

International Oil and Gas Exploration and Development 1991

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Introduction

It is important to understand the changes taking place in the global oil industry and their effects on the U.S. economy. While the world appears to have adequate oil supplies, our domestic production is declining and is projected to continue to decline. U.S. dependence on oil imports is nearly 45 percent and is projected to increase. These ever increasing imports come from a diverse group of countries, each with its own unique endowment of oil and gas resources. These foreign resources play a fundamental and increasing role in U.S. energy markets, the economy, and the direction of government policy and planning. Understanding the extent and availability of these foreign resources is essential.

Economic hard times have forced many industry organizations, publishers, and companies to reduce or discontinue publication of compiled basic international activity data. The time and expense of the necessary research are no longer affordable. EIA through its Foreign Energy Supply Assessment Program (FESAP) is attempting to fill this gap. By researching as many sources as possible and sorting out data conflicts, EIA intends to provide consistent and accurate historical data series.

This report starts where previous quarterly reporting ended. The *International Oil and Gas Exploration and Development Activities* quarterly report presented information through 1990 before being discontinued. This first publication of a new annual series contains most of the same data, plus some new material, through 1991. It also presents historical data covering a longer period of time than the previous quarterly report. Country-level data on oil reserves, oil production, active drilling rigs, seismic crews, wells drilled, oil reserve additions, and oil reserve-to-production ratios (R/P ratios) are listed for about 85 countries, where available, from 1970 through 1991. World and regional summaries are given in both tabular and graphical form. Also, a much longer history is available upon request for some items on a supplemental computer diskette. The most popular table in the previous quarterly report, a listing of new discoveries, continues in this annual report as Appendix A.

Data Descriptions

Refiner Acquisition Cost of Imported Crude Oil

The United States imports its oil from many countries. The weighted average price paid for this imported oil is used as the world oil price in this report.

U.S. and Foreign Expenditures

EIA, through its Financial Reporting System (FRS), collects these data from major U.S. companies with substantial operations, both domestic and foreign. Obviously, these data do not represent the magnitude of spending for the United States or for the entire global industry, but do give a good indication of the spending trends for large U.S. companies operating both in the United States and abroad. These expenditures are for petroleum property acquisition, exploration, and development activities. Property acquisition expenditures reflect a change in ownership, and generally are not related to activities that lead to more discoveries and increased production. At times of increased property disposal, the increase in acquisition expenditures may cause this item to follow a different trend than other activities.

Active Seismic Crews and Marine Vessels

Gathering of seismic data usually occurs very early in the exploration process and is considered to be a leading indicator of oil field activity. The Society of Exploration Geophysicists (SEG) collects foreign data four times a year on both land crews and ships active in collecting seismic data. Data are collected for March, June, September, and December and are reported for large regions of the world, not by country. Active crews in the United States are such a large percentage of the total activity that U.S. crews must be excluded from the total to obtain the trends in the rest of the world.

Active Rotary Rigs

Baker Hughes Inc. collects these data monthly as reported in the *Oil and Gas Journal*. The annual values presented in this report are weighted averages (weighted by the number of days in each month). Except for Yugoslavia, data are unavailable for Eastern Europe and the former Soviet Union. U.S. rig counts are a significant portion of the total and would obscure the trends in foreign countries if included in the world total.

Total Wells Drilled

These data come from several sources and were combined to provide as consistent a series as possible. Data for Eastern

Europe were unavailable until recent years. Again, U.S. data are excluded from the total. Total wells drilled include oil, gas, dry, and service wells. More wells do not necessarily mean more production or a larger increase in reserves. A new well in the United States may yield 100 barrels of oil per day or less. A new well in Saudi Arabia may yield 10,000 barrels of oil per day or more.

Annual Oil Production

A supplemental computer diskette, available upon request, has historical oil production back into the 1800's for some countries. These data come from several sources which were combined into as consistent a series as possible. Production is usually reported by each country, but some countries' production may be estimated due to availability. In these instances, the production is estimated by the sources (i.e., *World Oil*, API). Oil production includes crude oil and condensate, but does not include natural gas liquids (NGL). Production figures in this report may differ slightly from official EIA production figures published in the *International Energy Annual*. Different sources are used here to provide a longer and more consistent history.

Oil Reserves at Year-End

These are reserves remaining on December 31 and come from several sources which were combined into as consistent a series as possible. A supplemental computer diskette, available upon request, has historical oil reserves back to the end of World War II. Reserves are usually reported by each country, but some countries' reserves may be estimated. Communist and formerly communist countries may consider (or have considered) their reserves a state secret. The largest problem with international reserves data (reported or estimated) is that almost every country uses a different reserve definition. Not all countries report their reserves as proved reserves as defined in the United States. One should keep this fact in mind when making reserve comparisons. Each country has its own unique practices to suit its own reporting purposes. While some countries do report reserves similar to U.S. proved reserves others report reserves that may be similar to proved, probable, and possible reserves in the United States. Because of this uncertainty, caution should be used whenever reserve comparisons are made. Getting everyone to agree on and use a single standard definition would be extremely difficult. Oil reserves include crude oil and condensate, but do not include natural gas liquids (NGL).

Annual Oil Reserve Additions

These are gross reserve additions from discoveries and revisions. A computer diskette prepared for this report has historical reserve additions back to the end of World War II and is available upon request. Reserve additions are calculated from the reported reserves and production tables using a simple formula. Reserve additions are equal to end-year reserves minus beginning-year reserves plus annual production. Negative values indicate downward revisions. Positive values indicate discoveries and upward revisions. Caution is advised when comparing reserve additions for the reasons mentioned previously for reserve comparisons.

Annual Oil Reserve-to-Production Ratios (R/P)

These data are derived from the reserves and production tables. A computer diskette available upon request has the historical R/P ratios back to the end of World War II. Year-end reserves are divided by the annual production for the same year. The resulting value is the number of years the current reserves will last at the current production rate. R/P ratios can be raised by adding reserves or by reducing production. A downward revision in reserves or an increase in production will lower an R/P ratio. Reserves and production do not have a constant relationship. Often there is a time lag between the discovery and the reporting of newly discovered reserves, and the production of the newly discovered reserves. R/P ratios will increase with a discovery and later decrease as the discovery is developed and its production increases. In mature areas with lower R/P ratios, both production and reserves may decline so that there is little change in the R/P ratio as reserves are depleted. The previously mentioned inconsistent reserve definitions that make reserve comparisons uncertain also make comparing R/P ratios questionable. A general rule of thumb concerning proved reserves and R/P ratios is that a R/P ratio greater than 20 probably includes more than just proved reserves.

Foreign Oil and Gas Discoveries

Appendix A contains new field discoveries beginning in 1987, as compiled from public sources. Field discoveries are listed by country and by report date. Only reports of oil and gas fields containing an estimate of reserves are included in this table. Many other reports of new fields without reserve estimates were not included. These field reserves are simply reported here as they were reported in the cited source. They are not certified or checked for accuracy. Each reserve estimate is subject to the biases of the estimate originator. For fields having several reported reserve estimates over time, there is often a wide range in the estimates. This can be due to different estimators and/or increasing knowledge with the passage of time. Maintaining this list of reserve estimates

over time will yield some insight into the reserve estimation process.

World Oil and Natural Gas Reserves

Appendix B shows a comparison of 1991 oil and natural gas reserves by country, as published in *World Oil* and the *Oil and Gas Journal*.

Comparisons of the United States to Foreign Countries

U.S. data are not included in the graphical presentations in the body of this report because inclusion would obscure some of the foreign trends. However, such direct comparisons are very interesting as shown graphically in Appendix C. Data for Eastern Europe (EE) and the former Soviet Union (FSU) are absent from the seismic crew, active rotary rig, and total wells drilled graphs due to inconsistent availability. However, EE and FSU data are sufficiently available to be included for oil production, oil reserves, oil reserve additions, and R/P ratios in Appendix C graphs.

Identified Reserves and Undiscovered Resources

The U.S. Geological Survey's World Energy Resources Program periodically estimates undiscovered resources for

foreign countries with input from EIA. These data are presented in a published paper at the World Petroleum Congress every four years. Appendix D contains the U.S. Geological Survey's data for undiscovered resources of conventional crude oil and natural gas from the thirteenth World Petroleum Congress (1991). The tables also list identified reserves which are approximately the sum of proved, probable, and possible remaining reserves. The undiscovered resources are presented as a log-normal distribution with a 90 percent probability range (95 to 5 percent probability of occurrence). The mode and mean values are also given.

World Trends

One might expect worldwide oil field activity trends to follow trends in the world oil price. This is not necessarily true for all activity in all areas of the world. In some areas the cost to find and produce oil is so low that only a very large drop in price would affect the activity level. Some countries having a long term view may offer special terms or incentives allowing higher activity in a low price environment. Also, advances in technology such as 3-D seismic, horizontal drilling, coiled tubing, and others have reduced costs and improved success rates in many areas changing the correlations with price over time. Over the last 20 years there have been several significant changes in the world oil price (Table 1, Figure 1). An increase in world oil prices came in the 1973-74 period as a result of the Arab oil embargo. Another increase due to the Iranian revolution occurred in the 1979-80 period. After 1981, oil prices started declining and incurred a large drop in 1986 due to increased supply from Saudi Arabia. There was a short lived increase in 1990 caused by the Persian Gulf War. The general trend of world oil price since 1970 has been increasing into the early 1980s, declining to the mid-1980s, and then flat or slightly increasing thereafter. The 1991 price, in constant dollars, was down 66 percent from the 1980 peak.

Of course, changing oil prices will be reflected in the amount of capital available for investment. The trend in U.S. expenditures has been declining since the early 1980s (Table 2, Figure 2). These are the expenditures for oil and gas exploration, development, and property acquisition by large U.S. companies with both U.S. and foreign operations. Foreign expenditures by these companies have been increasing since the middle 1980s and have gone from about 27 percent in 1981 to about 51 percent in 1991 of their total expenditures. This shifting of investment from the United States to other countries may affect the trends of oil field activities relative to how closely they follow price trends. Some activities will affect changes in price rather than the opposite. Because the United States is a relatively mature, high-cost area, price changes may affect U.S. activities more than foreign activities (especially price decreases).

Seismic crew counts generally follow the rise and fall of oil prices (Table 3, Figure 3a). But the total crew count, excluding crews operating in the United States, shows a less drastic rise and fall. The U.S. crew counts were a significant

portion of the total and have an even more dramatic rise and fall. Inclusion of U.S. data in world totals obscures trends in the foreign industry. As of 1991, U.S. seismic crew counts have dropped 85 percent from their peak in 1981, while foreign crew counts have declined 36 percent from their peak in 1982.

The number of active rotary rigs in foreign countries generally follows price trends (Table 4, Figure 4a). Once again it is necessary to exclude U.S. rigs to obtain a trend in active foreign rigs. Foreign rigs have declined 40 percent from their peak in 1980. The number of U.S. rigs has declined 78 percent from its peak in 1981. The trend for Non-OPEC countries parallels the declining foreign total trend. However, the number of active rotary rigs in OPEC countries has been gaining slightly since 1987, although they are down 45 percent from the 1982 peak.

Total wells drilled in foreign countries do not closely follow oil price trends nor do they follow the trends for drilling rigs (Table 5, Figure 5a). Because rigs drill wells, one would expect their trends to be similar. However, after 1980, foreign rigs declined while foreign wells increased and remained at a higher level. This points to an increase in drilling efficiency corresponding to falling prices. To remain profitable when prices fall, companies must reduce their costs. An increasing application of new technologies, and the elimination of less productive equipment and personnel, in the interest of cost reduction, increased drilling efficiencies. Total wells, without the United States, generally increased through 1985, dropped in 1986, and then continued on an upward trend. The number of U.S. wells drilled was so large it must be excluded from the total to clearly see a foreign trend. Non-OPEC wells generally track the total. OPEC wells peaked in 1982, declined into 1987, and then continued on a slightly increasing trend, following the price trend a little better. The number of U.S. wells in 1991 was down 64 percent from a peak in 1984. Foreign wells, excluding Eastern Europe, were down only 18 percent in 1991 from the 1985 peak. However, OPEC wells were down 41 percent by 1991 from a 1982 peak.

Foreign annual oil production only mildly resembles world oil price trends (Table 6, Figure 6a). Price seems to have very little effect on production, but there are factors other than simple supply and demand relationships that affect both

price and production. Political events, weather, new discoveries, U.S. dollar exchange rates, and changing attitudes and perceptions are a few. For example, the price drop in 1986 was caused by an increase in supply from the Middle East and the perception of what a supply increase would do to oil prices already declining due to weak demand. Similarly, short-term production losses resulting from the Arab oil embargo during the 1973-74 period and the Iranian revolution in 1979 caused the price increases at these times even though annual world production actually increased during these two periods. Both production and price have increased since 1986. Foreign oil production for 1991 was 2 percent below the peak in 1979. Non-OPEC foreign production was increasing until 1989 and then was slowly falling through 1991. Non-OPEC foreign oil production for 1991 was off 3 percent from its peak in 1988. OPEC production was approximately flat through most of the 1970s, declined from 1980 through 1985, and has been on an upward trend since 1985. OPEC production in 1991 was down 24 percent from its 1977 peak year. U.S. oil production was down 18 percent from a recent peak in 1985 and off 23 percent compared to 1970.

Foreign year-end remaining oil reserves were flat through the 1970s and increasing through the 1980s; no resemblance to oil price trends is seen (Table 7, Figure 7a). OPEC reserves track total reserves. Because the majority of total reserves come from OPEC, this is expected. The Non-OPEC foreign group generally shows a slowly increasing trend. U.S. reserves have had a generally declining trend for the last 20 years. OPEC reserves for 1991 were 77 percent higher than in 1970. Foreign reserves were 80 percent higher than in 1970. For 1991, Non-OPEC foreign reserves were 91 percent higher and U.S. reserves were 37 percent lower than in 1970.

There has always been some question about the large reserve increases in the 1986-88 period in the OPEC countries. There has been some speculation that these increases, or at the least, their timing, were motivated by OPEC production quota rules and changing market share by some member countries. Reported reserves for these countries appear to be similar to proved, probable, and possible reserves. Exactly what fraction of these increases can be called proved (by U.S. definitions) is unknown. An independent field-by-field study of this area would be beneficial, but most of the data necessary for this kind of analysis are not publicly available. Because of the different reserve definitions in use around the world, reserve comparisons should be viewed with caution.

Annual additions to oil reserves were somewhat erratic but basically higher in the 1980s than in the 1970s for the foreign total (Table 8, Figure 8a). Foreign Non-OPEC and OPEC additions track each other somewhat except for the 1986-88 period. There appears to be no obvious correlation to oil price. The very large additions from OPEC in the 1986-88 period are obvious in the total world figures. These additions were from Iran, Iraq, Kuwait, Saudi Arabia, Abu Dhabi, and Venezuela. If one assumes the capital available to invest is related to oil price, and more or less investment should yield more or less reserve additions, then the conclusion one can draw from Figure 8 is that investments may be offset by an opposing investment efficiency factor. Often, the higher the rate of investment, the lower the reserve additions per invested dollar. Other studies done by EIA have shown this to be true for the United States. For some countries it may be more important to invest their oil income in areas unrelated to the oil industry, such as, water supply, rural electrification, roads and highways, communications, and improving the quality of life in general.

Reserve-to-production (R/P) ratios for foreign countries slowly declined through the 1970s with increasing production, and then increased through the 1980s with increasing reserves. Both reserves and production increased over the last 20 years for the Non-OPEC foreign countries to maintain fairly stable R/P ratios. OPEC R/P ratios declined through the 1970s with increasing production but dramatically increased in the 1980s from both declining production and increasing reserves. The 1991 R/P ratios stand at 48 for foreign countries, 83 for OPEC, 20 for foreign Non-OPEC, and only 9 for the United States.

Comparing the United States to Foreign Countries

The graphs contained in Appendix C illustrate the differences in upstream oil and gas activities between the United States and foreign countries. However, some historical data series in specific countries are presently unavailable, particularly for Eastern Europe (EE) and the former Soviet Union (FSU). The Appendix C figures showing seismic crews, active rotary rigs, and new wells drilled exclude EE and FSU data (Figures C1, C2, and C3). However, EE and FSU data series are adequate for oil production, oil reserves, oil reserve additions, and oil R/P ratios and therefore are included in the figures for these items (Figures C4, C5, C6, and C7).

Upstream activity statistics such as seismic crews, rotary rigs, and new wells drilled show the U.S. industry to be much more responsive to price changes than the foreign industry. During the peak oil price years, the 1981 peak for seismic crew counts in the United States was 31 percent higher than that for the rest of the world (ROW) (Figure C1). In 1991, U.S. seismic crew counts were 71 percent less than those for the reported ROW. Similarly, for their 1981 peak, U.S. rig counts were 142 percent higher than those for the reported ROW (Figure C2). However, in 1991, the U.S. rig counts were 13 percent below those for the reported ROW. The United States was also well ahead in wells drilled (Figure C3). For the 1981 peak, the number of U.S. wells was about 4.5 times those of the reported ROW. By 1991, the number of wells drilled in the United States was 37 percent greater than the ROW wells. (In 1991, U.S. wells drilled were 26 percent below the ROW including EE and FSU.)

Generally, U.S. oil production since 1970 has been slowly declining, with a plateau in the late 1970s to mid-1980s (Figure C4). The production for the ROW follows oil price trends better than the U.S. production. The variations of oil production in the ROW were largely due to OPEC production variations. High prices in the early 1980s put downward pressure on worldwide demand and therefore world production. Lower demand caused prices to decline. Then, with prices lower, demand began to increase. It is OPEC's policy to try to control oil prices with its production. Foreign oil production was about seven times U.S. oil production in 1991 while in 1970 it was less than four times U.S. production. The ROW has gone from 13 times the U.S. reserves in 1970 to 38 times

U.S. reserves in 1991 (Figure C5). The ROW is also able to add substantially more reserves each year than the United States (Figure C6). For 1991, a R/P ratio of more than five times that of the United States indicates the ROW reserves could last five times longer than U.S. reserves (Figure C7). The fact that the rest of the world can have so much more oil and produce so much more oil with less seismic, rig, and well activity, is a good indication of the relative maturity of U.S. oil resources. The United States has had a great amount of exploration and development activity. Many producing areas are mature in their development and have a low potential for the discovery of large new fields compared to the past. Significant potential for large new fields still exists in the United States in environmentally sensitive or protected areas. The United States is also a high cost area, and activities are affected more by price declines. Countries with low cost oil production and with oil exports accounting for most of their income may have a more significant impact on their economy from price declines than the United States.

Regional Trends

North America

The majority of activity in North America occurs in the United States. U.S. activities overshadow the rest of the continent and are not included here. Canada and Mexico are responsible for the vast majority of the remaining activity.

Seismic activity was flat or slightly increasing in the late 1970s and early 1980s (Table 3, Figure 3b). Seismic crews in these countries have been declining since 1985 and are now 50 percent of the 1985 peak. The largest changes are for Canada. The trend for active rotary rigs has been declining since 1980 (Table 4, Figure 4b). In 1991, rig counts were 63 percent lower than the peak in 1980. The trend for wells drilled rose to a peak in 1985 and then declined by 55 percent as of 1991 (Table 5, Figure 5b). Canada historically drilled 10 to 20 times the number of wells drilled in Mexico during the 1973-83 period, but since 1984 Canada has drilled as many as 69 times the number of wells drilled by Mexico. The high level of activity in Canada combined with the relatively low production is an indication of high maturity similar to the United States.

Large increases in oil production occurred in the early 1980s with a very slight trend downward thereafter (Table 6, Figure 6b). These increases came from Mexico. The 1991 production was 6 percent below the 1984 peak but 134 percent higher than in 1970. Oil reserves also increased in the late 1970s and early 1980s due to increases in Mexico (Table 7, Figure 7b). After a peak in 1984, reserves declined slowly to 1991. In 1991, reserves were 9 percent lower than in 1984 but about 300 percent higher than in 1970 due to increases in Mexico. Annual reserve additions, although erratic, tended to increase to the late 1970s and then declined (Table 8, Figure 8b). Reserve additions have been positive since 1974 except for 1985. However, in each of the last 4 years, reserve additions have not been large enough to offset production. Reserve-to-production ratios (R/P) have been fairly stable since the large jump in the late 1970s (Table 9, Figure 9b). Once again, the changes and trends were mostly due to Mexico. The 1991 R/P ratio stands at 38. Mexico's is 50 and Canada's is 13.

South America

Seismic activity in South America peaked in 1982 and, after declining, has been relatively flat since 1986 (Table 3, Figure

3b). In 1991, seismic activity was down 47 percent from the 1982 peak. The number of active rigs also peaked in 1982, then followed a downward trend through 1990 with a slight increase in 1991 (Table 4, Figure 4b). Historically, Argentina, Brazil, and Venezuela have had the majority of active rigs. Both Argentina and Venezuela maintained relatively higher rig counts in the late 1980s and into the 1990s while Brazil's declined. Total rig counts were down 48 percent from the 1982 peak. The number of wells drilled was stable in the early 1970s, rose to a peak in 1982, and then declined (Table 5, Figure 5b). While Argentina, Brazil, and Venezuela have added the majority of wells, Colombia, Peru, and Trinidad have made significant contributions. Compared to the 1982 peak, wells drilled are down 55 percent in 1991. Venezuelan wells drilled have increased each of the last four years.

Annual oil production was down through the late 1970s and early 1980s but has shown a slightly rising trend since 1984 (Table 6, Figure 6b). Venezuela is the largest contributor to South American production with roughly half. Countries that have been increasing their production through the 1980s include Brazil, Colombia, and Ecuador. Oil production in 1991 was 4 percent lower than in 1970. South America had large reserve increases in the late 1980s (Table 7, Figure 7b) due to large increases in Venezuela and to smaller increases in Brazil, Colombia, and Ecuador. In 1991, oil reserves were 183 percent higher than they were in 1970. Reserve additions have been erratic but were higher in the 1980s than in the 1970s (Table 8, Figure 8b). The large spike in reserve additions for 1986 was almost entirely from Venezuela. Reserve additions have usually been larger than production with Venezuela being by far the most prolific country. R/P ratios follow the same trends as reserves (Table 9, Figure 9b), dominated by Venezuela. In 1991, R/P ratios were 44 for South America and 72 for Venezuela.

Western Europe

Seismic crew counts increased to 1984 and then declined with a rise in 1991 (Table 3, Figure 3c). The 1991 crew counts were 36 percent lower than the 1984 peak. The United Kingdom, Italy, and West Germany have historically held higher rig counts, although West Germany's has declined in recent years (Table 4, Figure 4c). In 1991, 60 percent of the active rigs were in the United Kingdom and

Italy. The general trend peaks in 1982 and declines from there. In 1991, active rigs were down 49 percent from 1982. Rig counts for both the United Kingdom and Italy were down 38 percent from their 1985 peaks. The United Kingdom has contributed the most to wells drilled (Table 5, Figure 5c). Italy has also drilled a significant number of wells, as have France and Germany. The general trend increased to 1985, declined to 1989, and then increased again. In 1991, wells drilled were only 8 percent below the 1985 peak; the United Kingdom was up 64 percent from 1985.

Annual oil production has been generally increasing since 1976. Oil production, for 1991, was 1,250 percent higher than in 1970 due to the large discoveries in the North Sea (Table 6, Figure 6c). Norway and the United Kingdom had large increases in reserves due to North Sea development (Table 7, Figure 7c). Denmark, France, and Italy also increased their reserves. Oil reserves nearly tripled in the early 1970s and have been growing slowly since. In 1991, reserves were up 27 percent from 1973. Oil reserve additions have been somewhat erratic and nearly the same from the 1970s to the 1980s (Table 8, Figure 8c). Norway and the United Kingdom account for most of the reserves changes in the past 20 years. The large R/P ratio spike in the mid-1970s was caused by new discoveries in the North Sea, mostly belonging to the United Kingdom and Norway (Table 9, Figure 9c). In 1991, R/P ratios were 14 for the total, 6 for the United Kingdom, and 22 for Norway.

Eastern Europe (including FSU)

Historical seismic crew activity information is unavailable. A complete series for rig counts is only available for Yugoslavia (Table 4, Figure 4c). Data on wells drilled has essentially been available for only 2 years (Table 5). As expected, the former Soviet Union (FSU) accounted for 96 percent of the total wells drilled in 1991.

The FSU accounts for nearly all oil production in Eastern Europe (Table 6, Figure 6c). Production increased until the early 1980s, then leveled off, and declined the last 2 years. The 1991 oil production was 19 percent below the peak in 1987, and FSU production was 19 percent less than its peak in 1988. The other countries' production was stable or slowly declining. Just as in production, the FSU accounts for nearly all Eastern Europe reserves (Table 7, Figure 7c). Reserves have been relatively stable except for an increase and equivalent drop in the early to mid-1980s in FSU reserves. Oil reserve additions have been very erratic with

the 1980s being higher than the 1970s (Table 8, Figure 8c). All major changes are due to changes in the FSU. R/P ratios were stable with a 1991 ratio of 16 for both the FSU and total Eastern Europe (Table 9, Figure 9c).

Middle East

The number of Middle East seismic crews varies some but is relatively flat overall (Table 3, Figure 3d). The 1991 active crew count was 27 percent below the 1981 high. Active rotary rigs appear to have been slowly declining since the mid-1980s (Table 4, Figure 4d). Middle East rigs for 1991 were down 36 percent from the 1977 high. Iraqi rig counts were unknown in 1991 due to the Persian Gulf War. Relative to other countries in this region, rig counts for Iran, Iraq, Oman, Syria, and Turkey remained high into the late 1980s. Rig counts for Oman and Saudi Arabia have increased in recent years. Total wells drilled have been stable or slowly increasing since the early 1970s (Table 5, Figure 5d). Oman drilled the most wells followed by Saudi Arabia, Syria, Turkey, and Abu Dhabi. The 1991 wells drilled were 27 percent higher than in 1973. Oman drilled five times more wells in 1991 than in 1973, while Saudi Arabia was down 40 percent from 1973.

Annual oil production in the Middle East is dominated by Saudi Arabia followed by Iran, Iraq (until 1991), Abu Dhabi, and Kuwait (until 1991) (Table 6, Figure 6d). Oil production rose in the early 1970s, was stable in the late 1970s, declined in the early 1980s, and has been basically increasing since 1985. Total production for 1991 was down 27 percent from a peak in 1977. Saudi Arabia's production was off 16 percent from its 1980 peak. Saudi Arabia and others increased production in 1990 and 1991 to offset Persian Gulf War losses from Kuwait and Iraq. The Middle East oil reserves were stable in the 1970s but had large increases in the mid-to-late 1980s (Table 7, Figure 7d). Saudi Arabia dominated the reserves changes followed by Iraq, Iran, Kuwait, and Abu Dhabi. In 1991, reserves were 95 percent higher than the low in 1977. Saudi Arabia's reserves were 179 percent higher than its low in 1972. The Middle East's reserve additions were much higher in the 1980s than the 1970s and erratic (Table 8, Figure 8d). The large additions in 1986 were due to Iraq, Kuwait, and Abu Dhabi. Nearly all of the large reserve additions in 1988 came from Saudi Arabia. R/P ratios declined in the 1970s as production increased, then R/P ratios increased while production fell and reserves increased through the 1980s (Table 9, Figure 9d). The 1991 R/P ratio was 101. Saudi Arabia's was 88, Iran's was 52, and Abu Dhabi's was 89. Ratios for Kuwait and Iraq were abnormally high due to the lack of post war production.

Asia/Pacific

Seismic crew counts nearly tripled in the late 1970s and early 1980s, and then began to decline in 1983 (Table 3, Figure

3d). In 1991, crew counts were 42 percent lower than the peak in 1982. Active rigs have not declined as much as in other areas of the world, after reaching a peak in 1982 (Table 4, Figure 4d). Rig counts for 1991 were only 13 percent lower than the high in 1982. Increases in India dominate this trend. India's 1991 rig count was 172 percent higher than in 1982. The dramatic increase in wells drilled was due almost entirely to increases in China (Table 5, Figure 5d). Excluding China, wells in 1991 were 111 percent higher than in 1972. Wells drilled in India, Indonesia, and Australia make up the majority of wells, excluding China. In 1991, wells drilled in China were almost 400 percent higher than in 1979. India's wells, in 1991, were 435 percent higher than in 1979.

Annual oil production has been climbing over the last 20 years (Table 6, Figure 6d). In 1991, production was 273 percent higher than in 1970. China has the most production followed by Indonesia, India, Malaysia, and Australia. All four have had significant increases in production. China's production, in 1991, was seven times what it was in 1970. Excluding China, oil production was 176 percent higher than in 1970. Reserves have increased over the last 20 years (Table 7, Figure 7d). The 1991 reserves are 158 percent higher than in 1970. China holds the majority of the region's oil reserves and increases in reserves since 1970. India and Malaysia have also had substantial increases in reserves. Excluding China, 1991 reserves increased 63 percent since 1970. China's 1991 reserves increased nearly 430 percent since 1970. India's reserves in 1991 were eight times their 1970 value. Reserves for Malaysia tripled. Reserve additions were positive for all of the last 20 years except in 1977, and usually exceeded production (Table 8, Figure 8d). The largest addition in 1989 was almost all from China. R/P ratios have been stable since the late 1970s (Table 9, Figure 9d). The 1991 ratio was 23. China's was 29; India's, 26; and Malaysia's, 16.

Africa

Seismic crews active in Africa have generally declined since their peak in 1981; crew counts were down 43 percent in 1991 (Table 3, Figure 3d). The active rotary rigs have been declining since 1982, but have been flat the

last 2 years (Table 4, Figure 4d). Historically, Algeria has had the most rigs running as it did in 1991. Libya, Nigeria, and Egypt are also major contributors to the rig count. Both Nigeria and Algeria have had increases in recent years. Rig counts for the region in 1991 were down 56 percent from the 1982 peak. Nigeria's 1991 rig count was down 22 percent while Algeria's was down 62 percent from 1982. Libya's and Egypt's 1991 rig counts were off 50 and 53 percent respectively compared to 1982. After a decline in the early 1970s the total wells drilled peaked in 1982, declined to 1987, and were stable until the increase in 1991 (Table 5, Figure 5d). In 1991, wells drilled were 31 percent lower than the peak in 1982. The countries with the most wells drilled in 1991 were Nigeria and Egypt. Historically, the largest have been Algeria, Egypt, Libya, and Nigeria. Nigeria's wells in 1991 were down 52 percent from their peak in 1975, and Egypt's were off 49 percent from their 1985 peak.

Annual oil production has been stable over the last 20 years, except for a drop in 1981 (Table 6, Figure 6d). Production for 1991 was 2 percent above a previous peak in 1979. The largest producers were Nigeria, Libya, Algeria, and Egypt. Nigeria's 1991 production was down 18 percent from its 1979 peak, and Libya's fell 55 percent from 1970. Algeria's 1991 production was up 5 percent from a previous peak in 1979. Egypt has been steadily increasing production and was up 117 percent from 1970. Reserves have been very stable over the last 20 years (Table 7, Figure 7d). Libya, Nigeria, and Algeria have almost all of the reserves in Africa. In 1991, reserves were only 3 percent lower than peak reserves in 1981. Nigeria has added the most reserves over the last 20 years, yielding a three-fold increase for the country since 1970. Reserve additions have been somewhat erratic with little change from the 1970s to the 1980s (Table 8, Figure 8d). Nigeria, Algeria, and Libya have had the largest reserve additions in recent years. R/P ratios for Africa were flat in the 1970s, increased in the early 1980s, and have had a slight decline since 1981 (Table 9, Figure 9d). The 1991 ratios were 24 for the total, 26 for Nigeria, 42 for Libya, 22 for Algeria, and 11 for Egypt.

Table 1. U.S. Refiner Acquisition Cost of Imported Crude Oil, Dollars per Barrel

Year	Nominal \$	1991 \$
1970	2.96	9.91
1971	3.17	10.07
1972	3.22	9.78
1973	4.08	11.64
1974	12.52	32.85
1975	13.93	33.35
1976	13.48	30.36
1977	14.53	30.62
1978	14.57	28.46
1979	21.67	38.91
1980	33.89	55.68
1981	37.05	55.32
1982	33.55	47.16
1983	29.30	39.63
1984	28.88	37.39
1985	26.99	33.68
1986	14.00	17.02
1987	18.13	21.36
1988	14.56	16.52
1989	18.08	19.65
1990	21.76	22.70
1991	18.70	18.70

Source: EIA, *Annual Energy Review 1991*, Table 71.

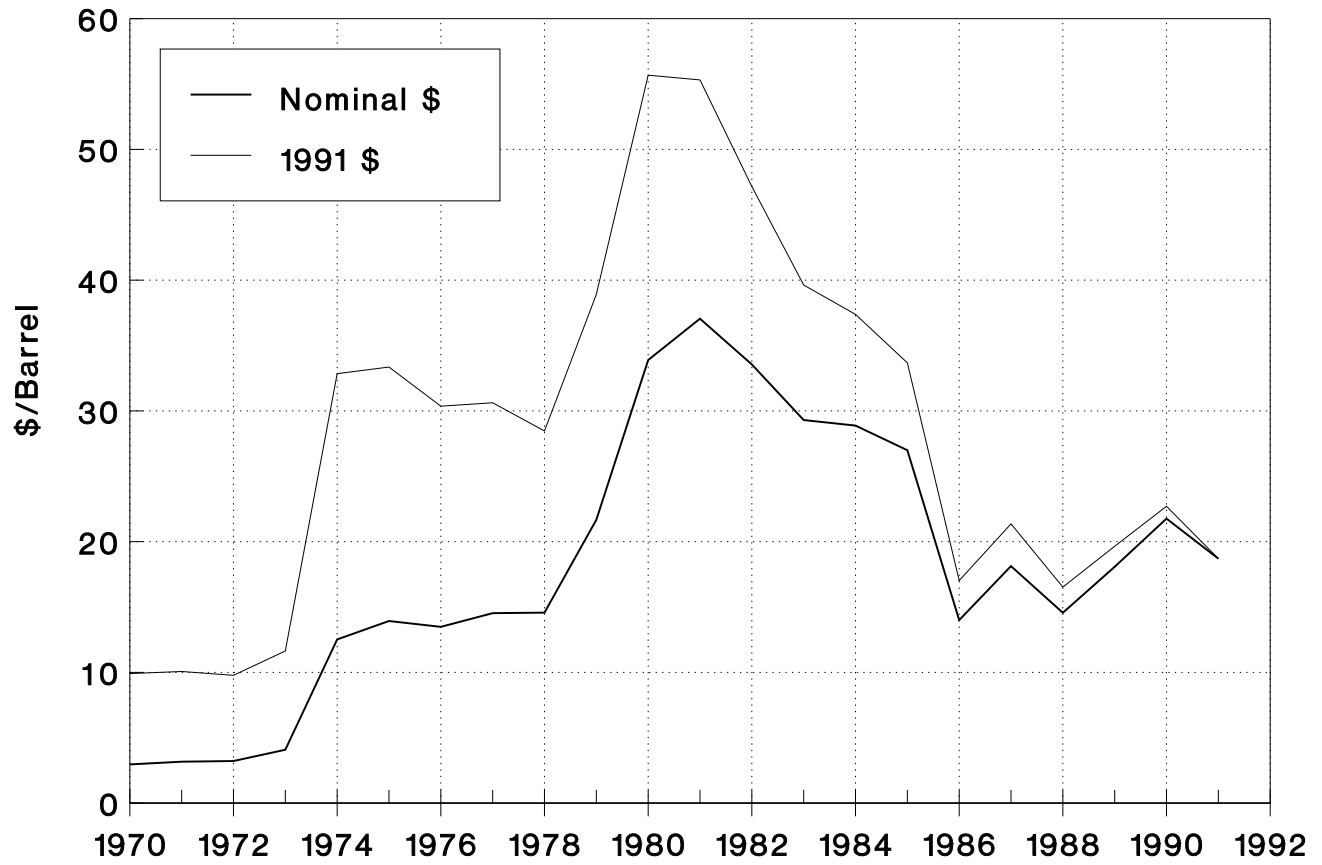
Table 2. Property Acquisition, Exploration, and Development Spending for FRS Companies, Million Dollars

Year	U.S.	Foreign	Total	U.S. Percent of Total	Foreign Percent of Total
1977	10,255	5,563	15,819	64.8	35.2
1978	11,410	6,290	17,700	64.5	35.5
1979	16,872	7,721	24,593	68.6	31.4
1980	22,870	10,724	33,594	68.1	31.9
1981	32,340	11,901	44,241	73.1	26.9
1982	31,824	12,743	44,567	71.4	28.6
1983	25,370	10,263	35,633	71.2	28.8
1984	27,015	10,037	37,052	72.9	27.1
1985	24,603	9,472	34,076	72.2	27.8
1986	14,504	7,505	22,009	65.9	34.1
1987	11,539	7,788	19,327	59.7	40.3
1988	15,547	9,651	25,198	61.7	38.3
1989	12,539	10,922	23,461	53.4	46.6
1990	13,372	11,957	25,329	52.8	47.2
1991	13,131	13,801	26,932	48.8	51.2

Notes: Development expenditures include support equipment.

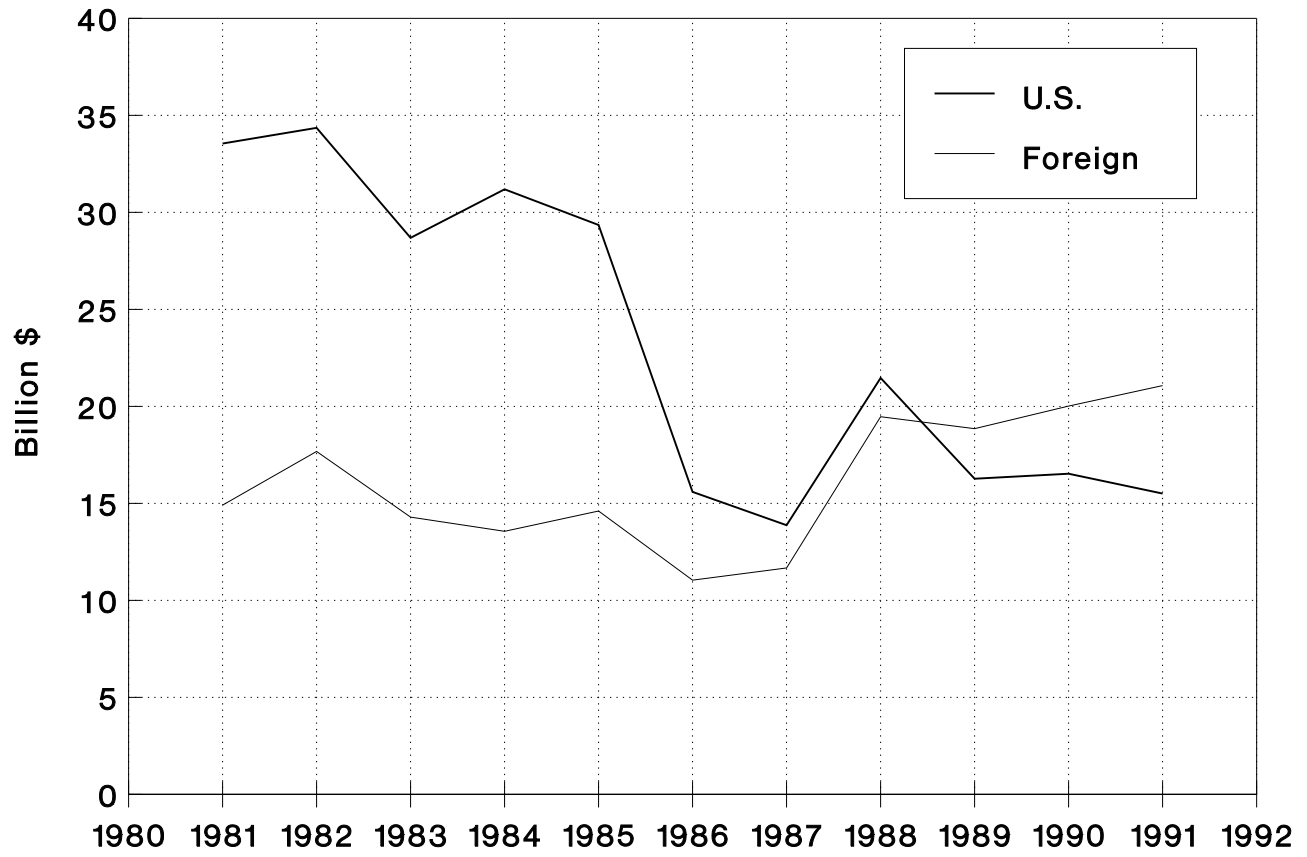
Source: Energy Information Administration, Financial Reporting System (FRS), Form EIA-28.

Figure 1. U.S. Refiner Acquisition Cost of Imported Crude Oil, 1970-1991



Source: Table 1.

Figure 2. U.S. and Foreign Expenditures of 30 Large Companies



Source: Table 2.

Table 3. Active Seismic Crews and Marine Vessels (Average)

Year	United States	Canada	Mexico	Central & South America	Europe	Middle East	Africa	Asia/Pacific	CIS ²	Total	Total w/o US
1976 ¹	277	41	18	61	na	na	na	na	na	621	344
1977	309	56	21	56	54	35	76	43	na	649	340
1978	352	84	27	54	52	40	74	58	na	740	388
1979	413	66	29	61	62	34	58	62	na	783	370
1980	540	78	32	75	83	44	70	74	na	995	456
1981	688	70	32	99	95	49	89	91	na	1,213	525
1982	569	67	30	105	100	46	75	118	na	1,110	541
1983	479	78	28	86	97	34	71	109	na	982	503
1984	490	88	32	88	115	38	62	97	na	1,009	518
1985	364	90	32	72	113	43	60	101	na	874	511
1986	183	54	29	53	91	37	49	83	na	577	394
1987	178	58	23	51	77	38	42	96	na	562	385
1988	176	70	21	57	74	44	42	86	na	570	394
1989	131	58	17	58	67	42	54	72	na	499	369
1990	125	53	18	53	63	39	57	75	na	481	357
1991	101	38	23	56	74	36	51	69	2	448	347

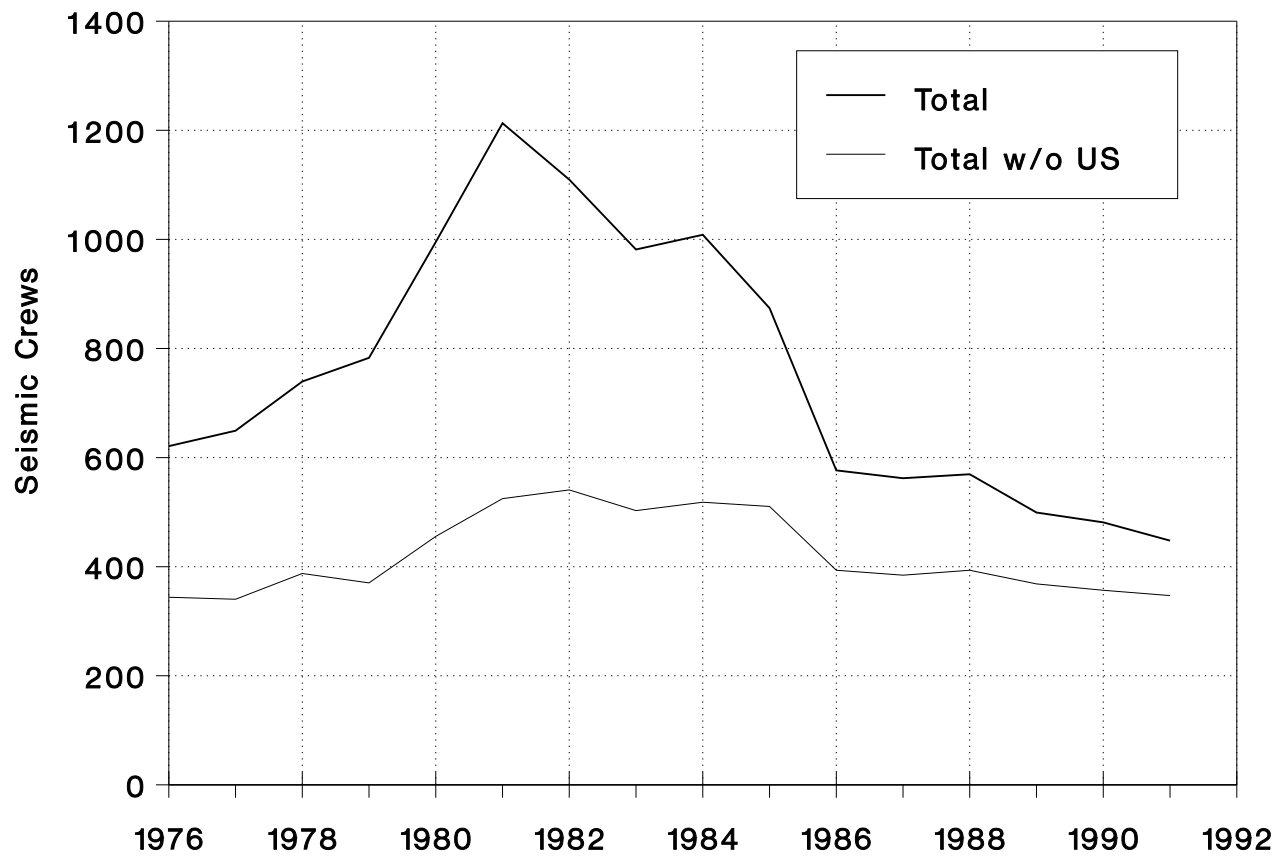
¹Year 1976 is the average of only the third and fourth quarters' reports.

²Data for the Commonwealth of Independent States (CIS) begin in the fourth quarter of 1991. CIS is noted by source as "former USSR".

Note: Data are collected for only 4 months of each year, March, June, September, and December. Annual values are an average of the 4 months reported. na = not available.

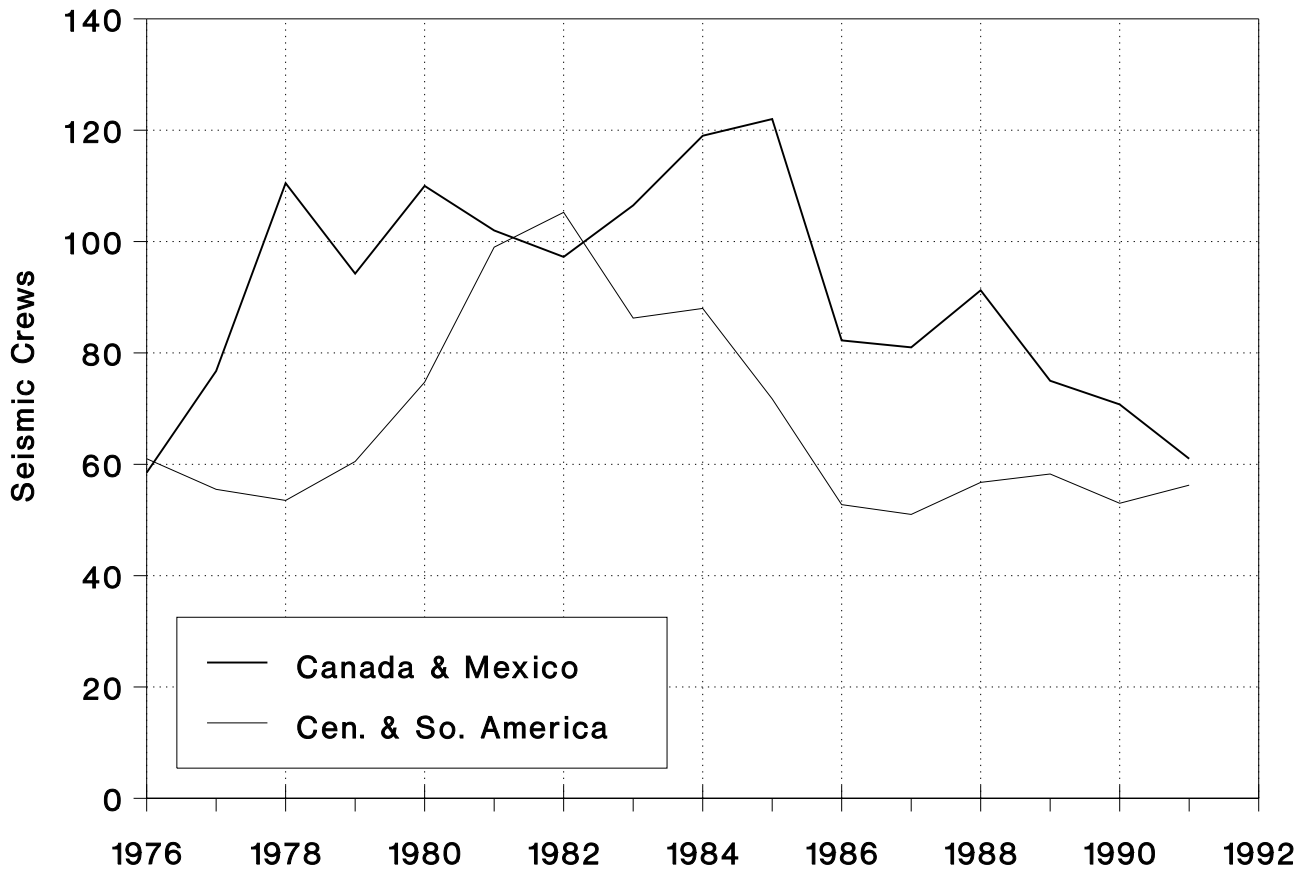
Source: Society of Exploration Geophysicists, *SEG News Release*.

