STRUCTURAL CHANGES
IN THE WORLD OIL INDUSTRY,
1962-1982

by

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It seems to be an axiom of historical changes that no matter how irrational and improbable they appear before their occurrence, they always become logical and inevitable in retrospect. This is certainly true of the colossal structural and quantitative changes which have taken place in the world oil market in the 20 years since the death of Enrico Mattei.

As with most historic developments, a few visionaries sensed the coming changes long before they occurred. Mattei was certainly one of these. His recognition of the emerging importance of the oil exporting country governments was a clear reflection of this vision. But the range, magnitude and form of the changes was beyond any one's grasp in the early 1960's.

In fact, in the first ten years after Mattei's death the outwardly visible structure of the world oil market changed very little. In 1972 the major international oil companies--Mattei's famous Seven Sisters--still appeared to dominate the world oil market about as much as they had ten years earlier. The oil exporting countries' role was still primarily that of revenue collectors and world oil demand was still rising substantially faster than total energy demand, thus displacing other energy sources. In 1972 Enrico Mattei would have had no difficulty recognizing and understanding the oil industry he had left behind in 1962.

In the subsequent ten years the massive structural and economic changes which are now often referred to as the "OPEC Revolution" turned the world oil industry into something basically
different from what Mattei and his contemporaries had known. True, the international Majors are still around in 1982 but their exclusive access to most of the oil reserves outside the U.S., which was the foundation of their global power, has been radically and probably irreversibly reduced while the national oil companies in the producing countries have become far more powerful than any of the private companies ever were.

Parallel with the structural changes came a discontinuity in price and market trends in the post-1972 period. World oil prices which had remained more or less unchanged in nominal dollars in the 1960's rose by an incredible 1,200-1,300% from 1972 to 1982. At the same time the relationship of the 1950's and 1960's between oil demand and total energy demand reversed itself completely after 1972, with oil demand growing at less than half the average annual growth rate of total energy in the ten years since then. In five of these ten years oil demand actually declined. In the twentyfive previous years this had never happened.

While drastic historical changes often give the appearance of spontaneity, they are invariably the end result of a, not always visible, gestation process. The gestation process for the OPEC revolution which began in 1973 took from the late 1950's until the very early 1970's. Before then the postwar growth in the world economy had been due largely to the reconstruction of war damages in Europe and the Far East and the meeting of unfulfilled demand accumulated during the war years. From
about 1957 to 1973, however, the world economy continued to grow at an astonishing average annual rate of about 5% (excluding the Soviet Bloc and China)* creating probably the biggest and longest economic boom in modern times.

The demand for energy was a major factor in this growth. Throughout the period it grew at about the same rate as the economy. But within the energy sector the emphasis was on oil not only for incremental energy demand but also to displace coal from existing markets. Thus the age of coal which had started about a hundred years ago seemed to draw to a close as the share of coal in world energy consumption dropped from nearly 50% in the early 1950's to a low of 19% by 1972. (As we now know, the assumption of coal's terminal decline was premature. Since 1979 coal's share has increased again. It is currently around 23%.)

The combined result of all these factors was that world oil demand grew at a fairly steady annual rate of 7.3% from 1957 to 1973, or from 15.4 million B/D to 47.9 million B/D. Since in those years only the major international oil companies had the experience, expertise, equipment and capital required to produce these gigantic quantities and find the underlying reserves, their domination of the oil market during that period was an inevitable function of the world's then seemingly unquenchable oil thirst. They provided consumers what they seemed to want most: ever more oil at declining real prices. It was

*Throughout this paper, unless stated otherwise, all references to the world economy, energy sector and oil market exclude the Soviet Bloc and China.
of course also a very good business proposition for these companies and it got the world progressively hooked on oil.

The smooth, steady growth in world oil production during this period, unencumbered by significant cost increase, tended to mask the inexorable fact that no compound growth rate of any finite matter can go on indefinitely. The limitations to the growth of oil, as the world entered the 1970's, were of a geological, economic and political nature and were based on the facts that oil is a depleting resource, that oil production has an inherently increasing cost structure and that the growing dependence of consuming countries on imported oil was bound to strengthen the political power of the exporting countries.

Up to 1973 the most visible of these limitations was the political. Underlying this development was the new philosophy and reality of the end of imperialism and colonialism, the recognition of the growing importance of the Third World, economically and politically, and the emergence of the U.N. as their advocate.

