THE FUTURE OF OPEC

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PART 1

THE WORLD ENERGY OUTLOOK

Professor Colin Robinson

1. WORLD ENERGY, 1950-1980

As a prelude to our discussion of OPEC, we need some statistics to illustrate how the world energy market has changed in recent years. The world energy statistics presented here are about as up-to-date as one can obtain; they include preliminary estimates for 1980 based on advance information from the forthcoming B.P. Annual Statistical Review which B.P. have kindly provided. Following discussion of the past we then need to consider world energy prospects and, in particular, the outlook for oil so that we can place the activities of OPEC in context. Where necessary, we repeat and bring up to date material contained in Surrey Energy Economics Discussion Paper No. 4.[1]

Table 1 summarises the post-war history of the world energy market which it is useful to divide into two sub-periods:

Pre-1973

The three important features of the pre-1973 period are:-

(i) a rapid growth in world energy consumption at about 5 per cent per annum on average (approximately the same rate at which world real GNP was increasing).

(ii) a drastic decline in the share of solid fuel in world energy, even though the tonnage of solid fuel consumed was increasing. In 1950 solid fuel accounted for over 60 per cent of world energy consumption; by 1973 its share had virtually halved to just over 30 per cent. The principal reason for this sharp decline was, of course, the increasing competitiveness of oil and gas.

(iii) fast increasing consumption of oil and gas because of the same market forces which brought relative decline to coal. Oil in particular increased its share of the market - to 46 per cent in 1973 compared with only 27 per cent in 1950 - as its falling relative price stimulated improvements in consumption and transport technology which brought it into widespread use as a fuel for industry and power generation. World gas consumption also increased rapidly and in 1973 was over 6 times what it had been in 1950.

In the post-war period up to 1973 we lived in a world which relied for its energy almost entirely on fossil fuels. The period began with coal supplying nearly two thirds and oil and gas just over one third of world energy. It ended with the positions more or less reversed: coal's share was about one third whereas oil and gas had roughly two thirds of the market.

Post-1973

Since the early 1970s, the price signals which energy producers, transporters and consumers receive have, of course, changed dramatically and market behaviour has, as a consequence, begun to alter. We need to look at why the market changed because it should have something to tell us about what may happen in the future. We should begin with the oil market because that was the source of the principal changes.

In a market such as crude oil there is a natural tendency for producers to try to form groupings. There are relatively few producers so that in principle, agreements are fairly easy to reach. The demand for individual crudes is fairly elastic but the market demand for crude oil is inelastic, except in the long run, because of the absence of close substitute products. Producers will therefore try to suppress competition among themselves so as to take advantage of the inelasticity of market demand, thus increasing the profits of the group as a whole.

During the 1960s the crude oil market was not dominated by any producer grouping even though OPEC had been formed in 1960. Indeed, in many countries oil prices fell in real terms. By the early 1970s, however, a significant change came over the market in that expectations were formed of future oil scarcity and therefore future oil price increases. In such circumstances oil will at the margin be held back for the higher-priced future (assuming that the rate at which prices net of costs are expected to rise exceeds producers' discount rates). Even in a competitive market, output would probably have been reduced and prices would have risen, providing increased revenues to the producers because of the inelasticity of market demand. How much difference OPEC made is not entirely clear but its presence in the market may well have accentuated the price rise in 1973-74.

The behaviour of the oil producing countries in the early 1970s is thus explicable in terms of the economist's standard resource depletion theory. [2] Other factors were also important at that time - for instance, OPEC's growing confidence after it had existed for over 10 years and a desire to lead a Third World crusade against "exploitation". The 1973 Arab-Israeli war also provided the proximate reason for the 1973 oil price increase. Nevertheless, without the economic forces we have mentioned, it is doubtful whether such increases could have been made. The influence of OPEC on the market is generally exaggerated. It does not have the output-sharing scheme which would exist in a true cartel and its members seem unlikely to agree on such a scheme. In the recent past, OPEC as such seems to have had little influence on oil prices. Prices increased in the two years up to early 1981 primarily because of anticipated shortages and uncertainty resulting first from the Iranian revolution and its after-effects and then from the Iran-Iraq war. OPEC seems to have done little more than meet, ex post, to try to reach some measure of agreement on what the price actually is in a rather confused market.

The process of rising oil prices which began in the early 1970s contains the seeds of its own eventual destruction. As oil prices

go higher, the desire to shift away from oil increases and the ability to shift should also increase as technological change is stimulated. Table 2 shows the changes since 1970 in the f.o.b. price of Light Arabian crude oil, which used to be the 'marker' crude. The official price is at present $32 per barrel and the market price of light crude in mid 1981 is roughly the same. As an approximation we can say that the market price of light crude now is roughly 22 times what it was in 1970. In real terms, of course, the increase has been much less. If we deflate the increase in nominal terms by the U.S. dollar index of the unit value of world exports of manufactures, which approximately tripled between 1970 and late 1980, we find that the real increase in the crude price has been 7 to 8 times in the last ten years. There was a big upward step in real terms in 1973-74 followed by relative stability until 1978 when real prices drifted downwards, to be followed by further large real increases from mid 1979 into 1980.

Such real increases should, on the face of it, set in motion powerful forces to shift consumers away from oil. Let us examine, with the aid of Table 1, the record since 1973 to see if there are signs of such adjustment.

The market changes of the last few years are what one would predict in a situation of rising real energy prices when the prices of oil and gas are increasing faster than those of other fuels. The rate of growth of total energy demand more than halved in 1973-1980 compared with 1950-1973 as energy prices increased relative to prices in general and world real GNP grew only slowly; oil consumption increased at only about 1 per cent per annum instead of 7½ per cent and its market share fell about 3 points; gas consumption grew at about 2½ per cent per annum compared with 8½ per cent in the earlier period; and there were signs of some revival in coal, consumption of which rose faster than total energy demand so that its market share increased from 32 to 34 per cent.

When we examine the last two years more closely (Table 3) we can see the considerable changes which occurred between 1979 and 1980. World energy consumption appears to have fallen a little and there was a substantial drop of about 3½ per cent in oil consumption. Only nuclear power showed any expansion of consequence and that was small compared with earlier hopes.

In the industrialised 'market' economies the decline in oil consumption was sharper - in the region of 8 to 9 per cent in the United States, Japan and Western Europe. Table 4 shows that EEC primary energy consumption fell between 1979 and 1980 by about 4½ per cent with oil consumption falling over 8½ per cent, and only nuclear power increasing substantially thanks to the French programme.

