4,176	10,877	3,364	18,417	81.7	^R 19,793	^R 58,242	^R 21,375	99,410	4,723	5,393	6,250	5,398
2000 ^E	7,358	16,455	4,025	27,838	85.5	^R 34,691	^R 83,091	^R 23,610	141,392	4,698	5,083	5,762	5,079
2001 ^E	8,060	22,083	^R 4,084	^R 34,227	^R 88.1	^R 42,504	^R 120,307	^R 27,156	189,967	^R 5,274	^R 5,448	^R 6,649	^R 5,550
2002 ^E	^R 6,058	15,947	^R 3,531	^R 25,536	^R 86.2	^R 27,375	^R 91,190	^R 19,744	^R 138,310	^R 4,519	^R 5,718	^R 5,592	^R 5,416
2003 ^E	5,694	20,011	4,446	30,151	85.3	28,808	124,543	26,286	179,637	5,059	6,224	5,912	5,958

¹ See "Footage Drilled" in Glossary.

² See "Crude Oil Well" in Glossary.

³ See "Natural Gas Well" in Glossary.

⁴ See "Dry Hole" in Glossary.

R=Revised. E=Estimate.

Notes: • Data are for all wells; see Table 4.5 for exploratory wells and Table 4.6 for development wells. See "Development Well" and "Exploratory Well" in Glossary. • Service wells, stratigraphic tests, and core tests are excluded. • For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. The as-received well completion data for recent years are incomplete due to delays in the reporting of wells drilled. The Energy Information Administration (EIA) therefore statistically imputes the missing data to provide estimates of total well

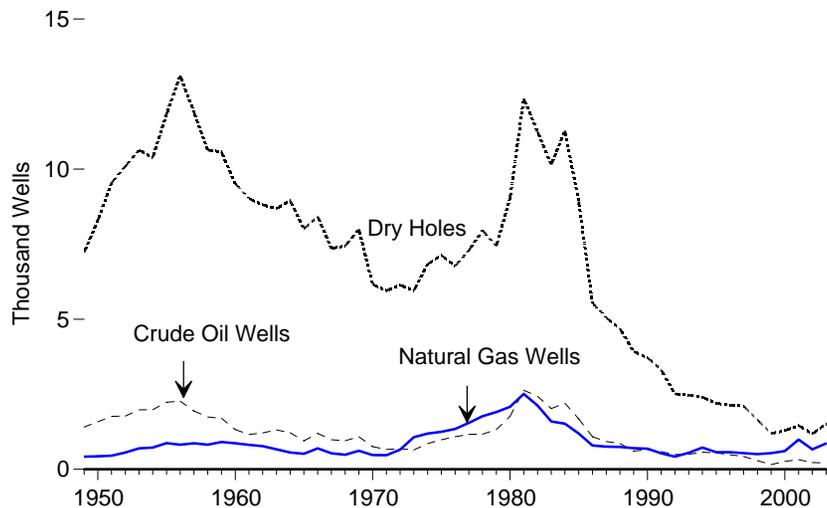
completions and footage where necessary. See "Completion (Crude Oil/Natural Gas Production)" in Glossary. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

Web Pages: • For data not shown for 1951-1969, see <http://www.eia.doe.gov/emeu/aer/resource.html>. • For related information, see http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html.

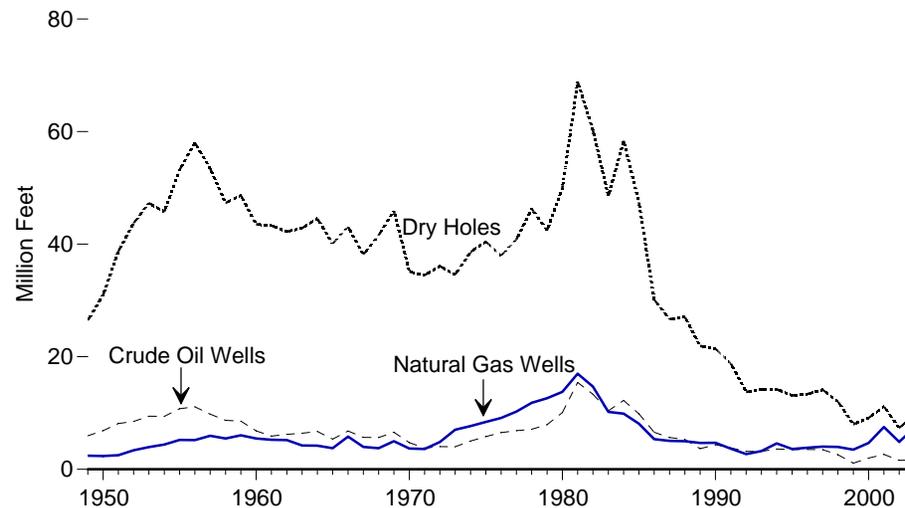
Sources: • 1949-1965—Gulf Publishing Company, *World Oil*, "Forecast-Review" issue. • 1966-1969—American Petroleum Institute (API), *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970-1994—EIA computations based on well reports submitted to the API. • 1995 forward—EIA computations based on well reports submitted to the Information Handling Services Energy Group, Inc. For current data see the EIA, *Monthly Energy Review*, Section 5.

Figure 4.5 Crude Oil and Natural Gas Exploratory Wells, 1949-2003

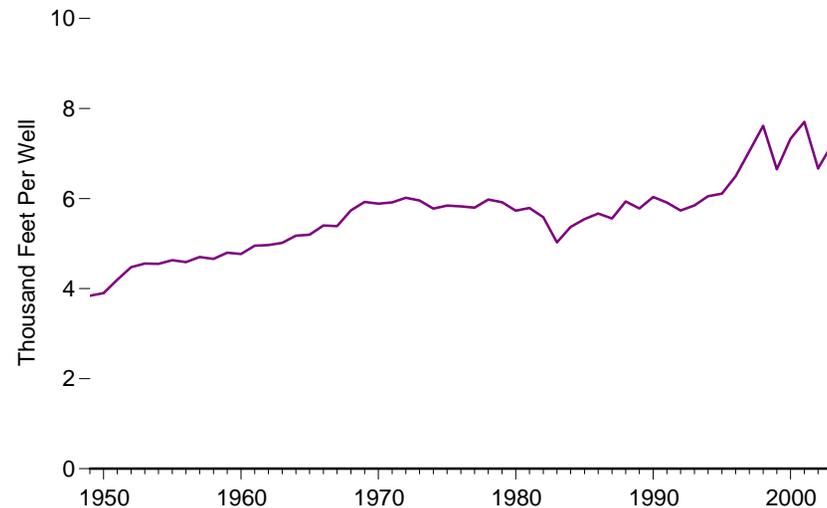
Exploratory Wells Drilled by Well Type



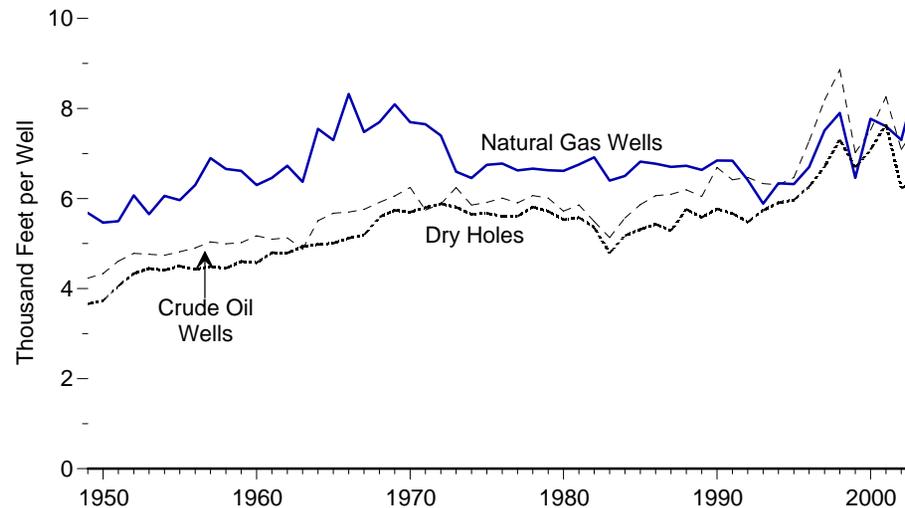
Exploratory Footage Drilled by Well Type



Exploratory Wells Average Depth, All Wells



Exploratory Wells Average Depth by Well Type



Note: These figures depict exploratory wells only; see Figure 4.4 for all wells and Figure 4.6 for development wells only.

Source: Table 4.5.

Table 4.5 Crude Oil and Natural Gas Exploratory Wells, Selected Years, 1949-2003

Year	Wells Drilled				Successful Wells (percent)	Footage Drilled ¹ (thousand feet)				Average Depth (feet per well)			
	Crude Oil ²	Natural Gas ³	Dry Holes ⁴	Total		Crude Oil ²	Natural Gas ³	Dry Holes ⁴	Total	Crude Oil ²	Natural Gas ³	Dry Holes ⁴	Total
1949	1,406	424	7,228	9,058	20.2	5,950	2,409	26,439	34,798	4,232	5,682	3,658	3,842
1950	1,583	431	8,292	10,306	19.5	6,862	2,356	30,957	40,175	4,335	5,466	3,733	3,898
1955	2,236	874	11,832	14,942	20.8	10,774	5,212	53,220	69,206	4,819	5,964	4,498	4,632
1960	1,321	868	9,515	11,704	18.7	6,829	5,466	43,535	55,831	5,170	6,298	4,575	4,770
1965	946	515	8,005	9,466	15.4	5,366	3,757	40,081	49,204	5,672	7,295	5,007	5,198
1970	757	477	6,162	7,396	16.7	4,729	3,678	35,123	43,530	6,247	7,695	5,700	5,885
1971	659	470	5,952	7,081	15.9	3,786	3,610	34,499	41,895	5,745	7,649	5,796	5,915
1972	685	656	6,134	7,475	17.9	4,028	4,847	36,081	44,956	5,880	7,400	5,882	6,015
1973	642	1,067	5,952	7,661	22.3	4,008	7,038	34,571	45,618	6,243	6,596	5,808	5,955
1974	859	1,190	6,833	8,882	23.1	5,029	7,683	38,603	51,315	5,855	6,456	5,649	5,777
1975	982	1,248	7,129	9,359	23.8	5,806	8,422	40,448	54,677	5,913	6,748	5,674	5,842
1976	1,086	1,346	6,772	9,204	26.4	6,527	9,121	37,969	53,617	6,010	6,777	5,607	5,825
1977	1,164	1,548	7,283	9,995	27.1	6,870	10,255	40,823	57,949	5,902	6,625	5,605	5,798
1978	1,171	1,771	7,965	10,907	27.0	7,105	11,798	46,295	65,197	6,067	6,662	5,812	5,978
1979	1,321	1,907	7,437	10,665	30.3	7,941	12,643	42,512	63,096	6,011	6,630	5,716	5,916
1980	1,764	2,081	9,039	12,884	29.8	10,086	13,763	49,971	73,820	5,718	6,614	5,528	5,730
1981	2,636	2,514	12,349	17,499	29.4	15,437	16,983	68,877	101,297	5,856	6,755	5,578	5,789
1982	2,431	2,125	11,247	15,803	28.8	13,349	14,694	60,217	88,260	5,491	6,915	5,354	5,585
1983	2,023	1,593	10,148	13,764	26.3	10,384	10,193	48,590	69,166	5,133	6,398	4,788	5,025
1984	2,198	1,521	11,278	14,997	24.8	12,236	9,889	58,373	80,498	5,567	6,502	5,176	5,368
1985	1,679	1,190	8,924	11,793	24.3	9,847	8,117	47,421	65,386	5,865	6,821	5,314	5,544
1986	1,084	793	5,549	7,426	25.3	6,573	5,372	30,137	42,082	6,063	6,774	5,431	5,667
1987	925	754	5,049	6,728	25.0	5,639	5,055	26,698	37,392	6,096	6,704	5,288	5,558
1988	855	743	4,693	6,291	25.4	5,294	5,000	27,047	37,340	6,192	6,729	5,763	5,936
1989	607	705	3,924	5,236	25.1	3,670	4,678	21,908	30,256	6,046	6,635	5,583	5,778
1990	654	689	3,715	5,058	26.6	4,375	4,716	21,433	30,525	6,690	6,845	5,769	6,035
1991	592	534	3,314	4,440	25.4	3,799	3,654	18,792	26,244	6,417	6,842	5,671	5,911
1992	493	423	2,513	3,429	26.7	3,190	2,712	13,761	19,663	6,470	6,412	5,476	5,734
1993	502	548	2,469	3,519	29.8	3,179	3,226	14,169	20,574	6,332	5,887	5,739	5,847
1994	570	726	2,405	3,701	35.0	3,595	4,601	14,204	22,401	6,308	6,338	5,906	6,053
1995	542	570	2,198	3,310	33.6	3,505	3,604	13,117	20,225	6,466	6,322	5,968	6,110
1996	483	570	2,136	3,189	33.0	3,514	3,819	13,379	20,712	7,276	6,700	6,264	6,495
1997	428	536	2,110	3,074	31.4	3,502	4,026	14,139	21,668	8,183	7,511	6,701	7,049
1998	291	504	1,647	2,442	32.6	^R 2,579	^R 3,983	^R 12,035	^R 18,597	^R 8,864	^R 7,902	^R 7,307	^R 7,616
1999 ^E	154	539	1,195	1,888	36.7	^R 1,102	^R 3,481	^R 7,993	^R 12,576	^R 7,018	^R 6,458	^R 6,689	^R 6,650
2000 ^E	264	609	1,288	2,161	40.4	^R 1,986	^R 4,678	^R 9,124	^R 15,788	^R 7,521	^R 7,771	^R 7,084	^R 7,329
2001 ^E	^R 322	^R 988	^R 1,458	^R 2,768	^R 47.3	^R 2,659	^R 7,514	^R 11,153	^R 21,326	^R 8,259	^R 7,605	^R 7,649	^R 7,704
2002 ^E	^R 225	^R 668	^R 1,180	^R 2,073	^R 43.1	^R 1,595	^R 4,878	^R 7,357	^R 13,830	^R 7,089	^R 7,302	^R 6,235	^R 6,671
2003 ^E	212	862	1,519	2,593	41.4	1,616	7,401	9,632	18,649	7,622	8,585	6,341	7,192