The formation of OPEC in 1960 reflected all these forces. It was a historic step in the direction of producer country power assertion, even though the organization was ignored by the oil companies until 1966 when they negotiated for the first time collectively with it on the issue of crediting royalties against income taxes.

Also, in 1966, the principle of producer country sovereignty over natural resources was greatly strengthened by a U.N. General Assembly resolution on this subject. The resolution, in turn, formed the philosophic basis for OPEC's famous Declaratory Statement of Petroleum Policy in Member Countries of 1968 which proved
to be a blueprint for the eventual transfer of control from
the concession holding companies to the host country govern-
ments.

As the world's dependency on OPEC oil increased, the organiza-
tion's demands for a stronger role in setting oil prices were
increasingly granted, culminating in the Teheran Agreement of
1971. In retrospect one can say that the real importance of
that agreement was not the relatively modest revenue increase
it gave to the producing countries but the oil companies' ac-
knowledgement that they had lost the power to set prices uni-
laterally.

The negotiations for the Teheran Agreement as well as a
series of selective full or partial nationalizations in Iraq,
Libya and Algeria and legislation for future nationalization
in Venezuela, all occurring during 1971-72, also drove home
to the companies the fact that under the new order of things
a private firm and a sovereign government were not equal bar-
gaining partners, even if the firm was a giant multinational
corporation and the government that of a very small country.
Any lingering concern by the oil producing countries that the
foreign corporations would have the active support of their
home country governments in a showdown was easily dissipated
during that period by the home country governments' (principally
the U.S.'s) deliberate hands off policy on the issues under
dispute.

This attitude was of course in large part the political
consequence of the oil importing countries' growing dependence
on foreign oil and their consequent fear of antagonizing their suppliers. In the U.S., for instance, where domestic production started to decline from 1971 on, oil import dependency rose from 22% of total supplies in 1969 to 36% in 1973.

The ultimate assertion of the producing countries' new power was OPEC's first unilateral price increase announced at a meeting in Kuwait on October 15, 1973. The oil companies were not present at the meeting nor had they been consulted beforehand. The Kuwait meeting established the full and exclusive sovereignty of OPEC's pricing policy which has been maintained ever since.

The world outside the oil industry was of course less concerned with the political implications of transferring the pricing power from companies to governments than with the economic implications, namely that the OPEC governments tripled the price of oil between October 1, 1973 and January 1, 1974, and after maintaining it at approximately that level in real terms for 5 years tripled it again between the end of 1978 and the beginning of 1981. The impact of this pricing policy on the world economy is too well known to require further discussion here.

What does interest us, however, is whether the OPEC price increases reflect only the organization's political power or whether they also reflect the aforementioned geological and economic resource limitations. In other words, what would have happened to the price of oil in the 1970's if the power structure of the industry had not changed in 1973?
As we have seen, the long term average annual world oil demand growth rate in the period to 1973 was 7.3%. The rate was more or less maintained until the end of the period. In the absence of a significant real price increase, the growth in demand would undoubtedly have continued, though perhaps at a somewhat slower rate because of progressive market saturation. But low cost oil would have continued to increase its share of the energy sector and low cost energy would have continued to grow nearly as fast as the economy.

What this would have done to world oil supplies within just a few years can be seen when we calculate demand from 1973 on at a hypothetical 5% annual growth rate. By 1978 the world would have required 61 million B/D instead of the actual 51 million B/D. If all OPEC members had been willing and able to maintain output in 1978 at their hypothetical maximum sustainable capacity of 34.5-35.0 million B/D, instead of their actual production of 30.3 million B/D, they could only have supplied slightly less than half the 10 million B/D additional requirements. By 1980 the 5% growth rate would have resulted in a consumption of 67 million B/D, or 18 million B/D more than the actual consumption. Furthermore, at the oil price assumed for the 5% demand growth rate, non-OPEC oil supplies would have increased by far less than the 3.5 million B/D actually realized between 1973 and 1980. This would have raised the hypothetical supply/demand gap still further.
Thus, it is obvious that a sharp increase in the real price of oil was required by the mid-1970's at the latest to avoid a major resource shortage by the end of the decade. The international oil companies' individual ability to bring about such an increase was limited by their need to remain competitive with each other. Had they tried to act collectively, or even given the impression of doing so, they would have run into major political and legal trouble in their home and other consuming countries. In retrospect it is clear that the pre-1974 production strategy of the private companies was essentially consumer oriented in that it was based on sales maximization rather than price maximization.