Britain, which had the biggest recession, naturally had the biggest drop in energy consumption (7½ per cent) and oil consumption (12½ per cent) as Table 5 indicates; indeed, use of each fuel declined in Britain in 1980. UK energy consumption in 1980 was about 7 per cent below what it had been in 1973 and oil consumption was down about 26 per cent compared with the 1973 peak. Real GDP increased by just over 4 per cent over the 7 years (about ½ per cent per annum); thus energy consumption per unit of real GDP fell about 11 per cent and oil consumption per unit of real GDP fell by almost 30 per cent. There have also been some big changes within the oil market - for instance, UK fuel oil consumption in 1980 (19.2 million tonnes) was less than half what it had been in 1973 (39.4 million tonnes).

Adjustment to the changed energy situation has clearly begun and to the extent it has occurred it seems to be attributable mainly to market forces. There is little sign that the policies of national governments or the EEC have helped: to some extent, indeed, government policies have been a hindrance to adjustment in that they have attempted to hold down energy prices. The one substantial government achievement seems to have been to establish the IEA emergency sharing plan. Otherwise the periodic international

meetings of consumer governments seem to have produced no more than general expressions of concern and oil import targets that would almost certainly have been achieved anyway as a consequence of rising oil prices and economic recession. Like OPEC meetings they have been well-staged and apparently dramatic events which, in fact, are of rather minor consequence compared with what is happening in the energy market place.

Despite the incipient adjustments we can see in the energy market, most observers of that market would probably agree that the speed of the adjustment process has so far been disappointing, particularly on the supply side. Energy demand and more especially oil demand have been depressed by relative price and income effects. In 1980 and 1981 especially, recession and the shock effect of the crude price increases (which generated expectations of further increases) had a substantial impact on consumption. Nevertheless there is little sign of any significant expansion of supplies of non-oil sources of energy apart from the limited revival in coal indicated in Table 1.

It is worth enquiring what constraints there have been on energy market adjustment in the last few years because we should thereby learn something about what may happen in the 1980s. These constraints are also discussed in Surrey Energy Economics Discussion Paper No. 4.[1]

2. CONSTRAINTS ON THE ADJUSTMENT PROCESS

Relatively small consumer price increases

Before considering true constraints to adjustment, we should examine what have been the price signals received by consumers. One reason why the market has not adjusted as fast as one might expect given the large increase in the real f.o.b. price of crude oil is that, for a variety of reasons, real consumer prices of oil and other fuels have risen much less. For example, as the tanker market has remained depressed, the c.i.f. price of crude

has risen less than the f.o.b. price; until the latter part of 1980 import costs in local European currencies were held down by the decline in the dollar; oil companies' refining, marketing and distribution costs have increased at a slower rate than the cost of their crude oil; and the specific duties which are levied on oil products in most consuming countries have fallen substantially in real terms, even though for some products such as gasoline taxes in Europe still constitute over half the consumer price. Furthermore, there has been rapid general inflation since 1973 which has limited the rise in energy prices relative to the general price level. If we take Britain as an example, [3] we find that in the household market the real price of heating oil rose by just under 90 per cent between 1973 and 1980, the real price of all household fuels increased only about 20 per cent and real gasoline prices went up about 28 per cent. Over the same period, the real price of fuel oil almost tripled and the real price of all industrial fuels approximately doubled. The oil price increases are large, especially in the industrial market, but much less dramatic than the increases in the f.o.b. export price of crude, which over the same period was multiplied about five times in real terms.

Another reason why consumer price increases for energy products have been limited has been the attempt by some governments to shield their citizens from rising energy prices. The United States has until recently been the worst culprit but there has been an element of fuel price subsidisation in many countries. In Britain, for instance, household gas prices have been held down and Canada is still trying to keep its crude oil prices below the world level.

Time lags in demand response

Another factor which reduces the speed of adjustment to a change in energy prices is the complementarity between fuels and fuel-using equipment. When energy prices change relative to prices in general and relative to one another, there are inevitably

significant time lags before consumers bring their actual stocks of fuel-using equipment into line with the stocks they desire (in terms of size and fuel efficiency) on the basis of the new prices and the prices they expect in the future. Car design, for example, takes time to change and further time before new designs become a significant part of consumers' stocks. Although all manner of housekeeping measures can reduce fuel consumption considerably, as we have seen in the last few years, large savings require investments in energy-conservation and in fuel switching which seem to require big real price changes (actual and expected) before they become economic. Recession, too, blunts the willingness to invest.

Time lags in supply response

To some extent a slow supply response to price changes is inevitable because of the time taken over such major projects as bringing in new oilfields, opening new mines and constructing new power stations. In addition to such inherent time lags it seems that, as on the demand side, governments must bear some share of the blame for slow adjustment because of their misplaced desire to tax away what they conceive to be 'windfall' profits. This is particularly true of taxation of the oil industry which hard-up governments all over the world now seem to regard as a virtually inexhaustible source of revenue. There is good reason to believe that the prospect of comparatively high profits for a period is a necessary condition if some of the less accessible, higher-cost sources of oil are to be developed. It may be tempting for governments to imagine they can jump direct to a long run equilibrium in which only 'normal' profits are made; but to achieve that happy state there probably needs to be a substantial period of relatively high profits which will stimulate supplies so eventually competing the profits away. [4]

The supply reaction has also been slowed by a phenomenon which has become increasingly important in the last ten to fifteen years - concern about the environment. It is not relevant to

this paper to argue whether such concern is right or wrong - it would indeed be difficult to generalise - but simply to point out that new energy supply facilities tend to be obtrusive and to represent potential pollution hazards. Thus we must expect objections to such facilities to delay their introduction. Whether we are talking about offshore oil fields in the United States, hydro-electric schemes in Norway or coal mines in Britain such delays have occurred and must be expected in the future.

However, the biggest 'environmental' problem - or, at least, the one which has probably caused most delays on the supply side - concerns not the fossil fuels but nuclear power. It is a curious paradox that the replacement energy source which was most advanced by the early 1970s happened to be the one which arouses most public concern and opposition. Governments of industrial countries forced nuclear along in the 1960s at a time when public protest was small or seemed unimportant, but now nuclear power programmes are in deep trouble almost everywhere in the world. To some extent the delays are attributable to technical difficulties in construction or operation and to the labour relations problems which often occur on large construction sites. Nevertheless, the main factor now seems to be a failure to convince the public - or at least a certain articulate section of the public - that large nuclear programmes are needed. To earlier concern about the various possible sources of danger from nuclear fission has been added the argument that the likely slow growth of electricity consumption has undermined the basis of most nuclear plans.