¹ See "Footage Drilled" in Glossary.

² See "Crude Oil Well" in Glossary.

³ See "Natural Gas Well" in Glossary.

⁴ See "Dry Hole" in Glossary.

R=Revised. E=Estimate.

Notes: • Data are for exploratory wells only; see Table 4.4 for all wells and Table 4.6 for development wells only. See "Development Well" and "Exploratory Well" in Glossary. • For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute (API) during the reporting year. For 1970 forward, the data represent wells completed in a given year. The as-received well completion data for recent years are incomplete due to delays in the reporting of wells drilled. The Energy Information Administration (EIA) therefore statistically imputes the missing data to provide estimates of total well completions and footage where necessary. See

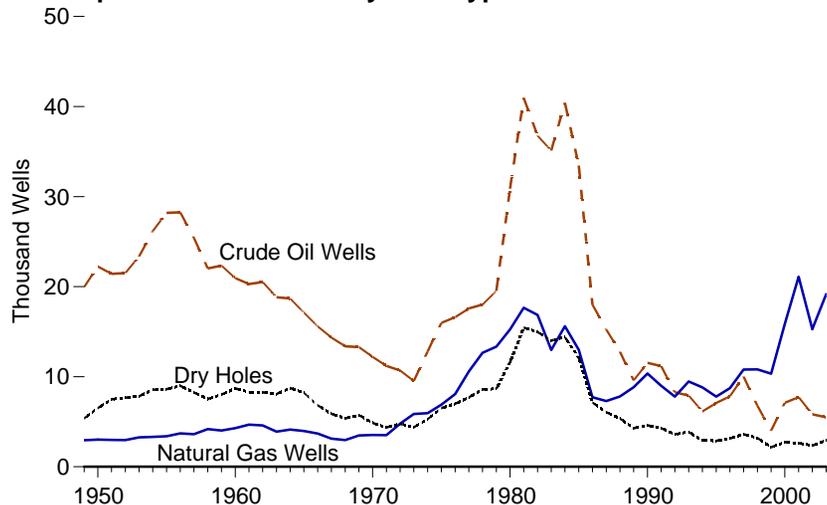
"Completion (Crude Oil/Natural Gas Production)" in Glossary. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

Web Pages: • For data not shown for 1951-1969, see <http://www.eia.doe.gov/emeu/aer/resource.html>. • For related information, see http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html.

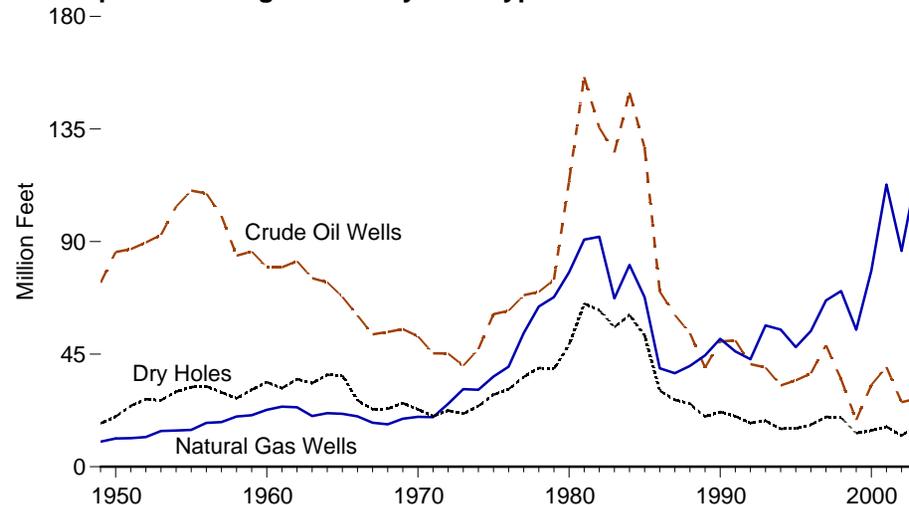
Sources: • 1949-1960—American Association of Petroleum Geologists, *Statistics on Exploratory Drilling in the United States, 1940 through 1960* (1962), pp. 4-19. • 1961-1965—*Bulletin of the American Association of Petroleum Geologists*, "North American Developments" issue. • 1966-1969—API, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970-1994—EIA computations based on well reports submitted to the API. • 1995 forward—EIA computations based on well reports submitted to the Information Handling Services Energy Group, Inc. For current data see the EIA, *Monthly Energy Review*, Section 5.

Figure 4.6 Crude Oil and Natural Gas Development Wells, 1949-2003

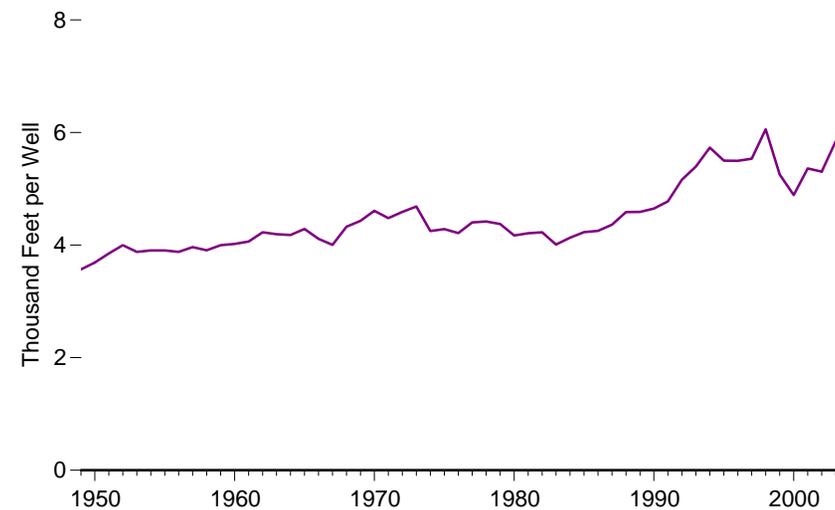
Development Wells Drilled by Well Type



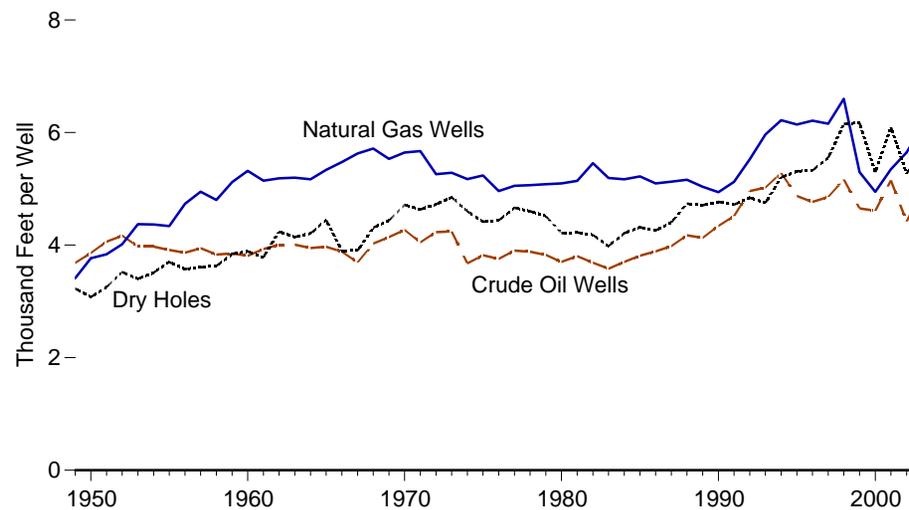
Development Footage Drilled by Well Type



Development Wells Average Depth, All Wells



Development Wells Average Depth by Well Type



Note: These figures depict developed wells only; see Figure 4.4 for all wells and Figure 4.5 for exploratory wells only.

Source: Table 4.6.

