Oil and Natural Gas Production

Worldwide production of both natural gas and, to a lesser extent, oil (crude oil and natural gas liquids) by the Financial Reporting System (FRS) companies increased in 2006 (**Table 7**). Natural gas production increased in every region except the U.S. Offshore (which experienced the largest decline and consists largely of the Gulf of Mexico), Canada, and Europe. However, only three regions showed increases in oil production: Africa (the largest absolute gainer), the Former Soviet Union, and the Middle East.

Table 7. Oil and Natural Gas Production by FRS Companies by Region, 2005 and 2006

Region	Crude Oil and Natural Gas Liquids (million barrels)			Natural Gas (billion cubic feet)		
	2005	2006	Percent Change	2005	2006	Percent Change
United States						
Onshore	758	716	-5.6	6,071	6,409	5.6
Offshore	363	360	-0.7	1,703	1,517	-10.9
Total United States	1,121	1,076	-4.0	7,774	7,926	1.9
Foreign						
Canada	189	164	-13.2	1,560	1,455	-6.7
Europe	484	441	-9.0	2,026	1,886	-6.9
Former Soviet Union	64	86	35.3	56	68	21.8
Africa	500	595	18.8	365	389	6.8
Middle East	97	147	52.3	134	191	42.1
Other Eastern Hemisphere	284	259	-8.9	1,779	1,839	3.3
Other Western Hemisphere	102	84	-17.3	1,027	1,193	16.2
Total Foreign	1,720	1,776	3.2	6,947	7,021	1.1
Total Worldwide	2,841	2,851	0.4	14,721	14,946	1.5

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

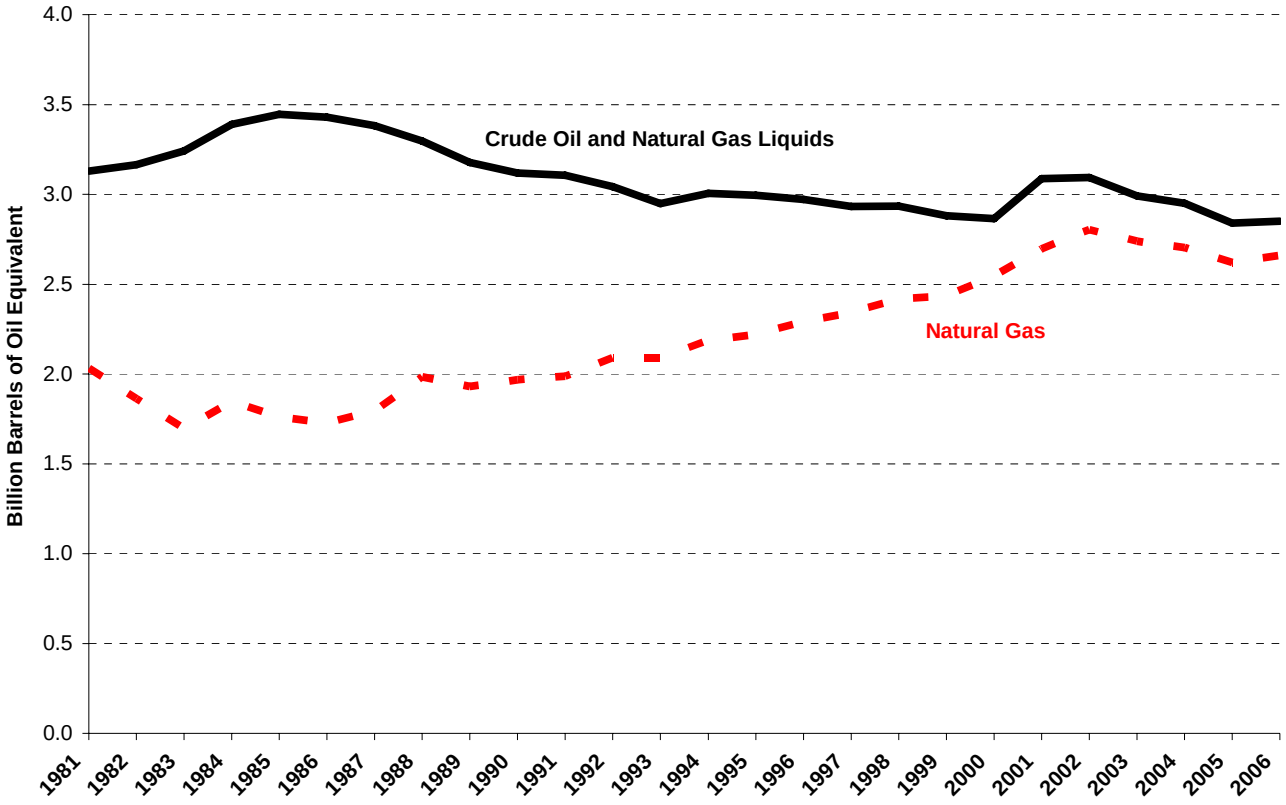
Source: Energy Information Administration, Form EIA-28, (Financial Reporting System).

In general, the production of oil by the FRS companies has been declining slowly since reaching a peak in 1985, while that of natural gas increased steadily through 2002 (**Figure 10**). The increased production in 2006 barely reversed a 3-year trend of annual declines that began in 2003. However, the longstanding trend of natural gas production increasing relative to oil production was not reversed. Since 1987, the gap between oil production and natural gas production, measured on a barrel-of-oil equivalent (boe) basis, widened only once, in 2001. The decline in oil production by the FRS companies runs counter to the long-running worldwide trend of increasing production, while the rise in natural gas production parallels the global trend.

