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Upon Acceptance of the IAEE's 5TH Annual Award for

Outstanding Contributions to the Profession and Literature

of Energy Economics

Tokyo, June 6, 1986

Thank you very much for presenting me with this year's annual award for Outstanding Contributions to the Profession and Literature of Energy Economics. I don't know how the four previous recipients of this award, all of them recognized luminaries in our field, feel about my joining their rank, but I am greatly honored to be among them.

I'm not sure what contribution I have made to our profession to deserve this award. But perhaps just having been an energy economist since long before anyone knew that there was such a profession may be considered a contribution. Let me say, it was not the most glamorous or exciting profession in those pre-1970 decades--the price of oil seemed to stay forever in the $3 dollar range, the Seven Sisters balanced supply and demand with the precision of an apothecary scale, and the unlimited future availability of oil and other energy sources at stable prices was so much taken for granted that few people really wanted to know about energy economics. Sure, we had our moments of excitement, like the Suez Canal closure in 1956 and the fear of an oil interruption during the Arab-Israeli war of 1967. But, by and large, when you introduced yourself as an energy economist in those days you were usually met with a blank stare or a puzzled frown.

Well, things have certainly changed! These days when I describe what I do, and I'm sure most of you have similar experiences, I'm immediately surrounded by a small crowd eagerly asking me whether the price of oil will drop below $10 or go back up over $20. If I pretend to know the answer I can get a lot of attention and create an air of suspense--until they find out that we are much too professional to give straight answers to simple questions.

Well, I was told at our Association's North American meeting in Philadelphia last November that I would have to give a talk in return for receiving the award, but I'm glad I didn't have to give my talk then. The world price averaged about $27 last November and I might have been tempted, or perhaps been asked as others were, to give a short-term outlook. My view at the time was that the prevailing price was clearly too high, given the fundamentals of the market structure, and could be expected to drop substantially by year-end or shortly thereafter. If I had limited myself to saying just that and no more, it would now be considered a very insightful forecast. However, had I been unwise enough to put actual numbers to my forecast I would now look a lot less insightful, for needless to say, we did not foresee a $13-14 price drop in the first quarter of 1986. I'm also glad that this conference did not take place just 6 weeks ago. For if I had made some comments then about the long-term outlook for energy I might have appraised the future of nuclear power differently from the way I see it now, following the disaster at Chernobyl. This is an ongoing process that all forecasters face. It will be interesting to see how many of the pronouncements made at this conference, including mine, remain valid when the IAEE has its ninth annual meeting.

I have cited two examples of recent changes, one (the price drop) brought on by <u>economic forces</u> and the other (the nuclear disaster) by <u>extraneous events</u>. As energy forecasters we are of course familiar with both influences. The first falls into our area of expertise and, despite much public criticism and even ridicule of our forecasting record, energy economists have generally understood and projected energy price trends and the market forces underlying them reasonably well, to the extent to which they were a function of economic forces. The second factor, the unpredictable and uncalculable extraneous non-economic event, is what so often fouls up our forecasts, even to the extent of reversing the direction of trends.

Let me cite a couple of carefully selected examples from my own forecasting experience. In May 1974 I stated in a paper that following the end of the Arab oil embargo, there would be no further supply constraint nor real price increases for the next 5 years (the period of my forecast). The projection was surprisingly accurate virtually up to the end of the period when an extraneous event in the form of the Iranian revolution completely upset it. In May 1978 in a long-term forecast I prepared together with our old friend Prof. Helmut Frank, the editor of the Association's Journal, we held real world oil prices approximately constant throughout the next 12 years, leading to a $23-25/barrel range in nominal dollars by 1990. The Iranian revolution did us in on that one within 9 months and for the next several years our price forecast was a bit of an embarassment. However, as extraneous factors once again gave way to underlying economic forces our forecast made a comeback. In fact, right now it is probably fairly close to the industry's latest consensus forecast for 1990. As the French say, <u>plus que ca change plus ca reste la meme chose</u>.