Figure 3a. Active Seismic Crews and Marine Vessels, 1976-1991



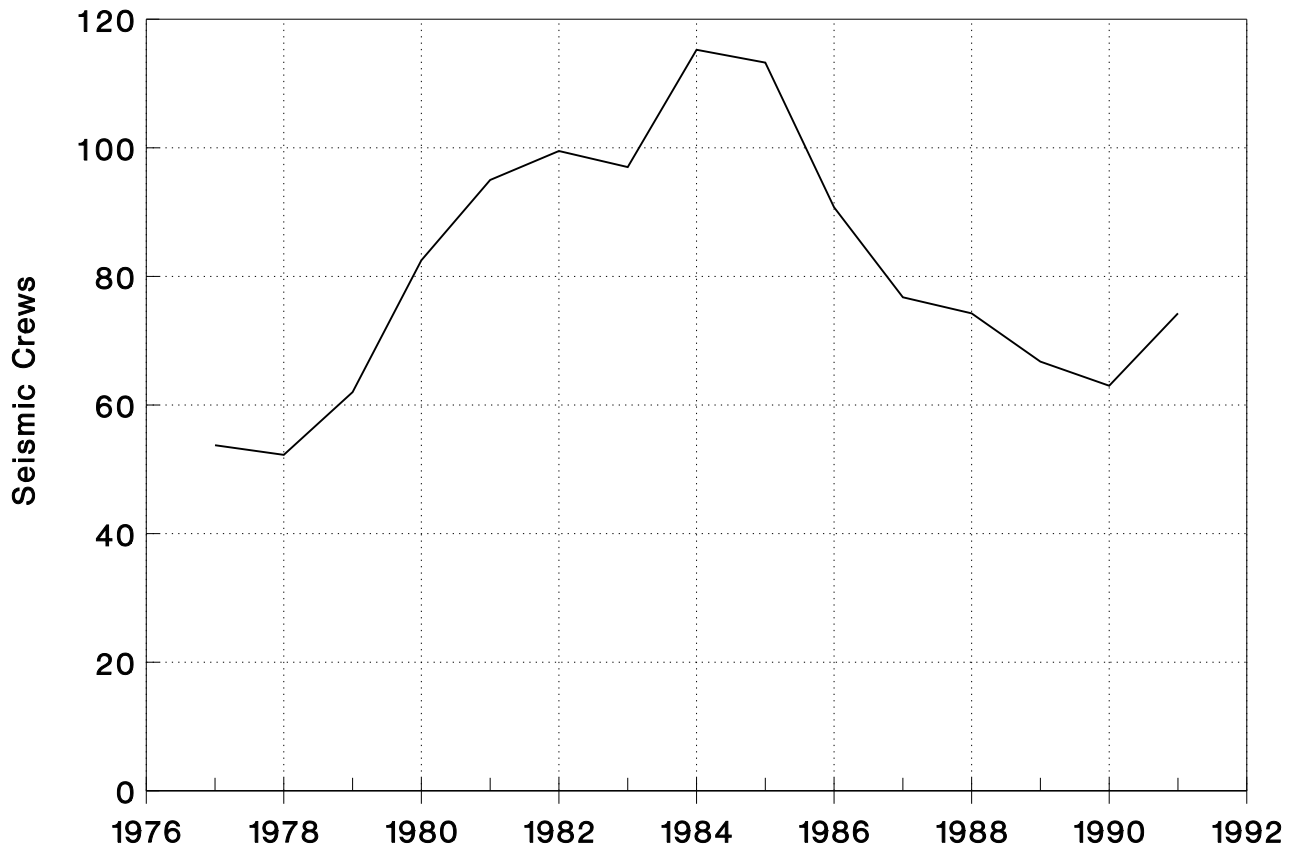
Source: Table 3.

Figure 3b. Active Seismic Crews and Marine Vessels, Western Hemisphere, Excluding the United States, 1976-1991



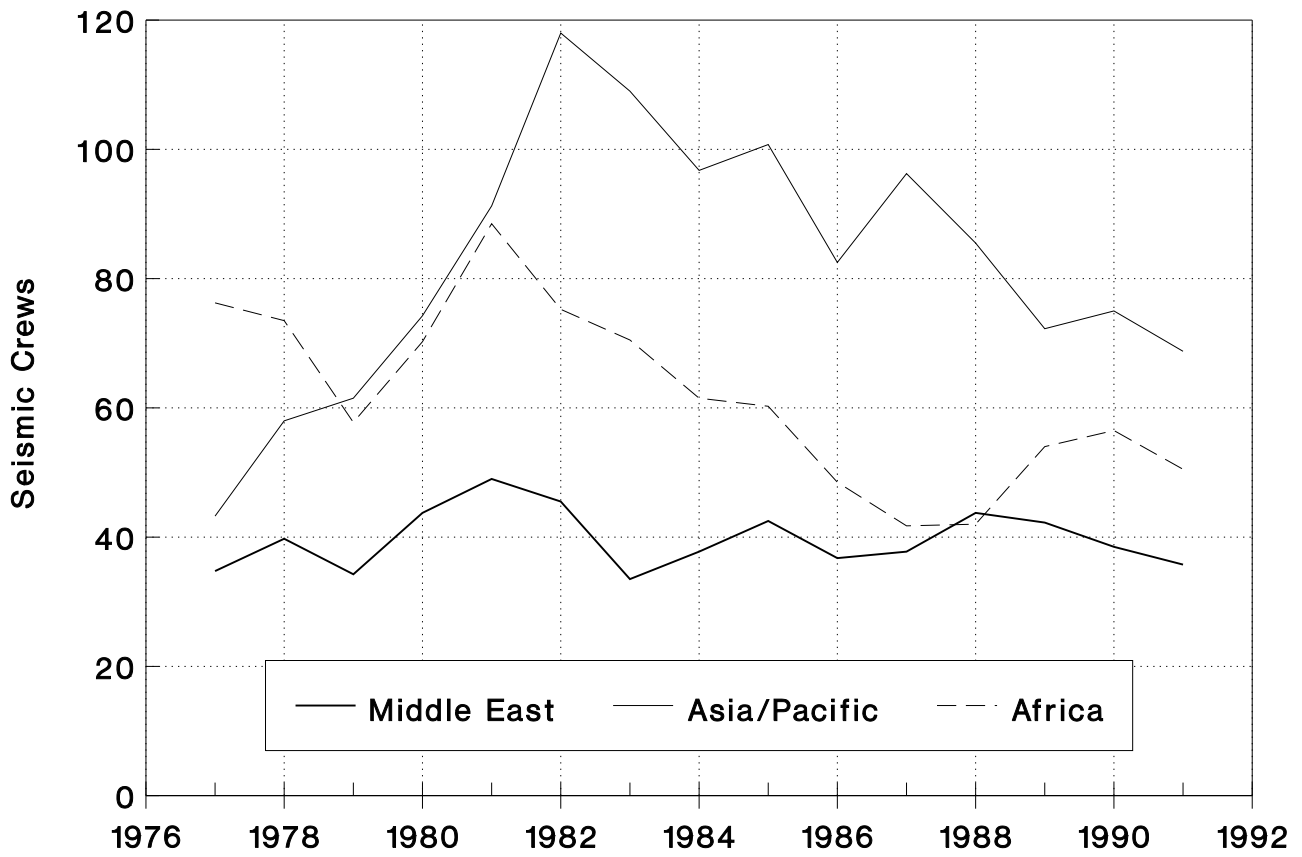
Source: Table 3.

Figure 3c. Active Seismic Crews and Marine Vessels, Europe, 1977-1991



Source: Table 3.

Figure 3d. Active Seismic Crews and Marine Vessels, Middle East, Asia/Pacific, and Africa, 1977-1991



Source: Table 3.

Table 4. Active Rotary Rigs, Annual Average

Region/Country	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
North America										
Canada	178	218	272	339	401	263	199	201	259	311
Mexico	138	148	167	205	215	218	202	187	195	196
United States	1,658	2,002	2,259	2,178	2,911	3,972	3,111	2,230	2,430	1,975
Other	2	3	0	1	4	0	0	1	1	0
Total	1,977	2,371	2,699	2,723	3,532	4,453	3,512	2,619	2,885	2,481
South America										
Argentina	65	68	72	63	76	70	67	73	82	81
Bolivia	8	6	6	5	4	11	11	8	6	5
Brazil	44	45	52	60	72	81	94	83	70	76
Chile	5	5	5	6	7	7	7	6	6	6
Colombia	7	11	11	15	14	22	23	18	16	21
Ecuador	1	1	1	3	3	4	6	5	4	2
Peru	14	13	16	20	21	24	23	16	17	12
Trinidad	17	14	17	14	13	14	13	10	9	10
Venezuela	16	20	33	47	51	63	69	41	30	33
Other	0	1	0	0	0	7	7	2	3	2
Total	178	184	212	234	261	303	320	262	241	247
Western Europe										
Austria	9	9	9	10	8	9	9	9	7	6
Denmark	2	0	0	0	3	2	2	5	3	4
France	13	7	8	11	13	21	22	17	20	22
Greece	0	0	2	2	3	6	5	3	4	1
Italy	11	12	17	21	19	32	38	26	26	40
Netherlands	18	18	14	17	17	17	21	17	18	24
Norway	8	5	5	7	11	12	13	10	10	13
Spain	7	5	5	5	11	11	12	8	9	10
United Kingdom	35	36	33	34	48	58	58	42	60	63
West Germany	22	21	22	21	22	26	31	25	19	20
Other	3	2	3	2	2	2	2	3	2	2
Total	129	116	120	130	156	194	211	164	177	205
Eastern Europe										
Hungary	na	na	na	na	na	na	na	na	na	na
Poland	na	na	na	na	na	na	na	na	na	na
Yugoslavia	13	24	22	22	22	22	24	21	25	27
Other	na	na	na	na	na	na	na	na	na	na
Total	13	24	22	22	22	22	24	21	25	27
Middle East										
Abu Dhabi	14	15	16	20	23	31	41	35	29	21
Dubai	6	3	2	1	3	2	3	7	7	5
Iran	56	56	53	8	na	na	3	13	20	20
Iraq ¹	26	27	29	32	39	14	11	23	19	28
Jordan	na	na	na	na	na	na	na	3	3	2
Kuwait ²	1	1	2	2	3	3	4	5	5	6
Oman	4	6	6	6	8	10	12	11	12	13
Qatar	5	6	6	6	8	7	5	3	2	3
Saudi Arabia	16	21	22	22	25	29	29	26	16	11
Syria	18	17	17	15	15	16	15	15	23	26

Table 4. Active Rotary Rigs, Annual Average (Continued)

Region/Country	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Turkey	17	15	16	8	24	26	34	26	24	25
Yemen ³	na	na	na	na	na	na	na	na	na	1
Other	5	6	4	1	3	5	6	3	1	3
Total	168	173	172	122	149	143	164	168	161	163
Africa										
Algeria	83	108	101	109	111	91	82	54	27	35
Angola	0	1	1	5	5	5	11	12	7	11
Congo	2	2	1	1	4	7	6	4	3	2
Egypt	22	20	16	21	26	27	36	35	36	37
Gabon	5	6	4	6	8	13	12	7	6	7
Kenya	0	0	1	0	0	0	0	0	0	0
Libya	19	23	28	33	41	33	30	24	26	30
Nigeria	15	16	16	18	20	23	27	17	11	10
South Africa	1	2	2	2	2	2	2	2	2	3
Tunisia	4	4	6	7	8	11	11	7	5	4
Other	9	11	15	18	20	27	28	21	18	16
Total	159	192	191	220	245	239	245	184	142	155
Asia-Pacific										
Australia	6	7	10	11	16	23	33	25	34	31
Bangladesh	3	2	2	2	3	5	5	2	4	5
Brunei	5	7	8	8	7	7	10	10	9	7
China, Offshore	0	0	0	9	12	9	10	10	9	14
India	41	42	39	40	43	44	50	56	57	62
Indonesia	51	46	62	66	77	86	92	88	82	80
Japan	14	14	13	15	16	16	21	20	18	16
Malaysia	4	8	11	13	12	12	13	10	9	8
Myanmar (Burma)	18	17	18	22	26	30	32	36	33	33
New Zealand	1	1	2	2	2	3	1	2	2	4
Pakistan	7	5	8	13	14	15	17	17	17	18
Papua, New Guinea	0	0	0	0	1	0	0	1	1	2
Philippines	6	6	6	15	12	13	14	8	3	2
Taiwan	10	11	9	10	12	11	3	5	6	7
Thailand	4	1	2	2	5	7	8	13	11	9
Other	0	1	1	2	1	0	0	0	0	0
Total	171	168	191	228	257	281	312	302	294	297
OPEC⁴	318	353	376	371	411	401	414	346	282	292
Non-OPEC	2,478	2,875	3,232	3,309	4,211	5,234	4,373	3,372	3,645	3,283
Non-OPEC w/o US	819	873	973	1,131	1,299	1,262	1,262	1,142	1,215	1,308
Total w/o US	1,137	1,226	1,348	1,502	1,710	1,663	1,676	1,488	1,497	1,600
Total	2,796	3,228	3,608	3,680	4,622	5,635	4,788	3,718	3,927	3,575

Table 4. Active Rotary Rigs, Annual Average (Continued)

Region/Country	1986	1987	1988	1989	1990	1991
North America						
Canada	177	181	195	129	137	124
Mexico	163	143	155	103	90	109
United States	968	937	937	871	1,008	862
Other	0	1	0	0	0	0
Total	1,307	1,262	1,287	1,103	1,236	1,094
South America						
Argentina	47	61	63	55	64	60
Bolivia	3	6	5	6	6	10
Brazil	77	60	39	28	23	21
Chile	6	7	5	5	5	6
Colombia	16	14	19	15	11	9
Ecuador	3	3	6	5	2	7
Peru	13	15	11	10	5	3
Trinidad	11	8	7	6	8	6
Venezuela	29	18	25	28	32	45
Other	0	1	0	0	0	0
Total	205	193	180	156	155	166
Western Europe						
Austria	6	4	4	2	1	1
Denmark	2	3	2	2	2	2
France	15	8	8	7	6	4
Greece	0	2	2	1	0	0
Italy	33	26	24	22	21	25
Netherlands	15	10	13	12	14	11
Norway	12	12	15	12	12	16
Spain	7	2	2	3	1	1
United Kingdom	43	44	57	46	48	39
West Germany	19	12	9	8	9	7
Other	1	0	1	0	0	1
Total	153	123	138	116	115	107
Eastern Europe						
Hungary	na	na	na	na	na	4
Poland	na	na	na	na	na	22
Yugoslavia	30	31	31	32	31	15
Other	na	na	na	na	na	na
Total	30	31	31	32	31	40
Middle East						
Abu Dhabi	15	9	7	6	9	13
Dubai	3	2	3	3	3	3
Iran	18	18	18	19	18	21
Iraq ¹	21	10	23	26	23	na
Jordan	2	2	2	3	2	2
Kuwait ²	6	6	6	4	2	1
Oman	13	10	9	13	17	14
Qatar	0	1	3	3	2	3
Saudi Arabia	6	5	4	5	10	16
Syria	27	22	24	24	17	14

Table 4. Active Rotary Rigs, Annual Average (Continued)

Region/Country	1986	1987	1988	1989	1990	1991
Turkey	27	26	21	20	17	19
Yemen ³	4	4	3	2	3	5
Other	3	1	0	1	1	0
Total	146	117	125	129	123	110
Africa						
Algeria	41	40	32	24	35	31
Angola	7	10	10	8	8	6
Congo	2	3	2	1	2	3
Egypt	33	22	21	18	15	17
Gabon	3	3	5	6	5	5
Kenya	0	1	1	2	1	0
Libya	20	12	16	17	15	15
Nigeria	10	11	13	14	18	21
South Africa	3	3	4	3	3	2
Tunisia	3	4	3	3	3	6
Other	7	4	5	4	2	0
Total	129	114	113	101	107	107
Asia-Pacific						
Australia	15	16	19	14	14	12
Bangladesh	5	5	2	5	4	0
Brunei	5	3	4	4	5	4
China, Offshore	7	4	8	4	3	2
India	70	116	131	135	137	136
Indonesia	62	37	44	46	52	53
Japan	15	10	11	6	7	6
Malaysia	8	8	9	12	13	13
Myanmar (Burma)	33	29	25	23	19	21
New Zealand	4	2	2	2	1	1
Pakistan	17	14	13	13	11	10
Papua, New Guinea	1	2	3	3	3	2
Philippines	1	2	3	7	6	5
Taiwan	7	4	4	5	3	3
Thailand	4	6	6	6	5	4
Other	0	0	1	1	1	0
Total	253	260	285	285	285	271
OPEC⁴	238	173	200	203	225	226
Non-OPEC	1,985	1,926	1,960	1,720	1,827	1,669
Non-OPEC w/o US	1,018	989	1,023	849	819	807
Total w/o US	1,255	1,162	1,222	1,052	1,044	1,033
Total	2,223	2,100	2,159	1,922	2,052	1,895

¹Rig counts from Iraq have been unavailable since August 1990 when Iraq invaded Kuwait.

²Rig counts from Kuwait were unavailable from August 1990 through August 1991.

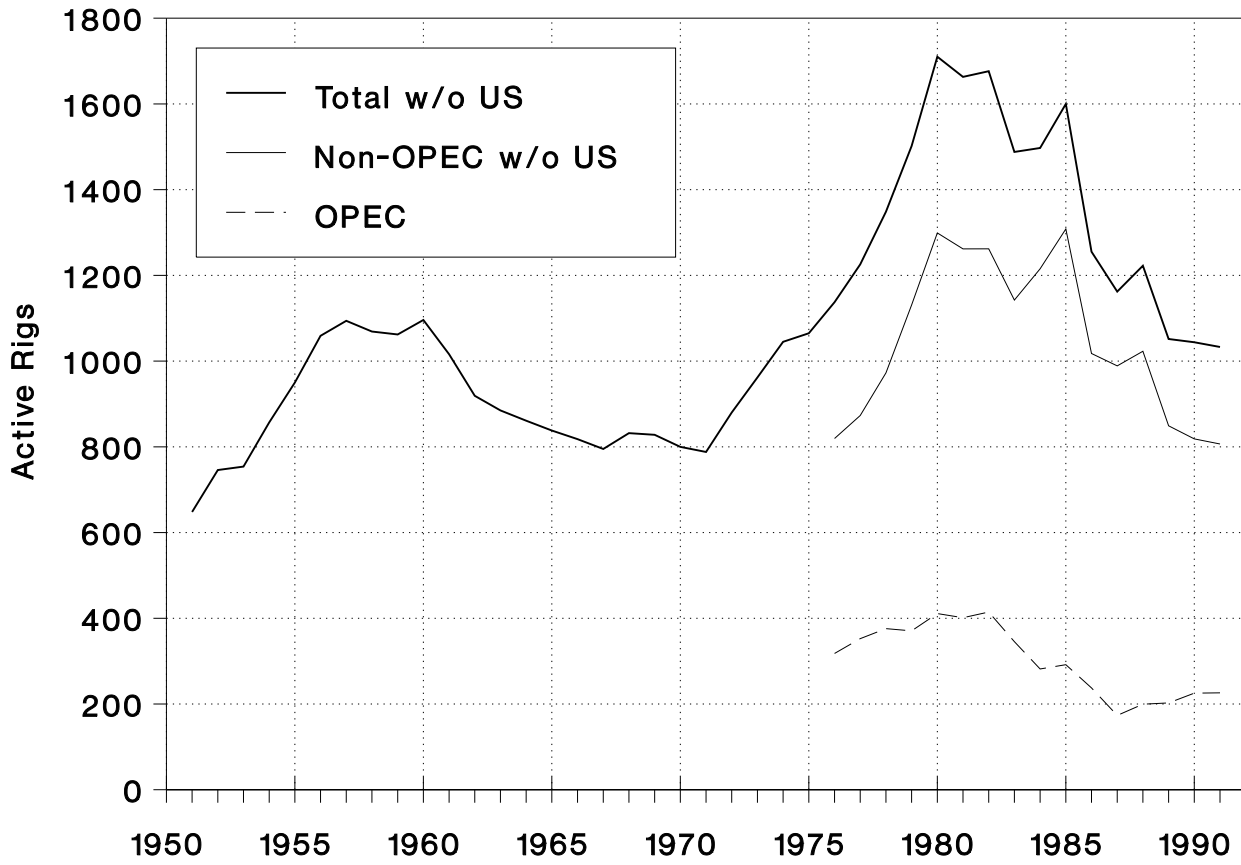
³Includes only North Yemen prior to May 1990.

⁴Includes Middle East Other.

Note: A listing of OPEC countries is contained in the Glossary. Column totals may not add due to independent rounding. na = not available.

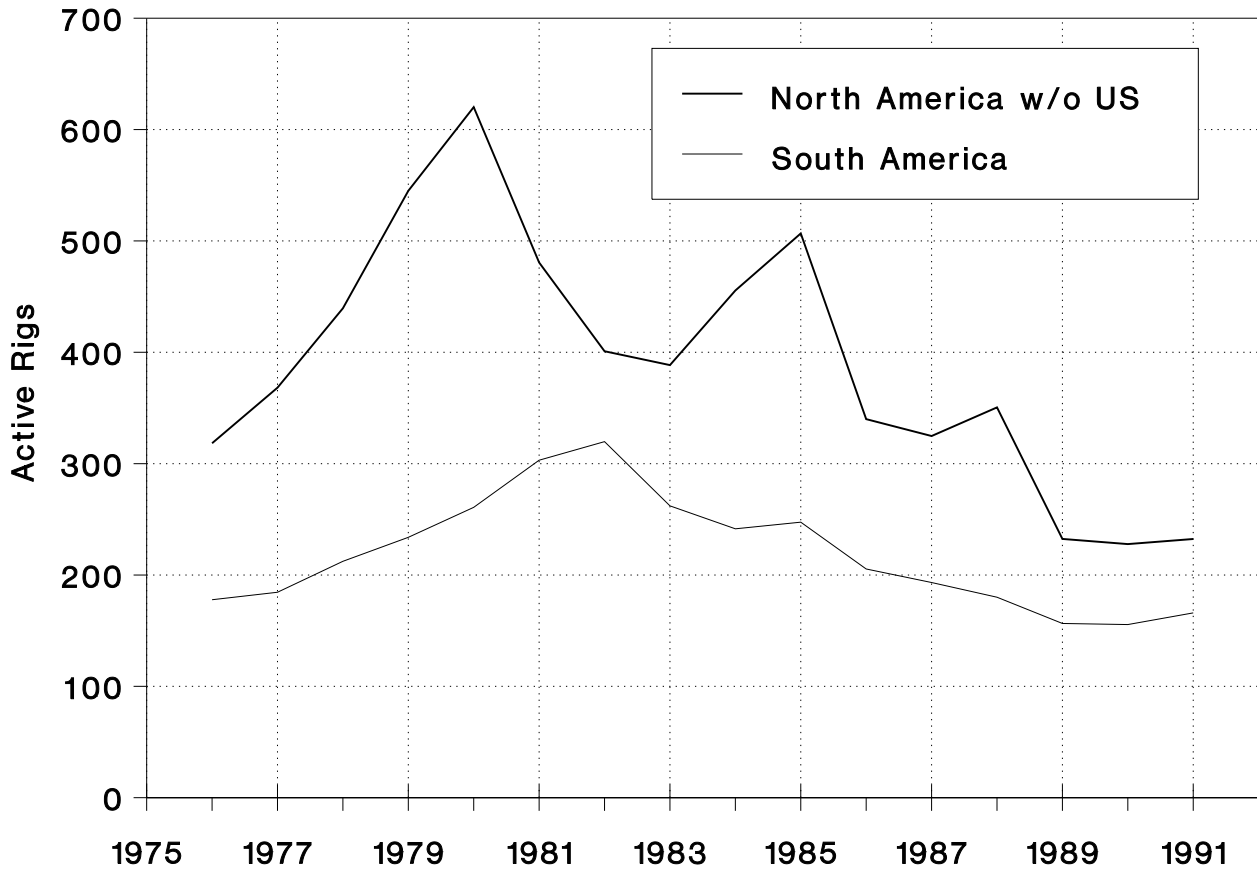
Source: Baker Hughes, Inc.

Figure 4a. Active Rotary Rigs, Excluding the United States, 1951-1991



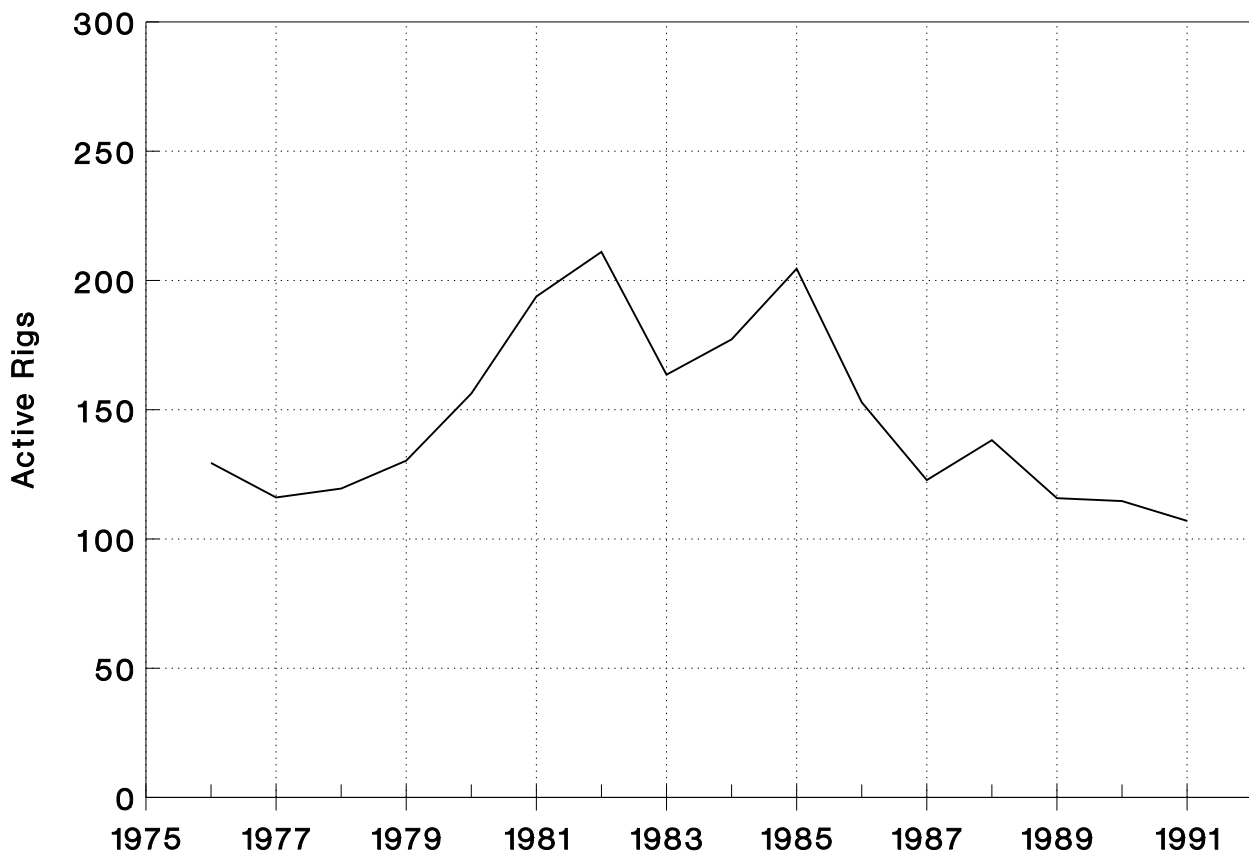
Source: Table 4.

Figure 4b. Active Rotary Rigs, Western Hemisphere, Excluding the United States, 1976-1991



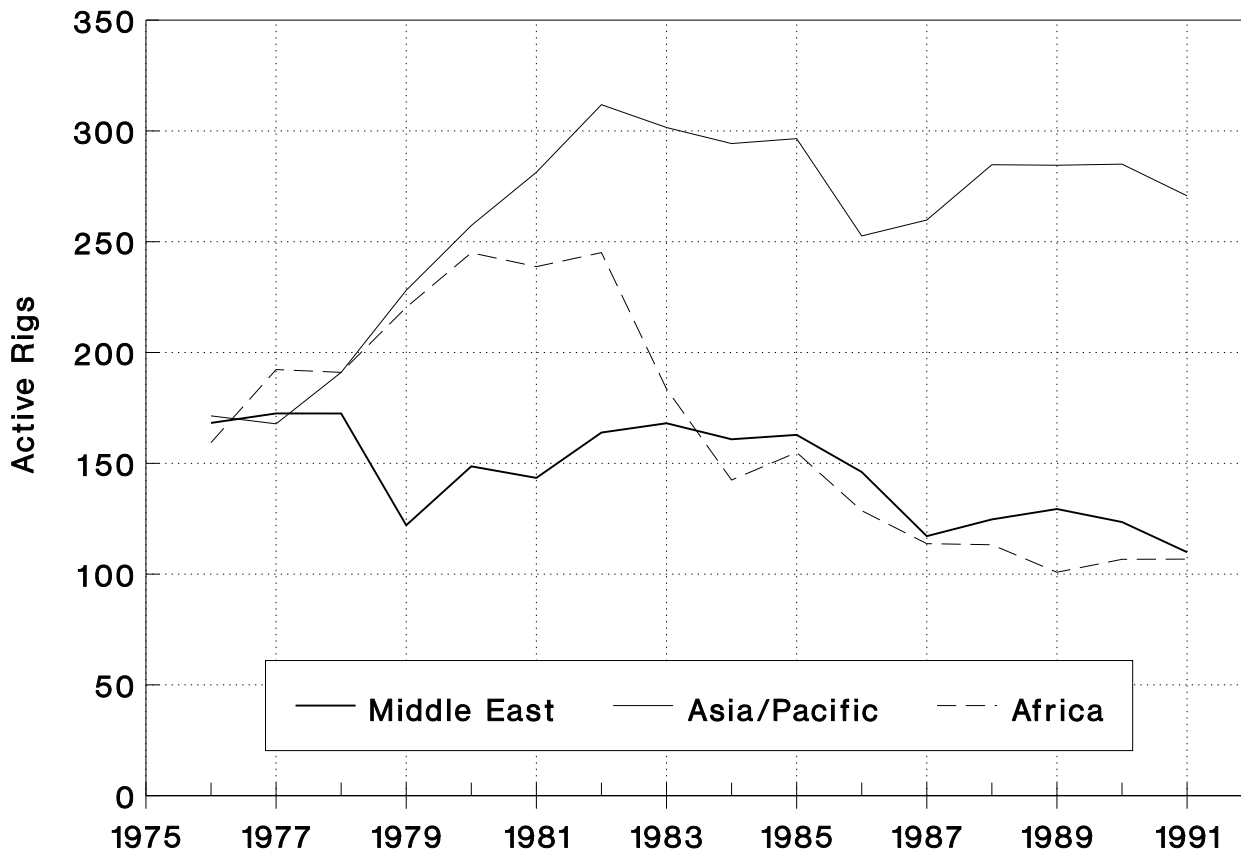
Source: Table 4.

Figure 4c. Active Rotary Rigs in Western Europe, 1976-1991



Source: Table 4.

Figure 4d. Active Rotary Rigs, Middle East, Asia/Pacific, and Africa, 1976-1991



Source: Table 4.

Table 5. Total Wells Drilled

Region/Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
North America											
Canada	3,108	3,175	3,673	4,561	4,193	4,324	5,690	6,257	6,764	7,781	9,416
Cuba	na	na	na	na	na	na	na	na	na	na	na
Mexico	502	516	431	422	409	353	336	307	306	333	434
United States	28,120	25,851	27,864	26,081	33,470	38,387	40,529	46,106	49,931	50,332	64,847
Other	13	6	11	9	7	7	6	13	13	25	26
Total	31,743	29,548	31,979	31,073	38,079	43,071	46,561	52,683	57,014	58,471	74,723
South America											
Argentina	579	595	615	599	606	529	585	880	775	773	953
Bolivia	33	18	14	16	15	18	40	38	33	29	23
Brazil	177	175	179	127	176	228	277	261	311	385	463
Chile	66	81	67	69	71	62	72	78	88	90	103
Colombia	58	71	56	54	37	30	49	69	83	145	174
Ecuador	37	81	59	64	40	14	19	16	16	40	23
Peru	135	121	118	116	153	169	155	155	156	451	540
Suriname	7	1	0	0	0	1	0	0	0	na	na
Trinidad	135	220	195	212	199	189	207	217	215	188	218
Venezuela	589	464	527	424	557	294	274	530	807	1,030	1,275
Other	0	12	4	3	8	4	12	21	20	0	0
Total	1,816	1,839	1,834	1,684	1,862	1,538	1,690	2,265	2,504	3,131	3,772
Western Europe											
Austria	60	53	79	74	81	82	75	77	55	65	66
Denmark	3	3	3	4	4	8	17	4	4	4	11
France	17	11	24	15	12	34	24	34	50	44	72
Germany ¹	59	62	48	36	67	69	103	105	110	134	142
Greece	2	1	2	3	3	1	3	7	8	6	19
Italy	89	94	77	45	47	62	53	74	97	58	103
Netherlands	51	84	93	72	79	88	92	83	99	93	107
Norway	15	15	15	21	37	46	31	24	19	72	66
Spain	0	13	14	20	10	18	33	24	22	22	35
Sweden	0	4	20	23	23	35	6	7	32	11	23
United Kingdom	66	74	71	111	130	151	143	197	192	151	196
Other	0	4	2	25	8	14	13	20	20	15	5
Total	362	418	448	449	501	608	593	656	708	675	845
Eastern Europe											
Albania	na	na	na	na	na	na	na	na	na	na	na
Bulgaria	na	na	na	na	na	na	na	na	na	na	na
Czechoslovakia	na	na	na	na	na	na	na	na	na	na	na
Hungary	na	na	na	na	na	na	na	na	na	na	na
Poland	na	na	na	na	na	na	na	na	na	na	na
Romania	na	na	na	na	na	na	na	na	na	na	na
USSR, former	na	na	na	na	na	na	na	na	na	na	na
Yugoslavia ²	na	na	na	na	na	na	na	na	na	118	186
Other	na	na	na	na	na	na	na	na	na	na	na
Total	0	0	0	0	0	0	0	0	0	118	186
Middle East											
Abu Dhabi	7	19	48	114	110	89	99	83	93	89	123
Bahrain	0	0	7	7	11	9	8	5	9	10	14
Dubai	0	7	13	16	17	17	24	23	9	7	13
Iran	44	104	59	75	103	153	169	166	112	0	0
Iraq ³	6	17	12	25	36	45	47	45	42	66	67
Israel	10	7	4	3	3	8	10	17	24	14	11
Kuwait	13	8	2	1	0	1	7	3	5	12	36
Neutral Zone	23	12	10	14	20	12	6	4	2	3	4
Oman	27	0	113	50	36	53	39	48	54	102	89

Table 5. Total Wells Drilled (Continued)

Region/Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Qatar	7	10	8	10	5	13	11	20	32	46	53
Saudi Arabia	43	56	176	323	300	212	138	180	145	144	223
Syria	na	na	na	35	40	65	63	37	36	30	73
Turkey	60	48	49	65	73	82	88	105	78	87	105
Yemen ⁴	na	na	na	na	na	na	na	na	na	na	na
Other	2	5	2	2	3	2	3	6	6	2	4
Total	242	293	503	740	757	761	712	742	647	612	817
Africa											
Algeria	115	109	79	104	65	103	157	189	177	267	249
Angola	37	55	34	30	50	20	5	12	14	21	22
Cameroon	6	2	5	8	8	9	13	41	44	58	54
Congo	9	16	43	17	9	38	6	17	35	21	39
Egypt	67	43	52	49	47	50	63	76	75	69	87
Gabon	26	36	44	52	60	47	40	36	30	38	40
Ghana	11	2	1	1	1	5	0	3	4	2	1
Libya	250	87	80	83	72	84	88	136	175	184	192
Morocco	1	9	7	4	2	7	10	5	4	7	11
Nigeria	168	227	258	251	247	264	176	172	138	116	132
South Africa	15	16	7	18	11	15	15	13	6	12	8
Tunisia	6	16	19	16	26	30	10	19	25	34	15
Zaire	0	4	6	9	0	7	5	2	7	1	2
Other	28	29	13	14	20	19	10	12	16	11	16
Total	739	651	648	656	618	698	598	733	750	841	868
Asia-Pacific											
Australia	125	98	133	71	51	29	36	41	73	107	127
Brunei	na	na	52	48	41	50	50	75	67	91	41
China	na	na	na	na	na	na	na	na	na	1,873	2,893
India	na	na	81	64	104	123	156	138	117	102	119
Indonesia	88	425	527	627	643	637	529	442	499	473	635
Japan	107	4	77	56	62	39	26	26	35	57	58
Malaysia	18	12	40	42	45	63	47	59	101	124	97
Myanmar (Burma)	3	0	24	26	54	51	56	26	31	32	32
New Zealand	9	9	11	4	4	11	9	3	21	12	4
Pakistan	7	4	4	4	8	7	5	12	7	12	12
Papua, New Guinea	na	na	na	na	na	na	2	1	1	na	1
Philippines	2	17	8	11	7	13	8	15	18	20	19
Taiwan	5	9	9	19	16	27	22	21	21	18	26
Thailand	0	1	3	6	17	11	6	3	8	7	9
Other	0	0	0	0	5	12	21	24	14	37	5
Total	364	579	969	978	1,057	1,073	973	886	1,013	2,965	4,078
OPEC⁵	1,381	1,586	1,845	2,121	2,238	1,973	1,768	2,035	2,272	2,477	3,046
Non-OPEC	33,885	31,742	34,536	33,459	40,636	45,776	49,359	55,930	60,364	64,336	82,243
Non-OPEC w/o US	5,765	5,891	6,672	7,378	7,166	7,389	8,830	9,824	10,433	14,004	17,396
Total w/o US	7,146	7,477	8,517	9,499	9,404	9,362	10,598	11,859	12,705	16,481	20,442
Total	35,266	33,328	36,381	35,580	42,874	47,749	51,127	57,965	62,636	66,813	85,289

Table 5. Total Wells Drilled (Continued)

Region/Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
North America											
Canada	7,186	6,561	7,095	9,763	12,564	5,991	7,078	8,886	5,804	6,020	5,539
Cuba	na	na	na	na	na	na	14	56	76	73	60
Mexico	412	358	314	303	288	246	103	144	123	106	184
United States	80,642	79,506	67,082	83,613	69,673	39,617	34,626	31,914	27,610	29,107	30,093
Other	26	34	30	26	21	20	3	5	7	5	4
Total	88,266	86,459	74,521	93,705	82,546	45,874	41,824	41,005	33,620	35,311	35,880
South America											
Argentina	904	957	1,005	1,014	922	716	941	959	763	880	679
Bolivia	37	31	18	14	18	24	19	25	42	33	44
Brazil	667	1,119	1,145	954	1,055	1,154	908	726	572	407	363
Chile	76	91	86	84	77	88	87	69	53	57	51
Colombia	197	194	248	271	352	279	170	274	203	155	131
Ecuador	41	32	32	24	27	29	28	44	32	37	63
Peru	541	427	126	179	177	147	153	117	95	56	62
Suriname	na	na	na	15	12	51	35	57	59	na	na
Trinidad	243	247	216	224	182	168	155	137	80	115	95
Venezuela	905	2,022	1,475	820	684	605	230	269	282	315	693
Other	3	7	7	0	10	4	2	0	3	80	107
Total	3,614	5,127	4,358	3,599	3,516	3,265	2,728	2,677	2,184	2,135	2,288
Western Europe											
Austria	74	78	53	72	70	38	37	25	25	26	35
Denmark	14	18	27	23	36	10	11	19	11	18	22
France	119	125	125	127	204	156	92	85	72	72	69
Germany ¹	121	161	118	136	72	74	38	30	17	21	41
Greece	14	15	13	7	4	2	3	5	3	1	0
Italy	104	139	156	138	142	219	226	163	124	135	168
Netherlands	85	103	89	119	139	95	72	77	72	79	85
Norway	55	71	63	84	102	96	86	86	91	96	110
Spain	38	32	34	25	34	19	13	10	11	6	10
Sweden	20	19	15	20	17	5	8	na	17	na	na
United Kingdom	197	235	248	327	283	266	295	368	382	504	465
Other	10	8	9	6	6	6	0	19	6	38	17
Total	851	1,004	950	1,084	1,109	986	881	887	831	996	1,022
Eastern Europe											
Albania	na	na	na	na	na	na	na	na	na	143	29
Bulgaria	na	na	na	na	na	na	na	na	na	8	9
Czechoslovakia	na	na	na	na	na	na	na	na	na	50	58
Hungary	na	na	na	na	na	na	na	na	91	91	65
Poland	na	na	na	na	na	na	na	na	247	133	171
Romania	na	na	na	na	na	na	na	na	1,196	506	430
USSR, former	na	na	na	na	na	na	na	na	na	18,940	18,110
Yugoslavia ²	149	158	193	133	210	196	128	na	101	64	20
Other	na	na	na	na	na	na	na	na	na	0	0
Total	149	158	193	133	210	196	128	0	1,635	19,935	18,892
Middle East											
Abu Dhabi	146	207	210	165	174	124	60	41	40	51	79
Bahrain	12	14	14	4	9	20	23	1	20	21	10
Dubai	11	21	29	34	34	31	18	24	23	24	25
Iran	0	0	18	40	50	27	28	23	28	24	52
Iraq ³	0	0	na	50	60	90	52	102	178	na	na
Israel	13	na	11	5	na	7	4	3	4	na	na
Kuwait	44	12	35	11	12	18	19	13	13	7	20
Neutral Zone	5	9	7	1	1	0	0	1	1	0	2
Oman	110	149	137	129	144	183	165	159	206	303	259

Table 5. Total Wells Drilled (Continued)

Region/Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Qatar	46	50	28	17	8	4	8	36	12	19	25
Saudi Arabia	229	185	202	117	103	30	24	18	45	98	194
Syria	79	84	82	140	98	108	100	72	118	108	96
Turkey	97	99	76	81	107	128	96	93	91	100	89
Yemen ⁴	na	na	na	3	19	48	59	64	72	77	71
Other	10	24	18	27	22	15	9	14	18	19	17
Total	802	854	867	824	841	833	665	664	869	851	939
Africa											
Algeria	159	162	140	66	40	46	55	58	57	70	69
Angola	34	83	80	57	60	48	52	59	50	57	56
Cameroon	50	71	73	50	32	4	5	8	10	3	15
Congo	61	77	56	36	33	32	33	29	34	39	41
Egypt	107	125	139	134	221	155	135	154	123	102	112
Gabon	61	66	50	39	43	21	28	53	50	45	64
Ghana	3	1	na	2	3	2	11	na	3	na	na
Libya	157	89	80	86	65	62	41	100	110	98	94
Morocco	16	11	10	9	5	7	8	4	na	na	na
Nigeria	172	127	112	84	58	56	58	65	71	95	127
South Africa	15	10	14	17	20	32	17	17	17	15	13
Tunisia	39	33	19	15	22	29	26	14	16	17	30
Zaire	4	7	15	44	39	8	4	6	0	2	5
Other	25	58	69	29	9	6	3	24	17	24	8
Total	903	920	857	668	650	508	476	591	558	567	634
Asia-Pacific											
Australia	193	329	272	373	365	178	282	291	225	243	223
Brunei	56	63	85	96	37	28	28	17	21	23	32
China	2,841	3,768	4,124	5,292	6,100	7,058	7,375	8,750	9,214	8,590	9,320
India	146	189	196	225	231	381	405	472	574	662	546
Indonesia	727	795	882	769	678	613	463	656	630	737	771
Japan	90	84	47	28	31	22	12	15	14	16	25
Malaysia	103	109	110	94	56	79	78	76	111	112	130
Myanmar (Burma)	35	64	190	257	209	82	63	66	30	50	81
New Zealand	6	5	14	14	20	22	18	18	9	15	11
Pakistan	22	20	27	46	77	81	38	54	53	60	73
Papua, New Guinea	0	na	4	5	5	na	6	15	26	24	15
Philippines	17	13	5	3	0	0	3	7	7	4	10
Taiwan	17	13	15	14	18	18	10	18	10	8	11
Thailand	19	51	106	108	88	22	54	81	83	80	74
Other	4	6	0	6	7	17	17	110	43	33	38
Total	4,276	5,509	6,077	7,330	7,922	8,601	8,852	10,646	11,050	10,657	11,360
OPEC⁵	2,672	3,769	3,286	2,326	2,032	1,742	1,093	1,473	1,558	1,602	2,232
Non-OPEC	96,189	96,262	84,537	105,017	94,762	58,521	54,461	54,997	49,189	68,850	68,783
Non-OPEC w/o US	15,547	16,756	17,455	21,404	25,089	18,904	19,835	23,083	21,579	39,743	38,690
Total w/o US	18,219	20,525	20,741	23,730	27,121	20,646	20,928	24,556	23,137	41,345	40,922
Total	98,861	100,031	87,823	107,343	96,794	60,263	55,554	56,470	50,747	70,452	71,015

¹West Germany only prior to 1991.

²Croatia only in 1991.

³Not available since August 1990 when Iraq invaded Kuwait.

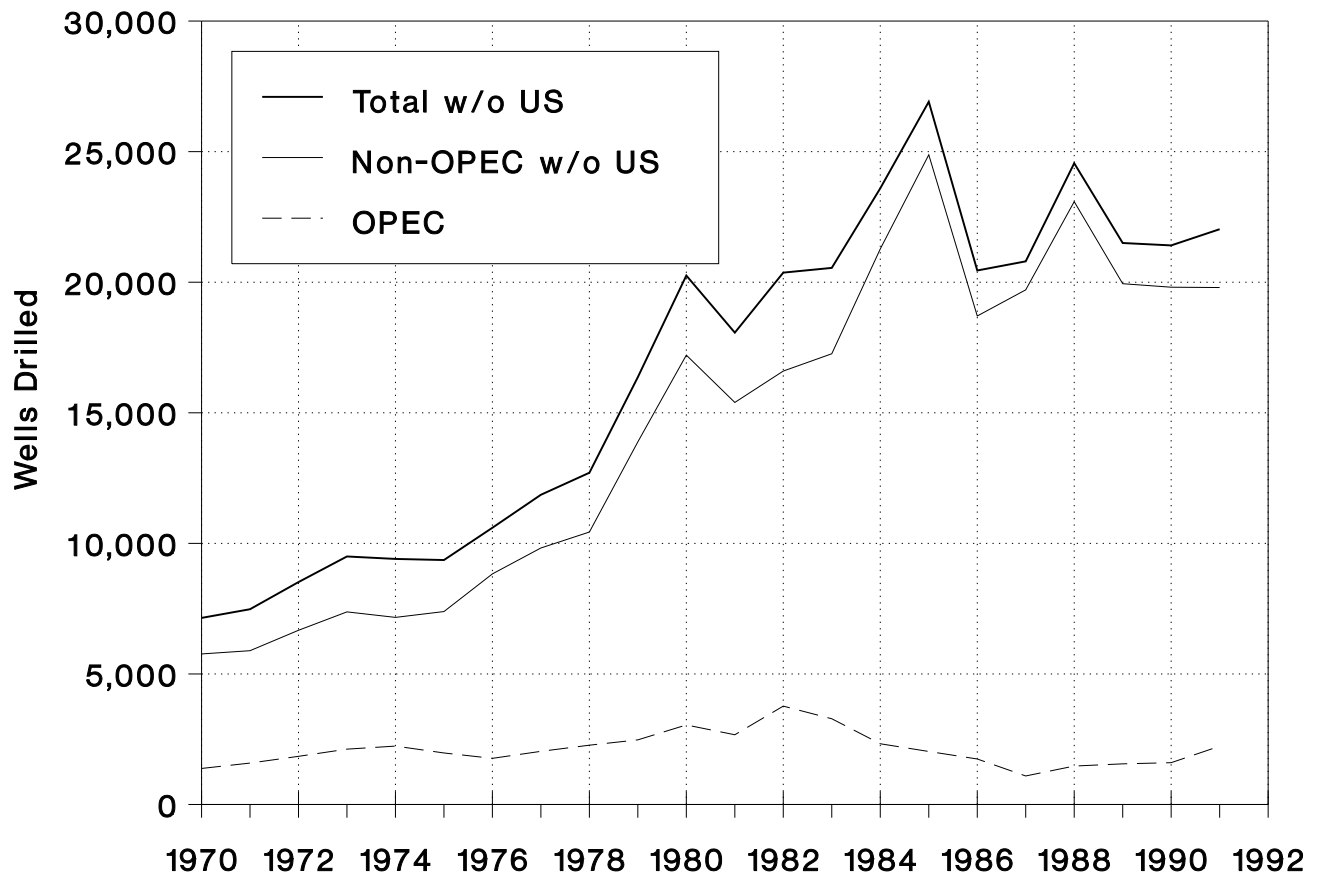
⁴North Yemen only prior to 1987.