Oil and Natural Gas Reserve Additions

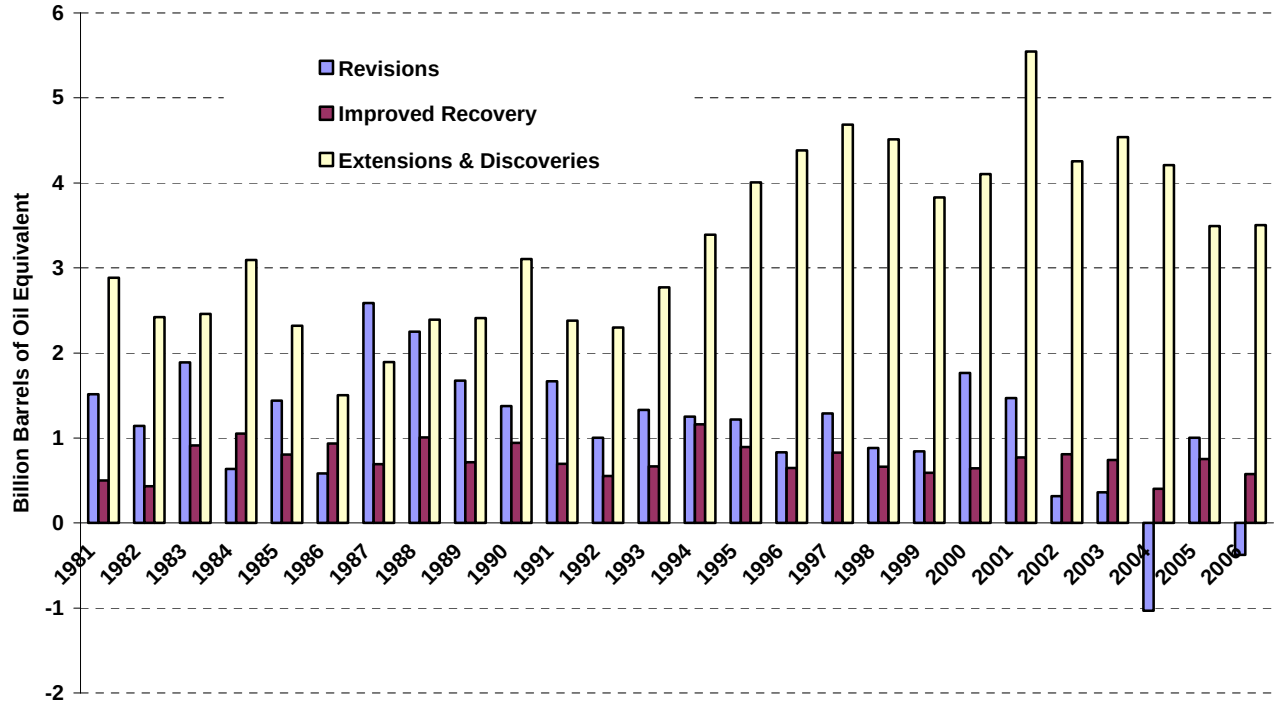
Reserve additions (excluding purchases and sales) are reported in the categories of revisions, improved recovery, and extensions and discoveries. Extensions and discoveries were the largest category of reserve additions in 2006, as they have been in all years except one since 1981 (**Figure 11**). Worldwide reserve additions from extensions and discoveries for the FRS companies essentially were unchanged in 2006 from 2005 levels, remaining at their lowest level since 1994. Reserve revisions were negative in 2006 for the second time in 3 years. Reserve additions from revisions have performed quite poorly in recent years. From 2002 through 2006, reserve revisions averaged

Figure 10. Worldwide Oil and Natural Gas Production by FRS Companies, 1981-2006



Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).

Figure 11. Worldwide Reserve Additions by FRS Companies by Type, 1981-2006



Note: Revisions exclude Alaskan natural gas reserve write-down in 1985 and 1987.
Source: Energy Information Administration Form, EIA-28 (Financial Reporting System).

just 55 million boe additions per year, while from 1981 through 2001 they averaged 1.4 billion boe per year. Reserves added through improved recovery techniques also decreased in 2006, but remained near historical levels.

Oil and Natural Gas Reserve Replacement

The reserve replacement rate is the additional proved reserves found through drilling as a percentage of reserves removed by production. Worldwide reserve replacement rates for both oil and natural gas deteriorated in 2006, although natural gas maintained its superior performance. Oil was replaced at the rate of 59 percent and natural gas at the rate of 88 percent (**Table 8**). Oil replacement rates for the FRS companies were the lowest in Europe and the U.S. Onshore, followed by Africa. In contrast, the companies replaced 259 percent of their oil production in Canada and all or nearly all of their production in the Middle East and in the Former Soviet Union. Natural gas had some of the lowest replacement rates in certain regions, with negative reserve additions in Europe reinforcing, rather than replacing, the decline in reserves caused by production and with replacement rates in the U.S. Offshore and the Other Western Hemisphere (Central and South America) of only 14 percent or less. For natural gas, the FRS companies replaced more than 13 times their production in the Middle East, while they more than replaced their production in the Former Soviet Union, Africa, and the U.S. Onshore.

From 1994 through 2001, the FRS companies replaced all of their worldwide oil and natural gas production and added an additional 7.6 billion boe of reserves. However, from 2002 through 2006, the companies replaced all of their natural gas production and added 2.0 billion boe to reserves, but they did not replace 5.1 billion barrels of their oil production, with most of that deficit occurring in the last 3 years (**Figure 12**). The resulting deficit of worldwide combined oil and natural gas reserve replacement was 3.1 billion boe.[25]

FRS companies did not replace 2.3 billion barrels of their U.S. oil production, including royalty production, while non-FRS companies replaced all of their U.S. oil production plus adding 1.3 billion barrels of reserves from 2002 through 2006. Note that these data include an estimate of royalty production and reserves, which are not included in FRS data.[26] Both FRS and non-FRS companies replaced all of their natural gas production, but FRS companies added only 0.8 boe to natural gas reserves, including royalty reserves, while non-FRS companies added 4.2 boe to reserves.

From 2002 through 2006 the replacement rates of oil and natural gas varied substantially among different regions of the world (**Figure 13**). The only region in which the FRS companies more than replaced oil production was the Former Soviet Union, while in five additional regions, the U.S. Onshore, Africa, the Middle East, the Other Eastern Hemisphere, and the Other Western Hemisphere, they found more natural gas than they produced. In the other three regions—the U.S. Offshore, Canada, and Europe—the FRS companies replaced neither oil nor natural gas production. The most surprising results here are for the U.S. Offshore, which often is considered a growing area. Comparing the period 1994–2001, when the FRS companies were replacing production successfully with proved reserves, and the period 2002–2006, when they were not, the largest declines in the average annual reserve additions for the U.S. Offshore were extensions and discoveries of natural gas, extensions and discoveries of oil, and revisions of oil. Nonetheless, extensions and discoveries of oil and of natural gas remained the largest contributors to reserve additions in both periods.

