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Hydrocarbon Energy Revisited

Many energy experts now project a continuation of relatively low prices for oil for much of the next decade. This would lead to a large increase in U.S. importation of oil and help OPEC eventually to resume ability to dictate high prices.

The facts and trends on which the current estimates are based seem solid. From 1969 to 1988 non-U.S., non-OPEC free world production increased fivefold. This, together with conservation and substitution induced by high prices for oil, led to a drop in sales by OPEC from 1979 to 1985 of almost 50%. To avoid a further loss of market share the price was drastically reduced by Saudi Arabia and others. The current level of prices has slowed exploration and drilling by non-OPEC countries, but with excess production capacity already in place, there is little likelihood of a substantial rise in world oil prices in the next several years, short of a major Mideast conflagration.

The effects of continuing low world oil prices on the complex U.S. energy system would be many and profound. Some of them are already apparent. Efforts in conservation, improved energy efficiency, and substitution of other fuels for oil have diminished. Exploration and drilling for hydrocarbons has dropped; production of petroleum has decreased; consumption of petroleum is increasing; imports of oil and its products have risen. Additional effects such as tightness in supplies of natural gas and price increases for that fuel will become apparent later. A possible future development is sharply expanded dependence on hydrocarbons for generation of electric power.

Before the early 1980s the contiguous continental United States had already become a mature petroleum province; costs of finding oil in it exceeded those of many countries. High prices for oil in the early 1980s led to extensive drilling here, but the current rate is only about a fifth of the peak. Unless substantial reserves are added, production capability diminishes with time. In 1985 production of crude oil plus condensate totaled 10.6 million barrels per day (Mbd). In 1988 it was 9.8 Mbd, and in 1989 it will be 9.3 Mbd. Experts predict that in the year 2000 it will be 6 Mbd.

Consumption of petroleum increased an average of 3.3% per year between 1985 and 1988 (17 Mbd of products in 1988). Experts predict that demand will continue to increase, but at the rate of only 1.0 to 1.5% per year. This slow rate prediction could be an underestimate.

In 1985, while high prices still prevailed, net imports of oil and its products were 4.3 Mbd. In 1988 they were 6.6 Mbd. During 1989 they will be about 7.2 Mbd. A recently released CONOCO report, "World Energy Outlook Through 2000," projects imports of 11 Mbd in the year 2000. The estimate is based on the assumption that use of oil will increase at the slow rate.

For many purposes oil and natural gas are interchangeable as fuels. This is particularly true in industrial applications and when they are used in power generation. Many of the large consumers can easily switch back and forth. When oil is cheap, the price for natural gas is depressed and drilling for gas is curtailed. Already, producible reserves of natural gas have diminished. When cheap natural gas is no longer available, it will be supplanted by oil.

Demand for hydrocarbons by the electrical utilities could lead to substantially enhanced importation of oil during the next decade. In the past, most of the base load generating plants have been fueled by coal; nuclear energy now contributes about 20% of electric power. However, only a few nuclear and coal plants are under construction. If demand for electricity continues to grow at a rate approaching that experienced in 1987 and 1988, the United States is headed for large shortages of base load capacity. Construction of coal and nuclear plants is costly and requires many years. In contrast, combined cycle plants fueled by natural gas or oil can be put into operation quickly and at low capital cost. Apparently many of the utilities are planning to pursue this course. But it is a course that would increase imports of oil further.

Substantial increases in importation of oil by the United States, Southeast Asia, and the less developed countries could restore control of the market to OPEC by the year 2000 or before. Unless there are economic incentives for improving energy efficiency, conservation, and substitution and for increasing domestic supplies, the United States will become increasingly vulnerable to a great, multicomponent energy crisis.—PHILIP H. ABELSON