Table 4.6 Crude Oil and Natural Gas Development Wells, Selected Years, 1949-2003

Year	Wells Drilled				Successful Wells (percent)	Footage Drilled ¹ (thousand feet)				Average Depth (feet per well)			
	Crude Oil ²	Natural Gas ³	Dry Holes ⁴	Total		Crude Oil ²	Natural Gas ³	Dry Holes ⁴	Total	Crude Oil ²	Natural Gas ³	Dry Holes ⁴	Total
1949	19,946	2,939	5,369	28,254	81.0	73,478	10,028	17,315	100,821	3,684	3,412	3,225	3,568
1950	22,229	3,008	6,507	31,744	79.5	85,833	11,329	20,020	117,183	3,861	3,766	3,077	3,691
1955	28,196	3,392	8,620	40,208	78.6	110,374	14,718	31,883	156,976	3,915	4,339	3,699	3,904
1960	20,937	4,281	8,697	33,915	74.4	79,739	22,780	33,826	136,345	3,809	5,321	3,889	4,020
1965	17,119	3,967	8,221	29,307	71.9	67,956	21,174	36,548	125,678	3,970	5,337	4,446	4,288
1970	12,211	3,534	4,869	20,614	76.4	52,130	19,945	22,951	95,026	4,269	5,644	4,714	4,610
1971	11,194	3,501	4,357	19,052	77.1	45,323	19,850	20,186	85,358	4,049	5,670	4,633	4,480
1972	10,693	4,784	4,757	20,234	76.5	45,241	25,159	22,475	92,875	4,231	5,259	4,725	4,590
1973	9,525	5,866	4,368	19,759	77.9	40,408	31,007	21,190	92,605	4,242	5,286	4,851	4,687
1974	12,788	5,948	5,283	24,019	78.0	46,996	30,766	24,296	102,059	3,675	5,173	4,599	4,249
1975	15,966	6,879	6,517	29,362	77.8	61,013	36,032	28,772	125,817	3,821	5,238	4,415	4,285
1976	16,602	8,063	6,986	31,651	77.9	62,365	39,992	31,008	133,365	3,756	4,960	4,439	4,214
1977	17,581	10,574	7,702	35,857	78.5	68,581	53,431	35,905	157,917	3,901	5,053	4,662	4,404
1978	18,010	12,642	8,586	39,238	78.1	69,936	64,043	39,493	173,472	3,883	5,066	4,600	4,421
1979	19,530	13,347	8,662	41,539	79.1	74,747	67,825	39,130	181,702	3,827	5,082	4,517	4,374
1980	30,875	15,252	11,599	57,726	79.9	114,264	77,721	48,849	240,834	3,701	5,096	4,211	4,172
1981	40,962	17,652	15,440	74,054	79.2	155,804	90,775	65,236	311,815	3,804	5,142	4,225	4,211
1982	36,768	16,854	14,972	68,594	78.2	135,532	91,933	62,570	290,035	3,686	5,455	4,179	4,228
1983	35,097	12,971	14,005	62,073	77.4	125,694	67,337	55,788	248,820	3,581	5,191	3,983	4,009
1984	40,407	15,606	14,403	70,416	79.5	149,534	80,689	60,671	290,894	3,701	5,170	4,212	4,131
1985	33,439	12,978	12,132	58,549	79.3	127,519	67,745	52,395	247,659	3,813	5,220	4,319	4,230
1986	18,013	7,723	7,129	32,865	78.3	70,049	39,355	30,370	139,774	3,889	5,096	4,260	4,253
1987	15,239	7,301	6,063	28,603	78.8	60,678	37,424	26,684	124,786	3,982	5,126	4,401	4,363
1988	12,781	7,812	5,348	25,941	79.4	53,366	40,320	25,328	119,014	4,175	5,161	4,736	4,588
1989	9,597	8,834	4,264	22,695	81.2	39,617	44,491	20,075	104,183	4,128	5,036	4,708	4,591
1990	11,544	10,355	4,598	26,497	82.6	50,105	51,153	21,919	123,176	4,340	4,940	4,767	4,649
1991	11,178	8,992	4,282	24,452	82.5	50,484	46,083	20,209	116,777	4,516	5,125	4,720	4,776
1992	8,264	7,786	3,605	19,655	81.7	40,993	43,016	17,452	101,461	4,960	5,525	4,841	5,162
1993	7,905	9,469	3,859	21,233	81.8	39,716	56,494	18,334	114,544	5,024	5,966	4,751	5,395
1994	6,151	8,812	2,902	17,865	83.8	32,495	54,811	15,102	102,408	5,283	6,220	5,204	5,732
1995	7,085	7,784	2,877	17,746	83.8	34,519	47,811	15,276	97,607	4,872	6,142	5,310	5,500
1996	7,831	8,732	3,146	19,709	84.0	37,335	54,243	16,754	108,333	4,768	6,212	5,325	5,497
1997	10,008	10,791	3,592	24,391	85.3	48,596	66,451	19,947	134,993	4,856	6,158	5,553	5,535
1998	6,773	^R 10,804	3,193	^R 20,770	^R 84.6	^R 34,997	^R 70,211	^R 19,648	^R 124,857	5,167	^R 6,599	^R 6,154	^R 6,059
1999 ^E	4,022	10,338	2,169	16,529	86.9	^R 18,691	^R 54,761	^R 13,382	^R 86,834	^R 4,651	^R 5,297	^R 6,170	^R 5,254
2000 ^E	7,094	15,846	2,737	25,677	89.3	^R 32,705	^R 78,413	^R 14,486	^R 125,604	^R 4,610	^R 4,946	^R 5,293	^R 4,890
2001 ^E	^R 7,738	^R 21,095	^R 2,626	^R 31,459	^R 91.7	^R 39,845	^R 112,793	^R 16,003	^R 168,641	^R 5,149	^R 5,347	^R 6,094	^R 5,361
2002 ^E	^R 5,833	^R 15,279	^R 2,351	^R 23,463	^R 90.0	^R 25,780	^R 86,312	^R 12,387	^R 124,480	^R 4,420	^R 5,649	^R 5,269	^R 5,305
2003 ^E	5,482	19,149	2,927	27,558	89.4	27,192	117,142	16,654	160,988	4,960	6,117	5,690	5,842

¹ See "Footage Drilled" in Glossary.

² See "Crude Oil Well" in Glossary.

³ See "Natural Gas Well" in Glossary.

⁴ See "Dry Hole" in Glossary.

R=Revised. E=Estimate.

Notes: • Data are for development wells only; see Table 4.4 for all wells and Table 4.5 for exploratory wells only. See "Development Well" and "Exploratory Well" in Glossary. • Service wells, stratigraphic tests, and core tests are excluded. • For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. The as-received well completion data for recent years are incomplete due to delays in the reporting of wells drilled. The Energy Information Administration (EIA) therefore statistically imputes the missing data to provide estimates of total

well completions and footage where necessary. See "Completion (Crude Oil/Natural Gas Production)" in Glossary. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

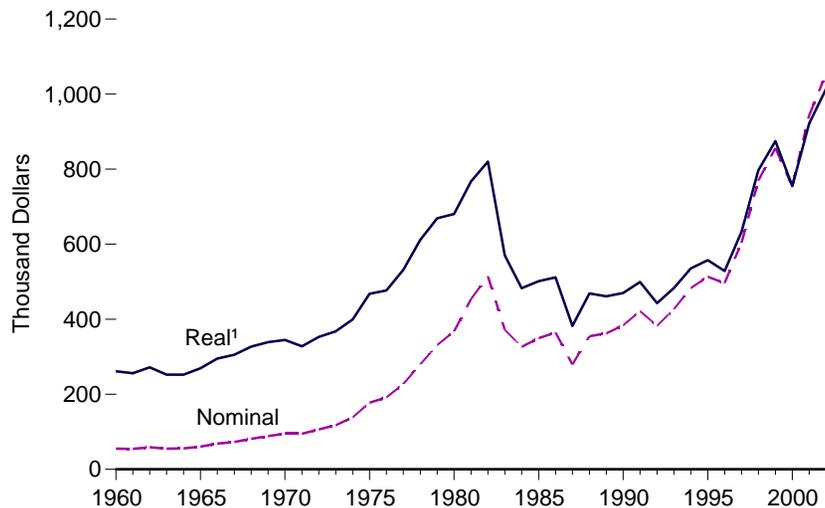
Web Pages: • For data not shown for 1951-1969, see <http://www.eia.doe.gov/emeu/aer/resource.html>.

• For related information, see http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html.

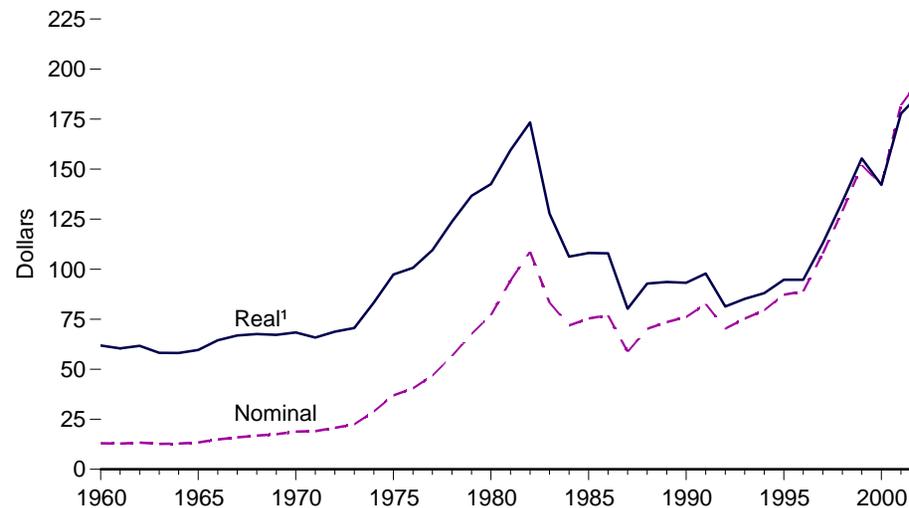
Sources: • 1949-1965—Gulf Publishing Company, *World Oil*, "Forecast-Review" issue. • 1966-1969—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970-1994—EIA computations based on well reports submitted to the American Petroleum Institute. • 1995 forward—EIA computations based on well reports submitted to the Information Handling Services Energy Group, Inc. For current data see the EIA, *Monthly Energy Review*, Section 5.

Figure 4.7 Costs of Crude Oil and Natural Gas Wells Drilled

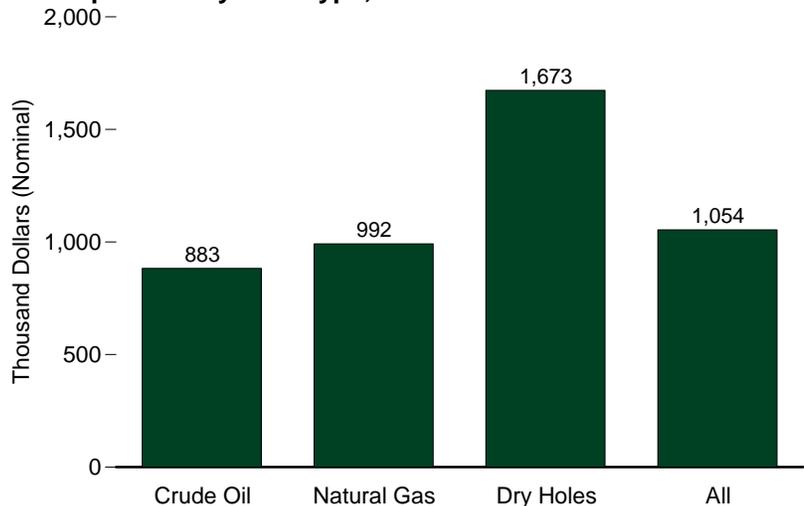
Costs per Well, All Wells, 1960-2002



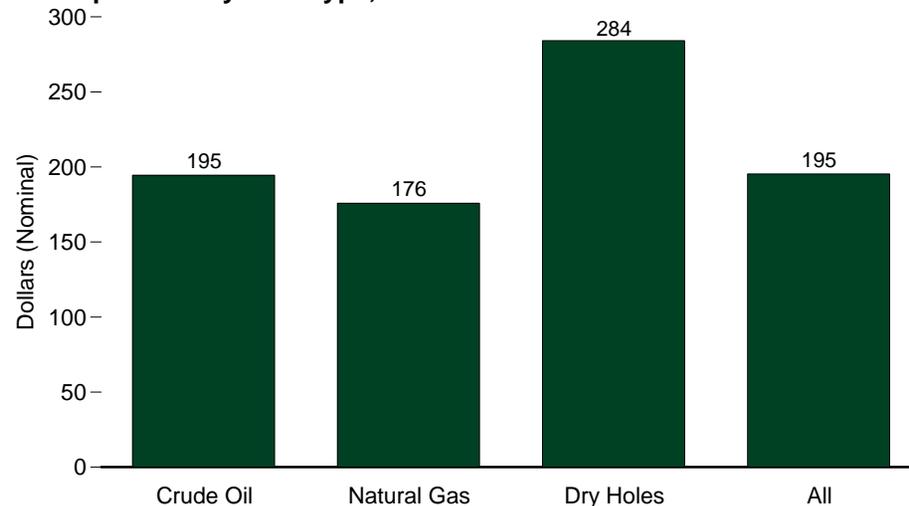
Costs per Foot, All Wells, 1960-2002



Costs per Well by Well Type, 2002



Costs per Foot by Well Type, 2002



¹ In chained (2000) dollars, calculated by using gross domestic product implicit price deflators. See Table D1.

Note: Because vertical scales differ, graphs should not be compared. Source: Table 4.7.