[25] Purchases, less sales of oil and natural gas reserves, by the FRS companies totaled 0.5 billion boe, but these reserves are not included because they do not add to the worldwide reserve total.

[26] For this estimate, royalty production and reserves are assumed to be 1/7 of total production and reserves, a standard proportion for royalty shares in the United States. They must be estimated because non-FRS production and reserves are estimated by subtracting FRS data, which do not include royalty data (as required by financial reporting rules in the United States), from total U.S. data, which include royalty data.

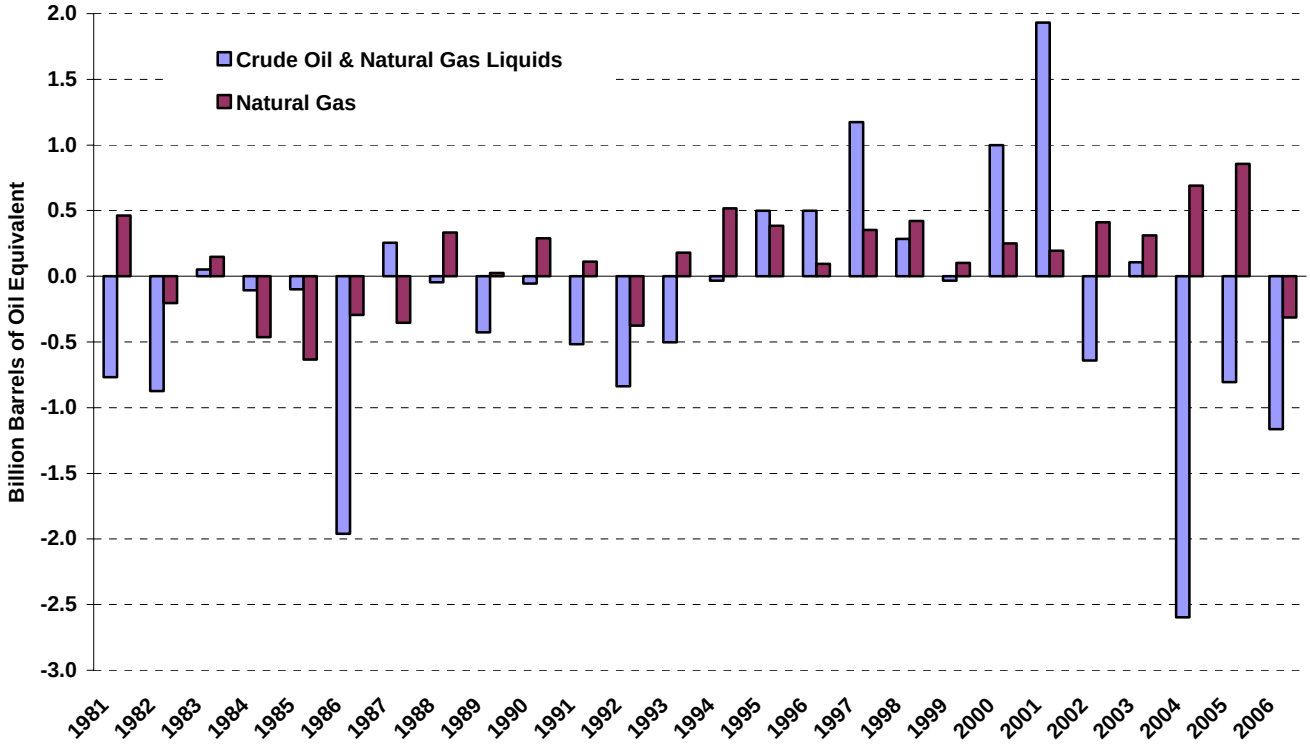
Table 8. Oil and Natural Gas Reserve Replacement Rates by FRS Companies, 2005 and 2006

Region	Drillbit Additions to Reserves		Production		Reserve Replacement Rate (percent)	
	2005	2006	2005	2006	2005	2006
	Crude Oil and Natural Gas Liquids (million barrels)					
United States						
Onshore	849	185	758	716	112	26
Offshore	158	230	363	360	44	64
Total United States	1,007	415	1,121	1,076	90	39
Foreign						
Canada	580	425	189	164	307	259
Europe	239	84	484	441	49	19
Former Soviet Union	-185	86	64	86	-290	99
Africa	203	248	500	595	40	42
Middle East	89	147	97	147	92	100
Other Eastern Hemisphere	40	215	284	259	14	83
Other Western Hemisphere	62	69	102	84	61	82
Total Foreign	1,028	1,274	1,720	1,776	60	72
Total Worldwide	2,035	1,689	2,841	2,851	72	59
	Natural Gas (billion cubic feet)					
United States						
Onshore	12,469	7,839	6,071	6,409	205	122
Offshore	786	159	1,703	1,517	46	10
Total United States	13,255	7,998	7,774	7,926	170	101
Foreign						
Canada	1,805	1,130	1,560	1,455	116	78
Europe	871	-732	2,026	1,886	43	-39
Former Soviet Union	133	122	56	68	238	179
Africa	1,054	512	365	389	289	132
Middle East	1,790	2,598	134	191	1,335	1,363
Other Eastern Hemisphere	221	1,399	1,779	1,839	12	76
Other Western Hemisphere	396	165	1,027	1,193	39	14
Total Foreign	6,270	5,195	6,947	7,021	90	74
Total Worldwide	19,525	13,192	14,721	14,946	133	88