Thus, for the world price increase to take place when it did, it had to come from an oil producer body with considerable collective enforcement power beyond the reach of the consumer country legal and political control, a strong self interest in substantial price increases, and the motivation to produce less oil in the short run in order to have more available for the long run. OPEC was such a body and that is why it succeeded so spectacularly in 1973-74 in bringing about the increase in the world oil price.

Thus, ostensibly, the change in the power structure of the world oil industry brought about the price increases of 1973. Yet, the underlying economic need to raise oil prices was a major factor in bringing about the change in the power structure. However, OPEC apparently overshot the mark at the
time—that is, its price increase was too fast and went too far, causing oil demand to decline in 1974 and 1975.

The basis for the second oil price explosion was also laid by structural changes outside of OPEC's reach or control. But again OPEC caused prices to rise earlier, faster and further than would have been the case if market forces had determined the increase.

The underlying reasons for the 1979-81 price increases were of course the Iranian revolution and the Iranian-Iraqi war. The first brought about a probably permanent reduction in Iranian output of some 2.5 million B/D from the level produced under the Shah, since a reduction of this magnitude was a basic policy aim of the new regime. In as much as OPEC had very little spare capacity just before the Iranian revolution (it was producing at a rate of about 30 million B/D), the reduction in Iranian output would have caused a significant market price increase even if OPEC had taken no action.

The Iranian-Iraqi war which has now lasted two years with no end in sight caused a further reduction in Iranian production and also ended most Iraqi exports which had amounted to nearly 3 million B/D in the first half of 1980. This would have caused a further substantial price increase in the fall of 1980 if had OPEC not already increased the price above the market clearing level in the previous 18 months.
Thus, the price increases during the period 1979-81 represented once again an OPEC-induced acceleration of an inevitable development. One could speculate that in the absence of this acceleration the world price of oil might now be some $8-9/Bbl below the current level of $32-33. This speculation is very imprecise but probably accurate enough to illustrate our point that while OPEC was an important factor in the historically unique series of oil price increases of the last 10 years, it was clearly not the only and probably not even the principal one. However, the fact that OPEC dramatically took on the role of announcing, imposing and enforcing these price increases created the illusion, within and without OPEC, that it was.

Now let us take a brief look at some of the structural changes in the oil industry, other than those directly connected with OPEC, during the last twenty years. One politically and strategically significant development has been the rise and decline of the Middle East as a source of oil supplies during this period. In the first ten years, the region's share of world oil production rose from 29% in 1962 to 41% in 1972, or from 6 to 18 million B/D. By 1981 the share was down to 36% and the volume two million B/D below the 1972 level. In the first half of this year the share was only 31% and the volume 12.6 million B/D. In the second half both will be still lower.
This development had not been expected in the 1960's or early 1970's. On the contrary, with about two thirds of the world's proved oil reserves located in the Middle East during that period (currently it is 61%), it was expected that the area's share of world production would continue to rise to a level approximately commensurate with its share of reserves. Until 1976 when the Middle East's share of world production reached 47% this was true. Since then there has been a steady decline in both share and volume.

The principal reason for this decline has been the growing supply of oil from areas outside the Middle East, mostly non-OPEC countries such as Mexico, Brittain, Norway and Egypt and the reversal of the decline in U.S. oil production from 1977 on. In the existing economic and political order of things, largely determined by OPEC's price and production policy, these new supplies are given priority over OPEC supplies most of which are located in the Middle East.

Another more temporary reason for the decline is of course the Iranian-Iraqi war. After its end the share and volume of Middle East production is likely to rise again. But it is unlikely to return to the levels of the 1972-80 period any time in the near future. Thus, the frightening prospect of the western world's growing dependence on Middle East oil which had formed such an important part of global strategic considerations in the 1970's has proved less inevitable than was then assumed. Of course western dependency on Middle East oil is not without
risk even at the present reduced level, principally because of the concentration of such a large share of the region's production and exports in one country--Saudi Arabia.

