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**OIL AND GAS TO 2000:
SAME PRODUCERS, DIFFERENT OUTLOOK**

A Presentation By

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I believe all the companies at this conference fall in the category of independent oil and gas producers. Independents hold over 50% of U.S. gas reserves and some 40% of U.S. oil reserves and account for 55% of gas production and some 45% of oil production. There is every indication that their share in both reserves and production will keep rising as the majors continue to downsize their U.S. upstream operations and shift more of their activities overseas. This process has been under way for some time, but as we know, it is now accelerating.

But while the independents' role will continue to grow in the production of both oil and gas, the two fuels are increasingly going separate ways, economically and even politically. I would like to briefly discuss these differences and then give you an overview of how we see the oil and gas markets develop over the next six years, i.e. between now and 2000.

Price Makers and Price Takers

The most obvious and probably most important difference between the two fuels is the process of price formation. U.S. oil prices are invariably determined internationally while gas prices are determined domestically. The domestic industry is a price taker in oil but a price maker in natural gas. The wellhead price of U.S. crude is set by the cost of imported oil, whose price in turn is determined by such factors as global supply/demand trends and OPEC policies, as well as short term events like civil unrest in Nigeria, U.N. sanctions on Iraq oil or the decline in Russian oil exports, to name just a few. Changes in U.S. oil demand and supply have only a marginal impact on U.S. wellhead prices.

U.S. gas prices, by contrast, are determined almost entirely domestically and changes in U.S. gas supply or demand have a quick and direct impact on price. Gas imports from Canada generally conform to U.S. domestic prices.

There is, of course, interfuels competition between oil and gas which affects each other's price structure. But actual interfuels competition is relatively small and limited. Last year gas-to-oil fuel substitution ranged from 1% to 2% of total U.S. gas demand. The potential for switching was about 4%. With growing environmental restrictions on residual fuel oil and the rise in combined-cycle turbines for electric power generation, interfuels competition can be expected to decline over time. An illustration of how little the prices of the two fuels actually interact is the Gulf War period. Oil prices in the second half of 1990 soared nearly 50% above the first half while gas wellhead prices rose by just 3.5%.

Production: Gas Rising, Oil Falling

Another essential difference is the domestic production level. U.S. oil production is steadily declining while gas production is steadily rising. In 1988 the two fuels were at productive parity -- as much gas as oil was produced on an energy equivalent basis. Since then gas production has increased by 7.5% while oil production declined by 16%. The divergence will continue this year with a likely 2.5-3.0% increase in U.S. gas production and 2.0-2.5% decrease in U.S. oil production.

The difference is also reflected in reserve replacement data. According to the latest Arthur Anderson *Oil & Gas Reserves Disclosures* study, the domestic industry replaced not quite 2/3 of its oil production last year, but almost 100% of its gas production. Directionally, this was in line with the replacement pattern of the last 5 years for both fuels.

U.S.: World's Second Largest Oil Producer

Of course, the meaning of these numbers depends on from where you look at them. Current U.S. crude production of 6.7 million B/D is still second only to Saudi Arabia's 8 million B/D. However, Saudi Arabia has the capacity to produce 10 million B/D while U.S. production is at capacity. Until 1992, Russian production exceeded U.S. production but the consistent fall in Russia has now put its production at least 1.5 million B/D below U.S. output. It is also worth pointing out that with all the reduction in U.S. output and the low prices, the wellhead value of U.S. oil production was still about \$42 billion in 1993, a respectable figure even in a \$6 trillion economy.

Demand: Oil and Gas Rising

On the demand side, there is much less difference between the two fuels than on the supply side. Both U.S. oil and gas demand have been rising, but gas faster than oil. From 1991 through 1994 oil demand will have risen by 5-1/2% and gas by at least 9%. But on a BTU basis, oil consumption is still 35-40% higher than gas consumption.

Thus, a change in domestic natural gas prices has less of an impact on U.S. consumers than a change in world oil prices of similar magnitude. On the supply side, a gas price change in either direction affects the U.S. producing industry more than an oil price change because on a BTU basis, U.S. gas production is now some 30% higher than oil production.

Gas Trends to 2000

Now let us look at the underlying trends for both fuels over the next six years. As you will see from the viewgraphs of published forecasts¹, supply and demand trends are likely to continue along existing lines. Let us first look at U.S. gas. Demand is projected to grow at an annual rate of about 1.5% from 1992 to 2000, while gas production may grow at about half that rate, according to the latest EIA reference case forecast. The gap will be filled largely by imports from Canada. However, gas imports are not as essential to balance domestic supply and demand as are oil imports. The former provide about 10% of U.S. requirements; the latter 44%. Thus, a reduction in gas imports could be offset much more readily by additional domestic production than could a reduction in oil imports. However, in certain markets, such as the Pacific Northwest, Canadian gas has a logistic advantage over domestic gas supplies.