⁵Includes Middle East Other.

Note: Total wells drilled consists of oil, gas, dry, and service wells. na = not available.

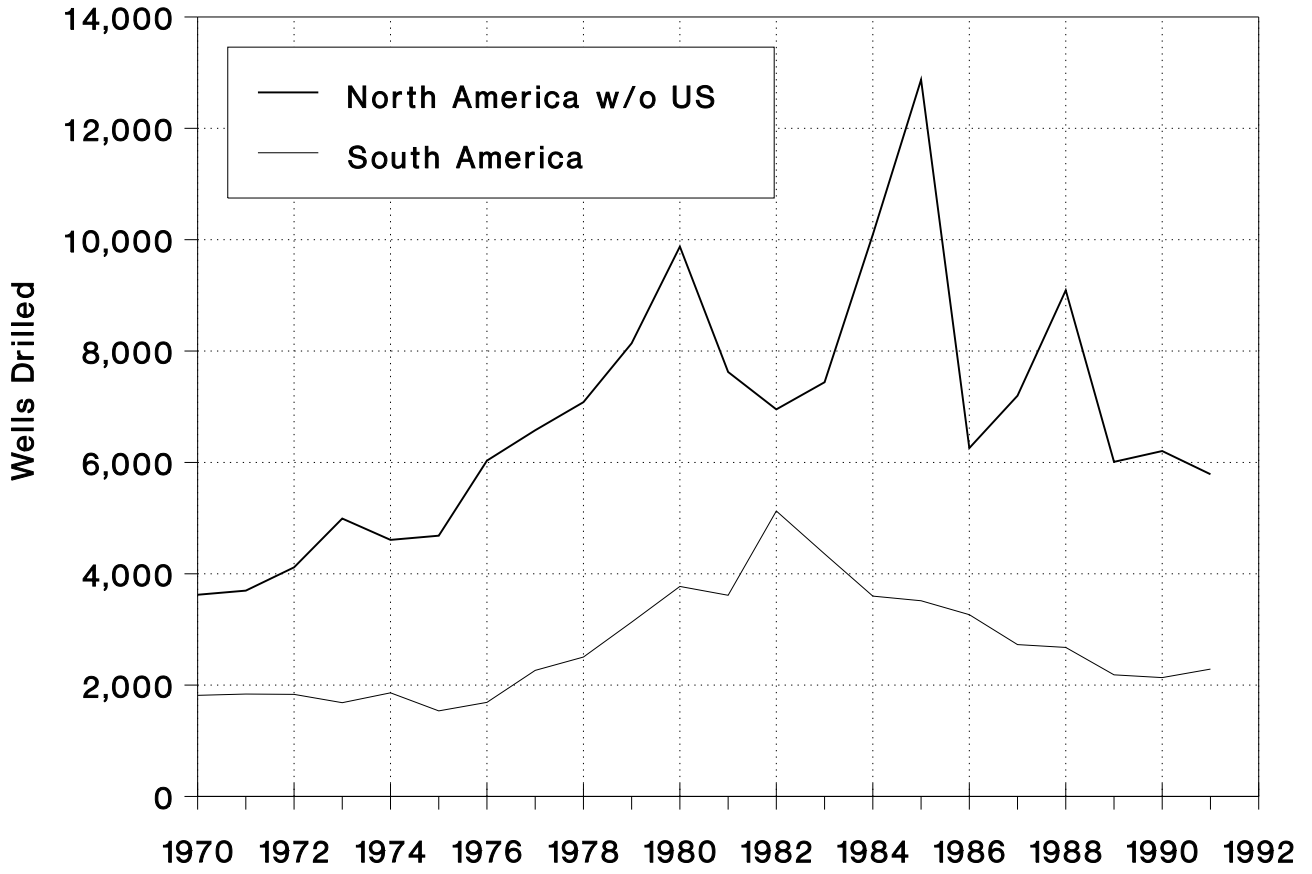
Sources: Gulf Publishing Co., *World Oil*; PennWell Publishing Co., *International Petroleum Encyclopedia*; PennWell Publishing Co., *International Energy Statistics Sourcebook 1991*.

Figure 5a. Total Wells Drilled, Excluding the United States and Eastern Europe, 1970-1991



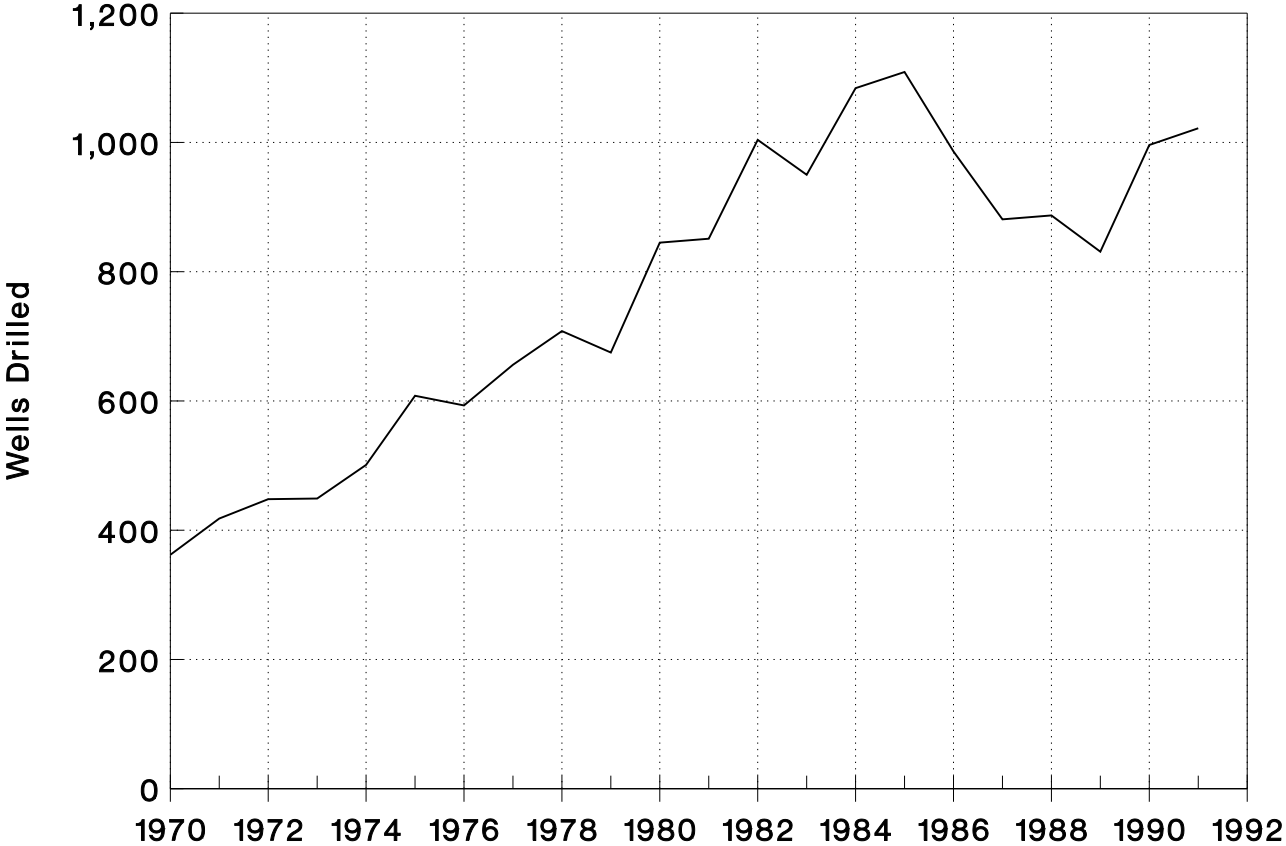
Source: Table 5.

Figure 5b. Total Wells Drilled, Western Hemisphere, Excluding the United States, 1970-1991



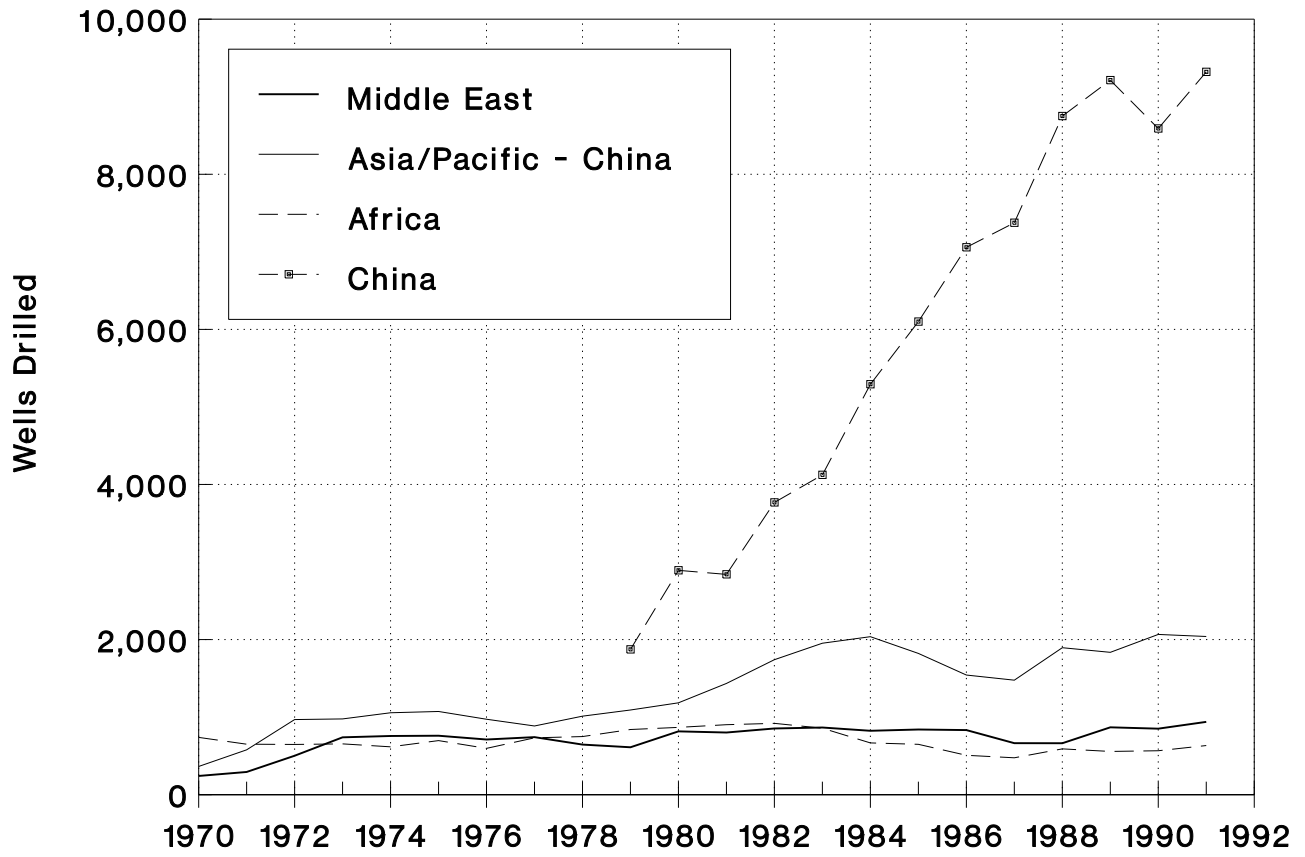
Source: Table 5.

Figure 5c. Total Wells Drilled, Western Europe, 1970-1991



Source: Table 5.

Figure 5d. Total Wells Drilled, Middle East, Asia/Pacific, and Africa, 1970-1991



Source: Table 5.

Table 6. Annual Oil Production, Million Barrels

Region/Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
North America											
Canada ¹	461.177	491.846	519.439	625.659	596.767	504.064	459.325	445.990	425.499	546.040	521.184
Cuba	1.194	1.250	1.281	1.037	1.278	1.004	0.366	0.730	0.365	1.095	0.915
Guatemala	na	na	na	na	0.002	0.027	0.096	0.046	0.222	0.571	1.570
Mexico	177.599	177.274	161.328	164.881	209.826	261.540	293.082	357.985	441.348	533.329	708.454
United States	3,517.505	3,453.995	3,455.406	3,360.920	3,202.510	3,056.875	2,976.312	3,009.425	3,178.055	3,121.480	3,146.502
Total	4,157	4,124	4,137	4,152	4,010	3,824	3,729	3,814	4,045	4,203	4,379
South America											
Argentina	143.399	154.514	158.464	153.536	151.106	143.966	145.546	156.490	162.991	173.025	179.659
Barbados	na	na	na	0.009	0.059	0.123	0.139	0.122	0.295	0.291	0.284
Bolivia	8.820	13.206	15.958	17.262	16.598	14.710	14.856	12.676	11.844	10.174	8.704
Brazil	60.923	63.513	61.085	62.119	64.752	62.758	61.028	58.685	58.528	60.433	66.437
Chile	12.432	12.883	12.539	11.411	10.039	8.932	8.381	7.119	6.281	7.971	12.821
Colombia	80.050	78.101	71.283	66.479	60.875	56.743	53.098	49.802	47.351	45.063	45.615
Ecuador	1.444	1.354	28.657	64.616	63.678	58.753	68.549	67.002	73.655	74.714	74.764
Peru	26.269	22.588	23.709	25.766	28.142	26.294	27.936	33.531	55.877	70.525	71.370
Suriname	na	na	na	na	na	na	na	na	na	na	na
Trinidad	51.047	47.148	51.211	60.670	68.248	78.621	77.673	83.619	83.777	78.249	77.613
Venezuela	1,353.420	1,295.406	1,178.487	1,228.594	1,086.240	856.364	839.737	816.817	790.418	860.068	793.488
Total	1,738	1,689	1,601	1,690	1,550	1,307	1,297	1,286	1,291	1,381	1,331
Western Europe											
Austria	19.515	17.549	17.267	17.981	15.609	14.204	13.502	12.462	12.486	12.098	10.267
Denmark	na	na	0.622	0.967	0.661	1.204	1.427	3.723	3.139	3.066	2.119
France	16.825	13.651	10.876	9.166	7.868	7.487	7.777	7.559	8.136	8.719	10.316
West Germany ²	54.427	53.597	50.508	48.455	44.719	41.471	40.011	39.013	36.541	34.479	33.452
Greece	na	na	na	na	na	na	na	na	na	na	0.476
Italy ³	9.575	8.952	7.611	7.139	7.552	7.235	7.645	7.460	10.032	11.581	12.468
Netherlands	13.080	11.727	11.193	10.168	9.183	9.022	9.370	9.417	9.558	8.969	8.749
Norway	na	2.081	12.078	11.753	12.775	69.193	102.334	142.350	127.750	139.928	203.793
Spain	1.457	0.874	1.047	5.190	14.363	13.451	12.951	7.167	7.132	8.097	10.456
Sweden	na	na	na	na	na	0.073	0.032	0.018	0.013	0.004	0.018
United Kingdom	1.253	1.696	2.650	3.011	3.375	11.303	85.973	271.716	385.821	557.545	577.225
Total	116	110	114	114	116	175	281	501	601	784	869
Eastern Europe											
Albania	9.995	8.674	10.163	15.513	16.681	17.965	13.855	15.000	13.344	12.410	10.948
Bulgaria	2.438	2.336	1.800	1.466	1.095	0.883	0.925	0.876	0.941	1.688	2.196
Czechoslovakia	1.424	1.356	1.293	1.220	1.179	0.963	0.882	0.913	0.913	0.883	0.679
East Germany ²	1.752	1.095	0.876	0.584	0.475	0.438	0.438	0.511	0.511	0.438	0.399
Hungary	14.780	14.879	15.041	15.300	14.491	15.260	15.006	16.717	16.045	15.260	14.823
Poland	3.146	3.116	2.577	2.770	2.847	4.069	4.081	2.701	2.657	2.967	2.562
Romania	102.067	102.479	105.488	106.100	107.939	108.739	109.559	109.186	102.106	94.900	84.034
USSR, former	2,549.550	2,778.300	2,902.932	3,094.000	3,314.200	3,512.250	3,793.956	3,876.300	4,174.140	4,270.500	4,402.980
Yugoslavia ⁴	21.140	21.932	23.765	24.600	26.816	27.406	25.925	29.265	30.369	29.628	31.403
Total	2,706	2,934	3,064	3,262	3,486	3,688	3,965	4,051	4,341	4,429	4,550
Middle East											
Abu Dhabi	252.179	341.004	383.827	482.239	515.142	510.338	571.756	602.765	527.839	533.995	495.588
Ajman	na	na	na	na	na	na	na	na	na	na	na
Bahrain	27.973	27.346	25.673	24.948	24.597	22.309	22.370	21.236	20.191	18.741	17.649
Dubai	31.321	45.651	54.900	80.300	88.158	92.844	114.870	116.435	132.240	129.317	127.834
Iran	1,397.460	1,661.901	1,838.825	2,139.269	2,197.935	1,952.705	2,152.509	2,067.038	1,879.350	1,107.775	608.292
Iraq	568.547	624.312	544.507	739.121	675.250	809.540	834.645	855.634	946.445	1,269.105	920.124
Israel	0.555	0.387	0.341	0.276	0.289	0.250	0.266	0.214	0.177	0.164	0.128
Jordan	na	na	na	na	na	na	na	na	na	na	na
Kuwait	998.110	1,067.795	1,097.719	1,004.780	830.580	671.527	700.085	651.379	691.310	808.475	509.644
Neutral Zone	183.859	199.068	205.717	192.220	197.522	179.623	167.482	133.478	171.550	205.495	196.928
Oman	121.210	107.430	103.131	106.925	106.047	124.649	133.796	124.158	114.732	107.726	103.212
Qatar	132.456	156.882	176.543	207.900	186.150	167.645	173.850	158.775	176.660	184.806	172.541
Ras al Khaimah	na	na	na	na	na	na	na	na	na	na	na
Saudi Arabia	1,295.335	1,641.615	2,098.423	2,677.146	2,996.543	2,491.834	3,053.887	3,291.187	2,944.128	3,376.644	3,525.080
Sharjah	na	na	na	na	8.500	13.981	13.540	10.293	8.067	4.928	3.623
Syria	29.356	36.462	39.158	36.812	63.328	68.394	69.540	63.510	62.415	60.225	62.739
Turkey	24.776	25.031	24.266	25.157	23.705	22.172	18.522	19.402	19.534	20.140	16.397
Yemen	na	na	na	na	na	na	na	na	na	na	na
Total	5,063	5,935	6,593	7,717	7,914	7,128	8,027	8,116	7,695	7,828	6,760

Table 6. Annual Oil Production, Million Barrels (Continued)

Region/Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
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Africa											
Algeria	376.024	279.627	394.914	378.036	355.814	344.572	384.300	408.800	424.860	435.938	417.606
Angola	40.838	33.922	50.966	58.701	63.144	57.586	55.906	52.203	53.786	52.195	49.814
Benin	na	na	na	na	na	na	na	na	na	na	na
Cameroon	na	na	na	na	na	na	na	0.278	4.520	12.606	20.626
Congo	0.137	0.130	2.334	13.480	17.066	12.366	13.792	12.507	17.006	19.217	22.121
Egypt	150.408	151.224	118.012	100.667	84.715	112.639	119.934	151.154	176.704	190.989	212.927
Gabon	39.292	41.911	45.831	75.242	73.913	81.242	82.266	81.628	76.798	70.989	64.621
Ghana	na	na	na	na	na	na	na	na	0.117	0.246	0.815
Ivory Coast	na	na	na	na	na	na	na	na	na	na	0.562
Libya	1,209.314	1,007.687	821.670	781.100	555.291	540.127	707.332	753.128	723.638	757.375	668.536
Morocco	0.335	0.172	0.202	0.321	0.189	0.154	0.135	0.166	0.159	0.139	0.101
Nigeria	395.836	558.375	665.282	747.669	823.318	660.146	758.054	758.991	695.488	839.707	757.920
Senegal	na	na	na	na	na	na	na	na	na	na	na
Tunisia	34.296	31.542	30.811	29.998	32.282	37.499	27.656	32.022	37.595	41.803	42.542
Zaire	na	na	na	na	na	0.193	9.150	8.331	6.604	7.614	6.692
Total	2,246	2,105	2,130	2,185	2,006	1,847	2,159	2,259	2,217	2,429	2,265
Asia-Pacific											
Australia	65.149	112.914	118.559	148.871	140.936	149.697	152.521	155.842	158.108	159.779	146.625
Bangladesh	0.021	0.022	0.034	0.038	0.038	0.047	0.054	0.054	0.053	0.048	0.055
Brunei	51.200	51.579	72.105	83.668	70.338	65.933	74.571	76.715	80.531	88.064	80.004
China	146.000	167.900	223.260	262.800	416.100	463.550	611.220	683.572	759.565	774.895	774.822
India	52.596	52.091	54.168	52.925	56.210	61.685	64.432	75.775	83.923	89.790	69.906
Indonesia	311.656	325.673	395.560	488.536	501.838	476.855	550.319	615.171	595.015	591.676	577.016
Japan	5.656	5.529	5.343	5.141	4.526	4.433	4.251	4.334	3.963	3.516	3.177
Malaysia	7.326	25.133	33.961	33.080	29.565	35.770	60.713	67.160	79.160	103.332	100.917
Myanmar	6.388	6.652	7.247	7.811	7.592	7.811	9.148	9.490	9.990	10.800	10.980
New Zealand	0.467	0.804	1.098	1.288	1.405	1.424	3.810	5.416	4.889	2.998	2.582
Pakistan	3.400	3.000	2.891	2.503	2.503	2.425	2.965	3.660	3.982	3.827	3.366
Papua New Guinea	na	na	na	na	na	na	na	na	na	na	na
Philippines	na	na	na	na	na	na	na	na	na	7.754	3.477
Taiwan	0.638	0.803	0.915	1.059	1.314	1.387	1.574	1.606	1.570	1.453	1.330
Thailand	0.070	0.095	0.047	0.041	0.055	0.100	0.100	0.077	0.049	0.050	0.050
Vietnam	na	na	na	na	na	na	na	na	na	na	na
Total	651	752	915	1,088	1,232	1,271	1,536	1,699	1,781	1,838	1,774
OPEC	8,545	9,247	9,902	11,222	11,092	9,849	11,105	11,322	10,784	11,176	9,839
Non-OPEC	8,133	8,402	8,653	8,986	9,222	9,389	9,888	10,404	11,187	11,714	12,089
Non-OPEC w/o US	4,616	4,948	5,197	5,625	6,019	6,333	6,912	7,395	8,009	8,593	8,942
Total w/o US	13,160	14,195	15,099	16,847	17,111	16,182	18,017	18,717	18,793	19,769	18,781
Total	16,678	17,649	18,555	20,208	20,314	19,239	20,993	21,726	21,971	22,891	21,928

Table 6. Annual Oil Production, Million Barrels (Continued)

Region/Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
North America											
Canada ¹	447.490	462.705	490.368	559.943	572.211	538.375	533.869	511.302	488.782	481.282	478.489
Cuba	2.081	3.942	4.818	5.636	6.570	6.570	5.931	5.302	5.301	5.227	5.402
Guatemala	1.493	2.292	2.549	1.715	1.068	1.802	1.337	1.343	1.328	1.414	na
Mexico	843.933	1,002.430	972.849	1,024.341	986.698	886.092	955.001	945.356	945.668	963.581	1,012.975
United States	3,128.780	3,156.885	3,171.120	3,249.714	3,274.415	3,168.200	3,047.385	2,979.240	2,778.745	2,684.575	2,691.145
Total	4,424	4,628	4,642	4,841	4,841	4,601	4,544	4,443	4,220	4,136	4,188
South America											
Argentina	181.459	179.054	171.769	175.101	187.804	157.367	155.213	160.643	163.885	171.674	184.664
Barbados	0.211	0.219	0.384	0.635	0.676	0.548	0.497	0.427	0.397	0.461	0.438
Bolivia	8.091	8.921	8.100	7.621	7.245	6.415	6.956	7.020	7.274	7.635	8.094
Brazil	80.300	94.852	120.394	174.289	205.551	216.339	215.169	210.931	224.855	238.440	236.056
Chile	15.104	15.626	14.365	14.036	13.048	12.205	10.922	8.934	8.065	7.157	6.500
Colombia	48.847	51.759	55.571	62.037	64.404	110.267	140.598	136.887	147.606	160.564	155.034
Ecuador	76.292	77.664	86.408	93.770	108.366	106.763	63.875	110.535	101.796	104.444	109.387
Peru	70.482	71.212	62.454	66.978	69.124	65.115	60.102	52.149	47.964	47.400	42.201
Suriname	na	0.004	0.116	0.245	0.416	0.707	0.801	1.240	1.387	1.441	1.497
Trinidad	69.114	64.619	58.343	65.153	67.454	64.421	59.182	57.463	55.932	55.039	52.423
Venezuela	769.516	691.686	657.297	668.316	615.755	634.005	620.135	691.008	653.350	779.275	866.875
Total	1,319	1,256	1,235	1,328	1,340	1,374	1,333	1,437	1,413	1,574	1,663
Western Europe											
Austria	9.249	8.964	8.828	8.430	8.390	7.725	7.466	8.400	8.208	8.141	9.068
Denmark	9.402	13.505	15.330	19.325	21.769	27.010	34.099	35.054	40.777	44.048	51.976
France	12.261	11.503	13.033	15.037	19.257	21.613	26.657	27.511	26.593	24.755	24.273
West Germany ²	32.206	30.740	29.728	29.372	29.652	29.111	27.487	28.534	27.322	26.131	25.275
Greece	1.472	7.300	8.404	9.591	8.935	9.673	8.892	8.218	6.862	5.906	6.098
Italy ³	10.696	11.768	15.045	15.302	17.717	18.904	26.805	39.662	34.156	34.791	29.831
Netherlands	8.964	11.078	17.649	21.090	25.600	35.759	33.626	30.817	27.615	28.813	26.955
Norway	172.907	193.762	239.560	263.664	281.526	324.236	375.646	429.417	561.889	615.232	703.244
Spain	8.937	10.965	21.680	16.985	15.887	13.630	12.041	10.909	7.715	5.906	7.875
Sweden	0.042	0.100	0.091	0.091	0.082	0.038	0.035	0.022	0.017	0.023	na
United Kingdom	657.000	766.500	807.672	881.694	917.810	910.105	884.083	784.191	654.022	683.893	681.325
Total	923	1,066	1,177	1,281	1,347	1,398	1,437	1,403	1,395	1,478	1,566
Eastern Europe											
Albania	10.660	9.887	10.917	10.058	9.439	9.542	9.351	9.159	8.904	6.594	5.935
Bulgaria	2.190	0.599	0.556	0.350	0.400	0.303	0.292	0.439	0.511	0.548	0.423
Czechoslovakia	0.604	0.657	0.642	0.617	0.834	1.036	1.073	1.039	1.060	0.836	0.975
East Germany ²	0.395	0.413	0.383	0.305	0.293	0.282	0.296	0.294	0.345	na	na
Hungary	15.443	14.797	14.629	15.313	13.642	14.630	13.979	13.064	13.720	16.187	15.584
Poland	2.337	1.759	1.460	1.402	1.446	1.241	1.488	1.243	1.180	1.229	1.184
Romania	86.783	85.775	87.600	85.359	81.028	82.399	78.475	68.625	68.854	59.514	50.912
USSR, former	4,444.240	4,471.615	4,499.355	4,503.183	4,336.955	4,485.485	4,556.371	4,557.432	4,489.500	4,100.124	3,706.140
Yugoslavia ⁴	32.120	31.536	30.554	29.954	30.777	30.247	28.231	26.864	20.066	18.681	10.066
Total	4,595	4,617	4,646	4,647	4,475	4,625	4,690	4,678	4,604	4,204	3,791
Middle East											
Abu Dhabi	413.816	318.523	292.000	307.440	291.270	387.010	390.915	421.266	536.915	628.713	722.335
Ajman	na	na	na	na	na	na	na	na	0.073	0.073	na
Bahrain	16.862	16.068	15.272	15.289	15.309	15.484	15.369	15.716	15.586	15.330	15.330
Dubai	130.888	130.670	123.188	125.172	140.233	143.445	148.555	159.082	155.855	153.227	147.205
Iran	503.700	856.290	909.580	800.442	824.079	704.085	894.615	636.840	1,043.170	1,127.120	1,209.063
Iraq	365.000	354.780	336.530	440.298	524.505	637.290	757.740	1,002.840	1,003.750	733.650	99.828
Israel	0.106	0.146	0.073	0.037	0.037	0.086	0.105	0.136	0.112	0.073	0.073
Jordan	na	na	na	na	0.021	0.548	0.137	0.122	0.077	0.110	0.110
Kuwait	343.392	239.112	317.550	333.792	314.265	486.910	425.043	459.330	584.730	429.788	67.890
Neutral Zone	134.372	114.002	141.931	150.060	143.096	139.029	143.445	117.852	135.050	108.770	47.085
Oman	119.807	118.775	141.931	152.818	184.182	204.291	212.528	225.929	233.823	243.638	259.150
Qatar	147.711	117.895	102.200	146.247	103.660	121.734	106.977	124.446	139.713	148.058	142.898
Ras al Khaimah	na	na	na	2.000	3.139	3.577	2.100	1.281	0.456	0.292	0.292
Saudi Arabia	3,512.697	2,309.435	1,596.620	1,435.481	1,200.850	1,711.777	1,456.715	1,803.685	1,775.190	2,284.024	2,948.835
Sharjah	2.628	5.977	13.706	22.965	23.798	20.290	16.790	17.934	15.786	10.074	9.016
Syria	62.821	56.797	61.320	62.220	64.970	70.810	83.950	93.879	115.705	141.620	173.740
Turkey	16.741	16.499	16.071	14.950	15.112	17.583	18.718	18.223	20.323	26.222	31.366
Yemen	na	na	na	na	na	3.650	9.481	62.220	68.620	68.985	71.905
Total	5,771	4,655	4,068	4,009	3,849	4,668	4,683	5,161	5,845	6,120	5,946

Table 6. Annual Oil Production, Million Barrels (Continued)

Region/Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Africa											
Algeria	352.225	346.750	337.625	354.070	386.900	365.000	382.520	376.980	409.043	420.927	456.350
Angola	47.286	47.602	67.124	71.630	84.863	105.065	131.169	165.022	165.224	172.924	181.388
Benin	na	0.056	1.545	2.500	2.920	2.550	2.010	1.610	1.095	1.400	na
Cameroon	31.556	40.014	45.078	54.900	68.255	63.620	60.955	61.488	58.400	56.199	55.115
Congo	30.660	34.040	39.968	47.580	41.520	42.888	45.990	49.410	59.748	56.400	56.210
Egypt	228.897	236.659	280.000	296.922	332.200	298.972	327.770	317.505	318.550	325.687	326.485
Gabon	55.436	56.703	57.216	64.782	62.415	60.225	56.276	57.861	74.683	98.576	107.453
Ghana	0.470	0.681	0.402	0.256	0.109	na	na	na	na	na	na
Ivory Coast	2.873	6.190	6.776	7.959	7.913	7.035	5.620	4.120	0.730	0.640	na
Libya	428.875	414.640	397.850	402.600	383.250	361.533	346.020	380.530	497.313	529.250	548.960
Morocco	0.133	0.102	0.133	0.108	0.178	0.198	0.140	0.152	0.075	0.328	0.328
Nigeria	515.844	473.720	451.870	501.420	544.580	536.550	465.000	554.124	585.460	659.570	690.945
Senegal	na	na	na	na	na	na	na	0.019	0.025	0.037	na
Tunisia	41.708	39.689	42.693	40.260	41.257	39.238	38.355	35.868	34.310	34.754	38.291
Zaire	7.540	9.845	10.585	13.176	12.624	11.857	11.315	10.724	9.855	10.753	6.454
Total	1,744	1,707	1,739	1,858	1,969	1,895	1,873	2,015	2,215	2,367	2,468
Asia-Pacific											
Australia	132.806	136.298	152.412	169.202	210.056	187.218	200.475	194.383	178.850	210.963	198.566
Bangladesh	0.074	0.084	0.093	0.143	0.152	0.160	0.300	0.324	0.345	0.406	0.329
Brunei	57.107	58.501	62.860	56.219	61.320	60.225	56.940	48.733	48.334	55.480	53.115
China	738.067	744.600	774.311	836.580	911.624	956.300	980.880	1,002.840	1,002.840	1,010.320	1,034.410
India	109.500	153.300	183.230	205.375	221.351	228.125	229.080	240.007	236.155	252.434	238.564
Indonesia	585.717	488.189	494.986	468.370	483.768	507.228	443.877	491.511	514.185	533.706	581.233
Japan	2.865	2.642	2.667	3.038	3.522	3.330	2.856	3.220	3.341	3.300	4.134
Malaysia	94.210	110.655	120.450	157.380	162.097	183.595	181.770	198.372	214.985	226.665	229.950
Myanmar	8.395	8.614	8.030	9.516	10.271	8.134	6.315	5.673	5.370	5.329	5.475
New Zealand	3.440	5.731	5.317	6.841	9.190	10.587	10.686	12.340	13.563	15.184	15.344
Pakistan	3.377	4.636	4.763	6.535	12.585	15.076	15.223	16.639	18.155	18.900	23.349
Papua New Guinea	na	na	na	na	na	na	na	na	na	na	0.404
Philippines	3.355	6.131	5.322	3.898	2.891	2.522	2.039	2.185	1.878	1.727	1.091
Taiwan	1.150	0.876	0.847	0.856	0.734	1.497	0.934	0.882	0.870	1.095	0.489
Thailand	0.590	1.351	2.179	8.052	12.780	14.711	11.642	13.575	14.089	15.516	16.389
Vietnam	na	na	na	na	na	0.290	2.400	5.475	10.220	20.075	24.017
Total	1,741	1,722	1,817	1,932	2,102	2,179	2,145	2,236	2,263	2,371	2,427
OPEC	8,262	6,918	6,230	6,223	6,046	6,820	6,657	7,297	8,125	8,645	8,646
Non-OPEC	12,254	12,732	13,094	13,673	13,877	13,920	14,048	14,076	13,830	13,604	13,403
Non-OPEC w/o US	9,125	9,575	9,923	10,423	10,602	10,752	11,001	11,097	11,051	10,920	10,712
Total w/o US	17,387	16,493	16,153	16,646	16,648	17,571	17,658	18,394	19,176	19,565	19,358
Total	20,516	19,650	19,324	19,896	19,922	20,739	20,705	21,373	21,954	22,249	22,049

¹Canadian production appears to include condensate and bitumen but excludes synthetic oil.

²West Germany includes East Germany after 1989.

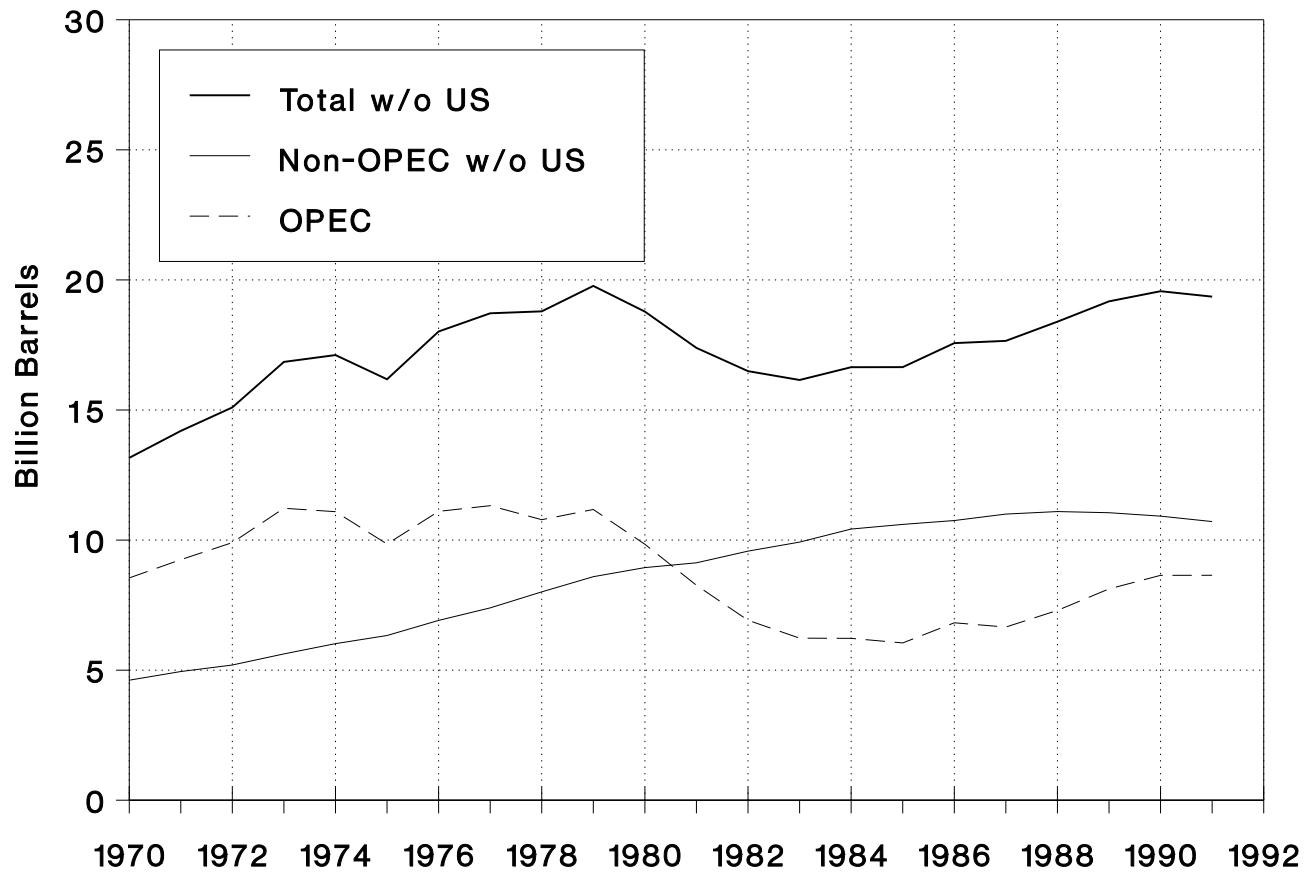
³Italy includes Sicily.

⁴Yugoslavia is Croatia only in 1991.

Notes: Totals and subtotals in bold are rounded to the nearest million barrels. Production figures in this table may differ slightly from official EIA production figures published in the *International Energy Annual 1991*, DOE/EIA-0219(91). Different sources are used here to provide a longer and more consistent history. Column totals may not add due to independent rounding. na = not available.

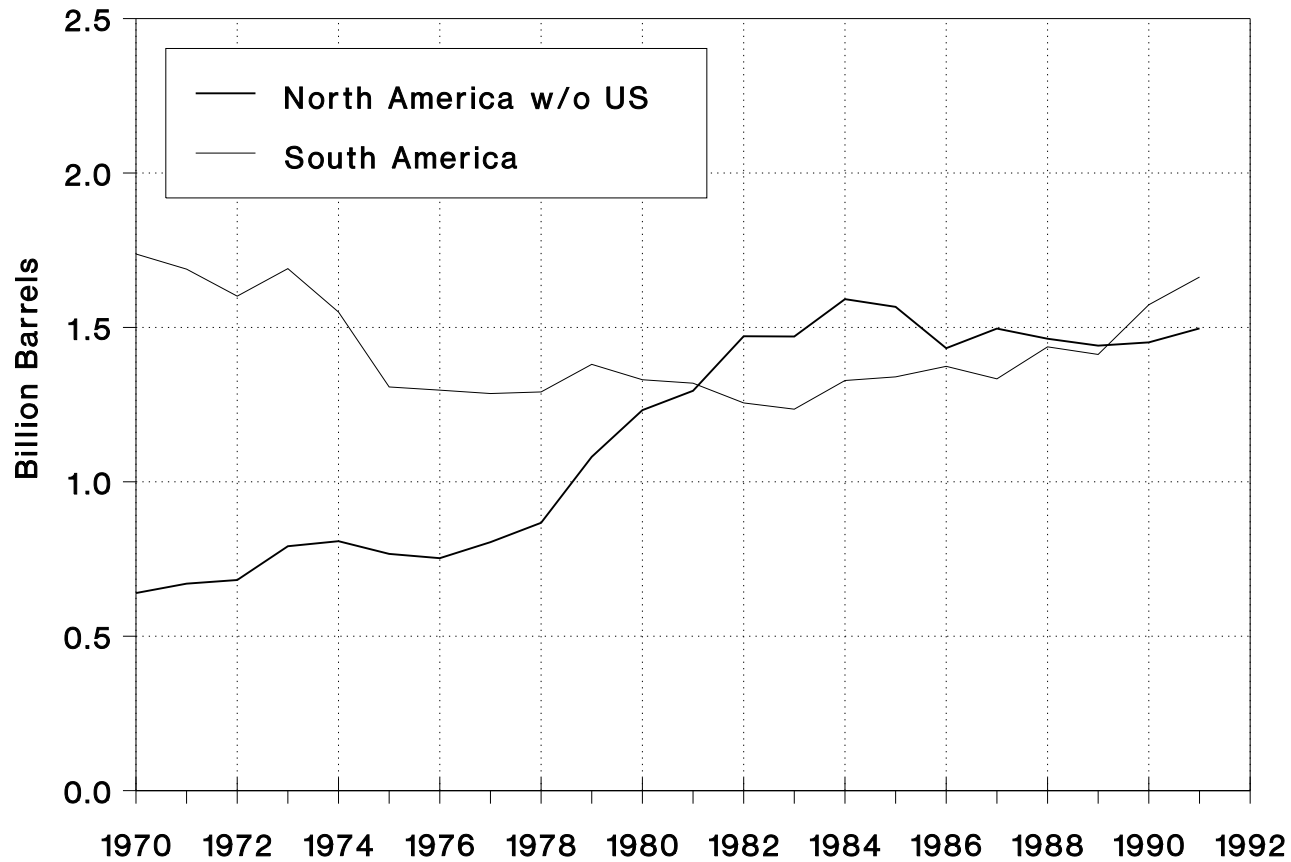
Sources: DeGolyer & MacNaughton, *Twentieth Century Petroleum Statistics 1991*; API, *Petroleum Facts & Figures 1971*; API, *Petroleum Facts & Figures 1959*; Gulf Publishing Co., *World Oil*; PennWell Publishing Co., *Oil & Gas Journal*; EIA, *Annual Energy Review 1991*; Petroconsultants S.A., *World Production and Reserves Statistics 1991*.

Figure 6a. Annual Oil Production, Excluding the United States, 1970-1991



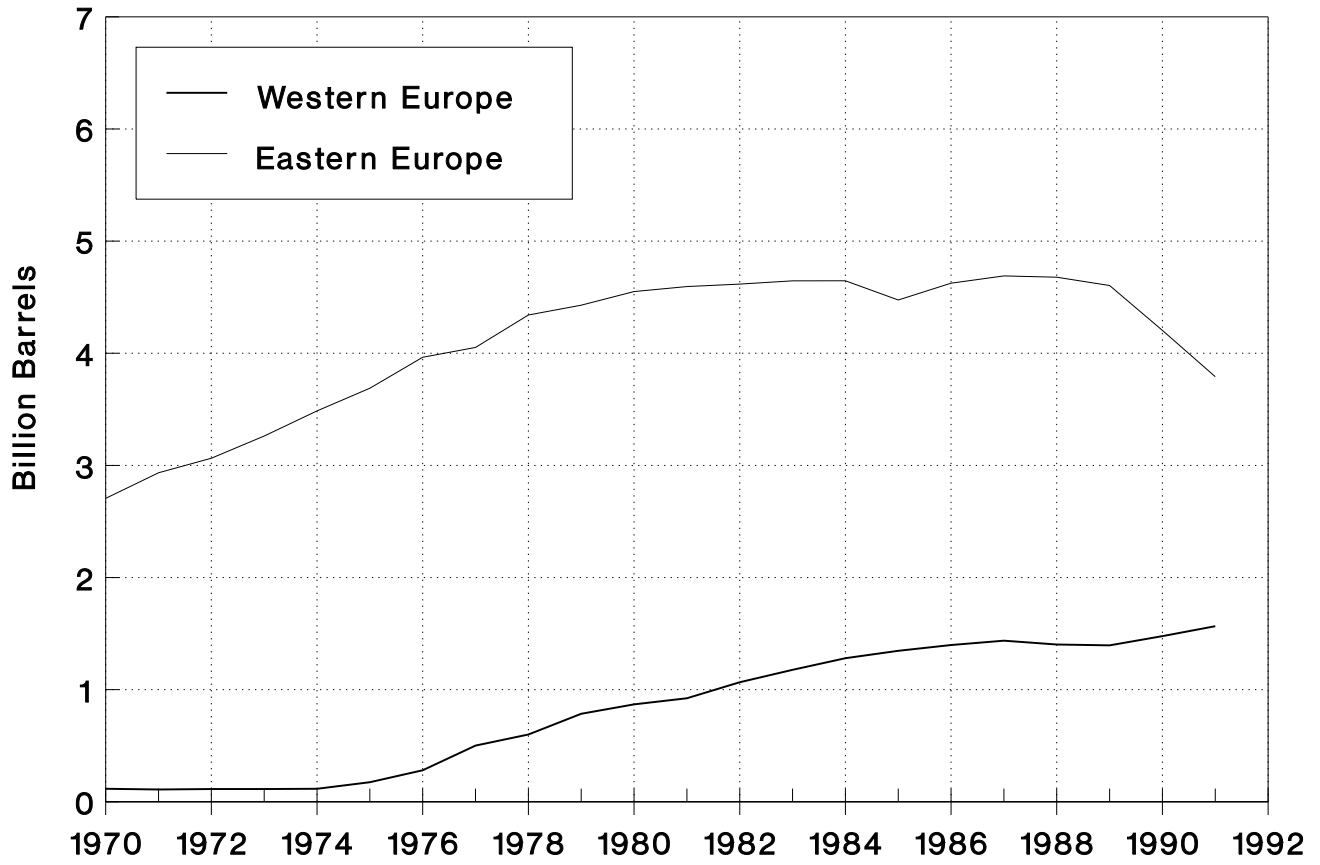
Source: Table 6.

