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Before the
Subcommittee on Oversight
of the
Permanent Select Committee on Intelligence
United States House of Representatives

October 17, 1979

MR. CHAIRMAN, I am pleased to appear before this Subcommittee to discuss recent forecasts of world oil supply by the Central Intelligence Agency (CIA) and the Energy Information Agency of the Department of Energy (EIA/DOE). In my remarks I will address three major issues:

- o The methodologies used in both the CIA and EIA forecasts,
- o The reasonability of their final estimates, and
- o The relationship between those estimates and policy choices.

Methodology

Feasible levels of oil production are determined by existing oil reserves and infrastructures, such as pressure maintenance equipment and pipelines. Although oil reserves may increase over time through new discoveries, care should be exercised in estimating additional reserves unless strong preliminary evidence exists to support such estimates. Within this capacity constraint, however, actual production levels are set by governments, with the exception of the United States, using criteria other than the availability of resources. First, most producers seek to achieve a production profile over time that conserves resource availability for future use. This is particularly true in the less developed countries, including OPEC nations, in

which there is strong sentiment that resources were alternatively squandered and underdeveloped in the past, depending on the transient needs of the Organization for Economic Cooperation and Development (OECD) community and the transnational oil companies. Second, for most oil-producing nations, production is the central variable in economic development plans and the only possible source of capital acquisition and foreign exchange. Thus, output levels are often set by the producer's desired rate and the type of development, rather than by demand. Third, production levels are the major lever that producers have to pursue their interests in global political and economic affairs. We are already familiar with this facet of production vis-a-vis a political settlement in the Middle East. It may also be used to influence the larger pattern of relations between the industrialized countries and the Third World, and to enhance economic development and diversification in the world's poorer nations. Thus, an appropriate methodology for forecasting world oil supply should recognize these economic and political considerations as well as the existing level of resources.

The CIA forecast apparently deserves higher marks by this standard than does that of the EIA/DOE. The CIA forecast attempts to incorporate the economic and political motivations of producers, including their tendency to conserve resources. The CIA forecast also attempts to include the anticipated pace of economic development and provides a brief summary of

these forces for each major producer. Its forecast sometimes seems to underestimate the costs of development, however, which are rising almost as rapidly as oil prices.

The EIA/DOE projections are more dependent on mathematical modeling. As the EIA/DOE analysis states on page 37, "OPEC production is determined as a function of price, world demand for oil, and OPEC's rate of capacity expansion." However, the rate of production capacity expansion is assumed, leaving price (which drives demand) as the residual determinant of production. The EIA analysis relies heavily on price as a supply determinant. On page 35, it stipulates a supply elasticity of 0.2 with respect to price. Many would find such an assumption a questionable basis on which to project supply. Certainly, the behavioral notion that OPEC nations will set their supplies in response to price is difficult to substantiate. In fact, higher prices have probably slowed expansion of production in Mexico, Iraq, Iran, and Kuwait, because these countries need to produce less oil to meet foreign exchange requirements for development plans. It also appears that the assumed OPEC capacities are critical to the functioning of the EIA/DOE model, but their derivation is unclear. We are only told, on page 35, that "the range of estimates used in this analysis . . . is a set of judgmental planning estimates" Since the capacities of individual countries are not specified in the reestimate, it is difficult to evaluate the method.

Finally, the EIA/DOE projections are given as a range, dependent on trends in demand and residual non-OPEC supply. Similarly, in the EIA update presented today, a range of \$17.00 to \$30.00 is given for the 1985 real price of oil. The ranges in these alternative estimates are so large that they are not very helpful in formulating policy. Moreover, the difficulty of using price in making projections is demonstrated by the fact that prices have already increased to the limits of the original range estimated for 1985. It is worth noting, however, that the production estimates that correspond to a \$15.00 price in the original Case C are fairly realistic. This argues for the CIA approach, which investigates what the oil producing nations intend to supply as opposed to focusing on price levels.

Reasonability of the Final Estimates

The CIA projects OPEC production of 30.2 million barrels per day in 1982, leading to an excess of demand over supply of 5.3 million barrels per day. CBO projects OPEC production of 32.2 million barrels per day in that year, and, using a CBO correction of the CIA's demand estimate, a small excess of supply over demand of 1.7 million barrels per day. The EIA mid-range now projects OPEC production of 31.9 million barrels per day in 1985, in contrast to CBO's projection of 35.3. Using the EIA Case E demand, which is based on high oil prices, CBO would project an excess supply in 1985 of 0.7 million barrels per day. Using the EIA update, one would infer

an EIA projection of an excess demand of 3.1 million barrels per day in that year, although this is not stated directly in the report.