Table 4.7 Costs of Crude Oil and Natural Gas Wells Drilled, 1960-2002

Year	Costs per Well (thousand dollars)					Costs per Foot (dollars)				
	Crude Oil ¹	Natural Gas ²	Dry Holes ³	All		Crude Oil ¹	Natural Gas ²	Dry Holes ³	All	
	Nominal	Nominal	Nominal	Nominal	Real ⁴	Nominal	Nominal	Nominal	Nominal	Real ⁴
1960	52.2	102.7	44.0	54.9	R261.1	13.22	18.57	10.56	13.01	R61.83
1961	51.3	94.7	45.2	54.5	R256.2	13.11	17.65	10.56	12.85	R60.39
1962	54.2	97.1	50.8	58.6	R271.8	13.41	18.10	11.20	13.31	R61.71
1963	51.8	92.4	48.2	55.0	R252.4	13.20	17.19	10.58	12.69	R58.22
1964	50.6	104.8	48.5	55.8	R252.2	13.12	18.57	10.64	12.86	R58.11
1965	56.6	101.9	53.1	60.6	R269.1	13.94	18.35	11.21	13.44	R59.64
1966	62.2	133.8	56.9	68.4	R295.1	15.04	21.75	12.34	14.95	R64.51
1967	66.6	141.0	61.5	72.9	R305.1	16.61	23.05	12.87	15.97	R66.84
1968	79.1	148.5	66.2	81.5	R327.0	18.63	24.05	12.88	16.83	R67.56
1969	86.5	154.3	70.2	88.6	R338.7	19.28	25.58	13.23	17.56	R67.15
1970	86.7	160.7	80.9	94.9	R344.6	19.29	26.75	15.21	18.84	R68.42
1971	78.4	166.6	86.8	94.7	R327.6	18.41	27.70	16.02	19.03	R65.82
1972	93.5	157.8	94.9	106.4	R352.8	20.77	27.78	17.28	20.76	R68.82
1973	103.8	155.3	105.8	117.2	R367.8	22.54	27.46	19.22	22.50	R70.65
1974	110.2	189.2	141.7	138.7	R399.5	27.82	34.11	26.76	28.93	R83.31
1975	138.6	262.0	177.2	177.8	R467.9	34.17	46.23	33.86	36.99	R97.34
1976	151.1	270.4	190.3	191.6	R476.7	37.35	49.78	36.94	40.46	R100.66
1977	170.0	313.5	230.2	227.2	R531.4	41.16	57.57	43.49	46.81	R109.49
1978	208.0	374.2	281.7	280.0	R611.8	49.72	68.37	52.55	56.63	R123.76
1979	243.1	443.1	339.6	331.4	R668.8	58.29	80.66	64.60	67.70	R136.64
1980	272.1	536.4	376.5	367.7	R680.4	66.36	95.16	73.70	77.02	R142.52
1981	336.3	698.6	464.0	453.7	R767.4	80.40	122.17	90.03	94.30	R159.51
1982	347.4	864.3	515.4	514.4	R820.0	86.34	146.20	104.09	108.73	R173.34
1983	283.8	608.1	366.5	371.7	R570.1	72.65	108.37	79.10	83.34	R127.81
1984	262.1	489.8	329.2	326.5	R482.5	66.32	88.80	67.18	71.90	R106.27
1985	270.4	508.7	372.3	349.4	R501.2	66.78	93.09	73.69	75.35	R108.09
1986	284.9	522.9	389.2	364.6	R511.7	68.35	93.02	76.53	76.88	R107.90
1987	246.0	380.4	259.1	279.6	R382.0	58.35	69.55	51.05	58.71	R80.21
1988	279.4	460.3	366.4	354.7	R468.6	62.28	84.65	66.96	70.23	R92.78
1989	282.3	457.8	355.4	362.2	R461.1	64.92	86.86	67.61	73.55	R93.63
1990	321.8	471.3	367.5	383.6	R470.2	69.17	90.73	67.49	76.07	R93.23
1991	346.9	506.6	441.2	421.5	R499.1	73.75	93.10	83.05	82.64	R97.86
1992	362.3	426.1	357.6	382.6	R442.9	69.50	72.83	67.82	70.27	R81.35
1993	356.6	521.2	387.7	426.8	R482.9	67.52	83.15	72.56	75.30	R85.20
1994	409.5	535.1	491.5	483.2	R535.4	70.57	81.90	86.60	79.49	R88.07
1995	415.8	629.7	481.2	513.4	R557.4	78.09	95.97	84.60	87.22	R94.70
1996	341.0	616.0	541.0	496.1	R528.6	70.60	98.67	95.74	88.92	R94.74
1997	445.6	728.6	655.6	603.9	R632.9	90.48	117.55	115.09	107.83	R113.01
1998	566.0	815.6	973.2	769.1	R797.2	108.88	127.94	157.79	128.97	R133.69
1999	783.0	798.4	1,115.5	856.1	R874.8	156.45	138.42	182.99	152.02	R155.33
2000	593.4	756.9	1,075.4	754.6	R754.6	125.96	138.39	181.83	142.16	R142.16
2001	729.1	896.5	1,620.4	943.2	R921.3	153.72	172.05	271.63	181.94	R177.72
2002	882.8	991.9	1,673.4	1,054.2	1,014.2	194.55	175.78	284.17	195.31	187.90

¹ See "Crude Oil Well" in Glossary.

² See "Natural Gas Well" in Glossary.

³ See "Dry Hole" in Glossary.

⁴ In chained (2000) dollars, calculated by using gross domestic product implicit price deflators. See Table D1.

R=Revised.

Notes: • The information reported for 1965 and prior years is not strictly comparable to that in more

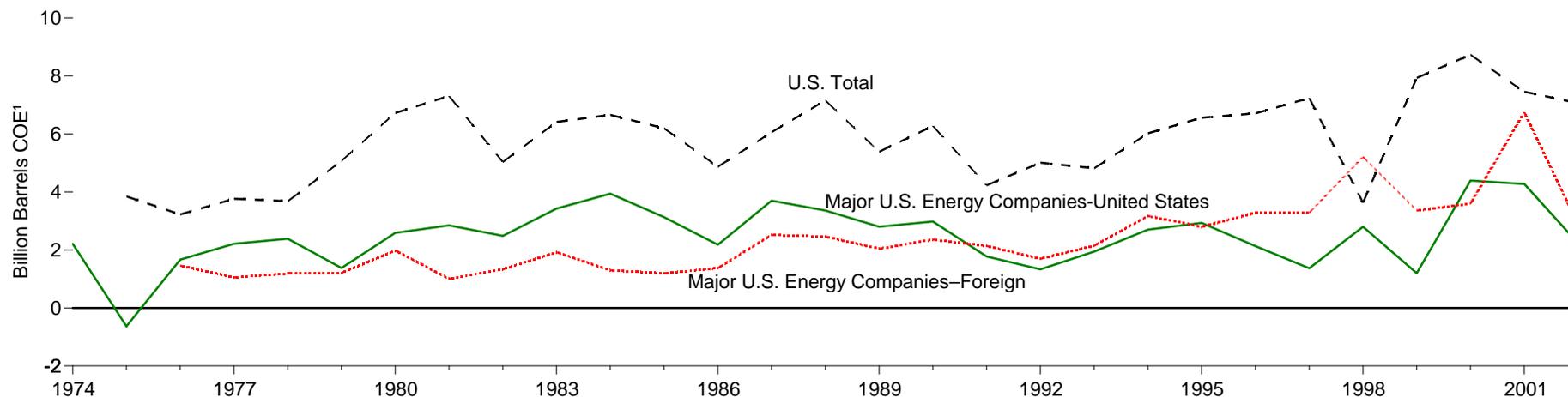
recent surveys. • Average cost is the arithmetic mean and includes all costs for drilling and equipping wells and for surface-producing facilities. Wells drilled include exploratory and development wells; excludes service wells, stratigraphic tests, and core tests. See "Development Well" and "Exploratory Well" in Glossary.

Web Page: For related information, see <http://api-ec.api.org/newsplashpage/index.cfm>.

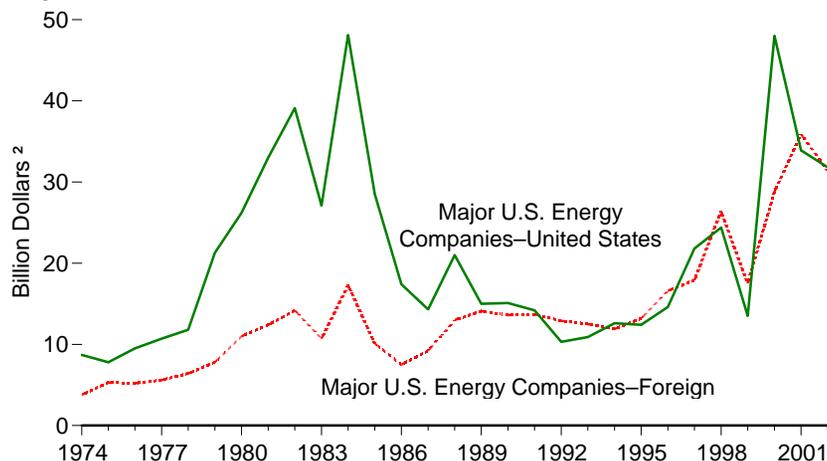
Source: American Petroleum Institute, 2002 Joint Association Survey on Drilling Costs.

Figure 4.8 Crude Oil, Natural Gas, and Natural Gas Liquids Gross Additions to Proved Reserves, and Exploration and Development Expenditures

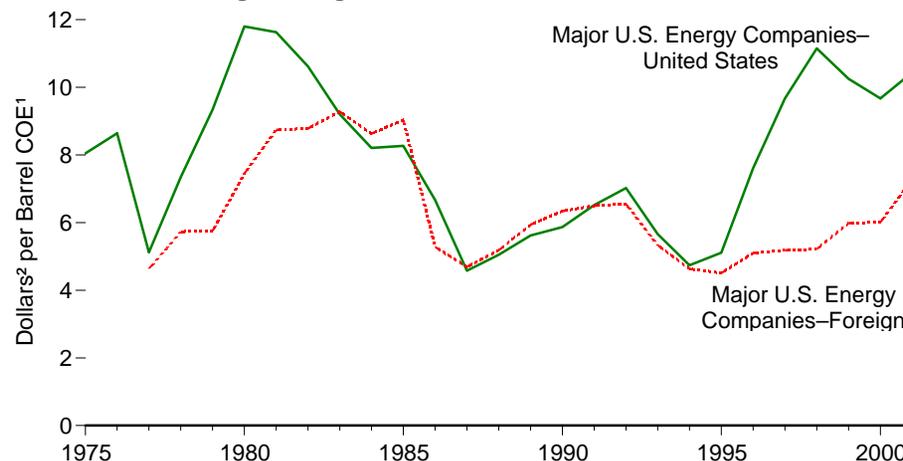
Gross Additions to Proved Reserves of Crude Oil, Natural Gas, and Natural Gas Liquids, 1974-2002



Crude Oil and Natural Gas Exploration and Development Expenditures, 1974-2002



Expenditures per Barrel of Reserve Additions, 1975-2001 Three-Year Moving Average



¹ Crude oil equivalent.

² Nominal dollars.

Note: "Major U.S. Energy Companies" are the top publicly-owned crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12.

Source: Table 4.8.

Table 4.8 Crude Oil, Natural Gas, and Natural Gas Liquids Gross Additions to Proved Reserves, and Exploration and Development Expenditures, 1974-2002

Year	Gross Additions to Proved Reserves ¹ of Crude Oil, Natural Gas, and Natural Gas Liquids (million barrels COE ²)			Crude Oil and Natural Gas Exploration and Development Expenditures (billion dollars ³)		Expenditures per Barrel of Reserve Additions, Three-Year Moving Average (dollars ³ per barrel COE ²)	
	U.S. Total	Major U.S. Energy Companies ⁴		Major U.S. Energy Companies ⁴		Major U.S. Energy Companies ⁴	
		United States	Foreign	United States	Foreign	United States	Foreign
1974	NA	2,205	NA	8.7	3.8	NA	NA
1975	3,846	-634	NA	7.8	5.3	8.05	NA
1976	3,224	1,663	1,459	9.5	5.2	8.64	NA
1977	3,765	2,210	1,055	10.7	5.6	5.12	4.64
1978	3,679	2,383	1,191	11.8	6.4	7.34	5.73
1979	5,071	1,378	⁵ 1,208	21.3	7.8	9.34	⁵ 5.75
1980	6,723	2,590	1,977	26.2	11.0	11.80	7.45
1981	7,304	2,848	1,006	33.0	12.4	11.63	8.74
1982	5,030	2,482	1,332	39.1	14.2	⁶ 10.62	⁶ 8.78
1983	6,412	3,427	1,918	27.1	10.7	9.20	9.28
1984	6,653	3,941	1,298	48.1	17.3	⁸ 8.21	⁶ 8.63
1985	6,190	⁷ 3,129	1,192	28.5	10.1	⁷ 8.27	9.03
1986	4,866	2,178	⁵ 1,375	17.4	7.5	6.67	⁵ 5.28
1987	6,059	⁷ 3,698	2,516	14.3	9.2	⁷ 4.58	4.69
1988	7,156	3,359	2,460	21.0	13.0	5.05	5.18
1989	5,385	2,798	2,043	15.0	14.1	5.62	5.94
1990	6,275	2,979	2,355	15.1	13.6	5.87	6.34
1991	4,227	1,772	2,135	14.2	13.7	6.52	6.50
1992	5,006	1,332	1,694	10.3	12.9	7.02	6.55
1993	4,814	1,945	2,147	10.9	12.5	5.66	5.33
1994	6,021	2,703	3,173	12.6	11.9	4.74	4.63
1995	6,558	2,929	2,799	12.4	13.2	5.11	4.51
1996	6,707	2,131	3,280	14.6	16.6	7.61	5.10
1997	7,233	1,367	3,279	21.8	17.9	9.67	5.18
1998	3,628	2,798	5,206	24.4	26.4	11.15	5.22
1999	7,929	1,197	3,360	13.5	17.5	10.25	5.98
2000	8,725	4,392	3,593	48.0	28.8	9.67	6.01
2001	7,449	4,271	6,744	33.9	35.9	^R 10.44	^R 7.28
2002	7,056	2,232	2,873	31.8	31.4	NA	NA

¹ Gross additions to proved reserves equal annual change in proved reserves plus annual production. See "Proved Reserves, Crude Oil," "Proved Reserves, Natural Gas," and "Proved Reserves, Natural Gas Liquids" in Glossary.