Figure 6b. Annual Oil Production, Western Hemisphere, Excluding the United States, 1970-1991



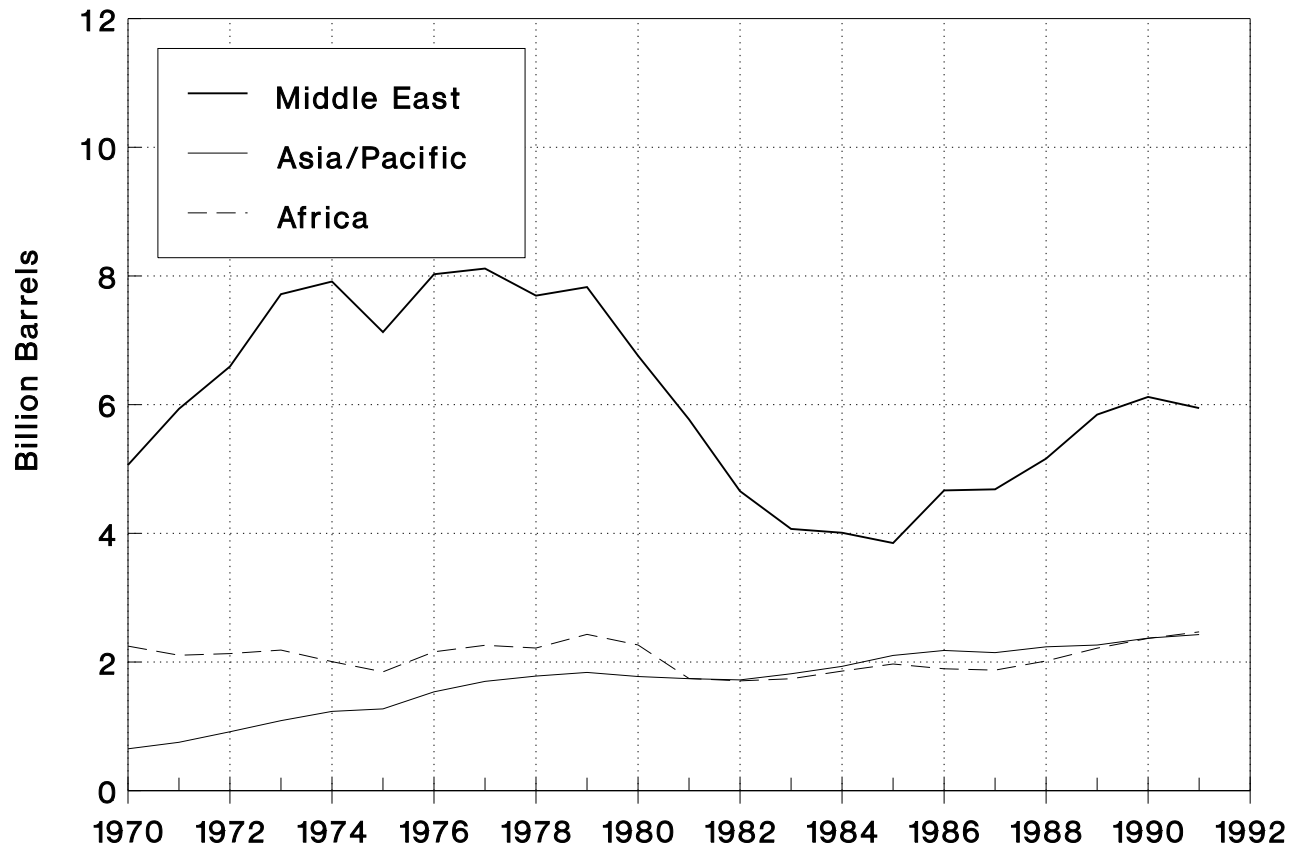
Source: Table 6.

Figure 6c. Annual Oil Production, Europe, 1970-1991



Source: Table 6.

Figure 6d. Annual Oil Production, Middle East, Asia/Pacific, and Africa, 1970-1991



Source: Table 6.

Table 7. Oil Reserves at Year-End, Million Barrels

Region/Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
North America											
Canada ¹	8,559.0	8,333.1	9,723.2	7,674.2	7,171.2	6,653.0	6,257.1	5,970.9	5,784.2	6,805.7	5,986.0
Cuba	32.0	31.0	88.0	87.0	86.0	85.0	84.0	83.0	83.0	82.0	81.0
Guatemala	na	na	10.0	10.0	13.0	13.0	21.3	16.0	16.0	16.0	20.0
Mexico	5,568.0	2,837.1	2,832.7	2,846.8	3,086.9	3,431.1	7,278.9	10,428.0	28,406.5	30,616.1	44,161.1
United States	39,001.3	38,063.0	36,339.4	35,299.8	34,250.0	32,682.1	30,942.2	31,780.0	31,355.0	29,810.0	29,805.0
Total	53,160	49,264	48,993	45,918	44,607	42,864	44,584	48,278	65,645	67,330	80,053
South America											
Argentina	1,573.0	2,000.0	2,466.0	2,312.0	2,459.0	2,500.0	2,515.0	2,317.0	2,425.0	2,900.0	2,457.0
Barbados	0.8	0.8	0.8	0.3	2.5	2.1	3.7	1.0	0.5	1.5	0.8
Bolivia	300.0	262.0	220.0	222.7	159.3	138.0	161.9	130.0	135.1	173.6	112.0
Brazil	857.0	855.0	797.7	744.0	778.9	782.8	854.8	1,094.0	1,126.0	1,248.0	1,318.0
Chile	120.0	120.0	144.4	219.8	209.8	200.9	388.0	514.9	578.0	570.4	580.3
Colombia	1,580.0	1,626.0	1,598.0	687.9	627.0	630.4	931.0	779.0	850.0	536.9	516.5
Ecuador	6,000.0	6,070.5	5,964.0	1,500.0	1,445.4	1,387.5	1,318.9	1,500.0	1,450.0	1,200.0	1,050.0
Peru	500.0	510.0	520.0	544.2	482.5	747.3	727.6	750.0	774.0	700.0	628.4
Suriname	na	na	na	na	na	na	na	na	na	na	na
Trinidad	605.0	1,053.0	560.0	500.0	651.0	651.0	650.0	650.0	650.0	700.0	650.0
Venezuela	14,040.9	13,740.4	13,872.1	13,811.7	18,567.0	18,394.8	18,228.6	18,043.0	18,228.0	18,526.1	19,608.5
Total	25,577	26,238	26,143	20,543	25,382	25,435	25,779	25,779	26,217	26,557	26,922
Western Europe											
Austria	189.7	186.5	184.5	165.9	171.6	175.7	161.8	137.3	137.6	125.4	123.1
Denmark	500.0	250.0	250.0	250.0	247.0	245.0	300.0	300.0	207.6	204.5	450.0
France	120.0	98.9	94.3	90.0	57.6	55.4	54.7	55.4	59.8	100.6	102.7
West Germany ²	544.5	560.0	545.0	542.0	535.6	360.7	320.8	309.2	305.0	463.7	343.5
Greece	na	0.5	0.5	4.0	136.9	136.9	136.9	136.9	136.9	55.0	50.0
Italy ³	305.0	271.1	212.7	240.9	565.9	328.2	327.0	320.2	327.0	375.4	361.9
Netherlands	230.0	261.2	269.0	268.0	99.5	91.1	80.1	70.8	61.3	81.8	123.3
Norway	2,800.0	2,000.0	2,300.0	4,500.0	5,500.0	6,402.0	4,987.0	4,764.0	4,094.0	5,920.0	8,800.0
Spain	8.5	35.0	65.0	90.0	109.3	262.3	250.6	303.4	296.3	181.7	132.7
Sweden	na	na	na	na	0.2	0.2	0.2	0.2	0.4	1.0	1.9
United Kingdom	1,000.0	3,000.0	6,000.0	10,900.0	7,725.0	9,827.0	9,896.0	10,070.0	10,191.0	8,755.0	8,209.0
Total	5,698	6,663	9,921	17,051	15,149	17,885	16,515	16,467	15,817	16,264	18,698
Eastern Europe											
Albania	93.0	90.0	88.0	76.0	144.1	142.1	129.4	130.1	126.8	164.4	306.6
Bulgaria	278.0	278.0	20.5	19.0	17.0	15.1	15.3	15.2	17.3	31.0	29.1
Czechoslovakia	12.0	12.0	19.5	18.5	18.0	17.1	14.0	14.6	13.7	13.3	12.5
East Germany ²	11.0	11.0	15.5	14.0	25.0	22.5	21.0	22.5	22.1	30.6	108.4
Hungary	267.0	210.0	220.0	205.0	195.0	228.9	204.0	193.3	213.6	203.2	188.0
Poland	37.0	48.5	47.0	45.0	42.0	40.2	36.8	24.3	21.7	21.3	28.9
Romania	867.0	1,481.0	1,505.0	1,405.0	1,295.3	1,304.9	1,200.3	1,667.0	1,565.0	934.1	1,090.2
USSR, former	58,000.0	60,000.0	45,000.0	47,500.0	56,341.4	58,878.3	59,900.0	59,000.0	58,438.0	59,787.0	82,000.0
Yugoslavia	315.0	315.0	330.4	330.4	320.0	370.4	344.4	355.3	324.9	317.0	376.1
Total	59,880	62,446	47,246	49,613	58,398	61,020	61,865	61,422	60,743	61,502	84,140
Middle East											
Abu Dhabi	14,850.0	15,100.0	18,234.0	18,700.0	25,500.0	25,500.0	24,929.8	24,333.8	30,000.0	35,973.0	35,480.0
Ajman	na	na	na	na	na	na	na	na	na	na	na
Bahrain	394.5	541.3	300.0	276.0	339.9	260.0	311.0	289.7	269.5	230.6	223.1
Dubai	1,300.0	1,500.0	1,975.0	1,995.0	1,906.8	1,906.8	1,792.3	1,675.9	1,583.7	1,454.7	1,327.0
Iran	60,000.0	60,450.0	66,250.0	68,000.0	68,050.0	50,108.0	48,130.0	46,863.0	44,965.7	40,557.9	39,935.7
Iraq	29,000.0	33,100.0	35,750.0	35,675.0	35,123.8	35,000.0	35,165.2	35,338.5	34,392.0	35,000.0	34,080.0
Israel	2.0	2.0	1.8	2.3	2.0	1.5	1.2	1.0	0.8	0.6	0.5
Jordan	na	na	na	na	na	na	na	na	na	na	na
Kuwait	75,500.0	66,023.0	73,973.5	72,969.0	70,890.0	70,219.1	71,800.0	72,000.0	71,400.0	68,530.0	68,023.0
Neutral Zone	12,800.0	13,000.0	10,132.8	10,325.0	6,827.6	6,648.0	6,480.0	6,343.0	6,171.5	6,676.9	6,480.0
Oman	4,000.0	4,750.0	3,027.0	3,321.0	3,293.7	3,293.7	3,160.3	3,086.1	3,271.4	2,240.0	2,484.0
Qatar	4,100.0	4,800.0	5,832.0	5,624.0	5,437.9	5,277.5	4,101.0	3,942.0	3,765.3	3,760.0	3,587.5
Ras al Khaimah	na	na	na	na	na	na	na	na	na	na	na
Saudi Arabia	138,667.0	137,040.0	92,992.0	96,922.0	103,480.0	107,857.0	110,187.0	110,400.0	113,284.0	113,384.0	164,220.0

Table 7. Oil Reserves at Year-End, Million Barrels (Continued)

Region/Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Sharjah	na	na	na	1,500.0	1,500.0	1,350.0	700.0	25.0	16.0	11.3	10.0
Syria	1,320.0	1,320.0	1,260.0	2,250.0	2,776.0	2,707.6	2,638.1	1,777.0	1,735.0	1,665.0	1,452.0
Turkey	200.0	181.1	142.0	143.3	118.5	99.3	84.4	243.5	224.0	226.4	274.8
Yemen	na	na	na	na	na	na	na	na	na	na	na
Total	342,134	337,807	309,870	317,703	325,246	310,229	309,480	306,318	311,079	309,710	357,578
Africa											
Algeria	8,098.3	9,839.6	9,750.0	9,329.5	9,034.9	10,000.0	9,616.8	10,000.0	9,575.1	8,440.0	7,293.9
Angola	750.0	1,000.0	1,233.0	1,310.0	1,409.1	1,358.6	1,321.8	1,413.9	1,365.1	1,325.0	1,375.0
Benin	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	22.0
Cameroon	11.0	11.0	11.0	11.0	50.0	80.0	210.0	147.6	143.1	150.2	270.0
Congo	3.6	330.0	737.0	750.0	500.0	490.0	476.3	463.8	745.8	727.5	705.4
Egypt	990.1	1,000.0	2,121.5	2,061.0	1,423.0	1,429.0	1,559.0	2,081.5	2,132.5	2,090.7	2,916.5
Gabon	485.0	602.0	1,000.0	760.7	652.1	579.6	586.8	543.4	466.6	434.7	470.9
Ghana	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.9	7.0	6.3
Ivory Coast	na	na	na	na	na	na	25.0	25.0	35.0	35.0	50.0
Libya	30,000.0	28,000.0	24,100.0	23,208.0	23,000.0	24,000.0	24,492.7	25,327.4	27,203.8	26,446.4	25,787.6
Morocco	0.9	1.2	1.5	1.2	1.0	0.9	0.7	0.6	0.4	0.2	1.3
Nigeria	5,600.0	10,000.0	12,600.0	18,250.0	13,651.5	13,000.0	12,241.9	12,243.4	12,273.4	11,633.7	11,295.1
Senegal	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
South Africa	na	na	na	na	na	na	na	na	na	na	na
Sudan	na	na	na	na	na	120.0	120.0	120.0	120.0	120.0	150.0
Tunisia	380.0	410.0	446.4	416.4	2,359.0	2,323.5	2,295.0	2,262.9	2,225.3	2,172.6	2,180.6
Zaire	1.0	7.0	23.0	150.0	150.0	142.4	140.9	132.5	125.9	122.1	115.2
Total	46,356	51,237	52,059	56,284	52,267	53,560	53,123	54,798	56,448	53,735	52,650
Asia-Pacific											
Afghanistan	95.0	90.0	89.9	89.8	85.0	85.0	85.0	84.0	na	na	na
Australia	1,461.0	1,650.0	1,549.9	2,300.0	2,500.0	2,350.0	2,280.0	2,180.2	2,472.1	2,013.2	1,984.9
Bangladesh	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.0	17.0
Brunei	2,400.0	2,400.0	1,800.0	2,200.0	2,000.0	1,900.0	1,900.0	1,423.3	1,383.0	1,295.0	1,294.0
China	5,669.0	12,500.0	12,500.0	14,800.0	14,800.0	17,242.0	18,000.0	18,026.0	20,025.2	19,250.0	19,000.0
India	742.7	739.6	787.0	891.0	926.4	1,070.8	2,049.3	2,260.0	2,310.0	2,478.0	2,409.0
Indonesia	10,000.0	10,673.4	10,700.0	11,500.0	12,000.0	12,000.0	11,500.0	8,297.1	7,824.1	11,002.8	10,539.6
Japan	25.5	24.9	24.0	29.1	76.2	32.6	28.3	26.5	22.5	19.0	31.1
Malaysia	1,200.0	1,200.0	1,500.0	2,000.0	1,500.0	1,500.0	1,074.6	1,007.4	1,043.0	1,400.0	1,800.0
Myanmar	50.0	39.5	40.0	43.0	60.5	67.2	63.0	67.9	57.9	47.1	747.9
New Zealand	226.0	225.0	131.6	130.3	115.0	125.0	190.0	105.0	110.0	110.0	173.0
Pakistan	35.0	35.5	35.5	32.4	29.9	26.0	286.0	282.3	278.4	200.0	196.5
Papua New Guinea	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Philippines	na	na	na	na	na	na	2.0	80.0	85.0	25.0	20.0
Taiwan	19.0	20.9	18.7	17.6	18.6	19.2	17.8	16.2	14.6	13.3	11.9
Thailand	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4
Vietnam	na	na	na	na	9.0	260.0	260.0	260.0	260.0	260.0	260.0
Total	21,973	29,648	29,226	34,083	34,170	36,727	37,785	34,165	35,935	38,162	38,517
OPEC	404,441	403,868	377,161	388,570	395,622	381,841	379,952	375,375	381,149	381,831	428,139
Non-OPEC	150,336	159,435	146,297	152,623	159,597	165,878	169,180	171,853	190,734	191,428	230,418
Non-OPEC w/o US	111,334	121,372	109,958	117,323	125,347	133,196	138,237	140,073	159,379	161,618	200,613
Total w/o US	515,775	525,240	487,119	505,893	520,969	515,037	518,189	515,448	540,528	543,449	628,752
Total	554,777	563,303	523,459	541,193	555,219	547,719	549,132	547,228	571,883	573,259	658,557

Table 7. Oil Reserves at Year-End, Million Barrels (Continued)

Region/Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
North America											
Canada ¹	6,656.0	6,425.9	6,435.8	6,538.0	5,056.0	4,839.0	6,787.5	6,974.9	6,768.5	6,424.1	6,104.0
Cuba	79.0	75.0	70.0	65.0	58.0	51.0	118.6	117.7	120.0	121.7	121.0
Guatemala	55.0	50.0	48.0	50.0	50.0	23.0	41.5	80.3	41.6	36.2	34.8
Mexico	48,083.8	48,083.8	49,911.0	56,410.0	55,593.0	54,880.0	54,110.0	53,012.0	51,983.0	51,298.0	50,925.0
United States	29,426.0	27,858.0	27,735.0	28,446.0	28,416.0	26,889.0	27,256.0	26,825.0	26,501.0	26,254.0	24,682.0
Total	84,300	82,493	84,200	91,509	89,173	86,682	88,314	87,010	85,414	84,134	81,867
South America											
Argentina	2,172.0	1,950.0	2,450.0	2,349.0	2,240.0	2,233.0	2,246.0	2,279.9	2,167.7	1,570.0	1,627.3
Barbados	0.5	0.7	0.6	0.6	0.4	0.5	3.6	3.3	3.2	3.1	3.3
Bolivia	133.9	180.0	158.0	157.0	156.0	156.6	173.5	176.0	176.0	125.0	111.1
Brazil	1,497.0	1,719.0	1,850.0	2,054.0	2,194.0	2,358.5	2,534.7	2,833.0	2,794.6	2,800.4	3,030.1
Chile	595.2	590.2	258.7	224.1	218.0	207.0	265.9	257.0	265.0	149.1	139.8
Colombia	440.4	554.5	670.4	1,200.0	1,543.0	1,942.0	2,028.0	2,196.2	1,977.5	1,789.0	1,743.8
Ecuador	1,100.0	1,073.6	860.0	831.5	1,125.0	1,606.0	1,250.0	1,514.9	1,413.2	1,741.6	1,748.0
Peru	882.0	775.1	696.3	670.4	589.0	535.8	480.4	853.0	847.0	823.2	821.8
Suriname	na	na	na	na	1.0	1.0	27.0	28.7	28.2	27.3	37.6
Trinidad	561.0	633.0	600.0	538.0	610.0	564.0	545.3	613.0	623.0	602.2	572.6
Venezuela	19,890.0	24,581.0	25,828.0	28,034.0	29,331.0	54,180.0	58,084.0	59,796.0	60,516.0	60,055.0	62,650.0
Total	27,272	32,057	33,372	36,059	38,007	63,784	67,638	70,551	70,811	69,686	72,485
Western Europe											
Austria	117.6	133.7	124.8	116.5	116.0	106.9	79.9	78.4	83.9	84.2	85.0
Denmark	371.0	358.0	360.0	533.0	535.0	516.0	555.0	540.9	798.8	754.8	730.0
France	125.3	145.7	156.7	220.8	257.0	226.6	216.3	202.5	180.4	170.8	177.0
West Germany ²	310.3	303.2	291.4	289.0	455.0	447.1	268.1	238.9	248.1	261.1	271.8
Greece	50.0	45.0	40.0	35.0	32.0	30.0	28.2	20.6	28.8	21.6	28.0
Italy ³	375.8	545.0	613.0	597.7	779.0	721.8	739.0	724.9	692.2	692.0	699.0
Netherlands	143.1	252.2	188.7	169.8	195.0	195.0	189.0	170.0	157.0	145.0	145.0
Norway	7,573.0	7,660.0	9,233.0	10,843.0	9,391.0	12,921.6	11,076.7	11,038.9	15,626.6	15,141.5	15,326.4
Spain	94.7	60.0	60.0	50.2	39.0	37.7	39.2	43.8	26.6	21.4	18.5
Sweden	2.2	2.9	2.8	2.7	2.6	2.6	2.6	2.6	2.6	2.6	na
United Kingdom	7,643.0	7,300.0	6,733.0	5,823.0	5,600.0	5,300.9	5,151.5	4,255.6	3,807.7	3,994.3	4,143.6
Total	16,806	16,806	17,803	18,681	17,402	20,506	18,345	17,317	21,653	21,289	21,624
Eastern Europe											
Albania	280.7	267.3	211.3	206.3	221.0	210.0	200.0	192.5	185.3	195.0	189.1
Bulgaria	26.3	24.3	14.4	14.1	13.0	15.0	13.0	12.8	13.0	13.2	12.8
Czechoslovakia	11.8	11.2	7.1	6.5	20.0	20.0	18.5	18.6	17.8	16.2	15.3
East Germany ²	96.4	89.1	2.8	2.5	2.0	4.0	4.6	4.4	13.0	na	na
Hungary	173.4	163.0	219.2	212.8	165.0	304.0	290.0	279.7	176.6	145.8	143.1
Poland	26.0	23.8	13.1	12.0	12.0	11.0	12.0	11.5	19.9	39.6	45.9
Romania	1,005.5	959.3	1,594.9	1,510.6	1,442.0	1,362.0	1,286.0	1,231.0	1,199.0	1,520.0	1,491.0
USSR, former	85,000.0	86,054.0	84,846.0	81,000.0	62,685.0	60,700.0	59,499.5	60,920.8	67,343.0	63,295.1	59,910.7
Yugoslavia	343.9	323.3	296.0	273.3	283.0	263.0	235.0	210.8	225.0	186.8	178.8
Total	86,964	87,915	87,205	83,238	64,843	62,889	61,559	62,882	69,193	65,412	61,987
Middle East											
Abu Dhabi	35,500.0	35,200.0	34,900.0	34,607.0	35,000.0	55,323.0	54,932.0	54,900.0	66,225.0	64,969.0	64,369.0
Ajman	na	na	na	na	na	na	15.0	15.0	15.0	15.0	na
Bahrain	206.2	190.1	185.0	173.0	180.0	141.0	126.0	112.0	97.0	70.0	84.0
Dubai	1,196.0	1,300.0	1,200.0	1,075.0	1,394.0	1,346.0	1,207.0	1,314.0	1,352.1	1,318.0	1,226.0
Iran	39,432.0	38,400.0	38,300.0	37,500.0	36,676.0	36,500.0	50,000.0	63,000.0	62,500.0	63,000.0	62,500.0
Iraq	33,700.0	33,400.0	33,500.0	38,500.0	38,500.0	100,000.0	100,000.0	99,000.0	100,000.0	100,000.0	100,000.0
Israel	0.4	1.0	1.0	1.0	0.7	0.7	0.7	1.6	1.5	1.4	1.3
Jordan	na	na	na	na	3.0	2.4	2.3	2.1	2.1	2.0	5.0
Kuwait	67,680.0	67,500.0	67,200.0	72,340.0	72,000.0	94,522.0	95,500.0	96,030.0	96,000.0	95,608.0	92,740.0
Neutral Zone	6,313.4	5,720.0	5,577.7	5,427.7	5,290.0	5,168.0	5,140.0	5,022.0	5,022.0	4,998.0	4,941.0
Oman	4,497.0	3,400.0	3,500.0	3,900.0	4,067.0	4,037.0	4,105.2	4,142.0	4,290.9	4,353.0	4,350.0
Qatar	3,437.8	3,318.0	4,646.0	4,500.0	3,512.0	3,495.0	2,707.0	2,583.0	3,782.0	2,993.0	2,851.0
Ras al Khaimah	na	na	100.0	100.0	100.0	200.0	400.0	400.0	400.0	400.0	400.0
Saudi Arabia	164,813.0	165,000.0	166,000.0	166,300.0	166,500.0	167,000.0	169,970.0	254,959.0	257,543.0	258,848.0	259,466.0

Table 7. Oil Reserves at Year-End, Million Barrels (Continued)

Region/Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Sharjah	306.0	404.0	400.0	450.0	490.0	500.0	1,500.0	1,500.0	1,500.0	1,500.0	1,500.0
Syria	1,890.0	1,750.0	1,460.0	1,397.5	1,540.0	1,620.0	1,720.0	1,800.0	2,000.0	1,880.0	1,800.0
Turkey	274.0	322.3	326.5	584.6	142.0	139.0	264.7	399.1	325.8	353.3	297.5
Yemen	na	na	na	500.0	500.0	500.0	1,050.0	2,000.0	4,300.0	1,678.5	2,008.5
Total	359,246	355,905	357,296	367,356	365,895	470,494	488,640	587,180	605,356	601,987	598,539
Africa											
Algeria	6,941.7	7,449.0	7,240.0	7,081.8	8,820.0	8,800.0	8,500.0	8,500.0	9,230.0	9,476.6	9,901.1
Angola	1,108.0	1,457.0	1,715.0	2,147.0	2,018.0	1,400.0	2,000.0	2,000.0	2,074.0	1,624.5	1,449.6
Benin	22.0	22.0	20.0	18.0	15.0	12.0	10.0	8.8	7.5	6.1	19.9
Cameroon	268.4	296.0	257.7	531.0	550.0	525.0	500.0	500.0	470.0	431.4	376.3
Congo	733.0	754.4	738.3	798.4	756.0	719.7	695.0	750.0	710.0	754.5	698.3
Egypt	3,530.3	3,699.6	3,958.6	4,025.6	3,800.0	4,500.0	4,685.0	4,270.5	4,300.0	3,459.0	3,535.5
Gabon	463.5	481.8	547.3	623.0	657.0	646.0	960.0	930.0	958.6	860.0	876.0
Ghana	2.3	5.4	3.8	3.8	3.8	2.4	1.0	1.0	1.0	0.5	0.5
Ivory Coast	314.0	115.5	108.0	108.0	125.0	125.0	120.0	120.0	100.0	100.0	100.0
Libya	25,858.7	21,500.0	21,800.0	22,800.0	22,800.0	22,800.0	22,570.0	22,570.0	22,800.0	22,800.0	22,800.0
Morocco	1.2	1.1	0.9	0.6	2.0	2.0	1.7	1.9	2.5	2.0	2.1
Nigeria	20,000.0	17,223.7	16,750.0	16,850.0	16,310.0	16,000.0	15,845.0	16,000.0	16,700.0	17,422.0	17,856.0
Senegal	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.9	9.9	9.8
South Africa	na	na	na	na	na	na	na	na	na	3.0	3.0
Sudan	200.0	400.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0
Tunisia	2,491.4	2,451.7	2,515.4	1,815.0	1,780.0	1,752.6	1,725.0	1,790.0	1,801.7	1,738.6	1,800.0
Zaire	107.7	121.6	125.0	125.0	121.0	111.0	112.0	96.2	92.4	170.7	164.3
Total	62,052	55,989	56,090	57,237	58,068	57,706	58,035	57,848	59,558	59,159	59,892
Asia-Pacific											
Afghanistan											
Australia	1,622.1	1,533.1	1,850.0	1,550.0	1,698.0	2,251.7	2,295.8	2,836.7	2,830.4	2,001.3	2,124.2
Bangladesh	22.0	22.0	22.0	22.0	22.0	29.0	28.0	28.0	40.0	39.0	0.5
Brunei	1,500.0	1,445.3	1,527.0	1,470.3	1,443.0	1,475.0	1,600.0	1,200.0	1,151.7	1,124.0	1,137.6
China	18,500.0	18,200.0	18,200.0	19,500.0	19,480.0	22,900.0	22,300.0	22,000.0	31,241.0	30,800.0	30,000.0
India	3,482.4	3,504.7	3,620.0	3,760.0	3,801.0	4,635.0	4,415.6	4,463.5	4,345.4	5,614.4	6,125.6
Indonesia	9,976.0	9,541.8	9,550.0	8,981.0	8,694.0	9,000.0	8,500.0	12,002.0	10,899.1	11,239.0	11,846.1
Japan	31.3	29.4	29.4	37.2	62.0	58.1	55.0	52.2	48.7	45.5	41.4
Malaysia	2,295.0	2,570.0	2,570.0	2,900.0	3,500.0	3,530.0	3,324.0	3,379.0	3,674.5	3,560.0	3,600.0
Myanmar	738.0	730.7	742.3	733.0	724.0	200.0	141.4	195.0	189.6	110.0	105.0
New Zealand	187.8	193.5	193.5	186.7	192.0	182.0	157.3	157.5	157.5	208.3	180.3
Pakistan	84.6	84.6	100.0	101.6	110.0	159.8	141.4	321.6	305.0	295.6	351.2
Papua New Guinea	32.0	32.0	32.0	50.0	50.0	65.0	200.0	200.0	180.7	200.0	200.0
Philippines	23.0	35.0	35.0	31.1	22.0	19.4	42.8	40.8	36.9	138.6	147.5
Taiwan	11.3	10.4	9.6	10.7	10.0	9.5	8.5	8.1	7.3	6.7	6.2
Thailand	75.0	30.0	30.0	58.0	109.0	96.4	120.3	230.7	268.5	268.5	257.2
Vietnam	260.0	290.0	290.0	290.0	290.0	290.0	290.0	290.0	280.0	500.0	500.0
Total	38,841	38,253	38,801	39,682	40,207	44,901	43,620	47,405	55,656	56,151	56,623
OPEC	435,508	431,019	433,539	445,169	446,074	575,480	595,830	698,521	715,443	715,502	715,922
Non-OPEC	239,972	238,398	241,228	248,592	227,521	231,482	230,321	231,672	252,198	242,316	237,096
Non-OPEC w/o US	210,546	210,540	213,493	220,146	199,105	204,593	203,065	204,847	225,697	216,062	212,414
Total w/o US	646,054	641,559	647,032	665,315	645,179	780,073	798,895	903,368	941,140	931,564	928,336
Total	675,480	669,417	674,767	693,761	673,595	806,962	826,151	930,193	967,641	957,818	953,018

¹Canadian reserves appear to include condensate and exclude both synthetic oil and bitumen.

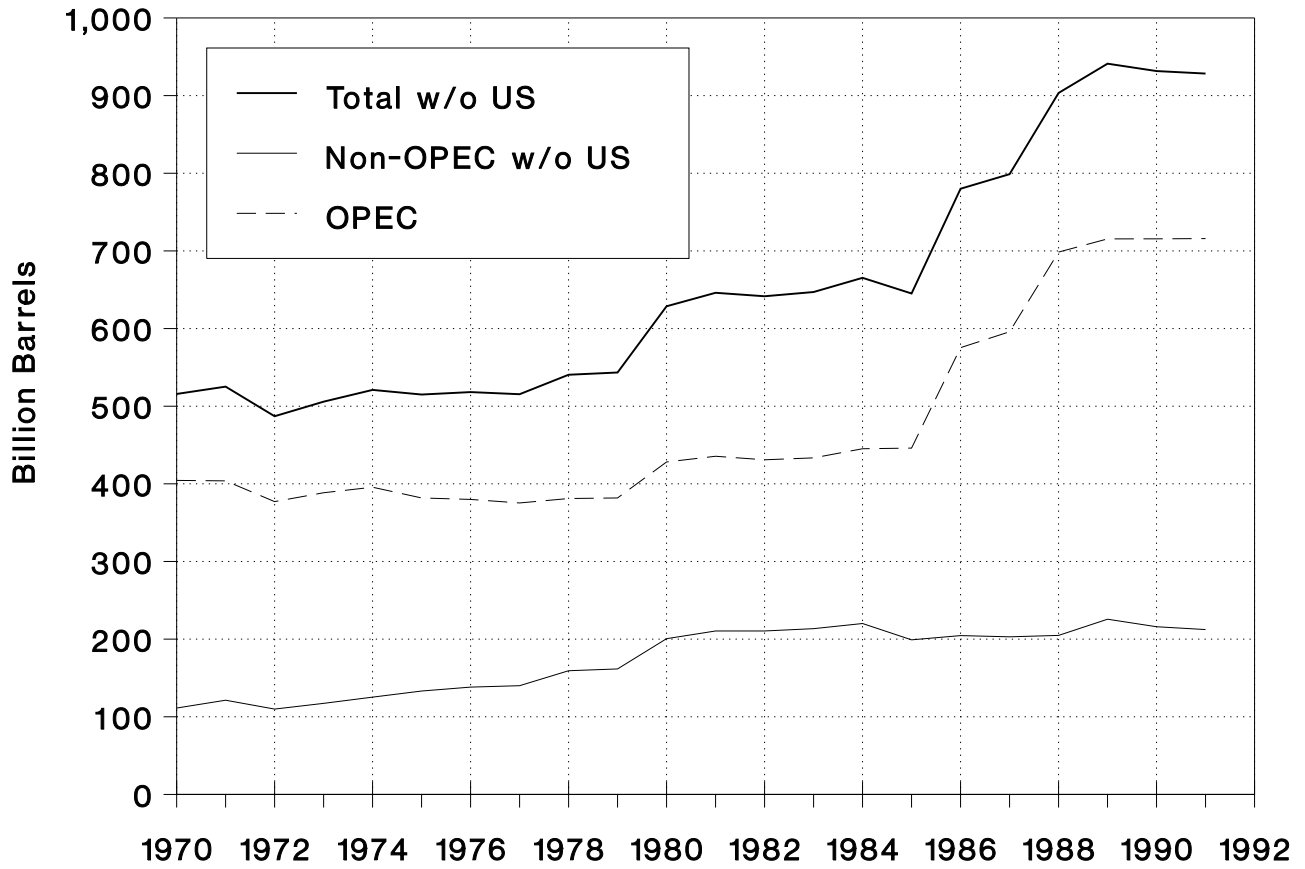
²West Germany includes East Germany after 1989.

³Italy includes Sicily.

Notes: Totals and subtotals in bold are rounded to the nearest million barrels. Column totals may not add due to independent rounding. na = not available.

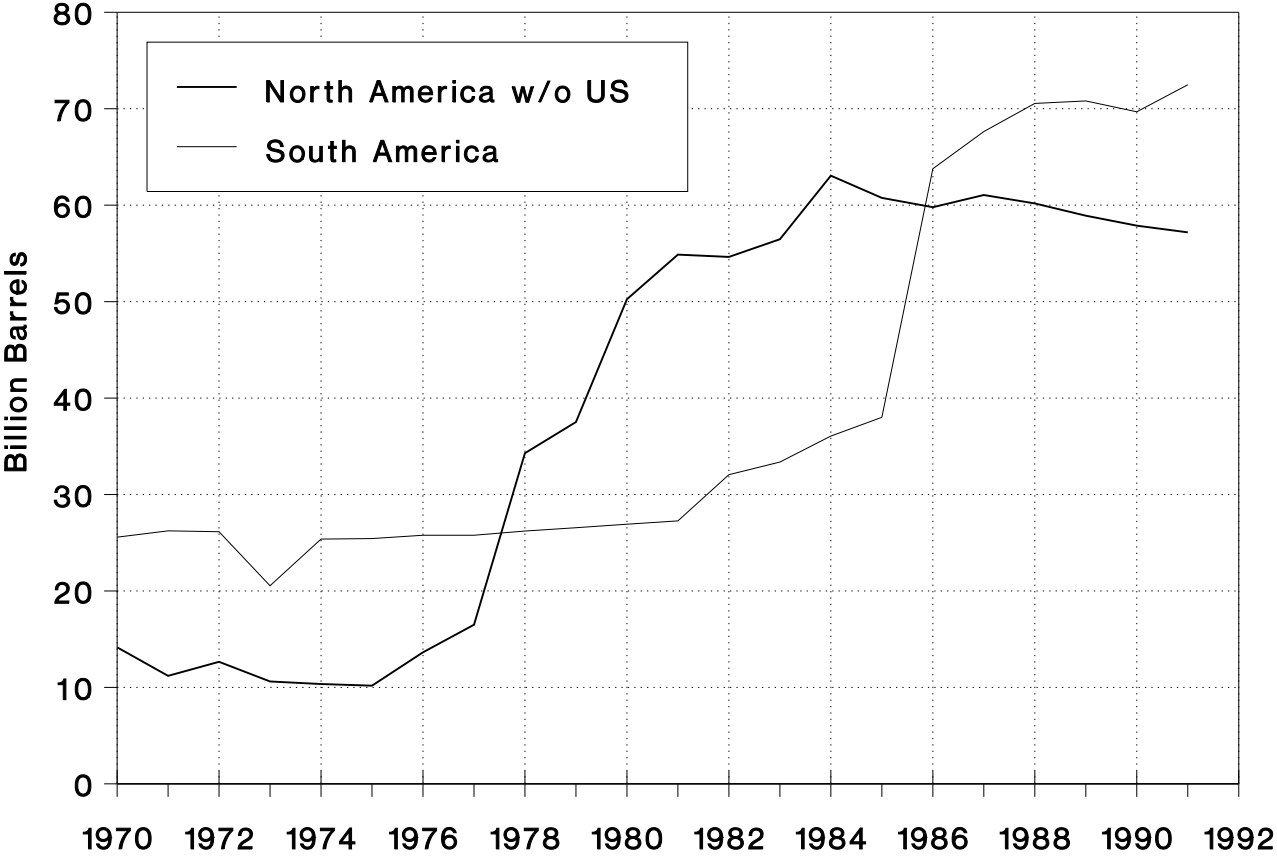
Sources: DeGolyer & MacNaughton, *Twentieth Century Petroleum Statistics 1945-1991*; API, *Petroleum Facts & Figures 1971*; API, *Petroleum Facts & Figures 1959*; Gulf Publishing Co., *World Oil*; PennWell Publishing Co., *Oil & Gas Journal*; PennWell Publishing Co., *Oil and Gas Journal Energy Statistics Sourcebook 1990*; EIA; Petroconsultants S.A., *World Production & Reserve Statistics 1991*.

Figure 7a. Oil Reserves, Excluding the United States, 1970-1991



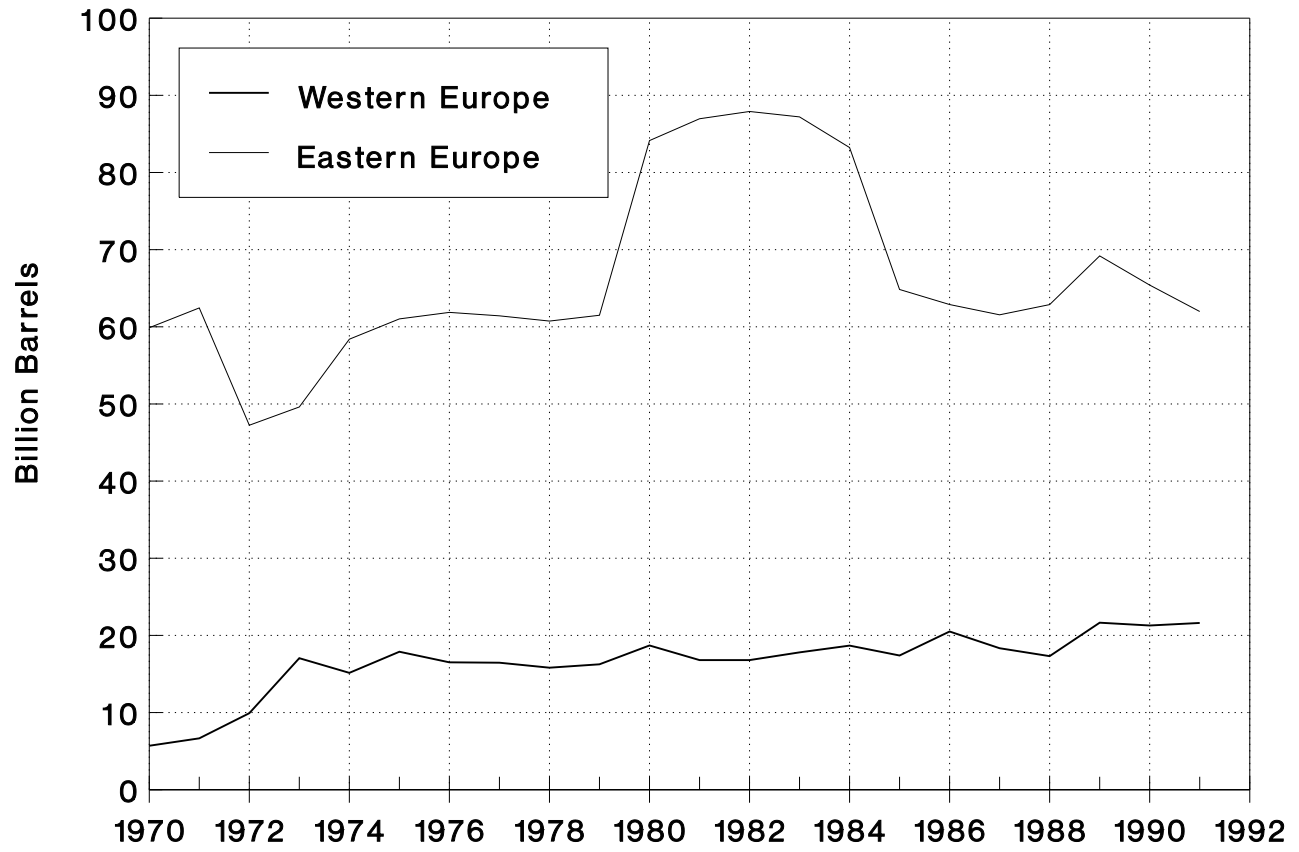
Source: Table 7.

Figure 7b. Oil Reserves, Western Hemisphere, Excluding the United States, 1970-1991



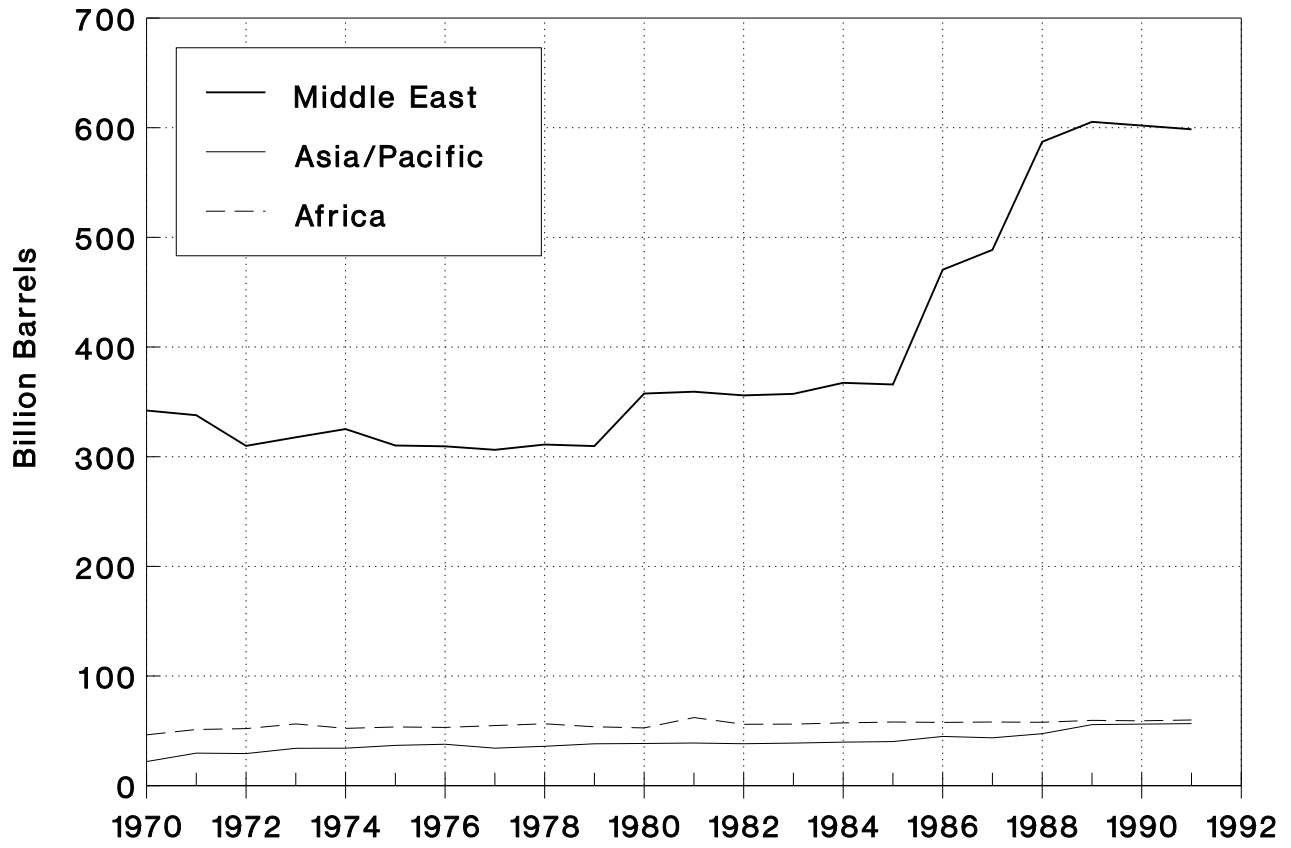
Source: Table 7.

Figure 7c. Oil Reserves, Europe, 1970-1991



Source: Table 7.

Figure 7d. Oil Reserves, Middle East, Asia/Pacific, and Africa, 1970-1991



Source: Table 7.