As you may recall, a far more famous economist then Helmut and I, Prof. Milton Friedman, the Nobel Prize recipient, had similar trouble with the Iranian revolution. He had widely predicted in 1974 that the OPEC cartel would fall apart and oil prices collapse in the near future. In the Fall of 1980, after he had had been awarded a prize for his forecast by the Association for the Promotion of Humor in International Affairs (there really is such a group), he explained that his economic analysis was correct and that had it not been for the extraneous event of the Iranian revolution he would have been right. He then reiterated his cartel-collapse prophecy with the caveat "provided that there is not another Iran". I am sure Prof. Friedman feels the price developments of 1986 have at last vindicated him.

However, he and others may find that there is an animistic aspect to OPEC's existence like that of the cat or the phoenix. True, its collective effectiveness has been quite negligible since the fourth quarter of last year. But it is now desperately trying to make a come-back by broadening its base through the recruitment of other oil exporters to lend it formal or informal support.

The question of the day is whether OPEC's new scheme will succeed and, if not, whether OPEC can effectively go it alone, as it did in the past. An equally important question is whether its failure to reconstitute itself would lead to a full scale price war or a continuation of the present state where the price is kept well above the short-term free market price by the deliberate production restraint of several, primarily Arabian Gulf, members. I will not try to provide answers to these questions, which would be recklessly risky just 3 weeks before the next OPEC meeting. Rather, I'd like to spend the few more minutes I have you as a captive audience to talk about OPEC as an institution since its existence has affected all our professional work more than any other single factor during the past 15 years.

I think OPEC's recent collapse is not necessarily another proof of the argument that cartels per se, even those operated legitimately by sovereign governments, are inherently self-destructive and hence have a very limited life span. What is inherently self-destructive for a cartel such as OPEC is to become deluded about the limits of its economic power and to adopt a rigid policy of price maximization based on the deluded belief that it reflects the true long-term equilibrium price of its product. In the period 1973-79 OPEC did not do this. In 1979-81 it definitely did. After 1981 the organization became increasingly flexible and market-conscious, but by then it may have been too late to control the counterveiling trend it had caused, an experience not unlike Aladdin's after he had let the genii out of the bottle.

In 1973 OPEC benefitted from the clear and present need to raise the world oil price substantially from its long-stagnant $2.50-3.00 level. With world oil demand persistently rising at 7-7.5% annually, with production in both the U.S and Canada (then 27% of total Non-Communist World production) declining since 1971, with new environmental restrictions in the U.S. accelerating the shift from coal to oil, with production from the newly discovered giant reserves in Alaska and the North Sea not recoverable at even twice the then prevailing prices, and with the almost total lack of excess producing capacity outside OPEC and very little within OPEC, a major price increase was clearly overdue. What OPEC did was to telescope into 4 months what the market would have had to do over 3-4 years. OPEC's action created a two-year global economic shock but afterward both the world economy and world oil demand grew again at reasonable rates (about 3.5% annually for oil from 1975 through 1979). So, the first price explosion was not detrimental to OPEC's longer term interest, namely the maintenance of some structural growth in the demand for its oil at its imposed price level.

The second price explosion had of course just the opposite effect. It had a decidedly negative impact on the world economy for over 3 years and, superimposed on the first price explosion, it caused a long-term decline in world oil demand. Last year, seven years after the second price explosion, world oil demand was still some 6.5 million B/D below the 1979 level, with a decline registered in every year but one. In retrospect it is difficult to understand what made OPEC think that it could permanently triple the price of oil on the basis of a brief interruption with attendant short-term hysterical market reactions. But the underlying motivation was not only greed on the part of the producers. Economic perceptions and analysis provided much of OPEC's rationale and much of this came from outside the producer cartel. Some analysts and planners in the oil consuming countries, in government, industry, consulting firms and academia, seemed to vie with each other from 1977 through 1982 in pessimistic long term prognostications about the world's ever-growing dependency on OPEC oil, explaining that economic growth and growth in oil demand had to move in the same direction (though not at the same rate). On the supply side this rationale was largely based on a presumed approaching resource limitation, developed as a general principle in the "Club of Rome" report of 1972 which influenced resource economics for the next 10 years. Under this view, oil prices would have to rise to the cost of alternative fuels. "Alternative" for this purpose meant commercially non-existing but theoretically very high-cost synthetic fuels, not low-cost abundant steam coal which could, and eventually did, displace and pre-empt substantial volumes of fuel oil in industrial and electric power installations.