There is room for reasonable people to differ about how real are the alleged hazards of nuclear power, about whether 'public opinion' really is for or against, and about what may happen to electricity demand. But whatever one's views on such matters, the relevant point so far as we are concerned is that there is a large question mark over the public acceptability of nuclear

power and that, whether we like it or not, further delays to nuclear programmes must be anticipated. Despite the oil supply problems of the last two years, an articulate section of public opinion in most industrial countries is unconvinced of the nuclear case. Only France, which by the mid or late 1980s should (barring accidents) provide about half its electricity from nuclear fission, has a big nuclear programme (over 35 GW) which is more or less on schedule: even there President Mitterand has already begun to curtail nuclear development. Belgium is aiming to be about 50 per cent nuclear before the end of the 1980s but its programme is, of course, comparatively small. The Japanese also have a fair-sized nuclear plan (30 GW by the mid 1980s) which has not so far been greatly delayed and Britain has a modest target of a total of 20 to 25 GW of nuclear plant by the end of the century, though with the prospect of a build-up of nuclear opposition as the PWR Inquiry scheduled for next year draws near. In the United States, which has over 50 GW of nuclear plant in operation, no nuclear order has been placed since 1978 partly because of the Harrisburg accident, and the German programme is in disarray. Although before the 'crisis' of the 1970s many people believed nuclear programmes to be over-ambitious and unlikely to be fulfilled, few expected that the delays would be as great as they have been.

3. EXPECTATIONS FOR THE 1980s

Our brief analysis of the energy market in recent times should help to identify in broad outline some of the trends we may expect in the 1980s, although we should bear in mind the extreme difficulty of foreseeing events in a market as uncertain as energy. To give us a focus we can concentrate on the possible extent of switch away from oil. Virtually everyone would agree that in the very long run energy consumers will have to use relatively little oil (and probably gas too), substituting other fuels whether fossil or nuclear, renewable or depleting, although we may well disagree about the process by which the low-oil-use society will be reached.

Oil supplies and prices

Since recent changes in the energy market have their roots primarily in oil, we should first consider oil supplies and prices in the 1980s.

It is tempting to believe that recent conflicts and changes of regime in the Middle East are a lapse from normality so that somehow soon all will settle down. Such an outcome is, however, unlikely. Most probably the Gulf war will come to some kind of conclusion in the foreseeable future, but the uncomfortable fact is that there are sufficient sources of tension and potential conflict in the Middle East to generate throughout the 1980s periodic bouts of supply uncertainty. Even if open conflicts are avoided, there is likely to be continued uncertainty in the oil market about the production plans of Saudi Arabia and other major producers. Although OPEC's share of world oil production will probably keep on falling, (it was less than 44 per cent in 1980 compared with 54 per cent in 1973), its members will still supply the great bulk of internationally traded oil. In any case, the Organisation itself, as in the recent past, will probably have little influence on prices. Instead we can perhaps anticipate a repetition of the pattern of recent years with actual or expected supply shortfalls driving up prices in steps, only for them subsequently to fall moderately in real terms as they are eroded by limited discounting and inflation. About the least likely oil price scenario for the 1980s is a smooth upward progression, despite OPEC's attempt to find a formula linked to real GNP in the OECD countries, inflation and exchange rates. Rather than OPEC control of the market in the 1980s, which would imply an output allocation scheme in the Organisation, we are more likely to have a disorderly market with periodic step increases in real oil prices followed by slight downward drift. Given that oil prices have already reached a level where consumers are becoming resistant to further increases, oil price increases in the 1980s may well be much less than in the 1970s. At some stage, perhaps in the second half of the 1980s, oil producers may conclude that real prices will not

increase much more. If they do, and assuming they have positive discount rates, they will want to increase production and oil prices may level off at least temporarily.

If we are correct in assuming continued uncertainty in the oil market during the 1980s there are implications both for the growth of total energy demand and for the switch from oil. Let us consider energy demand first.

Total energy demand

The 1980s are off to a poor start in terms of economic growth and the chances are that we should expect relatively slow economic expansion to continue in the rest of the decade. For most of the 1980s there may well continue to be real income transfers from oil consumers to oil producers and associated balance of payments deficits in the consuming countries which will make governments cautious in their macroeconomic policies and place a constraint on world economic growth. Thus world energy consumption will probably rise only gradually with what increase there is occurring mainly in fuels other than oil. A declining energy growth rate is, of course, an essential part of the adjustment to a world where existing energy producers will no longer supply at the prices they obtained in the early 1970s.

No one can hope to foresee accurately how fast world energy consumption will increase in the 1980s. The old days of 5 per cent per annum growth have obviously gone for now. Whether energy consumption in the 1980s will even increase at the rate of 2 per cent per annum or so which was achieved between 1973 and 1980 seems doubtful, given rather slow economic growth and the potential for more efficient energy use, gradually though the latter may be realised.

Substitutes for oil

It seems inevitable that the supply response to increasing energy prices will continue to be muted. During the 1980s we

can expect little from 'synthetic' fuels - whether from coal, tar sands or shale. Nor can one reasonably expect a sudden acceleration of nuclear plans. Actual nuclear capacity will probably lag behind even the much reduced programmes which are now being suggested, partly because electricity consumption will be increasing rather slowly so that electric utilities will be happy to delay their plans and partly because of continued public opposition. At present the non-communist world's nuclear capacity is approximately 125 GW and the plans appear to be to raise that capacity to some 310 GW by 1990.[5] Although plant which could be in service by 1990 is presumably all on order, it is probably optimistic to assume that it will all actually be in service by then. One certainly cannot preclude a really serious setback to nuclear programmes because of an accident somewhere in the world.

Coal offers more hope. As we have seen (Table 1) there are already signs of a revival which is likely to continue given the probable trend of oil prices and given the natural desire of many countries to diversify sources of fuel supply. International trade in coal, especially steam coal, should, therefore, expand very considerably. Although many countries have coal deposits, those with relatively large reserves which lie near the surface and can be mined cheaply are comparatively few. The United States, Australia and South Africa will probably become substantial exporters of steam coal, though, as all the reports on world trade in coal have told us,[6] the rate of growth of steam coal trade depends on the speed at which the necessary transport and handling infrastructure is developed: a particular bottleneck in the near future seems likely to be the lack of port facilities. However, internationally-traded coal is at present much cheaper than fuel oil and, given the competitive structure of the world coal market, there seems a good chance that coal export prices will in the long run rise much less than crude oil export prices. It is less likely that the deep-mining areas of Western Europe will be able to provide coal at competitive prices[7] so that, even in countries with indigenous

coal industries, there should be a market for imported coal if governments will allow it to appear. It seems a reasonable expectation that in the 1980s coal's share of the world energy market will continue to rise after its long period of decline and that the speed of the revival in coal generally will depend primarily on the speed at which constraints on the world steam coal trade are lifted.

As regards natural gas, the period of rapidly growing consumption is probably now over. During the 1980s there may be more LNG projects and a number of large new gas pipelines may enter service - for example, the proposed Soviet line from north west Siberia into Western Europe and the even longer Alaska gas line into the United States. Possibly even the British and Norwegian gas gathering lines will be built before 1990! Nevertheless, we must expect natural gas prices to be tending towards c.i.f. parity with crude oil in the near future: it seems indeed that in a recent contract with Distrigaz in Belgium, Algeria has negotiated a 'catch-up mechanism' which will achieve crude parity before long from an initial f.o.b. price of $4.80 per million Btu.[8] From the consumers' viewpoint, natural gas may by the mid 1980s offer little price advantage over oil products except where its price is held down by governments. The other advantages of natural gas - for instance, cleanliness and absence of storage - may well allow some expansion in the market but most probably it will be gradual.