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

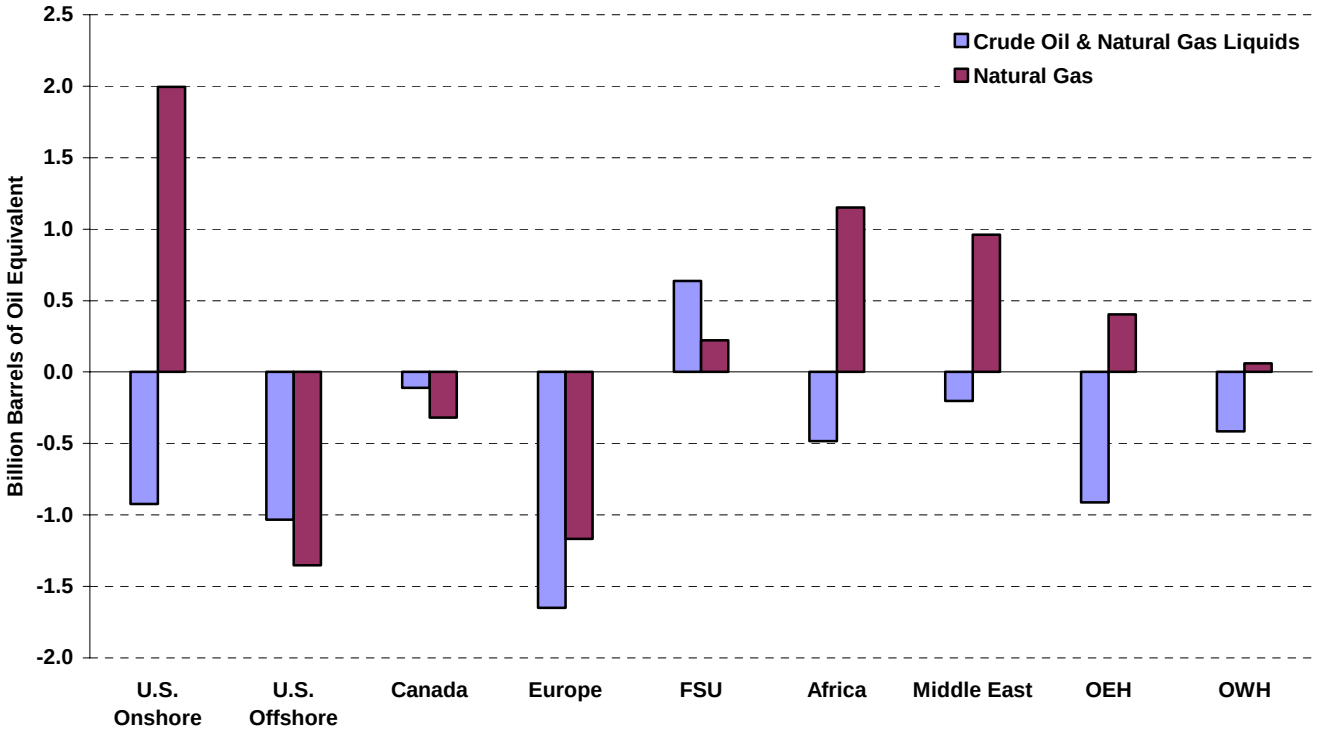
Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).

Figure 12. Worldwide Reserve Replacement by FRS Companies, 1991 - 2006



Note: Excludes purchases and sales of reserves.
Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).

Figure 13. Cumulative Reserve Replacement by FRS Companies by Region, 2002 - 2006



Notes: Excludes purchases and sales of reserves. FSU is the former Soviet Union. OEH is Other Eastern Hemisphere. OWH is Other Western Hemisphere.
Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).

Upstream Income

The financial performance of the upstream operations (oil and natural gas exploration, development, and production) of the FRS companies improved slightly in 2006, based on a revenue increase from foreign operations (**Table 9**). While domestic revenue fell slightly, worldwide revenues from the sale of oil and natural gas increased $22 billion (in constant 2006 dollars),[27] while worldwide operating expenses increased $12 billion. The leading contributor to increased expenses was production spending. However, a $10-billion-increase in foreign income taxes, which led to a notable increase in the effective foreign income tax rate, largely offset the increase in foreign operating income and resulted in little change in net income. In addition, foreign production taxes per boe of production increased 51 percent. With relatively flat net income and a substantial increase in net investment in place, the worldwide return on investment fell from 24 percent to 20 percent.

Lifting Costs

Lifting costs (also called production costs) are the out-of-pocket costs to operate and maintain wells and related equipment and facilities per boe of oil and natural gas produced after the hydrocarbons have been found, acquired, and developed for production. Because oil and natural gas often are produced together and their production costs often are not split, separate lifting costs for each are not available. Total lifting costs are divided into production taxes and direct lifting costs.

In 2006, total lifting costs for the FRS companies increased $1.23 per boe of production, with an increase in both the amount of oil and natural gas produced and the total amount of spending on production (**Table 10**). Increases in direct lifting costs accounted for 54 percent of the increase in total lifting costs, even though production taxes rose much faster than direct lifting costs. The largest contributor to increased worldwide direct lifting costs was production spending in the United States, which was up 23 percent in 2006, while Canada showed the highest level of direct lifting costs. Three regions had declines in direct lifting costs resulting from production increases, most notably, the Former Soviet Union, the Middle East, and Africa. The Middle East was the largest contributor to the increase in production taxes, in large part because of a significant change by one FRS respondent. The Former Soviet Union experienced a large decrease in the amount of total production taxes, which also was primarily influenced by a significant change by one FRS respondent. The largest contributor to the increase in worldwide total lifting costs was the U.S. Onshore (on a volume-weighted basis), with Africa a distant second. Decreases in direct lifting costs and especially production taxes combined to propel the Former Soviet Union from first to last place in total lifting costs between 2005 and 2006.

In 2006, worldwide direct lifting costs continued the increase in costs that began in 2000–2001, with domestic lifting costs surging ahead of foreign costs; the two converged in 1991, but began diverging in 2005 (**Figure 14**). The increase in domestic direct lifting costs was driven by spending increases relatively greater than production in the U.S. Onshore. In 2006, domestic direct lifting costs reached levels not seen since 1986. Between 2000 and 2006, domestic lifting costs rose 92 percent, while foreign lifting costs increased only 42 percent.

[27] Unless otherwise indicated, all dollar values and percentage changes in this report are based in constant 2006 dollars, adjusted using the Gross Domestic Product implicit price deflator.

