

Executive Summary

This report presents estimated costs and cost indices for domestic oil and natural gas field equipment and production operations for 1995, 1996, 1997, and 1998. The costs of all equipment and services are those in effect during June of each year. The sums (aggregates) of the costs for representative leases by region, depth, and production rate were averaged and indexed. This provides a general measure of the increased or decreased costs from year to year for lease equipment and operations. These general measures do not capture changes in industry-wide costs exactly because of annual variations in the ratio of the total number of oil wells to the total number of gas wells. The detail provided in this report is unavailable elsewhere. This report contains summary tables as well as the appendices, which contain detailed tables.

Price changes for oil and gas, changes in taxes on oil and gas revenues, and environmental factors (compliance costs and lease availability) have a significant impact on the number and cost of oil and gas wells drilled. These changes also impact the cost of oil and gas equipment and production operations.

Oil and gas prices rose from 1976 to the early 1980's, when deflated oil prices peaked at an index of about 260. In 1976, the average price of oil was \$8.19 per barrel and the average price of gas was \$0.58 per thousand cubic feet (Mcf). Deflated gas prices, which also rose to an index of about 270, were at a plateau from 1982 through 1984, before following oil prices downward. The 1998 oil price, after dropping from 1996, represents the lowest deflated oil price since 1976. By contrast, deflated gas prices have remained above 1976 prices, but were at a low in 1995. Clearly, the price trends reflect fundamental differences between the markets for oil and gas.

Figure ES1. Deflated Natural Gas Prices and Operating Cost Indices

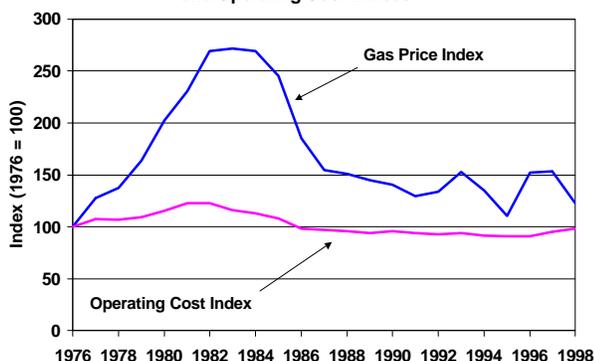


Figure ES1, with gas prices and operating costs indexed to 1976, shows the differences from 1976 values of deflated gas prices and deflated operating costs for gas wells. The greatest difference between the two series was during 1983, and the current downward trend in product prices, contrasted with increasing operating costs, indicate that producer profitability is much more strongly affected by product prices than by increasing operating efficiency.

Gas activity has been spurred in recent years by favorable tax treatment (including tax credits for tight formations gas and coalbed methane). Environment-related costs for natural gas operations, generally less than for oil operations, may equal those for oil where coalbed methane leases are concerned, as the main factor affecting operating costs in some coalbed methane regions is disposal of substantial amounts of formation water produced with the gas. No data have been collected on the environmental costs for gas wells.

Figure ES2. Deflated Oil Prices and Operating Cost Indices

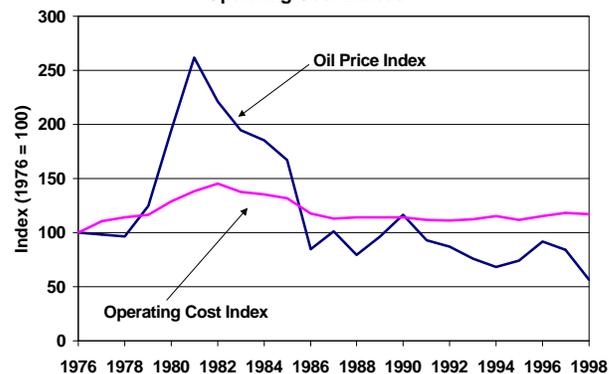


Figure ES2 similarly depicts deflated oil prices and operating costs indexed to 1976. There are two main differences between Figures ES1 and ES2. First, the gas price index has remained above the 1976 base, while oil prices rose above the base only twice since 1986, in 1987 and 1990. The 1998 deflated oil prices are only 20 percent of the peak price in 1981. Second, the oil operating cost index values have remained above 1976 levels while gas operating index values fell below 1976 values in 1986, and have fluctuated within a relatively narrow range since. The 1998 gas operating index value rose while that for oil dropped.

Oil operating costs were studied by obtaining equipment and operating costs for representative oil leases for 6 onshore regions of the lower 48 States. Each lease consists

of 10 wells producing by primary means (natural depletion) from depths of 2,000, 4,000, 8,000, and 12,000 feet. The aggregate average lease equipment costs for the six regions and four depths dropped slightly from 1997 to 1998 after rising from 1994. Since 1995, non-tubing costs have risen more than tubing prices, which dropped in 1998.

Oil production is an energy intensive operation, and when fuel prices (natural gas prices) increase, so do oil production costs. Gas production is more labor intensive with only minor fuel costs. Therefore, high energy prices are a boon to gas producers and the natural gas producing industry has fared better than the oil producing industry for the past decade. The change in gas prices has surpassed the change in gas well operating costs. Oil prices have fallen faster and farther than oil field operating costs since 1981, narrowing the profit margin and reducing the amount of internally raised capital available for investment in drilling and production operations. Costs and indices for additional waterflood oil recovery equipment and its operation were calculated for leases with well depths of 2,000, 4,000, and 8,000 feet in west Texas. Cost differentials between primary and secondary and primary operations in this region are presumed to be similar to those in other areas.

The aggregate average additional equipment cost for secondary recovery (waterflood) in 1998 was about 4 percent more than in 1995. Waterflood operating costs showed an increase of about 8 percent from 1995 to 1998 while primary oil recovery operating costs rose nearly 10 percent in the same period.

Useful insights from the data in this report lie primarily in the differences that are presented. The costs for equipment and operations are different in each area, differ between primary and secondary operations and differ between gas and oil operations. Cost trends for some items vary widely from time to time, while others remain unchanged for years at a time. Significant variables for 1998 include natural gas prices, labor and supervision costs, tubulars prices and drilling costs.

Data used in this work are revised for at least one year. Late arrival of data necessitates using estimates in some cases, and in other cases, small items have been grouped to reduce reporting burdens on data suppliers. In general, since 1976, data gathering has become more challenging, in part due to restructuring of the industry, and in part due to normal changes in product lists. Care is exercised in understanding the cost trends in the various supplier industry components, to avoid the use of prices which are not representative of the whole.