4. THE PROSPECTS FOR OIL - TO 1980 AND BEYOND

To conclude, we can try to be more specific about the prospects for oil. Obviously any conclusions are bound to be rather speculative because we need to guess not just what might happen to economic growth and relative fuel prices but also what price expectations consumers are likely to form. It is on the basis of those expectations that decisions will be made to invest in energy conservation or fuel-switching projects.

The general trend during the 1980s will most probably be that fuel consumers, because of a rise (actual and anticipated) in the price of oil relative to other fuels, will move away from oil. To some extent electrical utilities will substitute nuclear power for both oil and coal, though one must be sceptical about the chances of achievement of present nuclear programmes. To a limited extent, natural gas will continue to supplant oil where it still has some price advantage or where its other qualities are particularly valued. Strip-mined coal from North America, Australia and South Africa will probably also displace oil. For a while the price of coal in international trade may rise because of bottlenecks in the coal chain but there should be sufficient competition to keep the price well below crude oil; by the second half of the 1980s the bottlenecks should be eased.

As a consequence of substitution by other fuels, oil's share of world energy will probably continue to fall in the 1980s, as it has done since 1973. On the UN measurement conventions, oil now has about 43 per cent of the world energy market compared with 46 per cent in 1973. We should probably anticipate a decline to below 40 per cent by 1990 which, in a slowly growing energy market, would probably mean world oil consumption of the same order of magnitude as in 1980 - around 3000 million tonnes or 60-65 million barrels per day.

Some recent oil company forecasts may turn out to be on the high side. Exxon's December 1980 World Energy Outlook projected 1990 world oil demand as 70 million b/d, though that was based on a 3 per cent a year growth in world GNP which the company might not assume now. A Shell estimate of December 1980 gave 1990 world oil consumption as 65 million b/d which is close to what we have suggested. Conoco's World Energy Outlook, also published in December 1980, is also fairly close: Conoco have a 1990 figure of just over 52 million b/d for non communist world oil consumption which would seem to imply world oil consumption of at least 65 million b/d.

In saying that oil's market share will probably decline in the 1980s, we should not write off oil as an energy source. On the contrary, there is probably a long future for oil. The chances are that substantial reserves are yet to be discovered and, in terms of resources, there is no reason why a production level around 60 million b/d should not be sustained for many years into the future. Although, because of various uncertainties, (particularly in the Middle East) oil prices may well rise in steps for some years and consequently consumers' price expectations will make them shift away from oil, the trend away from oil is unlikely to be smooth. In the 1980s we shall quite possibly see further periods of falling real oil prices like the first half of 1981 when those consumers who can readily switch fuels (for instance, big electrical utilities like the CEGB) will burn more oil. Spurts of economic growth may also increase oil consumption temporarily. More important, during the very long run shift away from oil into next century, it is quite conceivable that there will be periods when consumers move back. For example, as suggested earlier, the adverse reactions of consumers to oil price increases in the 1980s may bring a change in producers' price expectations. Oil producers might come to believe that real prices are likely to rise only slowly or even fall; in such circumstances they would have an incentive to increase output, thus tending to depress prices and to stimulate consumption for a time.

So the future trend of oil consumption is likely to be more erratic than its past trend. Up to 1973 the rate of growth of world oil consumption was fairly steady at 7 to 8 per cent per annum as oil substituted for coal because of its falling relative price. Since 1973 oil's growth rate has dropped to 1 per cent a year as market forces have resulted in a switch back to other fuels. From now on we may for many years have substantial fluctuations in oil consumption around a level not too different from that in 1980.

However, we should not pretend we can be too precise about such an uncertain future. We are, after all, only a few years into what appears to be a long run transition away from a world fuelled mainly by oil and gas. As yet we cannot even see clearly what the replacements will be. It seems likely that well into the next century we shall still find that the three fossil fuels are the world's predominant sources of energy, though 'renewables' may then be quite significant. Possibly fusion power will eventually become a substantial energy source but one can be less confident about the future of nuclear fission; it may never play the major role in world energy which oil and coal do now.

TABLE 1

WORLD CONSUMPTION OF COMMERCIAL ENERGY 1950-1980

	1950		1973		1980		AVERAGE ANNUAL COMPOUND RATES OF INCREASE (%)	
	M.T.C.E.*	% OF TOTAL	M.T.C.E.	% OF TOTAL	M.T.C.E.	% OF TOTAL	1950-73	1973-80
SOLID FUELS	1534	61	2452	32	2991	34	2.1	2.9
LIQUID FUELS	672	27	3578	46	3855	43	7.5	1.1
NATURAL GAS	244	10	1517	20	1789	20	8.3	2.4
HYDRO-NUCLEAR	42	2	187	2	271	3	6.7	5.4
TOTAL	2492	100	7734	100	8906	100	5.0	2.0

* MILLION TONNES COAL EQUIVALENT

SOURCES : UNITED NATIONS: WORLD ENERGY SUPPLIES, 1950-74 AND 1973-78

BP STATISTICAL REVIEW OF THE WORLD OIL INDUSTRY 1979;

1980 FIGURES ARE ESTIMATED FROM PRELIMINARY RESULTS FOR THE BP STATISTICAL REVIEW 1980

TABLE 2

CRUDE OIL PRICES, 1970-1980

LIGHT ARABIAN CRUDE OIL, $ PER BARREL,
F.O.B., PERSIAN GULF

	POSTED PRICE	STATE SALES PRICE
OCTOBER 1970	1.80	
SEPTEMBER 1973	3.00	
OCTOBER 1973	5.12	
JANUARY 1974	11.65	
NOVEMBER 1974	11.25	10.46
OCTOBER 1975	12.38	11.51
JANUARY 1977	-	12.09
JULY 1977	-	12.70
JANUARY 1979	-	13.34
APRIL 1979	-	14.55
JUNE 1979	-	18.00
NOVEMBER 1979	-	24.00
JANUARY 1980	-	26.00
APRIL 1980	-	28.00
AUGUST 1980	-	30.00
NOVEMBER 1980	-	32.00

SOURCES: COLIN ROBINSON AND JON MORGAN: NORTH SEA OIL IN THE FUTURE, MACMILLAN, 1978 AND THE PETROLEUM ECONOMIST, VARIOUS ISSUES