² Crude oil equivalent: converted to Btu on the basis of annual average conversion factors. See Appendix A.

³ Nominal dollars.

⁴ "Major U.S. Energy Companies" are the top publicly-owned, U.S.-based crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS) (see Table 3.12).

⁵ Data for 1979 exclude downward revisions of 1,225 million barrels COE due to Iranian policies. Data for 1986 exclude downward revisions due to Libyan sanctions.

⁶ Data for 1982 and 1984 are adjusted to exclude purchases of proved reserves associated with mergers among the Financial Reporting System companies.

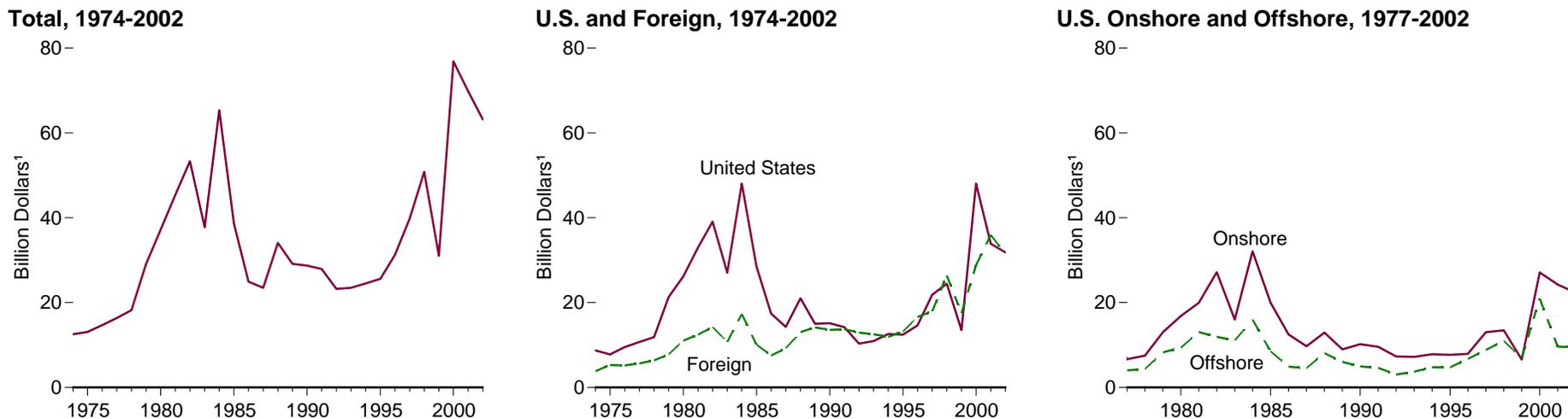
⁷ Data for 1985 and 1987 exclude downward revisions of 1,477 million barrels COE and 2,396 million barrels COE, respectively, of Alaska North Slope natural gas reserves.

R=Revised. NA=Not available.

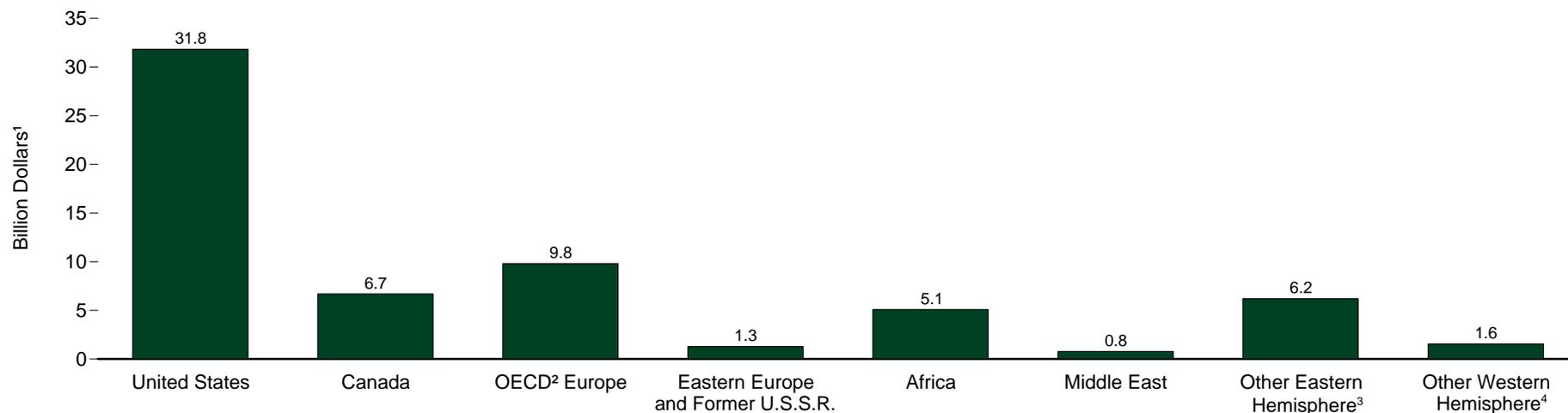
Web Page: For related information, see <http://www.eia.doe.gov/emeu/finance>.

Sources: **Major U.S. Energy Companies:** • 1974-1976—Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System" database, November 1997. • 1977 forward—EIA, *Performance Profiles of Major Energy Producers*, annual reports. **U.S. Total, Gross Additions to Proved Reserves:** • 1975-1979—American Gas Association, American Petroleum Institute, and Canadian Petroleum Association (published jointly), *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada as of December 31, 1979*, Volume 34 (June 1980). • 1980 forward—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, annual reports.

Figure 4.9 Major U.S. Energy Companies' Expenditures for Crude Oil and Natural Gas Exploration and Development by Region



By Region, 2002



¹ Nominal dollars.

² Organization for Economic Cooperation and Development. See Glossary.

³ This region includes areas that are eastward of the Greenwich prime meridian to 180° longitude and that are not included in other domestic or foreign classifications.

⁴ This region includes areas that are westward of the Greenwich prime meridian to 180° longitude and that are not included in other domestic or foreign classifications.

Notes: • "Major U.S. Energy Companies" are the top publicly-owned, U.S.-based crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12. • Because vertical scales differ, graphs should not be compared.

Source: Table 4.9.

Table 4.9 Major U.S. Energy Companies' Expenditures for Crude Oil and Natural Gas Exploration and Development by Region, 1974-2002 (Billion Dollars ¹)

Year	United States			Foreign								Total
	Onshore	Offshore	Total	Canada	OECD Europe ²	Eastern Europe and Former U.S.S.R.	Africa	Middle East	Other Eastern Hemisphere ³	Other Western Hemisphere ⁴	Total	
1974	NA	NA	8.7	NA	NA	—	NA	NA	NA	NA	3.8	12.5
1975	NA	NA	7.8	NA	NA	—	NA	NA	NA	NA	5.3	13.1
1976	NA	NA	9.5	NA	NA	—	NA	NA	NA	NA	5.2	14.7
1977	6.7	4.0	10.7	1.5	2.5	—	0.7	0.2	0.3	0.4	5.6	16.3
1978	7.5	4.3	11.8	1.6	2.6	—	0.8	0.3	0.4	0.6	6.4	18.2
1979	13.0	8.3	21.3	2.3	3.0	—	0.8	0.2	0.5	0.8	7.8	29.1
1980	16.8	9.4	26.2	3.1	4.3	—	1.4	0.2	0.8	1.0	11.0	37.2
1981	19.9	13.0	33.0	1.8	5.0	—	2.1	0.3	1.9	1.3	12.4	45.4
1982	27.2	11.9	39.1	1.9	6.3	—	2.1	0.4	2.4	1.1	14.2	53.3
1983	16.0	11.1	27.1	1.6	4.3	—	1.7	0.5	2.0	0.6	10.7	37.7
1984	32.1	16.0	48.1	5.4	5.5	—	3.4	0.5	2.0	0.5	17.3	65.3
1985	20.0	8.5	28.5	1.9	3.7	—	1.6	0.9	1.3	0.7	10.1	38.6
1986	12.5	4.9	17.4	1.1	3.2	—	1.1	0.3	1.2	0.6	7.5	24.9
1987	9.7	4.5	14.3	1.9	3.0	—	0.8	0.4	2.8	0.5	9.2	23.5
1988	12.9	8.1	21.0	5.4	4.3	—	0.8	0.4	1.4	0.7	13.0	34.1
1989	9.0	6.0	15.0	6.3	3.5	—	1.0	0.4	2.3	0.6	14.1	29.1
1990	10.2	4.9	15.1	1.8	6.6	—	1.4	0.6	2.4	0.7	13.6	28.7
1991	9.6	4.6	14.2	1.7	6.8	—	1.5	0.5	2.4	0.7	13.7	27.9
1992	7.3	3.0	10.3	1.1	6.8	—	1.4	0.6	2.4	0.6	12.9	23.2
1993	7.2	3.7	10.9	1.6	5.5	0.3	1.5	0.7	2.5	0.6	12.5	23.5
1994	7.8	4.8	12.6	1.8	4.4	0.3	1.4	0.4	2.8	0.7	11.9	24.5
1995	7.7	4.7	12.4	1.9	5.2	0.4	2.0	0.4	2.4	0.9	13.2	25.6
1996	7.9	6.7	14.6	1.6	5.6	0.5	2.8	0.5	4.1	1.6	16.6	31.3
1997	13.0	8.8	21.8	2.0	7.1	0.6	3.0	0.6	3.0	1.6	17.9	39.8
1998	13.5	11.0	24.4	4.8	8.6	1.3	3.1	0.9	3.9	3.7	26.4	50.8
1999	6.6	6.9	13.5	2.1	4.1	0.6	3.1	0.4	3.4	3.8	17.5	31.0
2000	27.1	21.0	48.0	4.9	7.5	0.9	2.7	0.6	6.8	5.4	28.8	76.8
2001	24.2	9.6	33.9	15.3	5.4	0.9	5.5	0.7	5.0	3.1	35.9	69.8
2002	22.3	9.5	31.8	6.7	9.8	1.3	5.1	0.8	6.2	1.6	31.4	63.2

¹ Nominal dollars.

² The European members of the Organization for Economic Cooperation and Development (OECD) are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, and the United Kingdom, and, for 1997 forward, Czech Republic, Hungary, and Poland.

³ This region includes areas that are eastward of the Greenwich prime meridian to 180° longitude and that are not included in other domestic or foreign classifications.

⁴ This region includes areas that are westward of the Greenwich prime meridian to 180° longitude and that are not included in other domestic or foreign classifications.

NA=Not available. — = Not applicable.

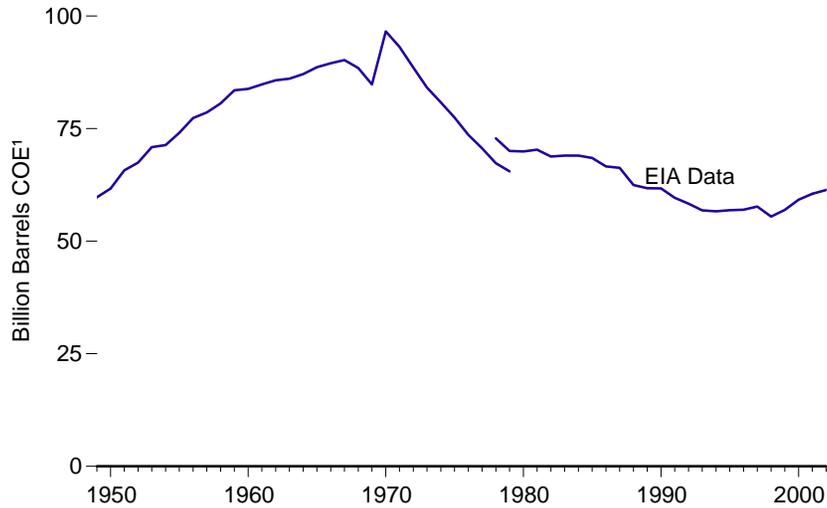
Notes: • "Major U.S. Energy Companies" are the top publicly-owned, U.S.-based crude oil and natural gas producers and petroleum refiners that form the Financial Reporting System (FRS). See Table 3.12.
• Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.doe.gov/emeu/finance>.