Table 9. Income Components and Financial Ratios in Oil and Natural Gas Production for FRS Companies, 2005 and 2006
(Billion 2006 Dollars)

Income Components and Financial Ratios	Worldwide		United States		Foreign	
	2005	2006	2005	2006	2005	2006
Oil and Natural Gas Revenues						
Oil	NA	NA	54.0	59.5	NA	NA
Natural Gas	NA	NA	56.5	49.7	NA	NA
Total Revenues	237.9	259.4	110.6	109.1	127.3	150.2
Expenses						
Depreciation, Depletion, and Amortization	34.5	40.5	17.5	20.7	17.0	19.8
Production Costs	38.7	45.8	19.0	22.6	19.8	23.2
Exploration Expenses	5.8	10.5	2.7	5.8	3.1	4.7
General and Administrative Expenses	3.2	3.4	2.2	2.2	1.0	1.2
Other Costs (Revenues)[a]	19.0	12.9	7.4	-0.3	11.6	13.3
Total Operating Expenses	100.7	112.6	48.3	50.3	52.4	62.3
Operating Income	137.2	146.8	62.2	58.8	74.9	88.0
Other Income (Expense)[b]	17.4	18.4	3.3	6.0	14.1	12.4
Income Tax Expense	62.5	72.7	23.7	23.5	38.7	49.2
Net Income	92.0	92.5	41.8	41.3	50.3	51.2
Less Unusual Items	4.2	2.2	0.0	0.8	4.2	1.3
Net Income, Excluding Unusual Items	87.8	90.3	41.8	40.4	46.0	49.8
Unit Values (Dollars per BOE of Production)[c]						
Direct Lifting Costs (Excluding Taxes)	5.29	5.96	5.56	6.83	5.06	5.25
Production Taxes	1.80	2.36	2.01	2.26	1.62	2.43
Percentages						
Return on Investment[d]	24.5	20.4	22.5	17.5	26.3	23.6
Effective Income Tax Rate[e]	41.1	44.6	36.2	36.3	44.8	50.0

[a]Other Costs (Revenues) include Raw Material Purchases. The Production Segment was prohibited from purchasing natural gas and NGLs for resale to third parties and unconsolidated affiliates beginning in 2003.

[b]Earnings of unconsolidated affiliates, gain (loss) on disposition of assets, discontinued operations, extraordinary items, and cumulative effect of accounting change.

[c]BOE = Barrels of oil equivalent. Natural gas is converted to equivalent barrels of oil at 0.178 barrels per thousand cubic feet.

[d]Net Income divided by net investment in place (Net investment in place = net property, plant, and equipment plus investments and advances to unconsolidated affiliates).

[e]Income tax expense divided by pretax income.

NA = Not available.

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

Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).

Table 10. Lifting Costs for FRS Companies by Region, 2005 and 2006
(2006 Dollars Per Barrel of Oil Equivalent)

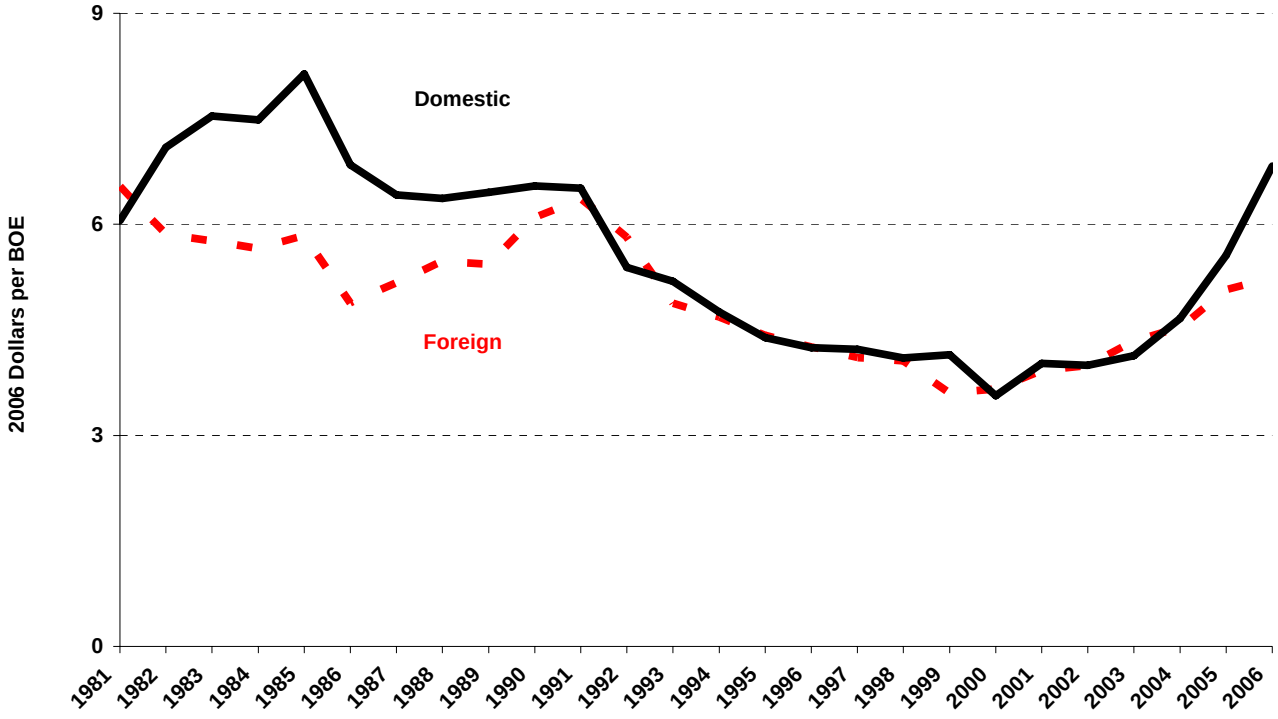
Region	Direct Lifting Costs			Production Taxes			Total		
	2005	2006	Percent Change	2005	2006	Percent Change	2005	2006	Percent Change
United States									
Onshore	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	7.94	9.69	22.0
Offshore	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	6.56	7.32	11.7
Total United States	5.56	6.83	22.8	2.01	2.26	12.4	7.57	9.09	20.0
Foreign									
Canada	7.20	8.29	15.1	0.31	0.34	7.7	7.52	8.63	14.8
Europe	5.89	6.34	7.6	1.41	2.00	42.0	7.30	8.34	14.3
Former Soviet Union	5.38	4.09	-24.0	3.25	0.76	-76.5	8.63	4.85	-43.8
Africa	4.22	4.10	-2.7	2.27	2.75	21.2	6.49	6.86	5.7
Middle East	4.96	4.59	-7.5	0.15	9.94	6,730.3	5.11	14.53	184.4
Other Eastern Hemisphere	3.86	4.32	11.8	2.00	2.15	7.2	5.87	6.47	10.2
Hemisphere	3.27	3.21	-1.9	2.45	2.37	-3.1	5.72	5.58	-2.5
Total Foreign	5.06	5.25	3.6	1.62	2.43	50.5	6.68	7.68	15.0
Worldwide Total	5.29	5.96	12.6	1.80	2.36	31.0	7.09	8.32	17.3