The CIA projections for 1982 are slightly more pessimistic than CBO's for several specific areas. The first is Iraq, where the CIA projects production of 2.4 million barrels per day for 1982. We would, instead, employ the 4.0 figure used by EIA. Iraqi production has already reached the 3.5 level, although continuing this level over the long term will require more investment in infrastructures. A less significant disagreement of about 0.5 million barrels per day exists for Libya, where renewed emphasis on exploration is finally taking place and a government production goal in excess of the 1982 projection exists. It is also possible that the projected net imports of the Soviet bloc and China will be smaller than stated by the CIA.

Finally, the CIA's estimate of 8.5 million barrels per day in 1982 for Saudi Arabia must be considered a minimum, unless a major change in relations occurs between the United States and the Saudis. Two factors concerning Saudi Arabia are often underestimated: its apparent desire to stabilize the world economy and the rate at which it is using its oil income. Some analysts have suggested that the Saudis even had a trade deficit in both 1978 and 1979. If this is the case, then they may prefer to sell more oil rather than liquidate some portion of their investment portfolio. CBO's

assumption is a 9.5 million barrel per day level in 1982, given continued cooperation between the United States and Saudi Arabia.

In total, we believe that the CIA estimate for 1982 understates OPEC production, and therefore overstates the theoretical margin between supply and demand--referred to as a "notional gap"--by 2.0 million barrels per day. Using the assumption of three percent real growth in OECD, this gap would close from 5.3 to 3.3 million barrels per day. Moreover, these notional gaps are based on demand projections made before the roughly 70 percent real price increases occurred in 1979. When these are factored in, these notional gaps could close by about an additional 5.0 million barrels per day. After making these corrections, one would project a fairly stable oil market over the next several years, barring unforeseen political upheavals.

In the EIA Case C, the most detailed estimate given in the EIA report, CBO finds one major disparity concerning U.S. production. The EIA estimates a U.S. level of 10.6 million barrels per day in 1985, with a minimum of 10.0; and 11.2 million barrels per day in 1990, with a minimum of 9.8. Even these minimums may be overestimates. Presuming total decontrol of crude oil by October 1981, as announced by the President, CBO projects output levels of about 9.2 million barrels per day for both 1985 and 1990. In addition to this disparity, we believe that the EIA reestimates presented today contain too low a figure for OPEC capacity--by 2.0-3.0

million barrels per day in 1985. The OPEC capacity estimates given in the EIA update represent a decline of 1.0 million barrels per day from present production. We see no reason to anticipate such an erosion. This does not mean that we see OPEC capacity increasing to meet any level of demand, but that we think absolute decreases are unlikely.

Policy Choices

The corrections CBO would suggest in both of these forecasts could influence the policy choices one might make in light of their results. The CIA's large notional gaps suggest immediate, and perhaps drastic, measures as the alternative to severe upward price pressure over the next three years. Rationing, quotas, and mandated conservation emerge as possibilities. Our proposed corrections would suggest a more stable oil market in which these measures might be unnecessary.

CBO's projections of world output are slightly higher than those of the EIA, while we anticipate lower U.S. production at each yearly level. The EIA projects U.S. imports of 9.0 million barrels per day in 1985, while CBO projects 10.4 using the same demand assumptions. Thus, our corrections would imply, for example, that quotas might be more restrictive, and that policies to mitigate the effects of large dollar outflows might be more important than those inferred from the EIA projections.

A further consideration is how policy in the OECD community would affect the results of these projections. Our judgment is that a precondition to stable real prices would be no increase in the level of imports by the OECD community through the 1980s. In 1990, this would mean U.S. imports of 8.0 million barrels per day, as opposed to the 12.0 we currently project. Yet, this alone would not assure constant prices. Prices might rise if OPEC abandons the dollar as the purchase currency of oil for a mixed basket of currencies. Alternatively, if demand was restricted through quotas, producers might choose to raise prices to a level that compensated for the reduction in demand.

Another way that policy could affect the results of these estimates is through inducing new supplies. On page 78 of the CIA report, a differentiation is made between producing nations constrained by their resources and those constrained by their rate of development or policy choices. The latter are the nations with "slack," notably Saudi Arabia, Kuwait, Iraq, Iran, Mexico, and China. This group, and to a lesser extent all oil producers, could provide both larger and more reliable supplies if the supplies were part of a larger bilateral relationship with the OECD community, involving financing, reciprocal trade, exploration, and import preferences. Current supply projections cannot anticipate the effects of such developments. The search for these kinds of relationships led most producing nations to form OPEC in 1960. Their further implementation might provide the United States with a means to ameliorate the inherent risks of oil imports.

Mr. Chairman, I would be happy to answer any questions.