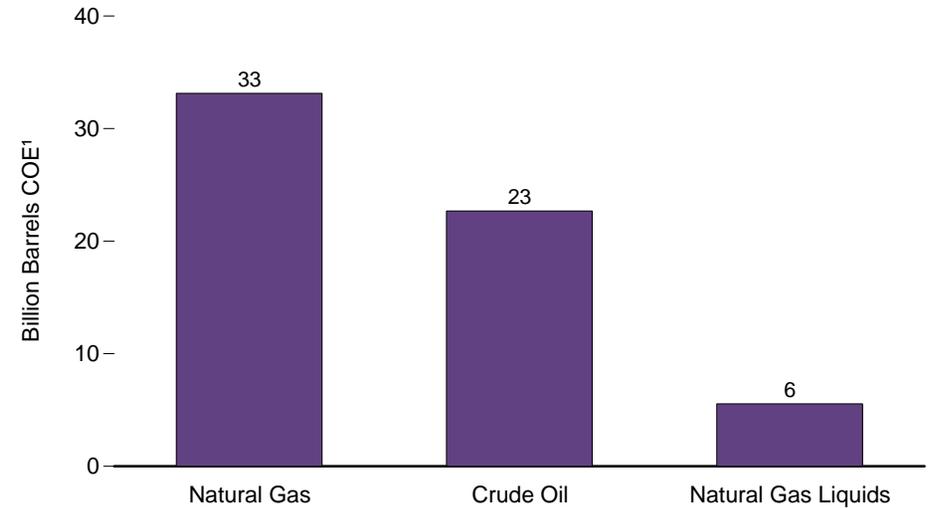
Sources: • 1974-1976—Energy Information Administration (EIA), Office of Energy Markets and End Use, Financial Reporting System Database, November 1997. • 1977 forward—EIA, *Performance Profiles of Major Energy Producers*, annual reports.

Figure 4.10 Crude Oil, Natural Gas, and Natural Gas Liquids Proved Reserves

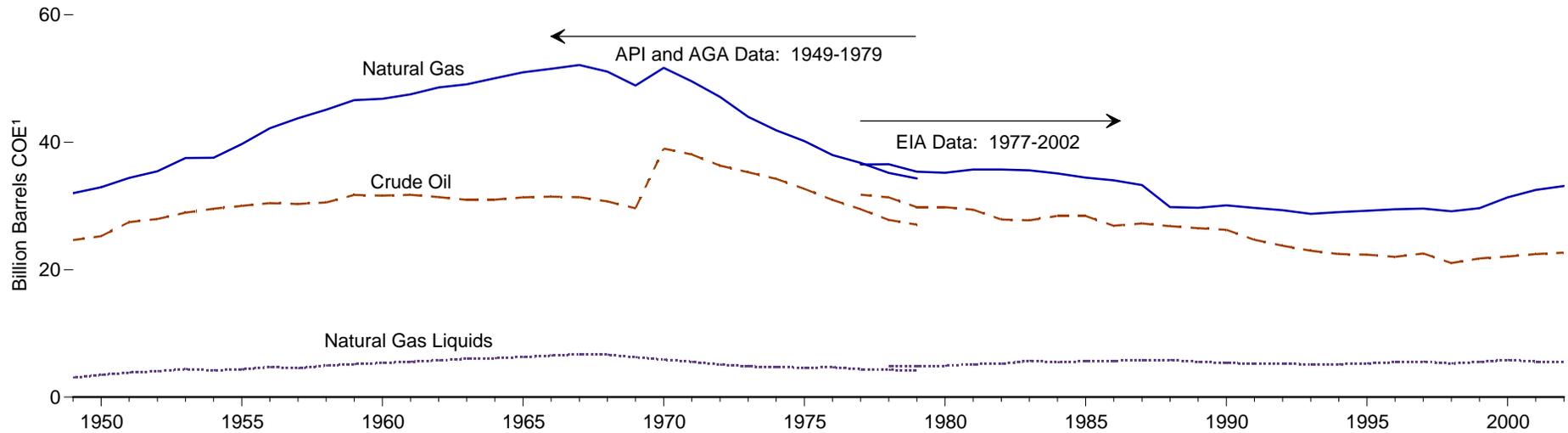
Total, 1949-2002



By Type, 2002



By Type, 1949-2002



¹ COE=crude oil equivalent.

• Because vertical scales differ, graphs should not be compared.

Notes: • Data are at end of year. • API=American Petroleum Institute. AGA=American Gas Association. EIA=Energy Information Administration.

Source: Table 4.10.

Table 4.10 Crude Oil, Natural Gas, and Natural Gas Liquids Proved Reserves, Selected Years, 1949-2002

Year	Crude Oil	Natural Gas (Dry)		Natural Gas Liquids		Total
	Billion Barrels	Trillion Cubic Feet ¹	Billion Barrels COE ²	Billion Barrels	Billion Barrels COE ²	Billion Barrels COE ²
American Petroleum Institute and American Gas Association Data						
1949	24.6	179.4	32.0	3.7	3.1	59.7
1950	25.3	184.6	32.9	4.3	3.5	61.7
1955	30.0	222.5	39.7	5.4	4.4	74.1
1960	31.6	262.3	46.8	6.8	5.4	83.8
1965	31.4	286.5	51.0	8.0	6.3	88.6
1970	39.0	290.7	51.7	7.7	5.9	96.6
1971	38.1	278.8	49.6	7.3	5.5	93.2
1972	36.3	266.1	47.1	6.8	5.1	88.5
1973	35.3	250.0	44.0	6.5	4.8	84.1
1974	34.2	237.1	41.9	6.4	4.7	80.8
1975	32.7	228.2	40.2	6.3	4.6	77.5
1976	30.9	216.0	38.0	6.4	4.7	73.6
1977	29.5	208.9	36.8	6.0	4.4	70.6
1978	27.8	200.3	35.2	5.9	4.3	67.3
1979	27.1	194.9	34.3	5.7	4.1	65.5
Energy Information Administration Data						
1977	31.8	207.4	36.5	NA	NA	NA
1978	31.4	208.0	36.5	6.8	4.9	72.8
1979	29.8	201.0	35.4	6.6	4.8	70.0
1980	29.8	199.0	35.2	6.7	4.9	69.9
1981	29.4	201.7	35.7	7.1	5.2	70.3
1982	27.9	201.5	35.7	7.2	5.2	68.8
1983	27.7	200.2	35.6	7.9	5.7	69.0
1984	28.4	197.5	35.1	7.6	5.5	69.0
1985	28.4	193.4	34.4	7.9	5.6	68.5
1986	26.9	191.6	34.0	8.2	5.7	66.6
1987	27.3	187.2	33.3	8.1	5.8	66.3
1988	26.8	168.0	29.8	8.2	5.8	62.5
1989	26.5	167.1	29.7	7.8	5.5	61.7
1990	26.3	169.3	30.1	7.6	5.4	61.7
1991	24.7	167.1	29.7	7.5	5.3	59.6
1992	23.7	165.0	29.3	7.5	5.2	58.3
1993	23.0	162.4	28.8	7.2	5.1	56.8
1994	22.5	163.8	29.0	7.2	5.1	56.6
1995	22.4	165.1	29.2	7.4	5.3	56.9
1996	22.0	166.5	29.5	7.8	5.5	57.0
1997	22.5	167.2	29.6	8.0	5.6	57.7
1998	21.0	164.0	29.2	7.5	5.3	55.5
1999	21.8	167.4	29.6	7.9	5.5	56.9
2000	22.0	177.4	31.4	8.3	5.8	59.2
2001	22.4	183.5	32.5	8.0	5.6	60.5
2002	22.7	186.9	33.1	8.0	5.6	61.4

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

² Crude oil equivalent. Natural gas and natural gas liquids are converted to Btu on the basis of annual average conversion factors. See Appendix A.

NA=Not available.

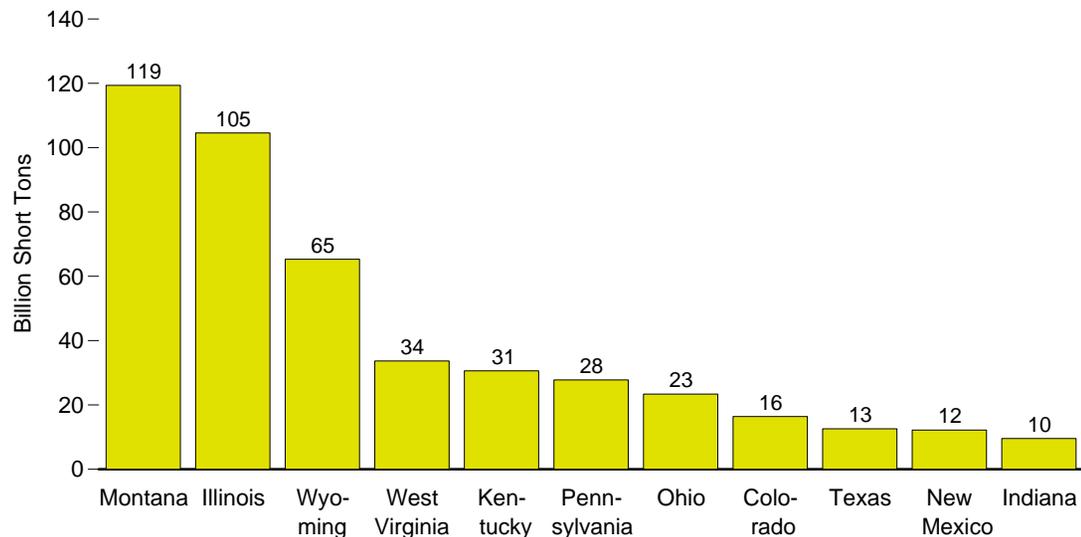
Notes: • Data are at end of year. • See "Proved Reserves, Crude Oil," "Proved Reserves, Natural Gas," and "Proved Reserves, Natural Gas Liquids" in Glossary.

Web Pages: • For data not shown for 1951-1969, see <http://www.eia.doe.gov/emeu/aer/resource.html>. • For related information, see http://www.eia.doe.gov/oil_gas/petroleum/info_glance/petroleum.html

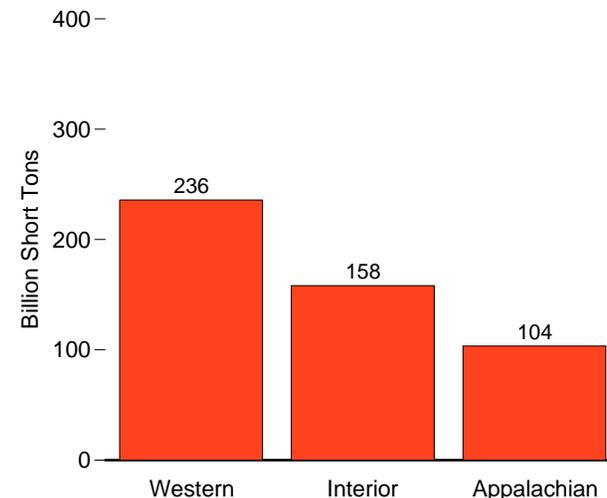
Sources: **American Petroleum Institute and American Gas Association Data:** American Petroleum Institute, American Gas Association, and Canadian Petroleum Association (published jointly), *Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the United States and Canada as of December 31, 1979*, Volume 34 (June 1980). **Energy Information Administration Data:** • 1977-1989—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, annual reports. • 1990 forward—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 2002 Annual Report* (December 2003), Table 1.