n.a. = Data not available.

Notes: Natural gas is converted to equivalent barrels of oil at 0.178 barrels per thousand cubic feet. Sum of components may not add to total due to independent rounding.

Source: Energy Information Administration, Form EIA-28, (Financial Reporting System).

Figure 14. Direct Oil and Natural Gas Lifting Costs for FRS Companies, 1981-2006



Note: Direct lifting costs are the costs of extracting oil and gas, excluding production taxes. BOE = Barrels of oil equivalent.
Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).

Finding Costs

Finding costs are the costs of adding proved reserves of oil and natural gas through exploration and development activities and by the purchase of properties that might contain reserves.[28] These costs are measured for oil and natural gas on a combined basis in units of dollars per boe. Ideally, finding costs would include all costs incurred (no matter when these costs were incurred or recognized on a company's books) in finding any particular proved reserves (not including the purchases of already discovered reserves). In practice, finding costs are actually measured as the ratio of exploration and development expenditures (including expenditures on unproved acreage but excluding expenditures on proved acreage) to proved reserve additions (excluding net purchases of proved reserves) over a specified period of time.[29] Finding costs generally are calculated in *Performance Profiles* as a weighted average over a period of 3 years.

Average worldwide finding costs for the FRS companies increased $5.84 per boe of reserves added in the 2004–2006 period (**Table 11**). Most of the increase came from a rise in exploration and development spending, which was amplified by a drop in reserves found. All FRS regions exhibited an increase in finding costs in 2004–2006.[30] The regions with the largest proportional increases were Europe, the U.S. Onshore, the Other Western Hemisphere, and Africa, while the U.S. Offshore was again the highest-cost region. However, the U.S. Onshore, because of its much greater share of worldwide reserve additions and its large increase in spending, contributed much more than the others to the increase in worldwide costs. Other notable contributors to the worldwide increase were much lower reserve additions in Europe and the Former Soviet Union and substantially increased spending in the U.S. Offshore. Only the Middle East had finding costs below $10 per boe in 2004–2006.

Finding costs in nearly all regions except the U.S. Onshore have exceeded their previous record highs, which were reached in the early 1980s, with the U.S. Offshore setting the pace (**Figure 15**).[31] As with lifting costs, the recent levels of finding costs are due in part to the high prices of oil and natural gas. Producers are willing to spend more to find oil and natural gas when their prices are higher.

Finding costs for the FRS companies have increased in all regions in recent years (**Figure 16**). [32] The U.S. Offshore stands out because its finding costs were the highest in 2004–2006, and it had the largest absolute increase in finding costs between the 1999-2001 and 2004-2006 periods. The most important contributor to this rise was a 76-percent fall in reserve additions from extensions and discoveries of oil. But the largest relative increase was for the Other Western Hemisphere, which had the second highest finding costs in 2004–2006. In this case, a fall in reserve additions from natural gas extensions and discoveries was the major cause of the rise in finding costs. Africa and Europe also had large absolute and relative increases between the two periods, with the increase in the former coming primarily from a rise in expenditures for development. In the latter, three important

[28] Alternatively, finding costs are the exploration, development, and unproved property acquisition costs of replacing reserves removed through production.

[29] One inherent limitation of measuring finding costs in this way is that the expenditures and the reserve additions recognized in a particular interval usually do not correspond exactly with each other. Expenditures usually are recognized in the period in which the payment actually occurred. Proved reserves usually are recognized when there is reasonable certainty that they can be produced economically. There is no reason that these activities must occur in the same time period (oil and natural gas wells often are operated over a long time period); therefore, some expenditures may not be recognized in the same time period in which their corresponding reserves are recognized. One way to moderate this limitation is to increase the time period over which finding costs are measured, allowing reserve additions and exploration and development expenditures to match more closely. However, the longer the time period over which finding costs are measured, the more out of date they become, because the costs include increasingly older expenditures and reserves, and costs and technology are continually changing. The only way to solve the correspondence problem is to calculate an average finding cost for all oil and natural gas produced by a well after it is permanently shut in, but then many costs included would be considerably out of date.

[30] Largely because negative revisions to oil reserves in 2004–2006 were not offset by other reserve additions, the Former Soviet Union had total reserve additions of less than zero in 2004–2006, rendering its finding cost calculation for that period meaningless.

[31] Finding costs in the Middle East have practically reached their historical high level; see preceding note.

[32] See note 29.