As you can see, the five gas forecasts project production increases to 2000, ranging from 1 to 2 TCF and demand increases ranging from 1.5 to 3 TCF. Our own forecast is close to the upper end of the range in both forecasts.

Figure 1

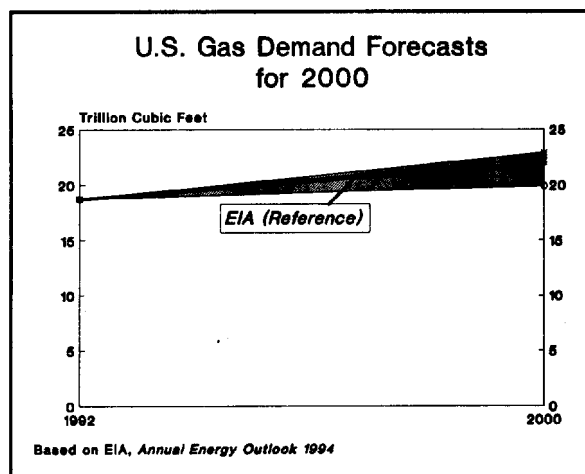
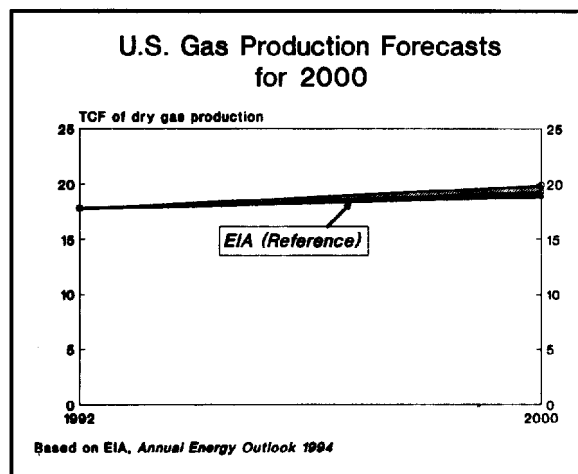


Figure 2



How will this demand/supply balance affect natural gas prices? Our EIA chart shows increases of 30% to over 45% in constant dollars from 1992 to 2000. Since there was a price increase of nearly 20% in 1993 which has, so far, maintained itself, the price rise from now to 2000 is likely to be much smaller than the growth rate shown here. Still, by 2000 we may see a wellhead price approaching \$3/MCF in nominal (current) dollars. This would be almost \$1 higher than this year's likely average price. Among the reasons why this price may not be

¹ The *Annual Energy Outlook, 1994* of the U.S. Energy Information Administration (EIA) compared several published forecasts.

reached or may be exceeded are higher imports than projected from Canada which is expanding its pipeline network into the U.S. markets, or, in the opposite direction, a failure to increase offshore Gulf Coast production through more drilling.

Oil Trends to 2000

Now let us look at the outlook for oil. Our published forecasts all show a continuing decline in U.S. production. We would certainly agree directionally with this projection. The decline ranges from 1 to 2 million B/D by 2000.

Note that the sharpest decline projected is the EIA's Reference Case which is out of line with most other forecasts.

It may be of interest to note that not all projections shown here foresee the decline in domestic oil production continuing beyond 2000. The EIA reference case projects a reversal of the decline between 2005 and 2010 while one other case shows an increase from 2000 to 2010. The assumptions underlying these reversals are improved drilling and exploration technologies as well as the impact of higher prices. Our view is that crude oil production in the Lower-48 region will decline by about 1 million B/D between now and 2000. Oil demand will continue to grow throughout this period, according to all forecasts, with the growth supplied from imported sources.