Figure 4.11 Coal Demonstrated Reserve Base, January 1, 2003

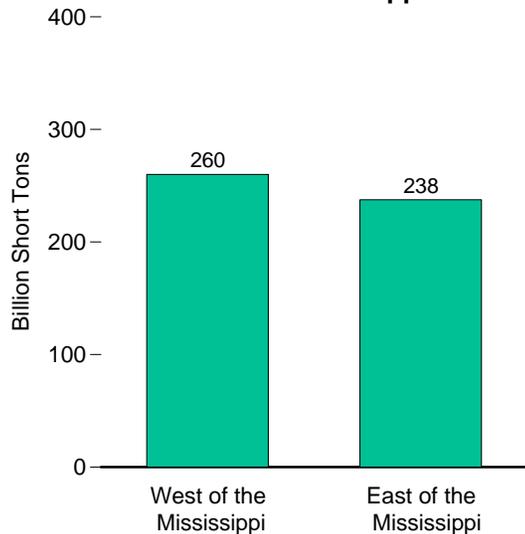
By Key State



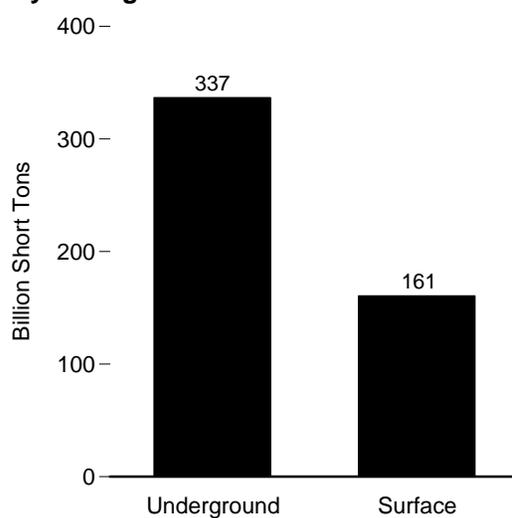
By Region



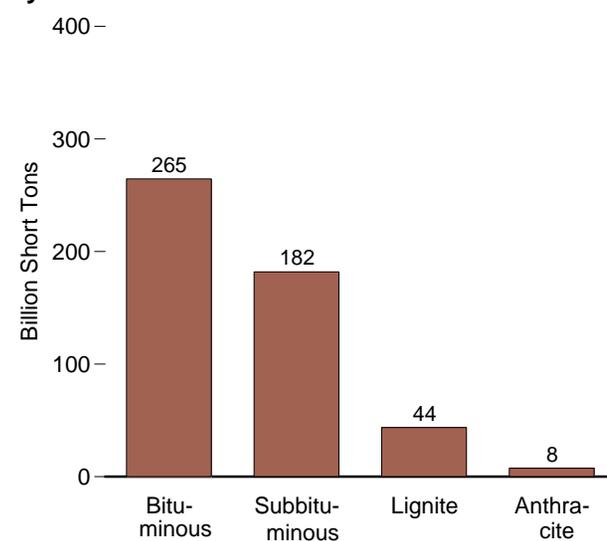
West and East of the Mississippi



By Mining Method



By Rank



Note: Because vertical scales differ, graphs should not be compared.

Source: Table 4.11.

Table 4.11 Coal Demonstrated Reserve Base, January 1, 2003
(Billion Short Tons)

Region and State	Anthracite	Bituminous Coal		Subbituminous Coal		Lignite	Total		
		Underground	Surface	Underground	Surface	Surface ¹	Underground	Surface	Total
Appalachian	7.3	71.9	23.3	0.0	0.0	1.1	75.9	27.7	103.6
Alabama	0.0	1.1	2.1	0.0	0.0	1.1	1.1	3.2	4.3
Kentucky, Eastern	0.0	1.5	9.5	0.0	0.0	0.0	1.5	9.5	11.0
Ohio	0.0	17.6	5.8	0.0	0.0	0.0	17.6	5.8	23.4
Pennsylvania	7.2	19.7	0.9	0.0	0.0	0.0	23.5	4.3	27.8
Virginia	0.1	1.1	0.6	0.0	0.0	0.0	1.2	0.6	1.8
West Virginia	0.0	29.7	4.0	0.0	0.0	0.0	29.7	4.0	33.7
Other ²	0.0	1.1	0.3	0.0	0.0	0.0	1.1	0.3	1.5
Interior	0.1	117.6	27.4	0.0	0.0	13.0	117.7	40.5	158.2
Illinois	0.0	88.1	16.6	0.0	0.0	0.0	88.1	16.6	104.6
Indiana	0.0	8.8	0.8	0.0	0.0	0.0	8.8	0.8	9.6
Iowa	0.0	1.7	0.5	0.0	0.0	0.0	1.7	0.5	2.2
Kentucky, Western	0.0	16.0	3.6	0.0	0.0	0.0	16.0	3.6	19.6
Missouri	0.0	1.5	4.5	0.0	0.0	0.0	1.5	4.5	6.0
Oklahoma	0.0	1.2	0.3	0.0	0.0	0.0	1.2	0.3	1.6
Texas	0.0	0.0	0.0	0.0	0.0	12.6	0.0	12.6	12.6
Other ³	0.1	0.3	1.1	0.0	0.0	0.5	0.4	1.6	2.0
Western	(s)	22.0	2.4	121.3	60.7	29.5	143.4	92.6	235.9
Alaska	0.0	0.6	0.1	4.8	0.6	(s)	5.4	0.7	6.1
Colorado	(s)	7.9	0.6	3.8	0.0	4.2	11.7	4.8	16.4
Montana	0.0	1.4	0.0	69.6	32.7	15.8	71.0	48.4	119.4
New Mexico	(s)	2.7	0.9	3.5	5.1	0.0	6.2	6.1	12.2
North Dakota	0.0	0.0	0.0	0.0	0.0	9.2	0.0	9.2	9.2
Utah	0.0	5.3	0.3	0.0	0.0	0.0	5.3	0.3	5.5
Washington	0.0	0.3	0.0	1.0	(s)	(s)	1.3	0.0	1.4
Wyoming	0.0	3.8	0.5	38.7	22.3	0.0	42.5	22.8	65.3
Other ⁴	0.0	0.0	0.0	(s)	(s)	0.4	0.0	0.4	0.4
U.S. Total	7.5	211.5	53.1	121.3	60.7	43.6	336.9	160.8	497.7
States East of the Mississippi River	7.3	184.9	44.3	0.0	0.0	1.1	188.8	48.8	237.6
States West of the Mississippi River	0.1	26.6	8.7	121.3	60.7	42.5	148.1	112.0	260.1

¹ Lignite resources are not mined underground in the United States.

² Georgia, Maryland, North Carolina, and Tennessee.

³ Arkansas, Kansas, Louisiana, and Michigan.

⁴ Arizona, Idaho, Oregon, and South Dakota.

(s)=Less than 0.05 billion short tons.

Notes: • See *U.S. Coal Reserves: 1997 Update* on the Web Page for a description of the methodology used to produce these data. • Data represent known measured and indicated coal resources meeting

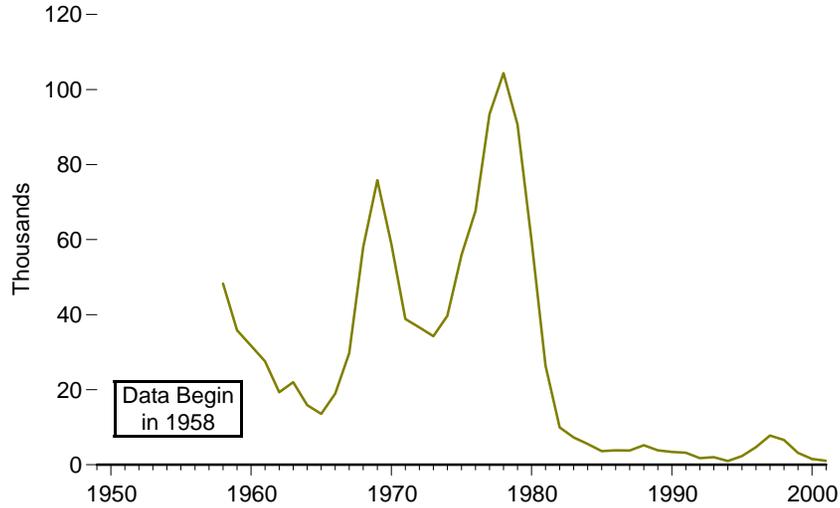
minimum seam and depth criteria, in the ground as of January 1, 2003. These coal resources are not totally recoverable. Net recoverability with current mining technologies ranges from 0 percent (in far northern Alaska) to more than 90 percent. Fifty-four percent of the demonstrated reserve base of coal in the United States is estimated to be recoverable. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.doe.gov/fuelcoal.html>.

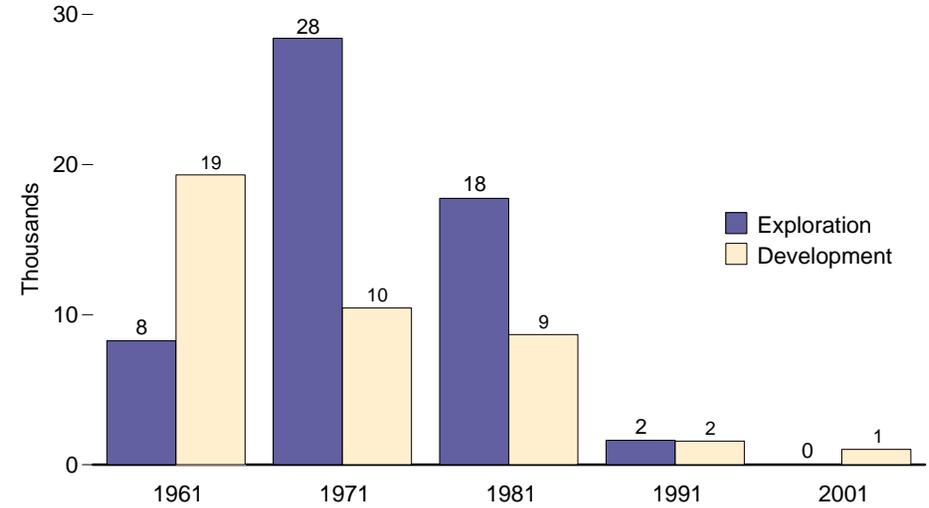
Source: Energy Information Administration, Coal Reserves Database.

Figure 4.12 Uranium Exploration and Development Drilling

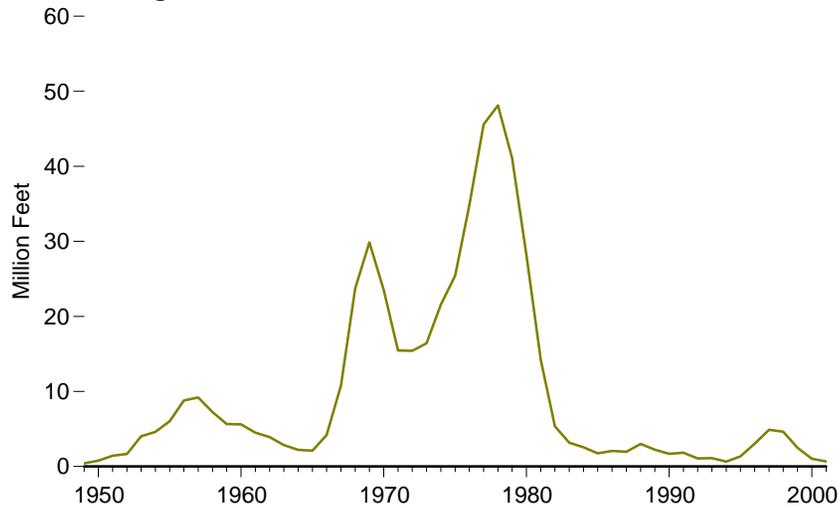
Total Holes Drilled, 1958-2001



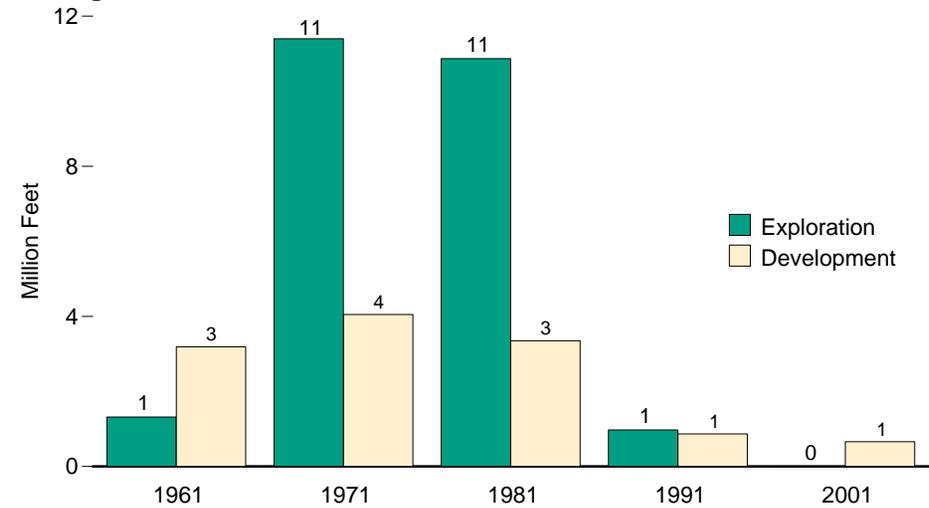
Holes Drilled, Selected Years



Total Footage Drilled, 1949-2001



Footage Drilled, Selected Years



Source: Table 4.12.