TABLE 3

WORLD CONSUMPTION OF COMMERCIAL ENERGY 1979 AND 1980

	1979	1980	% CHANGE 1980-1979
	MILLION TONNES COAL EQUIVALENT		
SOLID FUEL	2947	2991	+ 1.5
LIQUID FUELS	4000	3855	- 3.6
NATURAL GAS	1757	1789	+ 1.8
HYDRO	190	193	+ 1.6
NUCLEAR	72	78	+ 8.3
TOTAL	8966	8906	- 0.7

SOURCE: ESTIMATED FROM UN WORLD ENERGY SUPPLIES, 1973-78, BP STATISTICAL REVIEW OF THE WORLD OIL INDUSTRY 1979 AND PRELIMINARY RESULTS FOR BP STATISTICAL REVIEW 1980

TABLE 4

EEC PRIMARY ENERGY CONSUMPTION

1979 AND 1980

MILLION TONNES OIL EQUIVALENT

	1979	1980	% CHANGE* 1980-1979
COAL AND LIGNITE	220	221	+ 0.5
OIL	525	480	- 8.7
NATURAL GAS	173	168	- 2.5
NUCLEAR	37	43	+14.5
HYDRO AND OTHER	15	15	- 0.7
TOTAL	970	927	- 4.5

* CALCULATED FROM FIGURES BEFORE ROUNDING

SOURCE: F.T. EUROPEAN ENERGY REPORT, 15 MAY 1981

TABLE 5

UK PRIMARY ENERGY CONSUMPTION

1979 AND 1980

	MILLION TONNES COAL EQUIVALENT 1979	1980	% CHANGE 1980-1979*
COAL	130	122	- 6.2
OIL	139	121	-12.7
NATURAL GAS	71	71	- 1.0
HYDRO	2	2	- 8.2
NUCLEAR	14	13	- 3.1
TOTAL	356	329	- 7.6

* CALCULATED FROM FIGURES BEFORE ROUNDING

SOURCE : DEPARTMENT OF ENERGY, ENERGY TRENDS, APRIL 1981

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PART 2

OPEC AFTER GENEVA 1981: AN ASSESSMENT

Dr. Ahmed El Mokadem

1. AN OPENING REMARK

OPEC is the most exaggerated organization of modern times, if not of all times. Though I hate to quote a Communist, Mao Tse Tung's description of the Soviet Union as a "Paper-Tiger" is quite applicable to the case of "OPEC". "OPEC" is a Paper-Tiger ..." It is a creation of the mass-media with the usual attraction of wealth and glamour. This exaggerated picture is based primarily on the 1973/74 events which have a lot to do with a surprising and potentially dangerous war.

2. A GENERAL STATEMENT

Statement 1

OPEC after Geneva: Is the same as OPEC before; Is the same since January 1979; and, only slightly different from OPEC of the 1974-78 period. In other words, OPEC has not changed since late 1978, and the change compared with the previous period has been really minor, being the difference between: "Insignificant" and "Non-Existing".

Statement 2

OPEC did not, does not and is not likely to monopolize or cartelize the world oil market. Moreover, OPEC did not, does not and is not likely to stabilize or destabilize the oil market. As an organization it has no influence on the supply of, or the demand for, oil. Neither does it influence: exploration; production; marketing; transportation; refining of crude; or disposal of products.

Statement 3

OPEC, as an organization, has never had: 1) an overall pricing structure; 2) a production policy of any kind; 3) a co-ordinated marketing policy; 4) a co-ordinated downstream activity; 5) a co-ordinated energy investment policy; 6) a co-ordinated conservation policy; 7) a side-payments policy; 8) a strong administrative structure. Not only that, but "the probability of OPEC achieving a significant success in any of the above areas is remote."

3. THE ROLE OF OPEC 1974-1981 : SUMMARY

Let me first divide the period into sub-periods and provide general characteristics.

1974-1978: OPEC's role was insignificant. There was a perception of market leadership and an appearance of unity.

1979-August 1980: OPEC's role non-existant. Its leadership was seriously challenged and a disappearance of the appearance of unity occurred.

September 1980-May 1981: OPEC's role remains non-existant. Its leadership was partially restored though not fully recognized. Picture of disarray and seeds of conflict.

The 1981 Geneva Conference: The disarray is frozen. A so-called production policy is agreed but the split is polarized. The Gulf Council is created with the potential of by-passing OPEC.

3.1 The 1974-1978 Period

This period begins after the Tehran meeting in December 1973 with marker price at $10.84 (140% increase) and ends by the Abu Dhabi meeting of December 1978 (average 10% in four stages reaching $14.542 by December 1979).

A. OPEC' role "insignificant".

OPEC's decisions on pricing were, in effect, non-decisions.

1) Only twice did they agree on positive decisions: 10% September 1975, and average 10% December 1978 for 1979.

2) Even the 1975 decision was followed by discounting then a split in December 1976, was followed by more discounting.

3) The December 1978 decision was never implemented due to the Iranian revolution, and a free-for-all situation followed.

B. OPEC never had an overall pricing structure; not even in theory.

1) The December 1973 system of constant basic gravity differentials (BGD) defied the object of preventing substitution between individual OPEC crudes. Correct BGD should be variable, according to the following formula:

$$BGD_C = \left[BGD_O - 0.00082\ (1+i)(R_O-R) + \beta\right]$$

where

R = Basic Freight Rate (Intascale)

i = Average Freight Rate (Intascale)

β = Suez Canal Toll

BGD_C = Correct BGD BGD_O = OPEC BGD

2) Attempts to apply the Algerian method proved impractical

3) Fixing differentials was left to members e.g. Kuwait changed its price from $12.32 to $12.22 in 1977 in response to market circumstances though OPEC differentials remained unchanged and the marker remained at $12.70.

C. OPEC never led the market but always dragged their feet.

1) There have been long lags between decisions, for example: 21 months Tehran - Vienna, 15 months Vienna - Doha, and 18 months Stockholm - Abu Dhabi.

2) Quick response required at least strong central administration. This has not been the case since OPEC's administration has been kept delibrately weak.

Perception of Leadership

From January 1974 to December 1977 there was a 'perception' among members that Saudi Arabia was capable of exercising leadership for the following reasons:

1) Saudi Arabia was trying to keep price lower than others, the task of leadership would have been impossible had Saudi Arabia wanted higher prices.

2) The belief that Saudi Arabia could enforce its policy since its capacity to produce was estimated at 12 MB/D minimum.

3) In 1976 when its leadership was challenged, Saudi Arabia was able to make refusal of price increases effective by increasing output by 21% compared with 1975.

4) Militant members were convinced that for political reasons Iran will back up Saudi Arabia if necessary.

However, Saudi Arabia's leadership behaviour did not conform with either:

1) The price leadership cartel model which operates on the criteria: reduce output in weak market and vice versa. The opposite was true and Saudi Arabia output was 8.481 MB/D in 1974 and 9.2 MB/D in 1977 and its share was 27.6% and 29.5%, or

2) The dominant extractor model which predicts a declining share of Saudi Arabia. To the contrary, Saudi Arabia's share increased in the post-1973 period exceeding 29% in 1977.

