No Relief in Sight for Drilling

Drilling activity in 1985, as measured by the rig count, hit its lowest level in both the nation and Texas since 1976. Other measures, such as footage drilled and the number of wells completed, demonstrated similar declines. With oil prices expected to weaken further, drilling in 1986 is expected to continue its downward trend.

Drilling Weak in 1985

In 1985 the average number of rotary rigs running each week dropped to its lowest level since 1976 for Texas and the nation (Chart 1). The rig count, it should be noted, is not a perfect indicator of drilling because changes in rig efficiency or in well depth can affect the time needed to drill an individual well. As shown in Chart 2, for example, completions did not rise as rapidly as the rig count during the 1981 expansion because less-efficient rigs and crews were pressed into service. Recently, however, the relationship between the rig count and well completions has become closer as the least-efficient rigs and crews have now been retired. Further reductions in the rig count can be expected to reduce directly the number of well completions.

The decline in drilling during 1985 can be attributed to two principal factors. First, falling oil prices and strengthened belief that oil prices would continue to fall reduced the profitability of acquiring new reserves, even though costs of drilling remained low. Second, merger activity reduced drilling budgets by raising debt/equity ratios and draining cash reserves of major oil companies.

Oil Prices and Drilling

The drilling outlook for 1986 is not optimistic. Seismic crew activity, generally considered a leading indicator of drilling, has continued to decline. The number of seismic crews in October reached its lowest level in over six years. The outlook is worsened by expectations of further oil price reductions in the first half of 1986. Current production by the Organization of Petroleum Exporting Countries (OPEC) members is close to 18 million barrels per day (MMBD), 2 million above their quota. OPEC's current policy is directed toward maintaining its market share. Prices could fall dramatically if OPEC and non-OPEC countries do not reduce production during the seasonal downturn in consumption in the second and third quarters (which drove

(Continued on back page)

Electric Utility Consumption Not a Fuel Price Boost

During the 1970s and early 1980s, electric utilities, along with the rest of the United States economy, were hit with rising prices of fuels used to generate electricity. As utilities began to switch to coal and nuclear generation, the resulting drop in their demand for oil and natural gas helped promote the current price weakness for these sources of energy. Recent price declines, however, have not been sufficient to reverse the trend away from oil and natural gas as generation fuels. Thus, electric utilities' demand for these fuels will do little to prop up oil and gas prices in the near future.

Utilities' Fuel Decision

Electric utilities have two decisions to make regarding the most economical way to produce electricity. In the short run, electric utilities' provision of power essentially involves choosing which fuel combination to use, because they have relatively little flexibility to change the composition of their plants. In meeting differing levels of demand in the short run, utilities will first use the generating plants that have the lowest fuel costs to meet their so-called base load. When electricity consumption is high (during peak demand periods), utilities generally add gas- or oil-fired plants to meet this demand. Although these plants in recent years have had higher fuel costs than coal or nuclear units (Chart 3), their operation is more flexible. They can be brought on-line more easily, and in many cases, can burn either oil or gas to produce electricity.

In the long run, however, utilities must decide what types of generating plants to build to meet electricity demand. Expectations about which fuels (Continued on back page)
Chart 1
AVERAGE WEEKLY RIG COUNT
UNITED STATES AND TEXAS

-5,000 RIGS-------------------
-4,000
-3,000
-2,000
-1,000
0
1,000
2,000
3,000
4,000
5,000

UNITED STATES

TEXAS

[Year series: '73, '74, '75, '76, '77, '78, '79, '80, '81, '82, '83, '84, '85]

SOURCE: Hughes Tool Company.

Chart 2
RIG COUNT AND WELL COMPLETIONS
(3-MONTH MOVING AVERAGES)

150 (JUNE 1982 = 100)

RIG COUNT
WELL COMPLETIONS


Hughes Tool Company.

Chart 3
ELECTRIC UTILITY FUEL COSTS
2.00 DOLLARS PER MILLION BTU'S

POTENTIAL

PETROLEUM

NATURAL GAS

COAL

NUCLEAR

[Year series: '75, '77, '79, '81, '83, '85]

1. Deflated by Producer Price Index (1967 = 100).
2. Data for 1984 and 1985 extrapolated from prior years.

Chart 4
SHARE OF ELECTRIC GENERATION BY FUEL

65 PERCENT

COAL

NUCLEAR

NATURAL GAS

PETROLEUM

[Year series: '73, '75, '77, '79, '81, '83, '85]

NOTE: Excludes hydroelectric power.