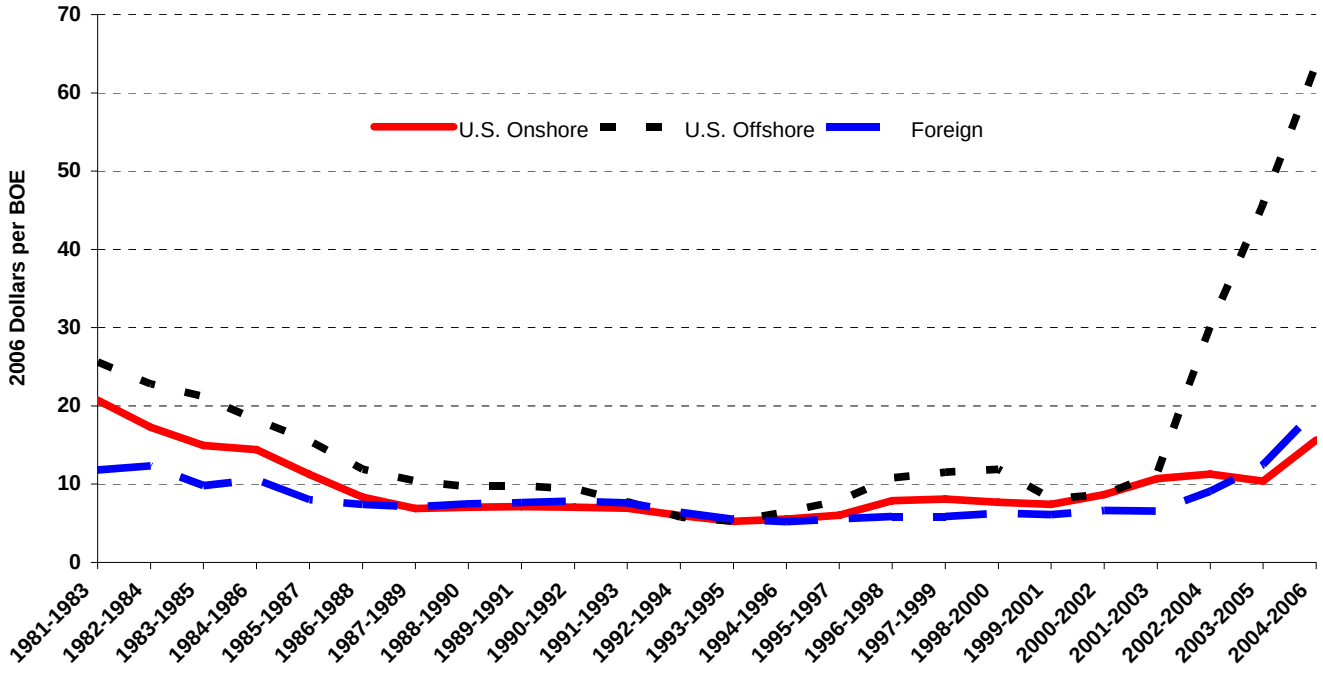
Table 11. Finding Costs by Region for FRS Companies, 2003-2005 and 2004-2006 (2006 Dollars per Barrel of Oil Equivalent)

Region	2003-2005	2004-2006	Percent Change
United States			
Onshore	7.05	11.34	60.9
Offshore	45.76	63.71	39.2
Total United States	10.40	15.62	50.2
Foreign			
Canada	17.43	19.39	11.2
Europe	10.26	22.79	122.1
Former Soviet Union	13.74	NM	NM
Africa	16.19	25.66	58.5
Middle East	4.95	5.26	6.3
Other Eastern Hemisphere	9.50	12.59	32.6
Other Western Hemisphere	26.56	42.59	60.4
Total Foreign	12.46	19.51	56.6
Worldwide	11.38	17.23	51.3

Notes: NM = Not meaningful. The above figures are 3-year weighted averages of exploration and development expenditures, excluding expenditures for proven acreage, divided by reserve additions, excluding net purchases of reserves. Natural gas is converted to equivalent barrels of oil at 0.178 barrels per thousand cubic feet. Sum of components may not add to total due to independent rounding.

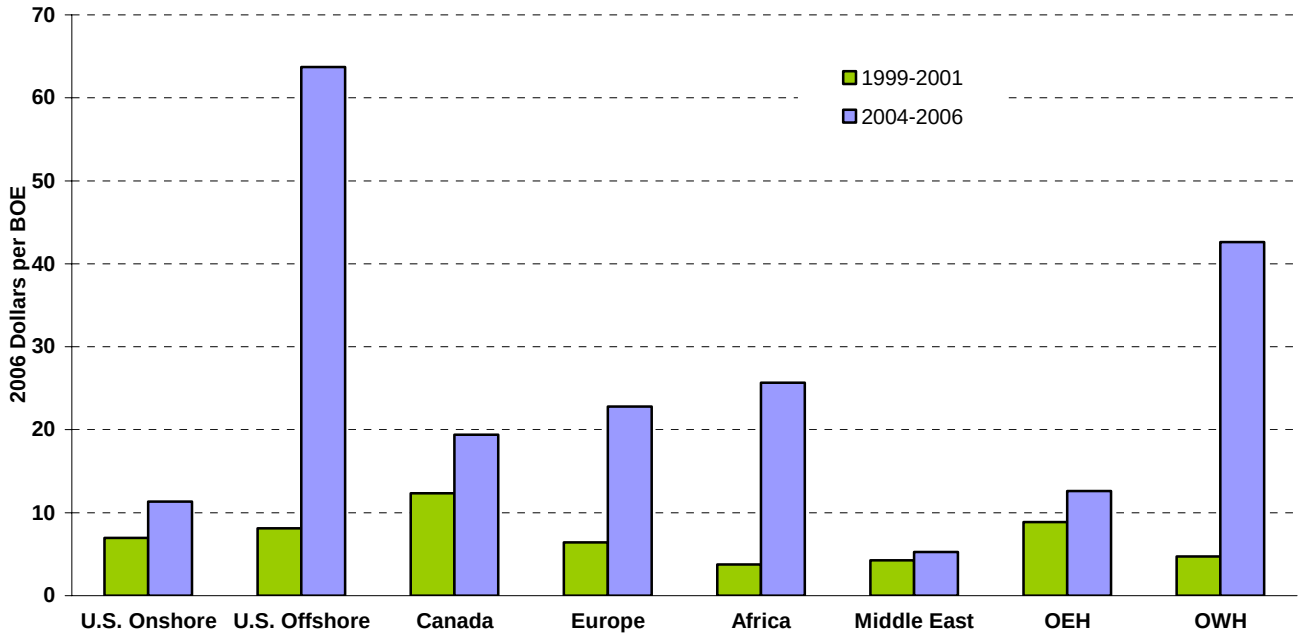
Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).

Figure 15. Finding Costs for FRS Companies, 1981-1983 to 2004-2006



Notes: Costs are the quotient of costs and reserve additions for each three-year period. BOE = Barrels of oil equivalent.
Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).