Another major structural change, connected directly with the events and developments described in this paper, took place among the private international oil companies. Essentially, these companies maintained and expanded their commanding role in the world oil market throughout the 1960's but saw it decline substantially from 1973 on. However, the decline was largely limited to the foreign upstream sector, that is, their production in most OPEC countries was partly or fully nationalized during this period. From the beginning of 1970 to the end of 1980 the producer governments ownership of OPEC oil rose from 2 percent to 80-90%. The principal losers were of course the international oil companies. Part of their losses in the OPEC countries were offset by new production in the North Sea, Alaska and other areas. But according to a calculation by the International Energy Agency, in 1981 these companies owned less than 10 million B/D of crude oil production, compared to over 25 million B/D in 1973.

The situation is different in the refining and marketing sector. Between 1973 and 1980 the seven major oil companies' share of world refining fell from 51% to 38% and of world product sales from 51% to 41%, according to a recent study by a U.S.
government agency*. Thus, these multinational companies are still the principal factor in the downstream sector of the world oil industry, just as they were 20 years ago. Much of their decline in this sector took place in the U.S. where the share of the smaller independent companies increased correspondingly. In Europe they also gave up markets to local national oil companies. The present situation of the majors is well summarized in the aforementioned U.S. government study:

"In 1982 the major oil companies remain the principal movers, processors, and marketers of crude oil in the industry, although their access to crude oil on an equity or preferential basis has been significantly reduced. They retain their unmatched ability to explore for and develop sources of crude oil; but in regions where most of the world's proven reserves are located they are buyers."

Since the spring of 1981 the world oil market has increasingly taken on the characteristics of a buyer's market. This has of course strengthened the position of refiner-buyers relative to that of producer-sellers. An indication of this change is that the "Aramco advantage" of secure access to Saudi Arabia's immense oil supplies has turned into a "Saudi advantage" of access to the Aramco partners' vast global disposal network. OPEC countries which have no such preferential access for the disposal of their oil because they have broken off all preferential relations with foreign oil companies are now at a relative

disadvantage. Libya's current attempt to dissuade Mobil Oil from leaving the country and its public regret over Exxon's decision to pull out in 1981 are overt signs of the producers' awareness of this change in market conditions.

Yet, despite the current pronounced buyers' market crude oil production remains highly profitable while crude oil refining is relatively unprofitable. There is nothing new about this relationship. Outside the U.S. it has existed throughout the 1960's and part of the 1970's. However, in those periods the major companies operated their non-U.S. refineries largely as controlled outlets for their profitable crude production. Now that most of these companies have a global crude oil deficit in their integrated operations they are unlikely to continue indefinitely to purchase crude at third-party prices and refine it without a profit. Hence, eventually refinery operations will have to become profitable on a sustained basis. The closing of excess refining capacity and the conversion of existing facilities to increase the output of light products which command higher prices than heavy ones are moves in this direction. So is the oil companies' increasing tendency to balance their products' requirements through spot market purchases rather than to process incremental volumes of crude in their own refineries.

As we have seen, the changes in the structure of the world oil industry during the last ten years have been truly monumental on a global scale. However, their very grandeur has also brought into being monumental counter-forces, particularly
in response to the price increases. In the last two years these counter-forces have become increasingly visible. The rapid rise in oil output outside of OPEC, discussed earlier, is one such counter-force. Another is the highly successful worldwide endeavor to conserve energy in general and oil in particular through substitution by other fuels. Even the world economic stagnation of the last two years, which has contributed significantly to the reduction in oil demand, belongs partly in this category, since the oil price shock of 1979-81 played an important role in causing it.

These counter-forces have already accomplished some surprising things: they have caused the average official nominal price of OPEC oil to decline (from a peak of $35.50/Bbl in the first quarter of 1981 to about $33 in the fall of 1982); they have substantially reduced OPEC oil exports in each year since 1979, with this year's level probably 40% below the 1979 one; and they have forced several OPEC members to improve their participation agreements with foreign producing companies in order to keep them from leaving.

The common factor in all of these developments is that they go counter to the general trend of the 1970's which was then widely considered permanent and irreversible. No one knows how far these new forces will go in counteracting or otherwise changing this trend. But they are apparently part of a dynamic historical process which could make the world oil market of the 1980's look very different from that of the previous decade.