Table 8. Annual Oil Reserve Additions, Million Barrels

Region/Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
North America											
Canada	400.377	265.946	1,909.539	-1,423.341	93.767	-14.136	63.425	159.762	238.821	1,567.586	-298.556
Cuba	-0.806	0.250	58.281	0.037	0.278	0.004	-0.634	-0.270	0.365	0.095	-0.085
Guatemala	na	na	na	0.000	3.002	0.027	8.396	-5.254	0.222	0.571	5.570
Mexico	175.599	-2,553.626	156.928	178.981	449.926	605.740	4,140.882	3,507.062	18,419.895	2,742.857	14,253.537
United States	12,886.905	2,515.695	1,731.806	2,321.320	2,152.710	1,488.975	1,236.412	3,847.225	2,753.055	1,576.480	3,141.502
Total	13,462	228	3,857	1,077	2,700	2,081	5,448	7,509	21,412	5,888	17,102
South America											
Argentina	143.399	581.514	624.464	-0.464	298.106	184.966	160.546	-41.510	270.991	648.025	-263.341
Barbados	-0.250	0.000	0.000	-0.491	2.309	-0.237	1.649	-2.528	-0.205	1.291	-0.379
Bolivia	-191.180	-24.794	-26.042	19.962	-46.802	-6.590	38.756	-19.224	16.944	48.674	-52.896
Brazil	65.923	61.513	3.785	8.419	99.652	66.658	133.028	297.885	90.528	182.433	136.437
Chile	1.532	12.883	36.939	86.811	0.039	0.032	195.481	134.019	69.381	0.371	22.721
Colombia	60.050	124.101	43.283	-843.621	-0.025	60.143	353.698	-102.198	118.351	-268.037	25.215
Ecuador	3,001.444	71.854	-77.843	-4,399.384	9.078	0.853	-0.051	248.102	23.655	-175.286	-75.236
Peru	16.269	32.588	33.709	49.966	-33.558	291.094	8.236	55.931	79.877	-3.475	-0.230
Suriname	na	na	na	na	na	na	na	na	na	na	na
Trinidad	66.047	495.148	-441.789	0.670	219.248	78.621	76.673	83.619	83.777	128.249	27.613
Venezuela	-610.680	994.906	1,310.187	1,168.194	5,841.540	684.164	673.537	631.217	975.418	1,158.168	1,875.888
Total	2,553	2,350	1,507	-3,910	6,390	1,360	1,642	1,285	1,729	1,720	1,696
Western Europe											
Austria	21.515	14.349	15.267	-0.619	21.309	18.304	-0.398	-12.038	12.786	-0.102	7.967
Denmark	360.000	-250.000	0.622	0.967	-2.339	-0.796	56.427	3.723	-89.261	-0.034	247.619
France	29.125	-7.449	6.276	4.866	-24.532	5.287	7.077	8.259	12.536	49.519	12.416
West Germany	173.227	69.097	35.508	45.455	38.319	-133.429	0.111	27.413	32.341	193.179	-86.748
Greece	na	na	0.000	3.500	132.900	0.000	0.000	0.000	0.000	-81.900	-4.524
Italy	-13.425	-24.948	-50.789	35.339	332.552	-230.465	6.445	0.660	16.832	59.981	-1.032
Netherlands	-31.920	42.927	18.993	9.168	-159.317	0.622	-1.630	0.117	0.058	29.469	50.249
Norway	700.000	-797.919	312.078	2,211.753	1,012.775	971.193	-1,312.666	-80.650	-542.250	1,965.928	3,083.793
Spain	-0.043	27.374	31.047	30.190	33.663	166.451	1.251	59.967	0.032	-106.503	-38.544
Sweden	na	na	na	na	na	0.103	-0.008	0.008	0.193	0.604	0.998
United Kingdom	992.253	2,001.696	3,002.650	4,903.011	-3,171.625	2,113.303	154.973	445.716	506.821	-878.455	31.225
Total	2,231	1,075	3,372	7,244	-1,786	2,911	-1,088	453	-50	1,232	3,303
Eastern Europe											
Albania	9.995	5.674	8.163	3.513	84.781	15.965	1.155	15.700	10.044	50.010	153.148
Bulgaria	35.438	2.336	-255.700	-0.034	-0.905	-1.017	1.125	0.776	3.041	15.388	0.296
Czechoslovakia	-1.576	1.356	8.793	0.220	0.679	0.063	-2.218	1.513	0.013	0.483	-0.121
East Germany	1.752	1.095	5.376	-0.916	11.475	-2.062	-1.062	2.011	0.111	8.938	78.199
Hungary	14.780	-42.121	25.041	0.300	4.491	49.160	-9.894	6.017	36.345	4.860	-0.377
Poland	3.146	14.616	1.077	0.770	-0.153	2.269	0.681	-9.799	0.057	2.567	10.162
Romania	102.067	716.479	129.488	6.100	-1.761	118.339	4.959	575.886	0.106	-536.000	240.134
USSR, former	2,549.550	4,778.300	-12,097.068	5,594.000	12,155.600	6,049.150	4,815.656	2,976.300	3,612.140	5,619.500	26,615.980
Yugoslavia	-228.860	21.932	39.165	24.600	16.416	77.806	-0.075	40.165	-0.031	21.728	90.503
Total	2,486	5,500	-12,136	5,629	12,271	6,310	4,810	3,609	3,662	5,187	27,188
Middle East											
Abu Dhabi	102.179	591.004	3,517.827	948.239	7,315.142	510.338	1.562	6.747	6,194.051	6,506.995	2.588
Ajman	na	na	na	na	na	na	na	na	na	na	na
Bahrain	-5.027	174.167	-215.648	0.948	88.484	-57.578	73.331	-0.052	0.000	-20.191	10.158
Dubai	331.271	245.651	529.900	100.300	0.000	92.844	0.314	0.000	40.040	0.316	0.184
Iran	6,397.460	2,111.901	7,638.825	3,889.269	2,247.935	-15,989.295	174.509	800.038	-18.000	-3,300.000	-13.908
Iraq	1,063.547	4,724.312	3,194.507	664.121	124.000	685.790	999.835	1,028.909	0.000	1,877.085	0.124
Israel	-6.445	0.387	0.141	0.765	0.000	-0.250	0.000	0.001	-0.036	0.000	-0.036
Jordan	na	na	na	na	na	na	na	na	na	na	na
Kuwait	5,288.110	-8,409.205	9,048.219	0.280	-1,248.420	0.609	2,281.003	851.379	91.310	-2,061.525	2.644
Neutral Zone	-16.141	399.068	-2,661.510	384.447	-3,299.898	0.043	-0.518	-3.522	0.050	710.903	0.020
Oman	1,121.210	857.430	-1,619.869	400.925	78.771	124.649	0.367	49.999	300.000	-923.678	347.212
Qatar	332.456	856.882	1,208.543	-0.100	0.000	7.298	-1,002.653	-0.225	0.000	179.466	0.000
Ras al Khaimah	na	na	na	na	na	na	na	na	na	na	na
Saudi Arabia	2,893.335	14.615	-41,949.577	6,607.146	9,554.543	6,868.834	5,383.887	3,504.187	5,828.128	3,476.644	54,361.080
Sharjah	na	na	na	na	8.500	-136.019	-636.460	-664.707	-0.933	0.228	2.323
Syria	29.356	36.462	-20.842	1,026.812	589.328	0.000	0.000	-797.556	20.415	-9.775	-150.233
Turkey	24.776	6.131	-14.834	26.479	-1.117	3.000	3.624	178.485	0.010	22.551	64.827
Yemen	na	na	na	na	na	na	na	na	na	na	na

Total	17,556	1,609	-21,344	14,050	15,457	-7,890	7,279	4,954	12,455	6,459	54,627
Table 8. Annual Oil Reserve Additions, Million Barrels (Continued)											
Region/Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Africa											
Algeria	449.324	2,020.927	305.314	-42.464	61.214	1,309.672	1.100	792.000	-0.040	-699.162	-728.494
Angola	145.838	283.922	283.966	135.701	162.244	7.086	19.106	144.303	4.986	12.095	99.814
Benin	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.000
Cameroon	0.000	0.000	0.000	0.000	39.000	30.000	130.000	-62.122	0.020	19.706	140.426
Congo	-2.263	326.530	409.334	26.480	-232.934	2.366	0.092	0.007	299.006	0.917	0.021
Egypt	-1,859.492	161.124	1,239.512	40.167	-553.285	118.639	249.934	673.654	227.704	149.189	1,038.727
Gabon	24.292	158.911	443.831	-164.058	-34.687	8.742	89.466	38.228	-0.002	39.089	100.821
Ghana	na	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	1.346	0.115
Ivory Coast	na	na	na	na	na	na	na	0.000	10.000	0.000	15.562
Libya	1,209.314	-992.313	-3,078.330	-110.900	347.291	1,540.127	1,200.032	1,587.828	2,600.038	-0.025	9.736
Morocco	-6.245	0.452	0.502	0.021	-0.011	0.054	-0.065	0.066	-0.041	-0.061	1.201
Nigeria	995.836	4,958.375	3,265.282	6,397.669	-3,775.182	8.646	-0.046	760.491	725.488	200.007	419.320
Senegal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sudan	na	na	na	na	na	na	0.000	0.000	0.000	0.000	30.000
Tunisia	4.296	61.542	67.211	-0.002	1,974.882	1.999	-0.844	-0.078	-0.005	-10.897	50.542
Zaire	0.000	6.000	16.000	127.000	0.000	-7.407	7.650	-0.069	0.004	3.814	-0.208
Total	961	6,985	2,953	6,410	-2,011	3,020	1,696	3,934	3,867	-284	1,180
Asia-Pacific											
Afghanistan	-5.000	-5.000	-0.100	-0.060	-4.840	0.000	0.000	-1.000	na	na	na
Australia	-275.051	301.914	18.459	898.971	340.936	-0.303	82.521	56.042	450.008	-299.121	118.325
Bangladesh	0.021	0.022	0.034	0.038	0.038	0.047	0.054	0.054	0.053	-0.952	1.055
Brunei	851.200	51.579	-527.895	483.668	-129.662	-34.067	74.571	-399.985	40.231	0.064	79.004
China	146.000	6,998.900	223.260	2,562.800	416.100	2,905.550	1,369.220	709.572	2,758.805	-0.345	524.822
India	534.096	48.991	101.568	156.925	91.610	206.085	1,042.932	286.475	133.923	257.790	0.906
Indonesia	1,461.656	999.073	422.160	1,288.536	1,001.838	476.855	50.319	-2,587.729	122.015	3,770.376	113.816
Japan	4.156	4.929	4.443	10.241	51.626	-39.167	-0.049	2.534	-0.037	0.016	15.277
Malaysia	407.326	25.133	333.961	533.080	-470.435	35.770	-364.687	-0.040	114.760	460.332	500.917
Myanmar	8.388	-3.848	7.747	10.811	25.092	14.511	4.948	14.390	-0.010	0.000	711.780
New Zealand	200.467	-0.196	-92.302	-0.012	-13.895	11.424	68.810	-79.584	9.889	2.998	65.582
Pakistan	3.500	3.500	2.891	-0.597	0.003	-1.475	262.965	-0.040	0.082	-74.573	-0.134
Papua New Guinea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Philippines	na	na	na	na	na	na	na	78.000	5.000	-52.246	-1.523
Taiwan	0.438	2.703	-1.285	-0.041	2.314	1.987	0.174	0.006	-0.030	0.153	-0.070
Thailand	0.070	0.095	-0.053	0.041	0.055	0.000	0.100	0.077	0.049	0.050	0.150
Vietnam	na	na	na	na	na	251.000	0.000	0.000	0.000	0.000	0.000
Total	3,337	8,428	493	5,944	1,311	3,828	2,592	-1,921	3,635	4,065	2,130
OPEC	19,922	8,674	-16,805	21,131	18,144	-3,931	9,216	6,745	16,558	11,859	56,146
Non-OPEC	22,664	17,501	-4,495	15,312	16,186	15,550	13,163	13,078	30,152	12,408	51,079
Non-OPEC w/o US	9,777	14,985	-6,227	12,991	14,034	14,061	11,927	9,230	27,399	10,832	47,938
Total w/o US	29,699	23,659	-23,031	34,122	32,177	10,130	21,143	15,975	43,957	22,690	104,084
Total	42,586	26,175	-21,300	36,443	34,330	11,619	22,379	19,822	46,710	24,267	107,226

Table 8. Annual Oil Reserve Additions, Million Barrels (Continued)

Region/Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
North America											
Canada	1,117.490	232.562	500.349	662.145	-909.829	321.375	2,482.369	698.702	282.382	136.882	158.389
Cuba	0.081	-0.058	-0.182	0.636	-0.430	-0.430	73.531	4.402	7.601	6.927	4.702
Guatemala	36.493	-2.708	0.549	3.715	1.068	-25.198	19.837	40.143	-37.372	-3.981	-1.408
Mexico	4,766.570	1,002.430	2,800.077	7,523.341	169.698	173.092	185.001	-152.644	-83.332	278.581	639.975
United States	2,749.780	1,588.885	3,048.120	3,960.714	3,244.415	1,641.200	3,414.385	2,548.240	2,454.745	2,437.575	1,119.145
Total	8,670	2,821	6,349	12,151	2,505	2,110	6,175	3,139	2,624	2,856	1,921
South America											
Argentina	-103.541	-42.946	671.769	74.101	78.804	150.367	168.213	194.543	51.685	-426.026	241.964
Barbados	-0.176	0.499	0.254	0.635	0.476	0.648	3.617	0.107	0.287	0.354	0.692
Bolivia	29.991	55.021	-13.900	6.621	6.245	7.015	23.856	9.520	7.274	-43.365	-5.806
Brazil	259.300	316.852	251.394	378.289	345.551	380.839	391.369	509.231	186.455	244.240	465.756
Chile	30.004	10.626	-317.135	-20.564	6.948	1.205	69.822	0.034	16.065	-108.743	-2.800
Colombia	-27.253	165.859	171.471	591.637	407.404	509.267	226.598	305.087	-71.094	-27.936	109.834
Ecuador	126.292	51.264	-127.192	65.270	401.866	587.763	-292.125	375.435	0.096	432.844	115.787
Peru	324.082	-35.688	-16.346	41.078	-12.276	11.915	4.702	424.749	41.964	23.600	40.801
Suriname	na	na	na	na	na	0.707	26.801	2.940	0.887	0.541	11.797
Trinidad	-19.886	136.619	25.343	3.153	139.454	18.421	40.482	125.163	65.932	34.239	22.823
Venezuela	1,051.016	5,382.686	1,904.297	2,874.316	1,912.755	25,483.005	4,524.135	2,403.008	1,373.350	318.275	3,461.875
Total	1,670	6,041	2,550	4,015	3,287	27,151	5,187	4,350	1,673	448	4,463
Western Europe											
Austria	3.749	25.064	-0.072	0.130	7.890	-1.375	-19.534	6.900	13.708	8.441	9.868
Denmark	-69.598	0.505	17.330	192.325	23.769	8.010	73.099	20.954	298.677	0.048	27.176
France	34.861	31.903	24.033	79.137	55.457	-8.787	16.357	13.711	4.493	15.155	30.473
West Germany	-0.994	23.640	17.928	26.972	195.652	21.211	-151.513	-0.666	36.522	39.131	35.975
Greece	1.472	2.300	3.404	4.591	5.935	7.673	7.092	0.618	15.062	-1.294	12.498
Italy	24.596	180.968	83.045	0.002	199.017	-38.346	44.055	25.562	1.456	34.591	36.831
Netherlands	28.764	120.178	-45.851	2.190	50.800	35.759	27.626	11.817	14.615	16.813	26.955
Norway	-1,054.093	280.762	1,812.560	1,873.664	-1,170.474	3,854.836	-1,469.254	391.617	5,149.589	130.132	888.144
Spain	-29.063	-23.735	21.680	7.185	4.687	12.330	13.541	15.509	-9.485	0.706	4.975
Sweden	0.302	0.800	0.001	0.001	0.002	-0.002	-0.005	0.102	-0.003	0.003	na
United Kingdom	91.000	423.500	240.672	-28.306	694.810	611.005	734.683	-111.709	206.122	870.493	830.625
Total	-969	1,066	2,175	2,158	68	4,502	-724	374	5,731	1,114	1,904
Eastern Europe											
Albania	-15.240	-3.513	-45.083	5.058	24.139	-1.458	-0.649	1.659	1.704	16.294	0.035
Bulgaria	-0.610	-1.401	-9.344	0.050	-0.700	2.303	-1.708	0.239	0.711	0.748	0.023
Czechoslovakia	-0.096	0.057	-3.458	0.017	14.334	1.036	-0.427	1.139	0.260	-0.764	0.075
East Germany	-11.605	-6.887	-85.917	0.005	-0.207	2.282	0.896	0.094	8.945	na	na
Hungary	0.843	4.397	70.829	8.913	-34.158	153.630	-0.021	2.764	-89.380	-14.613	12.884
Poland	-0.563	-0.441	-9.240	0.302	1.446	0.241	2.488	0.743	9.580	20.929	7.484
Romania	2.083	39.575	723.200	1.059	12.428	2.399	2.475	13.625	36.854	380.514	21.912
USSR, former	7,444.240	5,525.615	3,291.355	657.183	-13,978.045	2,500.485	3,355.871	5,978.732	10,911.700	52.224	321.740
Yugoslavia	-0.080	10.936	3.254	7.254	40.477	10.247	0.231	2.664	34.266	-19.519	2.066
Total	7,419	5,568	3,936	680	-13,920	2,671	3,359	6,002	10,915	436	366
Middle East											
Abu Dhabi	433.816	18.523	-8.000	14.440	684.270	20,710.010	-0.085	389.266	11,861.915	-627.287	122.335
Ajman	na	na	na	na	na	na	na	0.000	0.073	0.073	na
Bahrain	0.000	0.000	10.143	3.289	22.309	-23.516	0.369	1.716	0.586	-11.670	29.330
Dubai	-0.112	234.670	23.188	0.172	459.233	95.445	9.555	266.082	193.955	119.127	55.205
Iran	0.000	-175.685	809.580	0.442	0.079	528.085	14,394.615	13,636.840	543.170	1,627.120	709.063
Iraq	-15.000	54.780	436.530	5,440.298	524.505	62,137.290	757.740	2.840	2,003.750	733.650	99.828
Israel	0.000	0.772	0.073	0.037	-0.263	0.086	0.105	1.055	-0.024	-0.010	-0.038
Jordan	na	na	na	na	na	-0.052	0.037	-0.078	0.047	0.030	3.120
Kuwait	0.392	59.112	17.550	5,473.792	-25.735	23,008.910	1,403.043	989.330	554.730	37.788	-2,800.110
Neutral Zone	-32.231	-479.395	-0.419	0.060	5.446	17.029	115.445	-0.148	135.050	84.770	-9.915
Oman	2,132.807	-978.225	241.931	552.818	351.182	174.291	280.728	262.729	382.723	305.738	256.150
Qatar	-1.948	-1.905	1,430.200	0.247	-884.340	104.734	-681.023	0.446	1,338.713	-640.942	0.898
Ras al Khaimah	na	na	na	2.000	3.139	103.577	202.100	1.281	0.456	0.292	0.292
Saudi Arabia	4,105.697	2,496.435	2,596.620	1,735.481	1,400.850	2,211.777	4,426.715	86,792.685	4,359.190	3,589.024	3,566.835
Sharjah	298.628	103.977	9.706	72.965	63.798	30.290	1,016.790	17.934	15.786	10.074	9.016
Syria	500.793	-83.203	-228.680	-0.280	207.470	150.810	183.950	173.879	315.705	21.620	93.740
Turkey	15.911	64.799	20.271	273.075	-427.513	14.583	144.418	152.623	-52.977	53.722	-24.434
Yemen	na	na	na	na	0.000	3.650	559.481	1,012.220	2,368.620	-2,552.515	401.905
Total	7,439	1,315	5,359	13,569	2,384	109,267	22,814	103,701	24,021	2,751	2,513

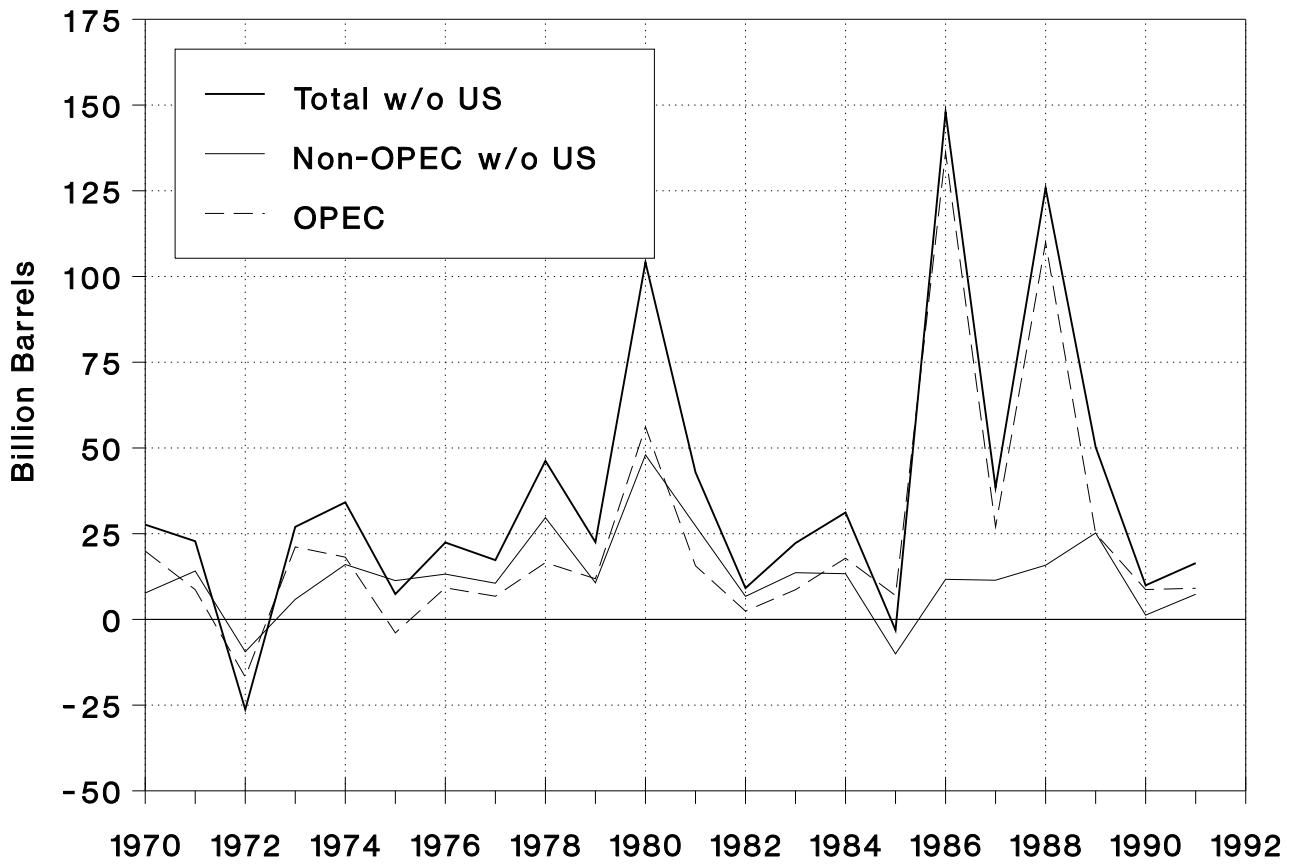
Table 8. Annual Oil Reserve Additions, Million Barrels (Continued)

Region/Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Africa											
Algeria	0.025	854.050	128.625	195.870	2,125.100	345.000	82.520	376.980	1,139.043	667.527	880.850
Angola	-219.714	396.602	325.124	503.630	-44.137	-512.935	731.169	165.022	239.224	-276.576	6.488
Benin	0.000	0.056	-0.455	0.500	-0.080	-0.450	0.010	0.410	-0.205	0.000	13.800
Cameroon	29.956	67.614	6.778	328.200	87.255	38.620	35.955	61.488	28.400	17.599	0.015
Congo	58.260	55.440	23.868	107.680	-0.880	6.588	21.290	104.410	19.748	100.900	0.010
Egypt	842.697	405.959	539.000	363.922	106.600	998.972	512.770	-96.995	348.050	-515.313	402.985
Gabon	48.036	75.003	122.716	140.482	96.415	49.225	370.276	27.861	103.283	-0.024	123.453
Ghana	-3.520	3.771	-1.198	0.256	0.109	-1.450	-1.350	0.000	0.000	-0.500	0.000
Ivory Coast	266.873	-192.310	-0.724	7.959	24.913	7.035	0.620	4.120	-19.270	0.640	0.000
Libya	499.975	-3,944.060	697.850	1,402.600	383.250	361.533	116.020	380.530	727.313	529.250	548.960
Morocco	0.033	0.002	-0.067	-0.192	1.578	0.198	-0.160	0.352	0.675	-0.172	0.467
Nigeria	9,220.744	-2,302.580	-21.830	601.420	4.580	226.550	310.000	709.124	1,285.460	1,381.570	1,124.945
Senegal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.001	-0.005	0.007	-0.050
Sudan	50.000	200.000	-100.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tunisia	352.508	-0.011	106.393	-660.140	6.257	11.838	10.755	100.868	46.010	-28.346	99.691
Zaire	0.040	23.745	14.385	12.776	8.624	1.857	12.315	-5.106	6.085	89.053	0.054
Total	11,146	-4,357	1,840	3,005	2,800	1,533	2,202	1,829	3,924	1,966	3,202
Asia-Pacific											
Afghanistan											
Australia	-229.994	47.298	469.312	-130.798	358.056	740.918	244.575	735.283	172.550	-618.137	321.466
Bangladesh	5.074	0.084	0.093	0.143	0.152	7.160	-0.700	0.324	12.345	-0.594	-38.171
Brunei	263.107	3.801	144.560	-0.481	34.020	92.225	181.940	-351.267	0.034	27.780	66.715
China	238.067	444.600	774.311	2,136.580	891.624	4,376.300	380.880	702.840	10,243.840	569.320	234.410
India	1,182.900	175.600	298.530	345.375	262.351	1,062.125	9.680	287.907	118.055	1,521.434	749.764
Indonesia	22.117	53.989	503.186	-100.630	196.768	813.228	-56.123	3,993.511	-588.715	873.606	1,188.333
Japan	3.065	0.742	2.667	10.838	28.322	-0.570	-0.244	0.420	-0.159	0.100	0.034
Malaysia	589.210	385.655	120.450	487.380	762.097	213.595	-24.230	253.372	510.485	112.165	269.950
Myanmar	-1.505	1.314	19.630	0.216	1.271	-515.866	-52.285	59.273	-0.030	-74.271	0.475
New Zealand	18.240	11.431	5.317	0.041	14.490	0.587	-14.014	12.540	13.563	65.984	-12.656
Pakistan	-108.523	4.636	20.163	8.135	20.985	64.876	-3.177	196.839	1.555	9.500	78.949
Papua New Guinea	0.000	0.000	0.000	18.000	0.000	15.000	135.000	0.000	-19.300	19.300	0.404
Philippines	6.355	18.131	5.322	-0.002	-6.209	-0.078	25.439	0.185	-2.022	103.427	9.991
Taiwan	0.550	-0.024	0.047	1.956	0.034	0.997	-0.066	0.482	0.070	0.495	-0.011
Thailand	75.190	-43.649	2.179	36.052	63.780	2.111	35.542	123.975	51.889	15.516	5.089
Vietnam	0.000	30.000	0.000	0.000	0.000	0.290	2.400	5.475	0.220	240.075	24.017
Total	2,064	1,134	2,366	2,813	2,628	6,873	865	6,021	10,514	2,866	2,899
OPEC	15,631	2,430	8,650	17,854	6,950	136,226	26,992	109,988	25,047	8,704	9,082
Non-OPEC	21,808	11,158	15,924	20,535	-7,199	17,881	12,887	15,428	34,355	3,732	8,185
Non-OPEC w/o US	19,058	9,569	12,876	16,575	-10,443	16,240	9,473	12,880	31,901	1,294	7,066
Total w/o US	34,689	11,999	21,525	34,429	-3,493	152,466	36,464	122,867	56,947	9,998	16,148
Total	37,439	13,588	24,574	38,389	-249	154,107	39,879	125,416	59,402	12,436	17,267

Note: Totals and subtotals in bold are rounded to the nearest million barrels. Column totals may not add due to independent rounding.
na = not available.

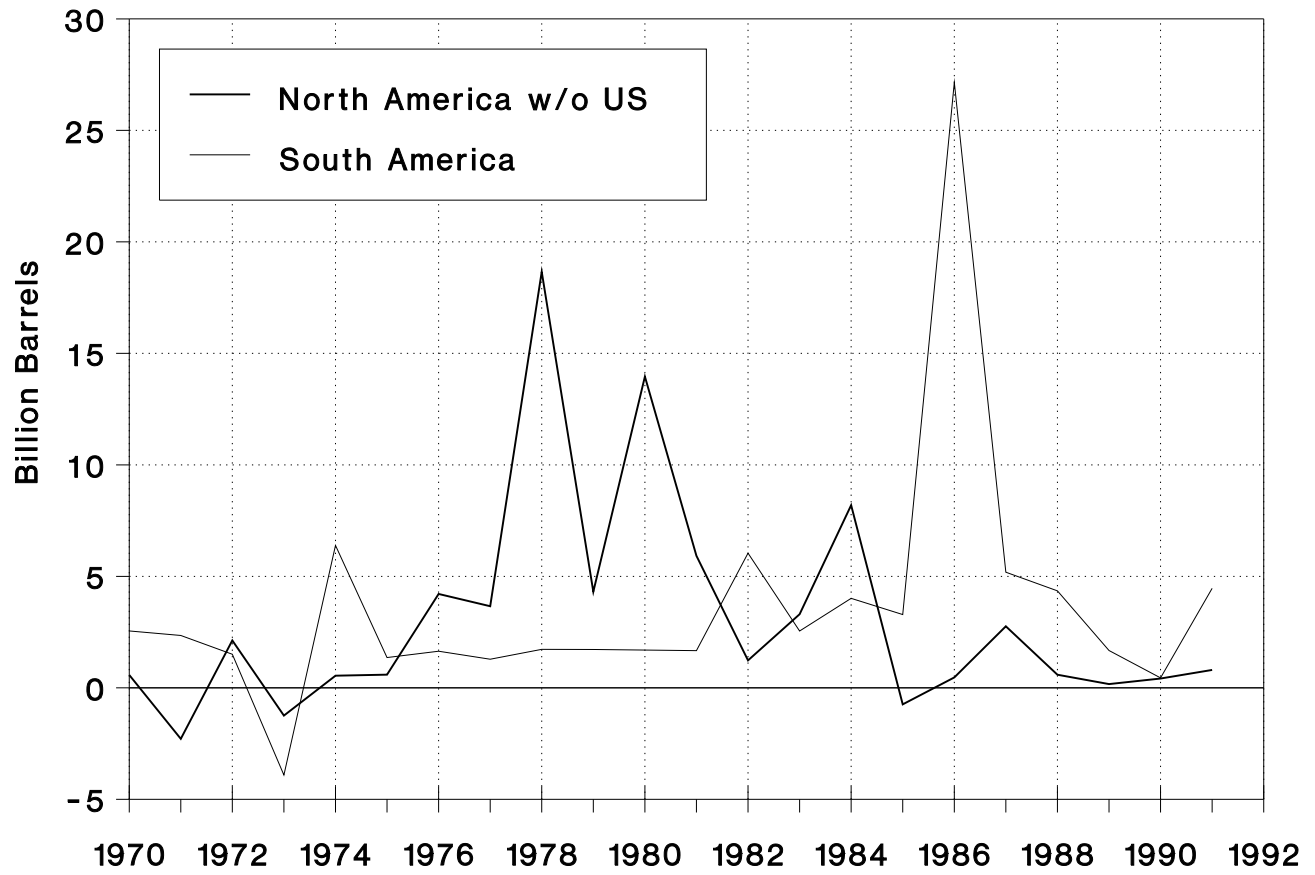
Source: See Tables 6 and 7.

Figure 8a. Annual Oil Reserve Additions, Excluding the United States, 1970-1991



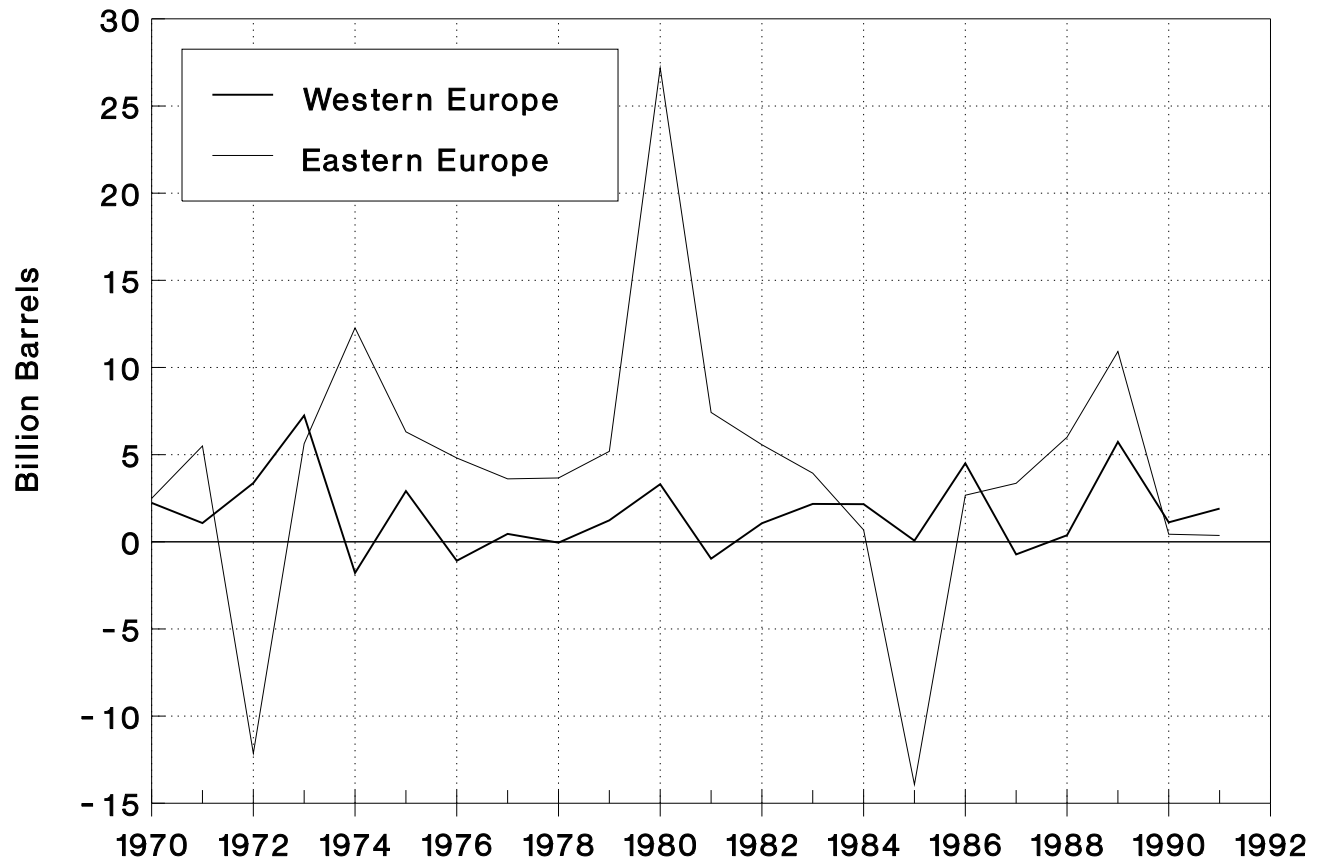
Source: Table 8.

Figure 8b. Annual Oil Reserve Additions, Western Hemisphere, Excluding the United States, 1970-1991



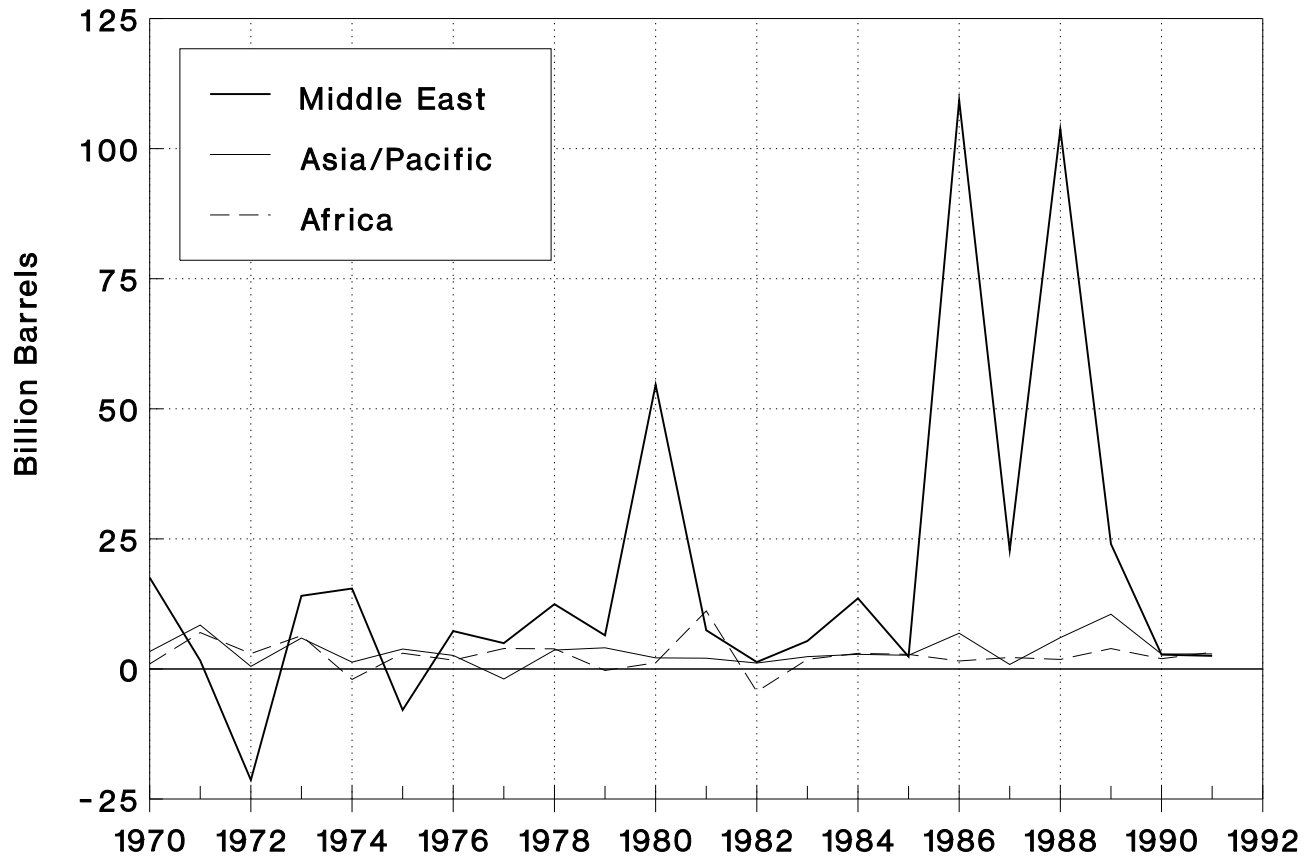
Source: Table 8.

Figure 8c. Annual Oil Reserve Additions, Europe, 1970-1991



Source: Table 8.

Figure 8d. Annual Oil Reserve Additions, Middle East, Asia/Pacific, and Africa, 1970-1991



Source: Table 8.

Table 9. Annual Oil Reserve-to-Production Ratios (R/P)

Region/Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
North America											
Canada	18.6	16.9	18.7	12.3	12.0	13.2	13.6	13.4	13.6	12.5	11.5
Cuba	26.8	24.8	68.7	83.9	67.3	84.7	229.5	113.7	227.4	74.9	88.5
Guatemala	na	na	na	na	6,500.0	481.5	221.9	347.8	72.1	28.0	12.7
Mexico	31.4	16.0	17.6	17.3	14.7	13.1	24.8	29.1	64.4	57.4	62.3
United States	11.1	11.0	10.5	10.5	10.7	10.7	10.4	10.6	9.9	9.5	9.5
Total	12.8	11.9	11.8	11.1	11.1	11.2	12.0	12.7	16.2	16.0	18.3
South America											
Argentina	11.0	12.9	15.6	15.1	16.3	17.4	17.3	14.8	14.9	16.8	13.7
Barbados	na	na	na	27.8	42.4	17.4	26.3	8.2	1.7	5.2	2.9
Bolivia	34.0	19.8	13.8	12.9	9.6	9.4	10.9	10.3	11.4	17.1	12.9
Brazil	14.1	13.5	13.1	12.0	12.0	12.5	14.0	18.6	19.2	20.7	19.8
Chile	9.7	9.3	11.5	19.3	20.9	22.5	46.3	72.3	92.0	71.6	45.3
Colombia	19.7	20.8	22.4	10.3	10.3	11.1	17.5	15.6	18.0	11.9	11.3
Ecuador	4,155.1	4,483.4	208.1	23.2	22.7	23.6	19.2	22.4	19.7	16.1	14.0
Peru	19.0	22.6	21.9	21.1	17.1	28.4	26.0	22.4	13.9	9.9	8.8
Suriname	na	na	na	na	na	na	na	na	na	na	na
Trinidad	11.9	22.3	10.9	8.2	9.5	8.3	8.4	7.8	7.8	8.9	8.4
Venezuela	10.4	10.6	11.8	11.2	17.1	21.5	21.7	22.1	23.1	21.5	24.7
Total	14.7	15.5	16.3	12.2	16.4	19.5	19.9	20.0	20.3	19.2	20.2
Western Europe											
Austria	9.7	10.6	10.7	9.2	11.0	12.4	12.0	11.0	11.0	10.4	12.0
Denmark	na	na	401.9	258.5	373.7	203.5	210.2	80.6	66.1	66.7	212.4
France	7.1	7.2	8.7	9.8	7.3	7.4	7.0	7.3	7.4	11.5	10.0
West Germany	10.0	10.4	10.8	11.2	12.0	8.7	8.0	7.9	8.3	13.4	10.3
Greece	na	na	na	na	na	na	na	na	na	na	105.0
Italy	31.9	30.3	27.9	33.7	74.9	45.4	42.8	42.9	32.6	32.4	29.0
Netherlands	17.6	22.3	24.0	26.4	10.8	10.1	8.5	7.5	6.4	9.1	14.1
Norway	na	961.1	190.4	382.9	430.5	92.5	48.7	33.5	32.0	42.3	43.2
Spain	5.8	40.0	62.1	17.3	7.6	19.5	19.3	42.3	41.5	22.4	12.7
Sweden	na	na	na	na	na	3.2	5.9	10.0	27.7	240.0	107.8
United Kingdom	798.1	1,768.9	2,264.2	3,620.1	2,288.9	869.4	115.1	37.1	26.4	15.7	14.2
Total	49.1	60.5	87.1	149.8	130.5	102.4	58.8	32.9	26.3	20.7	21.5
Eastern Europe											
Albania	9.3	10.4	8.7	4.9	8.6	7.9	9.3	8.7	9.5	13.2	28.0
Bulgaria	114.0	119.0	11.4	13.0	15.5	17.1	16.5	17.4	18.4	18.4	13.3
Czechoslovakia	8.4	8.8	15.1	15.2	15.3	17.8	15.9	16.0	15.0	15.1	18.4
East Germany	6.3	10.0	17.7	24.0	52.6	51.4	47.9	44.0	43.2	69.9	271.7
Hungary	18.1	14.1	14.6	13.4	13.5	15.0	13.6	11.6	13.3	13.3	12.7
Poland	11.8	15.6	18.2	16.2	14.8	9.9	9.0	9.0	8.2	7.2	11.3
Romania	8.5	14.5	14.3	13.2	12.0	12.0	11.0	15.3	15.3	9.8	13.0
USSR, former	22.7	21.6	15.5	15.4	17.0	16.8	15.8	15.2	14.0	14.0	18.6
Yugoslavia	14.9	14.4	13.9	13.4	11.9	13.5	13.3	12.1	10.7	10.7	12.0
Total	22.1	21.3	15.4	15.2	16.8	16.5	15.6	15.2	14.0	13.9	18.5
Middle East											
Abu Dhabi	58.9	44.3	47.5	38.8	49.5	50.0	43.6	40.4	56.8	67.4	71.6
Ajman	na	na	na	na	na	na	na	na	na	na	na
Bahrain	14.1	19.8	11.7	11.1	13.8	11.7	13.9	13.6	13.3	12.3	12.6
Dubai	41.5	32.9	36.0	24.8	21.6	20.5	15.6	14.4	12.0	11.2	10.4
Iran	42.9	36.4	36.0	31.8	31.0	25.7	22.4	22.7	23.9	36.6	65.7
Iraq	51.0	53.0	65.7	48.3	52.0	43.2	42.1	41.3	36.3	27.6	37.0
Israel	3.6	5.2	5.3	8.3	6.9	6.0	4.6	4.8	4.6	3.9	3.8
Jordan	na	na	na	na	na	na	na	na	na	na	na

Table 9. Annual Oil Reserve-to-Production Ratios (R/P) (Continued)

Region/Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Kuwait	75.6	61.8	67.4	72.6	85.3	104.6	102.6	110.5	103.3	84.8	133.5
Neutral Zone	69.6	65.3	49.3	53.7	34.6	37.0	38.7	47.5	36.0	32.5	32.9
Oman	33.0	44.2	29.4	31.1	31.1	26.4	23.6	24.9	28.5	20.8	24.1
Qatar	31.0	30.6	33.0	27.1	29.2	31.5	23.6	24.8	21.3	20.3	20.8
Ras al Khaimah	na	na	na	na	na	na	na	na	na	na	na
Saudi Arabia	107.1	83.5	44.3	36.2	34.5	43.3	36.1	33.5	38.5	33.6	46.6
Sharjah	na	na	na	na	176.5	96.6	51.7	2.4	2.0	2.3	2.8
Syria	45.0	36.2	32.2	61.1	43.8	39.6	37.9	28.0	27.8	27.6	23.1
Turkey	8.1	7.2	5.9	5.7	5.0	4.5	4.6	12.6	11.5	11.2	16.8
Yemen	na	na	na	na	na	na	na	na	na	na	na
Total	67.6	56.9	47.0	41.2	41.1	43.5	38.6	37.7	40.4	39.6	52.9
Africa											
Algeria	21.5	35.2	24.7	24.7	25.4	29.0	25.0	24.5	22.5	19.4	17.5
Angola	18.4	29.5	24.2	22.3	22.3	23.6	23.6	27.1	25.4	25.4	27.6
Benin	na	na	na	na	na	na	na	na	na	na	na
Cameroon	na	na	na	na	na	na	na	530.9	31.7	11.9	13.1
Congo	26.3	2,538.5	315.8	55.6	29.3	39.6	34.5	37.1	43.9	37.9	31.9
Egypt	6.6	6.6	18.0	20.5	16.8	12.7	13.0	13.8	12.1	10.9	13.7
Gabon	12.3	14.4	21.8	10.1	8.8	7.1	7.1	6.7	6.1	6.1	7.3
Ghana	na	na	na	na	na	na	na	na	50.4	28.5	7.7
Ivory Coast	na	na	na	na	na	na	na	na	na	na	89.0
Libya	24.8	27.8	29.3	29.7	41.4	44.4	34.6	33.6	37.6	34.9	38.6
Morocco	2.7	7.0	7.4	3.7	5.3	5.8	5.2	3.6	2.5	1.4	12.9
Nigeria	14.1	17.9	18.9	24.4	16.6	19.7	16.1	16.1	17.6	13.9	14.9
Senegal	na	na	na	na	na	na	na	na	na	na	na
Tunisia	11.1	13.0	14.5	13.9	73.1	62.0	83.0	70.7	59.2	52.0	51.3
Zaire	na	na	na	na	na	737.8	15.4	15.9	19.1	16.0	17.2
Total	20.6	24.3	24.4	25.8	26.1	29.0	24.6	24.3	25.5	22.1	23.2
Asia-Pacific											
Australia	22.4	14.6	13.1	15.4	17.7	15.7	14.9	14.0	15.6	12.6	13.5
Bangladesh	809.5	772.7	500.0	447.4	447.4	361.7	314.8	314.8	320.8	333.3	309.1
Brunei	46.9	46.5	25.0	26.3	28.4	28.8	25.5	18.6	17.2	14.7	16.2
China	38.8	74.4	56.0	56.3	35.6	37.2	29.4	26.4	26.4	24.8	24.5
India	14.1	14.2	14.5	16.8	16.5	17.4	31.8	29.8	27.5	27.6	34.5
Indonesia	32.1	32.8	27.1	23.5	23.9	25.2	20.9	13.5	13.1	18.6	18.3
Japan	4.5	4.5	4.5	5.7	16.8	7.4	6.7	6.1	5.7	5.4	9.8
Malaysia	163.8	47.7	44.2	60.5	50.7	41.9	17.7	15.0	13.2	13.5	17.8
Myanmar	7.8	5.9	5.5	5.5	8.0	8.6	6.9	7.2	5.8	4.4	68.1
New Zealand	483.9	279.9	119.9	101.2	81.9	87.8	49.9	19.4	22.5	36.7	67.0
Pakistan	10.3	11.8	12.3	12.9	11.9	10.7	96.5	77.1	69.9	52.3	58.4
Papua New Guinea	na	na	na	na	na	na	na	na	na	na	na
Philippines	na	na	na	na	na	na	na	na	na	3.2	5.8
Taiwan	29.8	26.0	20.4	16.6	14.2	13.8	11.3	10.1	9.3	9.2	8.9
Thailand	7.1	5.3	8.5	9.8	7.3	3.0	3.0	3.9	6.1	6.0	8.0
Vietnam	na	na	na	na	na	na	na	na	na	na	na
Total	33.8	39.4	31.9	31.3	27.7	28.9	24.6	20.1	20.2	20.8	21.7
OPEC	47.3	43.7	38.1	34.6	35.7	38.8	34.2	33.2	35.3	34.2	43.5
Non-OPEC	18.5	19.0	16.9	17.0	17.3	17.7	17.1	16.5	17.0	16.3	19.1
Non-OPEC w/o US	24.1	24.5	21.2	20.9	20.8	21.0	20.0	18.9	19.9	18.8	22.4
Total w/o US	39.2	37.0	32.3	30.0	30.4	31.8	28.8	27.5	28.8	27.5	33.5
Total	33.3	31.9	28.2	26.8	27.3	28.5	26.2	25.2	26.0	25.0	30.0

Table 9. Annual Oil Reserve-to-Production Ratios (R/P) (Continued)