Appearance of Unity

Despite the lack of an overall pricing structure, there was an appearance of unity for the following reasons: the perception of Saudi leadership; the fact that prices could still be ranked consistent with quality; the proportion of oil traded in spot market was relatively small (5%) with hardly any trading in spot market by OPEC members and finally, the relatively stable political environment (by Middle East standards).

3.2 The Period January 1979-May 1981

This period begins with the Iranian revolution in January 1979 and ends with the Geneva Conference in May 1981. It is divided into two sub-periods: from January 1979 to the Iran/Iraq war in August/September 1980, and from then until May 1981.

One general characteristic of the whole period is a picture of disarray and the 'non-existence of OPEC'. By this we do not mean the 'formal dissolution' of OPEC, nor its 'collapse and disintegration'. We mean a situation in which important pricing decisions were effectively made by members outside the OPEC framework, and/or every OPEC decision was broken; resulting in OPEC's role gradually decreasing, and that of the market gradually increasing. This process came about as a result of a number of factors and events as follows:

1) The 'surcharge' : a new pricing element. Due to uncertainties arising from the Iranian revolution, spot market prices started rocketing - $23 in February 1979, (official $13.335)- and the OPEC structure was unable to hold. Surcharges were imposed by members, and were meant to be temporary. The legality of the surcharges was based on OPEC's original concept of fixing floor prices. However, surcharges on top of an incoherent system of differentials meant a 'free-for-all'.

2) The 'increased importance of the spot market'. Because prices were changing so fast during 1979, oil producers everywhere started announcing prices based on information revealed by the spot market which reacts to changes faster than the OPEC organization. (Huge gap between official price of $14.55 (March 1979) and the spot price reaching $40 per barrel). For the first time OPEC members started trading openly in the spot market, which by then accounted for 15-20% of world oil output, compared with 3-5% in January 1979. At this time prices were related to spot not OPEC prices, surcharges continued, the OPEC marker ignored and a lot of oil was traded in spot market.

3) The 'weak and confused market leadership'. Saudi Arabia's leadership traditionally aimed to keep price rises as small as possible. With a drastic reduction in Iran's output (a complete shut-off for a period) and the resulting rocketing prices, Saudi Arabia was expected to increase output to compensate. However, the Saudis were taken by surprise and happened to face serious technical problems (pressure, salting, water seeping, etc..) and in particular, in the Ghawar oil field which was down to less than 50%.
In January 1979, with Iran down, they reduced their output from 10.5 to 8 MBD, then in February increased to 9.5 MBD, and in March it was back to 8.5 MBD. Such acrobatic behaviour led to two things: it caused confusion in an already charged environment, and it revealed Saudi's difficulties. As a result, Saudi Arabia was unable to enforce the Geneva Conference's decision of June 1979, and by the third quarter of 1979 a picture of disarray was obvious. Never before did crude oil differentials reflect as much heterogeneity. (Iranian Light - AL = ⊄5.50 November 1979 (15 cents in January), AL - Sahara Blend = $8.27 (less than $1.50 January)).

4) The 'last straw' : If you can't beat them, join them!!
In the approach to the Caracas Conference, the USSR had invaded Afghanistan and the spot price had risen to ⊄45. In a desperate attempt to regain lost initiative, Saudi Arabia took the unprecedented decision of pricing marker unilaterally prior to conference (from $18 to $24). This was the last straw representing a real departure from normal practice. The Conference ended with no agreement.

At this stage, prices were related to the spot market and not to OPEC. A lot of oil was being traded in spot market. The leadership was weak and confusing. The marker has been determined unilaterally. The appearance of unity had disappeared.

5) 1980 - The Year of the Beauty Contest's Decisions. Algiers, 28-32-37; Bali, 32-36-41. Towards the end of January 1980, Saudi Arabia raised the price of API 34° AL from $24 to $26 hoping to reduce world demand and reduce speculators' 'profits'. But Kuwait, U.A.E. and Iraq also raised their prices making the Saudi 'official' price of $26 a barrel the lowest price. Now approaching the Algiers Conference with a tattered pricing structure, talk about a 'long-term strategy' (LTS) sounded like a 'joke'. The outcome of the conference, in addition to obvious disagreement about LTS, was a 'joke', with the official marker price of $28, deemed marker price of $32 and Saudi's selling price of $26. Saudi Arabia argued that the pricing of AL API 34° was a function of her national sovereignty and that either <u>all</u> crudes should be priced by OPEC or <u>all</u> crudes should be priced by members. Now the Algiers conference opted for the latter, i.e. the freedom for all members including Saudi Arabia to price individually their crude. The marker had been relegated to a theoretical notional, voluntary concept with no output base to defend it. OPEC had been denied its only instrument. In addition, the dispute over the LTS marked the beginning of a serious conflict between those with huge reserves wanting to prolong the oil era and those interested in short-term maximizing of revenue.

6) The Saudi-Consumer-Competitive Fringe 'Grouping'. With the freedom to fix its price, Saudi Arabia moved with determination to ensure the maximization of the value and use of its oil over the long-term. Having solved most of their technical problems they pursued a policy of increasing output - 1980.8 (9.763), 1980.9 (9.74), 1980.10 (10.566), 1980.11 (10.465). On the other hand, higher prices and the world recession led to a continuing decline in demand (approx. 8%). With high inventories (90 days), non-OPEC output responding to higher prices (increase by more than 1 MBD), spot market prices started to fall. ⌐AL: Q.1 (38.15), Q.2 (35.70), Q.3 (34.60), NIG.L: Q.1 (41), QQ.2

(38.40), Q.3 (36.50) 7. The market was now weak and the Iran/Iraq war and the loss of 2.4 MBD (1980.10) led to only a small and temporary increase in spot prices. (AL: Q.3 (34.60), Q.4 (38.0); NIG.L: Q.3 (36.50, Q.4 (39.50)). With this background, the Bali conference resulted in another unrealistic decision*.

7) Contracts = Guaranteed bankruptcy ≠ Continuity of supply. During 1979-1980 period most OPEC members were involved in designing new contracts. The outcome in most cases was ridiculous. For example, certain new contracts negotiated at this time contained the following clauses:

Clause 3.6 (B)	Contract for API 31° with 30 days notice accept 30% API 27° otherwise ... cancel.
Clause 3.8	With 30 days notice ... process up to 25% for seller ... otherwise ... cancel.
Clause 7.1	Use national vessels for 50% otherwise ...
Clause 8	Buyer not to compete with seller on crude and products ... otherwise ...
Clause 10	Buyer accept modification by seller 15 days notice ... otherwise ...
Clause 11	Failure to lift ... pay 10% ... otherwise

Such contracts in a weak market reduced margins, adversely affected incentives to invest in upgrading facilities and aggravated the conflict between market chemistry and the composition of reserves.