As we know, after the initial impact of the second oil price shock, the market began to react rationally and quite effectively in response to the price increase, both on the supply and the demand side. As any cartel would do, OPEC leaned against the wind, with some members trying to prevent and others, such as Saudi Arabia, trying to slow down the market's inexorable downward pressure on prices. The net effect of these opposing forces was a relatively moderate but steady decline in the nominal dollar price of oil between the first quarter of 1981 and the last quarter of 1985, nearly 25% for the whole period. Until the beginning of last year the decline was partly offset in a number of countries by the rise in the dollar exchange rate. But last year both the dollar and the price of oil moved downward.

In retrospect, one can say the interaction of the cartel and the market during this period served both producers and consumers reasonably well. If it had continued for another couple of years, the price may well have reached the long-term equilibrium level to maintain the required production from the highest cost supply source to balance the market. Even in such major oil importing countries as Japan and the European Community, senior government officials have recently suggested that they would have preferred a continuation of the recent trend to the price collapse of 1986.

For the past 4 1/2 months the world price of oil has been clearly below the long-term equilibrium level, as I have just defined it. This is only a very brief period but the world oil industry's reactions already include structural changes which will have a negative effect on supplies for the next several years even if the price should return to or above the equilibrium level later this year and remain there. The drastic reduction in U.S. drilling activity and in exploration and production expenditures and employment are a prime example.

I will not risk my new status as a recipient of your prestigious award by ending my talk with a specific price or production forecast based on these recent developments. However, I would like to end with a broad-brush forecast:

I believe we are seeing the beginning of a structural trend reversal in the world oil market. The period of declining or stagnating world demand and the concurrent decline in OPEC production and exports which began in 1980 ended in 1985, and is likely to be followed from this year on by an extended period of rising demand and rising OPEC output and exports. The rate at which the new trend will proceed in the assumed direction depends of course on the price. Let us assume purely for illustrative purposes, and <u>not</u> as a forecast, that the world oil price will range between $15 and $20/Bbl for the next several years. Many companies, financial institutions and government agencies are currently projecting prices within this range at least for the next 12-18 months, while the oil minister of a major OPEC producing country has recently predicted that the mid-point of this range would be the likely price for the next 3 years.

If the price remains in this range for the next several years, the world oil market in the early 1990's will be very different from that of the mid-1980's. Nominal prices will be substantially, and real prices at least slightly, above the upper end of our range. All non-OPEC producers and all OPEC producers outside the Arabian Gulf are likely to operate at or near capacity or at their desired production ceiling. Excess producing capacity will be much smaller and will once again be concentrated almost entirely in the Middle East. Since demand will be rising and non-OPEC production flat or declining under this price scenario, the Gulf producers will be the true swing producers in a rising market which, according to basic economics, makes them the determiners of world prices. How they will carry out this function will depend to a large extent on whether the three or four major producers in the region will cooperate or compete with each other for market share and also whether those that can do so will raise their producing capacity in response to market demand, let it decline, or keep some of it shut in for economic, political or resource reasons.

Sheikh Yamani has recently been quoted as predicting a world oil shortage in the 1990's. He may well have had the scenario I just described in mind. I don't know whether his predictions were intended as a warning or as an objective analysis. In either case, if it is taken seriously it is much less likely to occur than if it is ignored. For, as we have seen, given the right signals and a bit of time, the market can counteract artificial imbalances quite effectively.

I use the term "artificial" imbalances because a physical oil shortage due to a structural resource constraint is highly unlikely during the remainder of this century, even if we assume that the consequences of the Chernobyl disaster will be a somewhat faster growth in oil demand than would otherwise have been the case. An oil shortage during this period could only come about through a disruption or denial of economically and logistically available supplies or a deliberate decision not to develop such supplies from existing reserves. The possibility of such an occurrence must of course be taken seriously, in view of recent history and current conflicts. We should therefore maintain all existing measures and institutions designed to cushion the impact of such an occurrence, if it should come. In the U.S. where oil imports could double between 1985 and the early 1990's under the price scenario I outlined, political availability and strategic access to future oil supplies are once again becoming a major concern. However, as I pointed out earlier, an analysis of the probability and nature of such exogenous events falls outside the expertise of energy economists and would certainly go beyond the scope and allotted time of my talk.

So, let me thank you again and leave you with the sincere hope tht producer prices will soon rise again, that consumer prices will fall further and that refiner margins will stay where they were in May.