Figure 16. Finding Costs for FRS Companies by Region, 1999-2001 and 2004-2006



Notes: Costs are the quotient of costs and reserve additions for each three-year period. OEH is Other Eastern Hemisphere. OWH is Other Western Hemisphere. BOE = Barrels of oil equivalent.
Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).

factors were involved—a fall in reserve additions from natural gas revisions, a rise in expenditures for development, and a fall in reserve additions from oil extensions and discoveries. The four remaining regions, led by the Middle East, had much less dramatic growth in relative and absolute finding costs between the two periods.

Total Costs

Total costs, the sum of finding and lifting costs, for the FRS companies increased substantially in all regions in the 2004–2006 period **(Table 12)**.[33] Worldwide, total costs rose $6.84 per boe to $24.29 per boe. Total costs ranged from $14.31 in the Middle East to $69.75 in the U.S. Offshore in 2004–2006. Because finding costs now have become so much greater than lifting costs, except in the Middle East and the U.S. Onshore, finding costs dominate the results in this table.

Spending to Replace Oil and Natural Gas Production by the FRS Companies

Using the actual finding costs and production levels of the FRS companies, the cost of finding additional reserves through drilling that are sufficient to replace production for any given year can be estimated. That is, finding costs times production equals the estimated expenditures necessary to replace that production. This calculation uses the annual production and three-year (ending in the production year) real finding costs. Actual exploration and development spending for new reserves exceeded the estimated cost to replace production in 2006 by 10 percent (**Figure 17**). In fact, actual spending to find reserves has exceeded the estimated amount necessary to replace production in 10 of the past 12 years. However, in the five years ending in 2006, the FRS companies have more than replaced their production with found reserves only twice, while they replaced production in all 7 preceding years. This suggests that, when finding costs are rising rapidly, as they have been in the past few years, the estimating procedure used here understates the amount of spending necessary to replace production.

[33] See note 29.

Table 12. Total Production Costs by Region for FRS Companies, 2003-2005 and 2004-2006 (2006 Dollars per Barrel of Oil Equivalent)

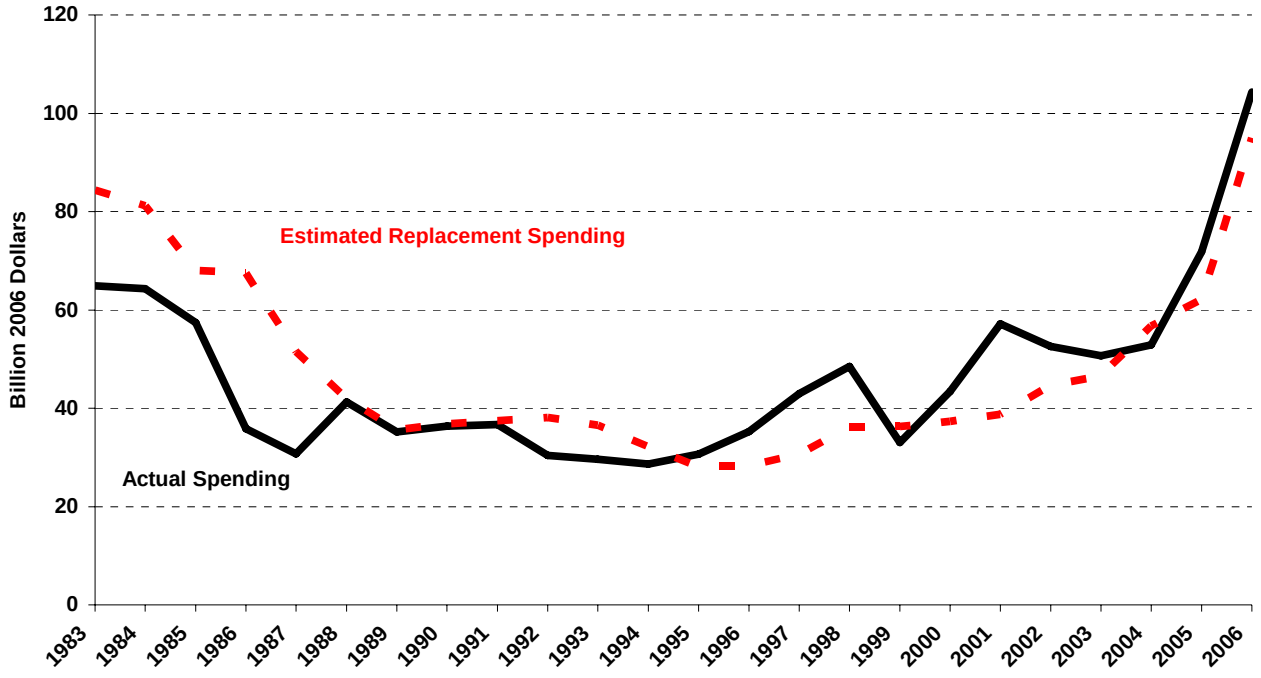
Region	2003-2005	2004-2006	Percent Change
United States			
Onshore	14.00	19.46	39.0
Offshore	50.56	69.75	37.9
Total United States	16.70	23.16	38.7
Foreign			
Canada	23.84	26.59	11.5
Europe	16.43	29.79	81.3
Former Soviet Union	21.29	NM	NM
Africa	22.26	32.13	44.3
Middle East	9.78	14.31	46.4
Other Eastern Hemisphere	14.98	18.76	25.2
Other Western Hemisphere	31.06	47.63	53.4
Total Foreign	18.33	26.17	42.8
Worldwide	17.45	24.29	39.2

NM = Not meaningful.

Notes: The above figures are 3-year weighted averages of exploration, development, and production expenditures, excluding expenditures for proven acreage, divided by reserve additions, excluding net purchases of reserves. Natural gas is converted to equivalent barrels of oil at 0.178 barrels per thousand cubic feet. Sum of components may not add to total due to independent rounding.

Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).

Figure 17. Actual Spending to Find Reserves and Estimated Spending Necessary to Replace Production for FRS Companies, 1983 - 2006



Source: Energy Information Administration, Form EIA-28 (Financial Reporting System).