* (with photographs participating in the conference)

The Geneva Conference, May 1981

The Geneva Conference took place in an atmosphere of a weak market, a price disarray, and the Saudi Government maintaining a tough stand in its quest for price reunification at a realistic level. The outcome was as expected:

1) 'Freezing the Disarray': the decision to freeze prices (disarrayed prices) did not mean the same thing to all members. To the Saudis it meant, reduce your prices to a marker of $32 per barrel and accept the LTS. To the others it meant, Saudi Arabia should increase its price to at least a marker of $36 per barrel and LTS to be discussed later. Thus the decision should be interpreted as 'the battle is not over'.

2) The 'so-called' production policy: the decision to cut production by 10 members has two aims:

   a) an attempt to 'counteract' the Saudi policy

   b) an attempt to 'influence' the 'perception in the oil market' of OPEC beginning to act as a cartel.

   Both aims have so far failed and are not likely to succeed. On the one hand the proposed reduction was 1.084 MB/D while Saudi's extra production is 2.3 MB/D plus an estimated glut of 2-3 MB/D, excluding proposed increases by Iran (to 3.3 MB/D) and Iraq (to 3.00 MB/D). On the other hand, the attempt to influence market perceptions which, suprisingly, worked on the 'Economist' (29.5.81) has had no effect on spot prices at all. The downward trend thus continues.

3) Polarization of the split: the two decisions taken together (the freeze and the cut) imply that forces within OPEC have been polarized into two camps ready for a straight fight. Interestingly enough the 'battlefield' is 'the market'. (Kuwait's position is very odd!! It is similar to Saudi Arabia in terms of high levels of reserves and low absorptive capacity and yet does not follow the moderate pricing strategy which we might expect on economic grounds.)

The Future

1) OPEC's troubles are not over yet! Worse is still to come in the form of:

   a) accommodating Iraq and Iran;
   b) the question of substitutes;
   c) the Gulf Council ... another decision centre.

2) I put my money on Saudi Arabia remaining the market leader. Here a tremendous increase in capacity can be expected by the mid-eighties.

PART 3

THE ROLE OF SAUDI ARABIA IN OPEC

Dr. Paul Stevens

The objective of this part of the paper is to attempt to outline what Saudi Arabia is trying to achieve, how they are going about it and what their probability is of succeeding. Very simply, their objective is to restore the status quo before the oil market changes which occurred in 1978-79. This meant regaining control over oil pricing in the OPEC context. The pricing system between 1974-78 worked in the following way [1]. Saudi Arabia set the price of its marker crude (Arabian Light) according to its own motives. Although this price was 'discussed' in the OPEC meetings it was ultimately a Saudi decision although at times there may have been some flexibility between very narrow limits. At the end of the meeting it was announced to the world that 'OPEC had set the price of oil'. Having set the price of the marker - a Saudi decision - there existed a notional formula by which the other crudes could be priced. This formula which was a hangover from the days of posted prices was generally unworkable and in any case ignored. The other producers merely charged prices which the market would bear, based upon the chemistry of the blend in relation to the price of the product barrel. If they tried to overprice, then the companies simply refused to lift as they were allowed to do so by the terms of the contract. They did so in the knowledge that if this left them short of crude then they could make up the deficiency by appealing to Saudi Arabia who would supply them from their excess capacity.

The great advantage of this system was that Saudi Arabia in practice did not have to use her excess capacity. Merely the threat was sufficient to keep the market in line. Thus, Saudi Arabia was able to impose pricing moderation with the result that there was a significant decline in the real price of crude in the period.

TABLE 6

OPEC CONFERENCES

		PRICE DECISION
KUWAIT	Oct 73	$05.11
TEHRAN	Dec 73	$10.84
VIENNA	Sep 75	$11.46
DOHA	Dec 76	Saudi Arabia + UAE 5%, Others 10% + 5% later
STOCKHOLM	July 77	$12.70 Saudi Arabia + UAE 5%, Others no 5%
ABU DHABI	Dec 78	$13.335, increasing to $13.843, $14.161, $14.542 (Aver.10%)
GENEVA	Mar 79	$14.55 + Prem
GENEVA	Jun 79	$18 + $2 Surcharge - $23.50 Maximum
CARACAS	Dec 79	$24 (Agreed before meeting)
ALGIERS	June 80	$28 (Marker) - $32 (Deemed marker) - $37 (Maximum)
BAGHDAD	Nov 80	Cancelled
BALI	Dec 80	$32 (Marker) - $36 (Deemed marker) - $41 (Maximum)
GENEVA	May 81	Decision to freeze prices + Production cut by all members except Saudi Arabia (Iran and Iraq not affected)

The system came into question during the period 1977-78 when rumours began to circulate to the effect that the fabled excess capacity of Saudi Arabia did not in fact exist. This was alleged to have come about as a result of technical problems in the fields. These 'rumours' seemed to gain credence when Saudi Arabia failed to impose its will upon OPEC after the price split which occurred at the Doha conference in December 1976. The system finally collapsed in 1979 when Iranian production went down. Saudi Arabia stepped in to help fill the gap, which meant that the excess productive capacity really had disappeared. With the excess capacity gone, pricing moderation also disappeared from the market with familiar results although Saudi Arabia fought a rearguard action to try to offset some of the worst effects. Since then Saudi Arabia has been trying to regain control of the situation.

In order to understand why Saudi Arabia has been trying to regain control, it is necessary to understand something of the motivations behind the actions of Saudi Arabia. Saudi policy, whether it concerns oil, foreign policy or development has two prime objectives.[2] The first is to maintain and strengthen the security and stability of Saudi Arabia i.e. the position of the House of Saud. The second is to increase the voice of Saudi Arabia in the world in general and the Arab world in particular. Given this background it is possible to concentrate on the 'oily' sub-objectives with respect to pricing moderation.

Several sets of motives underly the desire for price moderation. The first concerns Saudi Arabia's production-reserve ratio. On the basis of the official reserves in 1977 and given a production level of 8.5 million barrels per day (b.d.), i.e. the 'official' conservation level, Saudi Arabia has a production life of at least fifty years. In reality given the very limited amount of oil exploration carried out over the last decade, this time period is probably a gross understatement since the real reserves are likely to be very much larger than the official figure. With an indigenous population of less than five million, the importance

of Saudi Arabia in the world stems from the crucial importance of oil in the world coupled with Saudi Arabia's export capacity. The official government view in Saudi Arabia may be described as the 'noble oil argument'. In other words, oil is too precious to burn as a fuel and therefore oil substitutes in the energy field should be developed as soon as possible. The most effective way to achieve this substitution is by pushing up the price of oil and allowing the market mechanism to do the rest. However, it is not being too cynical to ask the question as to whether the Saudis would really wish to see the world importance of oil diminish, and with it their role in that world. Without the importance of oil, on the basis of population, Saudi Arabia would rank in the world power league along with Rwanda and Upper Volta. Thus Saudi Arabia is keen to price in such a way that the substitution effect is not too drastic.