Region/Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
North America											
Canada	14.9	13.9	13.1	11.7	8.8	9.0	12.7	13.6	13.8	13.3	12.8
Cuba	38.0	19.0	14.5	11.5	8.8	7.8	20.0	22.2	22.6	23.3	22.4
Guatemala	36.8	21.8	18.8	29.2	46.8	12.8	31.0	59.8	31.3	25.6	na
Mexico	57.0	48.0	51.3	55.1	56.3	61.9	56.7	56.1	55.0	53.2	50.3
United States	9.4	8.8	8.7	8.8	8.7	8.5	8.9	9.0	9.5	9.8	9.2
Total	19.1	17.8	18.1	18.9	18.4	18.8	19.4	19.6	20.2	20.3	19.5
South America											
Argentina	12.0	10.9	14.3	13.4	11.9	14.2	14.5	14.2	13.2	9.1	8.8
Barbados	2.1	3.3	1.6	0.9	0.6	0.9	7.3	7.7	8.0	6.7	7.6
Bolivia	16.5	20.2	19.5	20.6	21.5	24.4	24.9	25.1	24.2	16.4	13.7
Brazil	18.6	18.1	15.4	11.8	10.7	10.9	11.8	13.4	12.4	11.7	12.8
Chile	39.4	37.8	18.0	16.0	16.7	17.0	24.3	28.8	32.9	20.8	21.5
Colombia	9.0	10.7	12.1	19.3	24.0	17.6	14.4	16.0	13.4	11.1	11.2
Ecuador	14.4	13.8	10.0	8.9	10.4	15.0	19.6	13.7	13.9	16.7	16.0
Peru	12.5	10.9	11.1	10.0	8.5	8.2	8.0	16.4	17.7	17.4	19.5
Suriname	na	na	na	na	2.4	1.4	33.7	23.1	20.3	18.9	25.1
Trinidad	8.1	9.8	10.3	8.3	9.0	8.8	9.2	10.7	11.1	10.9	10.9
Venezuela	25.8	35.5	39.3	41.9	47.6	85.5	93.7	86.5	92.6	77.1	72.3
Total	20.7	25.5	27.0	27.1	28.4	46.4	50.7	49.1	50.1	44.3	43.6
Western Europe											
Austria	12.7	14.9	14.1	13.8	13.8	13.8	10.7	9.3	10.2	10.3	9.4
Denmark	39.5	26.5	23.5	27.6	24.6	19.1	16.3	15.4	19.6	17.1	14.0
France	10.2	12.7	12.0	14.7	13.3	10.5	8.1	7.4	6.8	6.9	7.3
West Germany	9.6	9.9	9.8	9.8	15.3	15.4	9.8	8.4	9.1	10.0	10.8
Greece	34.0	6.2	4.8	3.6	3.6	3.1	3.2	2.5	4.2	3.7	4.6
Italy	35.1	46.3	40.7	39.1	44.0	38.2	27.6	18.3	20.3	19.9	23.4
Netherlands	16.0	22.8	10.7	8.1	7.6	5.5	5.6	5.5	5.7	5.0	5.4
Norway	43.8	39.5	38.5	41.1	33.4	39.9	29.5	25.7	27.8	24.6	21.8
Spain	10.6	5.5	2.8	3.0	2.5	2.8	3.3	4.0	3.4	3.6	2.3
Sweden	52.4	29.0	30.9	29.9	32.2	68.4	73.1	120.0	154.1	113.0	na
United Kingdom	11.6	9.5	8.3	6.6	6.1	5.8	5.8	5.4	5.8	5.8	6.1
Total	18.2	15.8	15.1	14.6	12.9	14.7	12.8	12.3	15.5	14.4	13.8
Eastern Europe											
Albania	26.3	27.0	19.4	20.5	23.4	22.0	21.4	21.0	20.8	29.6	31.9
Bulgaria	12.0	40.6	25.9	40.3	32.5	49.5	44.5	29.2	25.4	24.1	30.3
Czechoslovakia	19.5	17.0	11.1	10.5	24.0	19.3	17.2	17.9	16.8	19.4	15.7
East Germany	244.1	215.7	7.3	8.2	6.8	14.2	15.5	15.0	37.7	na	na
Hungary	11.2	11.0	15.0	13.9	12.1	20.8	20.7	21.4	12.9	9.0	9.2
Poland	11.1	13.5	9.0	8.6	8.3	8.9	8.1	9.3	16.9	32.2	38.8
Romania	11.6	11.2	18.2	17.7	17.8	16.5	16.4	17.9	17.4	25.5	29.3
USSR, former	19.1	19.2	18.9	18.0	14.5	13.5	13.1	13.4	15.0	15.4	16.2
Yugoslavia	10.7	10.3	9.7	9.1	9.2	8.7	8.3	7.8	11.2	10.0	17.8
Total	18.9	19.0	18.8	17.9	14.5	13.6	13.1	13.4	15.0	15.6	16.4
Middle East											
Abu Dhabi	85.8	110.5	119.5	112.6	120.2	142.9	140.5	130.3	123.3	103.3	89.1
Ajman	na	na	na	na	na	na	na	na	205.5	205.5	na
Bahrain	12.2	11.8	12.1	11.3	11.8	9.1	8.2	7.1	6.2	4.6	5.5
Dubai	9.1	9.9	9.7	8.6	9.9	9.4	8.1	8.3	8.7	8.6	8.3
Iran	78.3	44.8	42.1	46.8	44.5	51.8	55.9	98.9	59.9	55.9	51.7
Iraq	92.3	94.1	99.5	87.4	73.4	156.9	132.0	98.7	99.6	136.3	1,001.7
Israel	3.5	6.8	13.7	27.0	18.9	8.1	6.7	11.9	13.2	19.2	17.7
Jordan	na	na	na	na	142.9	4.4	16.8	17.2	26.9	18.1	45.5

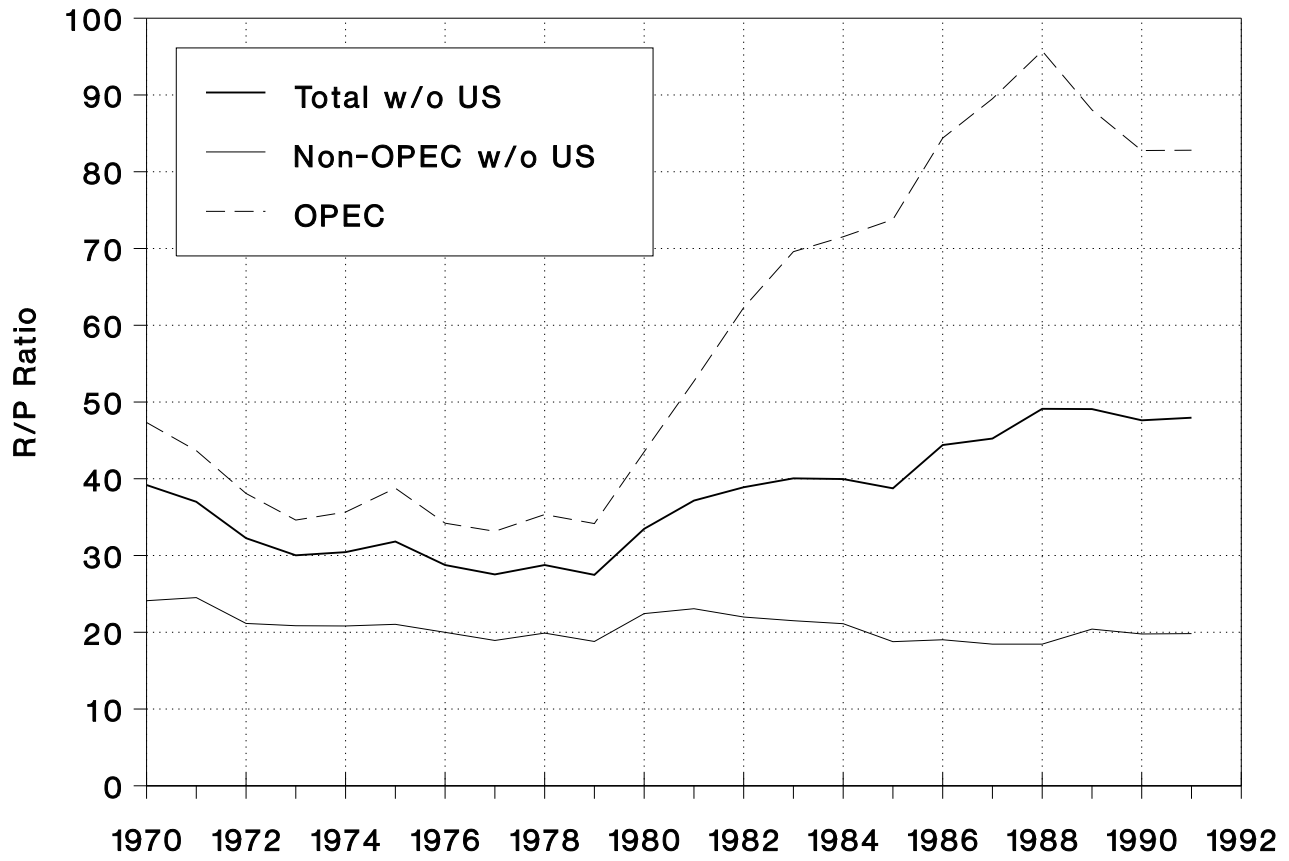
Table 9. Annual Oil Reserve-to-Production Ratios (R/P) (Continued)

Region/Country	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Kuwait	197.1	282.3	211.6	216.7	229.1	194.1	224.7	209.1	164.2	222.5	1,366.0
Neutral Zone	47.0	50.2	39.3	36.2	37.0	37.2	35.8	42.6	37.2	46.0	104.9
Oman	37.5	28.6	24.7	25.5	22.1	19.8	19.3	18.3	18.4	17.9	16.8
Qatar	23.3	28.1	45.5	30.8	33.9	28.7	25.3	20.8	27.1	20.2	20.0
Ras al Khaimah	na	na	na	50.0	31.9	55.9	190.5	312.3	877.2	1,369.9	1,369.9
Saudi Arabia	46.9	71.4	104.0	115.8	138.7	97.6	116.7	141.4	145.1	113.3	88.0
Sharjah	116.4	67.6	29.2	19.6	20.6	24.6	89.3	83.6	95.0	148.9	166.4
Syria	30.1	30.8	23.8	22.5	23.7	22.9	20.5	19.2	17.3	13.3	10.4
Turkey	16.4	19.5	20.3	39.1	9.4	7.9	14.1	21.9	16.0	13.5	9.5
Yemen	na	na	na	na	na	137.0	110.7	32.1	62.7	24.3	27.9
Total	62.3	76.5	87.8	91.6	95.1	100.8	104.3	113.8	103.6	98.4	100.7
Africa											
Algeria	19.7	21.5	21.4	20.0	22.8	24.1	22.2	22.5	22.6	22.5	21.7
Angola	23.4	30.6	25.5	30.0	23.8	13.3	15.2	12.1	12.6	9.4	8.0
Benin	na	392.9	12.9	7.2	5.1	4.7	5.0	5.5	6.8	4.4	na
Cameroon	8.5	7.4	5.7	9.7	8.1	8.3	8.2	8.1	8.0	7.7	6.8
Congo	23.9	22.2	18.5	16.8	18.2	16.8	15.1	15.2	11.9	13.4	12.4
Egypt	15.4	15.6	14.1	13.6	11.4	15.1	14.3	13.5	13.5	10.6	10.8
Gabon	8.4	8.5	9.6	9.6	10.5	10.7	17.1	16.1	12.8	8.7	8.2
Ghana	4.9	7.9	9.5	14.8	34.9	na	na	na	na	na	na
Ivory Coast	109.3	18.7	15.9	13.6	15.8	17.8	21.4	29.1	137.0	156.3	na
Libya	60.3	51.9	54.8	56.6	59.5	63.1	65.2	59.3	45.8	43.1	41.5
Morocco	9.0	10.8	6.8	5.6	11.2	10.1	12.1	12.5	33.3	6.1	6.5
Nigeria	38.8	36.4	37.1	33.6	29.9	29.8	34.1	28.9	28.5	26.4	25.8
Senegal	na	na	na	na	na	na	na	523.7	396.8	267.3	na
Tunisia	59.7	61.8	58.9	45.1	43.1	44.7	45.0	49.9	52.5	50.0	47.0
Zaire	14.3	12.4	11.8	9.5	9.6	9.4	9.9	9.0	9.4	15.9	25.5
Total	35.6	32.8	32.3	30.8	29.5	30.5	31.0	28.7	26.9	25.0	24.3
Asia-Pacific											
Australia	12.2	11.2	12.1	9.2	8.1	12.0	11.5	14.6	15.8	9.5	10.7
Bangladesh	297.3	261.9	236.6	153.8	144.7	181.3	93.3	86.4	115.9	96.1	1.5
Brunei	26.3	24.7	24.3	26.2	23.5	24.5	28.1	24.6	23.8	20.3	21.4
China	25.1	24.4	23.5	23.3	21.4	23.9	22.7	21.9	31.2	30.5	29.0
India	31.8	22.9	19.8	18.3	17.2	20.3	19.3	18.6	18.4	22.2	25.7
Indonesia	17.0	19.5	19.3	19.2	18.0	17.7	19.1	24.4	21.2	21.1	20.4
Japan	10.9	11.1	11.0	12.2	17.6	17.4	19.3	16.2	14.6	13.8	10.0
Malaysia	24.4	23.2	21.3	18.4	21.6	19.2	18.3	17.0	17.1	15.7	15.7
Myanmar	87.9	84.8	92.4	77.0	70.5	24.6	22.4	34.4	35.3	20.6	19.2
New Zealand	54.6	33.8	36.4	27.3	20.9	17.2	14.7	12.8	11.6	13.7	11.8
Pakistan	25.1	18.2	21.0	15.5	8.7	10.6	9.3	19.3	16.8	15.6	15.0
Papua New Guinea	na	na	na	na	na	na	na	na	na	na	495.0
Philippines	6.9	5.7	6.6	8.0	7.6	7.7	21.0	18.7	19.6	80.3	135.2
Taiwan	9.8	11.9	11.3	12.5	13.6	6.3	9.1	9.2	8.4	6.1	12.7
Thailand	127.1	22.2	13.8	7.2	8.5	6.6	10.3	17.0	19.1	17.3	15.7
Vietnam	na	na	na	na	na	1,000.0	120.8	53.0	27.4	24.9	20.8
Total	22.3	22.2	21.3	20.5	19.1	20.6	20.3	21.2	24.6	23.7	23.3
OPEC	52.7	62.3	69.6	71.5	73.8	84.4	89.5	95.7	88.1	82.8	82.8
Non-OPEC	19.6	18.7	18.4	18.2	16.4	16.6	16.4	16.5	18.2	17.8	17.7
Non-OPEC w/o US	23.1	22.0	21.5	21.1	18.8	19.0	18.5	18.5	20.4	19.8	19.8
Total w/o US	37.2	38.9	40.1	40.0	38.8	44.4	45.2	49.1	49.1	47.6	48.0
Total	32.9	34.1	34.9	34.9	33.8	38.9	39.9	43.5	44.1	43.0	43.2

Note: na = not available.

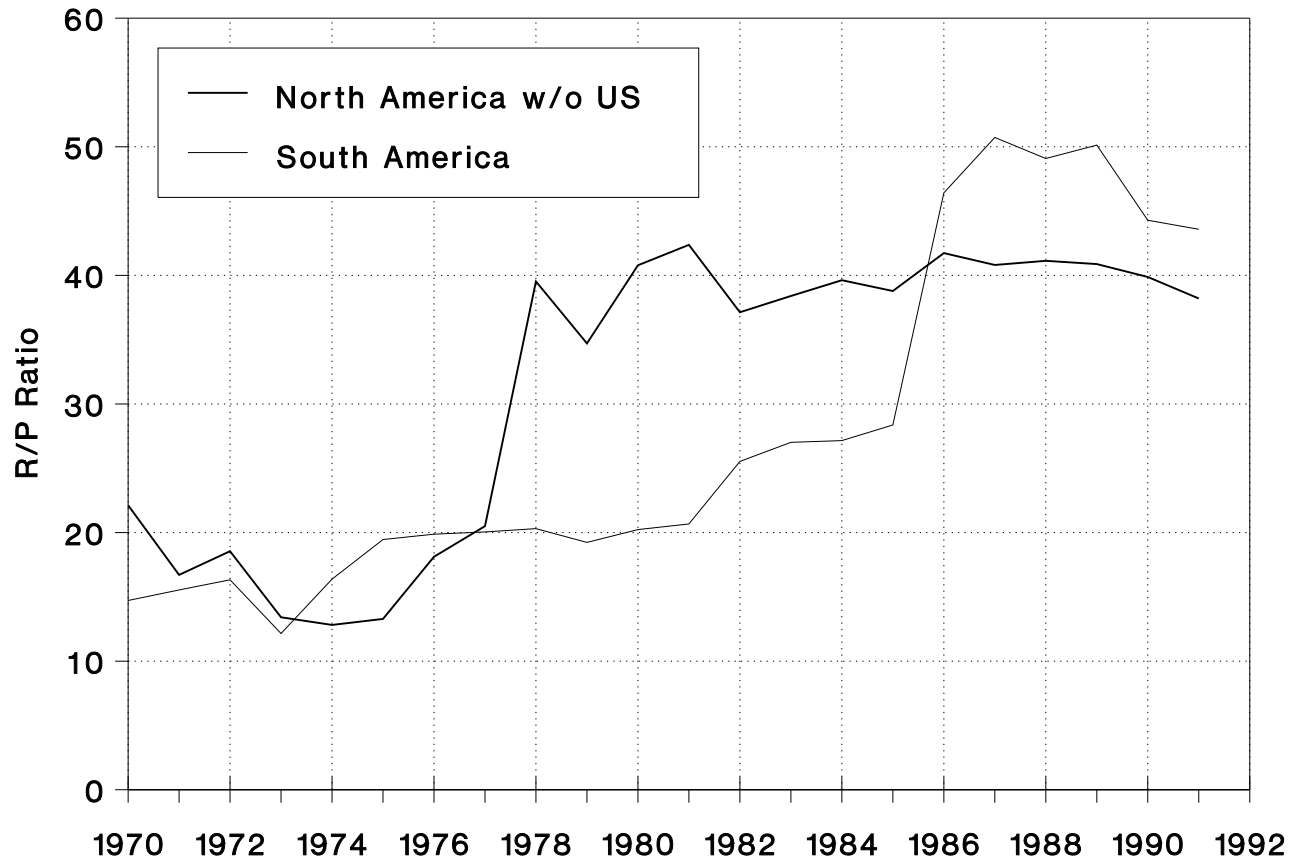
Source: See Tables 6 and 7.

Figure 9a. Annual Oil Reserves-to-Production Ratios (R/P), Excluding the United States, 1970-1991



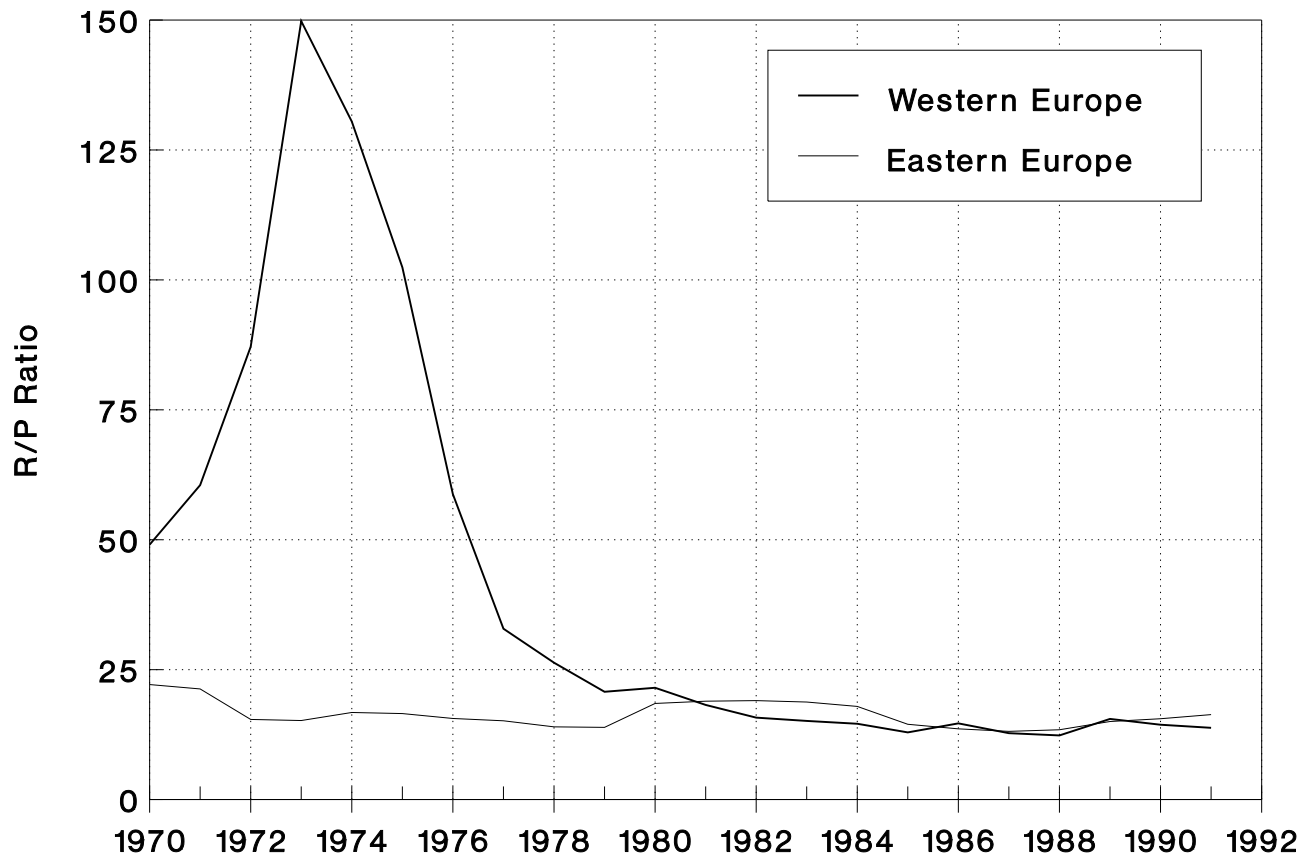
Source: Table 9.

Figure 9b. Annual Oil Reserves-to-Production Ratios (R/P), Western Hemisphere, Excluding the United States, 1970-1991



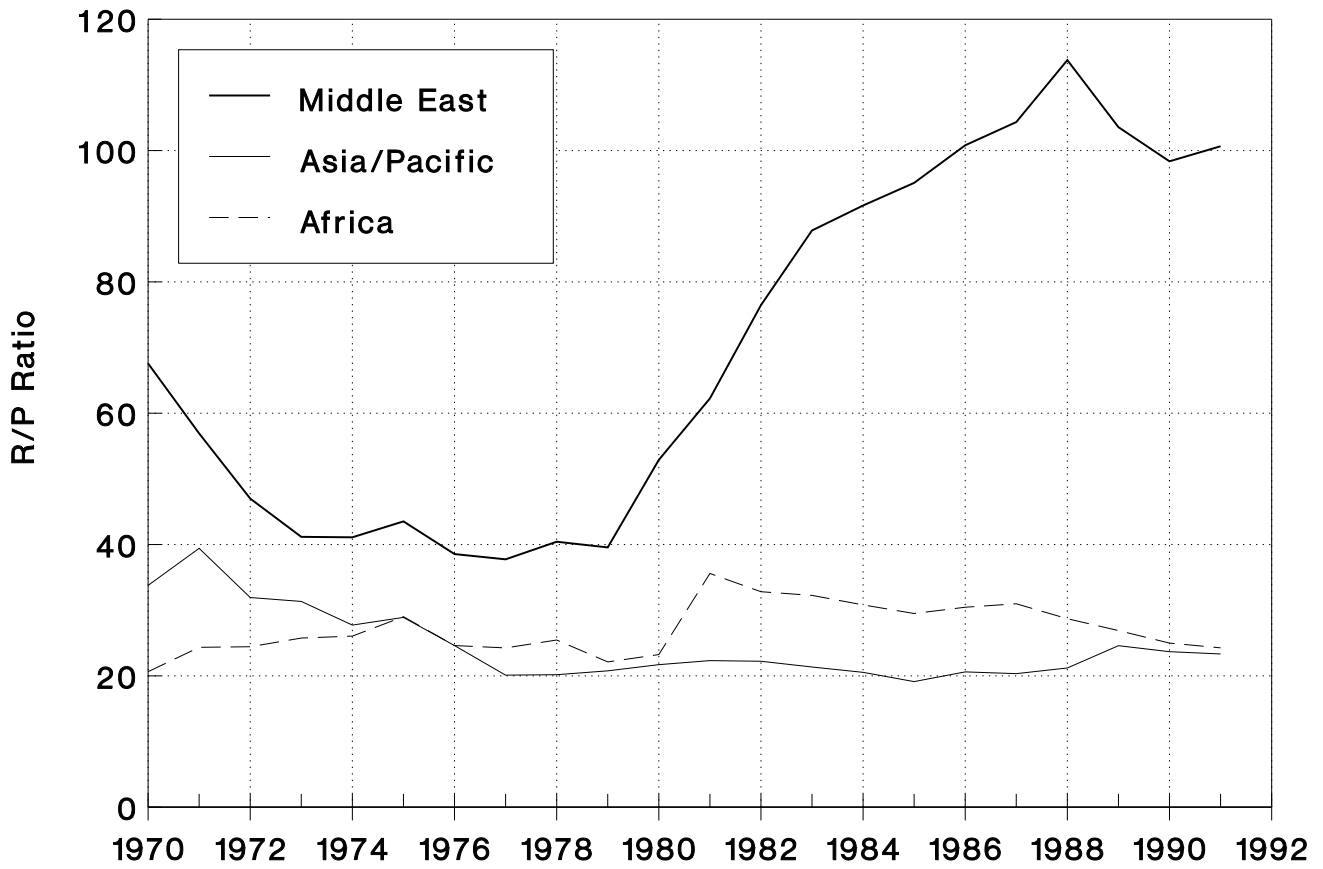
Source: Table 9.

Figure 9c. Annual Oil Reserves-to-Production Ratios (R/P), Europe, 1970-1991



Source: Table 9.

Figure 9d. Annual Oil Reserves-to-Production Ratios (R/P), Middle East, Asia/Pacific, and Africa, 1970-1991



Source: Table 9.

Appendix A

Foreign Oil and Gas Discoveries

Appendix A

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991

Country/Field/Well	Company	DiscReport			Oil	Gas	Comments
		Date	Date	Source	Reserves	Reserves	
					MMbbl	Bcf	
Abu Dhabi							
Bab & Bu Hasa fields found	Adco	1987	8/88	W. Oil		3300.0	deeper new gas reservoirs
Umm al-Anbar offshore	Mubarraz Oil	1982	8/88	W. Oil	40.0		west of Mubarraz field
Albania							
Marinze		1927	11/91	OGJ			1-1.2 Bbbls in place heavy oil
Algeria							
Hamra	Total		5/91	OGJ	175.0		150-200 MMbbls cond SE of Hassi
Messaoud	Sonatrach		6/91	OGJ			240 MMbbls in place Adrar region W
Otra							
Algeria							
Adrar	Sonatrach		8/91	W. Oil	240.0		
Angola							
Cobo #1 offshore	Elf	1990	6/90	Pet Mngt	140.0		
Argentina							
Hidra		1982	8/90	W. Oil	44.0		
Cuchuma #1	BHP	1990	9/90	OGJ	1.5		NW Argentina
Loma de la Lata	YPF		1/91	OGJ		1320.0	Neuquen basin
Ramos	YPF		1/91	OGJ		600.0	Noroeste basin
Aguaragua	YPF		1/91	OGJ		600.0	Noroeste basin
CNQ-8	Texaco		1/91	OGJ	15.0		San Jorge Curamched prospect
CNQ-11	Texaco		1/91	OGJ	5.0		Cuchuma prospect
El Huemul	Total		5/91	JPT	10300.0	0.2	
Chihuidos CNQ-10	Oliver Resources		10/91	JPT		300.0	Neuquen basin
Australia							
Coorroo #1	Delhi Pet	1986	1/87	Pet News	3.0		
Challis/Cassini	BHP	1984	8/87	W. Oil	30.0		20-40 MMbbls Timor Sea

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
			2/88	OGJ	45.0		40-50 MMbbls Timor Sea
			1/89	Ocn Ind	35.0		25-45 MMbbls Timor Sea
			8/89	OGJ	42.0		Timor Sea
			8/89	W. Oil	75.0		Timor Sea
			8/89	Pet News	55.0		Challis only Timor Sea
			1/90	Pet News	42.0		Timor Sea
			8/90	W. Oil	72.5		70-75 MMbbls
			12/90	W. Oil	42.0		
Jabiru	BHP	1983	8/87	W. Oil	37.5		35-40 MMbbls Timor Sea
			2/88	OGJ	30.0		Timor Sea
			9/88	OGJ	50.0		Timor Sea
			1/89	Ocn Ind	55.0		50-60 MMbbls Timor Sea
			8/89	OGJ	82.0		Timor Sea
			10/89	OGJ	100.0		Timor Sea
			1/90	Pet News	82.0		Timor Sea
			8/90	W. Oil	100.0		remaining
Petrel	Elf Aquitaine	1969	8/87	W. Oil		11100.0	6.7-15.5 Tcf Timor Sea
Tern	Elf Aquitaine	1971	8/87	W. Oil		1500.0	1.2-1.8 Tcf Timor Sea
N. Goodwyn	Woodside	1985	8/87	W. Oil	200.0	2000.0	NW Shelf
			10/87	AAPG	200.0		NW Shelf
Saladin	Wapet	1985	8/87	W. Oil	25.0		20-30 MMbbls NW Shelf
			5/88	OGJ	35.0		30-40 MMbbls Carnarvon basin
			5/90	Pet Engr	20.0		offshore Thevenard Island
Skua	BHP Petroleum	1986	2/88	OGJ	20.0		
			8/88	W. Oil	25.0		20-30 MMbbls Timor Sea
			1/89	Ocn Ind	45.0		40-50 MMbbls Timor Sea
			6/90	OGJ	30.5		
			8/90	W. Oil	50.0		
			12/90	W. Oil	30.5		
			5/91	OGJ	20.0		
			8/91	W. Oil	30.5		
			11/91	Com Rpt	34.0		
Bream	Esso-BHP	1969	8/88	W. Oil	35.0		Bass Strait
			12/90	W. Oil	55.0		
Tarwhine	Esso-BHP	1982	8/88	W. Oil	7.0		Bass Strait
Seahorse	Esso-BHP	1978	8/88	W. Oil	4.4		Bass Strait
Whiting	Esso-BHP	1983	8/88	W. Oil	21.0		Bass Strait
			12/90	W. Oil	14.0		
Talisman	Marathon	1984	9/88	OGJ	10.0		NW Shelf
			1/89	Ocn Ind	12.5		10-15 MMbbls NW Shelf
Dolphin & Perch fields	Esso	1967	12/88	Com Rpt	19.0		Bass Strait
			1/89	Ocn Ind	19.0		13 MMbbls Perch + 6 MMbbls Dolphin
Bass Strait							
Echo #1	Woodside	1988	1/89	Ocn Ind		1500.0	1-2 Tcf Carnarvon basin
			4/89	Pet News	150.0	1000.0	
Bambra #3	Bond Corp	1988	1/89	Ocn Ind	6.0	50.0	Carnarvon basin
Talbot	Santos	1989	1/90	Pet News	45.0		40-50 MMbbls Timor Sea
Yolla	Sargasco	1985	2/90	Pet Engr	3.0	270.0	plus 30 MMbbls LPG Bass Basin

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
		Date	Date		MMbbl	Bcf	
Cossack/Wanaea	Woodside	1989	3/90	OGJ	300.0		Northwest Shelf
Griffin	BHP	1989	3/90	OGJ	125.0		100-150 MMbbls Northwest Shelf
			11/90	OGJ	100.0		
			12/90	W. Oil	125.0		100-150 MMbbls Northwest Shelf
			1/91	OGJ	100.0		
			8/91	W. Oil	100.0		
Beharra Springs	Barrack Energy	1990	4/90	OGJ		120.0	southwest Australia
			8/91	W. Oil		7.1	
Cowle	Wapet	1990	6/90	OGJ	4.0		offshore Northwest Shelf
			5/91	OGJ	2.6		
Yammaderry	Wapet	1988	6/90	OGJ	4.0		offshore Northwest Shelf
Angler #1	Shell	1989	8/90	W. Oil		250.0	Bass Strait
Tubridgi	Doral Resources	1981	8/90	W. Oil		88.0	Carnarvon basin
Palm Valley	Magellan	1965	8/90	W. Oil		680.0	Amadeus basin Northern Territory
			5/91	Pet Engr		680.0	Prov+Prob+Poss 1.54 Tcf
Gorgon & W. Tryal Rocks	Wapet	81/73	8/90	JPT		8000.0	offshore west coast
Chinook & Scindian	BHP	89/90	11/90	OGJ	50.0		Northwest Shelf
Kingfish		1968	12/90	W. Oil	1.0		Bass Strait
Halibut		1967	12/90	W. Oil	900.0		Bass Strait
Scott Reef		1971	12/90	W. Oil		6100.0	Northwest Shelf
Angel		1971	12/90	W. Oil		1000.0	Northwest Shelf
Cossack	Woodside	1989	1/91	OGJ	85.0		Northwest Shelf
			6/91	JPT	80.0		
			8/91	W. Oil	85.0		80-90 MMbbls
			11/91	Com Rpt	60.0		
Mardie	Lennard Oil	1961	8/91	W. Oil	150.0		100-200 MMbbls heavy oil, NW Western
Aus							
Katnook			8/91	W. Oil		35.3	South Australia
Wanaea			11/91	Com Rpt	150.0		Northwest Shelf
Bangladesh							
Kailashtilla/Beanibazar	BOGMC	1962	8/87	W. Oil	40.0		Sylhet
			2/88	Pet News	40.0		Sylhet
Fenchuganj	BOGMC	1987	2/89	Pet News	40.0		
Haripur	BOGMC	1986	2/89	Pet News	40.0		First oil find in country
Jalalabad #1	Scimitar	1989	3/90	OGJ	30.0	1500.0	
Brazil							
RJS-345 Covina	Petrobras	1986	8/87	W. Oil	44.0		Campos basin
Marlim	Petrobras	1985	10/87	AAPG	1000.0		Campos basin
			4/88	OGJ	2750.0		Campos basin
			8/88	W. Oil	3600.0	1200.0	Campos basin
			2/91	JPT	3000.0		
			3/91	OGJ	1750.0		8.2 Bbbl & 3.53 Tcf in place

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
Albacora	Petrobras	1984	8/91	OGJ			15 Bbbls in place
		10/87	AAPG	500.0			Campos basin
		5/88	OGJ	1100.0			Campos basin
		8/88	W. Oil	1100.0	2300.0		Campos basin
Urucu	Petrobras	1986	3/91	OGJ	1000.0		4.4 Bbbl in place
		7/88	OGJ	150.0			40 API Upper Amazon
Tubarao state	Petrobras	1987	9/88	AAPG	400.0	3500.0	150 MMbbls oil + 250 MMbbls cond
		8/88	W. Oil	100.0			3200 bbl/d 50 API & 960 Mcfd off Parana
Merluza Field	Shell/Pecten	1984	1/91	OGJ	50.0	212.0	150 MMbbls in place
		9/88	AAPG	10.0	300.0		Santos basin offshore
		8/89	W. Oil	10.0	350.0		Santos basin offshore
Malhado 4-RJS-403	Petrobras	1986	1/91	OGJ	10.6	303.0	off Sao Paulo
	Petrobras	10/88	OGJ	30.0			Campos basin
	Petrobras	6/89	7/89	OGJ	125.0		500 MMbbls in place
Marlim 3-RNS-120	Petrobras	9/89	8/90	W. Oil	2.0	141.0	off NE Brazil
		11/89	OGJ	12.0	141.0		near Pescada field
1-RJS-412	Petrobras	2/90	3/90	OGJ	100.0		offshore Campos basin
4-RJS-381	Petrobras	7/89	8/90	W. Oil	250.0		between Albacora & Marlim
Grant	Petrobras	11/90	1/91	JPT	100.0		SW of Marlim Campos basin
Estrela do Mar	Petrobras	1/91	OGJ	75.0	106.0		Santos basin
Coral	Petrobras	1/91	OGJ	155.0	212.0		Santos basin
Urucu & Jurua	Petrobras	2/91	Pet Engr		2000.0		Amazon jungle
1-RJS-383	Petrobras	8/91	W. Oil	830.0			Campos basin
Canada							
Caroline	Shell	1986	8/87	W. Oil		2000.0	S. Alberta sour gas
		10/87	AAPG			2000.0	S. Alberta sour gas
Amauligak	Gulf	1984	10/88	AAPG	200.0	600.0	plus 20 million metric tons sulfur
		8/87	W. Oil	800.0			Beaufort Sea
		10/87	AAPG	750.0			700-800 MMbbls Beaufort Sea
		4/88	OGJ	550.0			500-600 MMbbls Beaufort Sea
		8/88	OGJ	500.0			Beaufort Sea
		2/89	OGJ		1500.0		Beaufort Sea
		8/89	OGJ	475.0	2000.0		450-500 MMbbls Beaufort Sea
Taglu Terra Nova	Esso Petro Canada	1984	3/90	OGJ	335.0	2200.0	Beaufort Sea
		6/90	Com Rpt	500.0	2500.0		
		11/91	Com Rpt	340.0			
		10/87	AAPG		3000.0		Mackenzie Delta
		12/87	AAPG	500.0			Jeanne D'Arc Basin
3/88	OGJ	130.0			Jeanne D'Arc Basin		
5/88	OGJ	150.0			Jeanne D'Arc Basin		
2/90	Pet Engr	400.0					
9/91	JPT	400.0					

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
Hibernia NF	Mobil	1979	7/88	Com Rpt	587.5		525-650 MMbbls 186 mi. E of St. John's
			8/89	W. Oil	500.0		off St. John's, Newfoundland
			6/90	Com Rpt	525.0		
			7/90	Oil Dly	890.0		
			8/90	OGJ	800.0		
			9/90	OGJ	875.0		850-900 MMbbls
			11/90	W. Oil	890.0		
			12/90	JPT	650.0		
			2/91	Pet Engr	500.0		
			3/91	OGJ	587.5		525-650 MMbbls
			9/91	JPT	592.5		535-650 MMbbls
White Rose	Husky	1988	10/88	OGJ	250.0		200-300 MMbbls
			9/91	JPT	300.0		
Elmworth (B.C. ext) Columbia Brassey	Canadian Hunter	1987	10/88	AAPG		3500.0	3-4 Tcf Elmworth ext into British
Parsons Lake	Canadian Hunter/BP Northeast British Columbia		11/87	11/88	OGJ	20.0	
	Gulf		2/89	OGJ		1900.0	Mackenzie Delta
			3/90	OGJ	30.0	1800.0	Mackenzie Delta
Ya Ya			2/89	OGJ		160.0	Mackenzie Delta
Inga			2/89	OGJ	36.0		British Columbia
Boundary Lake	Placer CEGO		3/89	OGJ	2.5	200.0	f/2 zones 5700 ft(sour gas) & 6900 ft
Cohasset & Panuke	Lasmo		7/90	Oil Dly	36.0		off Sable Island
			11/91	OGJ	27.5		25-30 MMbbls
Midale	Shell	1953	12/90	OGJ	180.0		SE Saskatchewan
			2/91	Pet Engr	180.0		CO2 flood
Klua	Petro-Canada		1/91	OGJ		75.0	SE of Fort Nelson, B.C.
Dina	Pinnacle Resources east central Alberta			7/91	OGJ	5.0	
Cohasset	Lasmo		12/91	OGJ	49.0		off Sable Island
Chad							
Sedigi	Exxon		4/91	OGJ	12.0		Lake Chad area
China							
Xijiang 24-3-1	Phillips	1985	4/87	P. Times	45.0		30-60 MMbbls
			3/89	OGJ	45.0		South China Sea
			6/91	OGJ	45.0		
Nanyang		1986	10/87	AAPG	293.0		Henan Province
Huizhou 21-1	ACT	1985	2/88	Pet News	30.0		South China Sea
			3/90	OGJ	127.0		South China Sea Pearl River basin
			1/91	OGJ	35.0		
			7/91	OGJ	39.0		

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
Suizhong 36-1	Bohai Oil		8/91	W. Oil	30.0		
		1986	2/88	Pet News	900.0		Liadong Bay
			3/88	OGJ	1022.0		Liadong Bay
			10/88	OGJ	800.0		1.2 Bbbls in place 17 API heavy oil
			1/89	Ocn Ind	900.0		17 API Liadong Bay
BZ 34-2	JCODCO		1/91	OGJ	700.0		
		1983	2/88	Pet News	35.0		Bohai
			1/91	OGJ	168.0		
Lufeng 13-1	JHN	1987	2/88	Pet News	35.0		30-40 MMbbls South China Sea
			4/89	Pet News	45.0		30-60 MMbbls
Dagang		1964	3/88	OGJ	730.0		added to Kongdian area
Bonan		1987	3/88	OGJ	1095.0		Shengli basin
Xixiapo Area		1987	3/88	OGJ	2920.0		
Huoshaochan		1983	3/88	OGJ	730.0		Xinjiang Province Junggar basin
Lihua 11-1	Amoco	1987	8/88	OGJ	730.0		21 API 1000 ft of water
			4/89	Pet News	700.0		
			6/91	OGJ			1.8 Bbbls in place
			7/91	OGJ			700-1400 MMbbls in place
Zhongyuan	ARCO/Cnooc	1988	9/88	OGJ	1.8		1.4-2.1 MMbbls added
		1983	1/89	OGJ		2815.0	2.1-3.53 Tcf South of Hainan Island
Yacheng 13-1			4/89	Pet News		3500.0	
			8/89	OGJ		3000.0	2.47-3.53 Tcf Hainan Island
Moxi		1987	2/89	Pet News		897.0	Sichuan Province
Aershan			2/89	Pet News	558.3		Erlan Basin Inner Mongolia
Gold Family	Bohai Oil	1988	2/89	Pet news	183.0		near Zibo in Huantai county S of Yellow
River							
Jin Zhou 20-2	Cnooc	1984	3/89	OGJ	555.0	706.0	533 MMbbls + 22 MMbbls cond N Bohai
Sea							
Bozhong 28-1	JCODC	1981	3/89	OGJ	30.0		south central Bohai Sea
Liuhua 4-1		1987	4/89	Pet News	30.0		
Yinggehai	ARCO		1/90	OGJ		3000.0	offshore Hainan Island
Kekkeya		1977	1/90	OGJ	250.0	1020.0	SW Tarim basin
Shengli		1962	7/90	OGJ	292.0		292 MMbbls increase
Tainan		1990	10/90	OGJ		702.0	eastern Qaidam basin
			9/91	OGJ		700.0	
Weiyuan			1/91	OGJ		1400.0	
Xijiang 30-2	Phillips		6/91	OGJ	50.0		40-60 MMbbl South China Sea
Huizhou 26-1	ACT		7/91	OGJ			150 MMbbls in place
Liaohe			11/91	W. Oil	4392.0		7.3 Bbbls potential, heavy oil
Colombia							
Amazonas Basin	Ecopetrol		8/87	W. Oil	40.0	10.0	
Cano Limon	Oxy	1983	8/87	W. Oil	1000.0		
			2/88	AAPG	1500.0		Colombia & Venezuela
Rubiales	Tuskar Resources	1981	4/89	OGJ	85.0		70-100 MMbbls southern Llanos basin
			8/89	W. Oil	250.0		heavy oil

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
			4/90	OGJ	350.0		
			8/90	W. Oil	250.0		14 API oil
			12/90	OGJ	350.0		at 13% recovery
			2/91	JPT	350.0		
			8/91	W. Oil	390.0		
Balcon	Ecopetrol	8/88	8/89	W. Oil	160.0		Upper Magdalena Valley basin
Chichemene	Chevron	1969	10/90	OGJ	16.5		Llanos basin
Toqui-Toqui	American Intl Pet		6/91	OGJ	10.0		
			12/91	OGJ	15.5		
Cusiana	BP		8/91	W. Oil	1000.0		Llanos foothills
			9/91	JPT	1000.0		speculated reserves Andes foothills
Pinuna	Ecopetrol		8/91	W. Oil	4.0		
Cote d'Ivoire							
Foxtrot Abidjan	Phillips	1982	8/89	OGJ			940 Bcf gas in place offshore SW of
			8/90	W. Oil		900.0	
			12/90	Com Rpt		550.0	
			1/91	OGJ		550.0	
			2/91	Pet Engr		550.0	
Denmark							
Dagmar	DUC	1983	6/89	OGJ	19.0		offshore 1st Danish field with sour gas
Gorm	DUC	1971	8/89	OGJ	20.0	15000.0	
Valdemar	DUC	1977	8/89	OGJ	30.0	210.0	
Harald	DUC	1980	8/89	OGJ	50.0	900.0	
Gert	DUC	1987	8/89	OGJ	120.0		50 MMbbls Danish, 70 MMbbls Norwegian
			8/90	OGJ	120.0		72 MMbbls Danish, 48 MMbbls Norwegian
Kraka (Anne)	DUC	1966	4/91	OGJ			12.6 MMbbls in place
Ecuador							
Payamino	Petroecuador	1987	10/89	OGJ	24.0		
Cantagallo	Petroecuador	1988	12/89	OGJ	45.0		Oriente region
			3/91	OGJ	45.0		32 API
			6/91	W. Oil	75.0		
Tiguino	Petro del Ecuador	1971	12/89	OGJ	25.0		Oriente region
			3/91	OGJ	25.0		32 API
Pucuna	Petro del Ecuador	1972	12/89	OGJ	20.0		Oriente region
			3/91	OGJ	20.0		22-25 API
Coca-Payamino	Petro del Ecuador	1971	12/89	OGJ	16.0		Oriente region
			7/90	OGJ	45.0		
			3/91	OGJ	45.0		

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
Camp Paraiso	Petroecuador	1987	12/89	OGJ	4.0		Oriente region
			6/91	W. Oil	20.0		
Frontera	Petroecuador	1987	12/89	OGJ	3.0		Oriente region
			6/91	W. Oil	10.0		
Singue #1	Petroecuador		3/91	OGJ	5.0		
Jivino	Occidental	1990	3/91	OGJ	30.0		Block 15
Mata Chivato	Tripetrol		5/91	OGJ	25.0		
Egypt							
Meleiha Permit	Agiba	1972	8/87	OGJ	63.0		Western Desert
Sinai	Petrobel	1987	10/88	AAPG	20.0		offshore Gulf of Suez
			4/91	OGJ	85.0		
Badr al-Din	Shell	1982	8/89	W. Oil	99.0		Western Desert
Magawish	Total		8/89	W. Oil	55.0		southern Gulf of Suez
Zeit Bay satellite	Shell	1990	5/90	OGJ	25.0		offshore Zeit Bay
Southeast Gemsa	Shell Winning	1989	8/90	W. Oil	25.0		offshore Gulf of Suez
Warda	Union Pacific		6/91	OGJ	250.0		Gulf of Suez

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
		Date	Date		MMbbl	Bcf	
Equatorial Guinea							
Alba	Walter	1984	4/90	OGJ	68.0	1300.0	offshore 22 mi north of Bioko Island
			8/91	W. Oil	13.0	400.0	
			11/91	W. Oil	42.0	30.0	
France							
Fontaine-au-Bron	Elf	1986	10/88	Com Rpt	4.2		
Gabon							
Kounga #1	Shell/Elf	7/86	8/87	W. Oil	360.0		
Rabi/Kounga	Shell	1985	10/87	AAPG	550.0		500-600 MMbbls
			2/88	AAPG	1300.0		
			5/88	OGJ	550.0		500-600 MMbbls
			8/88	W. Oil	785.0		370 MMbbls to 1.2 Bbbls, 2 Bbbls
possible			11/88	OGJ	428.0		
			8/90	W. Oil	485.0		
			12/90	JPT	425.0		
			7/91	OGJ	480.0		
			8/91	W. Oil	430.0		
Rabi	Shell	1985	11/87	OGJ	370.0		
Echira & Niungo	Shell/Elf	84/88	12/89	OGJ	36.5		
Coucal	Elf		10/91	OGJ	36.5		NE of Rabi Kounga
Germany							
Mittelplate	BASF(Wintershall)	1980	8/87	W. Oil	115.0		Heavy Oil
			8/90	W. Oil	18.0		offshore
			8/91	W. Oil	135.0		
B/4	BEB	1988	4/89	W. Oil		50.0	offshore
Schwedeneck Zee	BASF(Wintershall)	1978	8/90	W. Oil	140.0		offshore
Guatemala							
Rubelsanto area		1974	8/90	OGJ	80.0		several structures
India							
Gandhar	ONGC	1983	8/87	W. Oil	700.0		Gujarat State
Neelam	ONGC	1987	8/88	OGJ	314.0		offshore western India

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
Mid Tapti	ONGC	1982	2/89	Pet News		526.0	Gulf of Khambhat (Cambay)
South Tapti	ONGC	1978	2/89	Pet News		230.0	Gulf of Khambhat (Cambay)
Panna	ONGC	1976	2/89	Pet News	93.0	244.0	western offshore region
Tanot #1	OIL	1988	8/89	W. Oil		27.0	located in Rajasthan
Mori	ONGC	1990	4/90	OGJ	22.0		Krishna-Godavari basin Andhra Pradesh
Dikom	OIL	1990	5/90	OGJ	22.0		Assam Pradesh
R-7, R-9, R-12, R-13	ONGC		8/90	W. Oil	200.0		offshore west coast
Mukta	ONGC	8/81	9/90	OGJ	545.0		offshore west coast
Narimanam	ONGC		6/91	OGJ	21.9		43.8 MMbbls in place Thanjavur district
Nahorkatiya & Moran	OIL	53/56	6/91	W. Oil	560.0		near Digboi field
Bombay High L-III	ONGC		8/91	OGJ	438.0	635.6	
Bombay High L-II	ONGC		8/91	OGJ	120.0	282.5	
Bassein	ONGC		8/91	W. Oil		6000.0	offshore
South Bassein	ONGC		8/91	W. Oil	785.0		offshore
BS-13	ONGC	1991	9/91	OGJ		230.0	Offshore near Bombay High
Indonesia							
Tambora & Tunu	Total	1977	10/87	AAPG		10000.0	Mahakam Delta
			10/91	OGJ		5000.0	East Kalimantan
Bima	ARCO	1983	10/87	AAPG	150.0		NW Java
Intan/Widuri	Maxus	1987	6/88	OGJ	275.0		SE Sumatra
			2/89	Pet News	225.0		Widuri only SE Sumatra
			8/90	W. Oil	275.0		
			8/91	W. Oil	225.0		Widuri only
Pagerungan	ARCO	1985	5/89	Com Rpt		1500.0	offshore Bali
			8/89	Com Rpt		1400.0	
			5/90	OGJ		3000.0	2.5-3.5 Tcf Pagerungan Island, Java Sea
Northeast Intan	Maxus	1989	10/89	OGJ	10.0		off SE Sumatra
Belanak	Conoco	1982	12/89	OGJ		1000.0	W of Natuna Island S China Sea Block B
Minas	Caltex	1944	6/90	OGJ	500.0		added due to pattern waterflood
Duri	Caltex	1941	8/90	W. Oil	2700.0		increased from 385.7 MMbbls for
steamflood							
Anoa	Amoseas	1982	8/90	W. Oil	25.0		
Roabiba #1	Occidental	1990	9/90	Com Rpt		750.0	offshore Berau Block, Irian Jaya
Camar	Enterprise	1982	11/90	OGJ	12.0		65 mi NE of Surabaya, E Java
Natuna	Esso		12/90	OGJ		45000.0	70% CO2 largest gas accumulation in
Indonesia							
Belida	Conoco		3/91	OGJ	200.0		South China Sea
Asamera	Pertamina		11/91	JPT		6000.0	
Iran							
Kooh-e Mand		1988	12/88	OGJ	10000.0		very heavy crude southeast of Bushire
Behbahan		1988	12/88	OGJ	200.0		east of Behbahan