SEISMIC CREW COUNT

540 CREWS

(SEASONALLY ADJUSTED)

480
420
360
300
1983 1984 1985

Federal Reserve Bank of Dallas.

WELL PERMIT APPLICATIONS

4 THOUSAND APPLICATIONS

(SEASONALLY ADJUSTED)

TEXAS

OKLAHOMA

LOUISIANA


1. The August 1983 figure for Texas is 9,104.
Oklahoma Corporation Commission.
Texas Railroad Commission.
Federal Reserve Bank of Dallas.
• OPEC's decision to abandon setting official prices has increased uncertainty in the already weak oil market. After the announcement, spot prices dropped precipitously, although much of the loss was recouped because of the strong seasonal demand for oil. Despite the rebound, most analysts believe a fall in prices is inevitable. This is reflected in the sharp drop in futures prices. The possibility of a price cut is greatest in the spring during the expected seasonal reduction in demand.

• The outlook for oil prices has forced the drilling rig count to new lows. The decline has been especially steep in Texas, where the seasonally adjusted count is over 30 percent below last year's already depressed level. The fall in the rig count in the rest of the nation has not been as sharp. The slight increase in the nation's rig count in early December may be a sign that the deterioration in the energy sector may be slowing.

• Changes in the number of well permits are giving conflicting evidence about the future path of drilling. After declining steadily throughout the year, well permits in Texas gained slightly in November. In Louisiana, however, permits dropped sharply in the same period. The seismic crew count, another leading indicator of drilling, has continued to fall.

• The decline in oil prices is a positive sign for District refiners. Past refinery closures have helped boost refinery margins, increasing profitability. Lower oil prices should lead to increased consumption and gains in output. Nevertheless, employment fell drastically because of previously announced closures and restructuring.

• The weakness in domestic drilling is affecting energy-related manufacturing, with total employment in the oil field machinery sector shrinking steadily since July. Employment was surprisingly stable during the first half of 1985 owing to relatively strong levels of drilling in the rest of the world.
Drilling (cont.)

OPEC production to 14 MMBD in 1985). With falling prices, drilling can be expected to be reduced further. Estimates of the magnitude of the effect of falling prices on the rig count can be obtained through regression analysis. Based on historical relationships, each 10-percent decline in inflation-adjusted oil prices would be expected to lead eventually to a 6.3-percent decline in the rig count. As evidenced by the 1984 upturn, producers may accelerate drilling in the short run to speed production from existing reserves (whose value is reduced by falling prices), but eventually drilling falls to reflect the lower expected returns to drilling. Because producers have already factored falling prices into their decisions, such an upturn is not likely to be repeated. Consequently, in 1986 drilling is expected to be even weaker than in 1985.

—Ronald H. Schmidt

Consumption (cont.)

will be the most economical will affect what type of plants they choose to build, but the cost of the plants themselves is also crucial. Plants that use natural gas or fuel oil are cheaper to build, a fact that offsets the fuel cost advantage held by coal and nuclear power.

Effect of Changing Oil and Gas Prices

As a result of price increases in the 1970s, utilities began to substitute away from oil and natural gas for base-load electricity. Coal and nuclear fuel partially replaced oil and gas in generating units. As shown in Chart 4, the portion of electricity generated by natural gas declined from just over 20 percent in 1973 to about 13 percent in 1985. Petroleum's share fell from about 20 percent to less than 5 percent. Some of the declines occurred for legislative and regulatory reasons, but price changes played a significant role.

Recent oil and gas price declines, however, will not be enough in the short run to induce electric utilities to switch back to these fuels for two reasons. First, because of the differential that now still exists between the fuels, the prices of both oil and gas would have to fall drastically relative to coal and nuclear generation to induce utilities to switch back. Second, lower relative prices would have to persist for a long time in order to make it worthwhile for utilities to restructure the composition of their generating plants. Even then, it would be some time before the change could be effected. Therefore, the trend of switching away from oil and natural gas as fuel sources for electric utilities should continue. As a result, the oil and natural gas markets cannot rely on increasing utility demand to counter falling prices.

—William T. Long, Ill

The views expressed are those of the authors and do not necessarily reflect the positions of the Federal Reserve Bank of Dallas or the Federal Reserve System.