Figure 4

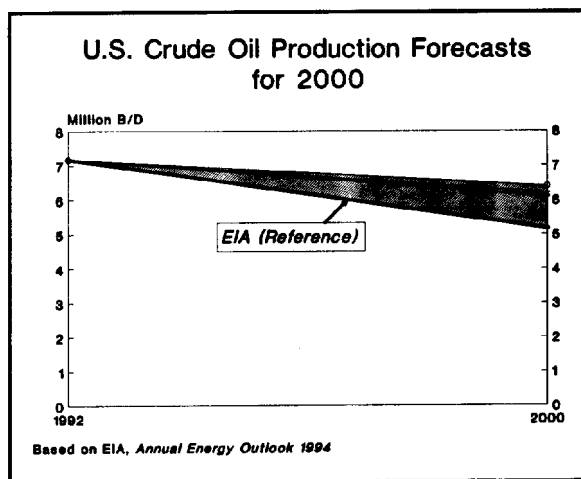
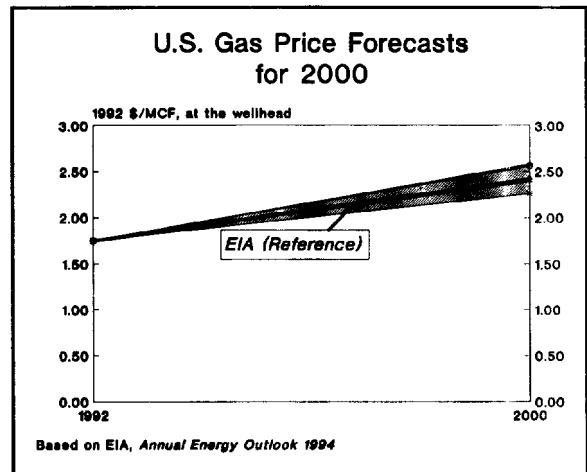


Figure 3

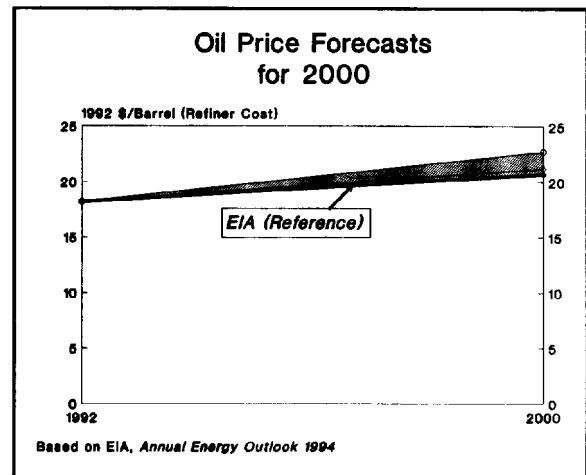


What oil price can be expected under this scenario? The answer is to be found in the world market, not the U.S. The latest EIA projections show a \$2.50 increase in real prices from 1992 to 2000. Since actual (nominal) prices in 1993 were more than \$2 below the 1992 level and since this year's average annual oil price will probably be no higher than last year's, the increase from 1994 to 2000 would have to be much steeper than shown on this chart to reach the projected prices by 2000. In nominal dollars the EIA's reference price (crude cost to U.S. refiners) for 2000 is almost \$27 which represents a \$9-10, or 50-60%,

increase over current prices. This projection which was calculated by the EIA in the fall of 1993 may now be on the high side.

World oil prices are currently above their fundamental market level due to extraneous events, of which the most important and the most visible is the current political upheaval in Nigeria. Whatever the short term effect of the Nigerian situation, it is unlikely to last long enough to affect oil exports in the post-1995 period. However, another extraneous event could very well have a significant downward effect on world oil prices throughout the second half of the 1990's. I'm referring to the lifting of the U.N. sanctions on Iraqi oil exports which it is reasonable to expect within the next 2 years. Iraq's return to the market will bring about a permanent increase in OPEC's productive capacity. OPEC may be able to avoid an increase in actual production by an offsetting pro-rata reduction in the quotas of all other members, although OPEC's record in effectively enforcing such agreements is hardly impressive. However, even if it does succeed, when Iraq comes back OPEC's capacity will be increased by 1.5-2.0 million B/D and eventually by much more.

Figure 5



Of course, world oil demand will also rise throughout the 1990's. By 2000 the world may need some 8-9 million B/D more oil than in 1994. But with Iraq production at or near its prewar level by then OPEC can easily supply 60-70% of this increase and still maintain a multi-million B/D excess producing capacity. The balance can be supplied from growing production in Latin America, Africa and Southeast Asia.

This scenario does not require, or support, a run-up in prices between now and 2000. Saudi Arabia, OPEC's superpower and largest holder of spare capacity, will probably want to see its revenue increase more through higher sales volumes than higher unit prices.

To be sure, there will be price increases in the second half of the 1990's from the current \$19 WTI level under our assumption. But they may be relatively modest increases, i.e. about in line with the inflation rate. This will not be the result of a deliberate policy but of a confluence of market forces.

Another Oil Price Crunch?

There is much talk these days about another oil price spike in the making. It is based on a scenario in which demand growth keeps reducing spare producing capacity while producers have not the means or the desire to invest in building new spare capacity. Such a development

is of course possible sometime in the future, although it is clearly avoidable and is not in the long-term interest of the principal oil exporting nations. Its occurrence within our time frame, i.e. the next 6-7 years, is quite unlikely. If prices rise sharply during this period it would have to be due to extraneous military, political or other events, not to an underlying supply constraint.