THE IMPACT OF CONSERVATION ON FUTURE OIL DEMAND

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SUMMARY

In the face of sharply rising oil cost over the last ten years, consumers cut back significantly on oil use through aggressive and widespread conservation measures and by switching to alternate fuels. Of the seven million barrels daily decline in Free World petroleum consumption from 1979 to 1982, at least 60 percent or 4.5 million barrels daily was due to conservation or higher oil prices.

Analysis of specific industries shows dramatic reductions of oil use in the past several years. In the Japanese steel industry, fuel oil has been eliminated entirely in blast furnace operations, and overall oil demand has fallen from 232,000 BPD in 1973 to 35,000 BPD in 1982. Similar sharp reductions have occurred in U.S. steel-making, the pulp and paper industry, and transportation.

Substantial conservation still lies ahead. The industrial countries are continuing to be impacted by the ripple effects of the 1973-74 price increases, while the brunt of the later 1979-80 price hikes is yet to be felt, particularly in the industrial and utility sectors. Conservation will, therefore, continue to be a drag on any increase in petroleum demand generated by economic recovery. The net effect may be a moderate lift to the demand for certain petroleum products in the short-term, but relatively slow growth in the longer term. Future demand for energy will also be adversely affected by prospects of much slower economic growth in the future than in the years before 1973.

Texaco's revised forecast of "Free World Energy Outlook to the Year 2000" shows energy demand growing by two percent a year until the end of the century and petroleum demand by only one percent annually. This forecast is predicated on an oil price scenario of declining real prices in the near-term and a rise toward the end of the decade in line with inflation and exceeding it in the 1990's. The net effect, however, is that real prices at the end of the period are no higher than at the beginning.

This price scenario is consistent with a rough balance between demand and the supply of oil estimated to be available over the forecast period. But in the near-term, OPEC production will still be substantially below preferred levels—a situation that may be troublesome although in the 1990's a tighter balance between potential supply and demand should develop.

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If there is any lesson in the events of the past ten years in the oil industry, it is that price matters to consumers. Before the 1970's, it was assumed that energy, and oil in particular, were so essential to economic growth that price had little effect on demand. That assumption was wrong. The response of consumers to higher oil prices has been aggressive and widespread. Conservation has radically altered the energy mix and energy-output relationship in many industries.

At the time conservation efforts began to reduce petroleum demand significantly, economic recession hit the industrial world. The combination of these two developments has decreased Free World petroleum demand by about seven million barrels daily from its peak of 52 million barrels daily in 1979 to 45 million barrels daily in 1982.

There is considerable concern regarding the recovery of demand in the future and the permanence of the sales lost to conservation and recession. This paper will examine that prospect by analyzing how consumers react to higher energy prices. First, the time response of demand to higher oil prices will be considered; second, the separate effects of recession and conservation in major energy-using sectors will be analyzed; and third, the extent of conservation already achieved in selected industries in Japan and the United States will be looked at in more detail. The studies made in these three areas will then provide a basis for evaluating the impact of conservation on future oil demand.

PATTERN OF RESPONSE TO OIL PRICE INCREASES

Over the last ten years, there were two sharp rises in oil prices. The first occurred in late 1973 and carried over into early 1974. At that time, crude oil prices rose about five-fold. The second round was from 1979 to 1980, when crude prices were increased almost three-fold. Over the ten years as a whole, prices for a light sour type crude oil rose from a little over $2 a barrel to a peak of $34 or more. The response of consumers to these price increases depended upon the availability of alternate fuels, the amount of fuel consumed in discretionary activities, and flexibility to modify or replace existing fuel-using equipment. A full response to a price increase may take as much as twenty years or more in the case of some petroleum products.

The exhibits that follow illustrate the points just made. The data are taken from studies based on a sectoral econometric model of the U.S. energy economy developed by the Finance and Economics Department of Texaco. There

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