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
		Date	Date		MMbbl	Bcf	
Lamard		1989	10/89	OGJ		8000.0	west portion only S Fars prov. 50 x 7.5 mi
res							
Marun		1963	10/90	OGJ	7650.0		5 Bbbls increase to 7.65 Bbbls
South Pars			12/91	OGJ	2750.0	100000.0	Persian Gulf
Iraq							
East Baghdad		1979	5/89	OGJ	7000.0		
			8/89	W. Oil	10800.0		22-24 API
Khabbaz	Technip Geoproduct	1983	12/89	OGJ		2000.0	
			8/90	W. Oil			2 Bbbls in place
Anfal		1954	12/89	OGJ		4500.0	northern Iraq near Kirkuk
Saddam		1983	8/90	W. Oil	3000.0		
Zubair 3rd pay zone		1948	8/90	W. Oil	1000.0		southern area
Al-Suba		1974	8/90	W. Oil	2200.0		southern area
Ireland							
Kinsale Head	Marathon	1971	8/90	W. Oil		1400.0	718 Bcf remaining offshore
Ballycotton	Marathon	3/89	8/90	W. Oil		73.0	offshore
			12/90	Com Rpt		71.0	
			7/91	OGJ		70.0	Celtic Sea
Italy							
Villafortuna	Agip	1984	6/88	OGJ	300.0		<300 MMbbls 45 API f/18700 ft River
Ticino							
Irminio	Selm	1982	8/89	W. Oil	30.0	10.0	20-40 MMbbls SE Sicily
Chioggia Mare	Agip	1985	8/90	W. Oil		880.0	off Venetian coast
Monte Alp1	Encor	1989	4/91	OGJ	5.1		southern Apennine mountains
Gaggiano	Agip	1982	5/91	OGJ	25.0		20-30 MMbbls 35 API Po Valley
Malossa	Agip	1973	5/91	OGJ	1.3	437.5	
Jordan							
Risha	NRA	7/87	10/88	AAPG		1000.0	15 MMcfd
			3/90	OGJ		500.0	
			8/90	W. Oil		406.0	
Kuwait							
Magwa & Minagish Fields		1986	8/87	W. Oil	20000.0		Marat Development Program

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
		Date	Date		MMbbl	Bcf	
Magwa field area well Burgan		1987	8/88	W. Oil	1000.0		1 Marat outpost well
		1938	9/91	OGJ	75000.0		world's 2nd largest oil field
Libya							
Bouri	Agip	1976	10/87	AAPG	420.0		
			5/88	Pet Mngt	600.0		500-700 MMbbls
			9/88	OGJ	670.0		
			10/88	AAPG	500.0		
			1/89	OGJ	2500.0	1250.0	5 Bbbls & 2.5 Tcf in place
			8/90	W. Oil	670.0		offshore
			4/91	OGJ	670.0	2500.0	
			8/91	W. Oil	670.0	2500.0	
Rimal offset Murzuk	Agip Rompetrol(Romania) onshore	1990	6/90	OGJ	65.0		60-70 MMbbls offset to Rimal Field
			1990	8/90	W. Oil	2000.0	
			4/91	OGJ	2000.0		
Tahaddi			10/90	OGJ		9000.0	
			8/91	W. Oil		9000.0	largest gas field
Sarir	Agoco		8/91	W. Oil	7000.0		
Lithuania							
Genciai			12/91	W. Oil	10.0		
Malaysia							
Seligi	Petronas	1971	1/89	Ocn Ind	420.0		171 mi off Trengganu largest in country
			8/90	W. Oil	440.0		
Jerneh	Esso	1969	7/89	Oil Dly		3000.0	largest gas field in country off Trengganu
Kinabalu Sabah	Shell	1989	8/89	W. Oil	175.0		150-200 MMbbls off Kota Kinabalu,
			8/90	W. Oil	200.0		offshore Sabah Block SB-1
Dulang	Petronas	1981	12/90	OGJ	170.0		38 API
			8/91	W. Oil	180.0		585 MMbbls in place
Abu St. Joseph	Esso		5/91	OGJ	100.0		180 mi E of Terengganu
			11/91	Com Rpt	110.0		
Mexico							
La Luna		1985	8/90	OGJ	20000.0		Chiapas-Tabasco province
Cantarell		1977	8/90	OGJ	8000.0		Campeche marine province
Chicontepec Paleo Canyon	Pemex		5/91	W. Oil	11000.0		
			11/91	W. Oil	12200.0	26700.0	

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
		Date	Date		MMbbl	Bcf	
Campeche Sound		11/91		W. Oil	25200.0		offshore area
Myanmar							
Martaban	JNOC		1/87	Pet News		4000.0	Gulf of Martaban
			8/87	W. Oil		5000.0	3-7 Tcf Gulf of Martaban
			11/89	Pet News		4300.0	Gulf of Martaban
3DA & 3CA Structures	MOGE	1983	2/89	Pet News		4300.0	Gulf of Martaban
			8/90	W. Oil		4100.0	
			8/91	W. Oil		4000.0	
Namibia							
Kudu	Namcor	1973	8/87	W. Oil		6500.0	3-10 Tcf
			8/89	W. Oil		2000.0	off Orange River mouth
			7/91	W. Oil		5000.0	
Netherlands							
F/15-4,-5	Petroland	1986	8/87	W. Oil		420.0	
F/14-5	Statoil	1986	10/87	AAPG	75.0		<75 MMbbls North Sea
K/5a basin	Elf Petroland	1988	10/88	OGJ		150.0	100-200 Bcf 36 MMcfd southern gas
K/6	Petroland	1986	5/89	OGJ		353.0	
Markham	Ultramar	1984	6/90	OGJ		500.0	Dutch North Sea
			8/90	OGJ		400.0	
			8/90	W. Oil		500.0	
			8/91	OGJ		700.0	Both Dutch & U.K North Sea
			9/91	OGJ		675.0	
			12/91	OGJ		700.0	
P/18a-2	Amoco	1989	8/90	OGJ		300.0	North Sea
Q/16a-7	NAM	1989	8/90	OGJ		250.0	North Sea
F3	NAM	1974	8/90	OGJ	30.0	425.0	North Sea
			9/91	OGJ	30.0	425.0	
Ameland North	NAM		8/90	OGJ		100.0	offshore
P12	Mobil	1983	8/90	OGJ		110.0	North Sea
			8/91	W. Oil		150.0	
Haven	Unocal	1980	8/90	OGJ	2.0		Q1 complex
			8/90	W. Oil	4.0		
Groningen	Shell-Esso	1959	11/90	OGJ		94630.0	remaining reserves are 51.9 Tcf
			5/91	OGJ		49580.0	remaining reserves
K15-FC	Nam		8/91	W. Oil		346.0	
F/15a	Elf Petroland		9/91	OGJ		350.0	
Helder	Unocal		9/91	OGJ	31.1		
Pasob	NAM		12/91	OGJ		175.0	

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport			Oil	Gas	
		Date	Date	Source	Reserves MMbbl	Reserves Bcf	
Grijpskerk	NAM	1990	12/91	OGJ		350.0	
Surhuisterveen	NAM		12/91	OGJ		35.0	
New Zealand							
Tariki 1/1A	Petrocorp	1986	10/87	AAPG	3.0	85.4	E. Taranaki Basin
			10/88	AAPG	4.2	85.0	
Ahuroa 2A	Petrocorp	1986	10/87	AAPG	1.0	37.2	E. Taranaki Basin
			10/88	AAPG	1.4	39.0	
Kupe South	TCPL Resources	12/86	2/88	Pet News	60.0	300.0	S. Taranaki Basin
			8/88	W. Oil	60.0		Taranaki Basin North Island
			2/89	Pet News	33.0	400.0	plus 26 MMbbls LPG Taranaki Basin
			8/90	W. Oil	27.5		plus 27.5 MMbbls LPG
Ngaere			2/89	Pet News	40.0		onshore Taranaki Basin
Waihapa	Petrocorp	1985	8/89	OGJ	14.0		Taranaki Peninsula
			11/90	OGJ	12.5	19.0	
McKee		1980	8/90	W. Oil	40.0		first onshore oil field
Maui		1969	8/90	W. Oil	129.0	4900.0	offshore
Nigeria							
Tunu #1	Shell	1988	8/88	Oil Dly	65.0		
Benin Estuary #1	Shell	1988	8/88	Oil Dly	15.0	100.0	
Ososo #1	Shell	1988	8/88	Oil Dly		150.0	
Gbetiokun #1	Shell	1987	8/88	W. Oil	50.0		
Opomoyo #1	Shell	1988	8/88	W. Oil	30.0		
Ebegoro South 1B	Agip	1987	10/88	AAPG	50.0		NE delta region
Orogho #1	Shell-NNPC	1988	2/89	OGJ	150.0		west of Sapele, Bendel state
Orubou #2	Shell-NNPC	1989	2/89	OGJ	100.0		near Benisede, Bendel state
Akono #1	Shell-NNPC	1988	2/89	OGJ	15.0		near Benisede, Bendel state
Kappa #3	Shell-NNPC		2/89	OGJ	20.0		off Rivers state
South HB #1	Shell-NNPC	1989	2/89	OGJ		1500.0	off Rivers state
Oso	Mobil	1967	2/90	OGJ	445.0	3000.0	offshore
			7/90	OGJ	500.0		
			4/91	OGJ		3500.0	
			8/91	W. Oil	500.0		
Iyak	Mobil	1967	2/90	OGJ	146.0		
Edop	Mobil	1981	2/90	OGJ	850.0		offshore
			8/91	W. Oil	850.0		
			12/91	W. Oil	680.0		
Sapele	Shell	1969	2/90	OGJ	700.0		heavy oil Niger Delta
Obagi/Ukpomani	Elf	1964	3/90	OGJ	100.0		Rivers & Bendel states
Agbara	Agip	1981	5/90	OGJ	65.0		73 mi SW of Port Harcourt
Diebu Creek East	Shell	1989	8/90	W. Oil	70.0		19.8 API Niger Delta
Etoro & Ekoko	Mobil	1990	12/90	OGJ	130.0		combined off SE Nigeria
			8/91	W. Oil	130.0		

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
Gbaran	Shell	1967	8/91	W. Oil	400.0	500.0	onshore Rivers State
Ogharefe	Pan Ocean		9/91	OGJ		370.0	Niger Delta
Yoho & Omon	Mobil	1991	11/91	OGJ	450.0		offshore

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
Norway							
Heidrun	Conoco	1985	8/87	W. Oil	745.0	1300.0	
			4/89	W. Oil	752.0	1100.0	
			8/89	OGJ	750.0	1400.0	Haltenbanken area
			10/89	OGJ	756.0	1060.0	Haltenbanken area
			1/90	OGJ	750.0	1250.0	Haltenbanken area
			2/90	JPT	550.0	1020.0	
			5/90	OGJ	750.0	1000.0	
			7/90	OGJ	750.0	1700.0	
			2/91	OGJ	756.0	1600.0	
			12/91	OGJ	750.0	1800.0	Block 6607-7
			Draugen	Shell	1984	8/87	W. Oil
2/88	AAPG	1000.0					
11/88	OGJ	422.0				106.0	
8/89	OGJ	400.0				60.0	Haltenbanken area
8/90	OGJ	428.0				176.0	
Snorre	Saga	1979	8/87	W. Oil	700.0	250.0	
			4/89	W. Oil	722.0	314.0	
			7/89	OGJ	673.5		667-680 MMbbbls
			8/89	OGJ	680.0	250.0	
			8/90	OGJ	770.0		
			12/90	JPT	767.0	250.0	
			8/91	Pet Engr	770.0	250.0	
Haltenbanken Area Veslefrikk	Statoil	1981	8/88	Pet Engr	230.0		Block 30/3
			4/89	W. Oil	191.0	124.0	
			10/90	JPT	725.0		
34/7-12	Saga	1987	8/88	W. Oil	250.0		200-300 MMbbbls
34/7-13	Saga	1988	8/88	W. Oil	45.0		30-60 MMbbbls
North Staffjord 33/9-4	Statoil	1977	8/88	W. Oil	120.0		
			11/88	OGJ	126.0		
			5/91	OGJ	300.0		Both North and East Staffjord
East Staffjord Ula	Statoil BP	1976	11/88	OGJ	95.0		
			12/88	OGJ	330.0		80 MMbbbls Upward Revision
Oseberg	Norsk Hydro	1979	4/89	W. Oil	125.0		
			5/89	OGJ	1570.0		80 mi west of Bergen
			2/90	Pet Mngt	1460.0		
			8/91	Pet Engr	1500.0	850.0	
			9/91	OGJ	1500.0	3250.0	
Gyda	BP	1980	4/89	W. Oil	212.0	116.0	
			7/90	OGJ	200.0	105.0	
Hod	Amoco	1974	4/89	W. Oil	37.0	141.0	
			12/90	JPT	25.0		
			10/91	JPT	54.0		Valhall satellite
Sleipner	Statoil	1974	4/89	W. Oil	175.0	1750.0	

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
East Troll Troll	Statoil		4/89	W. Oil	34.0	13200.0	
		1979	6/89	OGJ		43800.0	includes both East & West Troll
			8/89	OGJ		45500.0	
			8/90	OGJ	300.0	42300.0	3.35 Bbbls in place
			8/90	Pet Mngt		45900.0	
			5/91	JPT		46000.0	
			8/91	Pet Engr	475.0		
West Flank, Troll	Statoil		12/91	OGJ		45500.0	
			6/89	OGJ	258.0		western rim of Troll
			1/90	OGJ	260.0		western lobe of Troll
			5/90	OGJ	411.0		western province
Brage	Norsk Hydro	1980	6/89	OGJ	243.0	98.0	offshore
			2/90	OGJ	240.0	12.0	
			3/90	Pet Mngt	240.0	40.0	
Njord	Norsk Hydro	1986	8/89	OGJ	250.0	300.0	Haltenbanken area
			8/90	OGJ	290.0	280.0	
			12/91	OGJ	189.0	230.0	
East Sleipner	Statoil	1981	8/89	W. Oil	106.0	1800.0	
			8/91	Pet Engr		1700.0	
			12/91	OGJ		1800.0	
Odin Froy	Esso	1974	8/89	Pet Engr		1200.0	North Sea Block 30/10
	Elf	1987	8/89	Pet Engr	112.5	200.0	100-125 MMbbls North Sea Block 25/5
Gulfaks Midgard	Statoil Saga	1978 1981	12/89	OGJ	1449.0		95-125 MMbbls
			1/90	Pet Engr	100.0	3500.0	126 MMbbls added
			7/90	OGJ		3800.0	3-4 Tcf Haltenbanken area
			4/91	OGJ		3800.0	Block 6507/11
			5/91	OGJ	94.0	4020.0	
Little Froy 3/7-4	Elf Shell	1990	2/90	OGJ	45.0		30-60 MMbbls North of Froy structure
			2/90	OGJ	45.0	350.0	40-50 MMbbls & 300-400 Bcf Sojne basin
			8/90	OGJ	50.0	500.0	
Tordis	Saga	1987	5/90	OGJ	100.0		North Sea, Block 34/7
			2/91	JPT	113.0		
			9/91	OGJ	120.0	70.0	
			12/91	OGJ	133.0		North Sea
Ekofisk Froy, Lille Frigg, Little Froy 6507/8-4 Snoehvit	Phillips	1969	9/90	OGJ	190.0		190 MMbbls increase for water injection
	Elf	1987	9/90	JPT	163.5	423.8	
	Statoil	1990	10/90	W. Oil	0.1		70,000 bbls Haltenbanken sector
	Statoil	1984	10/90	OGJ		3500.0	on the Tromsoflaket, west edge of Barents
				9/91	OGJ		3900.0
Loke (Sleipner Theta)	Statoil	1983	12/90	OGJ	12.6	105.0	Sleipner satellite
			9/91	OGJ	13.0	205.0	
South Smorbukk	Statoil		1/91	OET	157.0	700.0	Haltenbanken Area
			2/91	JPT	150.0		Haltenbanken Area
			9/91	OGJ	160.0	1000.0	Block 6506/12

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
Embla (SE Eldfisk)	Phillips	2/91	JPT		107.0		
		8/91	Pet Engr		80.0	175.0	
		9/91	OGJ		200.0	300.0	Block 2/7
Helder	Unocal	5/91	OGJ		31.1		Block Q-1
Huldra	Statoil	7/91	OGJ		25.0	494.0	Blocks 30/2 & 30/3
West Sleipner	Statoil	9/91	OGJ			4700.0	
		12/91	OGJ		302.0	4700.0	
Snorre C-plus	Saga	9/91	OGJ		325.0	100.0	south of Snorre
Visund	Norsk Hydro	9/91	OGJ		150.0	2600.0	Block 34/8
East Oseberg	Norsk Hydro	9/91	OGJ		116.0		88-140 MMbbbls
Lille Frigg	Elf	9/91	OGJ		22.0	264.0	Block 25/2a
		11/91	JPT			247.0	North Sea
North Gamma	Norsk Hydro	10/91	OGJ		3.2	123.6	Oseberg satellite
Valhall	Amoco	10/91	JPT		540.0		North Sea
Statfjord	Statoil	11/91	OGJ		3350.0		largest oil field in North Sea

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
		Date	Date		MMbbl	Bcf	
Oman							
Bukha	IPC	1979	10/87	AAPG	40.0		
			7/91	OGJ		200.0	off Musandam Peninsula
Safaha	Occidental	1983	4/89	Com Rpt	71.0		50 MMbbls increase due to dev drilling
			12/90	Com Rpt	117.0		37 MMbbls increase due to dev drilling
			8/91	W. Oil	117.0		
Saih Nihayda (deep)	PDO	1989	6/89	Oil Dly		353.0	
			8/90	W. Oil		350.0	
Saih Nihayda (shallow)	PDO	1972	6/89	Oil Dly		1200.0	
Wadi Rafash	Chevron	1981	11/90	OGJ	11.0	188.0	NW Oman
Shams	Chevron	1978	11/90	OGJ	5.0	134.0	NW Oman
Amal Eastern High	PDO		12/91	OGJ			400 MMbbls very heavy oil in place
Pakistan							
Dhurnal	Occidental	1983	11/91	Com Rpt	50.0		
Ratana	Occidental	1989	11/91	Com Rpt	20.0	500.0	
Papua New Guinea							
Juha	Niugini Gulf	1982	8/87	W. Oil	65.0	1000.0	Suspended Development
			2/88	Pet News	32.0	800.0	
			3/89	OGJ	90.0	1100.0	
Iagifu	Niugini Gulf	1985	8/87	W. Oil	500.0		Southern Highlands
			2/88	Pet News	500.0		
			10/88	AAPG	400.0		46 API
Hides #1	BP	1987	1/88	OGJ		1500.0	Southern Highlands
			2/88	Pet News		1500.0	
			3/89	OGJ	60.0	2000.0	
			9/89	Pet News	39.0	1500.0	Southern Highlands
			6/90	Pet News		2000.0	
Pasca	International Pet.	1968	2/88	Pet News	30.0	355.0	300-410 Bcf
			2/89	Pet news	36.0	300.0	
			9/89	Pet News	36.0	350.0	offshore
			8/90	W. Oil	30.0		
Pandora	IPC	1988	12/88	OGJ		3000.0	offshore
			9/89	Pet News		4000.0	plus 1.7 Tcf prob, 2.7 Tcf poss offshore
Iagifu & NW Hedinia		1986	12/88	Pet News	130.0		
Iagifu-Hedinia-SE Hedinia	Chevron Niugini Gulf			2/89	Pet News	307.5	
	115-500 MMbbls						
			8/89	W. Oil	230.0		
Iagifu & Hedinia	Chevron		3/89	OGJ	165.0		30-300 MMbbls
Agogo	Chevron	1989	8/89	W. Oil	50.0		on trend with Iagifu and Hedinia
Iagifu, Hedinia, Agogo	Chevron		5/90	OGJ	170.0		
Lake Kutubu project	Chevron	1985	12/90	OGJ	200.0		Iagifu-Hedinia, Agogo, & Usano fields

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas		
		Date	Date		Reserves	Reserves		
					MMbbl	Bcf		
Gobe	Command Petro		2/91	JPT	200.0		lagifu-Hedinia fields	
			4/91	OGJ	185.0		lagifu-Hedinia, Agogo, & Usano fields	
			8/91	W. Oil	200.0		1 Bbbls possible	
			12/91	OGJ	90.0		30-150 MMbbls	
Peru								
Cashiriari	Shell	1986	10/87	AAPG		4000.0		
San Martin	Shell	1984	10/87	AAPG		3000.0		
Camisea	Petroperu		2/88	AAPG	1800.0		1.8 Bbbls eq	
			3/88	OGJ	650.0	12000.0		
			8/88	W. Oil	600.0	10000.0		
			8/89	OGJ	750.0	10000.0	a.k.a. Cashiriari/San Martin	
Chambira	Petroperu		11/90	OGJ	650.0	17000.0	central southern jungle	
			1/91	OGJ	725.0	10800.0		
		1989	8/89	OGJ	40.0		30-50 MMbbls 26 API northern jungle	
Pavayacu	Petroperu		8/90	W. Oil	30.0		northern jungle Block 8	
			1/91	OGJ	7.0		northern jungle	
Philippines								
Matinloc	Alcorn	1978	7/89	OGJ	1.5			
North Matinloc	Alcorn	1989	7/89	OGJ	4.2			
Galoc	Alcorn		7/89	OGJ	45.0		40-50 MMbbls	
			8/91	W. Oil	45.0			
Nido	Alcorn	1976	7/89	OGJ	0.7			
Cadlao	Alcorn	1977	7/89	OGJ	11.2			
Camago	Oxy & Shell		1989	7/90	OGJ	200.0	7500.0	5-10 Tcf offshore NW Palawan
				8/90	W. Oil		22000.0	
				9/90	Com Rpt		700.0	
				12/90	Com Rpt		1000.0	
				8/91	W. Oil		1200.0	6.1 Tcf & 33 MMbbls Prob offshore
Palawan			11/91	Com Rpt	20.0	1000.0		
San Antonio	PNOCEC	1980	9/90	JPT		17.0	abandoned field to be redrilled	
West Linapacan	Alcorn		1990	12/90	OGJ	100.0	1 Bbbls in place	
				3/91	JPT	100.0	west coast of Palawan	
				8/91	W. Oil	109.0		
Calauit-Busuanga	Petrocorp Expl		7/91	OGJ	100.0		offshore	
Calauit	Petrocorp		8/91	W. Oil	69.0		offshore Palawan	
Qatar								
North Field	QGPC		1971	8/87	W. Oil		130000.0	
				5/89	OGJ		150000.0	

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
		Date	Date		MMbbl	Bcf	
			2/91	OGJ		150000.0	
			6/91	OET		380000.0	
			8/91	OGJ		150000.0	
			9/91	W. Oil		380000.0	
Romania							
E. & W. Lebada		1981	8/87	W. Oil	73.0		Black Sea
Ghercesti		1970s		11/90	OGJ	50.0	20.
0	Moesian platform						
Bradesti		1965	11/90	OGJ		74.0	Transylvanian basin
Ibanesti		1965	11/90	OGJ		61.0	Transylvanian basin
Cusmed		1967	11/90	OGJ		75.0	Transylvanian basin
Bentid		1964	11/90	OGJ		100.0	Transylvanian basin
Firtusu		1966	11/90	OGJ		100.0	Transylvanian basin
Calacea-Satchinez		1968	11/90	OGJ	43.0		Pannonian basin
Turnu		1964	11/90	OGJ	15.0		10-20 MMbbls Pannonian basin
Abramut		1967	11/90	OGJ	15.0		10-20 MMbbls Pannonian basin
Teremia		1968	11/90	OGJ	15.0		10-20 MMbbls Pannonian basin
Moreni		1890	11/90	OGJ	800.0	400.0	largest field in Romania
Saudi Arabia							
Central Province	Saudi Aramco	1989	3/90	Pet Mngt	30000.0		southeast of Riyadh
			4/90	OGJ	2000.0		3 wells southeast of Riyadh
Ghawar		1948	9/91	OGJ	86000.0		world's largest field
Safaniya			9/91	OGJ	31000.0		world's 4th largest field
Senegal							
Dome Flore		1961	8/91	W. Oil	1000.0		10 degrees API
South Africa							
Mossel Bay Area	Soekor		8/87	W. Oil		1000.0	
Sudan							
Suakin		1976	8/89	W. Oil	123.0	864.0	Red Sea 30 mi from Port Sudan
Suriname							

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
		Date	Date		MMbbl	Bcf	
Tambaredjo	Staatsolie		2/91	Pet Engr	29.1		
Sweden							
Klints Bank	Satellite Explor	1989	4/89	OGJ	63.0		Swedish Baltic Sea off NE Gotland
Taiwan							
CBK	CPC	1979	1/87	Pet News	7.5	106.0	5-10 MMbbls
			2/88	Pet News	7.5		5-10 MMbbls Straits of Taiwan
Yung Kung	CPC		10/91	OGJ		24.5	Yunlin County
Tanzania							
Songo Songo Island			12/91	OGJ		1.5	
Thailand							
Bongkot (B Structure)	Total CFP	1973	7/88	OGJ		1800.0	6 Tcf possible
			10/89	Pet News		3500.0	
			12/89	OGJ	32.0	1800.0	
			1/90	OGJ		3500.0	Gulf of Thailand
			4/90	OGJ	32.0	1800.0	
			8/90	W. Oil		3000.0	2.4-3.6 Tcf
			12/90	OGJ		1765.0	
			4/91	OGJ	25.0	1500.0	
			9/91	OGJ	18.0	1500.0	
			10/91	JPT		1000.0	Block 5/27
Kaphong	Unocal	1979	7/88	OGJ	8.7	376.0	
Nam Phong	Esso	1981	12/88	OGJ		1500.0	Kaen Province NE of Bangkok 100 ppm
H2S			4/91	OGJ		1500.0	
			8/91	W. Oil		1500.0	
Sirikit	Shell	1981	2/89	OGJ	70.0		20 MMbbls increase to 70 MMbbls
E-5 Structure	Esso	1981	10/89	Pet News		1500.0	located in Khon Kaen
Bung Ya	NCII		4/91	OGJ	0.9		Sukhotahi province
Sukhotai	North Central		8/91	W. Oil	4.0		onshore
Neung	BP		9/91	OGJ	0.3		Ayutthaya area in central plains
Sawng	BP		9/91	OGJ	3.7		onshore
Jakrawam	Unocal		11/91	OGJ		70.0	Gulf of Thailand
Trinidad & Tobago							

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
		Date	Date		MMbbl	Bcf	
Pelican		1977	8/89	W. Oil	21.0	740.0	
Tabaquite	Trintopec	1990	8/91	W. Oil	8.0		central Trinidad
Tunisia							
Miskar	British Gas	1974	6/90	OGJ		1000.0	offshore
			12/90	OGJ		875.0	750 Bcf to 1 Tcf
			9/91	JPT		706.0	
			12/91	OGJ		1000.0	
Ezzaouia	Marathon	1986	12/90	OGJ	20.0		Near Djerba Island
Maamoura	Agip	1987	12/90	OGJ	50.0		Gulf of Hammamet
El Borma		1964	12/90	OGJ	700.0		Sahara platform
Turkey							
Karakus	TPAO	1988	12/89	OGJ	112.0		near Kahta
Zeynel #1	Alladin Middle East	1989	2/90	JPT	10.0		SE Turkey
Nemrut #1	Alladin Middle East	1990	2/90	JPT	25.0		SE Turkey
United Kingdom							
Don	BP	1977	4/87	P. Times	50.0		
			8/88	Pet Engr	56.0		
Amethyst East & West	BP	1972	4/87	P. Times		283.0	
			8/88	OGJ		850.0	
			4/89	W. Oil	9.0	850.0	
			8/90	OGJ		850.0	
Forties		1970	8/87	W. Oil	319.0		319 MMbbls Upward Revision
Magnus		1974	8/87	W. Oil	100.0		100 MMbbls Upward Revision
Nelson	Enterprise	1987	3/88	OGJ	162.5		150-175 MMbbls 6500 bbl/d 40 API
			4/89	W. Oil	320.0		
			8/89	OGJ	350.0	100.0	
			7/91	OGJ	450.0	185.0	
			9/91	JPT	450.0	185.0	
Gryphon	Kerr-McGee	1987	5/88	Pet Mngt	500.0		300-700 MMbbls
			8/88	Pet Engr	500.0		300-700 MMbbls
			8/88	W. Oil	212.5		175-250 MMbbls
			10/88	AAPG	250.0		Block 9/18b
			8/89	OGJ	250.0		
			12/90	Com Rpt	90.0		80-100 MMbbls
Forth	BP	1988	5/88	Pet Mngt	200.0	60.0	
			8/88	OGJ	200.0	600.0	
			6/91	OGJ	165.0	180.0	15-40 MMbbls additional in satellites Blk
9/23b							
Pickerel/Valkyrie area	ARCO/Conoco	1985	8/88	OGJ		850.0	

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
			8/90	OGJ		850.0	Pickerill only
			12/90	Com Rpt		808.0	Pickerill only
N & S Welland	ARCO	1984	8/88	OGJ		300.0	
			10/90	OGJ		240.0	
Venture	Conoco	1974	8/88	OGJ		60.0	
Lancelot area	Mobil	1985	8/88	OGJ		600.0	
Anglia	Ranger Oil	1972	8/88	OGJ		250.0	
			2/89	OGJ		200.0	Blocks 48/18b & 48/19b North Sea
			11/90	OGJ		235.0	
			9/91	OGJ		240.0	
Camelot	Mobil	1967	8/88	OGJ		250.0	
			12/88	Com Rpt		210.0	
			2/89	OGJ		250.0	
North Ravenspurn	Hamilton Brothers	1984	8/88	OGJ		1300.0	2 Tcf in place
			4/89	W. Oil		1200.0	
			10/90	OGJ		1300.0	
Sole Pits area 7 fields	Shell/Esso		8/88	OGJ		3000.0	
			11/90	OET		3000.0	
Gannet Complex	Shell Expro	1973	8/88	OGJ		500.0	
			5/89	Pet Engr	170.0	700.0	112 mi east of Aberdeen
			9/91	OGJ	170.0	700.0	4 fields
Joanne & Judy	Phillips	1981	8/88	OGJ	150.0	400.0	
			6/90	Pet Mngt	150.0	600.0	J Block
			4/91	OGJ	150.0	650.0	Block 30/7a
Tiffany	Agip	1977	7/90	OGJ	125.0		T-Block 16/17
			10/90	Pet Engr	125.0	100.0	
			3/91	OGJ	125.0		Block 16/17
			9/91	OGJ	125.0		
Toni	Agip	1977	12/90	OGJ	40.0		
			2/91	JPT	40.0		
Arbroath	Amoco	12/69	8/88	Pet Engr	103.0		5 mi f/Montrose field
Miller	BP	1983	8/88	Pet Engr	300.0		Blocks 16/7 & 16/8
			10/88	OGJ	300.0	570.0	
			4/89	W. Oil	326.0	470.0	
			7/89	OGJ	300.0	570.0	sour gas
			8/91	Pet Engr	240.0	570.0	
Kittiwake	Shell Expro	1981	8/88	Pet Engr	70.0		Block 21/18a
			1/91	Pet Engr	70.0		
			10/91	OGJ	70.0		
Scott (Waverley/Brunel)	Amerada Hess	1984	8/88	Pet Engr	175.0		150-200 MMbbbls Blocks 15/21a & 15/22
			10/88	OGJ	250.0		combined Waverley & Brunel
			12/88	OGJ	400.0		combined Waverley & Brunel
			6/90	Com Rpt	450.0	287.0	plus 38 MMbbbls NGL
			8/90	OGJ	450.0	290.0	plus 40 MMbbbls NGL
			12/90	Com Rpt	482.0	238.0	
			7/91	OGJ	490.0	290.0	
16/28c-11 U.K.	BP	1988	9/88	OGJ	10.0		6000 bbl/d 1st horizontal well f/semi off

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
Hudson Field 210/24a	Amoco	1987	10/88	AAPG	100.0		
Crawford	Hamilton Bros	1975	10/88	OGJ	14.6		140 mi east of Orkney Islands
			8/91	W. Oil	3.9		P & A with less than 2 years prod
Osprey	Shell	1974	12/88	OGJ	60.0		112 mi NE of Shetland Islands
			2/91	OGJ	60.0		
			3/91	W. Oil	60.0		Block 21/23a
Poole Bay	BP	1988	12/88	OGJ	100.0		offshore extension to Wytch Farm field
			1/91	W. Oil	100.0		
Clipper & Barque fields	Shell	1971	12/88	Com Rpt		860.0	Sole Pit area southern North Sea
			4/89	W. Oil		874.0	
			8/90	OGJ		875.0	
Emerald Shetlands	Sovereign	1978	2/89	OGJ	43.0		24 API f/5150-5600 ft 70 mi E of
			8/89	OGJ	40.0		
			8/90	OGJ	43.0		
Claymore	Occidental	1974	2/89	OGJ	195.0		total remaining
Chanter	E.E. Caledonia	1985	4/89	W. Oil	9.0	29.0	
			7/91	OGJ	3.2		
			9/91	JPT		30.0	
Cyrus	BP	1979	4/89	W. Oil	15.0		
			8/89	OGJ	11.4		
			10/89	OGJ	13.0		
			12/91	OGJ	13.0		
Glamis/Blair	Sun	1982	4/89	W. Oil	18.0		
			8/89	OGJ	17.5		
			8/90	OGJ	4.0		Blair only
Ivanhoe/Rob Roy	Amerada Hess	1975	4/89	W. Oil	88.0	30.0	
			5/89	OGJ	105.0	65.0	Block 15/21a, 110 mi east of Aberdeen
Tern	Shell	1975	4/89	W. Oil	175.0		
Wytch Farm	BP	1974	7/89	OGJ	230.0		
			2/90	OGJ	300.0		on and offshore
			11/91	Com Rpt	300.0		
Bruce	BP	1974	8/89	OGJ	210.0	2500.0	
			9/89	OGJ	210.0	2600.0	Blocks 9/8a, 9/9a, 9/9b
			9/90	OGJ	220.0	2500.0	
			8/91	Pet Engr	220.0	2600.0	
East Brae	Marathon	1980	8/89	OGJ	300.0	1200.0	
			9/90	OGJ	300.0	1400.0	Block 16/3a
			12/90	Com Rpt	318.0	1600.0	
			12/90	OGJ	300.0	1500.0	Blocks 16/3a & 16/3b
			8/91	OGJ	300.0	1500.0	
Alba	Chevron	8/84	8/89	OGJ	320.0		
			11/89	OGJ	250.0		20 API 1 Bbbls in place Block 16/26
			4/90	OGJ	275.0		250-300 MMbbls
			8/90	OGJ	300.0		
			12/90	Com Rpt	400.0		
			5/91	OGJ	400.0		
			5/91	OGJ	250.0		1 Bbbls in place 20 API

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
			6/91	Com Rpt	400.0		
			9/91	OGJ	390.0		heavy oil
			11/91	Com Rpt	300.0		
Block 4/26	Ranger	1985	8/89	OGJ		150.0	
Franklin	Ultramar	1986	8/89	OGJ	200.0	2000.0	Block 29/5 North Sea
			8/91	OGJ	250.0	2000.0	
Eider		1976	8/89	W. Oil	88.0		
Alwyn North	Total	1975	8/89	W. Oil		950.0	
			9/91	OGJ	22.0	158.0	Block 3/9
Audrey		1976	8/89	W. Oil		1000.0	
Cleeton & S Ravenspurn		1983	8/89	W. Oil		1200.0	
Welton		1982	8/89	W. Oil	20.0		
Saltire (East Piper)	Occidental	1988	8/89	Pet Engr	60.0		
			8/89	Com Rpt	100.0		Block 15/17
			6/90	Com Rpt	130.0		
			7/90	OGJ	120.0		
			8/90	OGJ	100.0		
			9/90	Com Rpt	130.0		
			2/91	OGJ	140.0		
			5/91	JPT	130.0		
			9/91	OGJ	140.0		
Moira	Phillips	1988	9/89	OGJ	5.5		Block 16/29a
			8/90	OGJ	6.0		
Linnhe	Mobil	1988	9/89	OGJ	10.0		
Donan	BP	1987	10/89	OGJ	21.0		160 mi NE of Aberdeen
			8/90	OGJ	20.0		
			12/91	OGJ	26.0		Block 15/20a
Thistle	BP	1973	11/89	OGJ	420.0		57 MMbbls increase to 420 MMbbls total
Beatrice	BP	1976	11/89	OGJ	130.0		18 MMbbls increase to 130 MMbbls total
Ninian	Chevron	1974	1/90	OGJ	1150.0		1.1-1.2 Bbbls 100 mi E of Shetland Is
Hamish	Amerda Hess	1988	2/90	OGJ	1.5		Block 15/21b close to Rob Roy
Wareham	BP	1964	2/90	OGJ	6.0		close to Wytch Farm
			5/91	W. Oil	5.0		
Murdoch	Conoco	1984	5/90	OGJ		250.0	200-300 Bcf Block 44/22b S North Sea
Andrews		1974	6/90	Pet Mngt	75.0	150.0	North Sea
Central Brae	Marathon	1976	8/90	OGJ	300.0	1300.0	North Sea
Everest & Lomond	Amoco	82/72	8/90	OGJ		1500.0	
Stockbridge	Ultramar	1984	8/90	W. Oil	7.0		onshore in Hampshire
Lyell	Conoco	1975	11/90	OGJ	30.0		Block 3/2 close to Ninian
			2/91	OGJ	30.0		400 MMbbl in place
			9/91	OGJ	40.0		
Staffa	Lasmo	1985	11/90	OGJ	9.0		Block 3/8b formerly East Ninian
Clair	BP	1976	5/91	OGJ	300.0		W of Shetlands 3 Bbbls in place
North Morecambe	British Gas	1974	5/91	OGJ		6000.0	W UK
			12/91	JPT		1000.0	
Singleton	Kelt Energy		6/91	OGJ	2.3		Southern England
Mungo	BP		7/91	OGJ	130.0		Blocks 23/16a & 22/20
Monan & Medan	BP		7/91	OGJ	60.0		Block 22/20 & 23/22a respectively

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
Marnoch	BP		7/91	OGJ	170.0		oil equivalent Block 22/24a & b
Machar	BP		7/91	OGJ	100.0		oil equivalent Block 23/26a
Erskine	BP		7/91	OGJ	200.0		oil equivalent Block 23/26a & b
Kilda/Lapworth	Chevron, Conoco		8/91	Pet Engr			5 Tcf in place
			9/91	OGJ	400.0	2500.0	
22/30c-8	Elf		9/91	OGJ	200.0	1000.0	
43/24-1	ARCO		9/91	OGJ		300.0	
Dunbar (S Alwyn)	Total		9/91	OGJ	120.0	494.0	
Southeast Alwyn	Total		9/91	OGJ	15.0	423.0	3 Dunbar satellites
Angus	Amerada Hess		9/91	Com Rpt	7.5		North Sea
			12/91	OGJ	7.5		Blocks 31/21 & 31/26a
Victor	Conoco	1972	11/91	JPT			475 Bcf remaining
Strathspey	Texaco	1975	11/91	OGJ	89.0	334.0	Block 3/4a
Brent	Shell		11/91	OGJ	1800.0		offshore
Scapa	Occidental		11/91	Com Rpt	77.0		Block 14/19
Former U.S.S.R.							
Bovanenkov/Kharasavey		1971	8/87	W. Oil		190000.0	Yamal Peninsula
Tengiz		1979	4/88	OGJ			18.25 Bbbls oil in place NE Caspian basin
			4/88	PIW			14-19 Bbbls oil in place
			8/88	W. Oil			18.25 Bbbls oil in place North Caspian
basin			4/89	OGJ	6500.0		6-7 Bbbls 16 Bbbls oil in place
			8/89	W. Oil	9500.0		officially reported Soviet reserves
			6/90	OGJ	10500.0		10-11 Bbbls, 35-40 Bbbls & 46 Tcf in
place			8/90	W. Oil	9500.0		25.5 Bbbls in place
			8/91	OGJ	7300.0	70600.0	35-40 Bbbls in place, 609 MM mt sulfur
Bovanenkovskoye		1971	8/88	W. Oil		79000.0	Yamal Peninsula
			2/89	OGJ		146000.0	Yamal Peninsula
			8/90	OGJ		141200.0	
Komsomolskoye		1966	2/89	OGJ		16000.0	western Siberia proved & probable
Yubileinoye		1969	3/89	OGJ		12100.0	western Siberia proved & probable
Piltun-Astokhskoye			4/89	OGJ	200.0		off Sakhalin Island Sea of Okhotsk
			3/91	OGJ	400.0		Explored reserves
			7/91	OGJ	500.0		
			8/91	W. Oil	200.0		
Shtokmanovskoye		1988	9/89	OGJ		123000.0	105-141 Tcf Barents Sea
			1/90	OGJ		106000.0	Barents Sea 250 mi NE of Murmansk
			6/90	OGJ		141000.0	
			8/90	W. Oil		127500.0	105-150 Tcf
			4/91	OGJ		94000.0	88-100 Tcf
			5/91	JPT		70600.0	
Russanovskoye		1989	12/89	AAPG		210000.0	Kara Sea
			8/90	OGJ		282400.0	70 mi offshore NW Yamal Peninsula
			6/91	OGJ		282400.0	

See footnotes at end of table.

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
					MMbbl	Bcf	
Russkoye		1968	6/90	OGJ		5000.0	northern Tyumen province
Komi			7/90	Oil Dly	4500.0		4-5 Bbbls remaining
Severo Gulyaevskaya & Prirazlomnaya		1990	11/90	JPT		717.0	
	(100 million tonnes)			Barents Sea			
Okha	Sodeco	1920	11/90	OGJ	200.0		Sakhalin Island
Odoptu-More	Sodeco	1953	11/90	OGJ	70.0		Sakhalin Island
			3/91	OGJ	200.0		Explored reserves
Chaivo-More	Sodeco	1979	11/90	OGJ	305.0	4200.0	Sakhalin Island
			3/91	OGJ	772.0	5000.0	630 MMbbl oil + 142 MMbbl cond
			8/91	W. Oil	770.0	4900.0	630 MMbbls oil + 140 MMbbl cond
Piltun-Astohskoye & Lunskoye			2/91	JPT		14150.0	10.6-17.7 Tcf
Sakhalin Island fields			2/91	Pet Engr	200.0		
			3/91	OGJ	10000.0		Sakhalin sector of Sea of Okhotsk
Lunskoye			3/91	OGJ			42 Tcf in place
			7/91	OGJ		10000.0	
Kokdumalak			6/91	OGJ	1420.0	5000.0	Amu-Daria basin Uzbekistan
Gazli		1957	6/91	OGJ		17000.0	Amu-Daria basin Uzbekistan
Shatlyk			6/91	OGJ		34000.0	Amu-Daria basin Uzbekistan
Shurtan			6/91	OGJ		19000.0	Amu-Daria basin Uzbekistan
Dauletabad-Donmez			6/91	OGJ		60000.0	Amu-Daria basin Uzbekistan
Azeri		1987	8/91	JPT	1000.0		Caspian Sea
Onbysk	Tatex		10/91	OGJ	60.0		Tataria
Inchkhe-More	Premier/Grynberg		10/91	OGJ	100.0		Caspian Sea
Karachaganak			10/91	OGJ		35000.0	Kazakhstan
West Mogotlorsk	Siberian American	1986	12/91	OGJ	42.5	32.5	40-45 MMbbls Tyumen
North Gubkinskoye	Geoilbent		12/91	OGJ	100.0		West Siberia
Venezuela							
ORS-52	Lagoven	1/86	11/86	AAPG	70.0	870.0	
Orinoco Heavy Oil Belt			11/86	AAPG	267000.0		
			8/87	W. Oil	109000.0		18-200 Bbbls
			7/89	OGJ	500000.0		1.25 Ttbbbls in place
			2/91	OGJ	270000.0		<9.9 API
			12/91	JPT	267000.0		recoverable bitumen
El Furrial	Lagoven	12/85	11/86	AAPG	1070.0	3700.0	
		1986	8/87	W. Oil	528.0		Monagas State
		1986	10/87	AAPG	750.0		0.5-1 Bbbls Monagas State
		1986	2/88	AAPG	2000.0	2800.0	Monagas State
			6/88	OGJ	832.0		Monagas State
			8/89	W. Oil	307.0	542.0	
S. Lake Maracaibo	Lagoven	1986	8/87	W. Oil	200.0		S. Lake Maracaibo
Apure Area	Corpoven	1986	8/87	W. Oil	650.0		600-700 MMbbls Apure Area
Eastern Venezuela Basin			2/88	AAPG	500000.0		
			3/88	OGJ	11300.0		
Monagas Trend			3/88	OGJ	8600.0		Monagas State Only
			8/90	W. Oil	20000.0		
Ceuta VLG 3725 X	Maraven		8/88	W. Oil	140.0		
El Carito #1X	Corpoven	1988	8/88	W. Oil	1200.0	2800.0	35 API

Table A1. Foreign Oil and Gas Discoveries Reported, 1987-1991 (Continued)

Country/Field/Well Comments	Company	DiscReport		Source	Oil	Gas	
		Date	Date		Reserves	Reserves	
		Date	Date		MMbbl	Bcf	
west Lake Maracaibo	PDVSA	7/87	8/88	W. Oil	819.0		western Lake Maracaibo region new field
El Furrrial Norte #1	Lagoven	1988	9/88	OGJ	150.0		23.5 API TVD 16420 ft
Ceuta South-Southeast	Maraven	1985	9/88	AAPG	800.0		south of Lake Maracaibo
Musipan		1987	8/89	W. Oil	520.0		Monagas State
Guafita		1984	8/89	W. Oil	450.0		Apure State
Boqueron	Lagoven	1989	8/89	Oil Dly	380.0		Monagas State
Chaguaramal	Lagoven		9/91	OGJ	25.0		400 mi E of Caracas
Vietnam							
White Tiger (Bach Ho)	VietSovpetro	1975	2/89	Pet News	2100.0		offshore Ho Chi Minh City
			2/89	AAPG	20.0		50-100 MMbbls possible
			10/89	Pet News	90.0		80-100 MMbbls
			8/90	W. Oil	20.0		100 MMbbls possible additional
			7/91	OGJ	237.5		175-300 MMbbls
Big Bear (Dai Hung)	Petrovietnam	1988	2/89	Pet News	20.0		Offshore Ho Chi Minh City
			8/90	W. Oil	100.0		requires 250 new wells
			7/91	OGJ	450.0		300-600 MMbbls
			11/91	JPT	700.0		
			12/91	OGJ	600.0		500-700 MMbbls
Dragon (Rong)		1974	7/91	OGJ	125.0		100-150 MMbbls
			12/91	OGJ	75.0		50-100 MMbbls
Yemen							
Alif	Yemen Hunt Oil	7/84	8/87	W. Oil	500.0		Marib
			11/91	Com Rpt	500.0		
Wadi al Jawf Area	Yepco	1986	8/87	W. Oil	500.0	6000.0	In Addition to Alif
Asa'ad Al-Kamil	YEPCO	12/87	8/89	OGJ	133.0	2700.0	
Sunah, Heijah, & Camaal	Oxy		12/91	OGJ	235.0		550 MMbbls in place

Note: See Glossary for abbreviations.