Table 4.12 Uranium Exploration and Development Drilling, Selected Years, 1949-2003

Year	Exploration ¹		Development ²		Total	
	Holes Drilled (thousands)	Footage Drilled (million feet)	Holes Drilled (thousands)	Footage Drilled (million feet)	Holes Drilled (thousands)	Footage Drilled (million feet)
1949	NA	0.36	NA	0.05	NA	0.41
1950	NA	0.57	NA	0.21	NA	0.78
1955	NA	5.27	NA	0.76	NA	6.03
1960	7.34	1.40	24.40	4.21	31.73	5.61
1965	6.23	1.16	7.33	0.95	13.56	2.11
1970	43.98	17.98	14.87	5.55	58.85	23.53
1971	28.42	11.40	10.44	4.05	38.86	15.45
1972	26.91	11.82	9.71	3.61	36.62	15.42
1973	22.56	10.83	11.70	5.59	34.26	16.42
1974	27.40	14.72	12.30	6.84	39.70	21.56
1975	34.29	15.69	21.60	9.73	55.89	25.42
1976	40.41	20.36	27.23	14.44	67.64	34.80
1977	62.60	27.96	30.86	17.62	93.45	45.58
1978	75.07	28.95	29.29	19.15	104.35	48.10
1979	60.46	28.07	30.19	13.01	90.65	41.08
1980	39.61	19.60	20.19	8.59	59.80	28.19
1981	17.75	10.87	8.67	3.35	26.42	14.22
1982	6.97	4.23	3.00	1.13	9.97	5.36
1983	4.29	2.09	3.01	1.08	7.30	3.17
1984	4.80	2.26	0.72	0.29	5.52	2.55
1985	2.88	1.42	0.77	0.34	3.65	1.76
1986	1.99	1.10	1.85	0.97	3.83	2.07
1987	1.82	1.11	1.99	0.86	3.81	1.97
1988	2.03	1.28	3.18	1.73	5.21	3.01
1989	2.09	1.43	1.75	0.80	3.84	2.23
1990	1.51	0.87	1.91	0.81	3.42	1.68
1991	1.62	0.97	1.57	0.87	3.20	1.84
1992	0.94	0.56	0.83	0.50	1.77	1.06
1993	0.36	0.22	1.67	0.89	2.02	1.11
1994	0.52	0.34	0.48	0.32	1.00	0.66
1995	0.58	0.40	1.73	0.95	2.31	1.35
1996	1.12	0.88	3.58	2.16	4.70	3.05
1997	1.94	1.33	5.86	3.56	7.79	4.88
1998	1.37	0.89	5.23	3.75	6.60	4.64
1999	0.27	0.18	2.91	2.33	3.18	2.50
2000	W	W	W	W	1.55	1.02
2001	0.00	0.00	1.02	0.66	1.02	0.66
2002	W	W	W	W	W	W
2003	NA	NA	NA	NA	W	W

¹ Includes surface drilling in search of new ore deposits or extensions of known deposits and drilling at the location of a discovery up to the time the company decides sufficient ore reserves are present to justify commercial exploitation.

² Includes all surface drilling on an ore deposit to determine more precisely size, grade, and configuration subsequent to the time that commercial exploitation is deemed feasible.

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

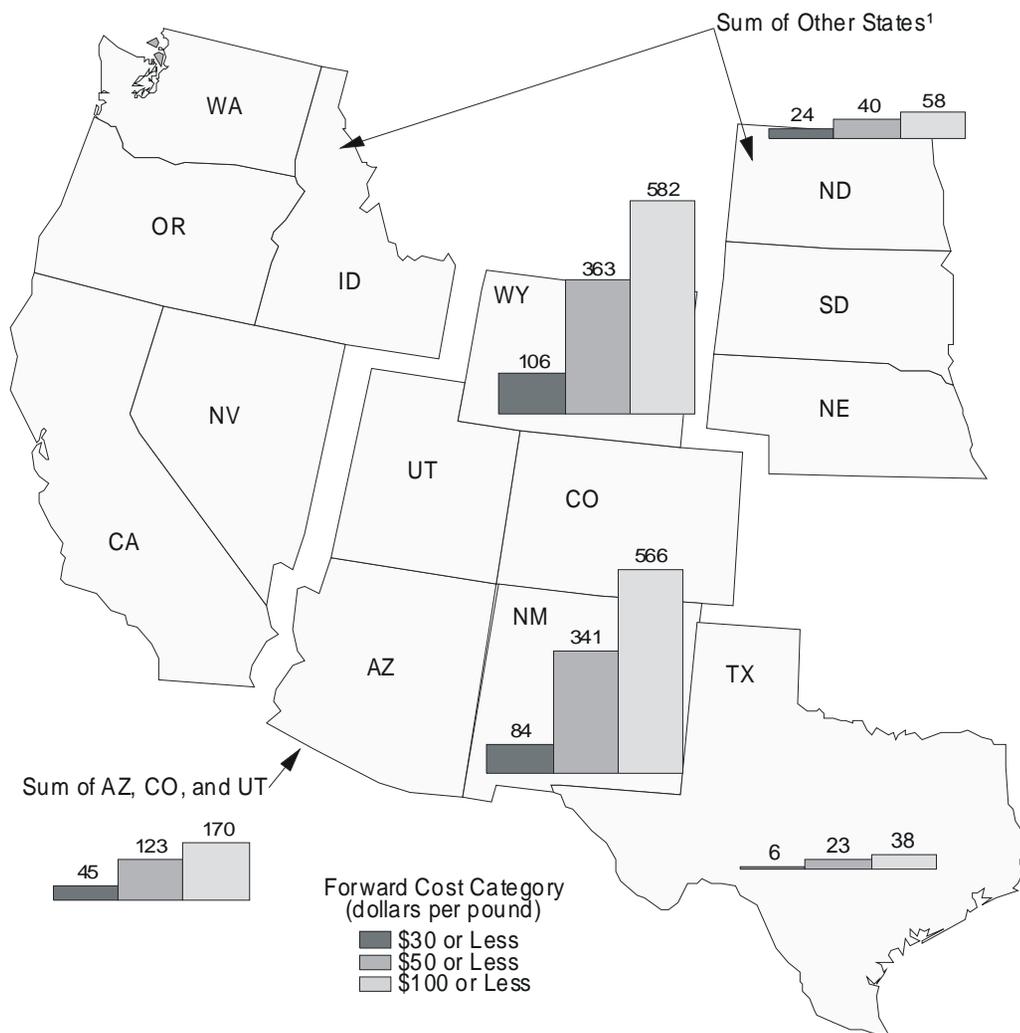
Note: Totals may not equal sum of components due to independent rounding.

Web Pages: • For data not shown for 1951-1969, see <http://www.eia.doe.gov/emeu/aer/resource.html>.
• For related information, see <http://www.eia.doe.gov/fuelnuclear.html>.

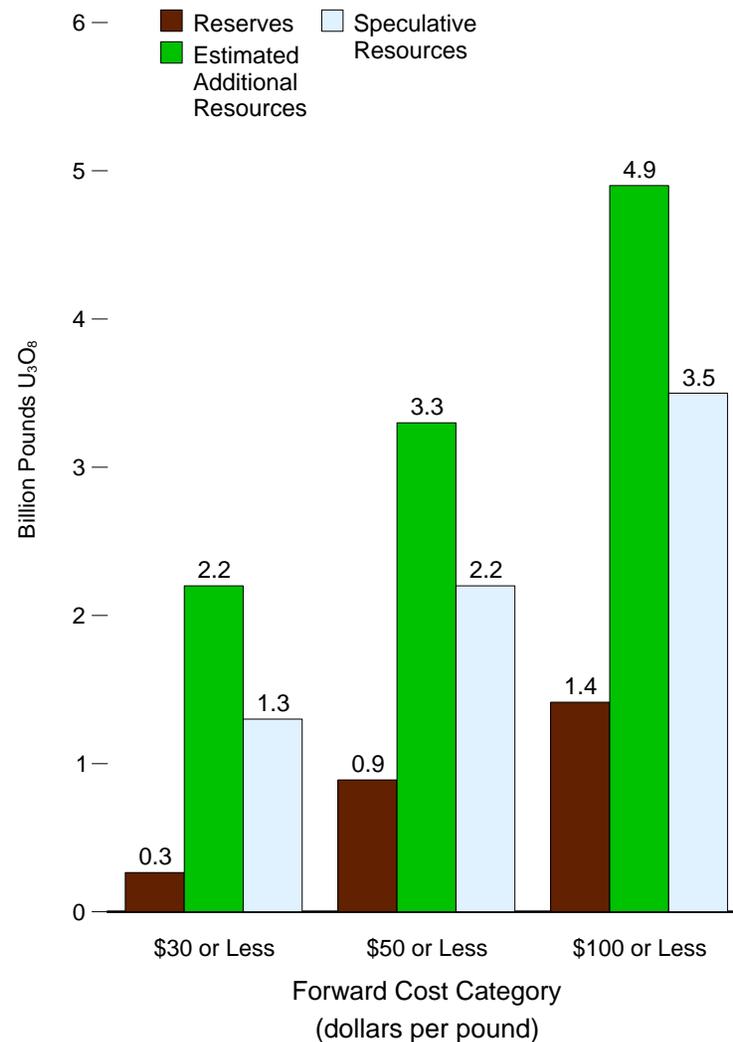
Sources: • 1949-1981—U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry, January 1, 1983*, Report No. GJO-100 (1983), Table VIII-5. • 1982-2002—Energy Information Administration (EIA), *Uranium Industry Annual*, annual reports. • 2003—EIA, "Domestic Uranium Production Report" (May 2004).

Figure 4.13 Uranium Reserves and Resources, 2003

Reserves, Million Pounds U₃O₈



Reserves and Resources



¹ California, Idaho, Nebraska, Nevada, North Dakota, Oregon, South Dakota, and Washington.

Note: Data are at end of year.
Source: Table 4.13.

Table 4.13 Uranium Reserves and Resources, 2003
(Million Pounds U₃O₈)

Resource Category and State	Forward-Cost Category (dollars per pound) ¹		
	\$30 or Less	\$50 or Less	\$100 or Less
Reserves ²	265	890	1,414
New Mexico	84	341	566
Wyoming	106	363	582
Texas	6	23	38
Arizona, Colorado, Utah	45	123	170
Others ³	24	40	58
Potential Resources ⁴			
Estimated Additional Resources	2,180	3,310	4,850
Speculative Resources	1,310	2,230	3,480

¹ Forward costs are all operating and capital costs (in current dollars) yet to be incurred in the production of uranium from estimated resources. Excluded are previous expenditures (such as exploration and land acquisitions), taxes, profit, and the cost of money. Generally, forward costs are lower than market prices. Resource values in forward-cost categories are cumulative; that is, the quantity at each level of forward cost includes all reserves/resources at the lower cost in that category.

² The Energy Information Administration category of uranium reserves is equivalent to the internationally reported category of "Reasonably Assured Resources" (RAR).

³ California, Idaho, Nebraska, Nevada, North Dakota, Oregon, South Dakota, and Washington.

⁴ Shown are the mean values for the distribution of estimates for each forward-cost category, rounded to the nearest million pounds U₃O₈.

Notes: • Data are at end of year. • U₃O₈ is uranium oxide. See "Uranium Oxide" in Glossary.

Web Page: For related information, see <http://www.eia.doe.gov/fuelnuclear.html>.

Sources: • Forward Costs \$30 or Less and \$50 or Less—Energy Information Administration (EIA), "U.S. Uranium Reserves Estimates" (June 2004). • Forward Costs \$100 or Less—EIA, Office of Coal, Nuclear, Electric and Alternate Fuels database as of June 2004.