A second set of reasons for price moderation concerns the health of the industrial consuming countries. Saudi Arabia would wish to see that health to be as robust as possible for a variety of reasons.

First, clearly someone has got to buy the oil and if the industrial consumers face a heavy recession, then oil demand falls accordingly. In the short term, given Saudi Arabia's domestic revenue requirements, this would not be a problem but in the longer term it could present difficulties. Second, the government of Saudi Arabia has a phobic hatred of 'communist/leftist' regimes. A serious deterioration in the economic health of the industrial consumers encourages the development and effectiveness of such groups. Third, the Saudis have a very realistic assessment of what could happen to the government in the event of a very 'non-moderate' policy being followed. The fate of Dr. Mossadegh and the Iranian nationalization, although some thirty years ago, and the more recent experiences of Chile still loom large in the analytical toolbox of political thinkers in the Third World. Finally, the Saudis view the West as friends and therefore feel it normal to behave in a friendly manner. It is very easy to be

cynical about such an attitude in a world of real politik, but there is little doubt that such thinking is very important among elements of the Saudi government.

Other reasons could be cited such as the vested interest in the West given to the Saudis by virtue of their overseas financial holdings, but the motives all lead in substantially the same direction, namely a policy of moderation in oil pricing. To achieve this involves regaining control of pricing which in turn means being able to restore the excess producing capacity which gave them the control in the earlier period.

In October 1977, it was estimated that Saudi Arabia's handling capacity for oil was some 12.5 million b.d. in terms of pipelines, terminal facilities and gas oil separators although not in gas using facilities.[3] But, in order to bring the fields into line, it was estimated that some three years drilling was required to bring field capacity to that level. Therefore, at that time, the government authorised the Arabian American Oil Company (ARAMCO) to increase the field capacity to 14 million b.d. by 1982 although at the time ARAMCO was pushing for 16 million b.d. In March 1978, the government reduced the target to 13.5 million b.d. but early in 1980 there were indications that the expansion plan was well ahead of schedule. This was mainly because of capital availability as a result of ARAMCO's windfall profits which arose because Saudi Arabia consistently priced well below the market rate. This was important because the Saudi Arabian government had insisted upon the self-financing of the plans.

At present, a variety of figures are being bandied around as to the possible production levels. Vaguely 'official' figures suggest a maximum possible capacity of 14 million b.d. with a maximum sustainable capacity of 12 million b.d. Although these figures seem to be rather optimistic many of the technical problems which arose from the age of the fields have now been overcome. For example, a major problem was saline encroachment in the fields but considerable expansion of the desalting

facilities at several places has overcome that particular difficulty.

What then is the probability that Saudi Arabia will succeed in regaining control? Since the question concerns the shape and position of the Saudi crude oil supply curve it would be helpful to think in terms of 'ability' and 'willingness' to supply.

The ability of Saudi Arabia to supply or threaten to supply sufficient oil to regain control looks good on paper. At present they have certainly regained their excess capacity although this is in part due to both a shift in the demand curve as a result of the recession and a movement up the demand curve as a result of a response to the higher price. Indeed this excess capacity is probably understated since it seems probable that part of the present Saudi production is in effect 'keeping the bed warm' for Iraq. Thus when Iraq comes back on stream significantly, Saudi production will drop to allow entry thereby increasing the unused capacity and hence the size of the 'big stick'. In addition, the nature of oil buying contracts has changed over the last couple of years which to some extent will make it easier for the companies to reduce lifting in the event of price pressure out of line with market reality. In particular, this will be the result of much more crude being sold on shorter term contracts. At the same time, however, this will make the market much more jumpy and less effective as a result of anticipated problems over the logistics of moving the crude, an activity previously undertaken by the companies within their integrated structure.

In terms of the 'willingness' of Saudi Arabia to supply, the situation is very much less promising. Two elements can be mentioned briefly. The first concerns revenue disposal and the second political pressures.

In the Third Five Year Plan (1980-85) it is claimed that the financial requirements of the plan can be met with exports of 'slightly under 5.3 million b.d.' Unfortunately the plan does

not make explicit the oil price on which this calculation is based but using the expenditure figures it seems probable that $24 per barrel was used. At $32 per barrel a rough calculation then gives an export requirement of less than 4 million b.d. However, there must be some scepticism over the viability of the plan. The plan freezes the number of foreign workers during the period of the plan at its 1979 level. This is not derived from the use of any production functions but is merely an administrative decision taken because of the concern over the impact of more foreign labour on the political and social structure of the Kingdom.

A more detailed study carried out by the Korean Development Institute [4] on behalf of the government using sectoral production functions to project labour requirements concludes that Saudi Arabia faces three alternative choices over the next decade. The first is to increase the number of foreign workers quite considerably to offset the anticipated labour shortage. This has already been ruled out as unacceptable by the Saudi Government. The second alternative is very substantially to increase the participation of women in the economy from its present level of less than 5 per cent. Again this is not a viable option, partly because it would be opposed by many senior government officials but also because of the lead time for training and assimilation. This then leaves the third option which is effectively very low economic growth.

This report, which has been taken very seriously in government circles, therefore implies that unless there is an horrendous amount of arms buying, Saudi surplus revenues will be very large. This implies in turn heavy overseas investment. While the international financial system can almost certainly cope, there is strong opposition among certain elements in the Saudi government to place yet more revenues abroad to be whittled away by inflation, currency devaluations and even possible sequestration.

The second factor which may reduce Saudi willingness to maintain high production to regain pricing control is political pressure from fellow OPEC members. Every government has its economic sacred cows. In Britain during the fifties and early sixties it was the Sterling exchange rate. In West Germany it has been the inflation rate. In the OPEC countries at present it is the official oil price. To be seen to reduce these prices is regarded as an admission of failure in the same way as a Sterling devaluation was. No clearer proof of this is needed than the recent developments in Mexico (although Mexico is not an OPEC country). The essence of the Saudi policy is to slaughter these sacred cows and not surprisingly there is considerable opposition. This is being translated into very heavy pressure on the Saudi government to desist.

The stability of the Saudi Arabian government is a source of endless discussion both inside and outside the Kingdom. Add to this the general uncertainty over the Arab-Israeli conflict and you have a great deal of steam clouding the crystal ball. As things stand, the Saudis appear to be regaining control. At a de facto level they already have it and it is likely that in the near future this control will gain a de jure respectability as a result of some form of agreement. However, the situation could change radically and - here is the problem - if it does so, it will happen almost overnight.

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