Sources: **AAPG**: American Association of Petroleum Geologists Bulletin or Explorer. **Com Rpt**: Company Report either annual or quarterly stock holders reports. **JPT**: Journal Of Petroleum Technology. **Ocn Ind**: Ocean Industries. **OET**: Oil and Energy Trends. **OGJ**: Oil and Gas Journal. **Oil Dly**: The Oil Daily. **PIW**: Petroleum Intelligence Weekly. **P. Times**: Petroleum Times. **Pet Engr**: Petroleum Engineer International. **Pet Mngt**: Petroleum Management. **Pet News**: Petroleum News. **W. Oil**: World Oil.

Appendix B

International Oil and Natural Gas Reserves

Appendix B

Table B1. International Oil and Natural Gas Reserves as of December 31, 1991

Region/Country	Oil (Million Barrels)		Natural Gas (Billion Cubic Feet)	
	Oil & Gas Journal	World Oil	Oil & Gas Journal	World Oil
North America				
Canada	5,588	6,104	96,734	96,000
Cuba	100	121	100	44
Mexico	51,298	50,925	71,508	70,954
United States ¹	24,682	24,682	175,325	175,325
Other	35	190	10	0
Total	81,703	82,022	343,677	342,323
South America				
Argentina	1,570	1,627	20,449	22,707
Bolivia	119	111	4,500	4,100
Brazil	2,800	3,030	4,046	4,372
Chile	300	140	4,100	3,885
Colombia	1,935	1,744	3,889	3,617
Ecuador	1,550	1,748	3,885	3,890
Peru	382	822	7,075	7,050
Trinidad and Tobago	535	573	8,900	8,719
Venezuela	59,100	62,650	110,000	126,492
Other	41	47	6	7
Total	68,333	72,492	166,850	184,839
Western Europe				
Austria	85	85	388	388
Denmark	755	730	4,059	4,000
France	171	177	1,296	1,705
Germany	449	272	8,760	8,151
Greece	41	28	44	27
Italy	692	699	11,370	11,437
Netherlands	145	145	69,570	68,864
Norway	7,609	15,326	60,670	96,651
Spain	21	19	740	178
United Kingdom	3,994	4,144	19,247	19,062
Other	0	72	1,700	1,530
Total	13,963	21,696	177,844	211,993
Eastern Europe				
Albania	165	189	670	404
Bulgaria	15	13	250	234
Czechoslovakia	15	15	490	335
Hungary	159	143	3,758	3,668
Poland	30	46	4,590	5,601
Romania	1,150	1,491	3,700	7,642
U.S.S.R.	57,000	59,911	1,750,000	1,853,383
Yugoslavia	240	179	2,900	2,909
Other	0	0	0	0
Total	58,774	61,987	1,766,358	1,874,175

Middle East

Abu Dhabi	92,200	64,369	182,800	188,325
Bahrain	83	84	6,010	5,900
Dubai	4,000	1,226	4,600	4,483
Iran	92,860	62,500	600,350	600,000
Iraq	100,000	100,000	95,000	109,400

Table B1. International Oil and Natural Gas Reserves as of December 31, 1991 (Continued)

Region/Country	Oil (Million Barrels)		Natural Gas (Billion Cubic Feet)	
	Oil & Gas Journal	World Oil	Oil & Gas Journal	World Oil
Middle East				
Kuwait ²	96,500	95,211	48,500	51,754
Oman	4,250	4,350	9,900	13,030
Qatar	3,729	2,851	162,000	162,000
Saudi Arabia ²	260,342	261,937	184,548	184,474
Syria	1,700	1,800	6,400	7,060
Turkey	540	298	705	633
Yemen	4,000	2,009	7,000	15,151
Other	1,906	216	12,010	3,298
Total	662,111	596,849	1,319,823	1,345,509
Africa				
Algeria	9,200	9,901	116,500	128,050
Angola	1,818	1,450	1,800	1,730
Cameroon	400	376	3,880	3,885
Congo	830	698	2,600	2,719
Egypt	4,500	3,536	12,400	11,965
Gabon	730	876	450	389
Libya	22,800	38,435	43,000	43,471
Nigeria	17,900	17,856	104,720	120,069
South Africa	0	3	1,800	1,978
Tunisia	1,700	1,800	3,000	3,178
Zaire	187	164	1,058	35
Other	423	355	19,033	16,495
Total	60,488	75,450	310,241	333,964
Asia-Pacific				
Australia	1,524	2,124	15,057	75,420
Brunei	1,350	1,138	11,200	13,985
China	24,000	30,000	35,400	35,000
India	6,127	6,126	25,772	25,783
Indonesia	6,581	11,846	64,837	104,250
Japan	60	41	968	1,174
Malaysia	3,045	3,600	59,055	59,100
Myanmar (Burma)	50	105	9,350	7,600
New Zealand	170	180	3,449	3,448
Pakistan	162	351	22,600	26,730
Papua New Guinea	200	200	8,000	6,500
Philippines	38	148	100	1,650
Taiwan	4	6	670	620
Thailand	262	257	13,600	14,710
Other	501	246	29,230	13,350
Total	44,073	56,368	299,288	389,321
OPEC	767,842	729,873	1,729,205	1,826,455

Non-OPEC	221,601	236,991	2,654,876	2,855,668
Non-OPEC w/o US	196,919	212,309	2,479,551	2,680,343
Total w/o US	964,761	942,181	4,208,756	4,506,798
Total	989,443	966,863	4,384,081	4,682,123

¹United States reserves are from EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 1991 Annual Report*

²Includes one-half of the reserves in the Neutral Zone.

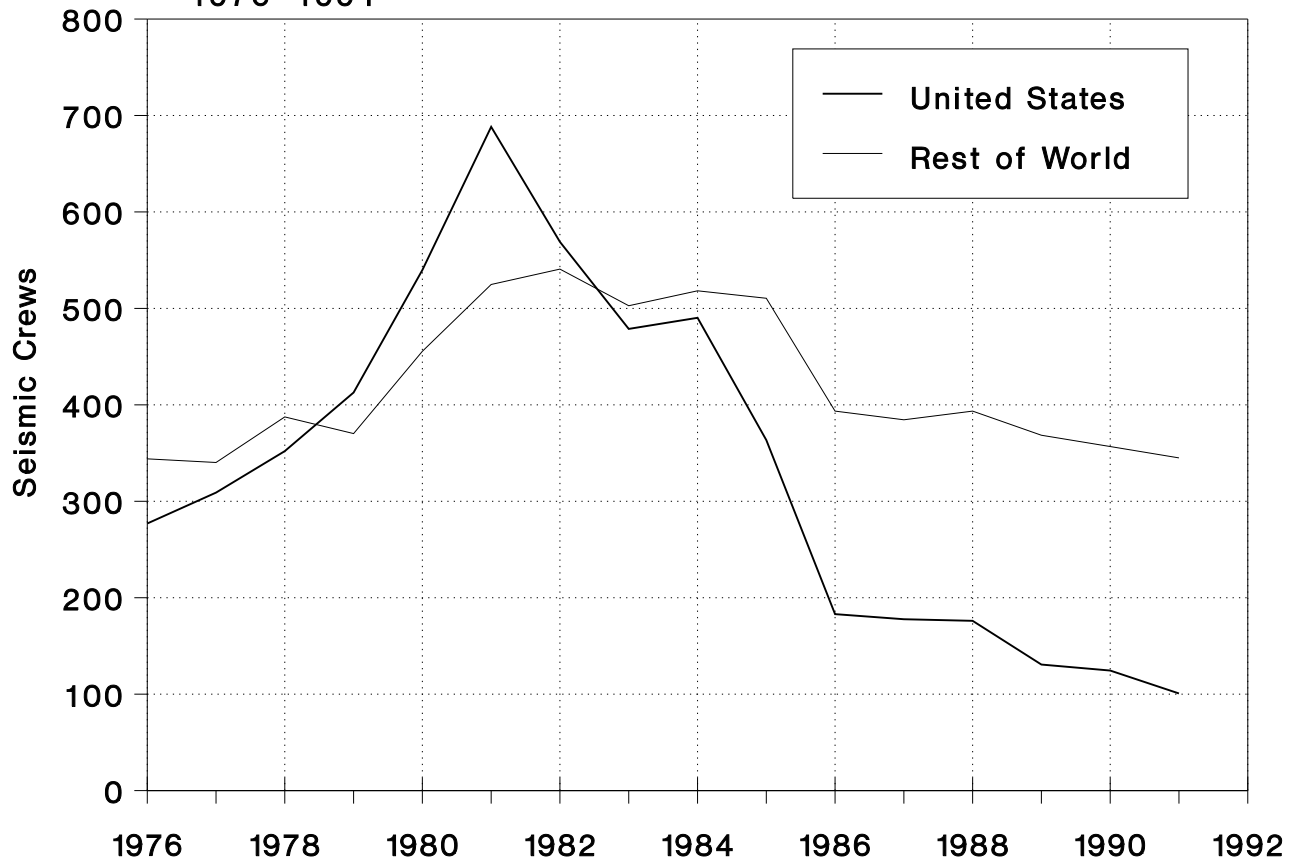
Note: Column totals may not add due to independent rounding.

Sources: PennWell Publishing Co., *Oil and Gas Journal*, December 31, 1991, pp. 48-49. Gulf Publishing Co., *World Oil*, August, 1992, p. 28.

Appendix C

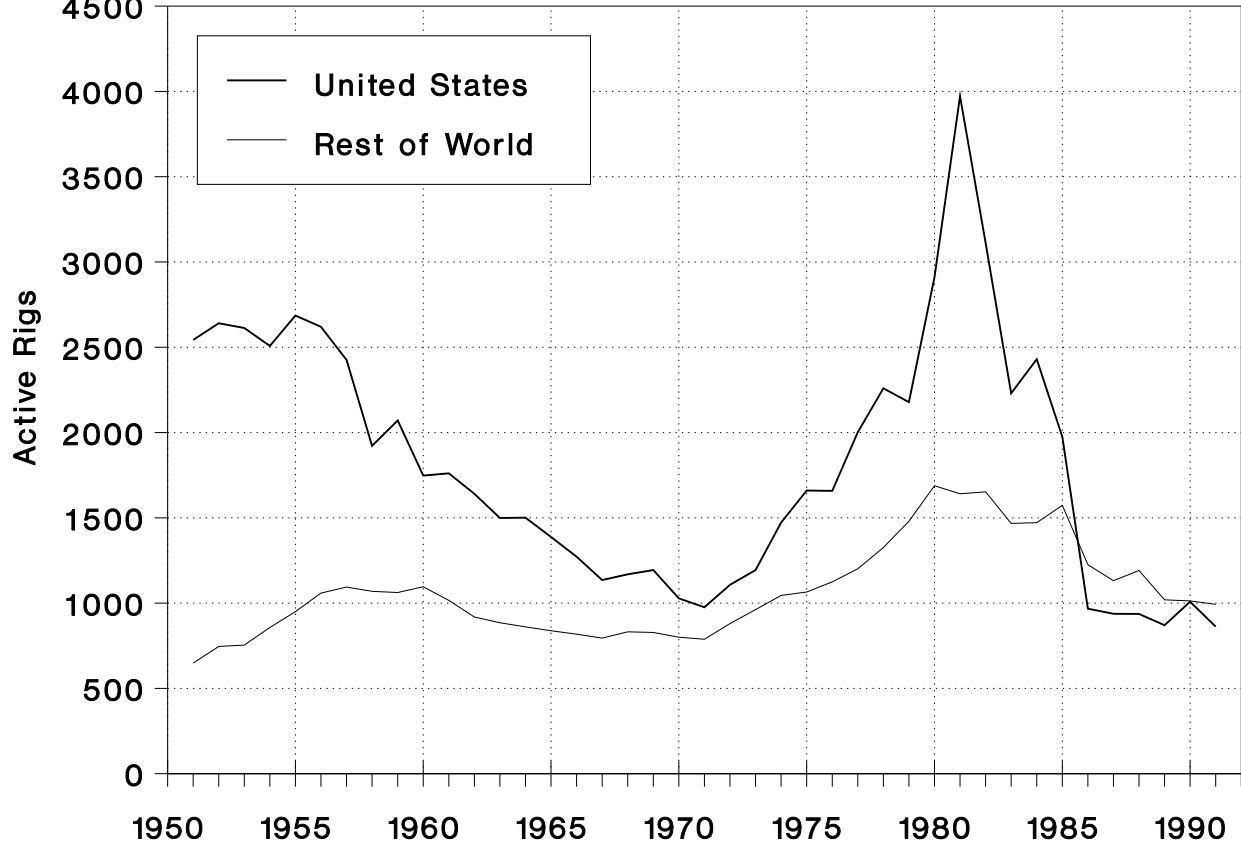
Comparison Graphs of the United States and Foreign Countries

Figure C1. Active Seismic Crews and Marine Vessels, Comparison of United States to Foreign Countries, Excluding the FSU and Eastern Europe, 1976-1991



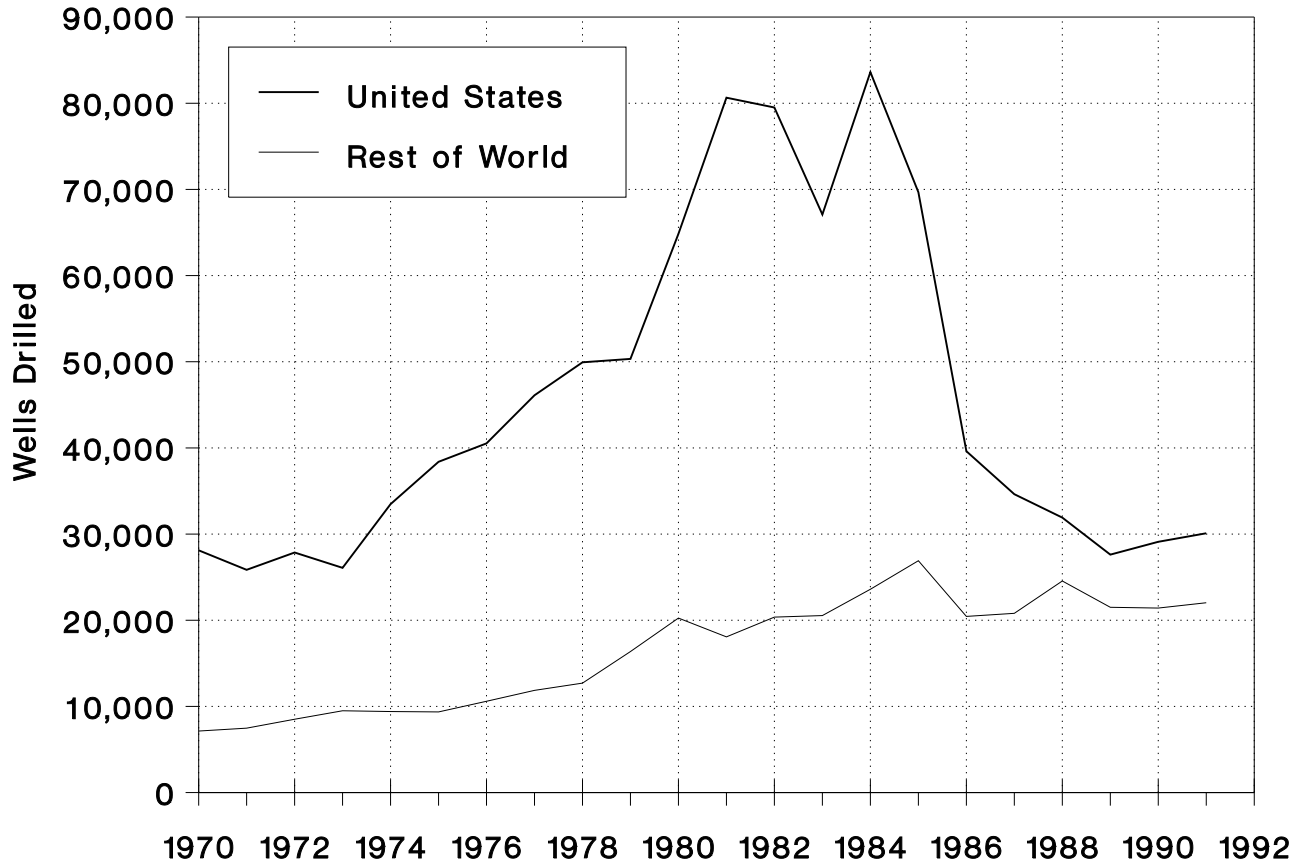
Source: Table 3.

Figure C2. Active Rotary Drilling Rigs, Comparison of United States to Foreign Countries, Excluding the FSU and Eastern Europe, 1951-1991



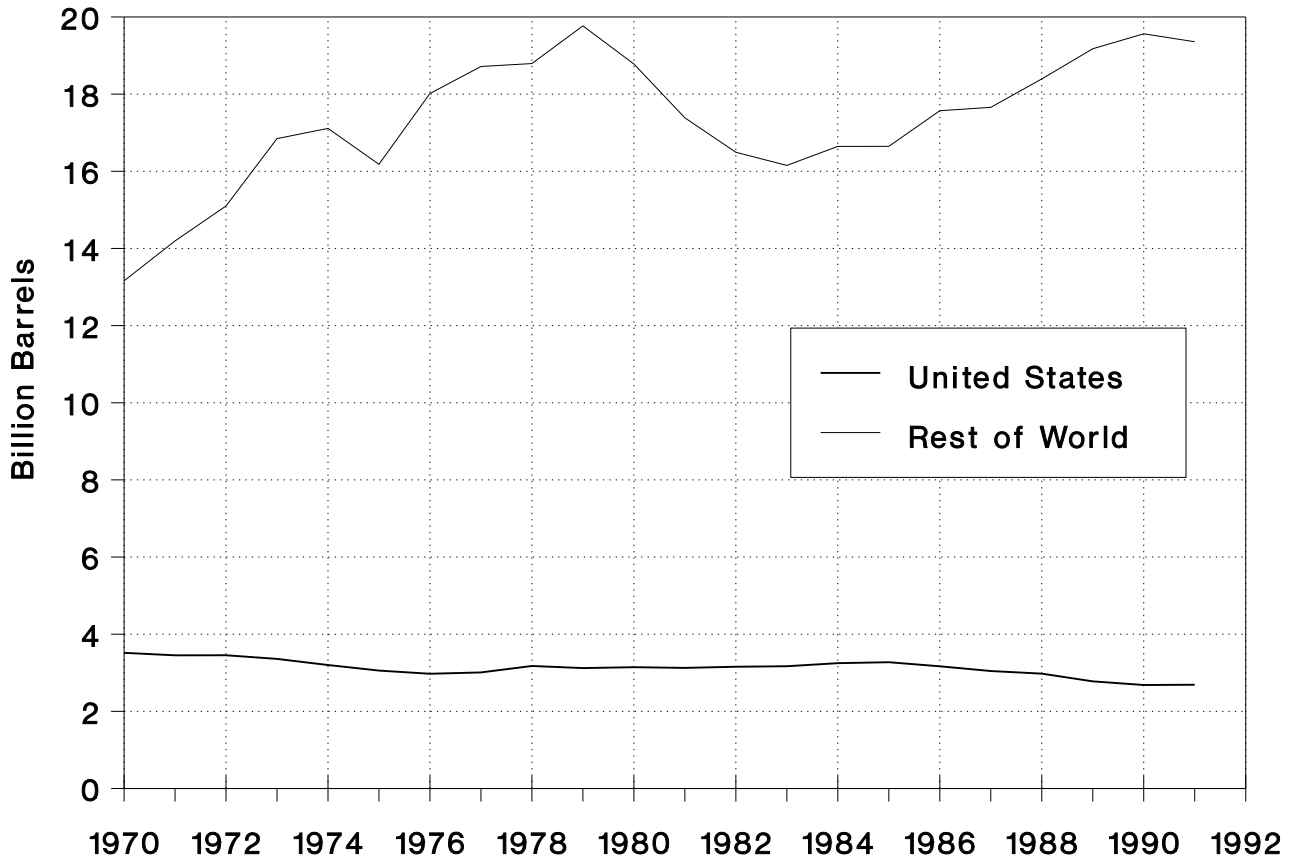
Source: Table 4.

Figure C3. Total Wells Drilled, Comparison of United States to Foreign Countries, Excluding the FSU and Eastern Europe, 1970-1991



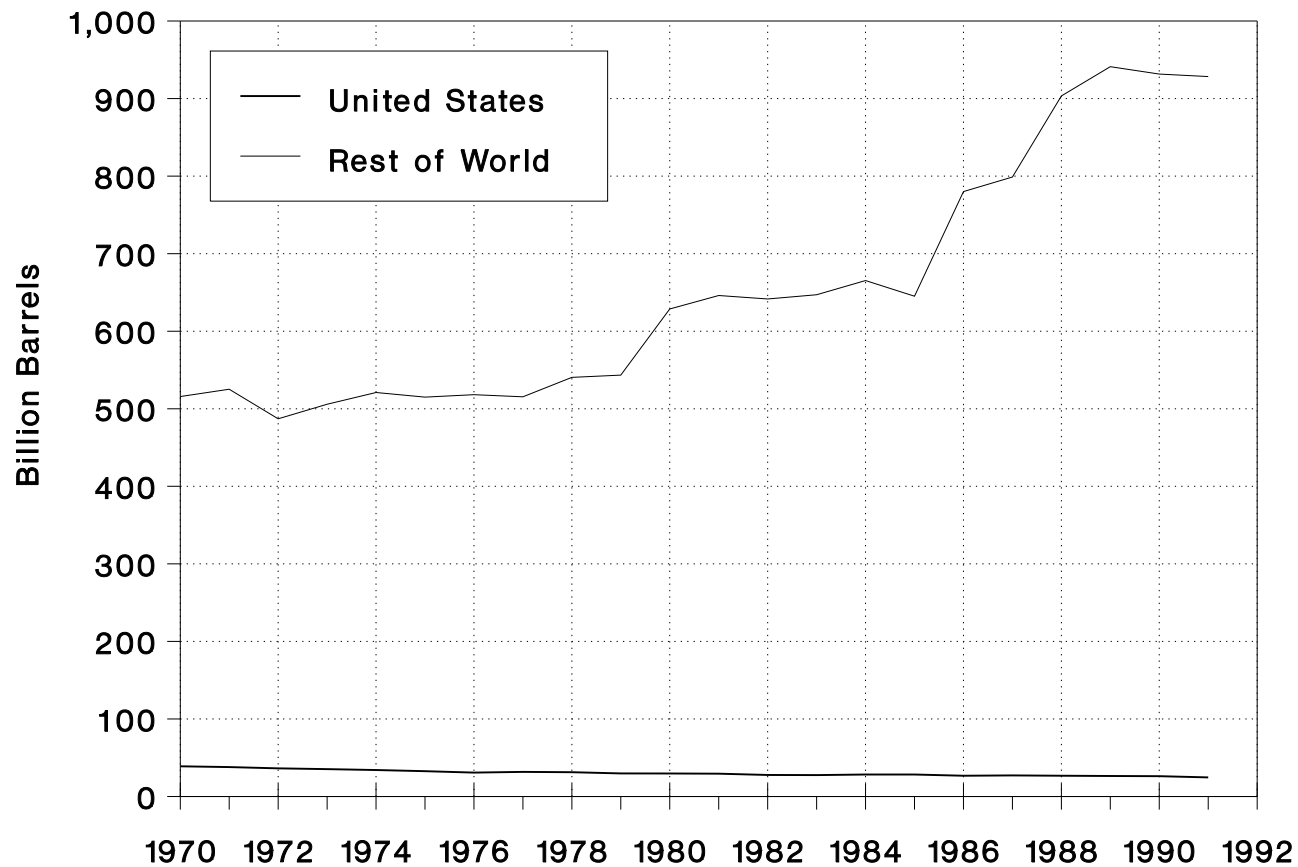
Source: Table 5.

Figure C4. Annual Oil Production, Comparison of United States to Foreign Countries, 1970-1991



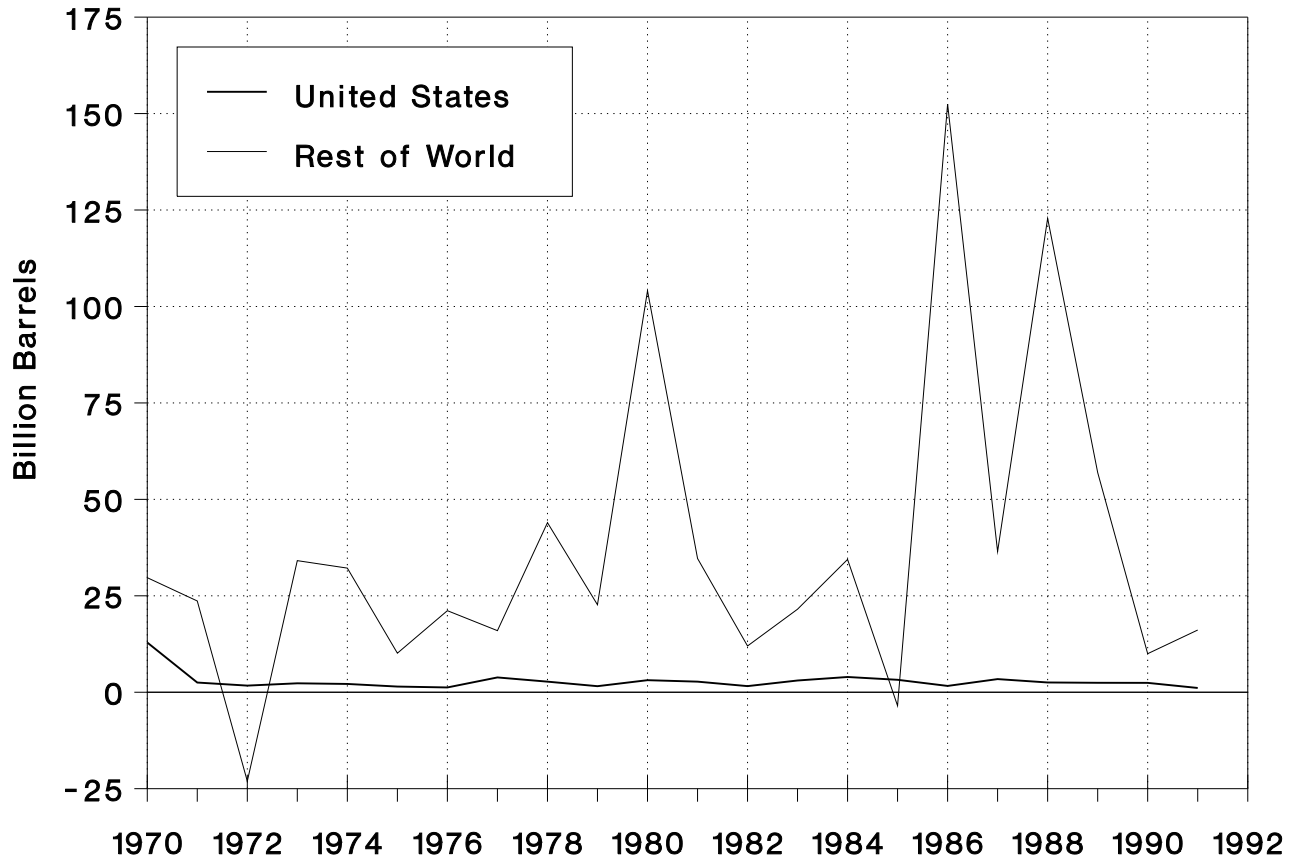
Source: Table 6.

Figure C5. Oil Reserves, Comparison of United States to Foreign Countries, 1970-1991



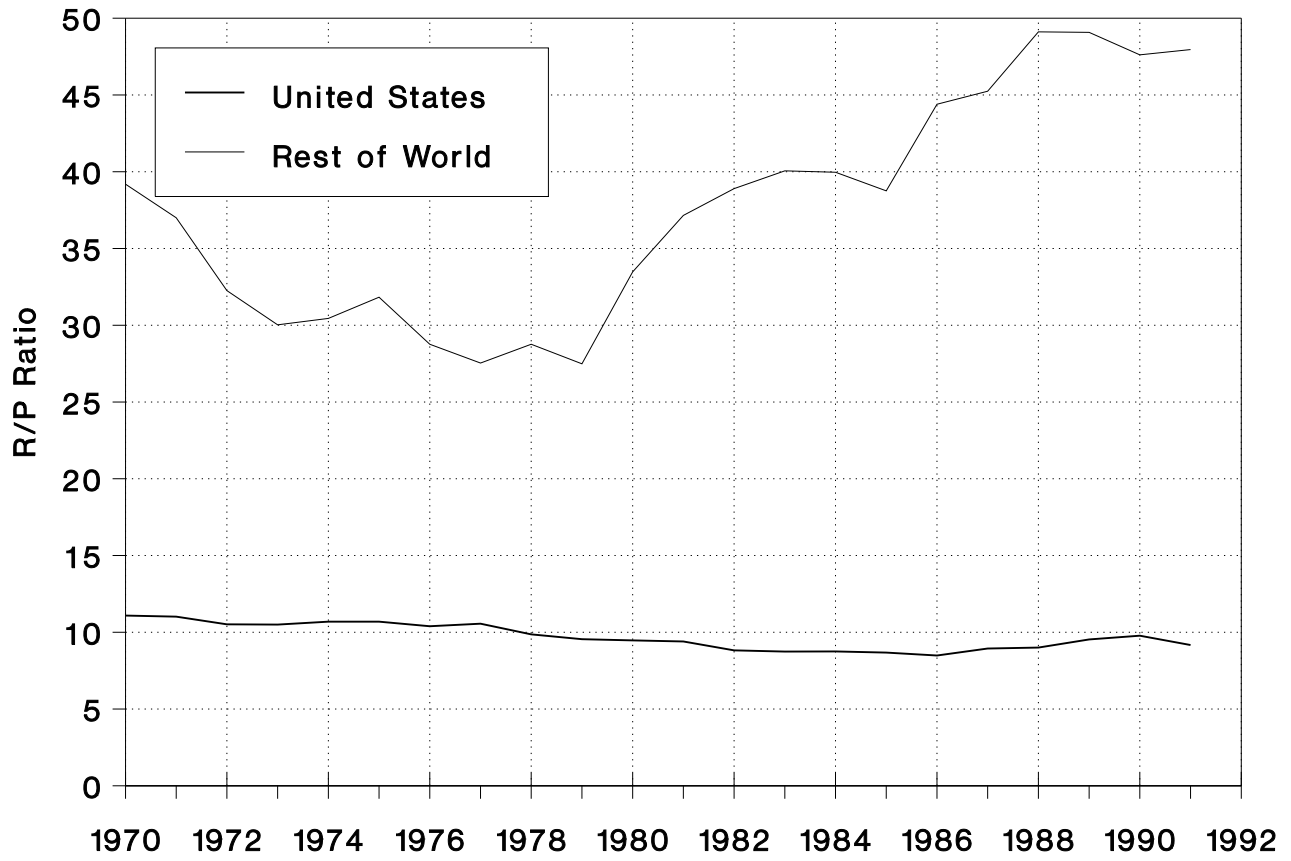
Source: Table 7.

Figure C6. Annual Oil Reserve Additions, Comparison of United States to Foreign Countries, 1970-1991



Source: Table 8.

Figure C7. Annual Oil Reserves to Production Ratio (R/P), Comparison of United States to Foreign Countries, 1970-1991



Source: Table 9.

Appendix D

Identified Reserves and Undiscovered Resources

Table D1. Identified Reserves and Undiscovered Resources of Conventional Crude Oil as of January 1, 1990, Billion Barrels

Region/Country	Cumulative Production	Identified Reserves	Original Reserves	Undiscovered Oil				Ultimate Resources (Mode)
				95%	Mode	5%	Mean	
North America								
Canada	14.8	13.0	27.8	13.5	22.1	50.0	28.1	49.9
Greenland	na	na	na	0.6	1.0	3.0	1.5	1.0
Mexico	16.6	44.9	61.5	15.0	25.0	75.0	36.9	86.5
United States	155.5	45.4	200.9	33.2	45.8	69.9	49.4	246.7
Total	187.0	103.5	290.5	63.0	97.8	190.6	115.9	388.3
South America								
Argentina	5.0	2.2	7.2	1.6	3.0	10.0	4.7	10.2
Bolivia	0.3	0.2	0.5	0.2	0.3	0.8	0.4	0.8
Brazil	2.7	10.5	13.2	6.3	10.2	22.4	12.7	23.4
Chile	0.4	0.3	0.7	0.1	0.2	0.5	0.3	0.9
Colombia	3.0	4.0	7.0	3.4	6.0	17.0	8.6	13.0
Ecuador	1.5	2.5	4.0	1.5	2.6	7.1	3.6	6.6
Peru	1.8	1.9	3.7	2.3	4.2	12.9	6.3	7.9
Trinidad	2.5	1.5	4.0	0.6	1.0	3.0	1.5	5.0
Venezuela	42.1	49.4	91.5	15.4	26.0	64.0	34.5	117.5
Total	59.3	72.4	131.7	33.9	56.4	131.2	72.6	188.1
Western Europe								
Italy	0.5	0.7	1.2	0.8	1.4	4.3	2.1	2.6
Netherlands	0.6	0.7	1.3	na	na	na	na	1.3
Norway	3.6	15.8	19.4	4.1	6.7	15.0	8.5	26.1
United Kingdom	9.2	17.7	26.9	4.6	8.0	22.0	11.3	34.9
Other	3.3	1.1	4.4	0.3	0.5	4.5	1.6	4.9
Total	17.2	35.9	53.1	10.2	17.4	44.1	23.4	70.5
Eastern Europe								
Greece	na	na	na	0.1	0.2	0.5	0.3	0.2
Romania	4.7	1.2	5.9	0.4	0.8	3.6	1.5	6.7
Other	2.2	0.7	2.9	0.3	0.6	2.2	1.0	3.5
Total	6.9	1.9	8.8	0.9	1.7	6.1	2.8	10.5
FSU	104.6	83.3	187.9	54.4	92.0	227.0	122.1	279.9
Middle East								
Bahrain	0.8	0.2	1.0	na	na	na	na	1.0
Iran	37.1	74.0	111.1	11.0	19.0	35.0	22.0	130.1
Iraq	20.9	106.0	126.9	15.0	35.0	80.0	44.7	161.9
Kuwait	23.9	86.2	110.1	1.0	2.0	7.0	3.2	112.1
Neutral Zone	4.6	14.1	18.7	1.0	2.0	4.0	2.4	20.7
Oman	3.1	7.0	10.1	0.4	1.0	4.0	1.8	11.1
Qatar	4.3	4.2	8.5	na	na	na	na	8.5
Saudi Arabia	57.6	260.1	317.7	31.2	50.0	105.0	61.3	367.7

Syria	1.3	2.0	3.3	na	na	na	na	3.3
U.A.E.	11.7	65.7	77.4	2.9	5.0	13.0	6.8	82.4
Other	1.3	4.7	6.0	na	na	na	na	6.0
Total	166.4	624.2	790.6	75.2	118.3	237.9	142.2	908.9

Table D1. Identified Reserves and Undiscovered Resources of Conventional Crude Oil as of January 1, 1990, Billion Barrels (Continued)

Region/Country	Cumulative Production	Identified Reserves	Original Reserves	Undiscovered Oil				Ultimate Resources (Mode)
				95%	Mode	5%	Mean	
Africa								
Algeria	9.5	9.0	18.5	0.5	1.5	5.0	2.4	20.0
Angola	1.5	2.9	4.4	0.6	1.5	3.5	1.9	5.9
Chad	na	na	na	0.2	0.4	1.0	0.5	0.4
Egypt	4.7	5.6	10.3	1.0	2.0	12.0	4.6	12.3
Gabon	1.4	1.4	2.8	0.7	1.3	3.1	1.7	4.1
Libya	16.4	30.7	47.1	4.0	6.0	15.0	8.0	53.1
Nigeria	13.0	17.5	30.5	4.0	7.0	18.0	9.5	37.5
Somalia	na	na	na	1.5	2.5	6.0	3.3	2.5
Sudan	na	na	na	1.0	1.5	5.0	2.4	1.5
Tunisia	0.8	1.1	1.9	1.0	2.0	9.0	3.8	3.9
Other	1.3	2.9	4.2	4.2	7.1	18.5	9.7	11.3
Total	48.7	71.1	119.8	20.2	34.9	91.6	47.8	154.7
Asia-Pacific								
Afghanistan	na	na	na	0.2	0.4	1.5	0.7	0.4
Australia/N.Z.	3.2	3.0	6.2	1.1	2.1	6.7	3.2	8.3
Bangladesh	na	na	na	na	0.2	0.4	0.2	0.2
China	14.0	31.4	45.4	18.4	32.0	87.2	44.8	77.4
India	2.8	4.3	7.1	1.4	2.5	6.8	3.5	9.6
Indonesia	13.8	13.0	26.8	4.8	7.9	17.8	10.0	34.7
Malaysia/Brunei	4.2	7.4	11.6	2.8	4.5	10.0	5.7	16.1
Myanmar	0.5	0.2	0.7	0.5	0.9	3.1	1.4	1.6
Pakistan	0.2	0.5	0.7	0.1	0.3	0.7	0.4	1.0
Thailand	na	0.2	0.2	0.6	1.0	3.0	1.5	1.2
Vietnam	na	na	na	2.2	4.0	12.0	5.9	4.0
Total	39.3	60.3	99.6	34.5	58.3	143.4	77.2	157.9
Antarctica	na	na	na	na	na	19.0	1.0	na
World	629.3	1,052.7	1,682.0	303.6	489.3	1,046.8	605.1	2,171.3

Note: **Identified Reserves** are approximately the same as Proved+Probable+Possible reserves. **Original Reserves** are the sum of Identified Reserves and Cumulative Production. **Undiscovered Resources** are shown for a 90 percent probability range (95 to 5 percent probability of occurrence) of a log-normal distribution. The **Modal** or most likely values and **Mean** or average values are also given for Undiscovered Resources. **Ultimate Resources** are the sum of Original Reserves and the Mode of the Undiscovered Resources. na = not available.

Source: Masters, C.D. et al. *World Resources of Crude Oil and Natural Gas*. In: World Petroleum Congress, Proceedings of the Thirteenth World Petroleum Congress, Chichester, England, Wiley, 1991, p. 51-64.

Table D2. Identified Reserves and Undiscovered Resources of Conventional Natural Gas and Natural Gas Liquids (NGL) as of January 1, 1990, Trillion Cubic Feet (Tcf) and Billion Barrels (Bbbls)

Region/Country	Cumulative Gas Production (Tcf)	Identified Gas Reserves (Tcf)	Original Gas Reserves (Tcf)	Undiscovered Gas				Ultimate Resources (Mode) (Tcf)	NGL Reserves (Bbbls)	Undiscovered NGL (Mean) (Bbbls)
				95% (Tcf)	Mode (Tcf)	5% (Tcf)	Mean (Tcf)			
North America										
Canada	77.8	97.0	174.8	155.2	274.9	800.0	399.0	449.7	3.2	13.2
Mexico	23.2	72.7	95.9	70.4	118.9	291.3	157.2	214.8	1.1	2.4
United States	749.5	296.4	1,045.9	306.8	385.3	507.2	399.0	1,431.2	13.8	18.5
Total	850.5	466.2	1,316.7	531.0	816.7	1,554.2	958.2	2,133.4	18.1	34.1
South America										
Argentina	10.2	26.3	36.5	10.0	17.0	43.0	22.9	53.5	0.4	0.3
Bolivia	1.8	5.7	7.5	4.7	7.8	18.2	10.1	15.3	0.1	0.2
Brazil	1.9	4.1	6.0	20.3	36.9	120.8	57.4	42.9	0.1	0.9
Chile	2.9	4.1	7.0	0.5	0.8	2.0	1.1	7.8	0.1	na
Colombia	2.5	4.0	6.5	6.7	11.6	31.3	16.1	18.1	0.1	0.2
Ecuador	0.1	4.0	4.1	3.5	6.1	16.7	8.6	10.2	0.1	0.1
Peru	1.1	7.0	8.1	13.8	23.6	60.8	32.0	31.7	na	0.5
Trinidad	2.8	8.7	11.5	3.9	6.9	20.0	10.0	18.4	0.1	0.1
Venezuela	15.3	121.0	136.3	13.3	130.0	380.0	189.2	266.3	5.4	8.5
Total	38.7	184.9	223.5	147.6	254.0	663.2	347.3	471.3	6.3	10.9
Western Europe										
Italy	14.0	11.6	25.6	11.1	20.0	62.0	30.1	45.6	0.2	0.5
Netherlands	54.5	60.9	115.4	5.0	6.6	20.0	9.8	122.0	0.9	0.1
Norway	10.4	93.1	103.5	86.3	122.0	195.0	133.8	225.5	1.4	2.0
United Kingdom	24.7	19.8	44.5	9.4	16.0	40.0	21.4	60.5	0.3	0.3
Other	23.4	18.3	41.7	26.6	50.0	200.0	88.0	91.7	0.3	1.3
Total	127.1	203.6	330.7	138.5	225.7	497.2	283.0	556.4	3.1	4.2
Eastern Europe										
Greece	na	na	na	2.8	5.0	15.0	7.4	5.0	na	0.1
Romania	29.8	3.4	33.2	6.9	12.0	33.0	16.9	45.2	0.1	0.3
Other	18.8	11.5	30.3	6.3	11.0	30.0	15.4	41.3	0.2	0.2
Total	48.6	15.0	63.6	17.3	29.4	74.7	39.7	93.0	0.2	0.6
FSU	358.3	1,550.0	1,908.3	738.5	1,227.0	2,861.0	1,582.1	3,135.3	23.3	23.7
Middle East										
Bahrain	1.8	6.3	8.1	na	na	na	na	8.1	0.1	na
Iran	17.6	600.0	617.6	300.0	450.0	1,000.0	566.7	1,067.6	9.0	8.5
Iraq	3.3	110.0	113.3	60.0	100.0	200.0	119.9	213.3	1.6	1.8
Kuwait	5.5	48.6	54.1	3.0	5.0	10.0	6.0	59.1	0.7	0.1
Neutral Zone	na	8.0	8.0	1.0	2.0	5.0	2.7	10.0	0.1	na
Oman	0.6	9.9	10.5	5.0	8.0	18.0	10.1	18.5	0.1	0.2
Qatar	2.9	300.0	302.9	na	na	na	na	302.9	4.5	na
Saudi Arabia	14.0	184.4	198.4	191.5	300.5	600.0	360.0	498.9	2.8	5.4
Syria	1.5	5.5	7.0	na	na	na	na	7.0	0.1	na
U.A.E.	7.7	184.4	192.1	31.8	50.0	100.0	59.9	242.1	2.8	0.9
Other	2.5	22.1	24.6	na	na	na	na	24.6	0.3	na
Total	57.5	1,479.2	1,536.7	603.7	943.4	1,865.0	1,125.3	2,480.1	22.2	16.9

Table D2. Identified Reserves and Undiscovered Resources of Conventional Natural Gas and Natural Gas Liquids (NGL) as of January 1, 1990, Trillion Cubic Feet (Tcf) and Billion Barrels (Bbbls), (Continued)

Region/Country	Cumulative Identified		Original Gas Reserves (Tcf)	Undiscovered Gas				Ultimate Resources (Mode) (Tcf)	NGL Reserves (Bbbls)	Undiscovered NGL (Mean) (Bbbls)
	Gas Production (Tcf)	Gas Reserves (Tcf)		95% (Tcf)	Mode (Tcf)	5% (Tcf)	Mean (Tcf)			
Africa										
Algeria	16.9	114.2	131.1	5.6	18.0	53.0	26.3	149.1	1.7	0.4
Angola	na	na	na	2.0	4.3	10.6	5.7	4.3	na	0.1
Chad	na	na	na	0.5	2.0	6.0	3.0	2.0	na	na
Egypt	1.5	11.5	13.0	8.0	21.0	60.0	30.2	34.0	0.2	0.5
Gabon	0.3	0.5	0.8	0.5	1.0	2.0	1.2	1.8	na	na
Libya	5.8	29.2	35.0	7.0	18.0	55.0	26.9	53.0	0.4	0.4
Nigeria	5.9	87.4	93.3	80.0	136.0	340.0	181.7	229.3	1.3	2.7
Somalia	na	na	na	3.8	12.9	40.3	19.5	12.9	na	0.3
Sudan	na	na	na	15.7	26.3	62.1	34.1	26.3	na	0.5
Tunisia	0.1	3.1	3.2	5.0	12.0	35.0	17.4	15.2	na	0.3
Other	2.0	15.6	17.6	35.7	61.5	162.2	84.5	79.1	0.2	1.3
Total	32.6	261.6	294.2	195.5	328.3	791.4	430.5	622.5	3.9	6.5
Asia-Pacific										
Afghanistan	1.0	na	1.0	8.8	14.7	35.0	19.2	15.7	na	0.3
Australia/N.Z.	7.6	77.4	85.0	10.9	18.9	50.0	26.0	103.9	1.2	0.4
Bangladesh	na	12.4	12.4	4.8	14.4	38.4	19.9	26.8	0.2	0.3
Myanmar	0.1	5.1	5.2	3.1	8.4	17.3	10.2	13.6	0.1	0.2
China	17.6	33.0	50.6	103.9	175.9	434.2	233.5	226.5	0.5	3.5
India	1.8	20.9	22.7	8.9	16.5	61.7	27.8	39.2	0.3	0.4
Indonesia	14.4	85.7	100.1	47.0	76.4	166.7	95.4	176.5	1.3	1.4
Malaysia/Brunei	5.0	65.8	70.8	27.5	45.0	100.0	56.7	115.8	1.0	0.8
Pakistan	5.8	23.0	28.8	15.0	34.4	60.0	39.0	63.2	0.3	0.6
Papua N.G.	na	4.5	4.5	14.9	25.0	60.0	32.7	29.5	na	0.5
Thailand	na	14.5	14.5	12.6	22.0	60.0	30.8	36.5	0.2	0.5
Vietnam	na	na	na	5.3	10.0	40.0	17.6	10.0	na	0.3
Other	28.1	3.5	31.6	14.9	25.0	60.0	32.7	56.6	0.1	0.5
Total	81.4	345.7	427.1	298.9	486.3	1067.1	608.6	913.4	5.2	9.1
World	1,594.6	4,499.8	6,094.4	2,777.1	4,417.3	9,126.6	5,374.6	10,511.7	82.2	106.0

Note: **Identified Reserves** are approximately the same as Proved+Probable+Possible reserves. **Original Reserves** are the sum of Identified Reserves and Cumulative Production. **Undiscovered Resources** are shown for a 90 percent probability range (95 to 5 percent probability of occurrence) of a log-normal distribution. The **Modal** or most likely values and **Mean** or average values are also given for Undiscovered Resources. **Ultimate Resources** are the sum of Original Reserves and the Mode of the Undiscovered Resources. na = not available.

Source: Masters, C.D. et al. *World Resources of Crude Oil and Natural Gas*. In: World Petroleum Congress, Proceedings of the Thirteenth World Petroleum Congress, Chichester, England, Wiley, 1991, p. 51-64.

Glossary of Abbreviations

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API	American Petroleum Institute, or the American Petroleum Institute measure of specific gravity for oil in degrees.
Bbbls	Billion barrels of crude oil, condensate, or oil equivalent.
bbbl/d	Barrels per day of oil unless otherwise noted.
Bcf	Billion cubic feet of natural gas.
CIS	Commonwealth of Independent States, the FSU excluding Georgia, Estonia, Latvia, and Lithuania.
cond	Condensate.
E	East.
EE	Eastern Europe.
eq	Equivalent oil amount of natural gas.
f/	From.
FSU	Former Soviet Union or former U.S.S.R.
ft	Feet or foot.
LNG	Liquefied natural gas.
LPG	Liquefied propane gas.
Mcfd	Thousand cubic feet per day of natural gas.
mi	Miles.
MMbbls	Million barrels of crude oil, condensate, or oil equivalent.
MMcfd	Million cubic feet per day of natural gas.
MMmt	Million metric tons.
N	North.
NE	Northeast.
NGL	Natural gas liquids.
NW	Northwest.
OPEC	Organization of Petroleum Exporting Countries are: Algeria, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates (UAE), and Venezuela.
P&A	Plugged and abandoned.
ROW	Rest of the world, all countries except the United States.
R/P	Reserves-to-Production Ratio, year-end reserves divided by the annual production of the same year.
S	South.
SE	Southeast.
SEG	Society of Exploration Geophysicists.
SW	Southwest.
Tbbls	Trillion barrels of crude oil, condensate, or oil equivalent.
Tcf	Trillion cubic feet of natural gas.
TVD	True vertical depth.
UAE	United Arab Emirates; includes Abu Dhabi, Ajman, Dubai, Fujairah, Ras al Khaimah, Sharjah, Umm al Qaiwain.
US	United States of America.
W	West.
w/o	Without.